



Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

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BIOLOGICAL EVALUATION

FOR

SOUNDVIEW BUSINESS CAMPUS **EVERETT, WA**

Wetland Resources, Inc. Project #14109

US Army Corps of Engineers Reference Number: NWS-2014-838

Prepared By

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1.0 INTRODUCTION

AmericanWest Bank and Veritas Development, Inc., hereafter referred to as the applicant, is proposing wetland impacts within Category II and III wetlands to accommodate a new industrial manufacturing business park and associated infrastructure on the 39.45-acre parcel located northwest of the terminus of 36th Avenue West, in the city of Everett, Washington (a portion of Section 3, Township 28N, Range 4E, W.M.).

To accommodate this development, the applicant is proposing wetland impacts within two Category II and two Category III wetlands (Washington Department of Ecology and City of Everett classifications) within the study area, totaling 0.25 acres (10,823 square feet) of impact. The subject wetlands are located in WRIA 7 (Snohomish River watershed). There are no streams on-site, however an on-site wetland outlets to Edgewater Creek to the northeast. Runoff from the western portion of the site flows to Japanese Gulch Creek to the west. Both of these streams drain to Possession Sound within a half mile of the project site.

1.1 PROJECT INFORMATION

| | |
|---------------------------|---|
| Project Name: | Soundview Business Campus |
| State: | Washington |
| County: | Snohomish |
| Location: | Portion of Section 3, Township 28N, Range 4E <i>Latitude:</i> 47.944579° <i>Longitude:</i> -122.283583° Parcel Number: 280403-002-001-00 |
| Project Proponent: | AmericanWest Bank and Veritas Development, Inc. c/o Bob Johnson Attn: Randy Previs 7016 15 th Avenue NW 22819 Woodway Park Rd Seattle, WA 98117 Woodway, WA 98020 |
| Proponent Contact: | Bob Johnson and Randy Previs Phone: 206-226-5900 206.817.6357 |
| Preparer: | Wetland Resources, Inc. 9505 19th Ave. SE, Suite 106 Everett, WA 98208 |
| Preparer Contact: | John Laufenberg 425-337-3174 |

2.0 STUDY PURPOSE

Wetland Resources, Inc. has prepared this Biological Evaluation (BE) on behalf of the applicant to facilitate review of the proposed action as required by Section 7(c) of the Endangered Species Act (ESA). This BE has been prepared to facilitate coordination between the United States Army Corps of Engineers (USACE), the National Oceanic and Atmospheric Administration National Marine Fisheries Division (NOAA Fisheries), and United States Fish and Wildlife Service (USFWS). NOAA Fisheries and the USFWS are jointly referred to as the Services within this assessment. Information provided by NOAA Fisheries (2005) and USFWS (2010) (Appendix B, *ESA Species and EFH Information*) indicate that the project will occur within the range of the following species listed in Table 1.

Table 2. Federally Listed Species in the project vicinity.

| Common Name | Scientific Name | Federal Status | WA State Status | Regulatory Agency | Critical Habitat Present |
|--|---------------------------------|-----------------------|------------------------|--------------------------|---------------------------------|
| Puget Sound Evolutionary Significant Unit (ESU) Chinook Salmon | <i>Oncorhynchus tshawytscha</i> | Threatened | Candidate | NMFS | No |
| Puget Sound Distinct Population Segment (DPS) Steelhead | <i>O. mykiss</i> | Threatened | None | NMFS | Proposed 2013; None designated |
| Coastal Puget Sound DPS Bull Trout | <i>Salvelinus confluentus</i> | Threatened | Candidate | USFWS | No |
| Puget Sound/Strait of Georgia ESU Coho Salmon | <i>O. kisutch</i> | Species of Concern | None | NMFS | None designated |

3.0 PROJECT PURPOSE AND OBJECTIVES

The purpose of this project is to permit a commercial development. The development will require filling of wetlands. Multiple site visits have been conducted to assess habitat and site conditions.

The objectives of this report are:

- To review available information on species within the action area that may be affected by the project.
- To discuss the impacts and effects of this project on species and habitat within the action area.
- To discuss permit conditions and conservation measures.
- To provide recommendations regarding effect determinations.

4.0 PROPOSED ACTION AND BASELINE CONDITIONS

4.1 SETTING DESCRIPTION

The subject property is 39.45 acres in size, located northwest of the terminus of 36th Avenue West, in the city of Everett, Washington. It is accessed via Seaway Boulevard and is less than a mile north of the Boeing Everett plant. The Public Land Survey System identifies the site as a portion of Section 3, Township 28N, Range 4E, W.M.

The site is undeveloped, comprised of a mixed, historically disturbed forest. Most of the site was clear-cut in 2006. It is bound to the south and west by mature forest. Commercial and single-family residential development lies to the east, with single-family residential development to the north. The larger portion of the property displays a general northern aspect. The southwestern portion of the site is underlain by a steep west aspect slope, sloping down toward the Burlington Northern/Boeing railroad spur and Japanese Gulch Creek. The southeastern corner of the site has a west aspect, draining toward Edgewater Creek. The property is zoned by the City of Everett as M-1, Office and Industrial Park.

Two Category II wetlands and two Category III wetlands are located on the subject property. One small Category III wetland (D) is located in the central portion of the site. Another small Category III wetland (B) and two small Category II wetlands (A and C) are located in the southeastern corner of the site. The on-site wetlands are described in greater detail in the *Critical Area Study for Soundview Business Center*, included as Appendix C of this report.

No streams are located on site. Japanese Gulch Creek (Type F) lies off-site to the west and Edgewater Creek (Type S) is located off-site to the northeast. Both of these streams flow directly to Possession Sound. There is intermittent hydrologic connectivity between Wetland A and

Edgewater Creek via stormwater conveyance. Additionally, hydrology from the western portion of the site flows down to Japanese Gulch Creek to the west. This creek is located within the city limits of Mukilteo, just outside of the city limits of Everett. Under Mukilteo Municipal Code, Japanese Gulch Creek is classified as a Type 3 stream (150' buffer) north of 5th Street and a Type 4 stream (50-75' buffer) south of 5th Street. The closest point between the project site and Japanese Gulch Creek is greater than 500 feet. The lower reach of Edgewater Creek (north of Debralon Lane) is classified as a Type S stream and receives up to a 200 foot buffer per EMC 37.170(3) and Everett's Shoreline Master Program (SMP) regulations. This reach is over 700 feet from the project site. The upper reach of Edgewater Creek (south of Debralon Lane) is classified as a Type N stream and receives a 50-75' buffer per EMC 31.170(3). This reach is greater than 200 feet from the project site. The salmonid species included in Table 1 are present in the lower reach of Japanese Gulch Creek and in the lower reach of Edgewater Creek.

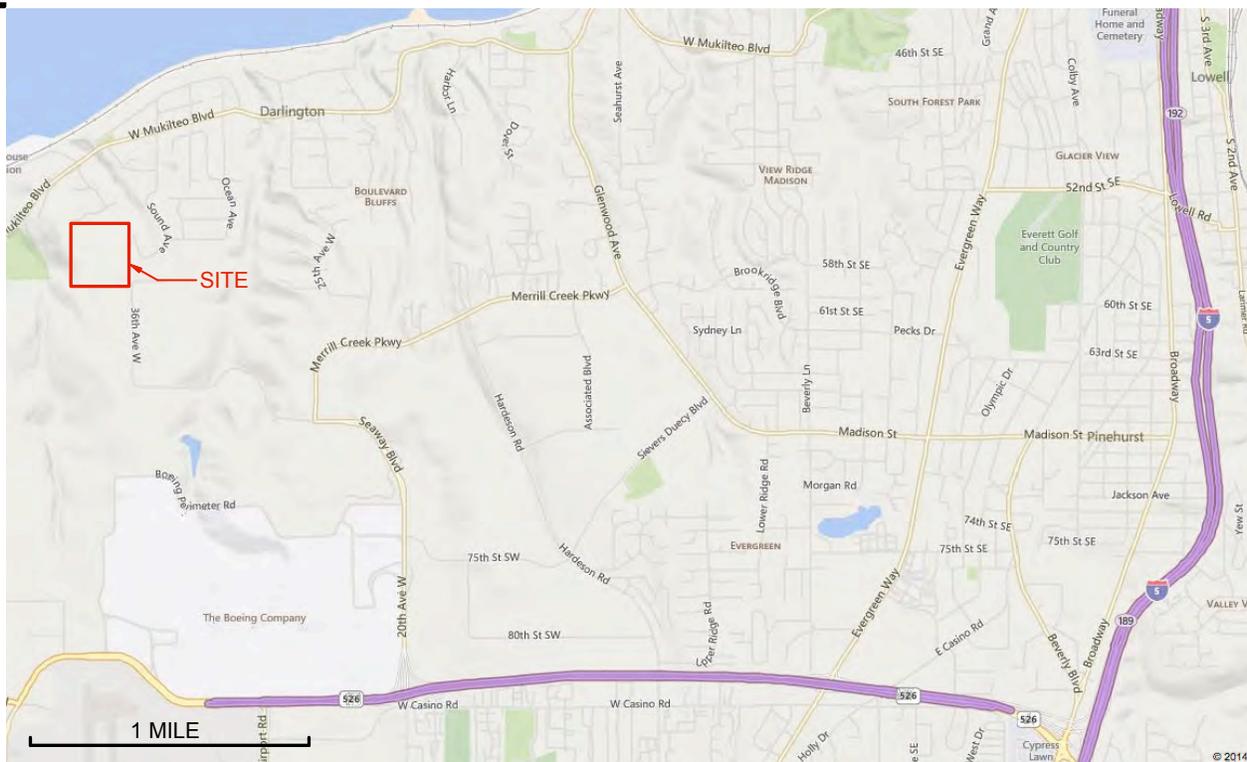


Figure 1: Vicinity map showing location of project site.

4.2 ACTION AREA

The ESA requires that all potential effects on listed and proposed endangered species be evaluated in relation to the complete range of area influenced by the proposed action (the action area; 50CFR Part 402.02). The action area covers the complete extent where measurable direct and indirect effects resulting from the proposed action are foreseeable and are reasonably certain to occur (USFWS, 1998 and NOAA Fisheries, 1996).

The proposed action includes wetland impacts for the proposed development. The terrestrial action area includes all suitable habitats for a radius of one mile from the project site. The aquatic action area includes the on-site wetlands and adjacent areas within one-quarter mile.

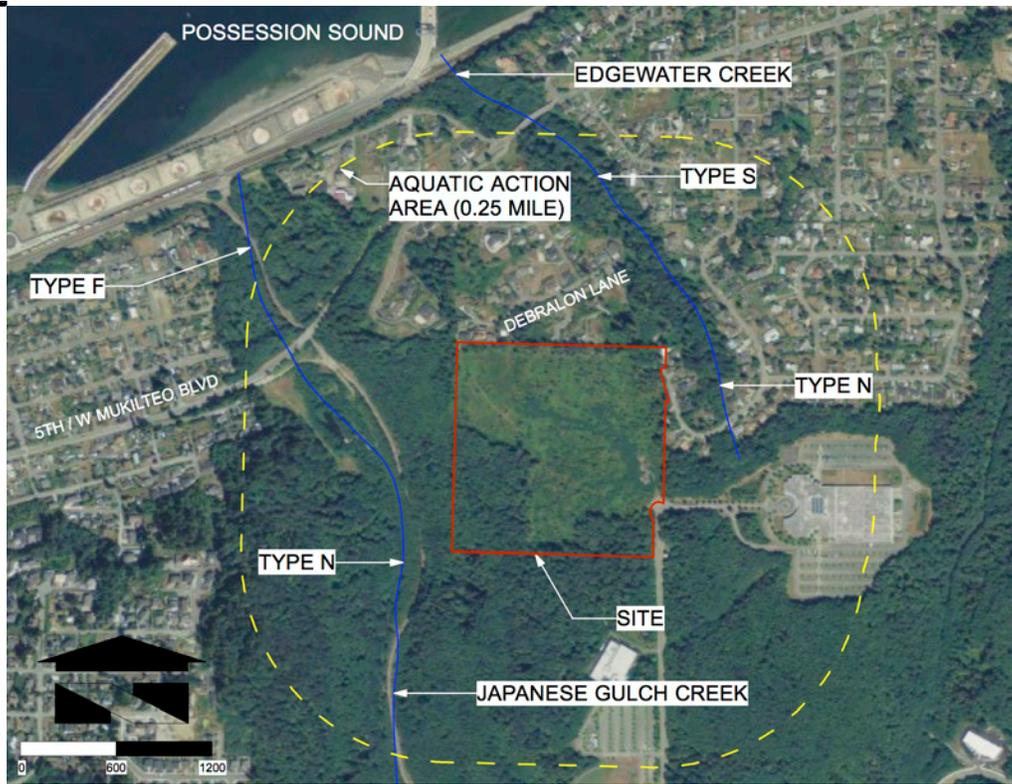


Figure 2: Aquatic Action Area Soundview Business Center.

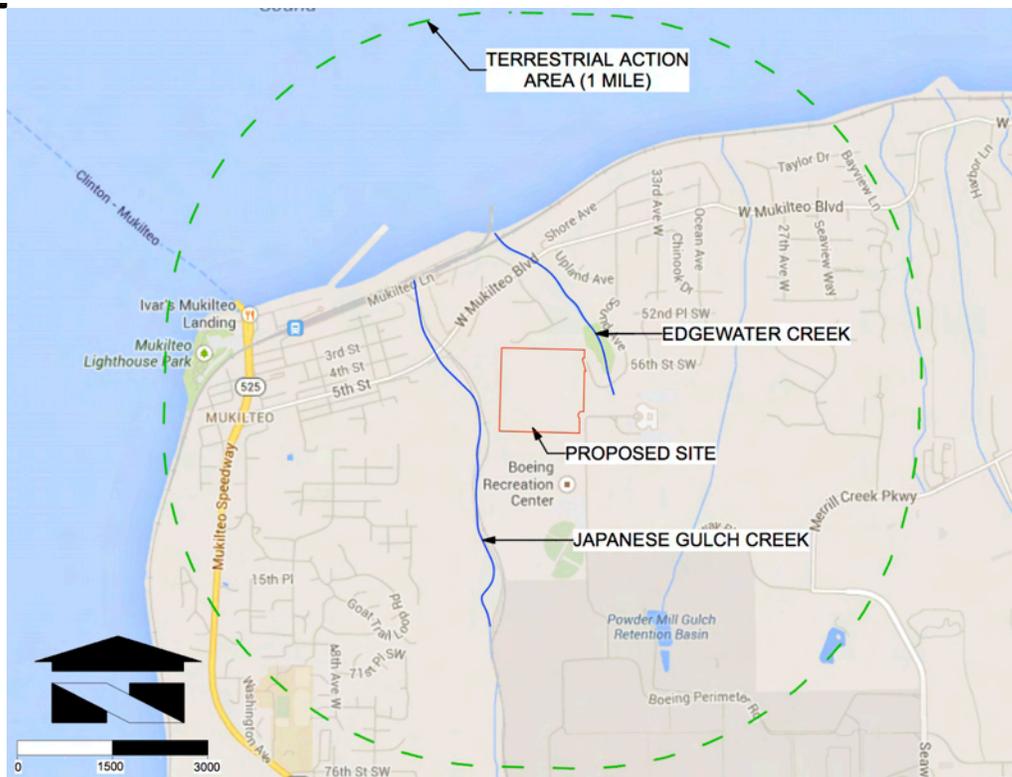


Figure 3: Terrestrial Action Area for Soundview Business Center.

4.3 BASELINE CONDITIONS

The study area contains two Category II wetlands (Wetlands A and C) and two Category III wetlands (Wetlands B and D; Washington Department of Ecology and City of Everett classifications) (see Appendix C).

Wetland A is a small, forested, depressional, Category II wetland located in the southeastern corner of the site. This wetland drains to a culvert under 36th Avenue W, then to a stormwater system on the property to the east, and finally into Edgewater Creek to the northeast.

Wetland B is a small, forested, depressional, Category III wetland located in the southeastern portion of the site that retains ponded water. This wetland has no outlet, with hydrology exiting via groundwater and evapotranspiration.

Wetland C is a small, forested, depressional, Category II wetland located in the southeastern portion of the site that retains ponded water. This wetland has no outlet, with hydrology exiting via groundwater and evapotranspiration.

Wetland D is a small, scrub-shrub, depressional, Category III wetland located in the center of the site. This wetland was logged in the past and vegetation is currently regenerating. This wetland has no outlet, with hydrology exiting via groundwater and evapotranspiration.

According to the WDFW Priority Habitats and Species Maps and the WDFW Salmonscape web application, the nearest occurrence of priority resident and anadromous fish habitat is in Japanese Gulch Creek, approximately 0.19 miles from the site, and Edgewater Creek, approximately 0.49 miles from the site. Both of these streams flow north into Possession Sound.

The land within the Japanese Gulch Creek drainage basin and Edgewater Creek drainage basin is predominately zoned for commercial and residential development, which includes a highly developed part of the City of Everett. Much of the development in the area occurred prior to stormwater detention requirements.

To determine the effects of a proposed action, it is necessary to characterize environmental baseline conditions and predict the effect that the proposed action(s) will have on them. The “Matrix of Pathways and Indicators,” listed below, provides a consistent, accurate method for evaluating the effects of the proposed action(s). The “Matrix of Pathways and Indicators” is from the document *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NOAA Fisheries 1996).

Japanese Gulch Creek and Edgewater Creek are separate and distinct waterways within the aquatic action area, and therefore separate discussions of the “Matrix of Pathways and Indicators” for these streams are provided below.

4.3.1 Japanese Gulch Creek Matrix of Pathways and Indicators

A discussion of environmental parameters for Japanese Gulch Creek is provided below. This creek has been the focus of several recent environmental restoration projects, which are ongoing. Efforts have been centered on the lower Japanese Gulch Creek reaches, which lie downstream of West Mukilteo Boulevard and comprise the majority of the creek downstream of the project site.

Table 2. Matrix of Pathways and Indicators Summary of Baseline Conditions within the action area for Japanese Gulch Creek

| Pathways: | Environmental Baseline | | | Effects of the Action | | |
|--|-------------------------------|----------------|---------------------------------|------------------------------|----------|---------|
| Indicators | Properly Functioning | At Risk | Not Properly Functioning | Restore | Maintain | Degrade |
| Temperature | X | | | | X | |
| Sediment/ Turbidity | X | | | | X | |
| Chemical Contamination / Nutrients | | X | | | X | |
| Physical Barriers | | | X | | X | |
| Substrate | X | | | | X | |
| Large Woody Debris (LWD) | X | | | | X | |
| Pool Freq./ Quality | | X | | | X | |
| Off-channel Habitat | | X | | | X | |
| Refugia | X | | | | X | |
| Width/Depth Ratio | | X | | | X | |
| Streambank Condition | | X | | | X | |
| Floodplain Connectivity | | X | | | X | |
| Change in Peak/ Base Flows | | X | | | X | |
| Increase in Drainage Network | | X | | | X | |
| Road Density & Location | | | X | | X | |
| Disturbance History | | | X | | X | |
| Riparian Reserves | | X | | | X | |

Water Quality

Environmental baseline habitat features for water quality include temperature, sediment/turbidity, and chemical contamination/nutrients.

Temperature

Temperature data was unavailable. However, given the existence of streamside vegetation, large woody debris, adjacent steep slopes, and known use by salmonids, it is assumed that temperatures are normally within properly functioning ranges. Based on these conditions, the action area is **properly functioning** for this element.

As the proposed action will have no effect on water temperature, the baseline condition of this element will be **maintained**.

Sediment/Turbidity

High levels of turbidity were recently rectified in 2012 by the diversion of the stream into a historic channel on the opposite side of the railway. Restorative actions have created gentler gradients and a culvert diverter located at the culvert passing under W Mukilteo Boulevard directs excess waters into the previous, non-fish bearing channel during large storm events.

These factors maintain conditions of low turbidity and reduced sediment within the water column. Based on these findings, the action area is **properly functioning** for this element.

Although unlikely, construction activities, including clearing and grading, may **temporarily degrade** the environmental baseline for sediment and turbidity. The project will incorporate erosion control BMPs to minimize sediment entry into downstream Japanese Gulch Creek, and will comply with related project permits and approvals. Sediment is expected to be temporary during construction and this habitat parameter will be **maintained** over the long term.

Chemical Contamination/Nutrients

Specific chemical contamination and nutrient data was unavailable for this metric. However, pre-existing garbage dumpsites existed in the creek downstream of the project site prior to stream restoration efforts. It is unclear if the chemical pollution caused by this waste (i.e. old oil barrels) has been remedied by these efforts. Additionally, given the heavy industrial use existing within the basin that is drained by Japanese Gulch creek, chemical contaminants are likely present in the water column. Based on these conditions, chemical contamination and nutrient levels have been determined to be **at risk** for this element.

By designing the stormwater detention and treatment system to meet minimum state requirements, including enhanced treatment, the proposed action will have no measurable effect on chemical contamination/nutrients. As a result, the baseline condition of this element will be **maintained**.

Habitat

Habitat access includes any physical in-water barriers that may impede fish migration. Habitat elements include substrate, large woody debris (LWD), pool frequency, pool quality, off-channel habitat, and refugia.

Physical Barriers

Japanese Gulch Creek downstream of project site has recently undergone restorative actions that have removed the physical barriers downstream of W. Mukilteo Boulevard. However, downstream of the project site, the culvert passing under W. Mukilteo Boulevard has been classified as non-fish passable due to a vertical standpipe draining a sedimentation pond which sources it. The action area is therefore considered **not properly functioning** for this element.

No in-stream or near-stream work is proposed, so the proposed action will **maintain** the baseline condition of this element.

Substrate

Substrate is rated as poor for approximately 150 feet upstream of W. Mukilteo Boulevard, and fair above that to where the stream becomes adjacent to the project site (Cherry Creek, 2010). Downstream of W. Mukilteo Boulevard, restoration actions have created conditions suitable for salmonid spawning behavior, which has been observed in coho salmon. Given the substrate requirements for spawning by this species, it is assumed that the restorative measures have been successful in creating quality substrate within these reaches of the stream. Based on these considerations, the overall status of Japanese Gulch Creek within the action area is considered **properly functioning** for this element.

While no work is proposed within Japanese Gulch Creek channel, grading and clearing could potentially mobilize sediment that could affect this element. As a result, this project may **temporarily degrade** this habitat parameter. The long-term effect of this project will be to **maintain** this parameter.

Large Woody Debris (LWD)

The recent restorative actions on Japanese Gulch Creek have installed large woody debris, adding to that which was already present within the stream channel. Given the adjacent forested steep slopes existing upstream of W. Mukilteo Boulevard, the area outside of the restoration area has a high potential for recruitment, and is known to have large woody debris present (Cherry Creek, 2010). Based on these conditions, Japanese Gulch Creek is considered to be **properly functioning** for this parameter.

LWD recruitment potential for a stream typically occurs within 200 feet of the OHWM. The subject development site is more than 500 feet from Japanese Gulch Creek, and that reach is inaccessible to salmonids. The trees to be removed from the project site would not result in an impact on LWD recruitment potential for Japanese Gulch Creek due to its distance from the creek. The proposed project will therefore **maintain** the parameter for LWD.

Pool Frequency and Quality

Due to the recent restoration actions, the reaches of Japanese Gulch Creek north of W. Mukilteo Boulevard contain multiple high quality pools dispersed throughout the stream channel. The reaches to the south of this area are still channelized, and pools are less frequent. Based on these conditions, Japanese Gulch Creek is considered to be **at risk** for this element.

As no development is proposed within the OHWM of Japanese Gulch Creek, the project will **maintain** the baseline condition for this parameter.

Off-Channel Habitat

The reaches upstream of the W. Mukilteo Boulevard culvert were found to have poor off-channel habitat. Downstream of the culvert, restorative actions created several areas of off-channel habitat on Japanese Gulch Creek. Given the combination of reaches with off-channel habitat and those without, the status of this parameter is considered **at risk**.

This project will **maintain** the baseline condition for this parameter because development will not occur within the off-channel habitats.

Refugia

Japanese Gulch Creek underwent recent restorative vegetation plantings and exists primarily within a forested ravine. The resultant presence of over hanging vegetation and large woody debris is believed to create ample refugia for fish. Based on these conditions, refugia is considered to be **properly functioning** in the action area.

No in-stream or near-stream work is proposed, so the proposed action will **maintain** the baseline condition of this element.

Channel Conditions and Dynamics

Parameters to assess channel conditions include width to depth ratio, streambank condition, and floodplain connectivity.

Width to Depth Ratio

The width to depth ratio for Japanese Gulch Creek is perceived to be relatively high south of the restoration area. Within the restoration area, stream depth is increased, improving (lowering) the width to depth ratio. Given the combination of reaches with a low width to depth ratio and those with a high ratio, the status of this parameter is considered **at risk**.

The proposed project will not alter the width to depth ratio of Japanese Gulch Creek. The proposed project will **maintain** the current width to depth ratio of the stream within the action area.

Streambank Condition

Some erosion was observed in the downstream reach of the stream. Therefore, slope stability is considered **at risk** for Japanese Gulch Creek.

This project will **maintain** the baseline condition for this parameter.

Floodplain Connectivity

Floodplain connectivity within Japanese Gulch Creek appears to have been at least partially reestablished north of W. Mukilteo Boulevard during recent restorative measures. The channelized nature of the stream south of the restoration actions limits this connectivity. Given the combination of reaches with floodplain connectivity and those without, the status of this parameter is considered **at risk**.

This project will not change the existing floodplain connectivity and, as a result, will **maintain** the baseline condition for this parameter.

Change in Peak/Base Flows

Recent restorative actions have reconnected Japanese Gulch Creek with an existing wetland near the mouth of the stream. Additionally, Japanese Gulch Creek drains approximately a one square-mile basin. These factors are believed to maintain base flows during the summer months. However, the channelized nature of the stream south of W. Mukilteo Boulevard increases the potential for flood events to create large rises in peak flow. For these reasons, this metric is considered **at risk** in the Japanese Gulch Creek action area.

This project will not change peak or base flows and, as a result, will **maintain** the baseline condition for this parameter.

Drainage Network

The action area and the Japanese Gulch Creek basin in general have experienced an increase in the drainage network due to roads as well as residential, commercial, and industrial development. Based on this, the baseline indicator is **at risk** in the watershed.

The drainage network will be expanded as part of this project, but on a relatively small scale compared to the basin. As a result, this project will **maintain** the baseline condition for this parameter.

Road Density & Location

There are several road crossings and generally very dense development over the Japanese Gulch Creek basin and near the gulch bottom. Therefore, the baseline conditions are **not properly functioning** for the action area and the watershed.

This project will not change road density or location and, as a result, will **maintain** the baseline condition for this parameter.

Disturbance History

The Japanese Gulch Creek basin has experienced extensive historical disturbance from road construction and residential, commercial, and industrial development. Vast areas of former wetlands have likely been converted to residential and commercial development. Japanese Gulch has a particularly high level of historical disturbance related to the railroad and timber industries during the early 20th century. Baseline conditions for this element are **not properly functioning** for both the action area and the watershed.

Although the project will involve clearing and grading within the action area, this change will not have a significant impact on the level of disturbance within the watershed. This is mainly due to the existing high level of disturbance resultant from surrounding developed areas. As a result, this proposed project will **maintain** the baseline condition for this parameter.

Riparian Reserves

Within the Japanese Gulch Creek drainage basin, steeply sloped forested area buffers the reaches near the project area. However, the dense development downstream at the stream’s mouth into Possession sound, and the Boeing railroad spur have fragmented some riparian areas. Based on these findings, riparian reserves are **at risk** in the Japanese Gulch Creek action area.

The proposed project will **maintain** the baseline condition for this parameter.

4.3.2 Edgewater Creek Matrix of Pathways and Indicators

While the City of Everett classifies the entirety of Edgewater Creek as non-fish bearing, Washington State Department of Natural Resources and the Washington Department of Fish and Wildlife classify the reach within the lower wetland area north of Debralon Lane as potentially fish bearing. The reasons described by the City of Everett for the non-fish bearing status are lack of past evidence of fish presence, high flow (velocity barriers) and low flow (depth barriers) conditions throughout the year, and the stream outfalling to Possession Sound via a significant drop to the beach from a 24-inch culvert (physical barrier). However, water velocity is generally only considered to exclude fish presence during flash events, and an on-site investigation by *Wetland Resources, Inc.* revealed that the culvert draining the stream into Possession Sound is at ground level, below high tide, with no significant drop. The culvert is capped by a trash rack with spacing wide enough to allow for fish passage. A lack of past fish presence does not preclude the possibility of future use. Given these considerations, the lower reach of Edgewater Creek (north of Debralon Lane) will be treated as fish bearing habitat for the purposes of this report. A discussion of environmental parameters for Edgewater Creek is provided below.

Table 3. Matrix of Pathways and Indicators Summary of Baseline Conditions within the action area for Edgewater Creek

| Pathways: | Environmental Baseline | | | Effects of the Action | | |
|--------------------------------------|-------------------------------|----------------|---------------------------------|------------------------------|----------|---------|
| | Properly Functioning | At Risk | Not Properly Functioning | Restore | Maintain | Degrade |
| Temperature | X | | | | X | |
| Sediment/ Turbidity | | | X | | X | |
| Chemical Contamination/ Nutrients | | X | | | X | |
| Physical Barriers | X | | | | X | |

| | | | | | | |
|------------------------------|----------|----------|----------|--|----------|--|
| Substrate | | | X | | X | |
| Large Woody Debris (LWD) | X | | | | X | |
| Pool Freq./ Quality | | | X | | X | |
| Off-channel Habitat | | | X | | X | |
| Refugia | X | | | | X | |
| Width/Depth Ratio | X | | | | X | |
| Streambank Condition | | X | | | X | |
| Floodplain Connectivity | X | | | | X | |
| Change in Peak/ Base Flows | | | X | | X | |
| Increase in Drainage Network | | X | | | X | |
| Road Density & Location | X | | | | X | |
| Disturbance History | | X | | | X | |
| Riparian Reserves | X | | | | X | |

Water Quality

Environmental baseline habitat features for water quality include temperature, sediment/turbidity, and chemical contamination/nutrients.

Temperature

Temperatures recorded for Edgewater Creek by the City of Everett (City of Everett, 2014) reports temperatures ranges well below the maximum allowed by the water quality criteria, pursuant to WAC 173-201A, as put forth by the Department of Ecology. Edgewater Creek was found to have a temperature range of 4.8°C – 13.4°C, and the WAC criteria requires less than 17.5°C. Based these conditions, Edgewater Creek is **properly functioning** for this element.

As the proposed action will have no effect on water temperature, the baseline condition of this element will be **maintained**.

Sediment/Turbidity

Sediment from landwasting slides, erosion, and that which accumulates on impervious surfaces within developed portions of the Edgewater Creek basin has created problematic conditions. Sediment storm runoff is particularly abundant in the lower reaches of Edgewater Creek, creating highly embedded gravel. High levels of turbidity exacerbate this situation. The mean base flow turbidity was measured at 7 NTU (City of Everett, 2014). Based on these findings, the action area is **not properly functioning** for this element.

Construction activities, including clearing and grading, may **temporarily degrade** the environmental baseline for sediment and turbidity. The project will incorporate erosion control BMPs to minimize sediment entry into downstream systems, and will comply with related project permits and approvals. Sediment is expected to be temporary during construction and this habitat parameter will be **maintained** over the long term.

Chemical Contamination/Nutrients

Water chemistry, metals, and nutrient measurements in Edgewater Creek are within acceptable levels. However, macro-invertebrate data indicates poor to very poor conditions. Macro-invertebrates are used as bio-indicators of ecosystem health. Additionally, coliform bacteria levels were above that allowed by water quality criteria, and are believed to be sourced from pet waste and other anthropogenic influences. Based on these findings, chemical contamination and nutrient levels have been determined to be **at risk** for this element.

By designing the stormwater system to meet minimum state requirements, including enhanced treatment, the proposed action will have no effect on chemical contamination/nutrients. As a result, the baseline condition of this element will be **maintained**.

Habitat

Habitat access includes any physical in-water barriers that may impede fish migration. Habitat elements include substrate, large woody debris (LWD), pool frequency, pool quality, off-channel habitat, and refugia.

Physical Barriers

The culvert running under the BNSF railway is capped by a trash rack and appears to be under water during high tide. Throughout the lower reaches of Edgewater Creek, north of W. Mukilteo Boulevard, there are no apparent physical barriers to fish passage. Therefore, the action area of Edgewater creek is considered **properly functioning** for this element.

No in-stream or near-stream work is proposed, so the proposed action will **maintain** the baseline condition of this element.

Substrate

Macro-invertebrate data indicates that there is a low proportion of clean stony substrate in the lower reaches of Edgewater creek. This is likely due to the abundant levels of sediment present within the stream channel. The high level of fines present have embedded the gravelly substrate, reducing the habitat functionality for fish spawning. Based on these conditions, the Edgewater Creek action area is considered to be **properly functioning** for this element.

While no work is proposed within Edgewater Creek channel or associated wetlands, grading and clearing could potentially mobilize sediment that could affect this feature. As a result, this project may **temporarily degrade** this habitat parameter. The long-term effect of this project will be to **maintain** this parameter.

Large Woody Debris (LWD)

Edgewater Creek has a large amount of large woody debris comprised of a wide variety of sizes. The relatively intact forested slopes bordering the stream provide ample recruitment for large woody debris. Due to the existing high density of LWD and the potential for LWD recruitment from the surrounding forested landscape, the action area is **properly functioning** for this parameter.

LWD recruitment potential for a stream typically occurs within 200 feet of the OHWM. The subject development site is more than 600 feet from Edgewater Creek fish habitat. Any trees to be removed from the project site would not result in an impact on LWD recruitment potential for Edgewater Creek. The proposed project will therefore **maintain** the parameter for LWD.

Pool Frequency and Quality

The NOAA Matrix of Pathways and Indicators (1996) considers a properly functioning pool frequency to be 96 pools per mile for a stream about 10 feet wide. Overall, the pool frequency in Edgewater Creek is very low. Within the lower reaches, almost the entire stream is comprised of riffle habitat. Based on this condition, Edgewater Creek is considered **not properly functioning** for this parameter.

As no development is proposed within or near the OHWM of Edgewater Creek, the project will **maintain** the baseline condition for this parameter.

Off-Channel Habitat

No off-channel habitat was observed north of W. Mukilteo Boulevard. This area comprises the reach considered as potentially fish-bearing by Washington Department of Natural Resources (WDNR) and USFWS. Therefore, this parameter shall be considered **not properly functioning**.

This project will **maintain** the baseline condition for this parameter because development will not occur within any existing off-channel habitats.

Refugia

Edgewater Creek is situated within a relatively intact sloped forested area, and is protected by a variety of overhanging vegetation and LWD. These features provide potential refugia for fish that may be present. Therefore, this parameter is considered **properly functioning** in the Edgewater Creek action area.

This project will **maintain** the baseline condition for this parameter.

Channel Conditions and Dynamics

Parameters to assess channel conditions include width to depth ratio, streambank condition, and floodplain connectivity.

Width to Depth Ratio

The banks of Edgewater Creek are incised in certain areas. This, in combination with high flow rates recorded during winter months, indicates that the stream channel becomes deep, but that width of the stream does not extend outwardly by a significant margin. Therefore, given the relative narrowness of the channel, Edgewater Creek is presumed to have a low width to depth ratio. Based on these conditions Edgewater Creek is considered to be **properly functioning** for this element.

The proposed project will not alter the width to depth ratio for Edgewater Creek or downstream systems. The proposed project will **maintain** the current width to depth ratio of the stream within the action area.

Streambank Condition

The stream bank along Edgewater Creek is incised in multiple areas and landwasting slides along the forested slope occur throughout the area. Slope stability is considered **at risk** for Edgewater Creek.

This project will not occur along the steep slopes or banks associated with Edgewater Creek and, therefore, will **maintain** the baseline condition for this parameter.

Floodplain Connectivity

Although Edgewater Creek may be somewhat channelized in some areas, the wetlands abutting the stream throughout the lower reaches north of W. Mukilteo Blvd appear to be connected during high flow events. Based on these conditions, the Edgewater Creek action area is **properly functioning** for this element.

This project will not change the existing floodplain connectivity and, as a result, will **maintain** the baseline condition for this parameter.

Change in Peak/Base Flows

Peak flow rates calculated for Edgewater creek are drastically higher than the base flow rates throughout the year. The 2-year storm event is over 7 to 25 times higher than that of the base flow depending on the reach, with differences becoming generally more extreme closer to the outfall. For these reasons, this metric is considered **not properly functioning** in the Edgewater Creek action area.

This project will not change peak or base flows and, as a result, will **maintain** the baseline condition for this parameter.

Drainage Network

There has been an increase to the drainage network primarily due to impervious surfaces associated with residential and commercial development in the basin. Based on this, the baseline indicator is **at risk** in the Edgewater Creek basin.

Stormwater from the proposed project is designed to mimic natural drainage patterns in the basin and, as a result, will **maintain** the baseline condition for this parameter.

Road Density & Location

The only road crossing over Edgewater Creek is a tall bridge for W. Mukilteo Boulevard. The bridge is not believed to have any significant impact on the stream given its disconnectedness due to height. The BNSF railroad crossing at the northern terminus of Edgewater Creek is the only other disruption in this category, with the majority of Edgewater creek being buffered from roads by the forested ravine. Therefore, the baseline conditions are **properly functioning** for the Edgewater Creek action area.

This project will not change road density or location and, as a result, will **maintain** the baseline condition for this parameter.

Disturbance History

Edgewater creek, like the other creeks emptying north into Possession Sound, has a high level of historical disturbance related to the railway and timber industry. Additionally, road runoff from residential development designed before modern stormwater conveyance requirements has destabilized portions of the sloped forested ravine associated with the stream. Baseline conditions for this element are **at risk** for the Edgewater Creek action area.

Although the project will involve approximately 33 acres of clearing and grading within the action area, this change will not have a significant impact on the level of disturbance within the watershed. This is mainly due to the existing high level of disturbance resultant from surrounding developed areas and relatively recent clearcutting of the subject property. As a result, this proposed project will **maintain** the baseline condition for this parameter.

Riparian Reserves

Within the Edgewater Creek drainage basin, riparian vegetation is dense and relatively undisturbed by recent activity. Riparian buffers are relatively wide compared to other nearby, urban stream channels. Based on these findings, riparian reserves are **properly functioning** in the Edgewater Creek action area.

No riparian vegetation will be disturbed by this project, so it will **maintain** the baseline condition for this parameter.

4.4 PROJECT DESCRIPTION

The applicant is proposing four industrial manufacturing buildings with associated parking and utilities on the subject property. With the exception of the steep slope area in the southwest portion, the site will be cleared and mass graded, cutting the higher, southern portion and filling the lower, northern portion to create a relatively level development site. Once clearing and grading is complete, underground utilities will be installed and then construction of the buildings and drive aisles will begin. Building construction will occur in two phases and is expected to occur over a two year period.

To accommodate the proposed development, the applicant is proposing to eliminate the four on-site wetlands, comprising a total of 0.25 acres (10,823 square feet). Avoidance of wetland impacts would make the project economically infeasible by not allowing for the mass grading that is required to balance the grades on site. Mitigation for eliminating the four small on-site wetlands is proposed through the use of mitigation banking.

The subject site is 39.45 acres in size. Approximately 33 acres will be developed with the remaining 5.96 acres being undeveloped steep slope in the southwestern portion of the property. This area may be developed in the future under a separate permit action.

4.4.1 Road Improvements

Internal drive aisles and parking are proposed to be placed within the developed portion of the site. Other minor work will occur in the existing cul-de-sac at the terminus of 36th Avenue West to provide level access to the site. No other road improvements are proposed.

4.4.2 Stormwater

Approximately 33 acres of the 39.45-acre site will be developed as industrial manufacturing buildings and associated utilities, parking, stormwater facilities, and access roads. New impervious surfaces will total approximately 26 acres.

There are currently four drainage areas existing onsite, as shown in Figure 4. The western-most portion of the site to be developed (Pre-Basin A) drains the western portion of the site down to Japanese Gulch Creek. The northwestern drainage area (Pre-Basin B) drains north into an intersecting ravine which leads into a series of existing stormwater conveyance features that eventually discharge into the ravine above Edgewater Creek. The northeastern drainage area (Pre-Basin C) drains to the northeast into a ravine that shallows out and is intersected by a drainage ditch leading into Edgewater Creek. The southeastern drainage area (Pre-Basin D) contains Wetlands A-C, and is hydrologically sourced from the off-site area to the south (Pre-Basin C Run-On). Runoff currently outlets from Wetland A into a catch basin, under 36th Avenue West via a culvert that flows to an existing stormwater conveyance ditch on the neighboring property.

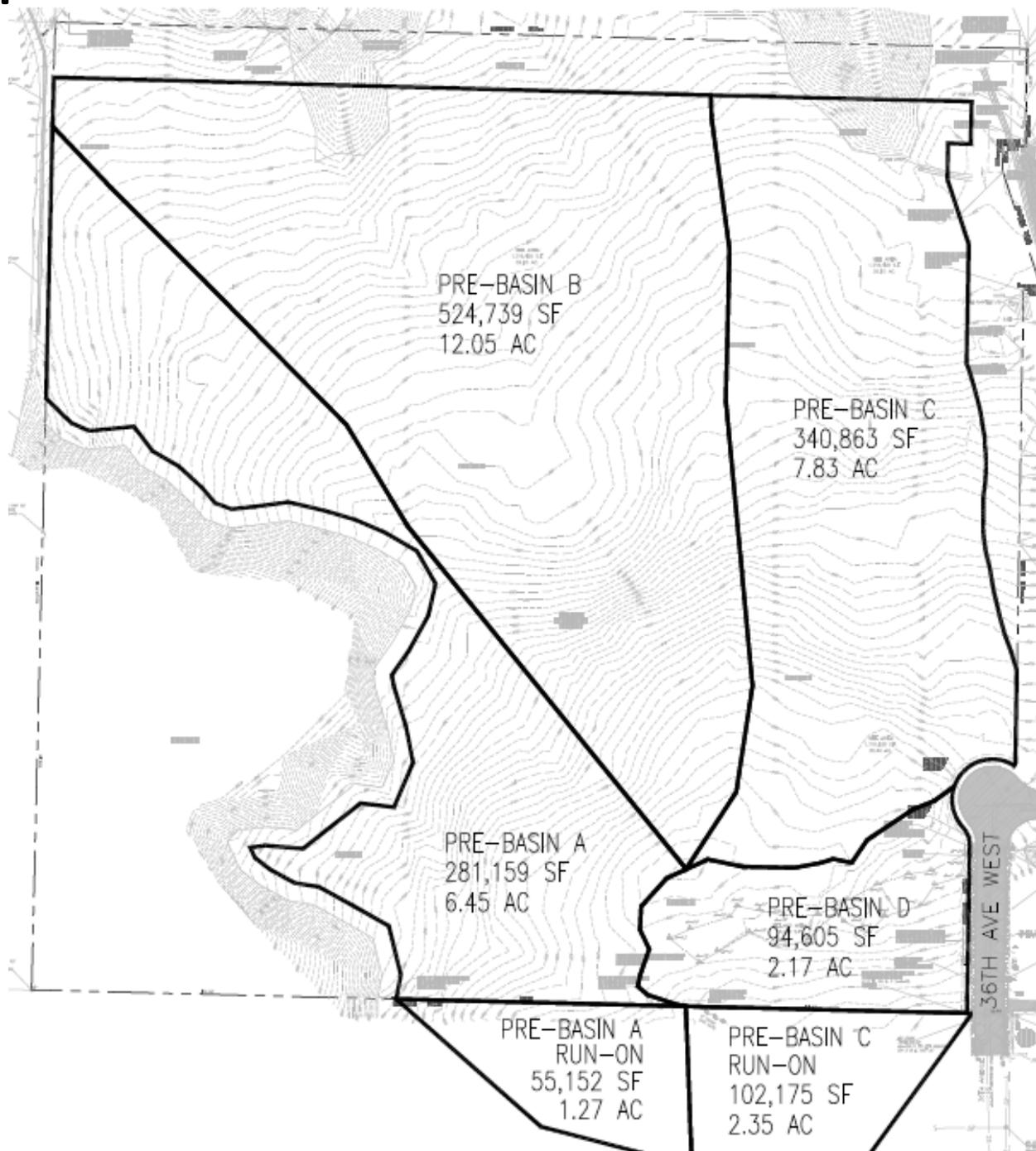


Figure 3: Drainage basins on the proposed development site for Soundview Business Center.

