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Exhibit 3.d

Critical Area Report

MUSTARD SEED LEGACY DEVELOPMENT, LLC

CRITICAL AREAS REPORT



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CRITICAL AREAS REPORT

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JULY 2019

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TABLE OF CONTENTS

1	INTRODUCTION	3
2	FEATURE SUMMARY	3
3	BACKGROUND	4
3.1	Existing Conditions.....	4
3.2	Local Critical Areas Inventory.....	5
3.3	National Wetlands Inventory	5
3.4	Sensitive Wildlife and Plants	5
3.5	State Water Classification System.....	5
3.6	Soil Information.....	6
4	METHODS	6
4.1	Hydrophytic Vegetation.....	6
4.2	Wetland Hydrology.....	7
4.3	Hydric Soils	7
5	RESULTS	7
5.1	Wetland A – Bell Marsh	7
5.1.1	Vegetation.....	7
5.1.2	Hydrology.....	8
5.1.3	Hydric Soils.....	8
5.1.4	Wetland Categorization.....	8
5.2	Fish and Wildlife Conservation Areas	8
5.2.1	Stream PS-1.....	9
5.3	Regulatory Considerations.....	9
5.4	Disclaimer	10
6	BIOLOGIST QUALIFICATIONS	10
6.1	Chad Wallin	10
7	REFERENCES	11

LIST OF FIGURES

Figure 1. Vicinity map	3
Figure 2. Stormwater Outfall and Channelization	9

LIST OF TABLES

Table 1. Wetland delineation summary	4
Table 2. Natural water feature identification summary	4
Table 3. Definitions for USFWS plant indicator status	7
Table 4. Wetland rating and categorization summary	8

LIST OF APPENDICES

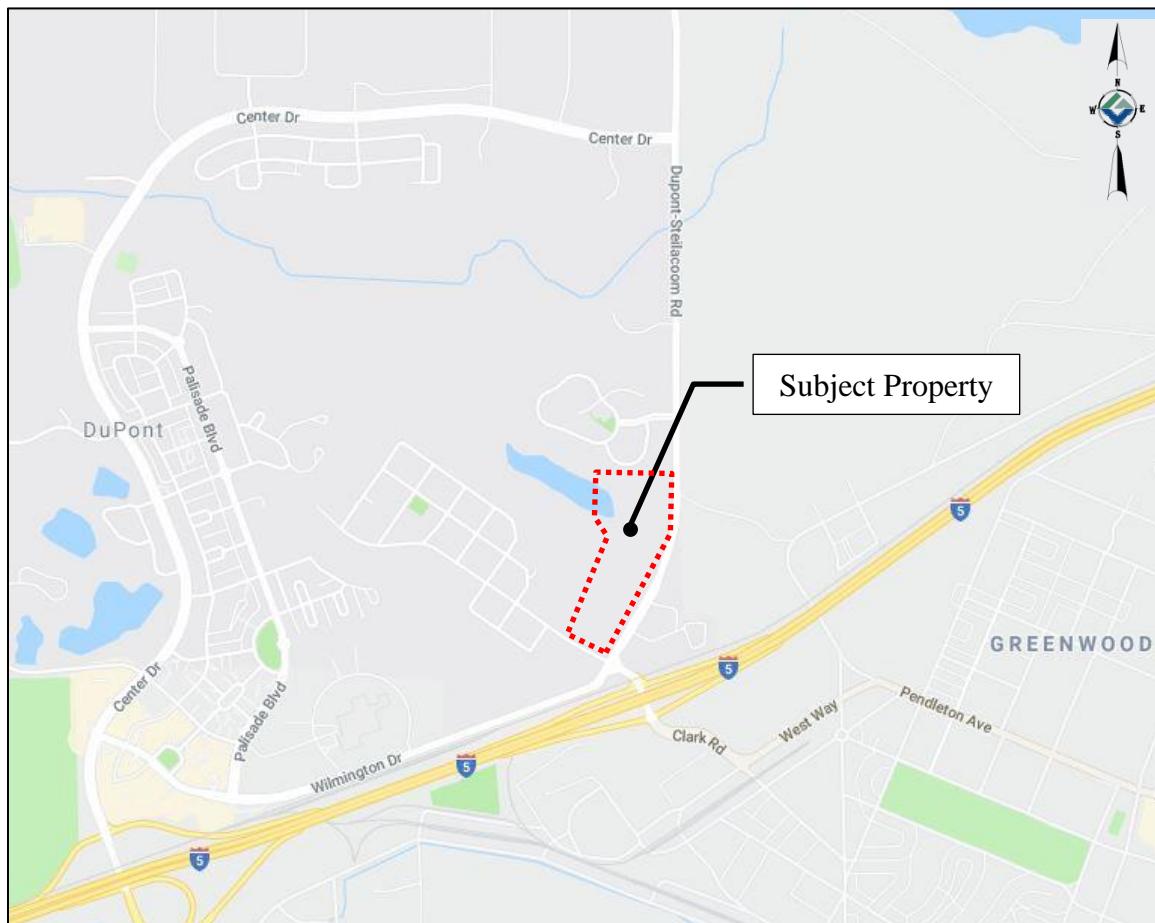
Appendix A. Wetland Delineation Map
Appendix B. Wetland Summaries
Appendix C. Wetland Datasheets
Appendix D: Wetland Rating Form
Appendix E: Queried Database Figures