Under developed conditions, stormwater from impervious surfaces on the site will be directed to on-site stormwater vaults located on the western and northern edges of the developed areas. Stormwater will be treated for water quality prior to detention via underground vaults. Clean stormwater will exit the site through a controlled release system. Stormwater will be released to the west, north, and northeast (Pre-Basins A, B, and C respectively) in proportions that will mimic the current drainage regimes within the site. Drainage released to Pre-Basin A will be

conveyed through a surface mounted pipe down the off-site slope to the west. It will be released to a ditch alongside the Boeing rail spur where it will flow to a regional detention pond and eventually into Japanese Gulch Creek. Drainage released to Pre-Basins B and C will be conveyed by existing ravines that drain to Edgewater Creek. Run-on that currently enters the southeastern corner of the site from off-site (Pre-Basin C Run-On) will be directed through a constructed swale into a catch basin, under 36th Avenue West, to the existing stormwater conveyance ditch on the neighboring property to the east. This conveyance also flows to Edgewater Creek.

Stormwater detention will be designed to match pre-development hydrologic conditions. Stormwater in post-developed conditions should have very little, if any, detectable effect on downstream systems such as Japanese Gulch Creek and Edgewater Creek. Stormwater will be treated using precast underground vaults with filter cartridges meeting the water quality requirements of the City of Everett. This method of filtration will remove metals and other pollutants prior to being released from the site. The preliminary stormwater plan sizes the detention vaults with a cumulative live storage capacity of approximately 750,000 cubic feet. The system will be designed using the Western Washington continuous simulation hydrology model (WWHM).

The drainage plan for this site is being prepared in accordance with the 2010 City of Everett Stormwater Management Manual, which is based on the 2005 DOE Stormwater Manual. The applicant will apply for a NPDES permit when all other permits are reviewed and approved.

Biological treatment using bioswales or rain gardens requires a great deal of land that would limit the development potential on the subject site, ultimately decreasing its economic viability. Biological treatment has therefore been determined to be an unreasonable stormwater treatment alternative for this site.

4.4.3 Clearing and Grading

Grading work to level the site will be extensive. The entire development area will be mass graded to accommodate construction of the proposed buildings and associated pavement.

Grading will include the elimination 10,823 square feet (0.25 acres) of Category II and III wetlands (DOE, City of Everett classification) through excavation. The wetlands lie on higher areas of the site that will be excavated and moved to the lower areas of the site to provide a relatively level final grade. Total grading quantity will be approximately 300,000 cubic yards on site. No export is planned, nor is any fill planned to be imported to the site, other than clean crushed rock to create a subsurface for the drive aisles and parking areas.

Wetland vegetation to be impacted includes red alder, western red cedar, trailing blackberry, creeping buttercup, lady fern, salmonberry, soft rush, toad rush, and slough sedge. On-site vegetation currently considered buffer will be removed and includes big-leaf maple, red alder, ocean spray, western sword fern, creeping buttercup, reed canary grass, salmonberry, salal, western red cedar, and stinging nettle.

4.4.4 Utility Coordination

Utilities are proposed to be placed within the developed portion of the site. Sewer and water mains, stormwater conveyance and electrical power will be placed under the drive aisles. Stormwater will be collected on site, treated and detained, and released, as described in section 4.4.2 above.

4.4.5 Wetland Impacts

To accommodate the proposed development, the applicant is proposing to eliminate the four on-site wetlands, Categories II and III, comprising a total of 0.25 acres (10,823 square feet). Off-site mitigation will take place in the form of mitigation banking.

For further information regarding the proposed mitigation measures, please refer to the *Wetland Mitigation Plan for Soundview Business Center* located in Appendix D.

4.4.6 Construction Timing, Machinery, and Staging Areas

Construction will begin upon receipt of all applicable permits. Grading work will occur during the typical drier construction season and building construction is expected to continue year-round.

A. Construction sequencing and timing of each stage: The project will be constructed in two phases. Phase 1 will begin with installation of temporary erosion and sedimentation control (TESC) measures, clearing, and mass grading of the site, expected to begin in spring 2015. Site preparation, clearing and grading is expected to take six months. Phase 1 will also include construction of two of the four buildings and portions of the stormwater system. Phase 1 is expected to take one year to complete. Phase 2 will include construction of the two remaining buildings and is expected to take one year to complete.

B. Site preparation: Site preparation will include installation of standard TESC measures.

C. Equipment to be used: Equipment will consist of standard grading, road building and construction equipment, including excavators, loaders, dozers, dump trucks, cranes, and rollers. No unusually loud noises will be generated from this equipment. No blasting is proposed.

D. Construction materials to be used: Standard TESC material will be used as necessary to maintain water quality, including silt fence, straw, fiber and/or plastic matting, and other materials, as appropriate. Clean rock will likely be imported from a select off-site source to create the subsurface for the drive aisles and parking areas. Other construction materials will include those necessary for construction of the buildings, stormwater vaults, drive aisles and parking areas, including concrete, asphalt, steel reinforcement, wood and other common building materials. No unusual materials are proposed to be used for this project.

E. Work Corridor: Approximately 33 acres of the 39.45-acre site will be developed, including all areas of the site except the steep slope area in the southwest portion. With the exception of

eliminating the four small on-site wetlands, all work will occur outside of critical areas and buffers. Please refer to the attached Site Plan.

F. Staging area and equipment washouts: All equipment will stage and work from the proposed developed area of the site. If necessary, an equipment washout will be provided in accordance with Washington Department of Ecology's best management practices (BMPs).

G. Stockpiling areas: Some stockpiling may occur during mass grading of the site and for import of crushed rock for road subsurfacing. All stockpiles will be managed with appropriate BMPs to maintain water quality.

H. Running of equipment during construction: Operating equipment will be limited to the equipment described above during normal daylight hours. All equipment will work from and stage on the subject property, or on 36th Avenue West.

I. Soil stabilization needs/techniques: Standard TESC measures will be employed for this project in accordance with Washington Department of Ecology's BMPs.

J. Clean-up and re-vegetation: The entire development portion of the site will be impervious surfaces, but will include some areas of landscaping, as required by City of Everett. Any areas outside of the development area that are inadvertently disturbed will be grass seeded and/or planted with native trees and shrubs per a planting plan to be developed using City of Everett guidelines.

K. Stormwater controls/management: A detailed stormwater plan is currently under development for the site. It will meet the 2010 City of Everett Stormwater Management Manual, which is based on the 2005 DOE Stormwater Manual.

L. Source location of any fill used: Fill will be sourced from on-site only for the development, with the exception of clean crushed rock that will be imported to provide a subsurface for the drive aisles and parking areas.

M. Location of any spoil disposal: No export of spoils is proposed.

5.0 STATUS OF THE SPECIES AND CRITICAL HABITAT

5.1 BULL TROUT

The life history of bull trout has been summarized in Appendix A.

5.1.1 Critical Habitat

Japanese Gulch Creek and Edgewater Creek are not mapped as critical habitat for bull trout (NOAA Fisheries, 2005). The nearest critical habitat is the nearshore habitat of Possession Sound, approximately a half mile downstream.

5.1.2 Environmental Baseline

There is no bull trout habitat on the subject property, however there is habitat within the action area. The nearest bull trout habitat (Edgewater Creek) is approximately 0.015 miles (650 feet) downstream of the site (WDFW 2014). Bull trout habitat also exists in Japanese Gulch Creek, approximately 0.02 miles (925 feet) downstream of the site. Connectivity to these off-site habitats will be intermittent, via a man-made stormwater conveyance system.

5.2 CHINOOK SALMON

The life history of Chinook salmon has been summarized in Appendix A.

5.2.1 Critical Habitat

Japanese Gulch Creek and Edgewater Creek are not mapped as critical habitat for Chinook (NOAA Fisheries, 2005). The nearest critical habitat is the nearshore habitat of Possession Sound, approximately a half mile downstream.

5.2.2 Environmental Baseline

There is no Chinook habitat on the subject property, however there is habitat within the action area. The nearest Chinook habitat (Edgewater Creek) is approximately 0.015 miles (650 feet) downstream of the site (WDFW 2014). Chinook habitat also exists in Japanese Gulch Creek, approximately 0.02 miles (925 feet) downstream of the site. Connectivity to these off-site habitats will be intermittent, via a man-made stormwater conveyance system.

5.3 STEELHEAD

The life history of steelhead is summarized in Appendix A.

5.3.1 Critical Habitat

Critical habitat has yet to be officially designated for Puget Sound steelhead (NOAA Fisheries 2011a).

5.3.2 Environmental Baseline

There is no steelhead habitat on the subject property, however there is habitat within the action area. The nearest steelhead habitat (Edgewater Creek) is approximately 0.015 miles (650 feet) downstream of the site (WDFW 2014). Steelhead habitat also exists in Japanese Gulch Creek, approximately 0.02 miles (925 feet) downstream of the site. Connectivity to these off-site habitats will be intermittent, via a man-made stormwater conveyance system.

5.4 COHO SALMON

The life history of Coho salmon is summarized in Appendix A.

5.4.1 Critical Habitat

No coho salmon critical habitat has been designated in Washington (NOAA Fisheries 2011b).

5.4.2 Environmental Baseline

There is no coho habitat on the subject property, however there is habitat within the action area. The nearest coho habitat (Edgewater Creek) is approximately 0.015 miles (650 feet) downstream of the site (WDFW 2014). Coho habitat also exists in Japanese Gulch Creek, approximately 0.02 miles (925 feet) downstream of the site. Connectivity to these off-site habitats will be intermittent, via a man-made stormwater conveyance system.

6.0 EFFECTS OF THE ACTION

6.1 DIRECT EFFECTS

Direct effects are defined as immediate effects of the project on the species or its habitat. Direct effects include those resulting from interdependent or interrelated actions.

The development site is approximately 0.02 miles upstream from fish habitat in Japanese Gulch Creek, and approximately 0.015 miles upstream from fish habitat in Edgewater Creek, both of which are habitat for listed anadromous salmonids. A total of approximately 33 acres of land will be developed. Site preparation, including clearing and grading, will occur in the drier times of the year while building construction will continue year-round. The project will result in existing scrub-shrub land to be cleared and 0.25 acres (10,823 square feet) of wetland to be eliminated.

Activities necessary to implement this action will result in direct effects to the action area with potential effects to listed species. Construction of the proposed industrial manufacturing center and infrastructure will require clearing and mass grading of the site. These activities will require the use of heavy machinery, which will be confined within the approved disturbance areas. Disturbances will also include permanent wetland impacts. Wetland impacts will be completed during the dry season when hydrology levels are diminished. This will help reduce the likelihood of a direct effect on the off-site stream systems.

Due to the lack of fish within the project area, no direct impacts to fish species or their habitats are expected.

Vegetation Removal

The approximately 33 acres to be developed will be cleared of vegetation. Wetland vegetation to be impacted includes red alder, western red cedar, trailing blackberry, creeping buttercup, lady fern, Salmonberry, soft rush, toad rush, and slough sedge. On-site vegetation currently considered buffer will be removed and includes big-leaf maple, red alder, ocean spray, western

sword fern, creeping buttercup, reed canary grass, salmonberry, salal, western red cedar, and stinging nettle. Due to the distance of the proposed impacts from ESA waters and the implementation of BMP erosion control measures, no direct impacts to listed fish species are expected to occur.

Construction Activities

The proposed grading and site preparation has the potential to mobilize fine sediments. The use of machinery on the site for grading and construction creates the risk of contaminant spills that could potentially be routed into the off-site streams. The mobilization of fine sediments has the potential to affect fish behavior and physiology, or indirectly decrease food and habitat availability, or the ability to locate prey.

Increases to sediment inputs to streams, particularly sediments that are 0.85 mm and smaller, have been well documented to have a negative impact on fish and other aquatic life (Peterson et al. 1992, Knutson and Naef, 1997). This danger will be minimized by conducting mass grading during the drier months and through the application of all appropriate BMP erosion control measures. If, during a rain event, runoff were to carry silt and sediment into the stormwater system, it would likely to be a small amount and for a short duration. Because salmonids have evolved in dynamic systems that commonly experience sediment flushes with flooding events, a limited sediment event should have a negligible impact on these species (Bjorn and Reiser 1991).

6.2 INDIRECT EFFECTS

Increasing impervious surfaces has potential to affect both the water quantity and quality of habitat for the listed species. Given the distance of the site from documented bull trout, steelhead, and Chinook salmon habitats, proposed construction precautions, stormwater detention and treatment, and the series of stormwater conveyance features, it is likely that most if not all of the potential sediment will settle before reaching these habitats.

Measures to reduce erosion, sedimentation, pollution, and to maintain peak and base flow rates within the off-site aquatic areas include construction of permanent detention vaults and water treatment systems. These features will be designed and constructed as described in the stormwater management section of this report. These combined measures will maintain the hydrology, water quantity, and water quality of the downstream systems. As a result of these measures, no indirect effects are expected.

6.3 INTERRELATED AND INTERDEPENDENT ACTIONS

The interrelated and interdependent actions associated with the proposed project include a commercial/industrial development that will increase the amount of traffic and human activity within the project area. A total of approximately 33 acres of scrub-shrub vegetation will be cleared. Increased roadway traffic will potentially increase loadings of heavy metals and other toxic chemicals. The total amount of impervious surface (approximately 26 acres) in the project area will increase.

The proposed project includes measures to maintain water quality, as discussed above. Therefore, while the project will result in the conversion of land use, the relative impact to downstream systems will be undetectable.

6.4 CUMULATIVE EFFECTS

Development continues to increase in the City of Everett. This trend is likely to continue, resulting in greater population density in the area.

6.5 BENEFICIAL EFFECTS

The proposed work will not result in any beneficial effects.

7.0 RECOMMENDED CONSERVATION MEASURES

Conservation measures for the wetland fill and associated development activities are listed below. These measures shall be followed during implementation of this action.

- Prior to any site work, a pre-construction meeting with the City of Everett, the contractor, and the wetland consultant shall occur to determine appropriate BMP erosion control measures.
- Prior to clearing or grading, areas that are to remain undisturbed shall be clearly marked by flagging or the use of high-visibility fencing. During the construction period, no disturbance beyond the marked clearing limits shall be permitted. The flagging/fencing shall be maintained by the owner/contractor for the duration of construction.
- Erosion and Sediment Control (ESC) facilities shall be constructed in conjunction with all clearing and grading activities, and in such a manner to ensure that sediment-laden water does not enter adjacent wetlands or streams.
- Appropriate erosion control measures will be installed in areas where construction will occur adjacent to wetland or streams. These may include sediment fencing, hay bales, sand bags, dirt berms, or other means.
- The use of silt fences, straw bales, and other sediment filtration devices will be used to minimize the inputs of fine sediment during rainstorms prior to completion of construction. Silt fencing shall be used in compliance with western Washington construction BMP's.
- Earthwork is anticipated to occur during the dry season.
- Temporary and permanent ground cover measures shall be provided in a timely manner to protect disturbed areas. Cover methods shall include mulch, erosion control blankets,

plastic covering, sodding, hydroseeding, jute matting, and clear plastic sheeting, where necessary and if inclement weather threatens exposed soils.

8.0 DETERMINATIONS OF EFFECT

Upon proper implementation of the proposed project, this action is expected to have the following effects on ESA regulated species.

8.1 PUGET SOUND ESU CHINOOK SALMON

The proposed action “**May Affect, but is Not Likely to Adversely Affect**” Chinook salmon.

A **may affect** determination is warranted based on the following rationale.

- There are listed Chinook in the watershed, downstream from the proposed development site.

A **not likely to adversely affect** determination for this action is warranted based on the following rationale.

- There is an extremely low potential that the proposed development would result in “take” of listed fish species.
- The listed fish species described in this report are not present on the subject property. The nearest habitat for fish species is 0.015 miles from the subject property and there is no accessibility to the subject property.
- There are no streams on-site, and no native trees or shrubs on the development site provide shading or LWD for bull trout or anadromous fish habitat. Thermal protection and LWD recruitment will not be affected.
- Best management practices will be used to prevent an increase in sedimentation in the vicinity of the project. Cleared areas will be seeded with an approved grass seed mixture.
- Earthwork is anticipated to be completed during the dry season.

8.2 PUGET SOUND DPS STEELHEAD

The proposed action “**May Affect, but is Not Likely to Adversely Affect**” steelhead.

A **may affect** determination is warranted based on the following rationale.

- There are listed steelhead in the watershed, downstream from the proposed development site.

A **not likely to adversely affect** determination for this action is warranted based on the following rationale.

- There is an extremely low potential that the proposed development would result in “take” of listed fish species.
- The listed fish species described in this report are not present on the subject property. The nearest habitat for fish species is 0.015 miles from the subject property and there is no accessibility to the subject property.
- There are no streams on-site, and no native trees or shrubs on the development site provide shading or LWD for bull trout or anadromous fish habitat. Thermal protection and LWD recruitment will not be affected.
- Best management practices will be used to prevent an increase in sedimentation in the vicinity of the project. Cleared areas will be seeded with an approved grass seed mixture.
- Earthwork is anticipated to be completed during the dry season.

8.3 PUGET SOUND COASTAL BULL TROUT

The proposed action “**May Affect, but is Not Likely to Adversely Affect**” bull trout.

A **may affect** determination is warranted based on the following rationale.

- There are listed bull trout in the watershed, downstream from the proposed development site.

A **not likely to adversely affect** determination for this action is warranted based on the following rationale.

- There is an extremely low potential that the proposed development would result in “take” of listed fish species.
- The listed fish species described in this report are not present on the subject property. The nearest habitat for fish species is 0.015 miles from the subject property and there is no accessibility to the subject property.
- There are no streams on-site, and no native trees or shrubs on the development site provide shading or LWD for bull trout or anadromous fish habitat. Thermal protection and LWD recruitment will not be affected.

- Best management practices will be used to prevent an increase in sedimentation in the vicinity of the project. Cleared areas will be seeded with an approved grass seed mixture.
- Earthwork is anticipated to be completed during the dry season.

8.4 PUGET SOUND/STRAIT OF GEORGIA COHO SALMON

The proposed action “**May Affect, but is Not Likely to Adversely Affect**” coho salmon.

A **may affect** determination is warranted based on the following rationale.

- There are candidate coho in the watershed, downstream from the proposed development site.

A **not likely to adversely affect** determination for this action is warranted based on the following rationale.

- There is an extremely low potential that the proposed development would result in “take” of listed fish species.
- The listed fish species described in this report are not present on the subject property. The nearest habitat for fish species is 0.015 miles from the subject property and there is no accessibility to the subject property.
- There are no streams on-site, and no native trees or shrubs on the development site provide shading or LWD for bull trout or anadromous fish habitat. Thermal protection and LWD recruitment will not be affected.
- Best management practices will be used to prevent an increase in sedimentation in the vicinity of the project. Cleared areas will be seeded with an approved grass seed mixture.
- Earthwork is anticipated to be completed during the dry season.

8.5 DESIGNATED CRITICAL HABITAT FOR BULL TROUT, STEELHEAD, AND CHINOOK SALMON

NMFS has determined that the habitats of Puget Sound bull trout, Puget Sound steelhead, and Puget Sound Chinook be considered Designated Critical Habitat. Japanese Gulch Creek and Edgewater Creek in the project area are not mapped as critical habitat for Puget Sound bull trout, Puget Sound steelhead, or Chinook salmon (NMFS 2005). As a result, this project will have no impact on Puget Sound bull trout, Puget Sound steelhead, or Puget Sound Chinook Designated Critical Habitat. This project will not result in the destruction or adverse modification of critical bull trout, steelhead, or Chinook critical habitat. Therefore, this project has a **No Effect** determination on Puget Sound bull trout, Puget Sound steelhead, and Puget Sound Chinook Designated Critical Habitat.

9.0 ESSENTIAL FISH HABITAT ASSESSMENT

The Magnuson-Stevens Fishery Conservation and Management Act requires that Essential Fish Habitat (EFH) must be identified by NMFS for federally managed marine fish. In addition, federal agencies must consult with NMFS on all proposed actions undertaken or funded by the agency that may affect EFH. The Pacific Fisheries Management Council (PFMC) has designated EFH for the Pacific salmon fishery, for federally managed groundfish, and for coastal pelagic fisheries.

For this project, only species of the Pacific salmon fishery could potentially be affected, as only freshwater systems are located in the action area. The EFH designation for the Pacific salmon fishery includes all streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except above the impassable barriers identified by PFMC. The Pacific salmon management unit includes Chinook, coho, and pink salmon.

Within the vicinity of the project area, EFH occurs for Puget Sound Chinook, coho and pink salmon. Chinook and coho are known to occur in Japanese Gulch Creek and likely to occur in Edgewater Creek. These species are known to use Japanese Gulch Creek for adult migration, juvenile out-migration, and rearing where suitable habitat is present. Fish habitat in Japanese Gulch Creek is approximately 0.02 miles from the project site, and 0.015 miles to Edgewater. The proposed project **may affect, but is not likely to adversely affect** essential fish habitat.

A **may affect** determination is warranted based on the following rationale.

- Essential Fish Habitat (EFH) occurs in the vicinity of the proposed development site.

A **not likely to adversely affect** determination for this action is warranted based on the following rationale.

- No direct in-water work is proposed. Sedimentation resulting from construction activities will be minimized by the implementation of BMP erosion control measures. Any sediment that does enter the water is expected to be minimal and of short duration.
- Earth work will occur during the drier months when fish are less likely to be present in the system.
- The on-site stormwater system will protect water quality.

10.0 USE OF THIS REPORT

This Biological Evaluation has been prepared for AmericanWest Bank and Veritas Development, Inc. to comply with consultation requirements under Section 7(c) of the Endangered Species Act.

This Biological Evaluation addresses the effects of the proposed action as well as the interrelated effects of the associated development on listed species. It addresses both direct and indirect impacts of the project to listed species, their habitat and forage base. The determinations of effect are based upon the effects analysis, which includes reviews of life history, habitat requirements, literature review, agency consultation, and field reconnaissance studies conducted by WRI. Effects on Essential Fish Habitat (EFH), as defined by NOAA's National Marine Fisheries Service (NMFS, 1999), are also examined.

The laws applicable to fisheries biology/management are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by fisheries biologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.



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Appendix A
Life Histories of Listed Species

LIFE HISTORY OF LISTED SPECIES

BULL TROUT

Adult Bull Trout

Bull trout range from northern California to southeast Alaska. In the Puget Sound region bull trout have a wide distribution with 35 subpopulations in the Coastal/Puget Sound area. Nineteen of these are found in the Puget Sound Basin (King County –Ecology of the Bull Trout).

Bull trout reach spawning maturity at 4 to 7 years and can live up to 12 years (Fish Passage Center). Bull trout typically spawn in the fall (Groot and Margolis, 1991), and prefer streams that have a cold groundwater upwelling component (Pratt, 1992) and water temperatures below 15°C (Rieman and McIntyre, 1993). Because bull trout can spawn multiple times, anadromous kelts migrate downstream after spawning.

Sedimentation, elevated water temperatures, loss of LWD recruitment, restricted flows, and loss of pool habitat, all pose threats to bull trout.

Juvenile Bull Trout

Winter rearing areas for juvenile rearing should provide a stable and non-turbid stream flow during storm events. Bull trout prefer holding velocities of around 5 inches per second for fish greater than 4 inches, and 4 inches per second for fish less than 4 inches (Spence *et al.*, 1996). Anadromous bull trout usually remain in freshwater for two to three years before emigrating to salt water (Wydoski and Whitney, 1979). Juveniles primarily rear in estuaries in the spring and summer. In early life stages, bull trout prey consists mainly of invertebrates. As fish grow they rely less heavily on invertebrates and may feed exclusively on fish (Bjornn, 1991). After entering marine waters, anadromous bull trout in Puget Sound feed mainly on fish including surf smelt (*Hypomesus pretiosus*), herring (*Clupea pallasii*), and juvenile salmonids (Brown, 1994).

CHINOOK SALMON

The life history of Chinook Salmon is described in detail in *Pacific Salmon Life Histories* (Groot and Margolis, 1991) and is included herein by reference. A summary to assist in the discussion of effects of the proposed action is included below.

Chinook Salmon occur on the Pacific Coast from central California to Alaska. In Puget Sound, Chinook generally return to their natal rivers in July or August. Chinook are one of the earliest fish to spawn, with spawning occurring from September through mid December (Salmon Watcher). After incubation, fry emerge and begin to travel downstream. Some travel directly to estuaries and the ocean while others may reside in the natal stream up to a year or more. The primary diet of Chinook in fresh water appears to be larval and adult insects. Many of the fry that migrate downstream rear to smolt size in river estuaries. Once leaving rivers and estuaries, Chinook enter the Pacific ocean where they range widely for a period of on average four to five years before returning to spawn and die.

COHO SALMON

The life history of Coho Salmon is described in detail in *Pacific Salmon Life Histories* (Groot and Margolis, 1991) and is included herein by reference. A summary to assist in the discussion of effects of the proposed action is included below.

Coho Salmon occur on the Pacific Coast from central California to Alaska. In Puget Sound, Coho generally return to their natal rivers in late summer and autumn after one winter at sea. Coho generally spawn from mid October through early January (Salmon Watcher). After an average incubation period of 42 to 56 days, fry emerge and spend up to 15 months in fresh water prior to migrating to the ocean. Fresh water, Coho depend on visual cues for locating food which primarily of insects. Once leaving rivers and estuaries, Coho enter the Pacific ocean where they range widely for on average a period of sixteen months before returning to spawn and die.

STEELHEAD TROUT

Steelhead (*Oncorhynchus mykiss*) occurs on the Pacific Coast from southern California to Alaska (NOAA Species of Concern). The life history of the Steelhead is more complex than any other species of anadromous fish (Barnhart 1986). These fish can be anadromous or fresh water resident. Resident fish are called rainbow trout while the anadromous strain are known as Steelhead (NOAA-NWFSC tech memo-27, NOAA Species of Concern). Steelhead generally spend from one to four years in fresh water prior to smoltification, and up to three years in salt water prior to first spawning. The average spawning age of these fish is four years (NOAA Species of Concern). In addition, Steelhead have the ability to spawn more than once (iteroparity). With the exception of *O. clarki*, all other species of *Oncorhynchus* spawn once and then die (semelparity) (Barnhart 1986, NOAA-NWFSC tech memo-27, NOAA Species of Concern). Steelhead may be divided in to two categories, either winter run or summer run fish (Barnhart 1986, California Department of Fish and Game 1954, NOAA-NWFSC tech memo-27, NOAA Species of Concern). Of the two categories, winter Steelhead are the most common and occur in all coastal rivers of Washington, Oregon, and California (NOAA-NWFSC tech memo-27). Winter Steelhead enter freshwater in a sexually mature state between November and April, and spawn soon thereafter in April and May (Barnhart 1986, NOAA Species of Concern). Summer Steelhead are less abundant than winter Steelhead. These fish enter freshwater as immature fish between May and October and do not mature and spawn for several months, generally until January and February (Barnhart 1986, NOAA Species of Concern). Steelhead from both winter and summer runs may enter freshwater in the spring or fall and are then called spring or fall-run Steelhead. In some large rivers, Steelhead may enter freshwater throughout the year (Barnhart 1986, California Department of Fish and Game 1954). After emergence from their eggs, Steelhead fry spend from one to four years in freshwater before becoming smolts and migrating to saltwater (Barnhart 1986).

Appendix B
Threatened and Endangered Species and EFH Information

Endangered Species Act Status of West Coast Salmon & Steelhead

(Updated Aug. 11, 2011)

| | | Species ¹ | Current Endangered Species Act Listing Status ² | ESA Listing Actions Under Review |
|---|----|---|--|----------------------------------|
| Sockeye Salmon (<i>Oncorhynchus nerka</i>) | 1 | Snake River | Endangered | |
| | 2 | Ozette Lake | Threatened | |
| | 3 | Baker River | Not Warranted | |
| | 4 | Okanogan River | Not Warranted | |
| | 5 | Lake Wenatchee | Not Warranted | |
| | 6 | Quinalt Lake | Not Warranted | |
| | 7 | Lake Pleasant | Not Warranted | |
| Chinook Salmon (<i>O. tshawytscha</i>) | 8 | Sacramento River Winter-run | Endangered | |
| | 9 | Upper Columbia River Spring-run | Endangered | |
| | 10 | Snake River Spring/Summer-run | Threatened | |
| | 11 | Snake River Fall-run | Threatened | |
| | 12 | Puget Sound | Threatened | |
| | 13 | Lower Columbia River | Threatened | |
| | 14 | Upper Willamette River | Threatened | |
| | 15 | Central Valley Spring-run | Threatened | |
| | 16 | California Coastal | Threatened | |
| | 17 | Central Valley Fall and Late Fall-run | Species of Concern | |
| | 18 | Upper Klamath-Trinity Rivers | Not Warranted | |
| | 19 | Oregon Coast | Not Warranted | |
| | 20 | Washington Coast | Not Warranted | |
| | 21 | Middle Columbia River spring-run | Not Warranted | |
| | 22 | Upper Columbia River summer/fall-run | Not Warranted | |
| | 23 | Southern Oregon and Northern California Coast | Not Warranted | |
| | 24 | Deschutes River summer/fall-run | Not Warranted | |
| Coho Salmon (<i>O. kisutch</i>) | 25 | Central California Coast | Endangered | |
| | 26 | Southern Oregon/Northern California | Threatened | |
| | 27 | Lower Columbia River | Threatened | • Critical habitat |
| | 28 | Oregon Coast | Threatened | |
| | 29 | Southwest Washington | Undetermined | |
| | 30 | Puget Sound/Strait of Georgia | Species of Concern | |
| | 31 | Olympic Peninsula | Not Warranted | |
| Chum Salmon (<i>O. keta</i>) | 32 | Hood Canal Summer-run | Threatened | |
| | 33 | Columbia River | Threatened | |
| | 34 | Puget Sound/Strait of Georgia | Not Warranted | |
| | 35 | Pacific Coast | Not Warranted | |
| Steelhead (<i>O. mykiss</i>) | 36 | Southern California | Endangered | |
| | 37 | Upper Columbia River | Threatened | |
| | 38 | Central California Coast | Threatened | |
| | 39 | South Central California Coast | Threatened | |
| | 40 | Snake River Basin | Threatened | |
| | 41 | Lower Columbia River | Threatened | |
| | 42 | California Central Valley | Threatened | |
| | 43 | Upper Willamette River | Threatened | |
| | 44 | Middle Columbia River | Threatened | |
| | 45 | Northern California | Threatened | |
| | 46 | Oregon Coast | Species of Concern | |
| | 47 | Southwest Washington | Not Warranted | |
| | 48 | Olympic Peninsula | Not Warranted | |
| | 49 | Puget Sound | Threatened | • Critical habitat |
| | 50 | Klamath Mountains Province | Not Warranted | |
| Pink Salmon (<i>O. gorbuscha</i>) | 51 | Even-year | Not Warranted | |
| | 52 | Odd-year | Not Warranted | |

1 The ESA defines a “species” to include any distinct population segment of any species of vertebrate fish or wildlife. For Pacific salmon, NOAA Fisheries Service considers an evolutionarily significant unit, or “ESU,” a “species” under the ESA. For Pacific steelhead, NOAA Fisheries Service has delineated distinct population segments (DPSs) for consideration as “species” under the ESA.

**LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND
CRITICAL HABITAT; CANDIDATE SPECIES; AND SPECIES OF CONCERN
IN **SNOHOMISH COUNTY****

**AS PREPARED BY
THE U.S. FISH AND WILDLIFE SERVICE
WASHINGTON FISH AND WILDLIFE OFFICE**

(Revised September 3, 2013)

LISTED

Bull trout (*Salvelinus confluentus*)
Canada lynx (*Lynx canadensis*)
Gray wolf (*Canis lupus*)
Grizzly bear (*Ursus arctos* = *U. a. horribilis*)
Marbled murrelet (*Brachyramphus marmoratus*)
Northern spotted owl (*Strix occidentalis caurina*)

Major concerns that should be addressed in your Biological Assessment of project impacts to listed species include:

1. Level of use of the project area by listed species.
2. Effect of the project on listed species' primary food stocks, prey species, and foraging areas in all areas influenced by the project.
3. Impacts from project activities and implementation (e.g., increased noise levels, increased human activity and/or access, loss or degradation of habitat) that may result in disturbance to listed species and/or their avoidance of the project area.

DESIGNATED

Critical habitat for bull trout
Critical habitat for the marbled murrelet
Critical habitat for the northern spotted owl

PROPOSED

North American wolverine (*Gulo gulo luteus*) – contiguous U.S. DPS
Oregon spotted frog (*Rana pretiosa*) [historical]

CANDIDATE

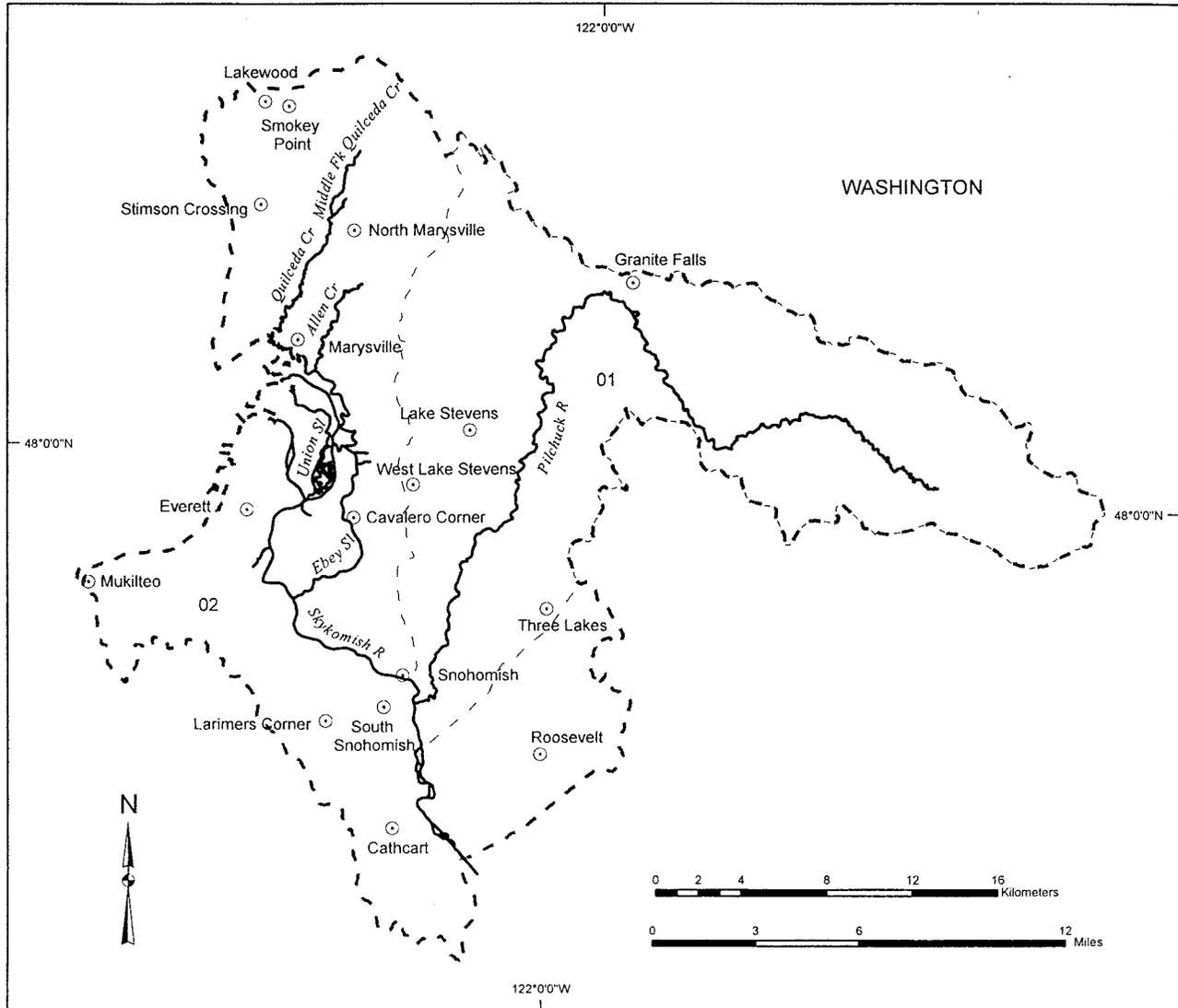
Fisher (*Martes pennanti*) – West Coast DPS
Yellow-billed cuckoo (*Coccyzus americanus*)
Pinus albicaulis (whitebark pine)

SPECIES OF CONCERN

Bald eagle (*Haliaeetus leucocephalus*)
Beller's ground beetle (*Agonum belleri*)
Cascades frog (*Rana cascadae*)
Long-eared myotis (*Myotis evotis*)
Long-legged myotis (*Myotis volans*)
Northern goshawk (*Accipiter gentilis*)
Olive-sided flycatcher (*Contopus cooperi*)
Pacific lamprey (*Lampetra tridentata*)
Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*)
Peregrine falcon (*Falco peregrinus*)
River lamprey (*Lampetra ayresi*)
Tailed frog (*Ascaphus truei*)
Western toad (*Bufo boreas*)
Botrychium pedunculatum (stalked moonwort)

**Final Critical Habitat for the
Puget Sound Chinook Salmon ESU**

**SNOHOMISH SUBBASIN
17110011**

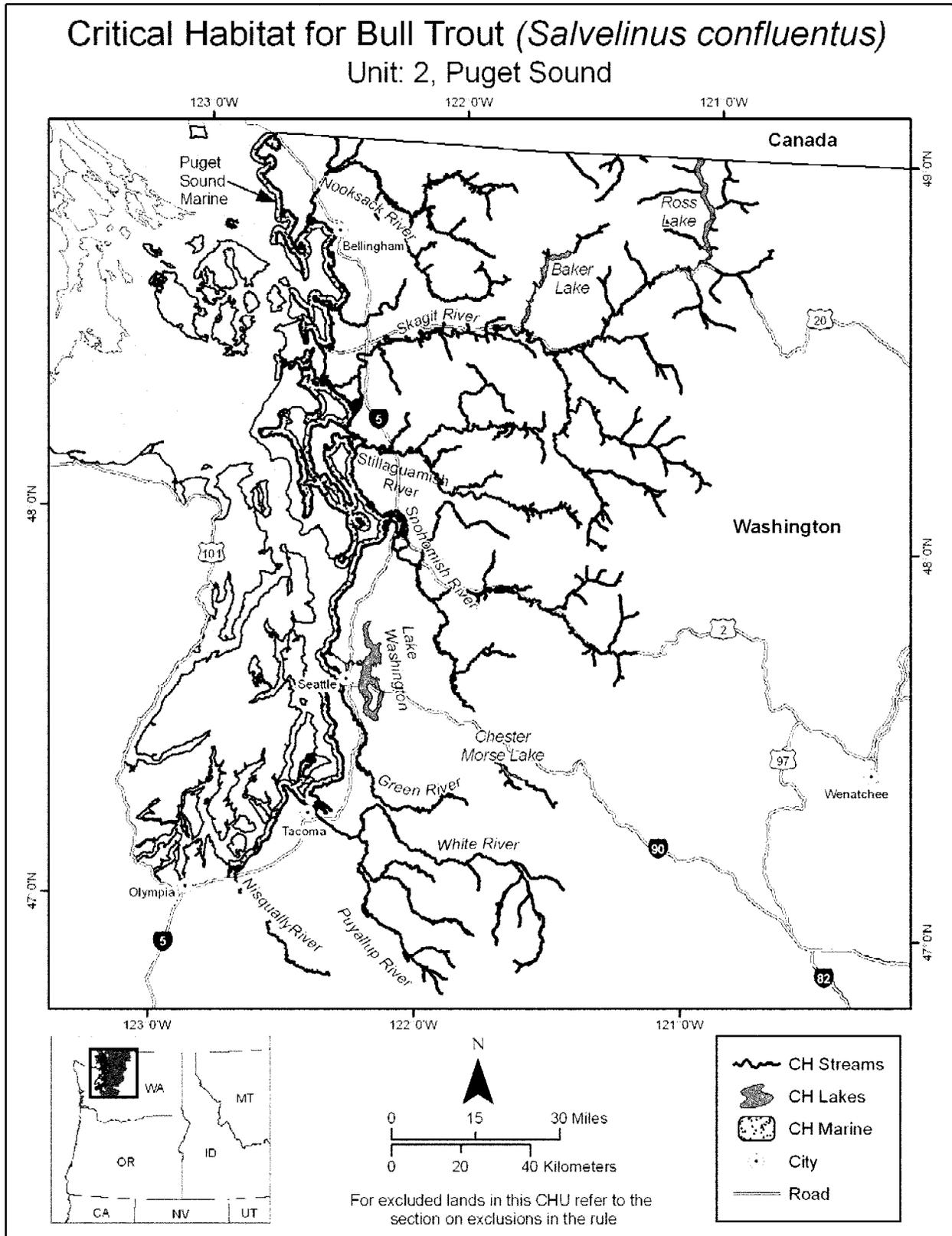


Legend

- ⊙ Cities / Towns
- ~ Critical Habitat
- - - Subbasin Boundary
- · - · - Watershed Boundaries

01 - 02 = Watershed code - last 2 digits of 17110011xx





BILLING CODE 4310-55-C

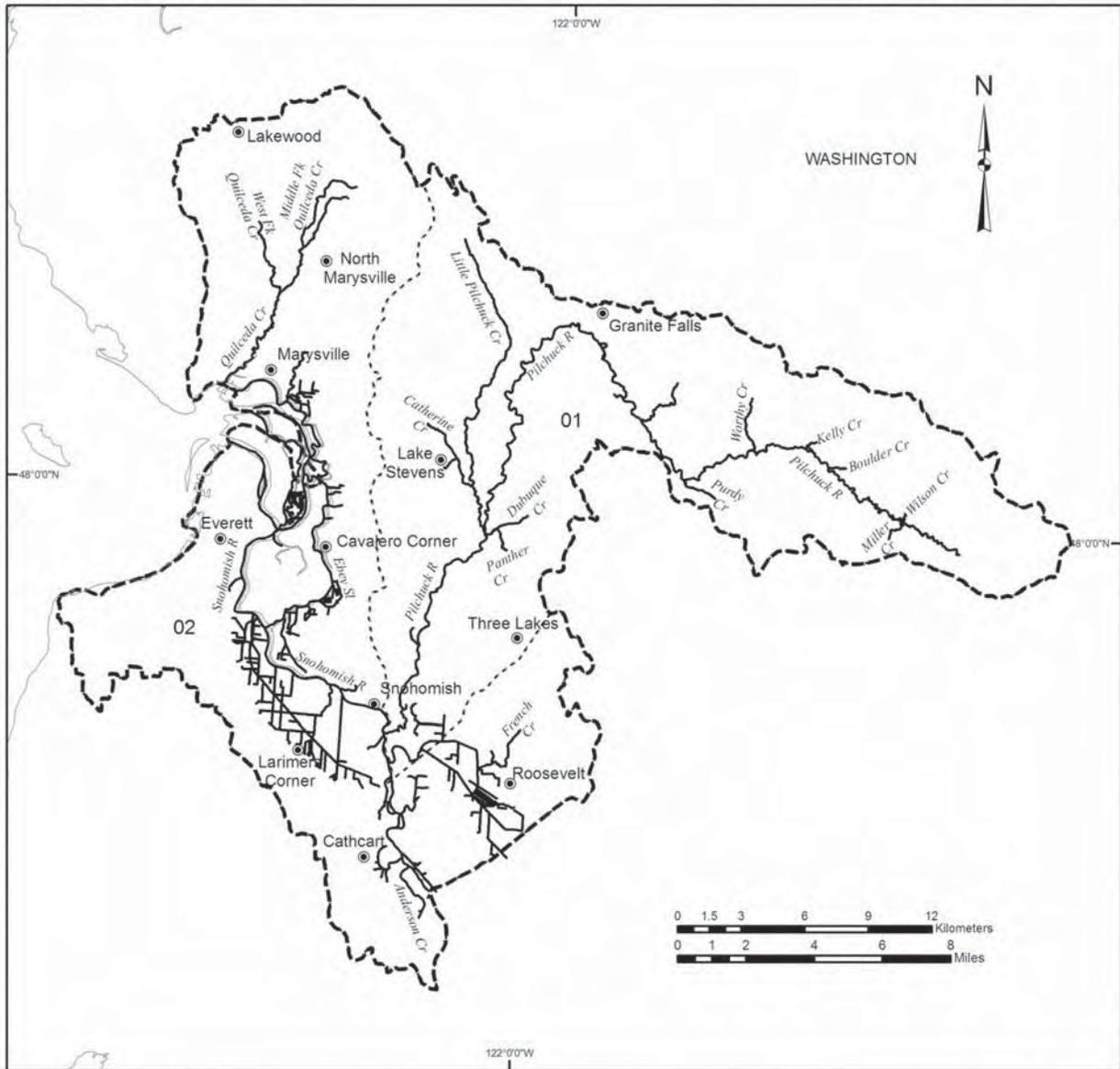
(10) Unit 3: Lower Columbia River Basins

(i) This unit consists of 119.3 km (74.2 mi) of streams. The unit is located in southwestern Washington.

(ii) Individual waterbodies in the unit are bounded by the following coordinates:

Proposed Critical Habitat for the Puget Sound Steelhead DPS

Snohomish Subbasin 17110011



Legend

- Cities / Towns
- ~ Critical Habitat
- State Boundary
- - - Subbasin Boundary
- ⋯ Watershed Boundaries

01 - 02 = Watershed code - last 2 digits of 17110011xx



This map does not show U.S. Department of Defense sites determined to be ineligible for designation nor excluded areas associated with Indian lands and Habitat Conservation Plans; see the regulatory text for a description of these excluded areas.

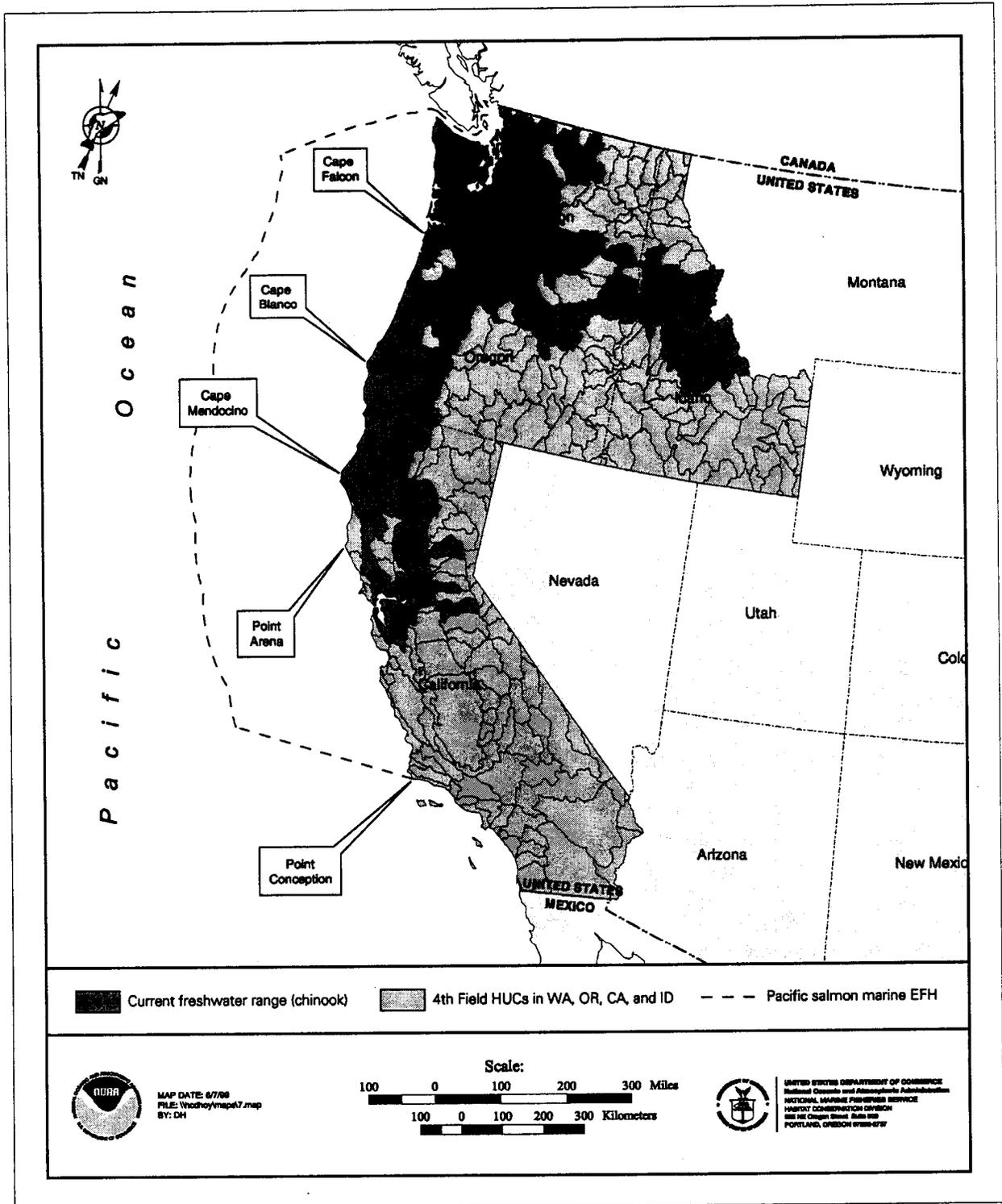


FIGURE A-2. Watersheds currently utilized by chinook salmon from Washington, Oregon, Idaho, and California.

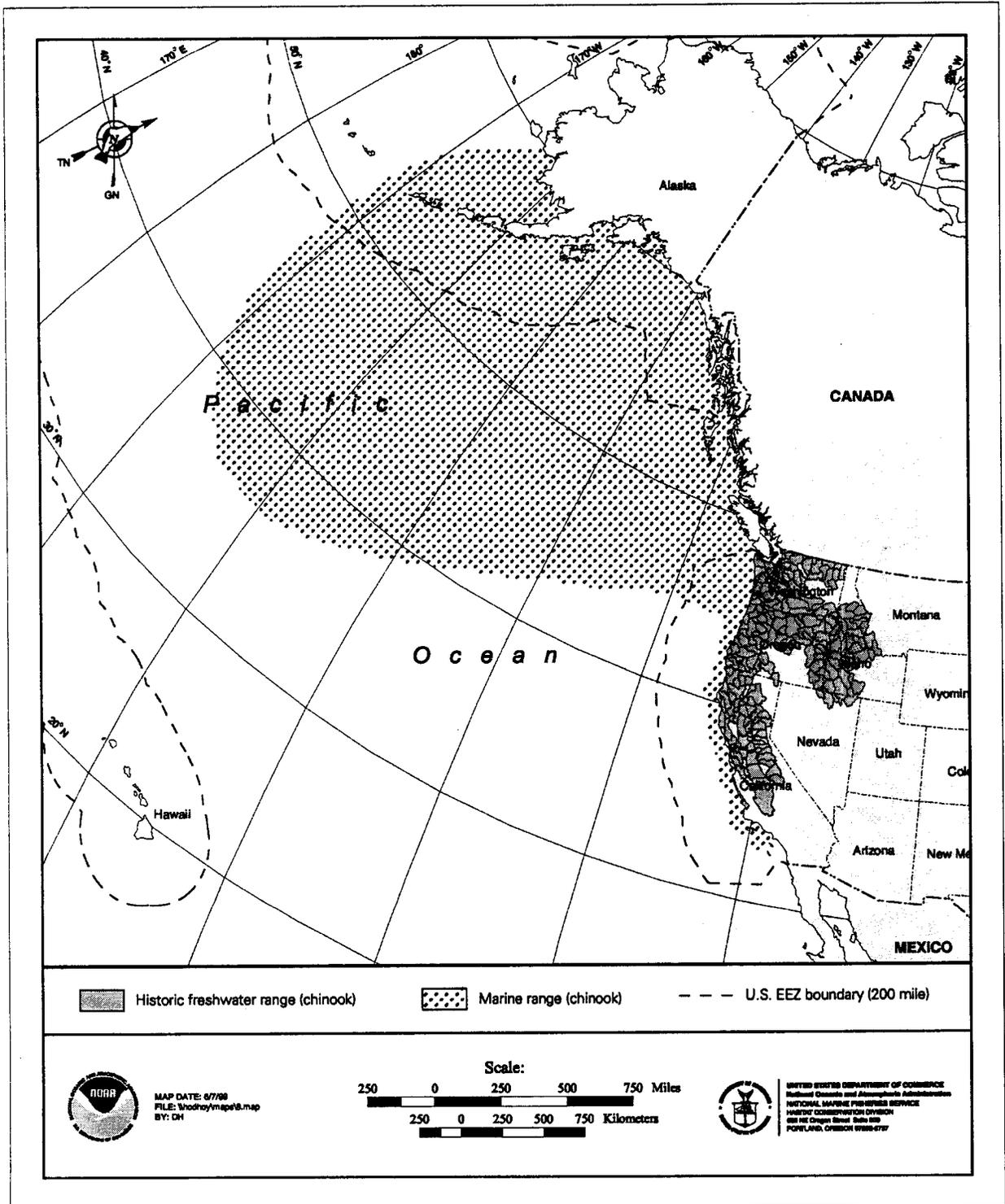


FIGURE A-3. Approximate historically accessible freshwater distribution and currently identified range of common marine occurrence of chinook salmon originating from Washington, Oregon, Idaho, and California.

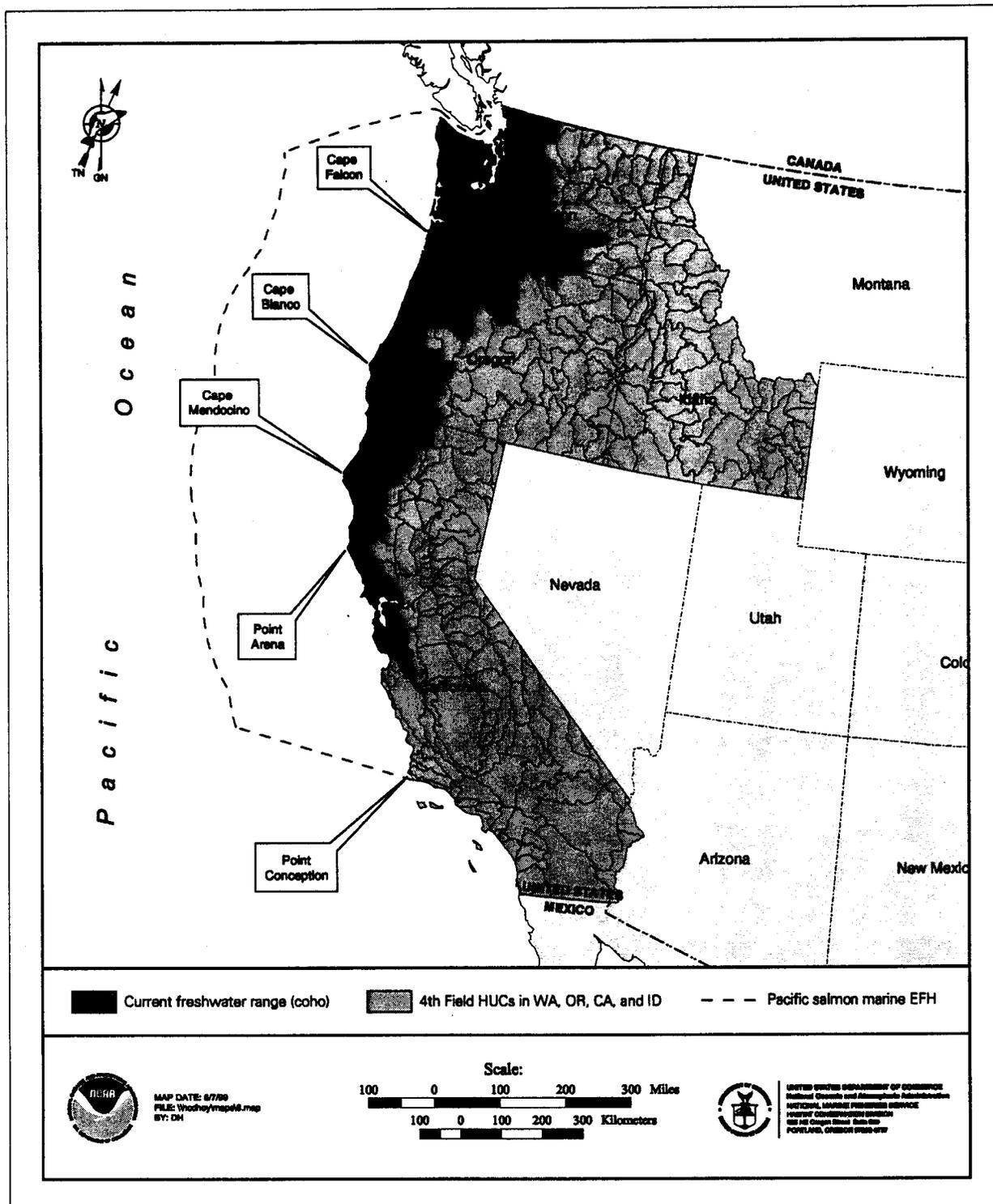


FIGURE A-4. Watersheds currently utilized by coho salmon from Washington, Oregon, and California.

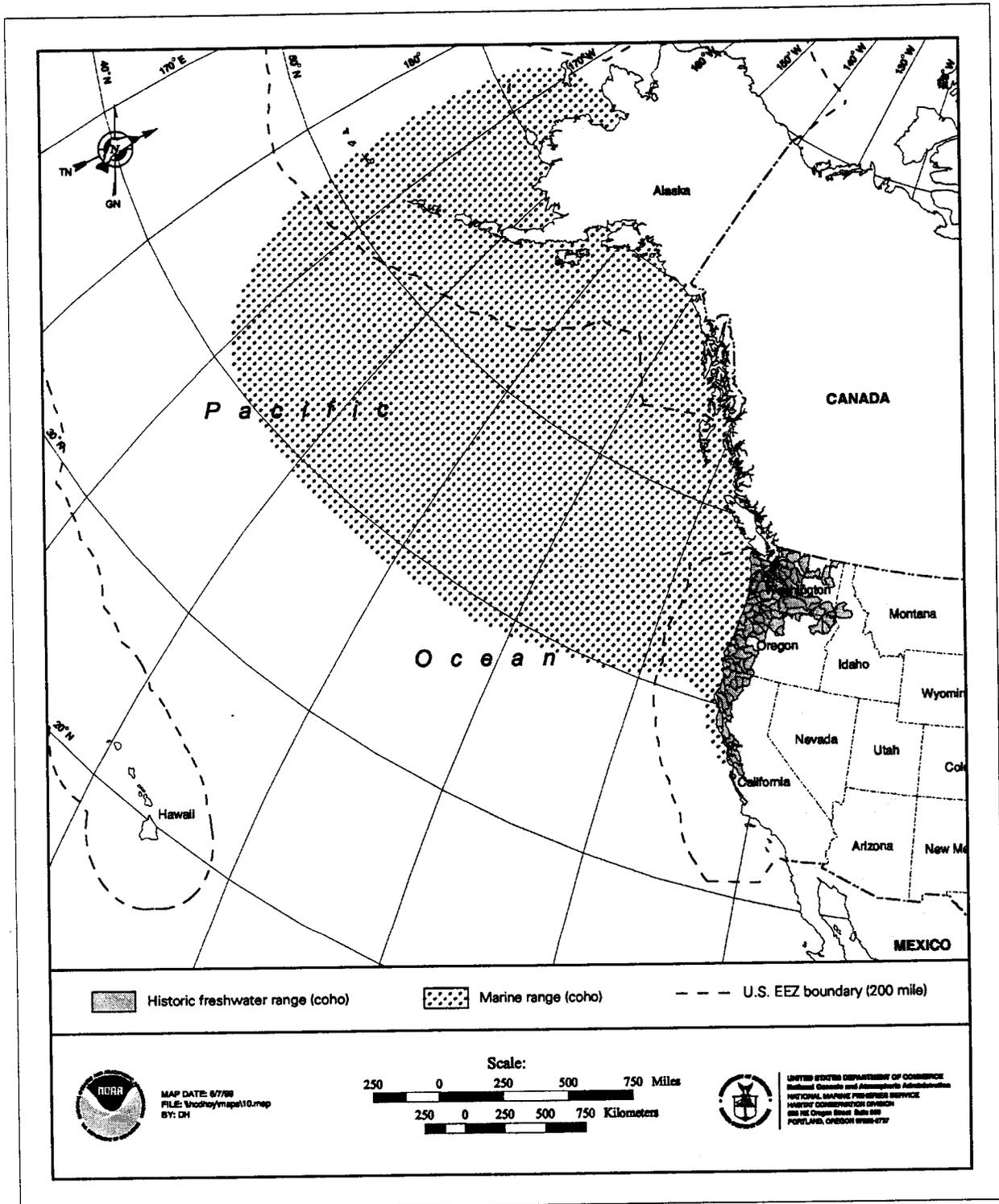


FIGURE A-5. Approximate historically accessible freshwater distribution and currently identified range of common marine occurrence of coho salmon from Washington, Oregon, and California.

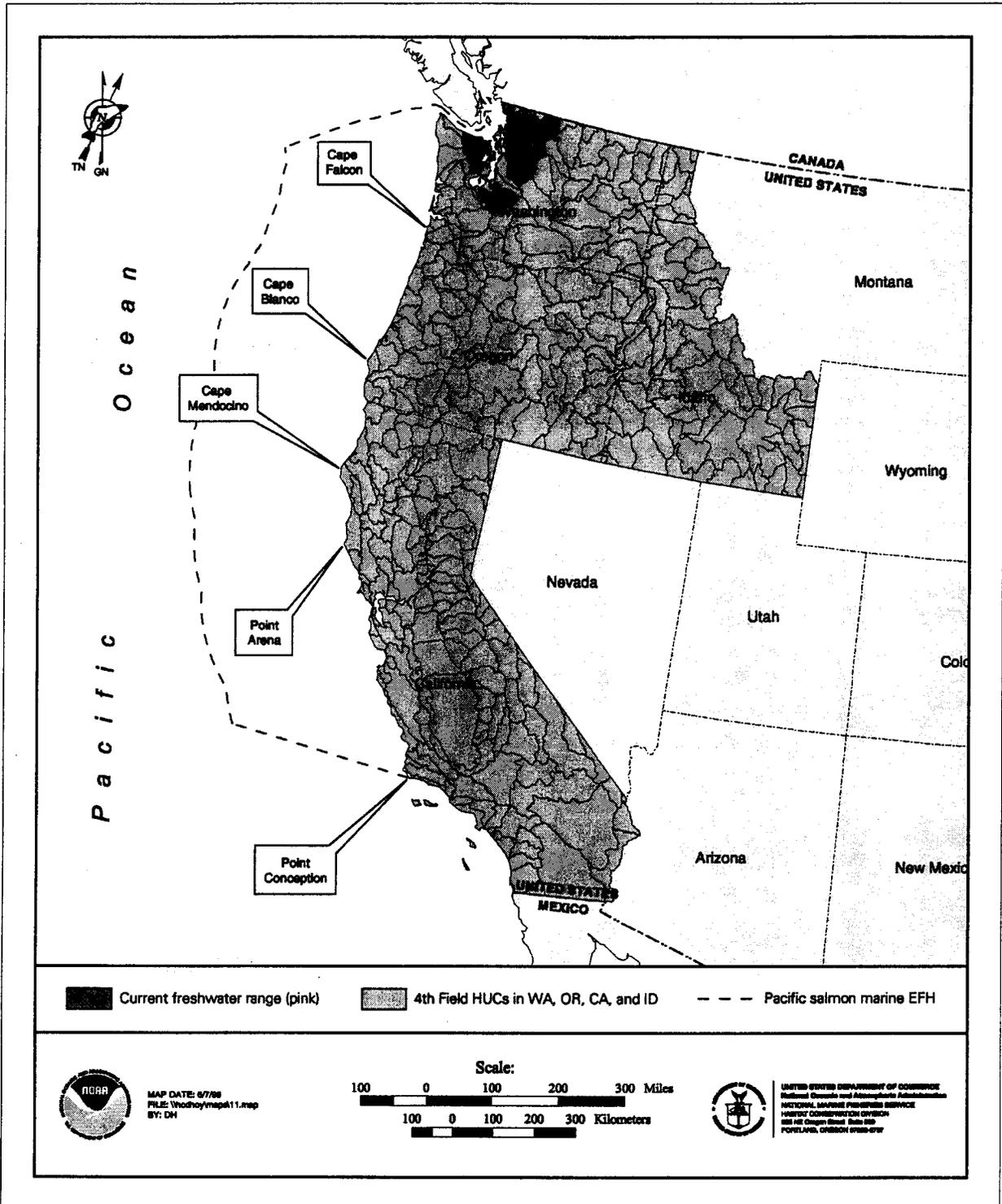


FIGURE A-6. Watersheds currently utilized by pink salmon from Washington.

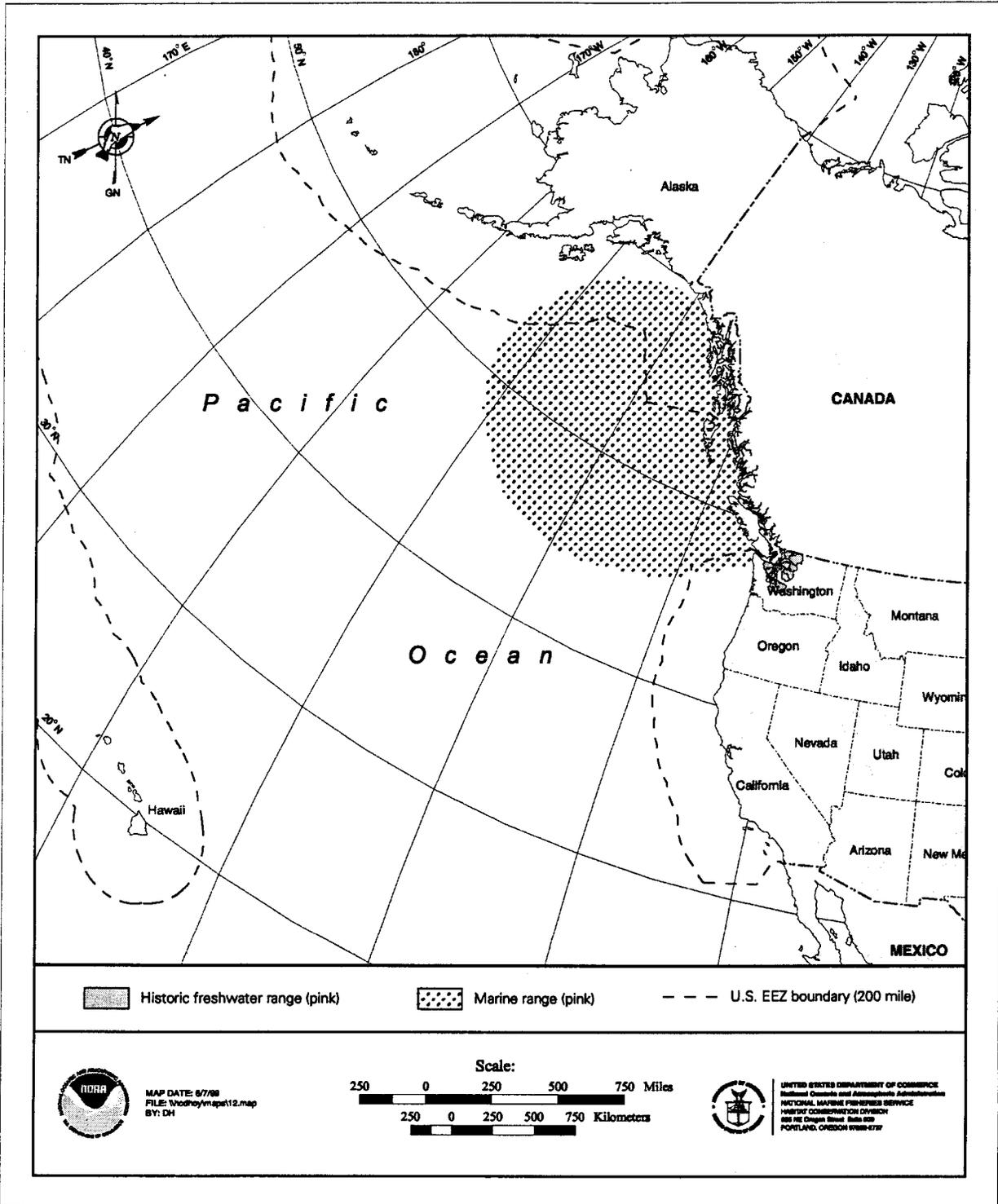


FIGURE A-7. Approximate historically accessible freshwater distribution, and currently identified range of common marine occurrence of Puget Sound pink salmon.

Appendix C
Critical Area Study



Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E.
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Fax (425) 337-3045

CRITICAL AREA STUDY

FOR

SOUNDVIEW BUSINESS CAMPUS

Wetland Resources, Inc. Project #14109

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Revision #1: September 15, 2014

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1.0 SITE DESCRIPTION

Wetland Resources, Inc. completed a site investigation and delineation in November, 2011, November, 2013, and July, 2014, to locate and evaluate jurisdictional wetlands and streams on and in the vicinity of the 39.45-acre parcel located northwest of the terminus of 36th Avenue West in Everett, Washington. (Section 3, Township 28N, Range 4E, W.M.)

The subject property is undeveloped, with a majority of the site having been logged in approximately 2006. Some forested areas still exist in the southeastern and southwestern portions of the site. An even aged stand of red alder, big-leaf maple, salmonberry and Himalayan blackberry currently occupy the areas of the site that were logged.

With the exception of the forested area in the southwestern portion of the site, the subject property displays a general northern aspect. The southwestern portion of the site contains a steep west aspect slope associated with Japanese Gulch. The southeastern corner of the site drains to the east.

Surrounding land use is comprised of a commercial development to the east (*Intermec Corp.*), residential development to the north and northeast, and forested areas to the west and south. The Boeing railroad spur lies just west of the site in Japanese Gulch. Current zoning of the site is M-1 Office and Industrial Park.



Figure 1: Current aerial view of the subject property.

There are four wetlands located on the subject site. The wetlands are identified as Wetlands A through D on the attached maps. Wetlands A through C are located in the forested area in the southeast corner of the site, while Wetland D is located in the central portion of the site.

The Washington State Department of Ecology's (DOE) *Washington State Wetland Rating System for Western Washington* (Revised) was used to classify the wetlands associated with this site. DOE's *Washington State Wetland Rating Form for Western Washington* (Version 2) was completed for each wetland. Rating forms and mapping are included as an appendix to this report. Based on the classifications and point totals achieved from the rating system, Everett Municipal Code, Chapter 37, was applied to determine wetland buffer widths. Wetlands B and D are classified as Category III wetlands under the rating system, with habitat scores below 19 points, and thereby receive 60-foot buffers (EMC 19.37.110(A)(1)(a)). Wetlands A and C are classified as Category II wetlands, both with 19 habitat points, and thereby receive 75-foot buffers (EMC 19.37.110(A)(1)(b)).

Everett Municipal Code (EMC 19.37.050(A)(7)) provides exemptions for small wetlands that meet certain criteria. Although Wetlands A through C are small (<4,000 sq. ft.), they are part of a wetland mosaic. Wetland mosaics occur when two or more wetlands lie within close proximity and, inclusive of the upland areas between the them, the wetlands compose more than 50% of the overall area. In this case, when Wetlands A through C are connected together, they make up 73% of the overall area which disqualifies this exemption. All four on-site wetlands are regulated.

2.0 WETLAND CLASSIFICATIONS

2.1 COWARDIN SYSTEM CLASSIFICATIONS

The wetland classifications applicable to this site according to the Cowardin System, as described in Classification of Wetlands and Deepwater Habitats of the United States, are as follows:

Wetlands A - C: Palustrine, Forested Wetland, Broad-leaved Deciduous, Saturated

Wetland D: Palustrine, Scrub-Shrub Wetland, Broad-leaved Deciduous, Saturated

2.2 CITY OF EVERETT CLASSIFICATIONS

Under the City of Everett's Municipal Code, Chapter 37, the on-site wetlands are classified as follows:

Wetland A (Category II): This small (2,155 sq. ft.), forested, depressional wetland received a total score for functions of 57 points with a habitat score of 19 on the DOE *Wetland Rating Form for Western Washington* (Version 2). Category II wetlands with habitat scores of 19 typically receive 75-foot protective buffers.

Wetland B (Category III): This small (171 sq. ft.), forested, depressional wetland received a total score for functions of 35 points with a habitat score of 13 on the DOE *Wetland Rating Form for Western Washington* (Version 2). Category III wetlands with habitat scores of less than 19 typically receive 60-foot protective buffers.

Wetland C (Category II): This small (3,577 sq. ft.), forested, depressional wetland received a total score for functions of 51 points with a habitat score of 19 on the DOE *Wetland Rating Form for*

Western Washington (Version 2). Category III wetlands with habitat scores of 19 typically receive 75-foot protective buffers.

Wetland D (Category III): This small (4,920 sq. ft.), scrub-shrub, depression wetland received a total score for functions of 45 points with a habitat score of 15 on the DOE *Wetland Rating Form for Western Washington* (Version 2). Category III wetlands with habitat scores of less than 19 typically receive 60-foot protective buffers.

3.0 WETLAND DETERMINATION

3.1 METHODOLOGY

On-site wetland conditions were evaluated using routine methodology described in the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), (referred as 2010 Regional Supplement). The methodology in the 2010 Regional Supplement coincides with the methodology described in the Washington State Wetlands Identification and Delineation Manual (Washington State Department of Ecology Publication #96-94, March 1997, as required by the City of Everett. Under this method, the process for making a wetland determination is based on three sequential steps:

- 1) Examination of the site for hydrophytic vegetation (species presence and coverage);
- 2) If hydrophytic vegetation is found, then the presence of hydric soils is determined;
- 3) Determination of the presence of wetland hydrology in the area examined under the first two steps.

3.1.1 Vegetation Criteria

The 2010 Regional Supplement defines hydrophytic vegetation as “the community of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to exert a controlling influence of the plant species present.” Field indicators were used to determine whether the vegetation meets the definition for hydrophytic vegetation.

3.1.2 Wetland Soils Criteria and Mapped Description:

The National Technical Committee for Hydric Soils, as described in the 2010 Regional Supplement, defines hydric soils as “a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.” Field indicators were used to determine whether a given soil meets the definition for hydric soils.

The soils underlying the site are mapped in the Soil Survey of Snohomish County Area Washington as Alderwood gravelly sandy loam, 2 to 8 percent slopes, Alderwood gravelly sandy loam, 15 to 25 percent slopes, and Alderwood-Everett gravelly sandy loam, 25 to 70 percent slopes.

Alderwood gravelly sandy loam is described as a moderately well drained soil on till plains. It is moderately deep over a hardpan. This soil formed in glacial till. Typically, the surface layer is very dark grayish brown gravelly sandy loam about 7 inches thick. The upper part of the subsoil is dark yellowish brown and dark brown very gravelly sandy loam about 23 inches thick. Included in this unit are small areas of soils that have a stony or bouldery surface layer and areas of McKenna soils, Norma soils, and Terric Medisaprists in drainageways on plains. Also included are small areas of Everett, Indianola, and Ragnar soils on terraces and outwash plains. Included areas make up about 15 percent of the total acreage. Permeability of this soil is moderately rapid above the hardpan and very slow through it. Soils sampled on site appear similar to the description for Alderwood gravelly sandy loam. Although Alderwood gravelly sandy loam is not listed as hydric, the predicted inclusions of Terric Medisaprists, McKenna, and Norma soils are listed as hydric on the Washington State Hydric Soils List.

Alderwood-Everett gravelly sandy loam is on till plains, terraces, and outwash plains. This unit is about 60 percent Alderwood gravelly sandy loam and about 25 percent Everett gravelly sandy loam. Included in this unit are small areas of Ragnar, Indianola, McKenna, and Norma soils and Terric Medisaprists in depressional areas and drainageways on plains. Also included are colluvial soils, slump areas, and escarpments. Included areas make up about 15 percent of the total acreage. The Alderwood soil is moderately deep over a hardpan and is moderately well drained. It formed in glacial till. Typically, the surface layer is very dark grayish brown gravelly sandy loam about 7 inches thick. The upper part of the subsoil is dark yellowish brown and dark brown very gravelly sandy loam about 23 inches thick. A weakly cemented hardpan is at a depth of about 35 inches. Depth to the hardpan ranges from 20 to 40 inches. Permeability of the Alderwood soil is moderately rapid above the hardpan and very slow through it. A seasonal perched water table is at a depth of 18 to 36 inches from January to March. Springs or seep areas are common. Although Alderwood-Everett gravelly sandy loam is not listed as hydric, the predicted inclusions of Terric Medisaprists, McKenna, and Norma soils are listed as hydric on the Washington State Hydric Soils List.

3.1.3 Hydrology Criteria

As stated in the 2010 Regional Supplement, the “term wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season.” It also explains “areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and chemically reducing conditions, respectively.”

Additionally, the US Army Corps of Engineers 1987 Wetland Delineation Manual states that “areas which are seasonally inundated and/or saturated to the surface for a consecutive number of days ≥ 12.5 percent of the growing season are wetlands, provided the soil and vegetation parameters are met. Areas inundated or saturated between 5 and 12.5 percent of the growing season in most years may or may not be wetlands. Areas saturated to the surface for less than 5 percent of the growing season are non-wetlands.” Field indicators were used to determine whether wetland hydrology parameters were met on this site.

3.2 BOUNDARY DETERMINATION FINDINGS

3.2.1 Wetland A

Cowardin Classification: Palustrine, Forested Wetland, Broad-leaved Deciduous, Saturated

WA Dept. of Ecology Rating: Category II, Habitat Score 19

City of Everett Rating: Category II

City of Everett Buffer Requirement: 75-foot buffer



Figures 1 & 2: Views of Wetland A

Wetland A is located in the Southeastern portion of the subject property. Wetland A is a depressional wetland with a highly constricted outlet. Forested vegetation dominates Wetland A. This wetland is part of a wetland mosaic existing in the southeastern corner of the site. The primary source of hydrology to the wetland complex is surface flows from the south.

Wetland A received a total score of 57, with a habitat score of 19 on the DOE *Wetland Rating Form for Western Washington*. In the city of Everett, wetlands that receive between 51 and 69 points are classified as Category II wetlands. Category II wetlands with a habitat score of 19 receive a buffer width of 75 feet.

Vegetation in this wetland is represented by the following observed species: Red alder (*Alnus rubra*, Fac) and Western red cedar (*Thuja plicata*, Fac) dominate the overstory of the wetland. The understory is dominated by a thick stand of salmonberry (*Rubus spectabilis*, Fac), with some Himalayan blackberry (*Rubus armeniacus*, FacU) and trailing blackberry (*Rubus ursinus*, FacU). The dominance of species rated “Facultative” and wetter meets the criteria for hydrophytic vegetation.

Typical soils within Wetland A were ponded at the surface at the time of inspection. Sampled soils were found to be very dark gray (10YR 3/1) from 0 to 18 inches below the surface, and sandy silt loam in texture. The wetland area, as mapped, appears to satisfy the criteria for hydric soils.

Soils in the wetland were moist with dark chromas, inferring the presence of water at or near the surface for at least 12.5 percent of the growing season. This satisfies wetland hydrology criteria. Wetland A meets all criteria for designation as a wetland.

3.2.2 Wetland B

Cowardin Classification: Palustrine, Forested Wetland, Broad-leaved Deciduous, Saturated

WA Dept. of Ecology Rating: Category III, Habitat Score 13

City of Everett Rating: Category III

City of Everett Buffer Requirement: 60-foot buffer



Figures 3 & 4: Views of Wetland B

Wetland B is located in the Southeastern portion of the subject property. Wetland B is a depressional wetland with no outlet. It is primarily dominated by a forested vegetation community. This wetland is part of a wetland mosaic existing in the southeastern corner of the site. The primary source of hydrology to the wetland complex is surface flows from the south.

Wetland B received a total score of 35, with a habitat score of 13 on the DOE *Wetland Rating Form for Western Washington*. In the city of Everett, wetlands that receive between 30 and 50 points are classified as Category III wetlands. Category III wetlands with a habitat score of 13 receive a buffer width of 60 feet.

Vegetation in this wetland is represented by the following observed species: no forested species rooted within the wetland itself, however an overstory of red alder overhangs the wetland boundary. Salmonberry dominates the fringes of the wetland with creeping buttercup (*Ranunculus repens*, FacW) present in the herbaceous layer. The dominance of species rated “Facultative” and wetter meets the criteria for hydrophytic vegetation.

Typical soils within Wetland B were moist to saturated at the surface at the time of inspection. Sampled soils were found to be dark gray (10YR 3/1) from 0 to 18 inches below the surface, and sandy silt in texture. The wetland area, as mapped, appears to satisfy the criteria for hydric soils.

Soils sampled in the wetland were moist with dark chromas, inferring the presence of water at or near the surface for at least 12.5 percent of the growing season. This satisfies wetland hydrology criteria.

Wetland B meets all criteria for designation as a wetland.

3.2.3 Wetland C

Cowardin Classification: Palustrine, Forested Wetland, Broad-leaved Deciduous, Saturated

WA Dept. of Ecology Rating: Category II, Habitat Score 19

City of Everett Rating: Category II

City of Everett Buffer Requirement: 75-foot buffer



Figures 5 & 6: Views of Wetland C

Wetland C is located in the Southeastern portion of the subject property. Wetland C is a depressional wetland with no outlet. Forested vegetation dominates Wetland C. This wetland is part of a wetland mosaic existing in the southeastern corner of the site. The primary source of hydrology to the wetland complex is surface flows from the south.

Wetland C received a total score of 51, with a habitat score of 19 on the DOE *Wetland Rating Form for Western Washington*. In the city of Everett, wetlands that receive between 51 and 69 points are classified as Category II wetlands. Category II wetlands with a habitat score of 19 receive a buffer width of 75 feet.

Vegetation in this wetland is represented by the following observed species: Western red cedar dominates the overstory of the wetland with an understory being by salmonberry and lady fern (*Athyrium filix-femina*, Fac) along the wetland fringe. The dominance of species rated “Facultative” and wetter meets the criteria for hydrophytic vegetation.

Typical soils within Wetland C were ponded at the surface at the time of inspection. Sampled soils were found to be dark gray (2.5Y 2/1) from 0 to 18 inches below the surface, and sandy-silt in texture. The wetland area, as mapped, appears to satisfy the criteria for hydric soils.

Soils sampled in the wetland were moist with dark chromas, inferring the presence of water at or near the surface for at least 12.5 percent of the growing season. This satisfies wetland hydrology criteria.

Wetland C meets all criteria for designation as a wetland.

3.2.4 Wetland D

Cowardin Classification: Palustrine, Scrub-Shrub Wetland, Broad-leaved Deciduous, Saturated

WA Dept. of Ecology Rating: Category III, Habitat Score 19

City of Everett Rating: Category III

City of Everett Buffer Requirement: 75-foot buffer



Figures 7 & 8: Views of Wetland D (2011)

Wetland D is located in the Southeastern portion of the subject property. Wetland D is a depressional wetland with no outlet. Forested vegetation dominates Wetland C. This wetland has been disturbed in the past and the vegetation is recently becoming reforested after significant clear-cutting events created highly disturbed conditions.

Wetland D received a total score of 48, with a habitat score of 19 on the DOE *Wetland Rating Form for Western Washington*. In the city of Everett, wetlands that receive between 30 and 50 points are classified as Category III wetlands. Category III wetlands with a habitat score of 19 receive a buffer width of 75 feet.

Vegetation in this wetland is represented by the following observed species: Red alder and salmonberry were observed at the wetland fringe with the remainder of the wetland represented by creeping buttercup, soft rush (*Juncus effusus*, FacW), toad rush (*Juncus bufonius*, FacW), and slough sedge (*Carex obnupta*, Obl). The dominance of species rated “Facultative” and wetter meets the criteria for hydrophytic vegetation.

Typical soils within Wetland C were ponded at the surface at the time of inspection. Sampled soils were very dark gray (10YR 3/1) with redoximorphic features (mottling) from 0 to 18 inches below the surface. The sampled soils had a fine sandy loam texture. The wetland area, as mapped, appears to satisfy the criteria for hydric soils.

Soils sampled in the wetland were moist with dark chromas, inferring the presence of water at or near the surface for at least 12.5 percent of the growing season. This satisfies wetland hydrology criteria. Wetland D meets all criteria for designation as a wetland.

3.2.5 Non-wetland areas within clear-cut

Vegetation in the non-wetland clear-cut portions of the site is dominated by red alder and large thick patches of salmonberry. Additional typical vegetation includes big leaf maple (*Acer macrophyllum*, FacU), thimbleberry (*Rubus parviflorus*, Fac), and Himalayan blackberry.

The soils within the non-wetland, clear-cut areas were dry to moist at the time of inspection. Sampled soils were brown (10YR 4/3) from 0 to 18 inches below the surface. The sampled soils had a gravelly sandy loam texture. These soil characteristics do not satisfy the criteria for hydric soils.

Soils sampled in the buffer were dry with light chromas, inferring the lack of water at or near the surface for at least 12.5 percent of the growing season. This does not satisfy wetland hydrology criteria.

These areas do not meet the three parameters for classification as wetland.

3.2.6 Non-wetland forested areas

Red alder, Western red cedar, and big leaf maple dominate the overstory of the forested areas that remain. The understory is dominated by dense salmonberry (*Rubus spectabilis*, Fac), Indian plum (*Oemleria cerasiformis*, FacU), red elderberry (*Sambucus racemosa*, FacU), red huckleberry (*Vaccinium parvifolium*, N.I.), and sword fern (*Polystichum munitum*, FacU). The dominance of species rated “Facultative-“ and drier does not meet the criteria for hydrophytic vegetation.

The soils within the forested areas were moist at the time of inspection. Sampled soils were found to range from dark gray (10YR 3/2) from 0 to 6 inches below the surface, to dark yellowish brown (10YR 4/4) from 6 to 18 inches below the surface. The sampled soils had a gravelly sandy loam texture. These soil characteristics do not satisfy the criteria for hydric soils.

Soils sampled in the buffer were dry with light chromas, inferring the lack of water at or near the surface for at least 12.5 percent of the growing season. This does not satisfy wetland hydrology criteria.

These areas do not meet the three parameters for classification as wetland.

4.0 EXISTING FUNCTIONS AND VALUES ASSESSMENT

4.1 METHODOLOGY

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to the on-site wetland and stream system, but is typical for assessments of similar systems common to Western Washington.