1 INTRODUCTION

Grette Associates is under contract with Mustard Seed Legacy Development to prepare a critical areas report that summarizes the critical areas reconnaissance performed at the property located at the corner of Barksdale Ave. and DuPont-Steilacoom Rd SW (Pierce County parcels 0119362043, 0119362039, 0119362009 and 0119362012) within the City of DuPont (Figure 1).

The purpose of this report is to document all wetlands and streams that are located within 200 feet of the subject property and has been prepared in conformance with the critical area report requirements defined in Chapter 25.105 of the DuPont Municipal Code (DMC).

Figure 1. Vicinity map



2 FEATURE SUMMARY

Grette Associates visited the subject property on April 30, 2019 to conduct an assessment to identify any wetlands or streams within 200 feet of the subject property.

Grette Associates collected wetland delineation data and delineated one wetland feature (Wetland A - Bell Marsh; Appendix A) that contained all three wetland criteria defined in the U.S. Army Corps of Engineers (USACE) *Federal Wetland Delineation Manual* (1987), and the USACE's *Regional Supplement to the Corps of Engineers Wetland*

Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (2010). Wetland A was rated according to DMC 25.105.050 and the Washington State Department of Ecology's (Ecology) *Washington State Wetland Rating System for Western WA – 2014 Update* (Hruby 2014). A wetland delineation summary, field datasheets and wetland rating form are presented in Appendices B, C and D, respectively. Copies of the queried database figures reviewed for this report are presented in Appendix E. Photographs of the site are presented in Appendix F. A summary of the delineated wetland is provided in Table 1.

In addition to the wetland delineation, one natural water feature (PS-1) was identified within 200 feet of the subject property (Appendix A). An ordinary high water mark (OHWM) determination was not completed given its location within Wetland A. This stream flows into the southern portion of Wetland A where a large stormwater pipe discharges. A summary of the stream is provided below in Table 2.

Table 1. Wetland delineation summary

Feature	Size (Approximate)	Cowardin Class ¹	Hydrology Modifier	HGM Class	Wetland Category	Buffer Width ²
A/Bell Marsh	20 acres	PAB/EM/SS/FO	Permanently Flooded and Seasonally Flooded	Depressional	II	100 ft.

¹ Classification based on Cowardin et al. (1979).

² Buffers are based on DMC 25.105.050.

Table 2. Natural water feature identification summary

Feature	Water Type ¹	Buffer ²
PS-1	F	100 ft.

¹ Natural water features were rated according to DMC 25.105.030 and WAC 222-16-030.

² Buffers are based on DMC 25.105.050

3 BACKGROUND

3.1 Existing Conditions

The subject property is undeveloped and largely dominated by Bell Marsh (Appendix A). Non-wetland areas are limited to the south and southeast portions of the subject property along DuPont-Steilacoom Road and Barksdale Ave, which consist predominately of a native forested area over a dense blackberry thicket (*Rubus armeniacus*) understory. Native trees present to the southeast include big leaf maple (*Acer macrophyllum*), Douglas fir (*Pseudotsuga menziesii*), black cottonwood (*Populus balsamifera*), and Oregon white oak (*Quercus garryana*). Where blackberry is not dominant, the understory consists of a mix of native and invasive species including English ivy (*Hedera helix*), tall Oregon grape (*Mahonia aquifolium*), osoberry (*Oemleria cerasiformis*), and red-osier dogwood (*Cornus sericea*). The aquatic bed portions of the site consist of a variety of invasive and native aquatic vegetation.

The marsh receives a significant input of stormwater from a large stormwater outfall in the south end of the site (Appendix F). This outfall originates from Joint Base Lewis-McChord (JBLM) to the south, and passes under I-5 to discharge on the subject property. The outfall drains a large stormwater detention pond on JBLM property. The outlet on the subject property consists of a large concrete pad with concrete wingwalls, surrounded by a chain link fence. Stormwater discharging from this outfall has created a channel

(Stream PS-1) within Wetland A leading to the north toward the outlet of the marsh beneath DuPont-Steilacoom Road near Pendleton Ave.

3.2 Local Critical Areas Inventory

Bell Marsh is identified as a wetland feature on the City of DuPont's Comprehensive Plan Map. A portion of the marsh/wetland is also identified as 100-year floodplain on the City's FEMA 100-year floodplain map from 1983, as well as on Pierce County's PublicGIS system as regulated floodplain (Floodzone A – Special Flood Hazard Area) (Appendix E).

3.3 National Wetlands Inventory

The U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) was queried to determine if previously-identified wetlands are present within 200 feet of the subject property (USFWS 2019). According to the NWI Interactive Online Mapper, there is one wetland (Wetland A) that corresponds to the location of Bell Marsh and two streams mapped within 200 feet of the subject property by the NWI (Appendix E). The wetland identified by the NWI is divided into a palustrine emergent wetland to the west and a scrub-shrub wetland to the east.

3.4 Sensitive Wildlife and Plants

The Washington Department of Fish and Wildlife's (WDFW) Priority Habitats and Species (PHS) database on-line mapper was queried to determine if state or federally listed fish or wildlife species occur near the subject property (WDFW 2019a). In addition to the features identified by NWI, the PHS database identifies the subject property to contain potential habitat for big brown bat (*Eptesicus fuscus*), little brown bat (*Myotis lucifugus*), Yuma myotis (*Myotis yumanensis*), and resident coastal cutthroat trout (*Oncorhynchus clarki*).

Additionally, WDFW's SalmonScape on-line mapper was queried to determine if listed SalmonScape species are identified by WDFW to occur within the subject property (WDFW 2019b). According to SalmonScape, with the exception of resident coastal cutthroat trout there are no SalmonScape species mapped in this tributary system of Sequalitchew Creek.

The Washington Department of Natural Resources' (WDNR) WA Wetlands of High Conservation Value Map Viewer was reviewed to determine if the subject property occurs in a location reported to contain high quality natural heritage wetlands or occurrences of wetlands with high conservation value. According to the WDNR mapper, there are no records of rare plants or high-quality native ecosystems occurring on or within 200 feet of the subject property (Appendix E).

3.5 State Water Classification System

The Washington Department of Natural Resources' (WDNR) Forest Practice Application Mapping Tool on-line mapper was queried to identify the water typing of any streams mapped by WDNR (WDNR 2019). According to WDNR, the onsite stream (PS-1) is mapped as a non-fish habitat (Type N) stream while Wetland A is mapped as a fish habitat feature (Type F) due to the wetland's outlet having a connection to a Type F stream (Appendix E).