Wetlands in Western Washington perform a variety of ecosystem functions. Included among the most important functions provided by wetlands are stormwater control, water quality improvement, and fish and wildlife habitat.

4.2 HYDROLOGIC FUNCTION

Wetlands A and C provide moderate values while Wetlands B and D provide low values for hydrologic function. Wetland A is considered a headwater wetland, which is a valuable characteristic to prevent high flows in downstream systems. Wetland B is limited for this function by its very small size. Wetland C provides moderate hydrologic function due to its lack of an outlet, ponding potential, and opportunity to reduce flooding and erosion downstream. Wetland D is limited for this function due to its lack of ponding potential.

4.3 WATER QUALITY FUNCTION

Wetlands have potential to increase water quality as hydrology passes through them by acting as natural filters. Woody vegetation within the wetlands uptakes overloaded nutrients and helps drop solids from suspension. Additionally, the vegetation within the wetlands causes hydrology to slow, increasing the chance that suspended solids will drop out. Wetland A provides a moderate value for this function due to its ponding potential and opportunity to improve water quality from adjacent development. Wetland B provides a low value for this function due to its lack of vegetation and lack of opportunity to improve water quality from surrounding development. Wetland C provides a low-moderate value for this function due to its dense vegetation and ponding potential. Wetland D provides a moderate value for this function based on its persistent vegetation and opportunity to treat stormwater from the adjacent logging road.

4.4 WILDLIFE HABITAT

Species such as passerine birds, small to large mammals, and limited amphibians are expected to utilize these wetlands. Wetlands A and C provide moderately-high values for this function based on the special habitat features within them (snags, downed logs, etc.), lack of invasive species, and relative buffer condition. Wetlands B and D provide low values for this function based on their lack of special habitat features, lack of diverse vegetation and interspersions, and lack of priority habitat components.

5.0 USE OF THIS REPORT

This Critical Area Study is supplied to AmericanWest Bank and Veritas Development, Inc., as a means of determining on-site critical area conditions, as required by the City of Everett during the permitting process.

This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions. Reports may be adversely affected due to the physical condition of the site and the difficulty of access, which may lead to observation or probing difficulties.

The laws applicable to sensitive areas are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

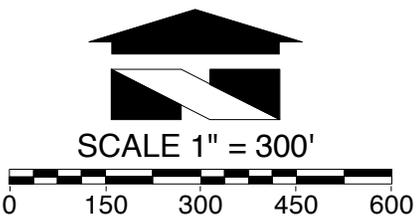
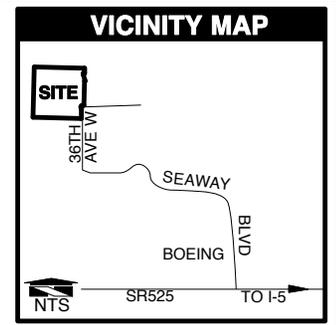


John Laufenberg
Principal Wetland Ecologist
Professional Wetland Scientist #1742

6.0 REFERENCES

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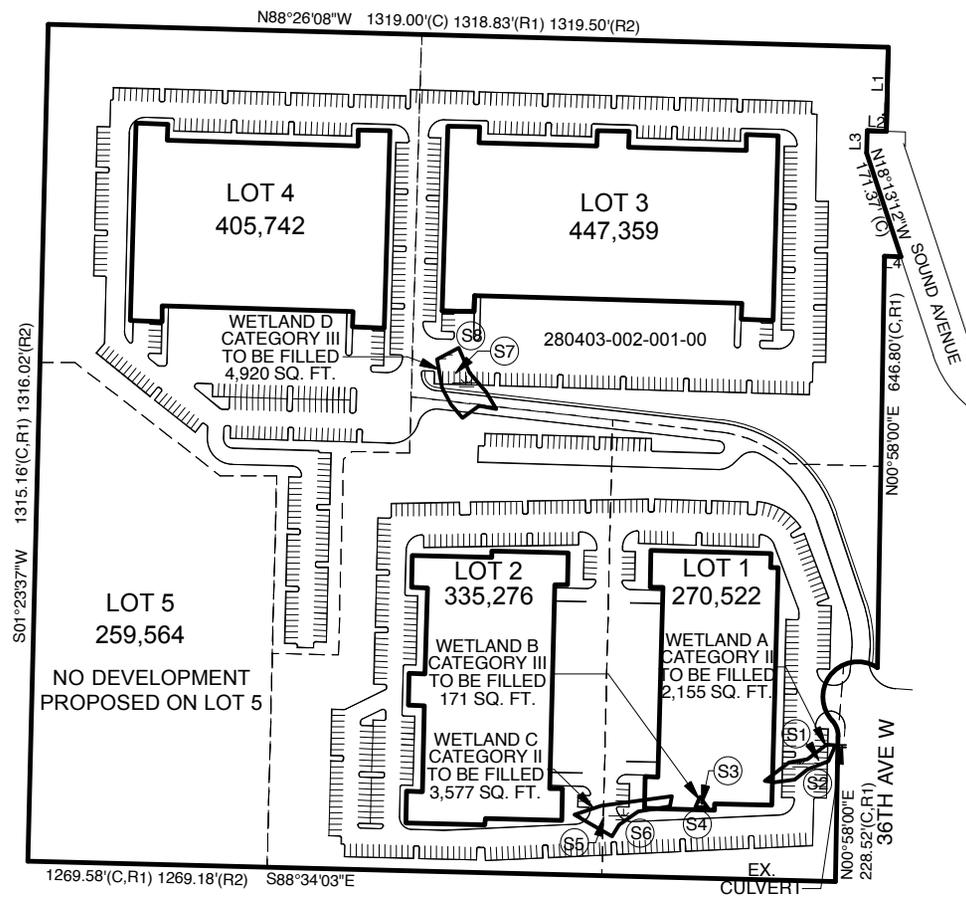
CRITICAL AREA STUDY MAP
SOUNDVIEW BUSINESS CAMPUS
 CITY OF EVERETT, WASHINGTON
 A PORTION OF SECTION 3, TOWNSHIP 28N, RANGE 04E, W.M.



LEGEND

| | |
|--|-----------|
| | WETLAND |
| | DATA SITE |

TOTAL PROPERTY
 1,718,462 (39.45 AC)



LINE TABLE

| LINE | BEARING | DISTANCE |
|------|-------------|------------------------------|
| L1 | N01°01'11"E | 132.36(C,R1) 133.70(R2) |
| L2 | S87°58'54"E | 29.67(C) 29.55(R1) 30.93(R2) |
| L3 | N01°04'53"E | 35.31(C,R1) 35.32(R2) |
| L4 | S86°53'13"E | 25.68(C) 25.67(R1,R2) |

| | | |
|--|---|---|
| REFERENCE: NWS-2014-838 | LOCATION: NORTHERN TERMINUS OF 36TH AVE W, EVERETT, WA PARCEL #280403-002-001-00 | PROPOSED PROJECT: CONSTRUCTION OF FOUR INDUSTRIAL MANUFACTURING BUILDINGS |
| APPLICANT: VERITAS DEVELOPMENT, INC. | LAT: 47.944579° LONG: -122.283583° | IN: UNNAMED WETLANDS AT: EVERETT, WA COUNTY: SNOHOMISH STATE: WASHINGTON |
| ADJACENT PROPERTY OWNERS: SEE PARCEL MAP (PAGE 5 OF 5) | SHEET 1 OF 5 DATE: 9/15/2014 | |

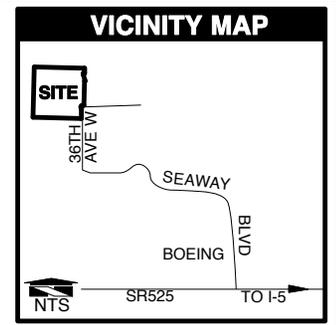
Wetland Resources, Inc.
 Designation / Mitigation / Restoration / Habitat Creation / Permit Assistance
 9505 19th Avenue S.E., Suite 106 Everett, Washington 98208
 Phone: (425) 337-3174
 Fax: (425) 337-3045
 Email: mailbox@wetlandresources.com

CRITICAL AREA STUDY MAP
SOUNDVIEW BUSINESS CAMPUS

Sheet 1/5
 WRI Job #14109
 Drawn by: SW
 Rev #1: 09.15.2014

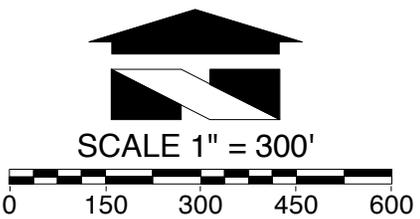
Veritas Development, Inc.
 22819 Woodway Park Rd
 Woodway, WA 98020

CRITICAL AREA STUDY MAP
SOUNDVIEW BUSINESS CAMPUS
 CITY OF EVERETT, WASHINGTON
 A PORTION OF SECTION 3, TOWNSHIP 28N, RANGE 04E, W.M.



LINE TABLE

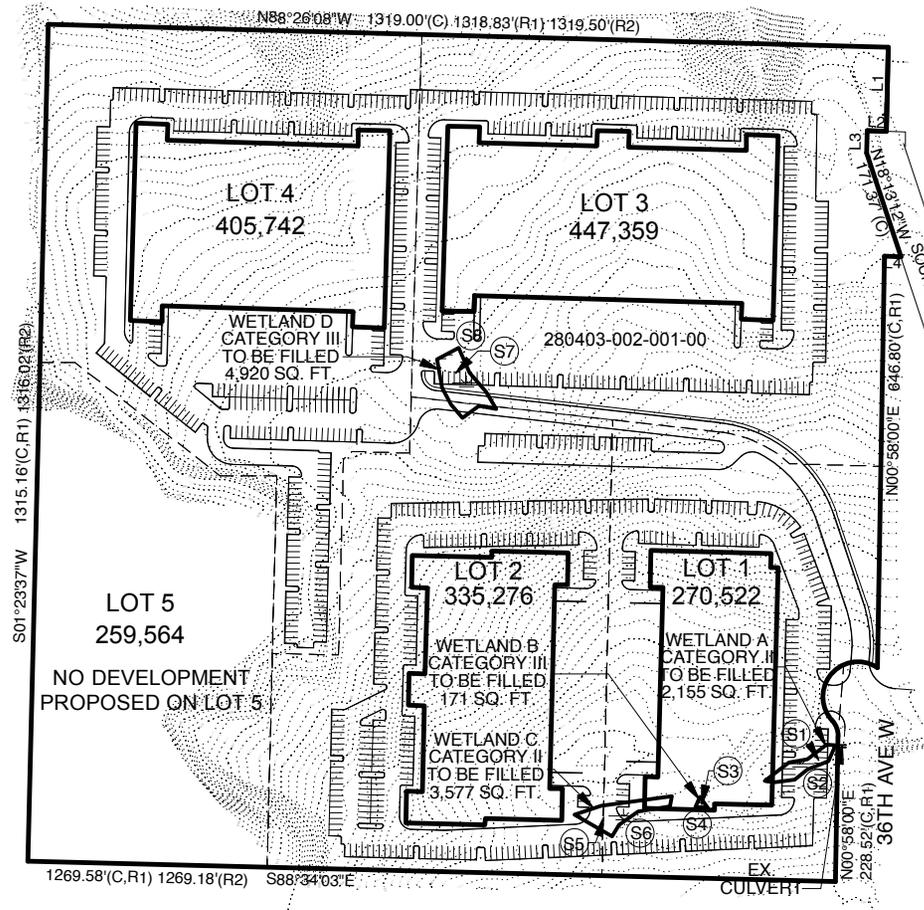
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| L4 | S86°53'13"E | 25.68(C) 25.67(R1,R2) |



LEGEND

- WETLAND
- DATA SITE

TOTAL PROPERTY
 1,718,462 (39.45 AC)



REFERENCE: NWS-2014-838
 APPLICANT: VERITAS DEVELOPMENT, INC.
 PROPOSED PROJECT: CONSTRUCTION OF FOUR INDUSTRIAL MANUFACTURING BUILDINGS
 LOCATION: NORTHERN TERMINUS OF 36TH AVE W, EVERETT, WA; PARCEL #280403-002-001-00
 SHEET 2 OF 5 DATE: 9/15/2014

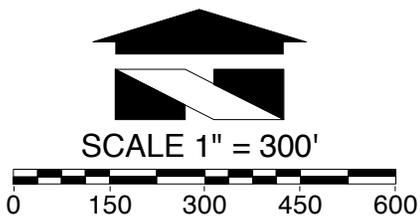
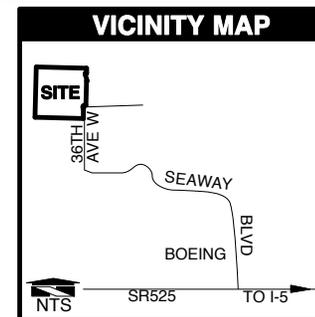
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 Fax: (425) 337-3045
 Email: mailbox@wetlandresources.com

CRITICAL AREA STUDY MAP
SOUNDVIEW BUSINESS CAMPUS

Veritas Development, Inc. WRI Job #14109
 22819 Woodway Park Rd Drawn by: SW
 Woodway, WA 98020 Rev #1: 09.15.2014

Sheet 2/5

CRITICAL AREA STUDY MAP
SOUNDVIEW BUSINESS CAMPUS
 CITY OF EVERETT, WASHINGTON
 A PORTION OF SECTION 3, TOWNSHIP 28N, RANGE 04E, W.M.



| LEGEND | |
|--------|-----------|
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| | DATA SITE |

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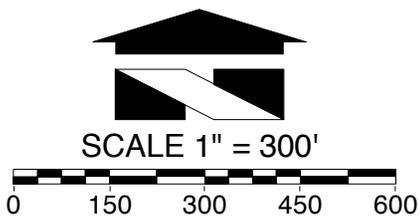
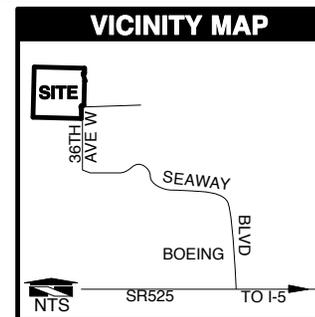
REFERENCE: NWS-2014-838
 APPLICANT: VERITAS DEVELOPMENT, INC.
 PROPOSED PROJECT: CONSTRUCTION OF FOUR INDUSTRIAL MANUFACTURING BUILDINGS
 LOCATION: NORTHERN TERMINUS OF 36TH AVE W, EVERETT, WA; PARCEL #280403-002-001-00
 SHEET 3 OF 5 DATE: 9/15/2014

Wetland Resources, Inc.
Designation / Mitigation / Restoration / Habitat Creation / Permit Assistance
 9505 19th Avenue S.E., Suite 106 Everett, Washington 98208
 Phone: (425) 337-3174
 Fax: (425) 337-3045
 Email: mailbox@wetlandresources.com

CRITICAL AREA STUDY MAP
SOUNDVIEW BUSINESS CAMPUS

Veritas Development, Inc. Sheet 3/5
 22819 Woodway Park Rd WRI Job #14109
 Woodway, WA 98020 Drawn by: SW
 Rev #1: 09.15.2014

CRITICAL AREA STUDY MAP
SOUNDVIEW BUSINESS CAMPUS
 CITY OF EVERETT, WASHINGTON
 A PORTION OF SECTION 3, TOWNSHIP 28N, RANGE 04E, W.M.



| LEGEND | |
|--------|-----------|
| | WETLAND |
| | DATA SITE |

TOTAL PROPERTY
 1,718,462 (39.45 AC)



LINE TABLE

| LINE | BEARING | DISTANCE |
|------|--------------|------------------------------|
| L1 | N01°01'11\"E | 132.36(C,R1) 133.70(R2) |
| L2 | S87°58'54\"E | 29.67(C) 29.55(R1) 30.93(R2) |
| L3 | N01°04'33\"E | 35.31(C,R1) 35.32(R2) |
| L4 | S86°53'13\"E | 25.68(C) 25.67(R1,R2) |

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 LOCATION: NORTHERN TERMINUS OF 36TH AVE W, EVERETT, WA; PARCEL #280403-002-001-00
 SHEET 4 OF 5 DATE: 9/15/2014

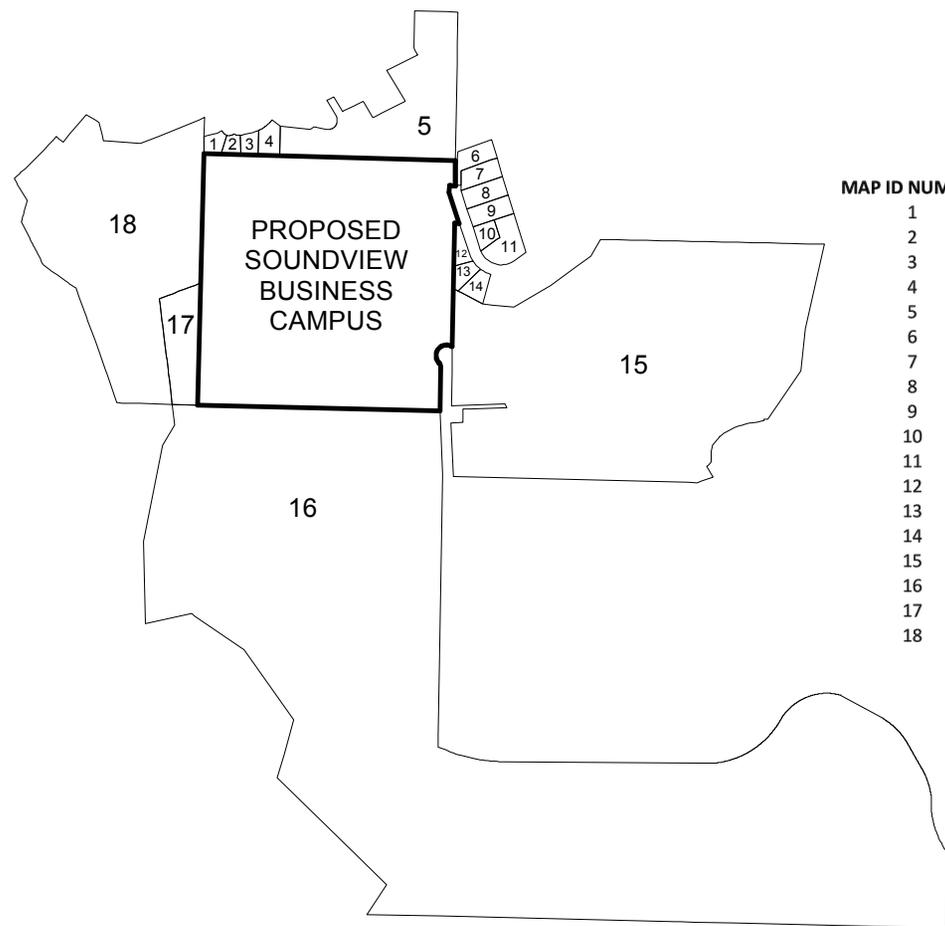
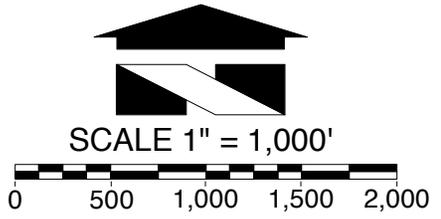
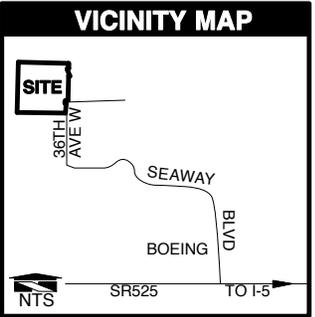
Wetland Resources, Inc.
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CRITICAL AREA STUDY MAP
SOUNDVIEW BUSINESS CAMPUS

Veritas Development, Inc.
 22819 Woodway Park Rd
 Woodway, WA 98020

Sheet 4/5
 WRI Job #14109
 Drawn by: SW
 Rev #1: 09.15.2014

PARCEL MAP
SOUNDVIEW BUSINESS CAMPUS
 CITY OF EVERETT, WASHINGTON
 A PORTION OF SECTION 3, TOWNSHIP 28N, RANGE 04E, W.M.



| MAP ID NUMBER | PARCEL NUMBER | OWNER NAME |
|---------------|----------------|-------------------------------|
| 1 | 00565400000900 | DONALD & BRIDGETTE MARCH |
| 2 | 00565400001000 | NASH PATEL |
| 3 | 00565400001100 | THOMAS LEMON & MELANIE HALLER |
| 4 | 00565400001200 | CHIKAKO NICHOLS |
| 5 | 28040300202200 | COLBY RE LLC |
| 6 | 00396700102000 | JUDITH HINCHEE |
| 7 | 00396700101900 | FERDINAND & ELAINE SANTIAGO |
| 8 | 00396700101800 | DAVID TERRY |
| 9 | 00396700101700 | JOHN BOSCH |
| 10 | 00396700101500 | MARY ANN MCCORD |
| 11 | 00396700101400 | DAN & CYNDY KEFFLER |
| 12 | 00731700002300 | J C ALLEN |
| 13 | 00731700000100 | ANDRE & DENISE LEDOUX |
| 14 | 00731700000200 | DONALD MCGILLVRAY |
| 15 | 28040300100200 | K B YUCCA VINE LLC ET AL |
| 16 | 28040300300500 | BOEING COMPANY |
| 17 | 00567000000900 | BOEING COMPANY |
| 18 | 00567000000201 | BNSF RAILWAY COMPANY |

REFERENCE: NWS-2014-838
 APPLICANT: VERITAS DEVELOPMENT, INC.
 PROPOSED PROJECT: CONSTRUCTION OF FOUR INDUSTRIAL MANUFACTURING BUILDINGS
 LOCATION: NORTHERN TERMINUS OF 36TH AVE W, EVERETT, WA; PARCEL #280403-002-001-00
 SHEET 5 OF 5 DATE: 9/15/2014

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PARCEL MAP
SOUNDVIEW BUSINESS CAMPUS

Sheet 5/5
 WRI Job #14109
 Drawn by: SW
 Rev #1: 09.15.2014

Veritas Development, Inc.
 22819 Woodway Park Rd
 Woodway, WA 98020

Appendix A
Wetland Determination Data Forms

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

Project/Site: Soundview Business Campus City/County: Everett/ Snohomish County Sampling Date: 11/11/2013
 Applicant/Owner: Veritas Development, Inc. State: WA Sampling Point: S1
 Investigator(s): JL,SB Section, Township, Range: S32, T28N, R4E, W.M.
 Landform (hillslope, terrace, etc.): Undulating Local relief (concave, convex, none): Concave Slope (%): <1
 Subregion (LRR): LRR-A Lat: 47.944211° Long: -122.282683° Datum: NAD83
 Soil Map Unit Name: Alderwood gravelly sandy loam (2-8% slopes and 15-25% slopes) and Alderwood-Everett gravelly sand loams (25 to 70% slopes) NWI classification: none

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

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

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: Wetland A | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10m x 10m</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--|------------------|-------------------|------------------|--|
| 1. <u>Alnus rubra</u> | 40 | Y | Fac | Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B) |
| 2. <u>Thuja plicata</u> | 20 | Y | Fac | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| <u>60</u> = Total Cover | | | | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ |
| Sapling/Shrub Stratum (Plot size: <u>10m x 10m</u>) | | | | |
| 1. <u>Rubus spectabilis</u> | 60 | Y | Fac | |
| 2. <u>Rubus armeniacus</u> | 10 | N | FacU | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| <u>70</u> = Total Cover | | | | Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% Prevalence Index is ≤3.0 ¹ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| Herb Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| <u>0</u> = Total Cover | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | |
| 2. _____ | | | | |
| <u>0</u> = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>100</u> | | | | |

Remarks:

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

Project/Site: Soundview Business Campus City/County: Everett/ Snohomish County Sampling Date: 11/11/2013
 Applicant/Owner: Veritas Development, Inc. State: WA Sampling Point: S2
 Investigator(s): JL,SB Section, Township, Range: S32, T28N, R4E, W.M.
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): <1
 Subregion (LRR): LRR-A Lat: 47.943969° Long: -122.282853° Datum: NAD83
 Soil Map Unit Name: Alderwood gravelly sandy loam (2-8% slopes and 15-25% slopes) and Alderwood-Everett gravelly sand loams (25 to 70% slopes) NWI classification: n/a

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

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

| | |
|---|--|
| Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: South of Wetland A; not logged | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10m x 10m</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--|------------------|-------------------|------------------|--|--|
| 1. <u>Thuja plicata</u> | 40 | Y | Fac | Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) | |
| 2. <u>Acer macrophyllum</u> | 20 | Y | FacU | | |
| 3. _____ | | | | Total Number of Dominant Species Across All Strata: <u>5</u> (B) | |
| 4. _____ | | | | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B) | |
| | 60 | = Total Cover | | | |
| Sapling/Shrub Stratum (Plot size: <u>10m x 10m</u>) | | | | Prevalence Index worksheet: | |
| 1. <u>Rubus spectabilis</u> | 40 | Y | Fac | | Total % Cover of: _____ Multiply by: _____ |
| 2. <u>Vaccinium parvifolium</u> | 10 | Y | Upl | OBL species _____ x 1 = _____ | |
| 3. _____ | | | | FACW species _____ x 2 = _____ | |
| 4. _____ | | | | FAC species <u>2</u> x 3 = <u>6</u> | |
| 5. _____ | | | | FACU species <u>2</u> x 4 = <u>8</u> | |
| | 50 | = Total Cover | | UPL species <u>1</u> x 5 = <u>5</u> | |
| Herb Stratum (Plot size: <u>3m x 3m</u>) | | | | Column Totals: <u>5</u> (A) <u>19</u> (B) | |
| 1. <u>Polystichum munitum</u> | 10 | Y | FacU | Prevalence Index = B/A = <u>3.8</u> | |
| 2. _____ | | | | Hydrophytic Vegetation Indicators: | |
| 3. _____ | | | | | <input type="checkbox"/> Dominance Test is >50% |
| 4. _____ | | | | | <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ |
| 5. _____ | | | | | Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 6. _____ | | | | | <input type="checkbox"/> Wetland Non-Vascular Plants ¹ |
| 7. _____ | | | | | Problematic Hydrophytic Vegetation ¹ (Explain) |
| 8. _____ | | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| 11. _____ | | | | | |
| | 10 | = Total Cover | | | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| 1. _____ | | | | | |
| 2. _____ | | | | | |
| | 0 | = Total Cover | | | |
| % Bare Ground in Herb Stratum <u>90</u> | | | | | |
| Remarks: | | | | | |

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

Project/Site: Soundview Business Campus City/County: Everett/ Snohomish County Sampling Date: 11/11/2013
 Applicant/Owner: Veritas Development, Inc. State: WA Sampling Point: S3
 Investigator(s): JL,SB Section, Township, Range: S32, T28N, R4E, W.M.
 Landform (hillslope, terrace, etc.): Undulating Local relief (concave, convex, none): concave Slope (%): <1
 Subregion (LRR): LRR-A Lat: 47.944117° Long: -122.283361° Datum: NAD83
 Soil Map Unit Name: Alderwood gravelly sandy loam (2-8% slopes and 15-25% slopes) and Alderwood-Everett gravelly sand loams (25 to 70% slopes) NWI classification: none

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

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

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: Wetland B | |

VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>10m x 10m</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|---|------------------|-------------------|------------------|--|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>2</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| _____ = Total Cover | | | | |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>10m x 10m</u>) | | | | Prevalence Index worksheet: |
| 1. <u>Rubus spectabilis</u> | <u>30</u> | <u>Y</u> | <u>Fac</u> | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| <u>30</u> = Total Cover | | | | UPL species _____ x 5 = _____ |
| <u>Herb Stratum</u> (Plot size: <u>3m x 3m</u>) | | | | Column Totals: _____ (A) _____ (B) |
| 1. <u>Ranunculus repens</u> | <u>40</u> | <u>Y</u> | <u>FacW</u> | Prevalence Index = B/A = _____ |
| 2. _____ | _____ | _____ | _____ | Hydrophytic Vegetation Indicators: |
| 3. _____ | _____ | _____ | _____ | <input checked="" type="checkbox"/> Dominance Test is >50% |
| 4. _____ | _____ | _____ | _____ | Prevalence Index is ≤3.0 ¹ |
| 5. _____ | _____ | _____ | _____ | Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 6. _____ | _____ | _____ | _____ | <input type="checkbox"/> Wetland Non-Vascular Plants ¹ |
| 7. _____ | _____ | _____ | _____ | Problematic Hydrophytic Vegetation ¹ (Explain) |
| 8. _____ | _____ | _____ | _____ | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| 11. _____ | _____ | _____ | _____ | |
| <u>40</u> = Total Cover | | | | |
| <u>Woody Vine Stratum</u> (Plot size: _____) | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| <u>0</u> = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>100</u> | | | | |
| Remarks: | | | | |

SOIL

Sampling Point: S3

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

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|----|----------------|---|-------------------|------------------|---------|----------------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-18 | 10YR 3/1 | 97 | 10YR 4/6 | 3 | C | M | sil | saturated to surface |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

| | | |
|--|---|---|
| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) | | Indicators for Problematic Hydric Soils³: |
| <input type="checkbox"/> Histosol (A1) | Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | Loamy Mucky Mineral (F1) (except MLRA 1) | Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | Redox Dark Surface (F6) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | Redox Depressions (F8) | |

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

Hydric Soil Present? Yes No

Remarks:
 Soil does not meet a Hydric Soil Indicator, but based on vegetation and hydrology indicators present, this appears to be a hydric soil.

HYDROLOGY

| | |
|---|---|
| Wetland Hydrology Indicators: | |
| Primary Indicators (minimum of one required; check all that apply) | Secondary Indicators (2 or more required) |
| <input checked="" type="checkbox"/> Surface Water (A1) | <input checked="" type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |

Field Observations:

Surface Water Present? Yes No Depth (inches): 2"

Water Table Present? Yes No Depth (inches): _____

Saturation Present? Yes No Depth (inches): Surface

(includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks:

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

Project/Site: Soundview Business Campus City/County: Everett/ Snohomish County Sampling Date: 11/11/2013
 Applicant/Owner: Veritas Development, Inc. State: WA Sampling Point: S4
 Investigator(s): JL,SB Section, Township, Range: S32, T28N, R4E, W.M.
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): <1
 Subregion (LRR): LRR-A Lat: 47.943919° Long: -122.283497° Datum: NAD83
 Soil Map Unit Name: Alderwood gravelly sandy loam (2-8% slopes and 15-25% slopes) and Alderwood-Everett gravelly sand loams (25 to 70% slopes) NWI classification: n/a

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

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

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: near Wetland B; area not logged | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10m x 10m</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--|------------------|-------------------|------------------|---|
| 1. <u>Alnus rubra</u> | 40 | Y | Fac | Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40</u> (A/B) |
| 2. <u>Acer macrophyllum</u> | 20 | Y | FacU | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 60 = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>10m x 10m</u>) | | | | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>2</u> x 3 = <u>3</u> FACU species <u>3</u> x 4 = <u>12</u> UPL species _____ x 5 = _____ Column Totals: <u>5</u> (A) <u>15</u> (B) Prevalence Index = B/A = <u>3</u> |
| 1. <u>Rubus spectabilis</u> | 50 | Y | Fac | |
| 2. <u>Sambucus racemosa</u> | 10 | Y | FacU | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 60 = Total Cover | | | | |
| Herb Stratum (Plot size: <u>3m x 3m</u>) | | | | Hydrophytic Vegetation Indicators: ___ Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. <u>Polystichum munitum</u> | 10 | Y | FacU | |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| 10 = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 1. _____ | | | | |
| 2. _____ | | | | |
| 0 = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>60</u> | | | | |
| Remarks: | | | | |

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

Project/Site: Soundview Business Campus City/County: Everett/ Snohomish County Sampling Date: 11/11/2013
 Applicant/Owner: Veritas Development, Inc. State: WA Sampling Point: S5
 Investigator(s): JL,SB Section, Township, Range: S32, T28N, R4E, W.M.
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): <1
 Subregion (LRR): LRR-A Lat: 47.944094° Long: -122.283981° Datum: NAD83
 Soil Map Unit Name: Alderwood gravelly sandy loam (2-8% slopes and 15-25% slopes) and Alderwood-Everett gravelly sand loams (25 to 70% slopes) NWI classification: none

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

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

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: Wetland C | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10m x 10m</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--|------------------|-------------------|------------------|--|
| 1. <u>Thuja plicata</u> | 40 | Y | Fac | Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) |
| 2. _____ | | | | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | | | | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) |
| 4. _____ | | | | |
| <u>40</u> = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>10m x 10m</u>) | | | | Prevalence Index worksheet: |
| 1. <u>Rubus spectabilis</u> | 20 | Y | Fac | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | | | | OBL species _____ x 1 = _____ |
| 3. _____ | | | | FACW species _____ x 2 = _____ |
| 4. _____ | | | | FAC species _____ x 3 = _____ |
| 5. _____ | | | | FACU species _____ x 4 = _____ |
| <u>20</u> = Total Cover | | | | UPL species _____ x 5 = _____ |
| | | | | Column Totals: _____ (A) _____ (B) |
| | | | | Prevalence Index = B/A = _____ |
| Herb Stratum (Plot size: <u>3m x 3m</u>) | | | | Hydrophytic Vegetation Indicators: |
| 1. <u>Athyrium filix-femina</u> | 5 | Y | Fac | <input checked="" type="checkbox"/> Dominance Test is >50% |
| 2. _____ | | | | Prevalence Index is ≤3.0 ¹ |
| 3. _____ | | | | Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 4. _____ | | | | <input type="checkbox"/> Wetland Non-Vascular Plants ¹ |
| 5. _____ | | | | Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| <u>5</u> = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Present? |
| 1. _____ | | | | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 2. _____ | | | | |
| <u>0</u> = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>95</u> | | | | |
| Remarks: | | | | |

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

Project/Site: Soundview Business Campus City/County: Everett/ Snohomish County Sampling Date: 11/11/2013
 Applicant/Owner: Veritas Development, Inc. State: WA Sampling Point: S6
 Investigator(s): JL,SB Section, Township, Range: S32, T28N, R4E, W.M.
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): >5
 Subregion (LRR): LRR-A Lat: 47.945397° Long: -122.285367° Datum: NAD83
 Soil Map Unit Name: Alderwood gravelly sandy loam (2-8% slopes and 15-25% slopes) and Alderwood-Everett gravelly sand loams (25 to 70% slopes) NWI classification: n/a

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

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

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: Site has been logged in the last 5-6 years. This site is in an area that was not logged. | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10m x 10m</u>) | Absolute % Cover | Dominant Species? | Indicator Status | |
|--|------------------|-------------------|------------------|--|
| 1. <u>Alnus rubra</u> | 30 | Y | Fac | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B) |
| 2. <u>Acer macrophyllum</u> | 20 | Y | FacU | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| | 50 | = Total Cover | | |
| Sapling/Shrub Stratum (Plot size: <u>10m x 10m</u>) | | | | |
| 1. <u>Rubus spectabilis</u> | 50 | Y | Fac | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ |
| 2. <u>Rubus parviflorus</u> | 30 | Y | Fac | |
| 3. <u>Rubus armeniacus</u> | 20 | Y | FacU | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| | 100 | = Total Cover | | |
| Herb Stratum (Plot size: <u>3m x 3m</u>) | | | | |
| 1. <u>Polystichum munitum</u> | 10 | Y | Fac | Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% Prevalence Index is ≤3.0 ¹ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| | 10 | = Total Cover | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 2. _____ | | | | |
| | 0 | = Total Cover | | |
| % Bare Ground in Herb Stratum <u>90</u> | | | | |

Remarks:

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

Project/Site: Soundview Business Campus City/County: Everett/ Snohomish County Sampling Date: 11/11/2013
 Applicant/Owner: Veritas Development, Inc. State: WA Sampling Point: S7
 Investigator(s): JL,SB Section, Township, Range: S32, T28N, R4E, W.M.
 Landform (hillslope, terrace, etc.): depression near toe of slope Local relief (concave, convex, none): concave Slope (%): <1
 Subregion (LRR): LRR-A Lat: 47.945844° Long: -122.284981° Datum: NAD83
 Soil Map Unit Name: Alderwood gravelly sandy loam (2-8% slopes and 15-25% slopes) and Alderwood-Everett gravelly sand loams (25 to 70% slopes) NWI classification: none

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

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

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Remarks: Area has been logged in the last 5-6 years. Slash pile is located within and adjacent to wetland area | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10m x 10m</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--|------------------|-------------------|------------------|--|
| 1. <u>Alnus rubra</u> | 30 | Y | Fac | Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) |
| 2. _____ | | | | Total Number of Dominant Species Across All Strata: <u>4</u> (B) |
| 3. _____ | | | | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) |
| 4. _____ | | | | |
| <u>30</u> = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>10m x 10m</u>) | | | | Prevalence Index worksheet: |
| 1. <u>Rubus spectabilis</u> | 30 | Y | Fac | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | | | | OBL species _____ x 1 = _____ |
| 3. _____ | | | | FACW species _____ x 2 = _____ |
| 4. _____ | | | | FAC species _____ x 3 = _____ |
| 5. _____ | | | | FACU species _____ x 4 = _____ |
| <u>30</u> = Total Cover | | | | UPL species _____ x 5 = _____ |
| | | | | Column Totals: _____ (A) _____ (B) |
| | | | | Prevalence Index = B/A = _____ |
| Herb Stratum (Plot size: <u>3m x 3m</u>) | | | | Hydrophytic Vegetation Indicators: |
| 1. <u>Ranunculus repens</u> | 60 | Y | FacW | <input checked="" type="checkbox"/> Dominance Test is >50% |
| 2. <u>Juncus effusus</u> | 30 | Y | FacW | Prevalence Index is $\leq 3.0^1$ |
| 3. <u>Carex obnupta</u> | 5 | N | Obl | Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 4. <u>Juncus bufonius</u> | Trace | N | FacW | <input type="checkbox"/> Wetland Non-Vascular Plants ¹ |
| 5. _____ | | | | Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| <u>95</u> = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Present? |
| 1. _____ | | | | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 2. _____ | | | | |
| <u>0</u> = Total Cover | | | | |
| % Bare Ground in Herb Stratum <u>5</u> | | | | |

Remarks:

SOIL

Sampling Point: S7

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

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|----|----------------|---|-------------------|------------------|---------|----------------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-18 | 10 YR 3/1 | 95 | 10 YR 4/6 | 5 | C | M | fsl | saturated to surface |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

| Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) | Indicators for Problematic Hydric Soils ³ : |
|---|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | |
| <input type="checkbox"/> Sandy Redox (S5) | |
| <input type="checkbox"/> Stripped Matrix (S6) | |
| <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | |
| <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Redox Depressions (F8) | |

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

Hydric Soil Present? Yes No

Remarks:
 Soil does not meet a Hydric Soil Indicator, but based on vegetation and hydrology indicators present, this appears to be a hydric soil.

HYDROLOGY

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

Field Observations:

Surface Water Present? Yes No Depth (inches): 3-5"

Water Table Present? Yes No Depth (inches): _____

Saturation Present? Yes No Depth (inches): to surface

(includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks:

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

Project/Site: Soundview Business Campus City/County: Everett/ Snohomish County Sampling Date: 11/11/13
 Applicant/Owner: Veritas Development, Inc. State: WA Sampling Point: S8
 Investigator(s): JL,SB Section, Township, Range: S32, T28N, R4E, W.M.
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): >5
 Subregion (LRR): LRR-A Lat: 47.945397° Long: -122.285367° Datum: NAD83
 Soil Map Unit Name: Alderwood gravelly sandy loam (2-8% slopes and 15-25% slopes) and Alderwood-Everett gravelly sand loams (25 to 70% slopes) NWI classification: n/a

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

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

| | |
|---|---|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> |
| Remarks: Area has been logged in the last 5-6 years. Data site is typical of upland conditions within logged area | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>10m x 10m</u>) | Absolute % Cover | Dominant Species? | Indicator Status | |
|--|------------------|-------------------|------------------|--|
| 1. <u>Alnus rubra</u> | 50 | Y | Fac | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B) |
| 2. <u>Acer macrophyllum</u> | 30 | Y | FacU | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| | 80 | = Total Cover | | |
| Sapling/Shrub Stratum (Plot size: <u>10m x 10m</u>) | | | | |
| 1. <u>Rubus spectabilis</u> | 60 | Y | Fac | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ |
| 2. <u>Rubus parviflorus</u> | 30 | Y | Fac | |
| 3. <u>Rubus armeniacus</u> | 10 | N | FacU | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| | 100 | = Total Cover | | |
| Herb Stratum (Plot size: <u>3m x 3m</u>) | | | | |
| 1. <u>Polystichum munitum</u> | 15 | Y | Fac | Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% Prevalence Index is ≤3.0 ¹ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| 11. _____ | | | | |
| | 15 | = Total Cover | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 2. _____ | | | | |
| | 0 | = Total Cover | | |
| % Bare Ground in Herb Stratum <u>85</u> | | | | |

Remarks:

Appendix B

Washington Department of Ecology Wetland Rating Forms

Wetland name or number A

WETLAND RATING FORM – WESTERN WASHINGTON

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

Name of wetland (if known): Wetland A Date of site visit: 07/11/14

Rated by JK Trained by Ecology? Yes No Date of training Oct/2006

SEC: 3 TOWNSHIP: 28N RANGE: 4E Is S/T/R in Appendix D? Yes No

Map of wetland unit: Figure 3/3 Estimated size 2155 SF

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I II III IV

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

| | |
|-----------------------------------|-----------|
| Score for Water Quality Functions | 18 |
| Score for Hydrologic Functions | 20 |
| Score for Habitat Functions | 19 |
| TOTAL score for Functions | 57 |

Category based on SPECIAL CHARACTERISTICS of wetland

I II Does not Apply

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

II

Summary of basic information about the wetland unit

| Wetland Unit has Special Characteristics | | Wetland HGM Class used for Rating | |
|--|-------------------------------------|--|-------------------------------------|
| Estuarine | | Depressional | <input checked="" type="checkbox"/> |
| Natural Heritage Wetland | | Riverine | <input type="checkbox"/> |
| Bog | | Lake-fringe | <input type="checkbox"/> |
| Mature Forest | | Slope | <input type="checkbox"/> |
| Old Growth Forest | | Flats | <input type="checkbox"/> |
| Coastal Lagoon | | Freshwater Tidal | <input type="checkbox"/> |
| Interdunal | | | <input type="checkbox"/> |
| None of the above | <input checked="" type="checkbox"/> | Check if unit has multiple HGM classes present | <input type="checkbox"/> |

Does the wetland unit 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 May Need Additional Protection (in addition to the protection recommended for its category) | YES | NO |
|--|------------|-----------|
| <p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p> | | ✓ |
| <p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).</p> | | ✓ |
| <p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p> | | ✓ |
| <p>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.</p> | | ✓ |

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 into 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 Wetland Units in 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 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 the only source (>90%) of water to it.

Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3 YES – The wetland class is **Flats**

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

3. Does the entire wetland unit **meet 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) at least 20 acres (8 ha) in size;

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

NO – go to 4 YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

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

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

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

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

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

NO - go to 5 YES – The wetland class is **Slope**

Wetland name or number A

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

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

The overbank flooding occurs at least once every 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 during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 YES – The wetland class is **Depressional**

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

NO – go to 8 YES – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. **GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT** (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within 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 <input type="checkbox"/> |
| Slope + Depressional | Depressional <input type="checkbox"/> |
| Slope + Lake-fringe | Lake-fringe <input type="checkbox"/> |
| Depressional + Riverine along stream within boundary | Depressional <input type="checkbox"/> |
| Depressional + Lake-fringe | Depressional <input type="checkbox"/> |
| Salt Water Tidal Fringe and any other class of freshwater wetland | Treat as ESTUARINE under wetlands with special characteristics <input type="checkbox"/> |

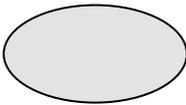
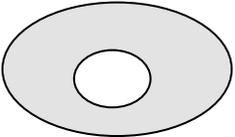
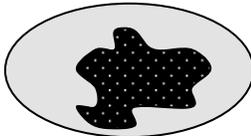
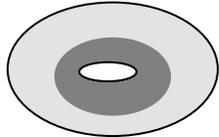
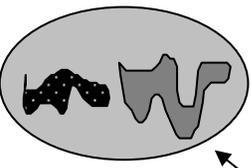
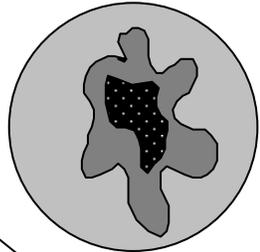
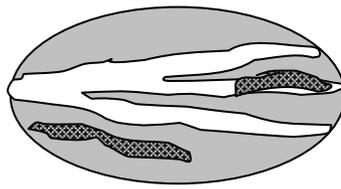
If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

| D Depressional and Flats Wetlands | | Points (only 1 score per box) |
|--|--|--|
| WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality | | |
| D | D 1. Does the wetland unit have the <u>potential</u> to improve water quality? | <i>(see p.38)</i> |
| D | <p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p><input type="checkbox"/> Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p><input checked="" type="checkbox"/> Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p><input type="checkbox"/> Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p><input type="checkbox"/> Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch points = 1 (If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p style="text-align: right;">Provide photo or drawing</p> | Figure 3/3 2 |
| D | <p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p><input type="checkbox"/> YES points = 4</p> <p><input checked="" type="checkbox"/> NO points = 0</p> | 0 |
| D | <p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5</p> <p><input checked="" type="checkbox"/> Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed vegetation <1/10 of area points = 0</p> <p style="text-align: right;">Map of Cowardin vegetation classes</p> | Figure 3/3 3 |
| D | <p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.</i></p> <p><input checked="" type="checkbox"/> Area seasonally ponded is > 1/2 total area of wetland points = 4</p> <p><input type="checkbox"/> Area seasonally ponded is > 1/4 total area of wetland points = 2</p> <p><input type="checkbox"/> Area seasonally ponded is < 1/4 total area of wetland points = 0</p> <p style="text-align: right;">Map of Hydroperiods</p> | Figure 3/3 4 |
| D | Total for D 1 | <i>Add the points in the boxes above</i> 9 |
| D | <p>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</p> <p>Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. <i>Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.</i></p> <p><input type="checkbox"/> Grazing in the wetland or within 150 ft</p> <p><input type="checkbox"/> Untreated stormwater discharges to wetland</p> <p><input type="checkbox"/> Tilled fields or orchards within 150 ft of wetland</p> <p><input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</p> <p><input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland</p> <p><input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen</p> <p><input type="checkbox"/> Other _____</p> <p><input checked="" type="checkbox"/> YES multiplier is 2 <input type="checkbox"/> NO multiplier is 1</p> | <i>(see p. 44)</i> multiplier 2 |
| D | TOTAL - Water Quality Functions | Multiply the score from D1 by D2 <i>Add score to table on p. 1</i> 18 |

| D Depressional and Flats Wetlands | | Points |
|---|---|---|
| HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation | | (only 1 score per box) |
| D | D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion? | (see p.46) |
| D | <p>D 3.1 Characteristics of surface water flows out of the wetland unit</p> <p><input type="checkbox"/> Unit is a depression with no surface water leaving it (no outlet) points = 4</p> <p><input checked="" type="checkbox"/> Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p><input type="checkbox"/> Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch points = 1 (If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p><input type="checkbox"/> Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0</p> | 2 |
| D | <p>D 3.2 Depth of storage during wet periods <i>Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).</i></p> <p><input type="checkbox"/> Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</p> <p><input checked="" type="checkbox"/> The wetland is a "headwater" wetland points = 5</p> <p><input type="checkbox"/> Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5</p> <p><input type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3</p> <p><input type="checkbox"/> Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1</p> <p><input type="checkbox"/> Marks of ponding less than 0.5 ft points = 0</p> | 5 |
| D | <p>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></p> <p><input type="checkbox"/> The area of the basin is less than 10 times the area of unit points = 5</p> <p><input checked="" type="checkbox"/> The area of the basin is 10 to 100 times the area of the unit points = 3</p> <p><input type="checkbox"/> The area of the basin is more than 100 times the area of the unit points = 0</p> <p><input type="checkbox"/> Entire unit is in the FLATS class points = 5</p> | 3 |
| D | Total for D 3 <i>Add the points in the boxes above</i> | 10 |
| D | <p>D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion? Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. <i>Note which of the following indicators of opportunity apply.</i></p> <p><input checked="" type="checkbox"/> Wetland is in a headwater of a river or stream that has flooding problems</p> <p><input type="checkbox"/> Wetland drains to a river or stream that has flooding problems</p> <p><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</p> <p><input type="checkbox"/> Other _____</p> <p><input checked="" type="checkbox"/> YES multiplier is 2 <input type="checkbox"/> NO multiplier is 1</p> | (see p. 49) multiplier <u>2</u> |
| D | TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4 <i>Add score to table on p. 1</i> | 20 |

| These questions apply to wetlands of all HGM classes. | | Points (only 1 score per box) |
|---|--|---|
| HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat | | |
| H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species? | | |
| <p>H 1.1 Vegetation structure (see p. 72) Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.</p> <p> <input type="checkbox"/> Aquatic bed <input type="checkbox"/> Emergent plants <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have >30% cover) If the unit has a forested class check if: <input type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon Add the number of vegetation structures that qualify. If you have:</p> <p style="text-align: right;"> <input type="checkbox"/> 4 structures or more points = 4 <input type="checkbox"/> 3 structures points = 2 <input checked="" type="checkbox"/> 2 structures points = 1 <input type="checkbox"/> 1 structure points = 0 </p> <p>Map of Cowardin vegetation classes</p> | | <p>Figure 3/3</p> <p style="font-size: 2em;">1</p> |
| <p>H 1.2. Hydroperiods (see p. 73) Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)</p> <p> <input type="checkbox"/> Permanently flooded or inundated <input type="checkbox"/> 4 or more types present points = 3 <input checked="" type="checkbox"/> Seasonally flooded or inundated <input type="checkbox"/> 3 types present points = 2 <input type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> 2 types present point = 1 <input checked="" type="checkbox"/> Saturated only <input type="checkbox"/> 1 type present points = 0 <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points </p> <p style="text-align: right;">Map of hydroperiods</p> | | <p>Figure 3/3</p> <p style="font-size: 2em;">1</p> |
| <p>H 1.3. Richness of Plant Species (see p. 75) Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold) You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle If you counted:</p> <p style="text-align: right;"> <input type="checkbox"/> > 19 species points = 2 <input checked="" type="checkbox"/> 5 - 19 species points = 1 <input type="checkbox"/> < 5 species points = 0 </p> <p>List species below if you want to:</p> | | <p style="font-size: 2em;">1</p> |

Total for page 3

| | |
|---|-------------------------------------|
| <p>H 1.4. Interspersion of habitats (see p. 76) Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-bottom: 20px;"> <div style="text-align: center;">  <p><input type="checkbox"/> None = 0 points</p> </div> <div style="text-align: center;">  <p><input checked="" type="checkbox"/> Low = 1 point</p> </div> <div style="text-align: center;">  <p><input type="checkbox"/> Moderate = 2 points</p> </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p><input type="checkbox"/> High = 3 points</p> </div> <div style="text-align: center;">  <p>[riparian braided channels]</p> </div> </div> <p>NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes</p> | <p>Figure 3 / 3</p> <p>1</p> |
| <p>H 1.5. Special Habitat Features: (see p. 77) Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). <input checked="" type="checkbox"/> Standing snags (diameter at the bottom > 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 (>30degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet turned grey/brown</i>) <input type="checkbox"/> At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (<i>structures for egg-laying by amphibians</i>) <input checked="" type="checkbox"/> Invasive plants cover less than 25% of the wetland area in each stratum of plants <p>NOTE: The 20% stated in early printings of the manual on page 78 is an error.</p> | <p>3</p> |
| <p>H 1. TOTAL Score - potential for providing habitat Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5</p> | <p>7</p> |

Comments

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

Total for page 6

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

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

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
 - Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
 - Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
 - Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.
 - Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
 - Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
 - Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*).
 - Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
 - Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A*).
 - Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
 - Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
 - Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
 - Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.
- If wetland has **3 or more** priority habitats = **4 points**
 If wetland has **2** priority habitats = **3 points**
 If wetland has **1** priority habitat = **1 point** No habitats = 0 points

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

1

Wetland name or number A

| | |
|--|----|
| <p>H 2.4 Wetland Landscape (<i>choose the one description of the landscape around the wetland that best fits</i>) (<i>see p. 84</i>)</p> <p><input checked="" type="checkbox"/> There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p><input type="checkbox"/> There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p><input type="checkbox"/> There is at least 1 wetland within ½ mile. points = 2</p> <p><input type="checkbox"/> There are no wetlands within ½ mile. points = 0</p> | 5 |
| <p>H 2. TOTAL Score - opportunity for providing habitat <i>Add the scores from H2.1, H2.2, H2.3, H2.4</i></p> | 12 |
| <p>TOTAL for H 1 from page 14</p> | 7 |
| <p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p> | 19 |

| | |
|---|--|
| <p>SC 2.0 Natural Heritage Wetlands (<i>see p. 87</i>) 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.</p> <p>SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (<i>this question is used to screen out most sites before you need to contact WNHP/DNR</i>) S/T/R information from Appendix D <input checked="" type="checkbox"/> or accessed from WNHP/DNR web site <input type="checkbox"/></p> <p>YES <input type="checkbox"/> – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO <input checked="" type="checkbox"/></p> <p>SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? <input type="checkbox"/> YES = Category I NO <input checked="" type="checkbox"/> not a Heritage Wetland</p> | <input type="checkbox"/> Cat. I |
| <p>SC 3.0 Bogs (<i>see p. 87</i>) Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>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 the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 <input type="checkbox"/> <input checked="" type="checkbox"/> No - go to Q. 2</p> <p>2. Does the unit 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? <input type="checkbox"/> Yes - go to Q. 3 <input checked="" type="checkbox"/> No - Is not a bog for purpose of rating</p> <p>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)? <input type="checkbox"/> Yes – Is a bog for purpose of rating <input type="checkbox"/> No - go to Q. 4</p> <p>NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog.</p> <p>1. 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)?</p> <p>2. <input type="checkbox"/> YES = Category I No <input type="checkbox"/> Is not a bog for purpose of rating</p> | |
| | <input type="checkbox"/> Cat. I |

| | |
|---|--|
| <p>SC 4.0 Forested Wetlands (see p. 90) Does the wetland unit 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 functions.</i></p> <p><input type="checkbox"/> Old-growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/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><input type="checkbox"/> Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); 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><input type="checkbox"/> YES = Category I NO <input checked="" type="checkbox"/> not a forested wetland with special characteristics</p> | <p>Cat. I <input type="checkbox"/></p> |
| <p>SC 5.0 Wetlands in Coastal Lagoons (see p. 91) Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> 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><input type="checkbox"/> The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> YES = Go to SC 5.1 NO <input checked="" type="checkbox"/> not a wetland in a coastal lagoon</p> <p>SC 5.1 Does the wetland meets all of the following three conditions?</p> <p><input type="checkbox"/> 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><input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 acre (4350 square feet)</p> <p><input type="checkbox"/> YES = Category I <input type="checkbox"/> NO = Category II</p> | <p><input type="checkbox"/> Cat. I</p> <p><input type="checkbox"/> Cat. II</p> |

| | |
|---|--|
| <p>SC 6.0 Interdunal Wetlands (<i>see p. 93</i>)</p> <p>Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><input type="checkbox"/> YES - go to SC 6.1 NO <input checked="" type="checkbox"/> 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> <p><input type="checkbox"/> Long Beach Peninsula- lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport- lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis- lands west of SR 115 and SR 109</p> <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger?</p> <p><input type="checkbox"/> YES = Category II <input type="checkbox"/> NO – go to SC 6.2</p> <p>SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?</p> <p><input type="checkbox"/> YES = Category III</p> | <p>Cat. II <input type="checkbox"/></p> <p>Cat. III <input type="checkbox"/></p> |
| <p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p> | <p><input type="checkbox"/> Cat. I</p> <p><input type="checkbox"/> Cat. II</p> <p><input type="checkbox"/> Cat. III</p> <p><input checked="" type="checkbox"/> N/A</p> |

Wetland name or number B

WETLAND RATING FORM – WESTERN WASHINGTON

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

Name of wetland (if known): Wetland B Date of site visit: 07/11/14

Rated by JK Trained by Ecology? Yes No Date of training Oct/2006

SEC: 3 TOWNSHIP: 28N RANGE: 4E Is S/T/R in Appendix D? Yes No

Map of wetland unit: Figure 3/3 Estimated size 171 SF

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I II III IV

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

| | |
|-----------------------------------|-----------|
| Score for Water Quality Functions | 8 |
| Score for Hydrologic Functions | 14 |
| Score for Habitat Functions | 13 |
| TOTAL score for Functions | 35 |

Category based on SPECIAL CHARACTERISTICS of wetland

I II Does not Apply

III

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

Summary of basic information about the wetland unit

| Wetland Unit has Special Characteristics | | Wetland HGM Class used for Rating | |
|--|-------------------------------------|--|-------------------------------------|
| Estuarine | | Depressional | <input checked="" type="checkbox"/> |
| Natural Heritage Wetland | | Riverine | <input type="checkbox"/> |
| Bog | | Lake-fringe | <input type="checkbox"/> |
| Mature Forest | | Slope | <input type="checkbox"/> |
| Old Growth Forest | | Flats | <input type="checkbox"/> |
| Coastal Lagoon | | Freshwater Tidal | <input type="checkbox"/> |
| Interdunal | | | <input type="checkbox"/> |
| None of the above | <input checked="" type="checkbox"/> | Check if unit has multiple HGM classes present | <input type="checkbox"/> |

Does the wetland unit 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 May Need Additional Protection (in addition to the protection recommended for its category) | YES | NO |
|--|------------|-----------|
| <p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p> | | ✓ |
| <p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).</p> | | ✓ |
| <p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p> | | ✓ |
| <p>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.</p> | | ✓ |

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 into 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 Wetland Units in 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 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 the only source (>90%) of water to it.

Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3 YES – The wetland class is **Flats**

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

3. Does the entire wetland unit **meet 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) at least 20 acres (8 ha) in size;

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

NO – go to 4 YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

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

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

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

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

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

NO - go to 5 YES – The wetland class is **Slope**

Wetland name or number B

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

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

The overbank flooding occurs at least once every 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 during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 YES – The wetland class is **Depressional**

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

NO – go to 8 YES – The wetland class is **Depressional**

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

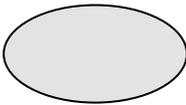
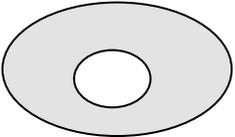
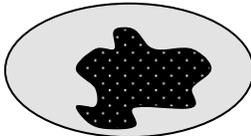
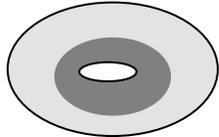
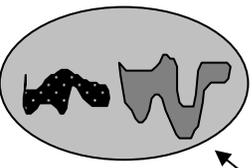
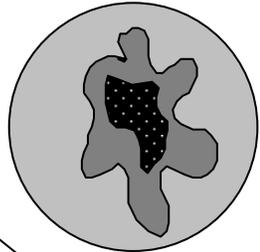
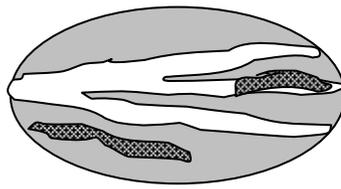
| <i>HGM Classes within the wetland unit being rated</i> | <i>HGM Class to Use in Rating</i> |
|---|---|
| Slope + Riverine | Riverine <input type="checkbox"/> |
| Slope + Depressional | Depressional <input type="checkbox"/> |
| Slope + Lake-fringe | Lake-fringe <input type="checkbox"/> |
| Depressional + Riverine along stream within boundary | Depressional <input type="checkbox"/> |
| Depressional + Lake-fringe | Depressional <input type="checkbox"/> |
| Salt Water Tidal Fringe and any other class of freshwater wetland | Treat as ESTUARINE under wetlands with special characteristics <input type="checkbox"/> |

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

| D Depressional and Flats Wetlands | | Points (only 1 score per box) |
|--|---|---|
| WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality | | |
| D | D 1. Does the wetland unit have the <u>potential</u> to improve water quality? | (see p.38) |
| D | <p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p><input checked="" type="checkbox"/> Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p><input type="checkbox"/> Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p><input type="checkbox"/> Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p><input type="checkbox"/> Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch points = 1 (If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p style="text-align: right;">Provide photo or drawing</p> | Figure 3/3 3 |
| D | <p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p><input type="checkbox"/> YES points = 4</p> <p><input checked="" type="checkbox"/> NO points = 0</p> | 0 |
| D | <p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3</p> <p><input checked="" type="checkbox"/> Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed vegetation < 1/10 of area points = 0</p> <p style="text-align: right;">Map of Cowardin vegetation classes</p> | Figure 3/3 1 |
| D | <p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.</i></p> <p><input checked="" type="checkbox"/> Area seasonally ponded is > 1/2 total area of wetland points = 4</p> <p><input type="checkbox"/> Area seasonally ponded is > 1/4 total area of wetland points = 2</p> <p><input type="checkbox"/> Area seasonally ponded is < 1/4 total area of wetland points = 0</p> <p style="text-align: right;">Map of Hydroperiods</p> | Figure 3/3 4 |
| D | Total for D 1 | 8 |
| D | <p>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</p> <p>Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. <i>Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.</i></p> <p><input type="checkbox"/> Grazing in the wetland or within 150 ft</p> <p><input type="checkbox"/> Untreated stormwater discharges to wetland</p> <p><input type="checkbox"/> Tilled fields or orchards within 150 ft of wetland</p> <p><input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</p> <p><input type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland</p> <p><input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen</p> <p><input type="checkbox"/> Other _____</p> <p><input type="checkbox"/> YES multiplier is 2 <input checked="" type="checkbox"/> NO multiplier is 1</p> | (see p. 44) multiplier <u>1</u> |
| D | TOTAL - Water Quality Functions Multiply the score from D1 by D2 <i>Add score to table on p. 1</i> | 8 |

| These questions apply to wetlands of all HGM classes. | | Points (only 1 score per box) | | | | | | | | | | | | |
|---|---|---|--|---|---|--|------------|--|---|---|--|---|------------|---|
| HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat | | | | | | | | | | | | | | |
| H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species? | | | | | | | | | | | | | | |
| <p>H 1.1 Vegetation structure (see p. 72) Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.</p> <p> <input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >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 structures that qualify. If you have:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><input type="checkbox"/> 4 structures or more</td> <td style="width: 50%; text-align: right;">points = 4</td> </tr> <tr> <td><input type="checkbox"/> 3 structures</td> <td style="text-align: right;">points = 2</td> </tr> <tr> <td><input checked="" type="checkbox"/> 2 structures</td> <td style="text-align: right;">points = 1</td> </tr> <tr> <td><input type="checkbox"/> 1 structure</td> <td style="text-align: right;">points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes</p> | | <input type="checkbox"/> 4 structures or more | points = 4 | <input type="checkbox"/> 3 structures | points = 2 | <input checked="" type="checkbox"/> 2 structures | points = 1 | <input type="checkbox"/> 1 structure | points = 0 | <p>Figure 3/3</p> <p style="font-size: 2em;">1</p> | | | | |
| <input type="checkbox"/> 4 structures or more | points = 4 | | | | | | | | | | | | | |
| <input type="checkbox"/> 3 structures | points = 2 | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> 2 structures | points = 1 | | | | | | | | | | | | | |
| <input type="checkbox"/> 1 structure | points = 0 | | | | | | | | | | | | | |
| <p>H 1.2. Hydroperiods (see p. 73) Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><input type="checkbox"/> Permanently flooded or inundated</td> <td style="width: 50%;"><input type="checkbox"/> 4 or more types present</td> <td style="width: 10%; text-align: right;">points = 3</td> </tr> <tr> <td><input checked="" type="checkbox"/> Seasonally flooded or inundated</td> <td><input type="checkbox"/> 3 types present</td> <td style="text-align: right;">points = 2</td> </tr> <tr> <td><input type="checkbox"/> Occasionally flooded or inundated</td> <td><input checked="" type="checkbox"/> 2 types present</td> <td style="text-align: right;">point = 1</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturated only</td> <td><input type="checkbox"/> 1 type present</td> <td style="text-align: right;">points = 0</td> </tr> </table> <p> <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points </p> <p style="text-align: right;">Map of hydroperiods</p> | | <input type="checkbox"/> Permanently flooded or inundated | <input type="checkbox"/> 4 or more types present | points = 3 | <input checked="" type="checkbox"/> Seasonally flooded or inundated | <input type="checkbox"/> 3 types present | points = 2 | <input type="checkbox"/> Occasionally flooded or inundated | <input checked="" type="checkbox"/> 2 types present | point = 1 | <input checked="" type="checkbox"/> Saturated only | <input type="checkbox"/> 1 type present | points = 0 | <p>Figure 3/3</p> <p style="font-size: 2em;">1</p> |
| <input type="checkbox"/> Permanently flooded or inundated | <input type="checkbox"/> 4 or more types present | points = 3 | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Seasonally flooded or inundated | <input type="checkbox"/> 3 types present | points = 2 | | | | | | | | | | | | |
| <input type="checkbox"/> Occasionally flooded or inundated | <input checked="" type="checkbox"/> 2 types present | point = 1 | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Saturated only | <input type="checkbox"/> 1 type present | points = 0 | | | | | | | | | | | | |
| <p>H 1.3. Richness of Plant Species (see p. 75) Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold) You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle</p> <p>If you counted:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><input type="checkbox"/> > 19 species</td> <td style="width: 50%; text-align: right;">points = 2</td> </tr> <tr> <td><input type="checkbox"/> 5 - 19 species</td> <td style="text-align: right;">points = 1</td> </tr> <tr> <td><input checked="" type="checkbox"/> < 5 species</td> <td style="text-align: right;">points = 0</td> </tr> </table> <p>List species below if you want to:</p> | | <input type="checkbox"/> > 19 species | points = 2 | <input type="checkbox"/> 5 - 19 species | points = 1 | <input checked="" type="checkbox"/> < 5 species | points = 0 | <p style="font-size: 2em;">0</p> | | | | | | |
| <input type="checkbox"/> > 19 species | points = 2 | | | | | | | | | | | | | |
| <input type="checkbox"/> 5 - 19 species | points = 1 | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> < 5 species | points = 0 | | | | | | | | | | | | | |

Total for page 2

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| <p>H 1.4. Interspersion of habitats (see p. 76) Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p><input type="checkbox"/> None = 0 points</p> </div> <div style="text-align: center;">  <p><input checked="" type="checkbox"/> Low = 1 point</p> </div> <div style="text-align: center;">  <p><input type="checkbox"/> Moderate = 2 points</p> </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>[riparian braided channels]</p> </div> </div> <p style="text-align: center;"><input type="checkbox"/> High = 3 points</p> <p style="text-align: center;">NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes</p> | <p>Figure 3 / 3</p> <p style="font-size: 2em;">1</p> |
| <p>H 1.5. Special Habitat Features: (see p. 77) <i>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.</i></p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland</p> <p><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)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet turned grey/brown</i>)</p> <p><input type="checkbox"/> At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (<i>structures for egg-laying by amphibians</i>)</p> <p><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in each stratum of plants</p> <p style="text-align: center;"><i>NOTE: The 20% stated in early printings of the manual on page 78 is an error.</i></p> | <p style="font-size: 2em;">0</p> |
| <p>H 1. TOTAL Score - potential for providing habitat <i>Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5</i></p> | <p style="font-size: 2em;">3</p> |

Comments

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| <p>H 2. Does the wetland unit have the opportunity to provide habitat for many species?</p> | |
| <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"/> 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5</p> <p><input checked="" type="checkbox"/> 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4</p> <p><input type="checkbox"/> 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4</p> <p><input type="checkbox"/> 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3</p> <p><input type="checkbox"/> 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3</p> <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <p><input type="checkbox"/> No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2</p> <p><input type="checkbox"/> No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2</p> <p><input type="checkbox"/> Heavy grazing in buffer. Points = 1</p> <p><input type="checkbox"/> Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) Points = 0.</p> <p><input type="checkbox"/> Buffer does not meet any of the criteria above. Points = 1</p> <p style="text-align: right;">Aerial photo showing buffers</p> | <p>Figure 3/3</p> <p style="text-align: center;">3</p> |
| <p>H 2.2 <u>Corridors and Connections</u> (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor</i>).</p> <p><input type="checkbox"/> YES = 4 points (go to H 2.3) <input checked="" type="checkbox"/> NO = go to H 2.2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?</p> <p><input checked="" type="checkbox"/> YES = 2 points (go to H 2.3) <input type="checkbox"/> NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland:</p> <p><input type="checkbox"/> within 5 mi (8km) of a brackish or salt water estuary OR</p> <p><input type="checkbox"/> within 3 mi of a large field or pasture (>40 acres) OR</p> <p><input type="checkbox"/> within 1 mi of a lake greater than 20 acres?</p> <p><input type="checkbox"/> YES = 1 point <input type="checkbox"/> NO = 0 points</p> | <p style="text-align: center;">2</p> |

Total for page 5

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

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

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*).
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A*).
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.
- If wetland has **3 or more** priority habitats = **4 points**
- If wetland has **2** priority habitats = **3 points**
- If wetland has **1** priority habitat = **1 point** No habitats = 0 points

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

0

Wetland name or number B

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| <p>H 2.4 Wetland Landscape (<i>choose the one description of the landscape around the wetland that best fits</i>) (<i>see p. 84</i>)</p> <p><input checked="" type="checkbox"/> There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p><input type="checkbox"/> There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p><input type="checkbox"/> There is at least 1 wetland within ½ mile. points = 2</p> <p><input type="checkbox"/> There are no wetlands within ½ mile. points = 0</p> | 5 |
| <p>H 2. TOTAL Score - opportunity for providing habitat <i>Add the scores from H2.1, H2.2, H2.3, H2.4</i></p> | 10 |
| <p>TOTAL for H 1 from page 14</p> | 3 |
| <p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p> | 13 |

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| <p>SC 2.0 Natural Heritage Wetlands (see p. 87) Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.</p> <p>SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (<i>this question is used to screen out most sites before you need to contact WNHP/DNR</i>) S/T/R information from Appendix D <input checked="" type="checkbox"/> or accessed from WNHP/DNR web site <input type="checkbox"/></p> <p>YES <input type="checkbox"/> – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO <input checked="" type="checkbox"/></p> <p>SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? <input type="checkbox"/> YES = Category I NO <input checked="" type="checkbox"/> not a Heritage Wetland</p> | <input type="checkbox"/> Cat. I |
| <p>SC 3.0 Bogs (see p. 87) Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>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 the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 <input type="checkbox"/> <input checked="" type="checkbox"/> No - go to Q. 2</p> <p>2. Does the unit 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? <input type="checkbox"/> Yes - go to Q. 3 <input checked="" type="checkbox"/> No - Is not a bog for purpose of rating</p> <p>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)? <input type="checkbox"/> Yes – Is a bog for purpose of rating <input type="checkbox"/> No - go to Q. 4</p> <p>NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog.</p> <p>1. 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)?</p> <p>2. <input type="checkbox"/> YES = Category I No <input type="checkbox"/> Is not a bog for purpose of rating</p> | |
| <input type="checkbox"/> Cat. I | |

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| <p>SC 4.0 Forested Wetlands (see p. 90) Does the wetland unit 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 functions.</i></p> <p><input type="checkbox"/> Old-growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/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><input type="checkbox"/> Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); 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><input type="checkbox"/> YES = Category I NO <input checked="" type="checkbox"/> not a forested wetland with special characteristics</p> | <p>Cat. I <input type="checkbox"/></p> |
| <p>SC 5.0 Wetlands in Coastal Lagoons (see p. 91) Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> 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><input type="checkbox"/> The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> YES = Go to SC 5.1 NO <input checked="" type="checkbox"/> not a wetland in a coastal lagoon</p> <p>SC 5.1 Does the wetland meets all of the following three conditions?</p> <p><input type="checkbox"/> 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><input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 acre (4350 square feet)</p> <p><input type="checkbox"/> YES = Category I <input type="checkbox"/> NO = Category II</p> | <p><input type="checkbox"/> Cat. I</p> <p><input type="checkbox"/> Cat. II</p> |

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| <p>SC 6.0 Interdunal Wetlands (<i>see p. 93</i>)</p> <p>Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><input type="checkbox"/> YES - go to SC 6.1 NO <input checked="" type="checkbox"/> 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> <p><input type="checkbox"/> Long Beach Peninsula- lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport- lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis- lands west of SR 115 and SR 109</p> <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger?</p> <p><input type="checkbox"/> YES = Category II <input type="checkbox"/> NO – go to SC 6.2</p> <p>SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?</p> <p><input type="checkbox"/> YES = Category III</p> | <p>Cat. II <input type="checkbox"/></p> <p>Cat. III <input type="checkbox"/></p> |
| <p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p> | <p><input type="checkbox"/> Cat. I</p> <p><input type="checkbox"/> Cat. II</p> <p><input type="checkbox"/> Cat. III</p> <p><input checked="" type="checkbox"/> N/A</p> |

Wetland name or number C

WETLAND RATING FORM – WESTERN WASHINGTON

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

Name of wetland (if known): Wetland C Date of site visit: 07/11/14

Rated by JK Trained by Ecology? Yes No Date of training Oct/2006

SEC: 3 TOWNSHIP: 28N RANGE: 4E Is S/T/R in Appendix D? Yes No

Map of wetland unit: Figure 3/3 Estimated size 3577 SF

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I II III IV

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

| | |
|-----------------------------------|-----------|
| Score for Water Quality Functions | 12 |
| Score for Hydrologic Functions | 20 |
| Score for Habitat Functions | 19 |
| TOTAL score for Functions | 51 |

Category based on SPECIAL CHARACTERISTICS of wetland

I II Does not Apply

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

II

Summary of basic information about the wetland unit

| Wetland Unit has Special Characteristics | | Wetland HGM Class used for Rating | |
|--|-------------------------------------|--|-------------------------------------|
| Estuarine | | Depressional | <input checked="" type="checkbox"/> |
| Natural Heritage Wetland | | Riverine | <input type="checkbox"/> |
| Bog | | Lake-fringe | <input type="checkbox"/> |
| Mature Forest | | Slope | <input type="checkbox"/> |
| Old Growth Forest | | Flats | <input type="checkbox"/> |
| Coastal Lagoon | | Freshwater Tidal | <input type="checkbox"/> |
| Interdunal | | | <input type="checkbox"/> |
| None of the above | <input checked="" type="checkbox"/> | Check if unit has multiple HGM classes present | <input type="checkbox"/> |

Does the wetland unit 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 May Need Additional Protection (in addition to the protection recommended for its category) | YES | NO |
|--|------------|-----------|
| <p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p> | | ✓ |
| <p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).</p> | | ✓ |
| <p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p> | | ✓ |
| <p>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.</p> | | ✓ |

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 into 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 Wetland Units in 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 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 the only source (>90%) of water to it.

Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3 YES – The wetland class is **Flats**

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

3. Does the entire wetland unit **meet 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) at least 20 acres (8 ha) in size;

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

NO – go to 4 YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

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

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

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

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

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

NO - go to 5 YES – The wetland class is **Slope**

Wetland name or number C

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

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

The overbank flooding occurs at least once every 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 during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 YES – The wetland class is **Depressional**

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

NO – go to 8 YES – The wetland class is **Depressional**

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

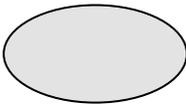
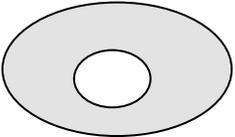
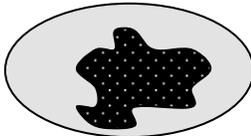
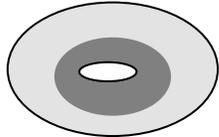
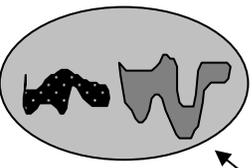
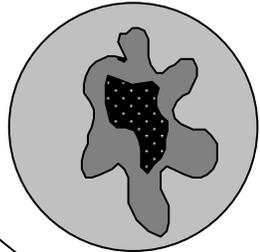
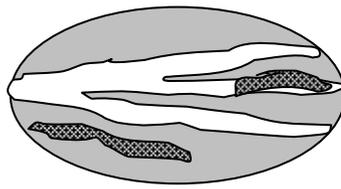
| <i>HGM Classes within the wetland unit being rated</i> | <i>HGM Class to Use in Rating</i> |
|---|---|
| Slope + Riverine | Riverine <input type="checkbox"/> |
| Slope + Depressional | Depressional <input type="checkbox"/> |
| Slope + Lake-fringe | Lake-fringe <input type="checkbox"/> |
| Depressional + Riverine along stream within boundary | Depressional <input type="checkbox"/> |
| Depressional + Lake-fringe | Depressional <input type="checkbox"/> |
| Salt Water Tidal Fringe and any other class of freshwater wetland | Treat as ESTUARINE under wetlands with special characteristics <input type="checkbox"/> |

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

| D Depressional and Flats Wetlands | | Points (only 1 score per box) |
|--|---|---|
| WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality | | |
| D | D 1. Does the wetland unit have the <u>potential</u> to improve water quality? | (see p.38) |
| D | <p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p><input checked="" type="checkbox"/> Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p><input type="checkbox"/> Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p><input type="checkbox"/> Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p><input type="checkbox"/> Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch points = 1 (If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p style="text-align: right;">Provide photo or drawing</p> | Figure 3/3 3 |
| D | <p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p><input type="checkbox"/> YES points = 4</p> <p><input checked="" type="checkbox"/> NO points = 0</p> | 0 |
| D | <p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p><input checked="" type="checkbox"/> Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1</p> <p><input type="checkbox"/> Wetland has persistent, ungrazed vegetation <1/10 of area points = 0</p> <p style="text-align: right;">Map of Cowardin vegetation classes</p> | Figure 3/3 5 |
| D | <p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.</i></p> <p><input checked="" type="checkbox"/> Area seasonally ponded is > 1/2 total area of wetland points = 4</p> <p><input type="checkbox"/> Area seasonally ponded is > 1/4 total area of wetland points = 2</p> <p><input type="checkbox"/> Area seasonally ponded is < 1/4 total area of wetland points = 0</p> <p style="text-align: right;">Map of Hydroperiods</p> | Figure 3/3 4 |
| D | Total for D 1 | Add the points in the boxes above 12 |
| D | <p>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</p> <p>Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. <i>Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.</i></p> <p><input type="checkbox"/> Grazing in the wetland or within 150 ft</p> <p><input type="checkbox"/> Untreated stormwater discharges to wetland</p> <p><input type="checkbox"/> Tilled fields or orchards within 150 ft of wetland</p> <p><input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</p> <p><input type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland</p> <p><input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen</p> <p><input type="checkbox"/> Other _____</p> <p><input type="checkbox"/> YES multiplier is 2 <input checked="" type="checkbox"/> NO multiplier is 1</p> | (see p. 44) multiplier <u>1</u> |
| D | TOTAL - Water Quality Functions | Multiply the score from D1 by D2 Add score to table on p. 1 12 |

| D Depressional and Flats Wetlands | | Points (only 1 score per box) |
|--|---|--|
| HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation | | |
| D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion? | | <i>(see p.46)</i> |
| D | D 3.1 Characteristics of surface water flows out of the wetland unit <input checked="" type="checkbox"/> Unit is a depression with no surface water leaving it (no outlet) points = 4 <input type="checkbox"/> Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 <input type="checkbox"/> Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch points = 1 <i>(If ditch is not permanently flowing treat unit as "intermittently flowing")</i> <input type="checkbox"/> Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0 | 4 |
| D | D 3.2 Depth of storage during wet periods <i>Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).</i> <input type="checkbox"/> Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 <input type="checkbox"/> The wetland is a "headwater" wetland points = 5 <input type="checkbox"/> Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 <input checked="" type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 <input type="checkbox"/> Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 <input type="checkbox"/> Marks of ponding less than 0.5 ft points = 0 | 3 |
| D | D 3.3 Contribution of wetland unit to storage in the watershed <i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i> <input type="checkbox"/> The area of the basin is less than 10 times the area of unit points = 5 <input checked="" type="checkbox"/> The area of the basin is 10 to 100 times the area of the unit points = 3 <input type="checkbox"/> The area of the basin is more than 100 times the area of the unit points = 0 <input type="checkbox"/> Entire unit is in the FLATS class points = 5 | 3 |
| D | Total for D 3 <i>Add the points in the boxes above</i> | 10 |
| D | D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion? Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. <i>Note which of the following indicators of opportunity apply.</i> <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 checked="" 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 _____ <input checked="" type="checkbox"/> YES multiplier is 2 <input type="checkbox"/> NO multiplier is 1 | <i>(see p. 49)</i> multiplier <u>2</u> |
| D | TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4 <i>Add score to table on p. 1</i> | 20 |

| These questions apply to wetlands of all HGM classes. | | Points (only 1 score per box) | | | | | | | | | | | | |
|---|---|---|--|--|---|--|------------|--|---|---|--|---|------------|---|
| HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat | | | | | | | | | | | | | | |
| H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species? | | | | | | | | | | | | | | |
| <p>H 1.1 Vegetation structure (see p. 72) Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.</p> <p> <input type="checkbox"/> Aquatic bed <input type="checkbox"/> Emergent plants <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have >30% cover) If the unit has a forested class check if: <input type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon Add the number of vegetation structures that qualify. If you have:</p> <p>Map of Cowardin vegetation classes</p> <table style="margin-left: auto; margin-right: 0;"> <tr> <td><input type="checkbox"/> 4 structures or more</td> <td>points = 4</td> </tr> <tr> <td><input type="checkbox"/> 3 structures</td> <td>points = 2</td> </tr> <tr> <td><input checked="" type="checkbox"/> 2 structures</td> <td>points = 1</td> </tr> <tr> <td><input type="checkbox"/> 1 structure</td> <td>points = 0</td> </tr> </table> | | <input type="checkbox"/> 4 structures or more | points = 4 | <input type="checkbox"/> 3 structures | points = 2 | <input checked="" type="checkbox"/> 2 structures | points = 1 | <input type="checkbox"/> 1 structure | points = 0 | <p>Figure 3/3</p> <p style="font-size: 2em;">1</p> | | | | |
| <input type="checkbox"/> 4 structures or more | points = 4 | | | | | | | | | | | | | |
| <input type="checkbox"/> 3 structures | points = 2 | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> 2 structures | points = 1 | | | | | | | | | | | | | |
| <input type="checkbox"/> 1 structure | points = 0 | | | | | | | | | | | | | |
| <p>H 1.2. Hydroperiods (see p. 73) Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Permanently flooded or inundated</td> <td><input type="checkbox"/> 4 or more types present</td> <td>points = 3</td> </tr> <tr> <td><input checked="" type="checkbox"/> Seasonally flooded or inundated</td> <td><input type="checkbox"/> 3 types present</td> <td>points = 2</td> </tr> <tr> <td><input type="checkbox"/> Occasionally flooded or inundated</td> <td><input checked="" type="checkbox"/> 2 types present</td> <td>point = 1</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturated only</td> <td><input type="checkbox"/> 1 type present</td> <td>points = 0</td> </tr> </table> <p> <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points </p> <p style="text-align: right;">Map of hydroperiods</p> | | <input type="checkbox"/> Permanently flooded or inundated | <input type="checkbox"/> 4 or more types present | points = 3 | <input checked="" type="checkbox"/> Seasonally flooded or inundated | <input type="checkbox"/> 3 types present | points = 2 | <input type="checkbox"/> Occasionally flooded or inundated | <input checked="" type="checkbox"/> 2 types present | point = 1 | <input checked="" type="checkbox"/> Saturated only | <input type="checkbox"/> 1 type present | points = 0 | <p>Figure 3/3</p> <p style="font-size: 2em;">1</p> |
| <input type="checkbox"/> Permanently flooded or inundated | <input type="checkbox"/> 4 or more types present | points = 3 | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Seasonally flooded or inundated | <input type="checkbox"/> 3 types present | points = 2 | | | | | | | | | | | | |
| <input type="checkbox"/> Occasionally flooded or inundated | <input checked="" type="checkbox"/> 2 types present | point = 1 | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Saturated only | <input type="checkbox"/> 1 type present | points = 0 | | | | | | | | | | | | |
| <p>H 1.3. Richness of Plant Species (see p. 75) Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold) You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle</p> <p>If you counted:</p> <table style="margin-left: auto; margin-right: 0;"> <tr> <td><input type="checkbox"/> > 19 species</td> <td>points = 2</td> </tr> <tr> <td><input checked="" type="checkbox"/> 5 - 19 species</td> <td>points = 1</td> </tr> <tr> <td><input type="checkbox"/> < 5 species</td> <td>points = 0</td> </tr> </table> <p>List species below if you want to:</p> | | <input type="checkbox"/> > 19 species | points = 2 | <input checked="" type="checkbox"/> 5 - 19 species | points = 1 | <input type="checkbox"/> < 5 species | points = 0 | <p style="font-size: 2em;">1</p> | | | | | | |
| <input type="checkbox"/> > 19 species | points = 2 | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> 5 - 19 species | points = 1 | | | | | | | | | | | | | |
| <input type="checkbox"/> < 5 species | points = 0 | | | | | | | | | | | | | |

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| <p>H 1.4. Interspersion of habitats (see p. 76) Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-bottom: 20px;"> <div style="text-align: center;">  <p><input type="checkbox"/> None = 0 points</p> </div> <div style="text-align: center;">  <p><input checked="" type="checkbox"/> Low = 1 point</p> </div> <div style="text-align: center;">  <p><input type="checkbox"/> Moderate = 2 points</p> </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>[riparian braided channels]</p> </div> </div> <p style="text-align: center;"><input type="checkbox"/> High = 3 points</p> <p style="text-align: center;">NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes</p> | <p>Figure 3 / 3</p> <p style="font-size: 2em;">1</p> |
| <p>H 1.5. Special Habitat Features: (see p. 77) Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). <input checked="" type="checkbox"/> Standing snags (diameter at the bottom > 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 (>30degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet turned grey/brown</i>) <input type="checkbox"/> At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (<i>structures for egg-laying by amphibians</i>) <input checked="" type="checkbox"/> Invasive plants cover less than 25% of the wetland area in each stratum of plants <p style="text-align: center;">NOTE: The 20% stated in early printings of the manual on page 78 is an error.</p> | <p style="font-size: 2em;">3</p> |
| <p>H 1. TOTAL Score - potential for providing habitat Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5</p> | <p style="font-size: 2em; border: 2px dashed black;">7</p> |

Comments

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| <p>H 2. Does the wetland unit have the opportunity to provide habitat for many species?</p> | |
| <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"/> 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5</p> <p><input checked="" type="checkbox"/> 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4</p> <p><input type="checkbox"/> 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4</p> <p><input type="checkbox"/> 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3</p> <p><input type="checkbox"/> 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3</p> <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <p><input type="checkbox"/> No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2</p> <p><input type="checkbox"/> No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2</p> <p><input type="checkbox"/> Heavy grazing in buffer. Points = 1</p> <p><input type="checkbox"/> Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) Points = 0.</p> <p><input type="checkbox"/> Buffer does not meet any of the criteria above. Points = 1</p> <p style="text-align: right;">Aerial photo showing buffers</p> | <p>Figure 3/3</p> <p style="text-align: center;">4</p> |
| <p>H 2.2 <u>Corridors and Connections</u> (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor</i>).</p> <p><input type="checkbox"/> YES = 4 points (go to H 2.3) <input checked="" type="checkbox"/> NO = go to H 2.2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?</p> <p><input checked="" type="checkbox"/> YES = 2 points (go to H 2.3) <input type="checkbox"/> NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland:</p> <p><input type="checkbox"/> within 5 mi (8km) of a brackish or salt water estuary OR</p> <p><input type="checkbox"/> within 3 mi of a large field or pasture (>40 acres) OR</p> <p><input type="checkbox"/> within 1 mi of a lake greater than 20 acres?</p> <p><input type="checkbox"/> YES = 1 point <input type="checkbox"/> NO = 0 points</p> | <p style="text-align: center;">2</p> |