3.6 Soil Information

According to the Natural Resources Conservation Service's (NRCS) Web Soil Survey (NRCS 2019), the soils within the subject property consist of DuPont muck, Spanaway gravelly sandy loam, and Everett-Spanaway-Spana complex (0-30 percent slopes). Dupont muck is listed as a hydric soil while the other two mapped soil units are not listed as hydric (NRCS 2019) (Appendix E).

4 METHODS

The subject property was traversed and data were collected to confirm wetland boundaries. The identified wetland was delineated according to the procedures described in the USACE's *Federal Wetland Delineation Manual* (1987), and the USACE's *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (2010). Paired data plots and soil test pits were excavated to evaluate wetland and upland conditions. Guidance from the USACE's *Regional Supplement* was used to evaluate the data at each data point.

The boundary of the wetland was established based on changes in vegetation, field indicators of hydric soils, water levels at or below 12 inches, topographic changes, and best professional judgment. Data plots were established in and adjacent to the wetland. The location of the wetland boundary was defined by placement of fluorescent orange flagging tape. The location of each data plot was defined by the placement of pink flagging tape. The wetland boundary flagging was labeled alpha-numerically (i.e. A-2), where the letter designates the wetland and the number designates the specific flag angle point.

Plants were determined to be more or less associated with wetlands based on their wetland indicator (FAC) status. The percent dominance for each plant strata was determined using the 50-20 Rule, which is the recommended method for selecting dominant species from a plant community in instances where quantitative data are available (USACE 2010). In utilizing this rule, dominants are the most abundant species that individually or collectively accounts for more than 50 percent of the total coverage of vegetation in the stratum plus any other species that, by itself accounts for at least 20 percent of the total.

4.1 Hydrophytic Vegetation

The U.S. Fish and Wildlife Service (USFWS) and the NWI have established a rating system that has been applied to commonly occurring plant species on the basis of their frequency of occurrence in wetlands (Table 3). Species indicator status expresses the range in which plants may occur in wetlands and non-wetlands (uplands). Under this system, vegetation is considered hydrophytic when there is an indicator status of facultative (FAC), facultative wetland (FACW) or obligate wetland (OBL) (Table 3). The hydrophytic vegetation criterion for wetland determination is met when **more than** 50 percent of the dominant species in the plant community are FAC or wetter. The Corps' *National Wetland Plant List* (Lichvar 2016) was used to determine vegetation indicator status.

Table 3. Definitions for USFWS plant indicator status

Plant Indicator Status Category	Indicator Status Abbreviation	Definition (Estimated Probability of Occurrence)
Obligate Upland	UPL	Occur rarely (<1 percent) in wetlands, and almost always (>99 percent) in uplands
Facultative Upland	FACU	Occur sometimes (1 percent to <33 percent) in wetlands, but occur more often (>67 percent to 99 percent) in uplands
Facultative	FAC	Similar likelihood (33 percent to 67 percent) of occurring in both wetlands and uplands
Facultative Wetland	FACW	Occur usually in wetlands (>67 percent to 99 percent), but also occur in uplands (1 percent to 33 percent)
Obligate Wetland	OBL	Occur almost always (>99 percent) in wetlands, but rarely occur in uplands (<1 percent)
Not Listed	NL	Not listed due to insufficient information to determine status

4.2 Wetland Hydrology

Evidence of permanent or periodic inundation (water marks, drift lines, drainage patterns), or soil saturation to the surface for 14 consecutive days or more during the growing season meets the hydrology criterion. Oxidized root channels in the top 12 inches and hydrogen sulfide are primary indicators and water-stained leaves and geomorphic position are secondary indicators of wetland hydrology.