Total for page 6

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

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

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
 - Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
 - Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
 - Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.
 - Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
 - Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
 - Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*).
 - Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
 - Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A*).
 - Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
 - Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
 - Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
 - Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.
- If wetland has **3 or more** priority habitats = **4 points**
 If wetland has **2** priority habitats = **3 points**
 If wetland has **1** priority habitat = **1 point** No habitats = 0 points

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

1

Wetland name or number C

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| <p>H 2.4 Wetland Landscape (<i>choose the one description of the landscape around the wetland that best fits</i>) (<i>see p. 84</i>)</p> <p><input checked="" type="checkbox"/> There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p><input type="checkbox"/> There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p><input type="checkbox"/> There is at least 1 wetland within ½ mile. points = 2</p> <p><input type="checkbox"/> There are no wetlands within ½ mile. points = 0</p> | 5 |
| <p>H 2. TOTAL Score - opportunity for providing habitat <i>Add the scores from H2.1, H2.2, H2.3, H2.4</i></p> | 12 |
| <p>TOTAL for H 1 from page 14</p> | 7 |
| <p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p> | 19 |

| | |
|---|--|
| <p>SC 2.0 Natural Heritage Wetlands (<i>see p. 87</i>) 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.</p> <p>SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (<i>this question is used to screen out most sites before you need to contact WNHP/DNR</i>) S/T/R information from Appendix D <input checked="" type="checkbox"/> or accessed from WNHP/DNR web site <input type="checkbox"/></p> <p>YES <input type="checkbox"/> – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO <input checked="" type="checkbox"/></p> <p>SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? <input type="checkbox"/> YES = Category I NO <input checked="" type="checkbox"/> not a Heritage Wetland</p> | <input type="checkbox"/> Cat. I |
| <p>SC 3.0 Bogs (<i>see p. 87</i>) Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>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 the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 <input type="checkbox"/> <input checked="" type="checkbox"/> No - go to Q. 2</p> <p>2. Does the unit 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? <input type="checkbox"/> Yes - go to Q. 3 <input checked="" type="checkbox"/> No - Is not a bog for purpose of rating</p> <p>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)? <input type="checkbox"/> Yes – Is a bog for purpose of rating <input type="checkbox"/> No - go to Q. 4</p> <p>NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog.</p> <p>1. 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)?</p> <p>2. <input type="checkbox"/> YES = Category I No <input type="checkbox"/> Is not a bog for purpose of rating</p> | |
| <input type="checkbox"/> Cat. I | |

| | |
|---|--|
| <p>SC 4.0 Forested Wetlands (see p. 90) Does the wetland unit 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 functions.</i></p> <p><input type="checkbox"/> Old-growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/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><input type="checkbox"/> Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); 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><input type="checkbox"/> YES = Category I NO <input checked="" type="checkbox"/> not a forested wetland with special characteristics</p> | <p>Cat. I <input type="checkbox"/></p> |
| <p>SC 5.0 Wetlands in Coastal Lagoons (see p. 91) Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> 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><input type="checkbox"/> The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> YES = Go to SC 5.1 NO <input checked="" type="checkbox"/> not a wetland in a coastal lagoon</p> <p>SC 5.1 Does the wetland meets all of the following three conditions?</p> <p><input type="checkbox"/> 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><input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 acre (4350 square feet)</p> <p><input type="checkbox"/> YES = Category I <input type="checkbox"/> NO = Category II</p> | <p><input type="checkbox"/> Cat. I</p> <p><input type="checkbox"/> Cat. II</p> |

| | |
|---|--|
| <p>SC 6.0 Interdunal Wetlands (<i>see p. 93</i>)</p> <p>Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><input type="checkbox"/> YES - go to SC 6.1 NO <input checked="" type="checkbox"/> 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> <p><input type="checkbox"/> Long Beach Peninsula- lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport- lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis- lands west of SR 115 and SR 109</p> <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger?</p> <p><input type="checkbox"/> YES = Category II <input type="checkbox"/> NO – go to SC 6.2</p> <p>SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?</p> <p><input type="checkbox"/> YES = Category III</p> | <p>Cat. II <input type="checkbox"/></p> <p>Cat. III <input type="checkbox"/></p> |
| <p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p> | <p><input type="checkbox"/> Cat. I</p> <p><input type="checkbox"/> Cat. II</p> <p><input type="checkbox"/> Cat. III</p> <p><input checked="" type="checkbox"/> N/A</p> |

Wetland name or number D

WETLAND RATING FORM – WESTERN WASHINGTON

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

Name of wetland (if known): Wetland D Date of site visit: 07/11/14

Rated by JK Trained by Ecology? Yes No Date of training Oct/2006

SEC: 3 TOWNSHIP: 28N RANGE: 4E Is S/T/R in Appendix D? Yes No

Map of wetland unit: Figure 3/3 Estimated size 4920 SF

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I II III IV

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

| | |
|-----------------------------------|-----------|
| Score for Water Quality Functions | 16 |
| Score for Hydrologic Functions | 14 |
| Score for Habitat Functions | 19 |
| TOTAL score for Functions | 48 |

Category based on SPECIAL CHARACTERISTICS of wetland

I II Does not Apply

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

III

Summary of basic information about the wetland unit

| Wetland Unit has Special Characteristics | | Wetland HGM Class used for Rating | |
|--|-------------------------------------|--|-------------------------------------|
| Estuarine | | Depressional | <input checked="" type="checkbox"/> |
| Natural Heritage Wetland | | Riverine | <input type="checkbox"/> |
| Bog | | Lake-fringe | <input type="checkbox"/> |
| Mature Forest | | Slope | <input type="checkbox"/> |
| Old Growth Forest | | Flats | <input type="checkbox"/> |
| Coastal Lagoon | | Freshwater Tidal | <input type="checkbox"/> |
| Interdunal | | | <input type="checkbox"/> |
| None of the above | <input checked="" type="checkbox"/> | Check if unit has multiple HGM classes present | <input type="checkbox"/> |

Does the wetland unit 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 May Need Additional Protection (in addition to the protection recommended for its category) | YES | NO |
|--|------------|-----------|
| <p>SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.</p> | | ✓ |
| <p>SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).</p> | | ✓ |
| <p>SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i></p> | | ✓ |
| <p>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.</p> | | ✓ |

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 into 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 Wetland Units in 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 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 the only source (>90%) of water to it.

Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3 YES – The wetland class is **Flats**

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

3. Does the entire wetland unit **meet 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) at least 20 acres (8 ha) in size;

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

NO – go to 4 YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

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

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

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

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

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

NO - go to 5 YES – The wetland class is **Slope**

Wetland name or number D

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

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

The overbank flooding occurs at least once every 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 during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 YES – The wetland class is **Depressional**

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

NO – go to 8 YES – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. **GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT** (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within 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 <input type="checkbox"/> |
| Slope + Depressional | Depressional <input type="checkbox"/> |
| Slope + Lake-fringe | Lake-fringe <input type="checkbox"/> |
| Depressional + Riverine along stream within boundary | Depressional <input type="checkbox"/> |
| Depressional + Lake-fringe | Depressional <input type="checkbox"/> |
| Salt Water Tidal Fringe and any other class of freshwater wetland | Treat as ESTUARINE under wetlands with special characteristics <input type="checkbox"/> |

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

| D Depressional and Flats Wetlands | | Points (only 1 score per box) |
|--|---|--|
| HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation | | |
| | D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion? | <i>(see p.46)</i> |
| D | <p>D 3.1 Characteristics of surface water flows out of the wetland unit</p> <p><input checked="" type="checkbox"/> Unit is a depression with no surface water leaving it (no outlet) points = 4</p> <p><input type="checkbox"/> Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p><input type="checkbox"/> Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch points = 1 <i>(If ditch is not permanently flowing treat unit as "intermittently flowing")</i></p> <p><input type="checkbox"/> Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0</p> | 4 |
| D | <p>D 3.2 Depth of storage during wet periods</p> <p><i>Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).</i></p> <p><input type="checkbox"/> Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</p> <p><input type="checkbox"/> The wetland is a "headwater" wetland points = 5</p> <p><input type="checkbox"/> Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5</p> <p><input type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3</p> <p><input type="checkbox"/> Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1</p> <p><input checked="" type="checkbox"/> Marks of ponding less than 0.5 ft points = 0</p> | 0 |
| D | <p>D 3.3 Contribution of wetland unit to storage in the watershed</p> <p><i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i></p> <p><input type="checkbox"/> The area of the basin is less than 10 times the area of unit points = 5</p> <p><input checked="" type="checkbox"/> The area of the basin is 10 to 100 times the area of the unit points = 3</p> <p><input type="checkbox"/> The area of the basin is more than 100 times the area of the unit points = 0</p> <p><input type="checkbox"/> Entire unit is in the FLATS class points = 5</p> | 3 |
| D | Total for D 3 <i>Add the points in the boxes above</i> | 7 |
| D | <p>D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?</p> <p>Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur.</p> <p><i>Note which of the following indicators of opportunity apply.</i></p> <p><input type="checkbox"/> Wetland is in a headwater of a river or stream that has flooding problems</p> <p><input type="checkbox"/> Wetland drains to a river or stream that has flooding problems</p> <p><input checked="" type="checkbox"/> Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems</p> <p><input type="checkbox"/> Other _____</p> <p><input checked="" type="checkbox"/> YES multiplier is 2 <input type="checkbox"/> NO multiplier is 1</p> | <i>(see p. 49)</i> multiplier <u>2</u> |
| D | TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4 <i>Add score to table on p. 1</i> | 14 |

| These questions apply to wetlands of all HGM classes. | | Points (only 1 score per box) |
|--|--|---|
| HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat | | |
| H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species? | | |
| <p>H 1.1 Vegetation structure (see p. 72) Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.</p> <p> <input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have >30% cover) If the unit has a forested class check if: <input checked="" type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon Add the number of vegetation structures that qualify. If you have: <input checked="" type="checkbox"/> 4 structures or more points = 4 <input type="checkbox"/> 3 structures points = 2 <input type="checkbox"/> 2 structures points = 1 <input type="checkbox"/> 1 structure points = 0 </p> <p>Map of Cowardin vegetation classes</p> | | <p>Figure 3/3</p> <p>4</p> |
| <p>H 1.2. Hydroperiods (see p. 73) Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)</p> <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> <p style="text-align: right;"> <input type="checkbox"/> 4 or more types present points = 3 <input type="checkbox"/> 3 types present points = 2 <input checked="" type="checkbox"/> 2 types present point = 1 <input type="checkbox"/> 1 type present points = 0 </p> <p style="text-align: right;">Map of hydroperiods</p> | | <p>Figure 3/3</p> <p>1</p> |
| <p>H 1.3. Richness of Plant Species (see p. 75) Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold) You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle If you counted: <input type="checkbox"/> > 19 species points = 2 <input checked="" type="checkbox"/> 5 - 19 species points = 1 <input type="checkbox"/> < 5 species points = 0 List species below if you want to: </p> | | <p>1</p> |

Total for page 6

| | |
|---|---|
| <p>H 1.4. Interspersion of habitats (see p. 76) Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-bottom: 20px;"> <div style="text-align: center;"> <input type="checkbox"/> None = 0 points</div> <div style="text-align: center;"> <input type="checkbox"/> Low = 1 point</div> <div style="text-align: center;"> <input checked="" type="checkbox"/> Moderate = 2 points</div> <div style="text-align: center;"> <input type="checkbox"/> High = 3 points</div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <input type="checkbox"/> High = 3 points</div> <div style="text-align: center;"> <input type="checkbox"/> High = 3 points</div> <div style="text-align: center;"> [riparian braided channels]</div> </div> <p style="text-align: center; margin-top: 10px;">NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes</p> | <p>Figure 3 / 3</p> <p style="font-size: 2em; margin-top: 50px;">2</p> |
| <p>H 1.5. Special Habitat Features: (see p. 77) Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). <input type="checkbox"/> Standing snags (diameter at the bottom > 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 (>30degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet turned grey/brown</i>) <input type="checkbox"/> At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (<i>structures for egg-laying by amphibians</i>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in each stratum of plants <p style="text-align: center; margin-top: 10px;">NOTE: The 20% stated in early printings of the manual on page 78 is an error.</p> | <p style="font-size: 2em;">1</p> |
| <p>H 1. TOTAL Score - potential for providing habitat Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5</p> | <p style="font-size: 2em;">9</p> |

Comments

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

Total for page 7

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <http://wdfw.wa.gov/hab/phslist.htm>)

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

- Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*).
- Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*).
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A*).
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.
- If wetland has **3 or more** priority habitats = **4 points**
- If wetland has **2** priority habitats = **3 points**
- If wetland has **1** priority habitat = **1 point** No habitats = 0 points

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

0

Wetland name or number D

| | |
|--|----|
| <p>H 2.4 Wetland Landscape (<i>choose the one description of the landscape around the wetland that best fits</i>) (<i>see p. 84</i>)</p> <p><input type="checkbox"/> There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p><input checked="" type="checkbox"/> There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p><input type="checkbox"/> There is at least 1 wetland within ½ mile. points = 2</p> <p><input type="checkbox"/> There are no wetlands within ½ mile. points = 0</p> | 3 |
| <p>H 2. TOTAL Score - opportunity for providing habitat <i>Add the scores from H2.1, H2.2, H2.3, H2.4</i></p> | 10 |
| <p>TOTAL for H 1 from page 14</p> | 9 |
| <p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p> | 19 |

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

| Wetland Type <i>Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.</i> | Category |
|--|--|
| <p>SC 1.0 Estuarine wetlands (see p. 86) Does the wetland unit meet the following criteria for Estuarine wetlands?</p> <p> <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. <input type="checkbox"/> YES = Go to SC 1.1 NO <input checked="" type="checkbox"/> = Go to SC 2.0 </p> | |
| <p>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?</p> <p> <input type="checkbox"/> YES = Category I <input type="checkbox"/> NO go to SC 1.2 </p> | <p>Cat. I <input type="checkbox"/></p> |
| <p>SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? <input type="checkbox"/> YES = Category I <input type="checkbox"/> NO = Category II</p> <p> <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 the 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. </p> <p> <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. </p> <p> <input type="checkbox"/> The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. </p> | <p> <input type="checkbox"/> Cat. I <input type="checkbox"/> Cat. II <input type="checkbox"/> Dual rating I/II </p> |

| | |
|---|--|
| <p>SC 2.0 Natural Heritage Wetlands (<i>see p. 87</i>) 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.</p> <p>SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (<i>this question is used to screen out most sites before you need to contact WNHP/DNR</i>) S/T/R information from Appendix D <input checked="" type="checkbox"/> or accessed from WNHP/DNR web site <input type="checkbox"/></p> <p>YES <input type="checkbox"/> – contact WNHP/DNR (see p. 79) and go to SC 2.2 NO <input checked="" type="checkbox"/></p> <p>SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? <input type="checkbox"/> YES = Category I NO <input checked="" type="checkbox"/> not a Heritage Wetland</p> | <input type="checkbox"/> Cat. I |
| <p>SC 3.0 Bogs (<i>see p. 87</i>) Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>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 the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 <input type="checkbox"/> <input checked="" type="checkbox"/> No - go to Q. 2</p> <p>2. Does the unit 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? <input type="checkbox"/> Yes - go to Q. 3 <input checked="" type="checkbox"/> No - Is not a bog for purpose of rating</p> <p>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)? <input type="checkbox"/> Yes – Is a bog for purpose of rating <input type="checkbox"/> No - go to Q. 4</p> <p>NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog.</p> <p>1. 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)?</p> <p>2. <input type="checkbox"/> YES = Category I No <input type="checkbox"/> Is not a bog for purpose of rating</p> | |
| <input type="checkbox"/> Cat. I | |

| | |
|---|--|
| <p>SC 4.0 Forested Wetlands (see p. 90) Does the wetland unit 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 functions.</i></p> <p><input type="checkbox"/> Old-growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/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><input type="checkbox"/> Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); 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><input type="checkbox"/> YES = Category I NO <input checked="" type="checkbox"/> not a forested wetland with special characteristics</p> | <p>Cat. I <input type="checkbox"/></p> |
| <p>SC 5.0 Wetlands in Coastal Lagoons (see p. 91) Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> 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><input type="checkbox"/> The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> YES = Go to SC 5.1 NO <input checked="" type="checkbox"/> not a wetland in a coastal lagoon</p> <p>SC 5.1 Does the wetland meets all of the following three conditions?</p> <p><input type="checkbox"/> 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><input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 acre (4350 square feet)</p> <p><input type="checkbox"/> YES = Category I <input type="checkbox"/> NO = Category II</p> | <p><input type="checkbox"/> Cat. I</p> <p><input type="checkbox"/> Cat. II</p> |

| | |
|---|--|
| <p>SC 6.0 Interdunal Wetlands (<i>see p. 93</i>)</p> <p>Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><input type="checkbox"/> YES - go to SC 6.1 NO <input checked="" type="checkbox"/> 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> <p><input type="checkbox"/> Long Beach Peninsula- lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport- lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis- lands west of SR 115 and SR 109</p> <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger?</p> <p><input type="checkbox"/> YES = Category II <input type="checkbox"/> NO – go to SC 6.2</p> <p>SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?</p> <p><input type="checkbox"/> YES = Category III</p> | <p>Cat. II <input type="checkbox"/></p> <p>Cat. III <input type="checkbox"/></p> |
| <p>Category of wetland based on Special Characteristics</p> <p><i>Choose the “highest” rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered NO for all types enter “Not Applicable” on p.1</p> | <p><input type="checkbox"/> Cat. I</p> <p><input type="checkbox"/> Cat. II</p> <p><input type="checkbox"/> Cat. III</p> <p><input checked="" type="checkbox"/> N/A</p> |

Appendix D
Wetland Mitigation Plan



Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E.
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Everett, Washington 98208
(425) 337-3174
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WETLAND MITIGATION PLAN

FOR

SOUNDVIEW BUSINESS CAMPUS

Wetland Resources, Inc. Project #14109

Prepared By:

Wetland Resources, Inc.
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Prepared For:

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Woodway, WA 98020

August 2014

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APPENDIX A: LETTER OF CREDIT AVAILABILITY AND PRICE LIST

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1.0 PROJECT DESCRIPTION

AmericanWest Bank and Veritas Development, Inc., hereafter referred to as the applicant, is proposing four new industrial manufacturing buildings with associated parking and utilities for the subject property. To accommodate the proposed development the applicant is proposing to eliminate the four on-site wetlands, Categories II and III (City of Everett and Washington Department of Ecology classifications), comprising a total of 0.25 acres (10,823 square feet). Mitigation for these impacts will be accomplished through the use of mitigation banking.

1.1 PROJECT LOCATION

The 39.45-acre site is located northwest of the terminus of 36th Avenue West, in the city of Everett, Washington (a portion of Section 3, Township 28N, Range 4E, W.M.; Lat: 47.945341 Long: -122.284462). The site is located within the Japanese Gulch Creek and Edgewater Creek drainage basins, which are part of WRIA 7 (Snohomish River watershed).

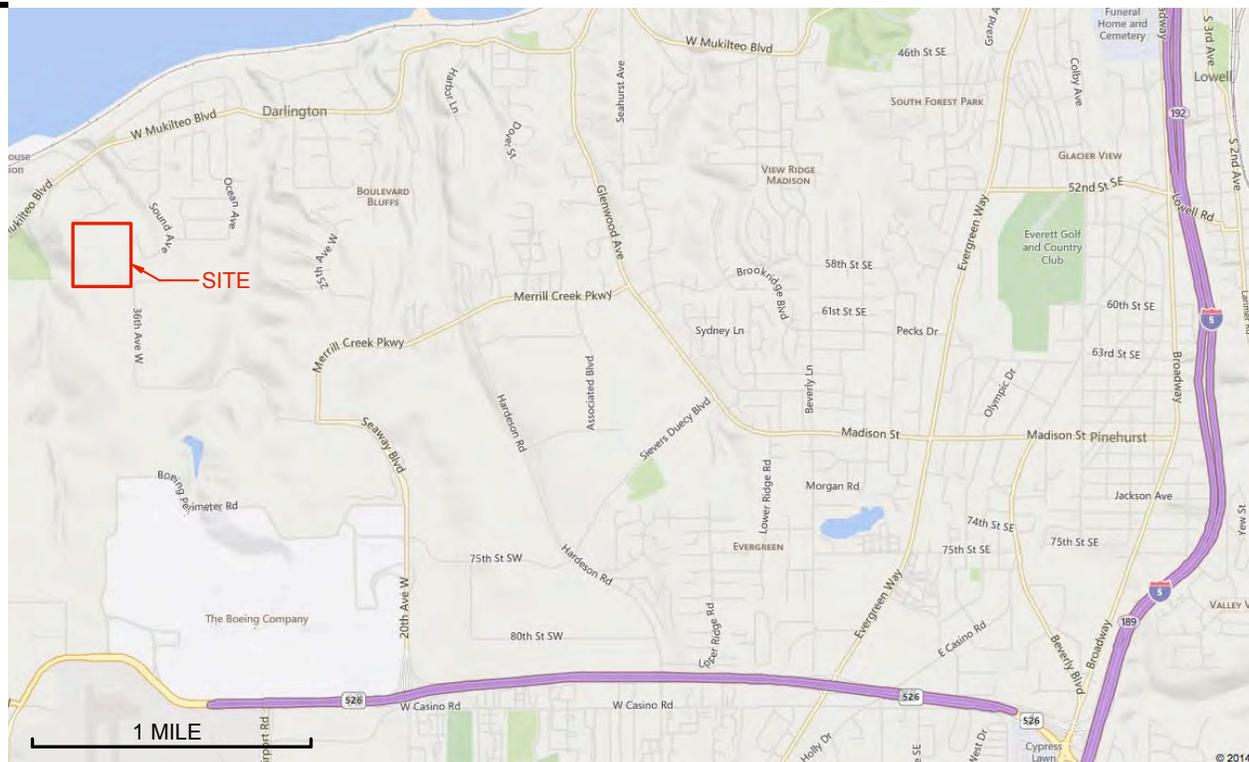


Figure 1: Vicinity map showing location of project site.

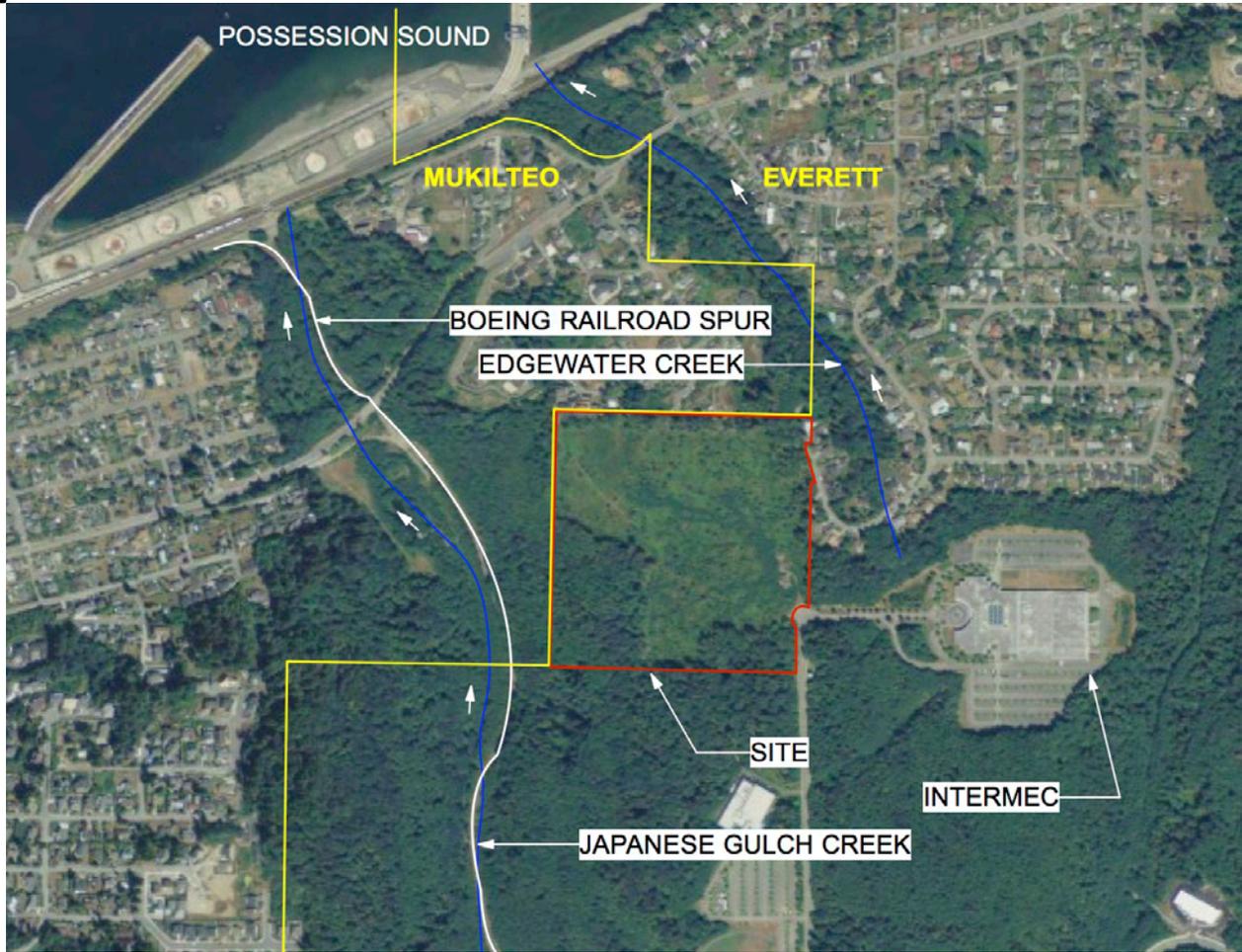


Figure 2: Location of project site relative to nearby streams.

1.2 TYPE OF DEVELOPMENT

The applicant is proposing four new industrial manufacturing buildings with associated parking, access road, stormwater system, and utilities.

1.3 SIZE OF THE PROJECT

The subject site is 39.45 acres in size. Approximately 33.52 acres will be developed with the remaining 5.96 acres being an undeveloped steep slope in the southwestern corner of the property.

1.4 CONSTRUCTION SCHEDULE

Construction will begin upon receipt of all applicable permits and approvals. It is anticipated that construction will occur in two phases spanning from April 2015 to April 2017.

2.0 DESCRIPTION OF THE DEVELOPMENT SITE (BASELINE CONDITIONS)

The site is undeveloped and located in an area of existing commercial and residential development. Mature forest is present on the steep slope located in the southwest corner of the property as well as in the southeastern corner of the site, which contains a wetland mosaic comprised of three wetlands. The remainder of the site, which makes up the majority, was clear-cut in 2006 and is currently vegetated by scrub-shrub communities due to the resultant succession. With the exception of the southwestern portion of the site, the subject property displays a general northern aspect. Surrounding land use is comprised of a commercial development to the east (Intermec Corp.), residential development to the north and northeast, and forested areas to the west and south. The Boeing railroad spur lies just west of the site. Current zoning of the site is M-1 Office and Industrial Park.

The study area contains two Category II wetlands (Wetlands A and C) and two Category III wetlands (Wetland B and D) (Washington Department of Ecology (DOE) and City of Everett classifications). Photographs and wetland rating forms are included in the Critical Area Study, Appendix C of the Biological Evaluation. Edgewater Creek and Japanese Gulch Creek both receive drainage from the project site, and are both within a half-mile of the site.

There are currently four drainage areas existing onsite, as shown in Figure 3. The western-most portion of the site to be developed (Pre-Basin A) drains down the steep slope along the western border and in the southwestern corner of the site, and subsequently into Japanese Gulch. The northwestern drainage area (Pre-Basin B) drains north into an intersecting ravine, which leads into a series of several existing stormwater conveyance features that eventually discharge into the ravine above Edgewater Creek. The northeastern drainage area (Pre-Basin C) drains to the northeast into a ravine that shallows out and is intersected by a drainage ditch leading into Edgewater Creek. The southeastern drainage area (Pre-Basin D) contains Wetlands A-C, and is hydrologically sourced from the off-site area to the south (Pre-Basin C Run-On). Runoff currently outlets from Wetland A into a catch basin, under 36th Avenue W, flowing to an existing stormwater conveyance ditch on the neighboring property.

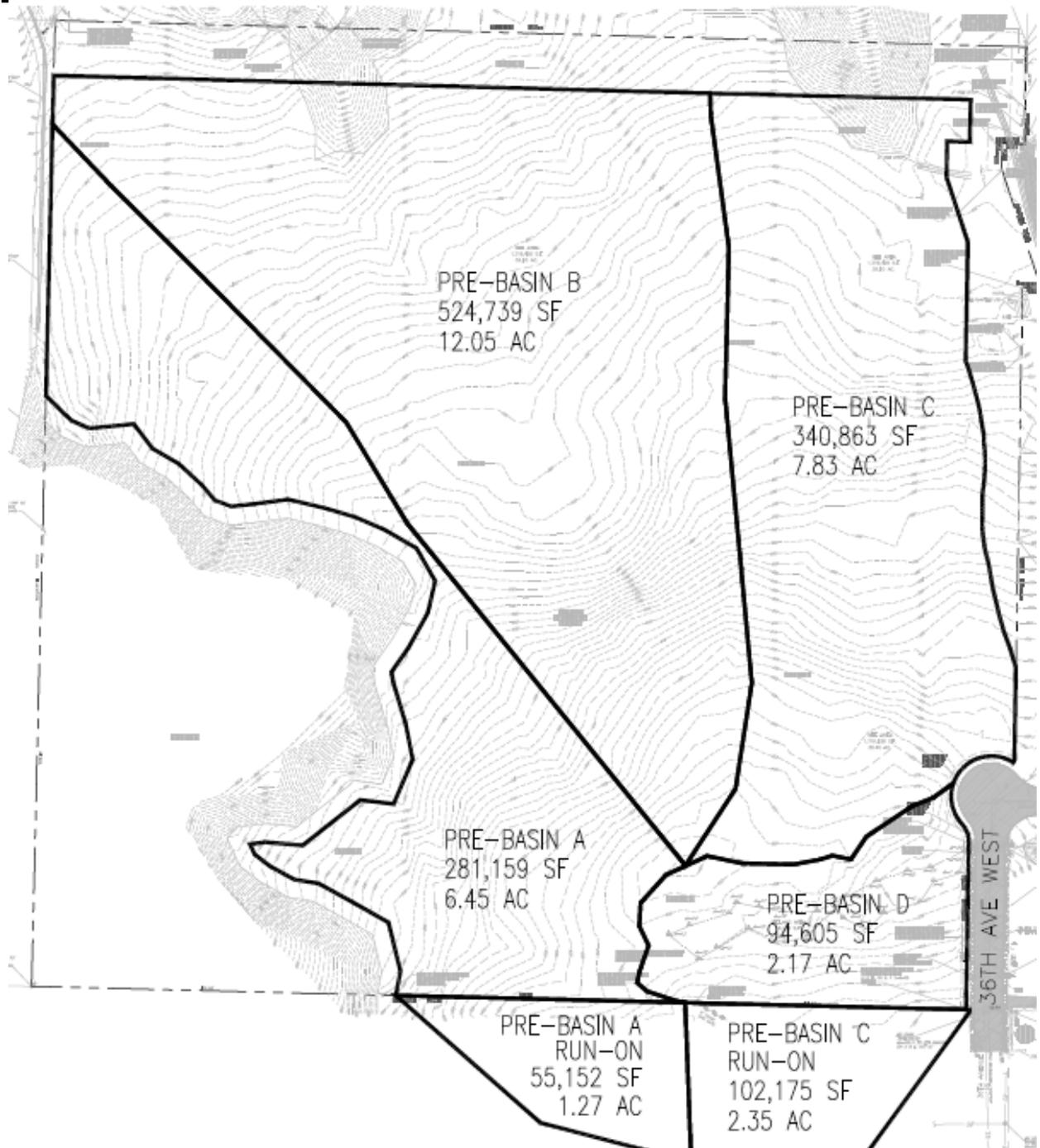


Figure 3: Drainage basins on the proposed development site.

2.1 EXISTING WETLANDS AND OTHER AQUATIC RESOURCES ON OR ADJACENT TO THE DEVELOPMENT SITE

Wetland Resources, Inc. completed a site investigation and delineation in July, 2014, to locate and evaluate jurisdictional wetlands and streams on and in the vicinity of the subject property.

Wetland A, Category II, is a small, forested, depressional wetland in the southeastern portion of the site. This wetland drains to a culvert under 36th Avenue W, then to a stormwater system on the property to the east, and finally into Edgewater Creek to the northeast.

Wetland B, Category III, is a small, forested, depressional wetland in the southeastern portion of the site that retains ponded water. This wetland has no outlet, and hydrology exits via groundwater and evapotranspiration.

Wetland C, Category II, is a small, forested, depressional wetland in the southeastern portion of the site that retains ponded water. This wetland has no outlet, and hydrology exits via groundwater and evapotranspiration.

Wetland D, Category III, is a small, depressional, scrub-shrub wetland in the center of the site. This wetland has been disturbed in the past and the vegetation is regenerating after clear-cutting created highly disturbed conditions. This wetland has no outlet, and hydrology exits via groundwater and evapotranspiration.

According to the WDFW Priority Habitats and Species Maps and the WDFW SalmonScape web application, the nearest occurrence of priority resident and anadromous fish habitat is in Japanese Gulch Creek, approximately 0.02 miles from the site, and Edgewater Creek, approximately 0.015 miles from the site. Both of these streams flow north into Possession Sound.

Table 1. Wetland Information

| Wetland Name | Category | Size |
|---------------------|-----------------|---------------------------------|
| Wetland A | II | 0.049 Acres (2,155 square feet) |
| Wetland B | III | 0.004 Acres (171 square feet) |
| Wetland C | II | 0.082 Acres (3,577 square feet) |
| Wetland D | III | 0.113 Acres (4,920 square feet) |

2.2 KNOWN HISTORIC OR CULTURAL RESOURCES ON THE DEVELOPMENT SITE

There are no known historic or cultural resources on the development site. The ravine to the west, known as Japanese Gulch, is known to have an extensive history of resident Japanese-American migrant workers who were employed by the local railroad and timber industries during the beginning of the twentieth century. Please refer to the Cultural Resources Assessment for the Soundview Business Campus Project, located in Appendix E of the Biological Evaluation.

2.3 MAP OF THE BASELINE CONDITIONS OF THE DEVELOPMENT SITE AND ADJACENT PROPERTIES

For a map showing the baseline conditions of the development site and adjacent properties, please refer to the Critical Area Study Map in Appendix C of the Biological Evaluation.

3.0 ASSESSMENT OF IMPACTS AT THE DEVELOPMENT SITE

3.1 AREA (ACREAGE) OF WETLAND IMPACTS

To accommodate the proposed development the applicant is proposing to eliminate the four on-site wetlands, Categories II and III, comprising a total of 0.248 acres (10,823 square feet).

Table 2. Wetland Impacts

| Wetland Name | Category | Impact Area |
|---------------------|-----------------|---|
| Wetland A | II | 0.049 Acres (2,155 square feet) |
| Wetland B | III | 0.004 Acres (171 square feet) |
| Wetland C | II | 0.082 Acres (3,577 square feet) |
| Wetland D | III | 0.113 Acres (4,920 square feet) |
| Total | | 0.248 Acres (10,823 square feet) |

3.2 DESCRIPTION OF THE WATER REGIME

Wetlands A through D are hydrogeomorphically classed as depression wetlands. The source of hydrology for these wetlands includes surface runoff, seasonal high water table, and precipitation. All of the Wetlands A through C are seasonally flooded and Wetland D contains areas that are seasonally saturated and areas that are seasonally flooded.

3.3 DESCRIPTION OF THE SOILS

The soils underlying the site are mapped in the Soil Survey of Snohomish County Area Washington as Alderwood gravelly sandy loam, 2 to 8 percent slopes, Alderwood gravelly sandy loam, 15 to 25 percent slopes, and Alderwood-Everett gravelly sandy loam, 25 to 70 percent slopes.

Alderwood gravelly sandy loam is described as a moderately well drained soil on till plains. It is moderately deep over a hardpan. This soil formed in glacial till. Typically, the surface layer is very dark grayish brown gravelly sandy loam about 7 inches thick. The upper part of the subsoil is dark yellowish brown and dark brown very gravelly sandy loam about 23 inches thick. Included in this unit are small areas of soils that have a stony or bouldery surface layer and areas of McKenna soils, Norma soils, and Terric Medisaprists in drainageways on plains. Also included are small areas of Everett, Indianola, and Ragnar soils on terraces and outwash plains. Included areas make up about 15 percent of the total acreage. Permeability of this soil is moderately rapid above the hardpan and very slow through it. Soils sampled on site appear similar to the description for Alderwood gravelly sandy loam. Although Alderwood gravelly sandy loam is not listed as hydric, the predicted inclusions of Terric Medisaprists, McKenna, and Norma soils are listed as hydric on the Washington State Hydric Soils List.

Alderwood-Everett gravelly sandy loam is on till plains, terraces, and outwash plains. This unit is about 60 percent Alderwood gravelly sandy loam and about 25 percent Everett gravelly sandy loam. Included in this unit are small areas of Ragnar, Indianola, McKenna, and Norma soils and Terric Medisaprists in depression areas and drainageways on plains. Also included are colluvial soils, slump areas, and escarpments. Included areas make up about 15 percent of the total acreage. The Alderwood soil is moderately deep over a hardpan and is moderately well drained. It formed in glacial till. Typically, the surface layer is very dark grayish brown gravelly sandy

loam about 7 inches thick. The upper part of the subsoil is dark yellowish brown and dark brown very gravelly sandy loam about 23 inches thick. A weakly cemented hardpan is at a depth of about 35 inches. Depth to the hardpan ranges from 20 to 40 inches. Permeability of the Alderwood soil is moderately rapid above the hardpan and very slow through it. A seasonal perched water table is at a depth of 18 to 36 inches from January to March. Springs or seep areas are common. Although Alderwood-Everett gravelly sandy loam is not listed as hydric, the predicted inclusions of Terric Medisaprists, McKenna, and Norma soils are listed as hydric on the Washington State Hydric Soils List.

3.4 DESCRIPTION OF THE VEGETATION

Vegetation on the site is comprised of a mix of scrub-shrub and deciduous/coniferous forest. The on-site wetlands are comprised of both scrub-shrub and forested vegetation.

Typical vegetation within Wetland A is represented by red alder (*Alnus rubra*, Fac) and Western red cedar (*Thuja plicata*, Fac) in the overstory. The understory is dominated by a thick stand of salmonberry (*Rubus spectabilis*, Fac), with some Himalayan blackberry (*Rubus armeniacus*, FacU) and trailing blackberry (*Rubus ursinus*, FacU).

Wetland B is a small wetland with no forested species rooted within the wetland itself, however an overstory of red alder overhangs the wetland boundary. Salmonberry dominates the fringes of the wetland with creeping buttercup (*Ranunculus repens*, FacW) present in the herbaceous layer.

Wetland C is dominated by Western red cedar, and has an understory of salmonberry and lady fern (*Athyrium filix-femina*, Fac) along the wetland fringe.

Vegetation within Wetland D is represented by species typical in disturbed regenerating clear-cut areas. Red alder and salmonberry were observed at the wetland fringe with the remainder of the wetland represented by creeping buttercup, soft rush (*Juncus effusus*, FacW), toad rush (*Juncus bufonius*, FacW), and slough sedge (*Carex obnupta*, Obl).

Vegetation in the non-wetland clear-cut portions of the site is dominated by young red alder and dense salmonberry. Additional typical vegetation includes big leaf maple (*Acer macrophyllum*, FacU), thimbleberry (*Rubus parviflorus*, Fac), and Himalayan blackberry.

Vegetation in the non-wetland forested portions of the site is dominated by red alder, Western red cedar, and big leaf maple in the overstory. The understory is dominated by dense salmonberry, Indian plum (*Oemleria cerasiformis*, FacU), red elderberry (*Sambucus racemosa*, FacU), red huckleberry (*Vaccinium parvifolium*, N.I.), and sword fern (*Polystichum munitum*, FacU).

No rare plants or rare plant communities are known to occur on this site or adjacent properties.

3.5 DESCRIPTION OF FAUNA USING THE SITE

Bird species expected to use this site include: Pileated Woodpecker (*Dryocopus pileatus*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), house finch (*Carpodacus mexicanus*), black-capped chickadee (*Poecile atricapillus*), bushtit (*Psaltiriparus minimus*), northern flicker (*Colaptes auratus*), hairy woodpecker (*Picoides villosus*), downy woodpecker (*Dendrocopos villosus*), red-breasted

nuthatch (*Sitta canadensis*), brown creeper (*Certhia Americana*), Swainson's thrush (*Hyocichla ustulata*), starling (*Sturnus vulgaris*), varied thrush (*Ixoreus naevius*), pacific-slope flycatcher (*Empidonax difficilus*), evening grosbeak (*Hesperiphona vespertina*), western tanager (*Piranga ludoviciana*), barred owl (*Strix varia*), and sharp-shinned hawk (*Accipiter striatus*).

Mammals expected to use this site include Virginia opossum (*Didelphis virginiana*), shrews (*Sorex spp.*), weasels (*Mustela spp.*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), gray squirrel (*Sciurus carolinensis*), black tailed deer (*Odocoileus hemionus columbianus*), American beaver (*Castor canadensis*), and eastern cottontail rabbit (*Sylvilagus floridanus*).

Other wildlife expected to use this site include pacific tree frog (*Hyla regilla*), northwestern salamander (*Ambystoma gracile gracile*), and rough-skinned newt (*Taricha granulosa granulosa*).

These lists are not meant to be all-inclusive and may omit species that currently utilize or could utilize the site. No threatened or endangered species are known to be associated with the site.

3.6 WETLAND FUNCTIONS AND VALUES

3.6.1 Methodology

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to this site, but is typical for assessments of similar systems common to western Washington.

Wetlands in western Washington perform a variety of ecosystem functions. Included among the most important functions provided by wetlands are stormwater control, water quality improvement, fish and wildlife habitat, aesthetic value, recreational opportunities, and education. Assessments of these functions for the project site are provided below.

3.6.2 Existing Conditions

Wetland A - Category II

Wetland A is a depressional wetland with a highly constricted outlet. Forested vegetation dominates Wetland A. This wetland is part of a wetland mosaic existing in the southeastern corner of the site. Based on its score for functions on the Wetland Rating Form, Wetland A offers low-moderate levels of water quality improvement functions, low-moderate levels of hydrologic functions and moderate levels of wildlife habitat functions.

Wetland B - Category III

Wetland B is a depressional wetland with no outlet. It is primarily dominated by a forested vegetation community. This wetland is part of a wetland mosaic existing in the southeastern corner of the site. Based on its score for functions on the Wetland Rating Form, Wetland B offers low levels of water quality improvement and hydrologic control functions and a low level of habitat function.

Wetland C - Category II

Wetland C is a depressional wetland with no outlet. Forested vegetation dominates Wetland C. This wetland is part of a wetland mosaic existing in the southeastern corner of the site. Based on its score for functions on the Wetland Rating Form, Wetland C offers low levels of water quality improvement functions, low-moderate levels of hydrologic functions and moderate levels of wildlife habitat functions.

Wetland D - Category III

Wetland D is a depressional wetland with no outlet. It is primarily dominated by a scrub-shrub vegetation community with returning young forest. Based on its score for functions on the Wetland Rating Form, Wetland D offers low-moderate levels of water quality functions, low levels of hydrologic control functions, and a moderate level of habitat function.

3.7 WETLAND RATING

Wetlands A through D have been rated using the Washington Department of Ecology (DOE) *Wetland Rating Form for Western Washington* (Version 2). Wetlands A and C received between 51 and 69 points, which equates to Category II classifications. Wetlands B and D received between 30 and 50 points, which equates to Category III classifications.

3.8 BUFFERS

Pursuant to Everett Municipal Code, EMC 19.37, Wetlands A and C are designated 75-foot standard buffers, Wetland B is designated a 60-foot standard buffer, and Wetland D is designated a 75-foot buffer.

3.9 WATER QUALITY

No waters on or adjacent to the subject property are listed on the 303d list for Washington State.

4.0 MITIGATION APPROACH

4.1 MITIGATION SEQUENCING

Due to the location of the on-site wetlands and the mass grading that is required across the site, elimination of the four on-site wetlands is unavoidable. Wetlands A through C lie in the higher, southern portion of the site. Material from this portion of the site is required to be moved to the lower, northern portion of the site to create a relatively flat building site. Elimination of these three wetlands is also required to provide level access to the site from 36th Avenue West. Similarly, Wetland D lies in the center of the site where mass grading is required to balance the site grades. Avoiding impacts to these for small wetlands would make the project physically infeasible due to grading requirements and would therefore make the project economically infeasible.

For loss of wetlands, the applicant is proposing to mitigate the unavoidable impacts through the purchase of credits at an approved wetland mitigation bank that has already been constructed. One of two approved mitigation banks in the Snohomish River basin, either the Snohomish Basin Mitigation Bank or the Skykomish Habitat Mitigation Bank, will be used for this project. Credits are available at both banks, as described in Appendix A of this report. Through the

purchase of approved credits, all functions and values lost due to the elimination of the on-site wetlands will be immediately replaced within the same drainage basin.

Table 3. Mitigation Types and Ratios

| Feature Name | Wetland Category | Impact area (sq. ft.) | Proposed Mitigation Banking Credits | Mitigation Ratio |
|---------------------|-------------------------|--------------------------------|--|-------------------------|
| Wetland A | Category II | 0.049 Acres (2,155 sq. ft.) | 0.059 Acres | 1.2:1 |
| Wetland B | Category III | 0.004 Acres (171 sq. ft.) | 0.004 Acres | 1.0:1 |
| Wetland C | Category II | 0.082 Acres (3,577 sq. ft.) | 0.098 Acres | 1.2:1 |
| Wetland D | Category II | 0.113 Acres (4,920 sq. ft.) | 0.113 Acres | 1.0:1 |

4.2 PROJECT SPECIFIC GOALS AND OBJECTIVES

The goal of this mitigation plan is to replace the functions and values lost through the elimination of on-site wetlands. The objective to replace lost functions and values is through purchase of wetland mitigation bank credits at an approved mitigation bank within the same drainage basin (WRIA 7).

Goal 1. Replace functions and values lost to the elimination of on-site wetlands.

Objective 1. Purchase credits from an approved wetland mitigation bank within the same drainage basin as the development site (WRIA 7).

4.3 MITIGATION STRATEGY

The applicant is proposing to accomplish the objectives stated above through the following measures:

- Purchase 0.275 credits from Mitigation Banking Services, LLC, the management arm of the two approved, functioning mitigation banks in the Snohomish River basin.

4.4 MITIGATION BANKING

On-site mitigation for the permanent buffer impacts is not feasible given the topographic condition, which requires that the on-site wetlands be completely excavated in order to level the site. The only on-site area outside of the development footprint is a steep, mature forested area, and would not be feasible for wetland creation or enhancement. Off-site mitigation is therefore proposed through the purchase of credits at an established wetland mitigation bank. There are two approved wetland mitigation banks in the Snohomish River basin (WRIA 7), one of which will be utilized for this project. This mitigation concept is allowed under certain circumstances by EMC 37.120(C)(12)(b).

Mitigation credit ratios for impacts to buffers have been determined for Category II and III wetlands. The guidelines require 1.2 credits per acre of impacted Category II wetland and 1.0 credit per acre of impacted Category III wetland.

Table 4: Mitigation Bank Credits Proposed for Use as Wetland Mitigation

| Impacted Area | Total Wetland Area (sq. ft.) | Permanently Impacted Area (acres) | Everett & Ecology Rating | Credit Ratio per Impact Acre | Credit Proposed For Use |
|----------------------|-------------------------------------|--|-------------------------------------|-------------------------------------|--------------------------------|
| Wetlands | | | | | |
| Wetland A | 2,155 | 0.049 | II | 1.2 | 0.06 |
| Wetland B | 171 | 0.004 | III | 1.0 | 0.004 |
| Wetland C | 3,577 | 0.082 | II | 1.2 | 0.098 |
| Wetland D | 4,920 | 0.113 | III | 1.0 | 0.113 |
| Total | | 0.248 | | | 0.275 |

Based on these mitigation ratios, the applicant is required to purchase 0.275 credits for the 0.248 acres of impact.

4.5 CITY OF EVERETT WETLAND MITIGATION BANKING CODE

EMC 37.120(C)(12)(b) authorizes the use of wetland mitigation banking for unavoidable impacts to wetlands according to the following requirements:

EMC 37.120(C)(12)(b): *Credits from a wetland bank may be approved for use as compensation for unavoidable impacts to wetlands when:*

- i. The director determines that the wetland mitigation bank provides appropriate compensation for the authorized impacts.*

The mitigation bank being proposed for use in conjunction with this project has already been previously approved to provide appropriate compensation for impacts, including those to Category II and III wetlands.

- ii. The proposed use of credits is consistent with the terms and conditions of the bank's certification.*

Credits will be used to compensate for impacts to Category II and III wetlands, as determined by approving agencies. The proposed ratios and use of credits are consistent with the terms and conditions of the bank's certification.

- iii. Replacement ratios for projects using bank credits shall be consistent with the terms and conditions of the bank's certification.*

Bank credits required for impact compensation were calculated using the approved ratios for replacement for the mitigation bank being used.

- iv. *Credits from a certified wetland mitigation bank may be used to compensate for impacts located within the service area specified in the bank's certification. In some cases, bank service areas may include portions of more than one adjacent drainage basin for specific wetland functions.*

The subject property and the wetlands proposed for elimination are located within the service area of both approved wetland mitigation banks.

5.0 PROPOSED MITIGATION SITE

5.1 MITIGATION SITE SELECTION

Washington State Department of Ecology publication #09-06-032, *Selecting Wetland Mitigation Sites Using a Watershed Approach*, dated December 2009, was used to evaluate the selected mitigation site. The selected mitigation site is one of the two existing wetland mitigation banks in the Snohomish River basin (WRIA 7).

5.2 MITIGATION TYPE AND LOCATION HIERARCHY

The applicant carefully considered the mitigation options for the proposed impacts. The following is the hierarchy of mitigation options presented in Section 332.3(b)(2)-(6) of the *Federal Compensatory Mitigation for Losses of Aquatic Resources Final Rule* and associated rationale for proposed mitigation:

- **Mitigation bank credits** – The City of Everett allows the use of mitigation banking under EMC 19.37.120(C)(12). The applicant proposes to use mitigation bank credits for this project.
- **In-lieu fee program credits** - In-lieu fee is not specifically identified in Everett Municipal Code as a potential option for wetland mitigation. In addition, no in-lieu fee program is known to be available in Everett.
- **Permittee-responsible mitigation under the watershed approach** – The applicant chooses to use mitigation banking rather than permittee-responsible mitigation under the watershed approach. Mitigation banking is the most desired mitigation option under this hierarchy.
- **Permittee-responsible mitigation, on-site in kind** – The applicant chooses to use mitigation banking rather than permittee-responsible mitigation, on-site in kind. Mitigation banking is the most desired mitigation option under this hierarchy.
- **Permittee-responsible mitigation, off-site and out of kind** – The applicant chooses to use mitigation banking rather than permittee-responsible mitigation, off-site and out of kind. Mitigation banking is the most desired mitigation option under this hierarchy.

5.3 SECTION 332.3(a)(1) COMPLIANCE

- **Likelihood of ecological success** – The applicant is proposing to utilize a mitigation bank. Both eligible mitigation banks are constructed, functioning and successful.
- **Location of the compensatory mitigation site relative to the impact site** – The two approved mitigation banking sites are located in the Monroe area of Snohomish

County, within the same drainage basin (Snohomish River, WRIA 7) as the impacts. The project site is located within the approved service areas of both mitigation banks.

- **Cost of the proposed mitigation** - The anticipated cost of purchasing mitigation bank credits is \$53,625.00 (see Appendix A of this report).
- **Long term management** – Both approved mitigation banks are subject to long term management and maintenance.

5.4 LOCATION AND SIZE OF MITIGATION AREA

The proposed mitigation will occur at one of the two approved mitigation banks in the Snohomish River basin (WRIA 7). 0.275 credits will be required to meet the approved mitigation ratios, which equates to 10,823 square feet.

5.5 SITE OWNERSHIP

The owner of the mitigation banking site is:

Mitigation Banking Services, LLC
Attn: Zach Woodward
PO Box 354
Kirkland WA 98033

6.0 USE OF THIS PLAN

This Wetland Mitigation Plan is supplied to AmericanWest Bank and Veritas Development, Inc., as a means of providing mitigation for wetland impacts, as required during the permitting process.

This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions. Reports may be adversely affected due to the physical condition of the site and the difficulty of access, which may lead to observation or probing difficulties.

The laws applicable to sensitive areas are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.



Scott Walters
Associate Ecologist

Wetland Resources, Inc.



John Laufenberg
Principal Ecologist
Professional Wetland Scientist #1742

7.0 REFERENCES

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Appendix A

Letter of Credit Availability and Price List
from Mitigation Banking Services, LLC



May 12, 2014

**To: John Laufenberg
Principal Ecologist
Wetland Resources Inc.**

RE: InterAir Project/Wetland Mitigation Credit Information

John,

Mitigation Banking Services LLC. (MBS) is the management and sales representative for the *Snohomish Basin Mitigation Bank* and the *Skykomish Habitat Mitigation Bank* which have a service area including all freshwater aquatic resource and buffer areas of Water Resource Inventory Area 7 (WRIA-7) in Washington State. The mitigation banks are certified under WAC Chapter 173-700 to sell and transfer mitigation credits for unavoidable impacts to aquatic resources and other critical habitat areas. As of the date above, both banks have wetland and critical habitat credits available for sale and transfer. Based on the MBS price sheet for 2014-2015 attached to this document, MBS offers the following price quote for the amount of impact that your project is currently planning for:

| Project Wetland Impacts | Mitigation Bank Credit Use Ratio (credit : impact) | Credits Required | Cost |
|--------------------------------|---|----------------------------|--------------------|
| 5,091 sq/ft CAT 3 | 1 : 1 | 5,091 sq/ft (.117 credits) | \$195K per credit |
| 5,732 sq/ft CAT 2 | 1.2 : 1 | 6,878 sq/ft (.158 credits) | \$195K per credit |
| Total | - | .275 credits | \$53,625.00 |

With the purchase and transfer of mitigation credits, all mitigation liability is transferred from the permit applicant and project to the mitigation bank. The mitigation banks are regulated by the Washington State Interagency Bank Review Team to ensure performance standards are met and the restoration is successful prior to release of credits. Upon purchase of credits, official credit transfer letters and an updated bank credit ledger are sent to the involved regulatory agencies regulating the development project, as well as the bank review team, co-chaired by the US Army Corps of Engineers and Washington Department of Ecology. The transfer of credit is also recorded with the County Auditor's office. Thanks John and please let me know if you have any additional questions.

Sincerely,

Zach Woodward
Manager, Mitigation Banking Services LLC.

<Enclosures 2014 MBS CREDIT PRICE LIST>



Mitigation Credit Price List – 2014-2015

Skykomish Habitat Mitigation Bank and Snohomish Basin Mitigation Bank

Costs for Mitigation Bank Credits within the WRIA-7 Service Area:

| Resource | Cost Per Square Foot | Cost Per Credit |
|---|----------------------|--------------------------|
| Wetland Credit | | |
| ➤ 0-1 Credits | \$4.47 | \$195,000 |
| ➤ 1-3 Credits | \$4.02 | \$175,000 |
| ➤ 3 or more Credits | \$3.67 | \$160,000 |
| | | Per Square Foot |
| Stream Credit | | \$4.47 |
| Critical Area Buffer Credit | | \$1.50 SBMB/ \$1.00 SHMB |
| Minimum Credit Transaction Amount: | \$2,500.00 | |

Suggested mitigation use ratios established by the Corps and Ecology for use of credits from the MBS Banks:

| Resource Category | Mitigation Credit : Impact Area |
|----------------------|---------------------------------|
| Wetland Category I | Case by Case |
| Wetland Category II | 1.2:1 |
| Wetland Category III | 1:1 |
| Wetland Category IV | .85:1 |
| Buffer Credit | 1:1 / .2:1* |
| Stream Credit | Case by Case |

*"1:1" ratio utilizes physical buffer area at SBMB only, debiting "buffer credit". ".2:1" ratio utilizes wetland and riparian buffer habitat within SHMB and SBMB, debiting traditional credits.

For a detailed service area map of the MBS banks please go to:
www.mitigationbankingservices.com/service-area

Appendix E
Cultural Resources Assessment



**Cultural Resources Assessment for the Soundview Business Campus Project,
Everett, Snohomish County, Washington**

Contains Confidential Information—Not for Public Distribution

Prepared by:
Melanie M. Diedrich, M.A., RPA
Jennifer Hushour, M.Sc., RPA

Cultural Resources Assessment for the Soundview Business Campus Project, Everett, Snohomish County, Washington

Contains Confidential Information—Not for Public Distribution

Prepared by:

Melanie M. Diedrich, M.A., RPA
Jennifer Hushour, MSc., RPA

Prepared for:

John Laufenberg
Wetland Resources, Inc.
9505 19th Avenue SE, Suite 106
Everett, Washington 98208

Submitted by:

Tierra Right of Way Services, Ltd.
2611 NE 125th Street, Suite 202
Seattle, Washington 98125

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EXECUTIVE SUMMARY

Tierra Right of Way Services, Ltd. (Tierra), was contracted by Wetland Resources, Inc., to conduct a cultural resources assessment for the Soundview Business Campus Project (the project) located in Everett, Snohomish County, Washington. The project proposes to construct a large four-building facility on Snohomish County Tax Parcel 28040300200100. The four wetlands on the parcel will be filled for construction, and this will be mitigated through an offsite mitigation bank (location to be determined). Four archaeological sites and four properties listed on the National Register of Historic Places (NRHP) have been recorded within 1.6 km (1.0 mile) of the project location. Three ethnographically named places have been recorded within 1.6 km (1.0 mile) of the project location, all to the west and northwest of the project's area of potential effect (APE), within the City of Mukilteo along the shoreline. No archaeological sites or NRHP-eligible historic structures have been recorded within the APE.

Tierra's cultural resources assessment consisted of background review, field investigation, and production of this report. Background review determined the APE to be located in an area of moderate probability for historic properties. Field investigation included visual reconnaissance, limited pedestrian survey, and subsurface testing. Research did not identify any evidence to suggest that archaeological deposits or features might be present. Moreover, subsurface testing confirmed the relatively thin layer of potentially artifact-bearing soil (6–45 cm [2–18 inches]) above glacial till. Therefore, Tierra recommends a finding of No Adverse Effect to cultural resources for this project.

INTRODUCTION

Tierra was contracted by Wetland Resources to conduct a cultural resources assessment for the Soundview Business Campus Project (the project), located in Section 3, Township 28 North, Range 4 East, Willamette Meridian, in Everett, Snohomish County, Washington. The project proposes to divide approximately 39 acres into 5 lots of 4 buildings and a paved area containing 650 parking stalls on Snohomish County Tax Parcel 28040300200100 (Figures 1–3). The project also includes the filling of four wetlands. Mitigation of wetland filling will through use of an off-site mitigation bank. This report has been prepared to assess the effects of the project on cultural resources, in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended.

PROJECT INFORMATION

Facility Construction

The project proposes to construct four buildings and parking lots and install utilities, storm water systems, and a central access road from 36th Avenue NE. Work associated with the building facilities and roadway would be within the central portion of the site. Project development would require clearing, grading, and grubbing, which would necessitate the removal of trees and heavy undergrowth within the proposed footprint.

Tierra understands the APE to be defined as the footprint of construction as described above and illustrated in Figures 1–5. Staging areas are to be located within the APE.

REGULATORY CONTEXT

National Historic Preservation Act

Under Section 106 of the NHPA, agencies involved in a Federal undertaking must take into account the undertaking's potential effects to historic properties (36 CFR 800.16(l)(1)). The project will require a permit from the U.S. Army Corps of Engineers (USACE), a Federal agency, and therefore the project is considered a Federal undertaking. The work performed by Tierra was intended, in part, to assist in regulatory requirements for Section 106 of the NHPA and the implementing regulations in 36 Code of Federal Regulations (CFR) Part 800. A historic property is typically aged 50 years or older and is defined in 36 CFR Part 800.16(l)(1) as follows:

... any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

The procedures under Section 106 generally require the Federal agency involved in the undertaking to identify the APE, inventory any historic properties that may be located within the APE, and determine if the identified historic properties located within the APE may be eligible to be listed in or eligible for listing in the NRHP. An APE is defined in 36 CFR 800.16(d), as follows:

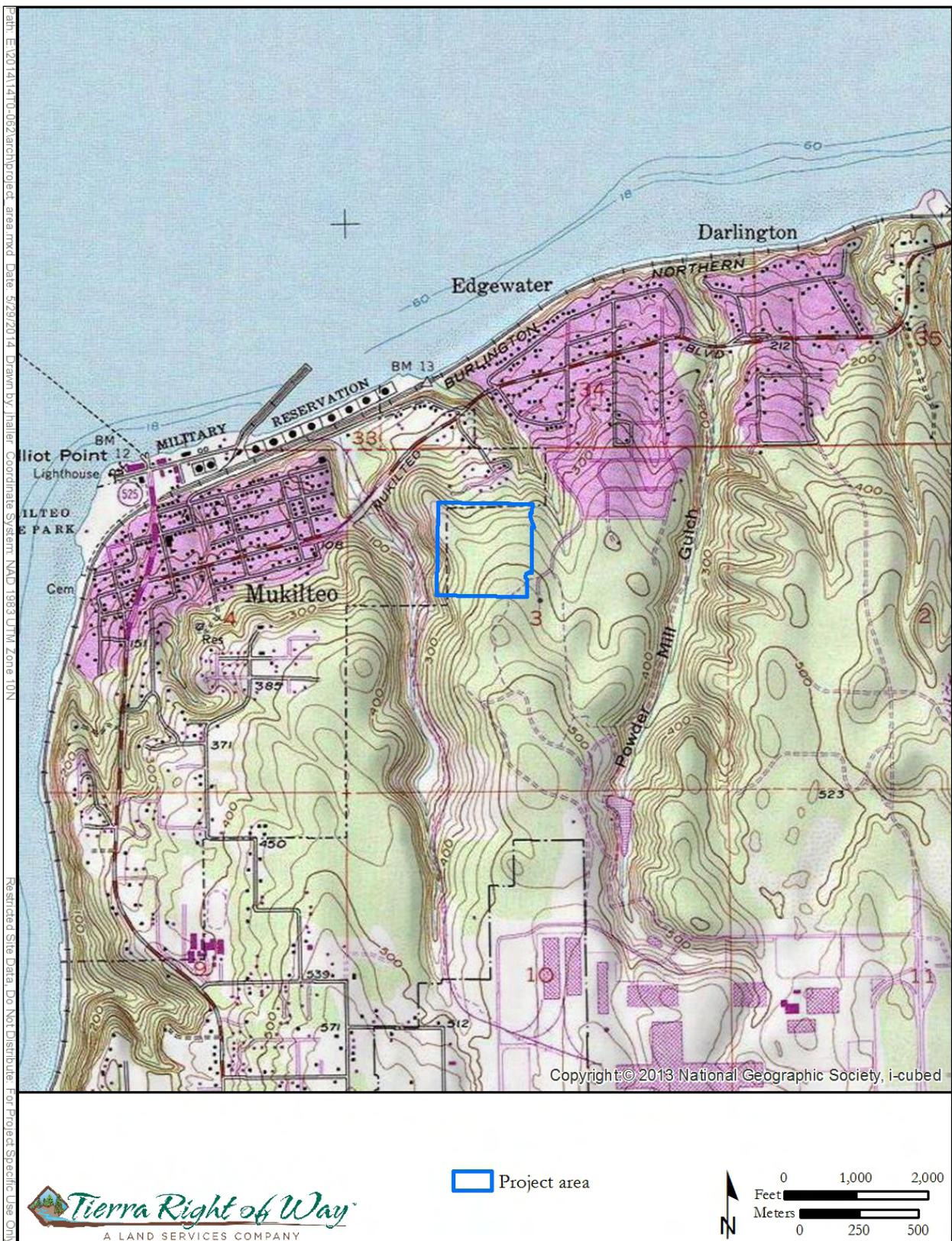


Figure 1. Detail of the Mukilteo, WA (1978), U.S. Geological Survey (USGS) 7.5-minute quadrangle map showing the project location.

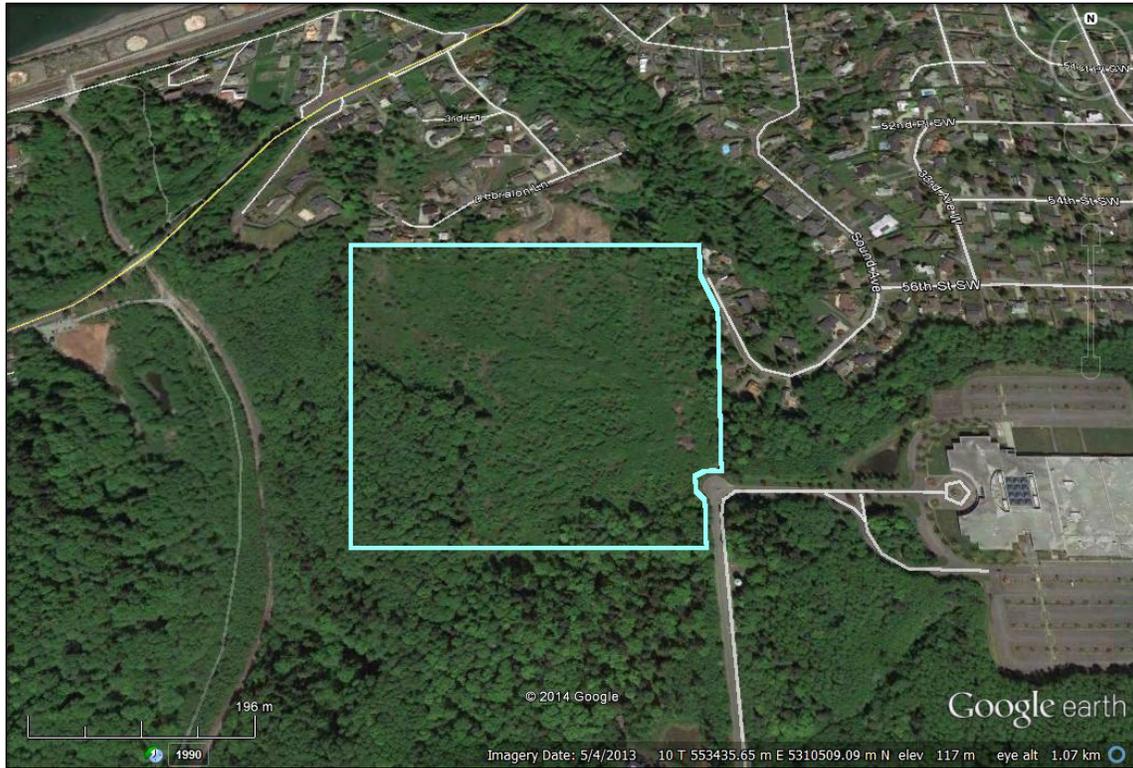


Figure 2. Aerial view of project area in 2011.

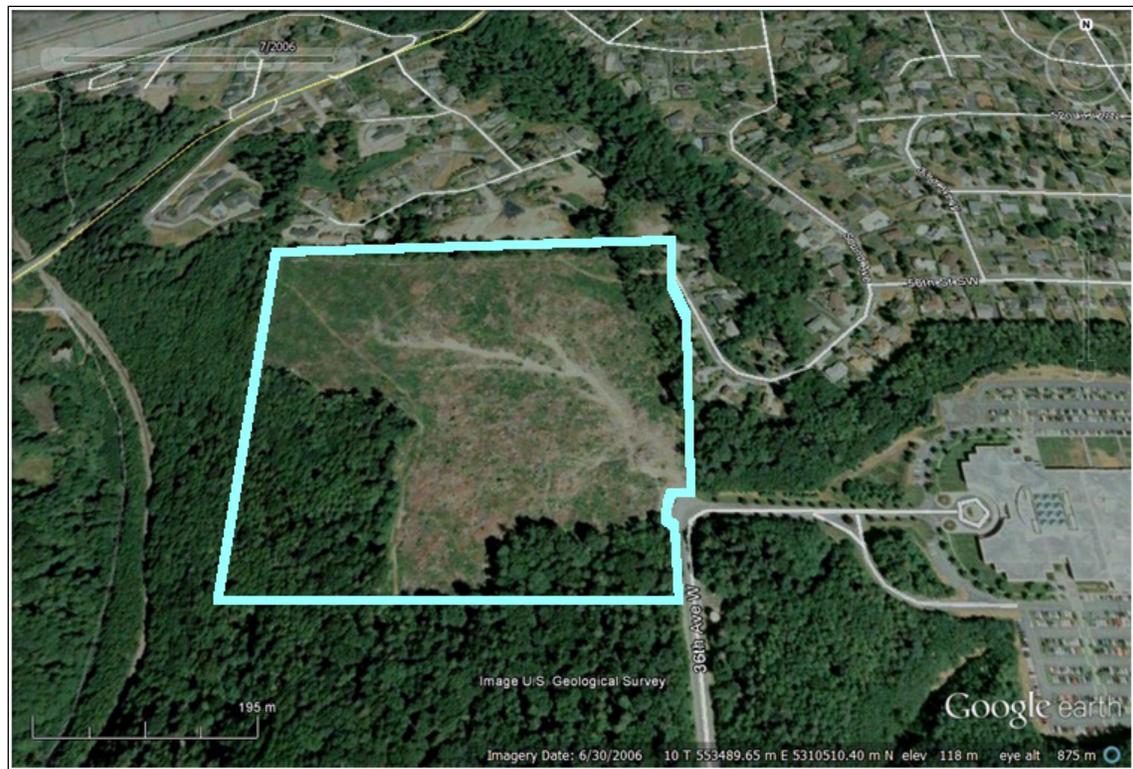
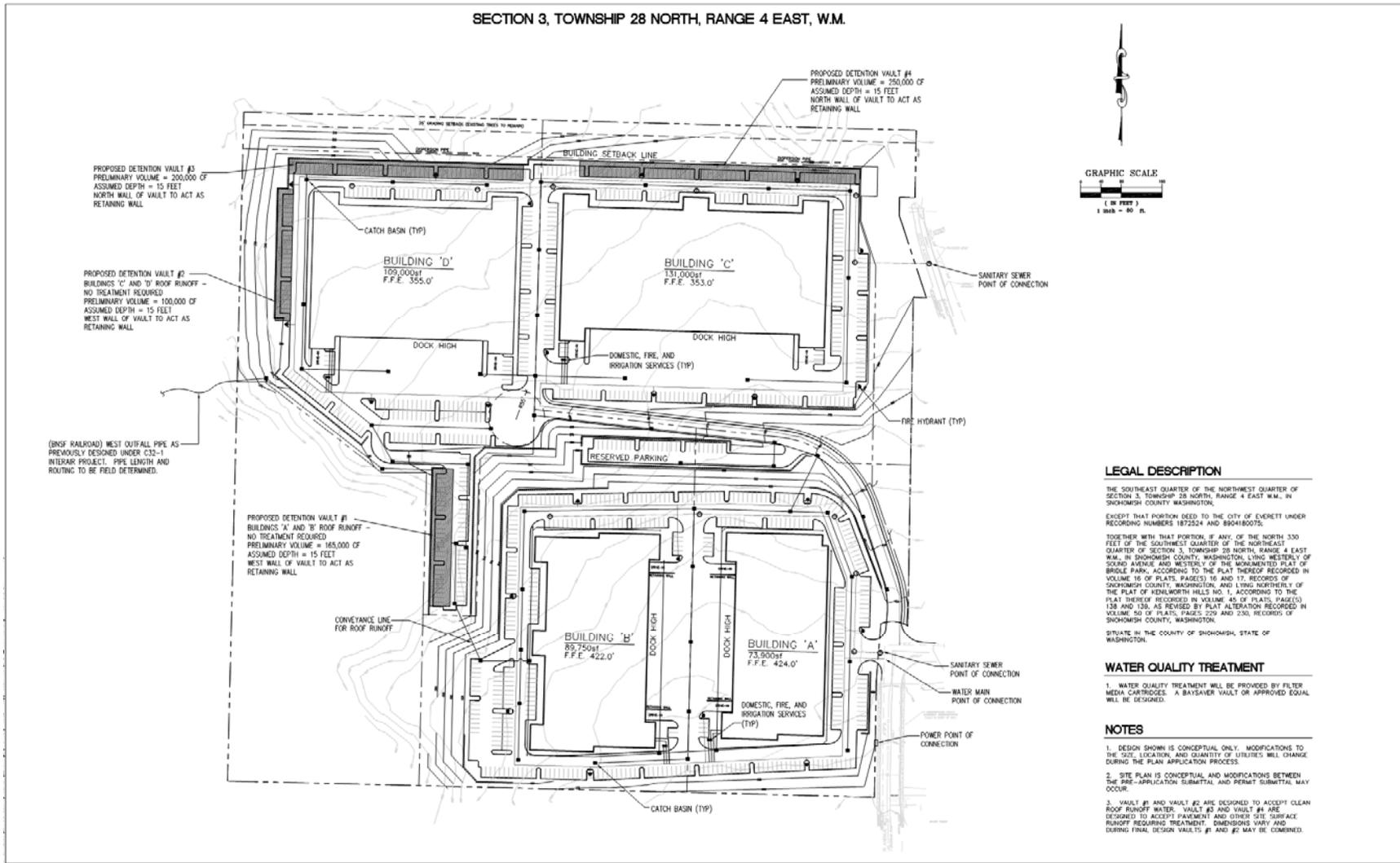


Figure 3. Aerial view of project area in 2006, showing clearing of trees and undergrowth vegetation in 2005.



| No. | Date | By | Revision Description | Designed By: | Issue Date: | | VERITAS DEVELOPMENT, INC. 22819 WOODWAY PARK ROAD WOODWAY, WA 98020 | SOUNDVIEW BUSINESS CAMPUS 36TH AVENUE W EVERETT, WA | PRELIMINARY UTILITY PLAN | C11 |
|-----|------|----|----------------------|--------------|-------------|--|--|--|---------------------------------|------------|
| | | | | TNO | 06/02/14 | | | | | |
| | | | | TNO | PRE-APP | | | | | |
| | | | | STP | 50-411-001 | | | | | |

Figure 4. Proposed site development, plan view.

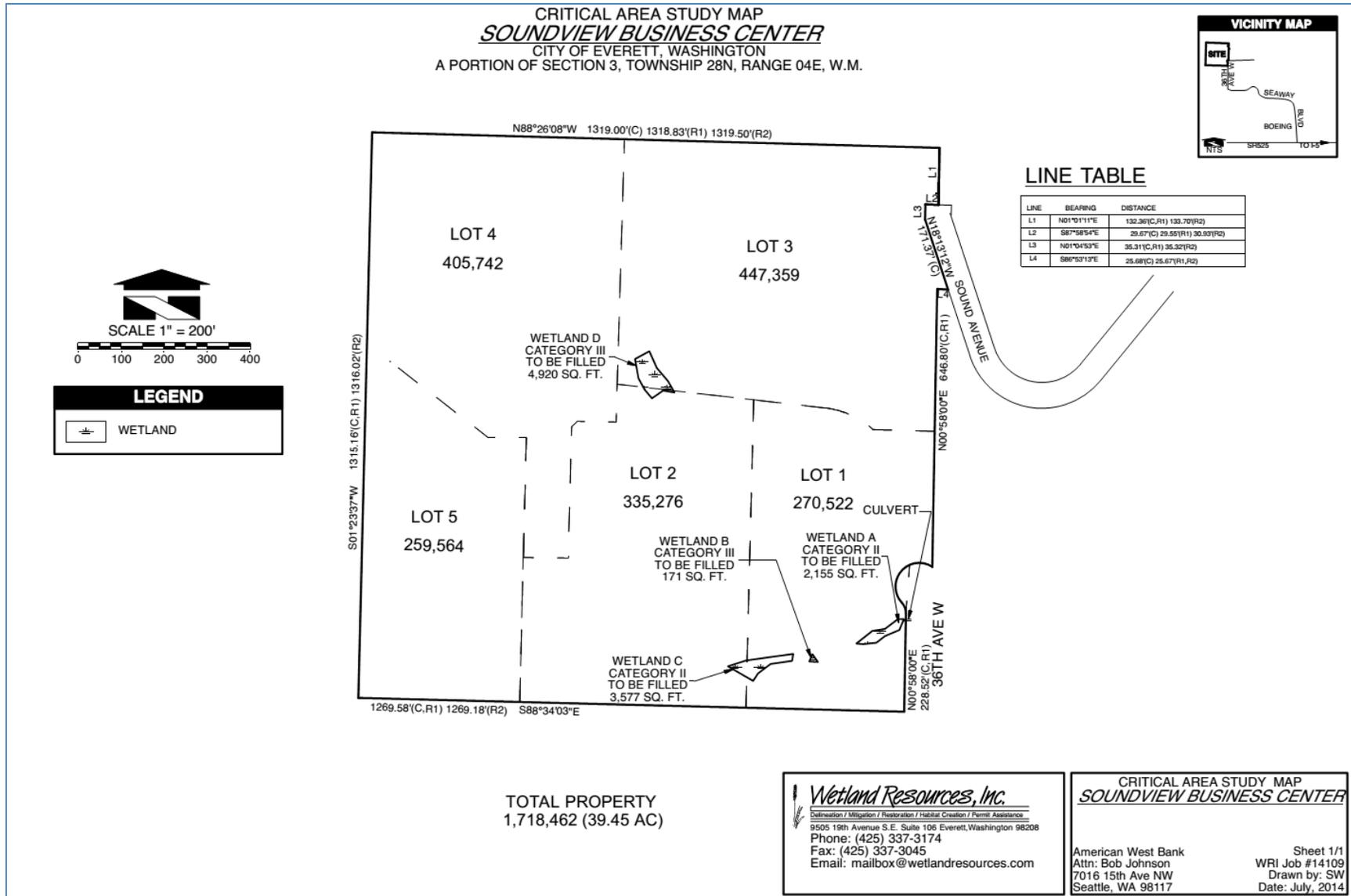


Figure 5. Portion of the proposed mitigation plans (image source: Wetland Resources, Inc.).

...the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

If NRHP-eligible historic properties are identified within the APE, then potential adverse effects to the historic properties must be assessed and a resolution of adverse effects recommended. Under Section 106, the responsible Federal agency must, at minimum, consult with and seek comment from the State Historic Preservation Officer (SHPO) and/or the Tribal Historic Preservation Officer (THPO), as applicable, and consult with any affected or potentially affected Native American Tribe(s).

For the purposes of this analysis, the degree to which the project adversely affects NRHP-eligible historic properties is the primary criterion for determining significant impacts. Secondary criteria include whether an alternative has the potential to affect districts, sites, buildings, structures, and objects listed in or eligible for listing in the Washington Heritage Register (WHR), the State of Washington's equivalent of the NRHP.

ENVIRONMENTAL CONTEXT

Literature review for this project included a review of environmental data on the project area illustrated in geologic and soils maps and of reports on recent geological and geomorphological investigations that described subsurface conditions and the post-depositional processes likely to affect any cultural deposits in the study area.

Physiographic Province

The APE is located within the western hemlock (*Tsuga heterophylla*) vegetation zone of the Puget-Willamette Lowland physiographic province (Franklin and Dyrness 1988). Vegetation would have included western red cedar (*Thuja plicata*), western hemlock, and Douglas fir (*Pseudotsuga menziesii*) prior to clearing. The project area presently consists of tall grasses, thistle, and wetland deciduous trees.

Geomorphology

The project area is located on a glacially deposited terrace overlooking the Japanese Gulch drainage in the southeastern portion of the Puget Lowland. The Puget Lowland is a geological and physiographic province that was shaped by at least four periods of extensive glaciation during the Pleistocene (Easterbrook 2003; Lasmanis 1991). The bedrock was depressed and deeply scoured by glaciers, and sediments were deposited and often reworked as the glaciers advanced and retreated. A mantle of glacial drift and outwash deposits were left across much of the region at the end of the last of these glacial periods, the Fraser Glaciation (Easterbrook 2003).

The Vashon Stade of the Fraser Glaciation began around 18,000 B.P. with an advance of the Cordilleran Ice Sheet into the lowlands (Porter and Swanson 1998). The Puget Lobe of the ice sheet flowed down into the Puget Lowland and reached its terminus just south of Olympia between 14,500–14,000 B.P. (Clague and James 2002; Easterbrook 2003; Waitt and Thorson 1983). The Puget Lobe was thicker towards the north and thinned towards its terminus in the south. The Puget Lobe began to retreat shortly after reaching its terminus, allowing marine waters to enter the lowlands.

The lowlands, having been recently scoured by the Puget Lobe, filled readily. The remaining ice was lifted and rapidly melted as berg ice (Easterbrook 2003).

The modern landform is characterized primarily by deposits of glacial till with inclusions of hydric soils associated with glacial runoff. With the exception of minor fluctuations, which can be attributed to extensive land clearing during the nineteenth and twentieth centuries, the ecological landscape surrounding the APE has been relatively stable (Leopold et al. 1982).

The topography of the site is a generally northern aspect; the southwestern corner of the APE slopes steeply down to Japanese Gulch. There is a forested, defined wetland mosaic in the southeast corner of the site, as well as a disturbed Category III wetland area within the central portion of the property. The level portion of the project APE has been clear-cut within the past 10–12 years and has been replaced over time with dense early successional alder (*Alnus rubra*) and Himalayan blackberry (*Rubus* sp.) growth.

Soil Survey

Soils mapped within the APE consist of Alderwood gravelly sandy loam in the western and central portion and Alderwood-Everett gravelly sandy loam, 25–70 percent slopes, in the southeastern portion of the project area (NRCS 2014).

The Alderwood series consists of moderately deep poorly drained soils formed over hardpan. The soils are comprised of glacial till. A typical profile has a 18-cm-deep (7-inch-deep) A horizon of very dark grayish brown, ashy, gravelly sandy loam; a B horizon (Bw1, Bw2, Bg) from 18–89 cm (7–35 inches) of yellowish brown, dark brown, and olive brown very gravelly, ashy sandy loam containing areas of McKenna, Norma, and Medisaprists soils; and a C horizon (2Cd1, 2Cd2) from 89–152 cm (35–60 inches) of dark grayish to grayish brown gravelly sandy loam (NRCS 2014). Alderwood soils are moderately well drained and acidic (pH 5.8 to 6.0); the perched water table above the densic layer is highest from January through March. Native vegetation would have been predominantly red alder (*Alnus rubra*), western red cedar, big leaf maple (*Acer macrophyllum*), western hemlock, and Douglas fir, with an understory of salal (*Gaultheria shallon*), Oregon grape (*Mobonia nervosa*), western bracken fern (*Pteridium aquilinum*), western swordfern (*Polystichum munitum*), Pacific rhododendron (*Rhododendron macrophyllum*), huckleberry (*Vaccinium* spp.), and orange honeysuckle (*Lonicera ciliosa*) (NRCS 2014).

The Alderwood-Everett series is similar to the Alderwood series. Everett soils are on glacial outwash terraces, terrace escarpments, drift plains, and moraines. A typical profile has a very thin Oi horizon of decomposing plant material over a narrow (5-cm [2-inch]) A horizon. The cambic (Bw) horizon is a 50.0-cm (19.7-inch) layer of decomposing parent material (NRCS 2014). Everett series soils have a strongly acid pH of 5.3 in the A horizon; the Bw horizon moves from a strongly acid pH of 5.5 in the upper layer to a moderately acid pH of 5.6 in the deeper layers. These soils formed under natural vegetation such as red alder, western red cedar, western hemlock, and Douglas fir, with an understory of salal, western swordfern, oceanspray (*Holodiscus discolor*), and Oregon grape.

CULTURAL CONTEXT

The determination of the probability for historic properties to be located within the APE was based largely upon review and analysis of past environmental and cultural contexts and previously documented cultural resource studies and sites. Consulted sources included project files; local geologic data to better understand the depositional environment; archaeological, historic, and

ethnographic records made available on the Washington Information System for Architectural and Archaeological Records Data (WISAARD) database; and selected published local historic records, including the Bureau of Land Management’s (BLM’s) General Land Office (GLO) Survey Records database, HistoryLink, Historic Map Works, the University of Washington’s Digital Collection, and Washington State University’s Early Washington Maps Collection.

Thousands of years of human occupation in the Puget Sound area have been summarized in a number of archaeological, ethnographic, and historical investigations over the past several decades. These provide a regional context for evaluating the project area (Greengo 1983; Matson and Coupland 1995; Nelson 1990) and will not be repeated in great detail here (Table 1).

Table 1. Summary of Regional Precontact-era Settlement Patterns^a

| Period | Date Range | Characteristics |
|--------|-------------------|---|
| Early | 15,000–5,000 B.P. | <p>Occupation sites located on uplands or upper river terraces, lithic workshops, and temporary hunting camps.</p> <p>Artifact assemblages include a wide variety of flaked stone tools, such as fluted projectile points, laurel-leaf-shaped bifaces, and cobble tool industries suggestive of large game hunting, butchering and processing supplemented by riverine and marine fish and invertebrates</p> |
| Middle | 5,000–1,000 B.P. | <p>Occupation sites represented by living floors, evidence of structural supports and hearths are more common during this period, representing specialized seasonal spring and summer fishing and root-gathering campsites and winter village locations, typically located adjacent to, or near, river or marine transportation routes.</p> <p>Large occupation sites often associated with fish weirs and other permanent constructions Evidence of task-specific, year-round activities including salmon and clam processing, woodworking, basket and tool manufacture. Shell middens appear in the archaeological record</p> <p>Artifact assemblages became diversified, with some regional variation. Tools were manufactured from ground stone, antler, and bone. Smaller triangular projectile points and notched stone projectile were common.</p> |
| Late | 1,000–250 B.P. | <p>Ethnographically described occupation sites consisting of large, plank houses established and persisted into the historic period. Similar economic and occupational trends persisted throughout the Puget Sound region until the arrival of European explorers. Subsistence shift to riverine and marine is complete, supplemented by terrestrial hunting and plant resources.</p> <p>Activities are represented by organic materials (basketry, wood and foodstuffs) preserved in submerged, anaerobic sites, and sealed storage pits. Artifact assemblages consist of a range of hunting, fishing and food processing tools, bone and shell implements and midden deposits, as well as exotic trade goods.</p> |

^a From Carlson 1990; Larson and Lewarch 1995; Morgan et al. 1999; Nelson 1990; Wessen and Stilson 1987.

Human use of the area is generally oriented toward resource locations (e.g., fresh water, terrestrial and marine food resources, forests, and suitable terrain). Archaeological context for evaluating this project area is provided by information regarding the local and regional chronological sequence and research problem domains as included in Ames and Maschner (1999), Carlson (1990), Meltzer and Dunnell (1987), Wessen and Stilson (1987), and others.

Traditional Territories

Relevant ethnographic reports and syntheses of archaeological, anthropological, and historical sources were also reviewed (e.g., Haeberlin and Gunther 1930; Ruby and Brown 1992; Spier 1936; Suttles and Lane 1990; Waterman 1922, 2001). Information regarding Historic-era cultural features and land-use patterns was acquired by examining nineteenth-century maps. Additional resources for ethnohistoric accounts included electronic documents such as historical society and Tribal web pages.

The study area is within the traditional lands of the Southern Coast Salish people, who are now politically associated with the Stillaguamish and Snohomish Tribes (Haeberlin and Gunther 1930; Ruby and Brown 1992; Spier 1936; Waterman 1922, 2001). These are Southern Coast Salish speakers of a local dialect of the Lushootseed language (Native Languages 2013; Suttles and Lane 1990; Snohomish 2013). Native Americans in this area recognized distinctions between people based on landscape characteristics while maintaining close social and economic ties. “Saltwater Indians” lived at the mouth of the Snohomish River, using both riverine and marine resources. People living inland or upriver were referred to as “Canoe Indians” and made their living from both terrestrial and riverine resources (Suttles and Lane 1990; Waterman 1922, 2001).

The Snohomish Tribe “comprised the largest Native American population in this county area... [living] along the shores of Puget Sound from Warm Beach, [south] to Richmond Beach and along the Snohomish River to Monroe” (Riddle 2006). In 1855, the Snohomish, Stillaguamish, and other Puget Sound Tribes met Governor Isaac Stevens and signed treaties which relinquished traditional Tribal lands and forced local Tribes onto reservations. The Snohomish Tribal leaders signed the Point Elliott Treaty, but when it was not ratified, war broke out, and for a time the Snohomish people were placed in internment on Whidbey Island (Snohomish 2013). Following the implementation of the 1855 Treaties by executive order of President Grant in 1873, the Snohomish, Snoqualmie, Skagit, Suiattle, Samish, Stillaguamish, and others were placed on the Tulalip Reservation. Although recognized as a “political entity” as signers of the Point Elliot Treaty, the Snohomish people are not recognized as a “Tribal entity” by the Federal government, and continue to seek Tribal acknowledgement and land restoration (Ruby and Brown 1992:214; Tulalip Tribes 2014). Today, the combined Tulalip Tribes exercise traditional fishing rights extending from the Canadian border south to Vashon Island, including the Snohomish River. The Snohomish Tribe also considers the project area vicinity as a usual and accustomed place (Riddle 2008).

Recorded Place Names

Waterman (1922, 2001) recorded numerous named geographic features near the project area. These include descriptive names for geographic features, resource procurement sites, village (or habitation sites), and names associated with mystical events. Although there are no recorded place names within the project APE or on the parcel’s landform, there are two place names recorded within 1.6 km (1.0 mile) to the west of the project APE, one to the north, and one approximately 3.2 km (2.0 miles) to the northeast; all four places are on the shoreline, as would be expected given our current

understanding of precontact-era settlement and land use patterns. The two closest are very near or on Point Elliott (Table 2). *Beka'li*, translated as a “good camping ground,” was on the “land spit and adjoining salt marsh” that became present-day Mukilteo (Waterman 1922, 2001). According to Riddle (2007), this was the site of a Snohomish permanent winter village. The author goes on to say:

According to Tribal tradition, Dokwibuth the Transformer instructed inhabitants to move from this spot north to the mouth of the Snohomish River, where they built the fortified village of Hebolb (Riddle 2007).

The name Mukilteo is an anglicized pronunciation of *Beka'li* and has also been translated as “to swallow” or “narrow passage” or “a throat, a neck, or narrowing in a body of water” (Riddle 2007).

Table 2. Summary of Place Name Information Recorded by Waterman (1922, 2001)

| Name | Translation | Location | Distance and direction from APE |
|--------------------|---|--|--------------------------------------|
| <i>HudsligwEd</i> | middle or center place, your soul side | central waterfront in Everett | 3.62 km (2.25 miles) northeast |
| <i>HuxuktLa'al</i> | tops of trees are broken off at this location | a place on the shoreline west of Everett | 1.40 km (0.87 miles) north-northeast |
| <i>Sklels</i> | dirty rocks | a spot on the shore very close to Point Elliot | 1.37 km (0.85 miles) west |
| <i>Beka'li ti'</i> | good camping ground, or narrow passage | the town of Mukilteo | 0.40–1.37 km (0.25–0.87 miles) west |

Settlement and Post-Settlement History

Encouraged by the Donation Land Claim Act, a wave of Euroamerican settlers arrived in the area in the 1850s, largely by way of the Naches Pass Trail (Bjarke 1942; Bonney 1927; Meany 1910). Several years later, as a result of the Homestead Act of 1862, another influx of settlers arrived. These settlers farmed on the prairies and along the rivers, logged the upland forests, and extracted coal (Carpenter 1986; Marino 1990). Chinese and Japanese immigrants first arrived in the area in the latter part of the nineteenth century. Coal and logging ventures brought about further settlement and development of the region.

History of Mukilteo

The APE is within the modern-day extension of the Everett City limits; however, the historic City center (ca. 1910) would have been about 3.2 km (2.0 miles) to the northeast. The historic landmarks and archaeological sites within 1.6 km (1.0 mile) are to the west of the project area in the town of Mukilteo.

Although the APE has largely remained untouched since the logging activities within the last 10–12 years, the landscape surrounding the project area has been radically transformed. It has essentially been old-growth forest, timber land, and an industrial and travel corridor all within the past 150 years. Nearby Japanese Creek, which runs alongside the Boeing railroad spur to the west of the project, has been straightened and channelized. This rapid shift of land use is typical of western settlement and illustrates the rapid rate of changing priorities not just in western culture, but in all

DAHP WISAARD

The WISAARD database indicates that there are no recorded archaeological sites or NRHP- or WHR-listed properties within the APE. The four sites (Table 3) within 1.6 km (1.0 mile) of the APE are downslope from the terrace upon which the APE sits. The Japanese Gulch refuse scatter is at the mouth of Japanese Creek, which runs adjacent to the Burlington Northern Santa Fe (BNSF) Boeing Spur rail line, originally built by the U.S. Army in the mid-1940s to service the Mukilteo Explosives Loading Terminal. The other three archaeological sites are on the Mukilteo shoreline, running west from the Gulch to Point Elliott. There are four historic properties listed on the NRHP: the Mukilteo Light Station at Point Elliot, the Point Elliott Treaty Site, the Point Elliott Treaty Monument, and the Fowler Pear Tree all within 0.8–1.4 km (0.5–0.9 miles) of the APE. None of these sites will be affected by the project.

Table 3. Cultural Resources Recorded within 1.6 km (1.0 Mile) of the Project Area

| Site | Description | Location | Status | Project Effects |
|-------------|---|--|----------------------|------------------------|
| 45SN575 | Japanese Gulch Community, refuse scatter | 0.45 km (0.28 miles) west-northwest, at the mouth of the creek | potentially eligible | none |
| 45SN398 | Japanese Gulch Village, house floor feature | 0.64 km (0.40 miles) west-northwest, on the south side of the main rail line | eligible | none |
| 45SN393 | Mukilteo shoreline site, precontact shell midden | 0.8 km (0.5 miles) west-northwest along the shoreline, north of the main rail line, extending to Point Elliott | eligible | none |
| 45SN404 | Crown Lumber Company Store, historical commercial property and debris | 1.20 km (0.75 miles) west, just south of precontact shell midden on shoreline | eligible | none |

Historic Maps

A review of mid-to-late nineteenth- and twentieth-century maps shows the project area is relatively unchanged in regard to urban development since 1895 (Figure 7) (Metsker 1936; GLO 1860). This may be because up until 1930, most of the APE was owned by various logging interests. Landscape modifications appear to have been largely associated with logging, rail construction, and drainage. These changes can be identified by an examination of available historical maps and aerial imagery. The 1860 GLO map (see Figure 7), for example, shows Japanese Creek with a much wider meander than depicted on a recent Google Earth aerial image (Figure 8), which illustrates the modified drainage created after the development of the rail spur. No additional paved roads, homesteads, or urban centers or housing developments are seen in any of the historical or modern maps. Apart from ground disturbance associated with the rail spur and creek re-channelization, land development within the APE has been limited to surface ground disturbance during historical and modern logging and grubbing operations.

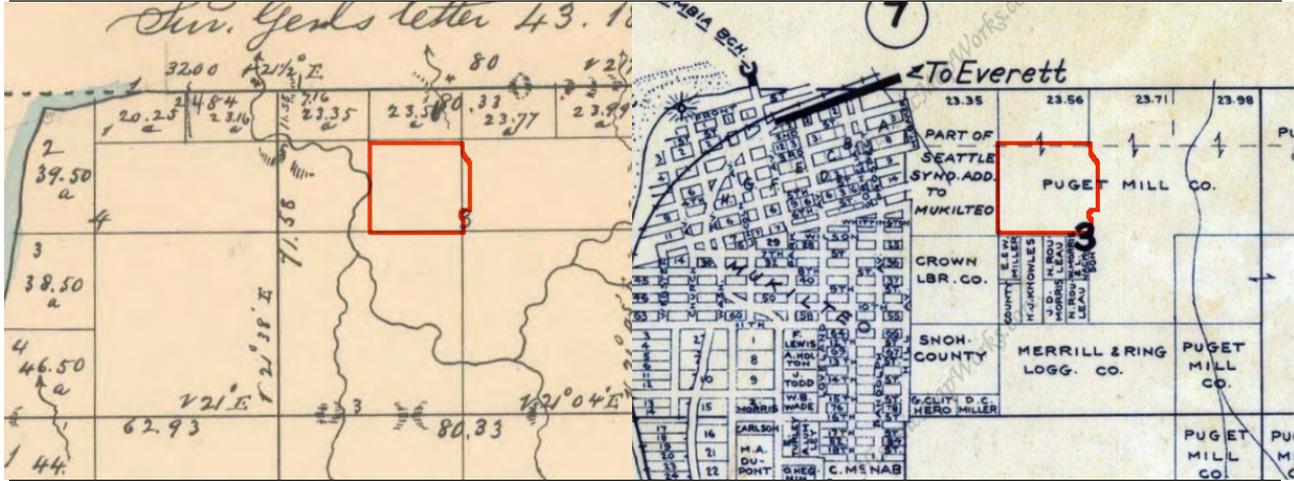


Figure 7. Portion of 1860 GLO Cadastral map (left); Portion of 1936 Metsker map (right).

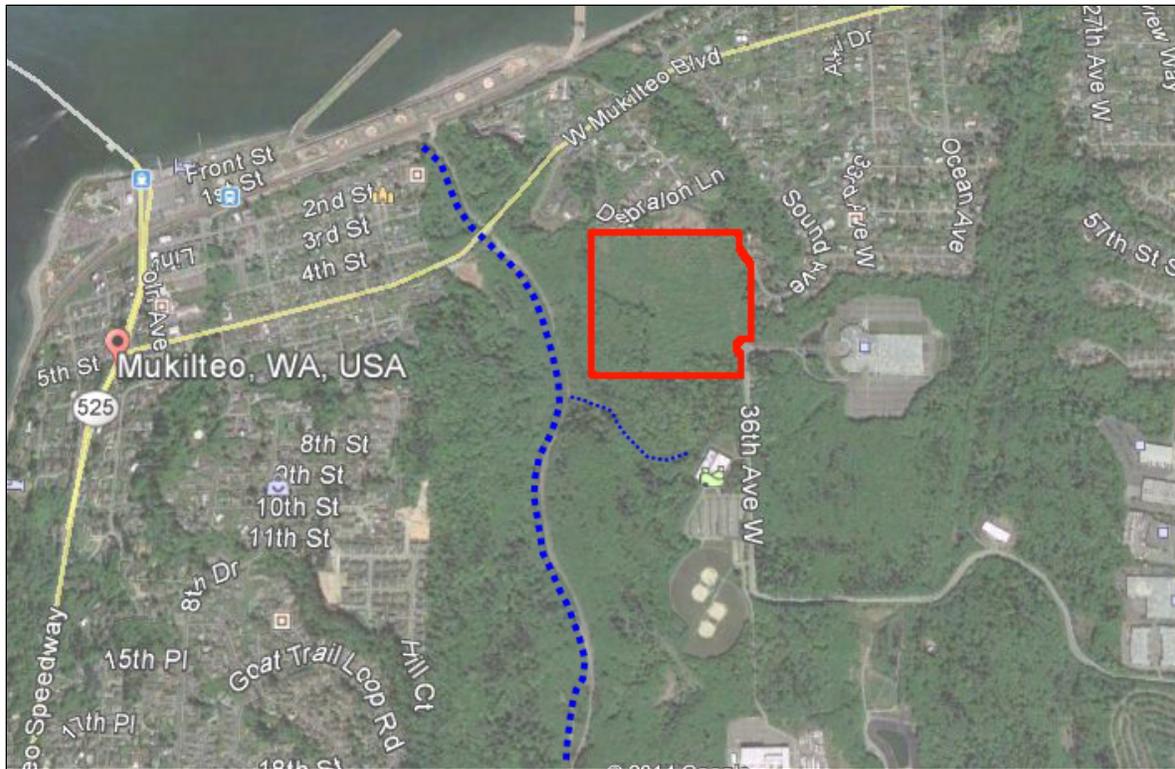


Figure 8. Google Earth image with APE (red) and present-day drainage of Japanese Gulch/Creek in blue.

RESEARCH DESIGN

DAHP Archaeological Predictive Model

The predictive model map overlay indicates that the project is within an area identified as “Survey Contingent Upon Project Parameters: Low Risk” and “Survey Contingent Upon Project Parameters: Moderately Low Risk”.

Model probabilities are calculated using information from two general sources—data derived from archaeological surveys conducted prior to model development, and a consideration of the relationship between these recorded sites and various environmental factors (Kauhi 2009).

The approach to modeling settlement systems used by the Washington Department of Archaeology and Historic Preservation (DAHP) presumes that the distribution of archaeological sites on the landscape is non-random and that there is a statistically significant relationship between physical landscape features (e.g., elevation, distance to water, soils, and landform type) and site location. Any predictive model can only be as accurate as the information derived from the set of previously recorded sites used to create it, which means any site identification biases represented in research will also be present in the model. Additionally, because this type of model uses an inductive approach, it is also limited in its ability to characterize the type of site that might be encountered in a particular setting, since, by design, the causal relationship between identified archaeological sites and particular geographic settings is not considered. More simply put, the predictive model “recognizes” that a given number of archaeological sites have been recorded within a specific distance from a given geographic features, and it therefore “rates” projects undertaken on a specific landscape as having a high or low risk to encounter archaeological deposits without providing a distinction between historic and precontact sites or between archeological isolates and village sites.

This should not be viewed as a failure of the model so much as a function of the model. As noted on the Minnesota Department of Transportation’s (MnDOT 2013) Archaeological Predictive Model webpage:

The dependability of these models is a function of their performance. This can be examined and tested by comparing a predictive model to archaeological field survey results. By comparing known archaeological site locations to the model's predictions, it is possible to determine, with specifiable confidence, how accurately a model performs. It is, in fact, this very approach that gives us confidence in a model and allows us to use it as a predictive tool. Field-testing a model is an essential component of demonstrating its reliability.

In this report, the author presents a project assessment that considers the implications of the predictive model but is also informed by an understanding of the geomorphological context, local settlement patterns, and post-depositional processes derived from a review of available environmental documentation and reports of nearby cultural resource surveys (Bush 2013; Piper et al. 2012; White 2008) and surveys conducted on similar landforms (Berger 2009; Landreau and Geffen 2003; Kenmotsu 2008; Rinck and Boggs 2010; Robinson 2004). This deductive approach is designed to not only more accurately characterize the potential for a given project to encounter

archaeological deposits, but also to identify the types of and conditions of archaeological materials which may be encountered.

Evaluation of Historic Properties

Historic properties, defined by the National Park Service (NPS) as “a district, site, building, structure or object significant in American history, architecture, engineering, archeology or culture at the national, State, or local level,” are typically evaluated in terms of historic significance, integrity, and the general stipulation that the property be 50 years old or older (for exceptions, see 36 CFR 60.4, Criteria Considerations [a–g]).

Significance

NRHP Bulletin Guidelines (Little et al. 2000; Shrimpton 1990) state that in order to be eligible for listing in the NRHP, a historic property must be significant in American history, architecture, archaeology, engineering, or culture and possess integrity of location, design, materials, workmanship, feeling, and association. Additionally, to be considered eligible, a historic property must meet one or more of the four criteria:

- a) The property must be associated with events that have made a significant contribution to the broad patterns of our history; or
- b) The property must be associated with the lives of persons significant in our past; or
- c) The property must embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- d) The property must have yielded, or may be likely to yield, information important on prehistory or history.

Most cultural resources, historic and prehistoric alike, are evaluated under Criterion (d), their potential to yield important information. This objective is accomplished by developing historic contexts. A historic context is a body of information about the past and the tangible expressions of past events organized by the elements of theme, place, and time (NPS 1986, 1991).

Integrity

Integrity is the ability of a historic property to convey its significance. Integrity must be evident through historic qualities that include location, design, setting, materials, workmanship, feeling, and association (NPS 1991:1). Degree of integrity should be taken into consideration when evaluating resources under the NRHP criteria, for example:

- If eligible for its historic associations under Criterion (a), then the resource should retain substantial aspects of its overall integrity, although design and workmanship may not weigh as heavily as those aspects related directly to its historic associations.
- To be eligible for its association with a prominent person under Criterion (b), the resource should retain some aspects of integrity, although design and workmanship may not be as important as the others.

-
- To be eligible for its architectural merits under Criterion (c), a resource must retain its physical features that constitute a significant construction technique or architectural style. Critical aspects of integrity for such properties are design, workmanship, and materials. Location and setting will also be important for those resources whose design reflects their immediate environment.
 - Resources significant under Criterion (d) may not have the type of integrity described under the other criterion. Of the seven aspects of integrity, location, design, materials, and possibly workmanship are the most important.

Archaeological Expectations

Soils and Geomorphological Context

Given the presence of mapped soils indicative of ancient glacial till terrace (Alderwood and Alderwood-Everett gravelly sandy loam), primary soil deposition in this location, which is sterile glacial till, would have occurred long before human habitation. Some post-glacial shallow soil within the forest and wetland environment of the terrace cover the glacial till and might contain evidence of patterned human behavior, including expressions of episodes of resource gathering and/or processing, travel or short-term/single-use camp sites represented by lithic scatters, and/or small concentrations of fire-modified rocks (FMR). The absence of recorded trail systems and/or freshwater sources in the terrace uplands make the project area an unlikely location for any of these types of resources. As indicated in Table 1, from 5,000 years ago to the early contact period large village occupation sites generally occurred in lowland areas, were associated with fish weirs, and were typically located adjacent to or near river or marine transportation routes. Occupation of upland terrace locations would most likely have occurred 15,000–5,000 years ago; these sites are represented by temporary camps and lithic workshops. Expected artifact assemblages would include flaked stone tools, cobble tools, large-animal bones, and fish bones.

Anaerobic conditions in wetlands often provide good preservation of cellulose and other plant fibers (Diedrich 2013). However, soil pH¹ is a better indicator of whether or not an area is preservative for other organic materials, such as bone or shell. According to Deborah Surabian (2011:4):

The pH of soil has the largest influence on bone preservation, with preservation generally advantageous in soils above pH 5.3 and adverse in soils pH 5.3 or less. Soils containing a highly acidic pH will decompose bone rapidly ... If the soil is neutral or basic, a buried skeleton may persist for centuries in good condition. In a corrosive soil environment, it is clear that, irrespective of taphonomy, the outcome will be the same: catastrophic mineral dissolution.

The potentially artifact-bearing soils consist of a very shallow layer of soil that would have provided little protection for cultural deposits, if any were present. Additionally, the glacially derived soils mapped in the project area would poorly preserve organic materials, as soil conditions are not anaerobic and the soil pH values range from strongly to moderately acidic. The hydric soils mapped in the central and southeastern portion of the APE, while likely to present anaerobic conditions, are moderately acidic in the upper layers and slightly acidic in the deeper layers. This means that

¹ A pH less than 7 is acidic and a pH greater than 7 is basic or alkaline.

although wood or plant fibers might be present in the wetland soils, preserved bone would be unlikely.

As ephemeral as early upland camp sites would have been, and given the general acidity of evergreen forest soils, it is unlikely that anything other than lithic tools or flakes would have survived.

Land Use Patterns

While there is extensive evidence of use of the nearby shoreline and presumed use of the riverine environments for a wide variety of resources (e.g., marine and freshwater fish, rushes, shellfish, and transportation) in the precontact and ethnohistoric eras, precontact use of the forested uplands tended to be limited to resource gathering (cedar bark, cambium, root gathering), hunting, and travel, all of which left few or no archaeological footprints. No known trails were evident on the 1860 GLO map, and the gravelly glacial till topped by thin forest topsoil presents a low probability for preservation. The parcel was again logged and mechanically cleared of vegetation sometime around 2005, when a grading permit was obtained prior to the development of the parcel (which never took place). The history of Settlement and post-Settlement land use in the wider region indicates that the surface and near-surface environment within the project area is likely to have been profoundly affected by timber and stump removal.

Conclusions

While there is ample archaeological evidence for human activity in the region dating to 10,000 years B.P. and an ethnographically recorded village site less than 1.6 km (1.0 mile) west at Point Elliott, the APE was not likely to have been used for long-term habitation until the early Historic era. The geomorphological context (e.g., wetland and glacial till terrace above a steep gulch and fish-bearing Japanese Creek) and understood patterns of land use indicate that evidence of late precontact use of the project area could include surface or near-surface expressions of episodes of resource gathering and/or processing or travel or short-term/single-use camp sites represented by lithic scatters and/or small concentrations of FMR and charcoal. Given the relatively thin layer of potentially artifact-bearing soil (6–45 cm [2–18 inches]) above glacial till in the central wetland portion of the site (which is proposed to be filled), and historic logging and grubbing activities, disturbance may extend well into the upper, potentially artifact-bearing soils. The result would be moderately to highly disturbed surficial or near-surface deposits atop Pleistocene (culturally sterile) glacial till.

Post-Settlement land use is generally represented in the local archaeological record by structural foundations; fence posts; metal tools and/or hardware; refuse such as ceramic, can, and/or glass fragments; and evidence of slashpile or trash burning. If field use required drainage, terra cotta tiles, pipes, and other drainage features would also be expected. No structures, fence lines, or drainage features are evidenced on any historic or modern map. It is unlikely that any historic cultural resources located would be considered eligible for listing on Federal or local historic registers.

FIELD INVESTIGATIONS

Field investigation was conducted by Jenifer Hushour, Melanie Diedrich, and Keith Solmo on May 13, 14, 27, and 28, 2014, in clear, warm weather. Tierra archaeologists conducted shovel testing along the existing trails (n=14) on the first 2 dates, and then again following vegetation removal (n=7) on May 27th and 28th, for a total of 21 shovel test probes (STPs). Additionally, the excavations of four mechanized soil test pits (SPs) were observed by Tierra archaeologists. No other shovel testing was possible at this time since the permit obtained for the vegetation removal and soil test

pits extended only to the area indicated in Figure 9 and the overgrowth was otherwise impenetrable (Photo 1).

Surface Survey

The project location is comprised of a relatively flat, north-sloping terrace containing big leaf maple and Douglas fir; dense, closely spaced early successional red alder trees; and wetland undergrowth of red elderberry (*Sambucus racemosa*), salmonberry (*Rubus spectabilis*), and extensive invasive Himalayan blackberry growth. Blackberry growth exceeded 3 m (10 feet) in height over most of the area, the and completely obscured and obstructed access to ground surface (Photo 2; see Photo 1). On May 13th and 14th, surface survey was conducted, but due to the dense vegetation, survey was limited to either side of the established walking trails on the east and south perimeters of the project area. Mechanized grubbing into the interior area on May 27th and 28th offered some additional surface survey opportunity.

The parcel has been cleared for logging at least twice in its history. One episode likely occurred during the Historic era, based on the 1936 Metsker map (see Figure 6) showing it as mill property and a notched tree stump observed after vegetation removal (Photo 3). The parcel was again logged and mechanically cleared of vegetation sometime around 2005, when a grading permit was obtained prior to planned development of the parcel that never actually took place (see Figures 2 and 3). Logging slash was bulldozed into centrally located piles at this time, which is noted in the Wetland Resources “Critical Area Study and Wetland Mitigation Plan for Interair Commerce Center” (2011); logging slash was also observed during the archaeological survey (Photo 4). After the 2005 clearing of the parcel, vegetation was allowed to grow back. The area is now completely covered in dense young alder, blackberries, and salmonberry. Vegetation was so dense that, except along existing trails, penetration for our testing purposes was impossible without the aid of mechanical removal (Photo 5; see Photos 1–4). The proponent therefore used a mechanical excavator to clear vegetation from a portion of the parcel on May 27th and 28th. A permit for this work was obtained from the City of Everett. No grading or excavating was conducted, with the exception of the soil testing discussed below. All vegetation removal and the excavation of soil test pits was observed by a Tierra archaeologist, with negative results.

Subsurface Testing

Testing consisted of the excavation of a total of 21 STPs. Testing on May 13th and 14th consisted of excavating STPs 1–6, along the west side of the south-north trail along the eastern perimeter, and STPs 6–14, along the north side of the east-west-ranging trail along the south portion of the site. This east-west trail bordered the northern perimeter of the wetland mosaic area on the southeast corner of the site connecting to the steep slope of Japanese Gulch.

Along both the eastern and the southern perimeters, the sediments observed were consistent overall. A shallow forest-soil A horizon consisted of dark yellowish brown sandy loam with rooty organics and small pea-sized rounded gravels atop Alderwood-Everett series glacial till of light olive to gray sandy silt with rounded gravels and cobbles.

In roughly half of the STPs a third strata was evident; it was found either between the A horizon and the glacial deposits or it replaced the forest soil entirely. This layer consisted of a brown sandy silt loam containing organics including charcoal bits, charred roots, and woody debris with cobbles and gravels (see Photos 3–5).

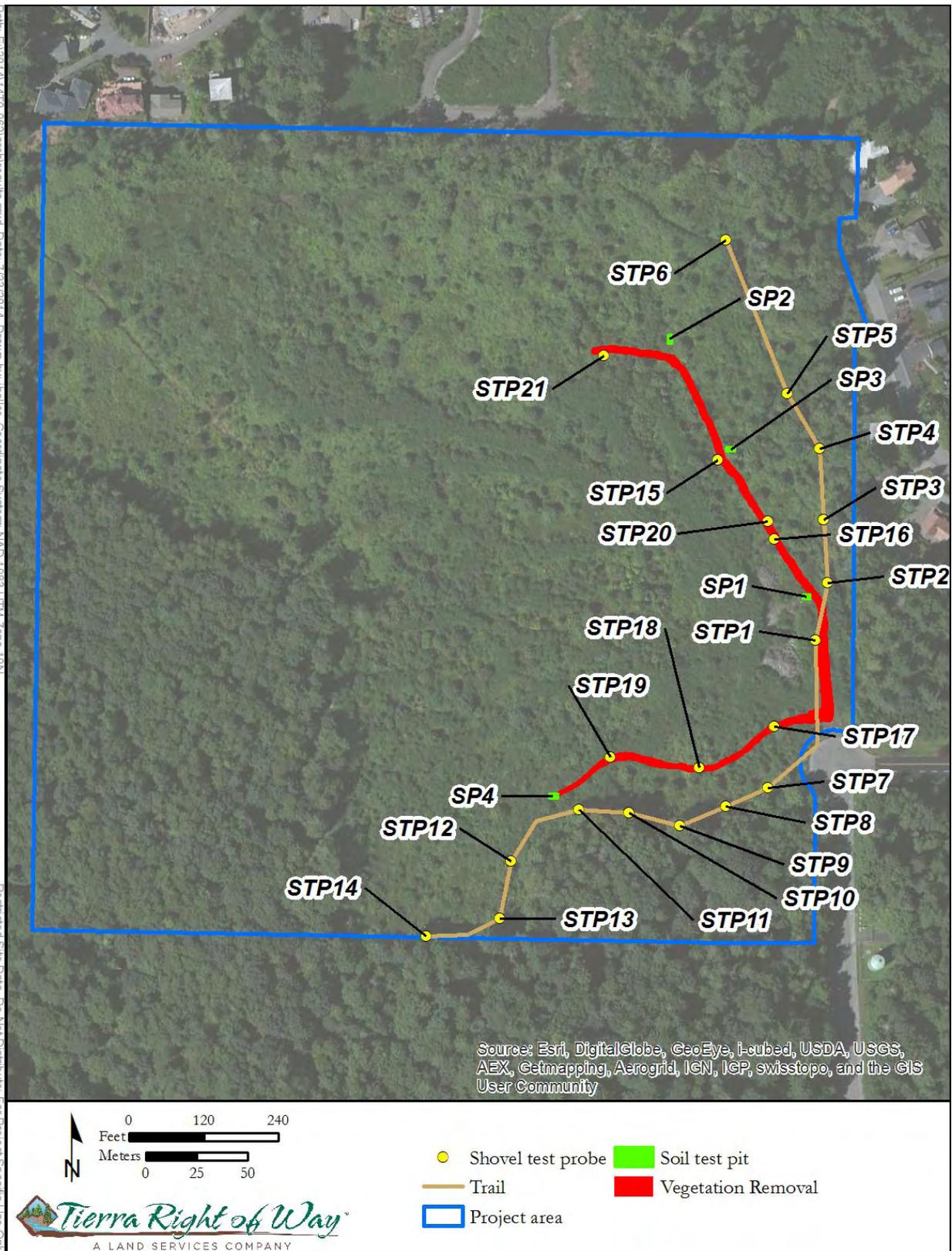


Figure 9. Detail of aerial image depicting the project APE and Shovel Test Probe (STP) and backhoe Shovel Pit (SP) locations (image source: Google Earth 2013).



Photo 1. Dense blackberry growth seen throughout the site (left); surface visibility obstructed by dense blackberry growth (right).



Photo 2. View of the undergrowth evidence of logging just north of the trail along the south border of the site: stumps and moss-covered logs (left); wood-debris obstructed all surface visibility (right).



Photo 3. Notched tree stump observed on site following vegetation removal.



Photo 4. Logged slash in piles. View is to the west.



Photo 5. Mechanized vegetation removal.

This strata suggested clear mixing of surface soil with glacial till material, indicating past disturbance that was probably associated with logging, grubbing, stump removal, and bulldozing activities either in 2005 or perhaps earlier. Testing on May 27th and 28th consisted of the excavation of seven additional STPs (STPs 15–21) and four soil test pits (SPs 1–4), along the mechanically cleared path west and north of the testing performed earlier in the month. The SPs revealed the same forest soil A horizon over a mixed and disturbed B horizon consisting of orange-brown sandy silt loam containing charcoal bits, wood, and roots among typical glacially deposited rounded and subrounded cobbles and gravels (Photos 6–11). The olive-to-gray glacial till was observed in all the STPs and SPs at depth. No artifacts, features, or other cultural indicators were observed in the soil test pits, shovel probes, walls, or backdirt.



Photo 6. STP 8, northwest profile; arrow pointing to burned or rotting wood/root in north wall.



Photo 7. STP 12, view of west profile with charcoal at 6–34 cm (2–13 inches) below surface, with the three soil horizons seen throughout the site.

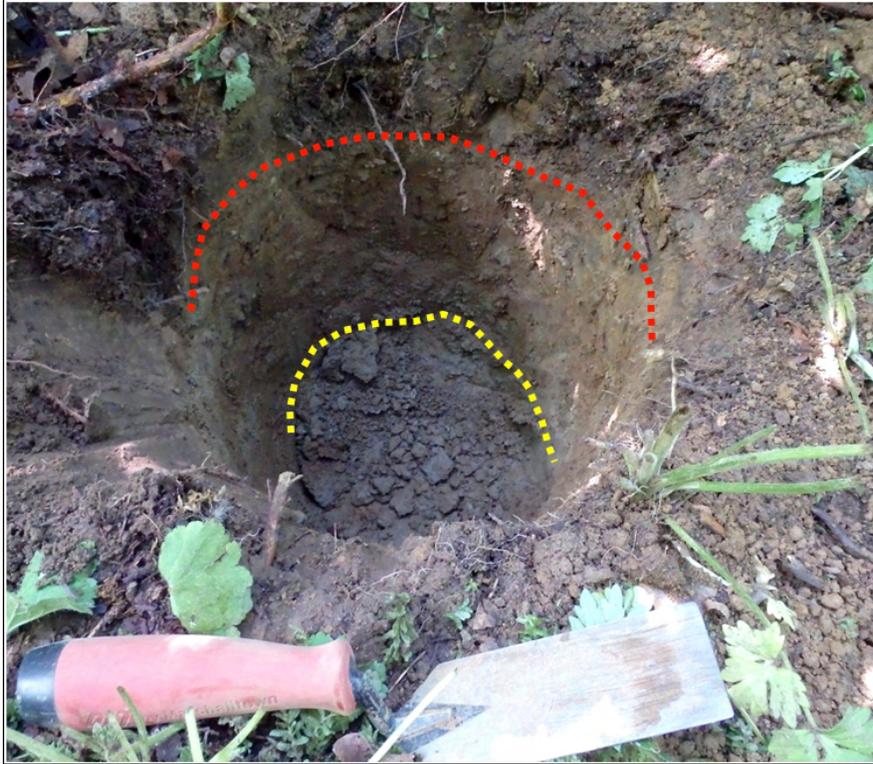


Photo 8. STP 13, west profile showing the three soil horizons observed at the site.



Photo 9. STP 19.



Photo 10. STP 20. View is to the north.



Photo 11. STP 4. View is to the west.

CONCLUSIONS AND RECOMMENDATIONS

Tierra's cultural resources assessment consisted of background review, field investigation, and production of this report. Background review determined the APE to be located in an area of low probability for historic properties. Field investigation included visual reconnaissance, limited pedestrian survey, and subsurface inspection.

Neither research nor subsurface testing identified any evidence to suggest that archaeological deposits or features might be present.

DAHP predictive model probability calculations are based on known environmental factors and/or information derived from archaeological research. Historic land use patterns indicate that much of the surface and near-surface environment has been highly disturbed by modern construction events and serial flooding and scouring. The absence of artifacts and features within the project area may be a result of the lack of distinctive archaeological signatures associated with the types of pre-modern activities practiced within this wooded terrace area. Furthermore, given the depositional environment, the history of post-Settlement logging practices, and the reported recent disturbance events, no intact archaeological deposits are likely to be located below the surface. The aerial view of the 2005 logging, stump clearing, and leveling in Figure 3 argue strongly for fairly deep soil disturbance. Moreover, subsurface testing confirmed the relatively thin layer of potentially artifact-bearing soil (6–45 cm [2–18 inches]) above glacial till. Given these project conditions and the fact that the ground-disturbing activities are planned in areas unlikely to contain intact archaeological deposits, the likelihood that intact archaeological deposits would be encountered is extremely low.

Therefore, Tierra recommends a finding of No Adverse Effect to cultural resources for this project.

In the unlikely event that archaeological materials are encountered during the development of the property, an archaeologist should immediately be notified and work should be halted in the vicinity of the find until the materials can be inspected and assessed. At that time, the appropriate persons are to be notified of the exact nature and extent of the resource so that measures can be taken to secure them.

In the event of inadvertently discovered human remains or indeterminate bones, pursuant to RCW 68.50.645, all work must stop immediately and law enforcement should be contacted. Any remains should be covered and secured against further disturbance, and communication established with local police, the DAHP, and any concerned Tribal agencies.

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APPENDIX A. SUMMARY OF RESULTS OF SUBSURFACE TESTING

Table A.1. Summary of Results of Shovel Probe Testing (UTM Zone 10T WGS84 Datum, 50-cm-Diameter Units)

| STP | Elevation (Feet) | UTM | Depth (cm below surface) | Sediment Description | Interpretation |
|-----|------------------|------------------------|--------------------------|--|--|
| 1 | 127.06 | 5310451N, 553573.3E | 0–26 | 10YR3/4, dark yellowish brown sandy loam with woody organics and small rounded gravels | Wet forest soils with bark and chipped wood suggesting disturbance from logging activity |
| | | | 26–35 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles. | Alderwood-Everett series glacial till |
| 2 | 124.08 | 5310478N, 553579.2E | 0–9 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Shallow wet forest soil |
| | | | 9–37 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 37–52 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 3 | 119.98 | 5310510N, 553577.6E | 0–10 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Shallow wet forest soil |
| | | | 10–50 | 2.5Y5/3 light olive sand/silt with rounded gravels. Fist-sized cobbles in upper 10-20 cm, only small rounded gravels below | Alderwood-Everett series glacial till |
| 4 | 117.76 | 5310545N, 553575.6E | 0–38 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Wet forest soil |
| | | | 38–48 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 5 | 112.07 | 5310572N, 553559.5E | 0–15 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Shallow wet forest soil |
| | | | 15–51 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 51–61 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 6 | 108.23 | 5310647N, 553529.7E | 0–8 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Shallow wet forest soil |
| | | | 8–24 | 2.5Y5/3 light olive sand/silt with rounded gravels. Fist-sized cobbles in upper 10-20 cm, only small rounded gravels below | Alderwood-Everett series glacial till |

| STP | Elevation (Feet) | UTM | Depth (cm below surface) | Sediment Description | Interpretation |
|-----|------------------|------------------------|--------------------------|---|--|
| 7 | 134.36 | 5310379N, 553550.2E | 0-18 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 18-32 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 8 | 134.53 | 5310369N, 553529.5E | 0-20 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Wet forest soil |
| | | | 20-50 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles. At 30-40 cmbs, a rotting root or burned log was on the north wall. Unit terminated at dense cobbles | Alderwood-Everett series glacial till |
| 9 | 132.39 | 5310360N, 553507.3E | 0-32 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| 10 | 133.28 | 5310366N, 553482.4E | 0-9 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Shallow wet forest soil |
| | | | 9-43 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 43-57 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 11 | 134.83 | 5310368N, 553457.6E | 0-8 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Shallow wet forest soil |
| | | | 8-54 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 54-61 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 12 | 134.21 | 5310343N, 553424.7E | 0-6 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Shallow wet forest soil |
| | | | 6-34 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles. At 10-20 cmbs, charred wood, charcoal | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 34-40 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |

| STP | Elevation (Feet) | UTM | Depth (cm below surface) | Sediment Description | Interpretation |
|-----|------------------|----------------------------|--------------------------|---|--|
| 13 | 132.52 | 5310314N, 553418.8E | 0–10 | 10YR3/4, dark yellowish brown sandy loam with rooty organics and small rounded gravels | Shallow wet forest soil |
| | | | 10–41 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 41–55 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 14 | 129.34 | 5310306N, 553383.0E | 0–22 | 10YR4/3 brown sand/silt loam with rounded gravels and cobbles | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 22–40 | 2.5Y5/3 light olive sand/silt with rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 15 | 115.99 | 5310539.2N, 553525.7E | 0–20 | 10YR3/4, dark yellowish brown silty loam with small rooty organics | |
| | | | 20–65 | 10YR4/3 dry, compact brown sand/silt loam with sub-rounded gravels and cobbles | Alderwood-Everett series glacial till |
| 16 | 119.92 | 5310500.5N, 553553.45E | 0–16 | 10YR3/4, dark yellowish brown silty loam with small rooty organics | |
| | | | 16–55 | 10YR4/3 dry, compact orange brown sand/silt loam with sub-rounded gravels and cobbles, small and med. Cobbles throughout, some mottling at upper edge | |
| 17 | 130.42 | 5310408.5N, 553553.25E | 0–3 | 10YR3/4, dark yellowish brown silty loam with small rooty organics | |
| | | | 3–38 | 10YR4/3 dry, compact orange brown sand/silt loam with small cobbles throughout | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 38–50 | Light gray very compact sandy silt , small gravels | Alderwood-Everett series glacial till |
| 18 | 130.64 | 5310388.5N, 553516.61E | 0–12 | 10YR3/4, dark yellowish brown silty loam with small rooty organics | |
| | | | 12–49 | 10YR4/3 damp orange brown clay loam with small cobbles throughout | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 49–60 | Light gray damp, very compact sandy silt , small gravels | Alderwood-Everett series glacial till |
| 19 | 131.82 | 5310393.72N, 553473.28E | 0–12 | 10YR3/4, dark yellowish brown silty loam with small rooty organics | |

| STP | Elevation (Feet) | UTM | Depth (cm below surface) | Sediment Description | Interpretation |
|-----|------------------|----------------------------|--------------------------|---|--|
| 19 | 131.82 | 5310393.72N, 553473.28E | 12-51 | 10YR4/3 dry, compact orange brown sand/silt loam with small cobbles throughout | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 51-70 | Light gray very compact sandy silt , small gravels | Alderwood-Everett series glacial till |
| 20 | 119.36 | 5310509.42N, 553550.05E | 0-12 | 10YR3/4, dark yellowish brown silty loam with small rooty organics | |
| | | | 12-39 | 10YR4/3 dry, compact orange brown sand/silt loam with small cobbles throughout | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 39-50 | Light gray very compact sandy silt , small gravels | Alderwood-Everett series glacial till |
| 21 | 112.05 | 5310590.48N, 553470.08E | 0-6 | 10YR3/4, dark yellowish brown silty loam with small rooty organics | |
| | | | 6-53 | 10YR4/3 dry, compact orange brown sand/silt loam with small cobbles throughout. Charcoal, evidence of burning | Mixture of Alderwood-Everett series glacial till and surface soil horizon and organic material |
| | | | 53-65 | Light gray compact sandy silt | Alderwood-Everett series glacial till |

Table A.2. Summary of Results of Backhoe Soil Test Pits (UTM Zone 10T WGS84 Datum)

| SP | Length (m), Direction | Width (m), Direction | Depth (cm below surface) | Sediment Description |
|----|--------------------------|-------------------------|-----------------------------|---|
| 1 | 3.5 E/W | 2.2 N/S | 0-35 | Dark brown loam with rooty organics |
| | | | 35-90 | Orange-brown glacial till, mottled with upper and lower strats at respective depths |
| | | | 90-180 | Compact light gray sandy loam |
| 2 | 4.5 N/S | 2.2 E/W | 0-5 | Dark brown loam with rooty organics |
| | | | 5-72 | Orange-brown glacial till, mottled with upper and lower strats at respective depths |
| | | | 72-160 | Compact light gray sandy loam |
| 3 | 4.4 E/W | 2.2 N/S | 0-14 | Dark brown loam with rooty organics |
| | | | 14-90 | Orange-brown glacial till, mottled with upper and lower strats at respective depths |
| | | | 90-200 | Compact light gray sandy loam |
| 4 | 4.3 E/W | 2.2 N/S | 0-7 | Dark brown loam with rooty organics |
| | | | 7-75 | Orange-brown glacial till |
| | | | 75-220 | Compact light gray sandy loam |

CULTURAL RESOURCES REPORT COVER SHEET

Author: Melanie M. Diedrich, M.A.; Jennifer Hushour, M.Sc.

Title of Report: Cultural Resources Assessment for the Soundview Business Campus Project, Everett, Snohomish County, Washington

Date of Report: August 6, 2013

County: Pierce Section: 3 Township: 28 North Range: 04 East

Quad: Mukilteo, WA (1978), 7.5-minute USGS Quad

PDF of report submitted (REQUIRED) Yes

Historic Property Export Files submitted? Yes No

Archaeological Site(s)/Isolate(s) Found or Amended? Yes No

TCP(s) found? Yes No

Replace a draft? Yes No

Satisfy a DAHP Archaeological Excavation Permit requirement? Yes # No

DAHP Archaeological Site #:

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