4.3 Hydric Soils

Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper soil horizons are considered hydric soils. Field indicators include histosols, the presence of a histic epipedon, a sulfidic odor, low soil chroma, and gleying. Soil conditions were compared to the Field Indicators of Hydric Soils detailed in the Corps' *Regional Supplement*.

5 RESULTS

5.1 Wetland A – Bell Marsh

Bell Marsh is a Palustrine Aquatic-Bed/Emergent/Scrub-Shrub/Forested wetland that is approximately 20 acres in size (Appendix A). Hydrogeomorphically, Bell Marsh is classified as a depressional wetland. The marsh is located west of DuPont-Steilacoom Road. A culvert beneath DuPont-Steilacoom Road near Pendleton Ave provides a hydrologic connection to MacKay Marsh to the northeast and the remainder of the Sequalitchew Creek headwaters.

5.1.1 Vegetation

Vegetation within Bell Marsh is largely dominated by black cottonwood (*Populus balsamifera*) and willows (*Salix sp.*) with an understory largely dominated by reed canarygrass (*Phalaris arundinacea*). Red-osier dogwood and small-fruited bulrush (*Scirpus microcarpus*) are also present in wetter areas of the marsh. In general, the understory vegetation is limited to the southern extent of the wetland and along its margins. Aquatic bed vegetation (such as *Potamogeton sp.*) is present throughout much of the permanently-flooded areas of the marsh.

5.1.2 Hydrology

Hydrologic support for Bell Marsh is primarily provided by high groundwater and stormwater from the perennial stream (PS-1) that flows into the southern portion of the wetland. This stream channel appears to have been formed by the discharge of stormwater from a large culvert that conveys the stormwater from a detention pond located on JBLM property south of I-5.

In addition, Bell Marsh contains a highly constricted permanently flowing outlet that is located in the northeast portion of the wetland near the intersection of DuPont-Steilacoom Road and Pendleton Ave. This outlet is mapped as a total fish blockage according to WDFW (WDFW 2019b) which prevents fish from accessing Bell Marsh from downstream sources.

5.1.3 Hydric Soils

Soils observed within Bell Marsh generally consisted of an upper layer (0-18 inches) of a very dark brown (10YR2/2) mucky material. While no carbon testing was completed, based on the observed soil textures (greasy and lack of fiber content) the soils observed appeared to meet the *Histosol* hydric soil indicator (USACE 2010). Additionally, the soils throughout most of the wetland have been mapped as DuPont Muck by the NRCS (Appendix E). This series, rated as hydric by the NRCS, consists of very poorly drained soils formed in organic deposits. Based on the NRCS description of the DuPont Series, this soil is classified as an organic soil.

5.1.4 Wetland Categorization

To determine the categorization of Bell Marsh based on function, the wetland classification guidelines in Ecology's wetland rating system (Hruby 2014) were used. Based on this guidance, the wetland was given a score for each of three functions: Water Quality, Hydrology, and Habitat (Table 4).

Table 4. Wetland rating and categorization summary

Feature	Cowardin Class	HGM Class	Water Quality	Hydrology	Habitat	Total	Category
Wetland A/Bell Marsh	PAB/EM/SS/FO	Depressional	5	8	7	20	II

Please see Appendix D for copies of the wetland rating forms used to determine the function scores and resulting wetland categorization. Per DMC 25.015.050, Category II wetlands are subject to a 100-foot buffer.

5.2 Fish and Wildlife Conservation Areas

Per DMC 25.105.030, Fish and Wildlife Habitat Conservation Areas (FWHCAs) are typically those areas that support regulated fish and wildlife species or the habitats that play a critical role in sustaining said species. This section is intended to document all FWHCAs that were identified within 200 feet of the subject property and to satisfy the critical area report requirements defined in Chapter 25.105. Please note that a habitat management plan (HMP) will be prepared under a separate cover to address the development standards defined in DMC 25.105.050(2).

5.2.1 Stream PS-1

Stream PS-1 is a perennial surface water feature that appears to originate at the outlet of a large stormwater outfall located at the southern end of Bell Marsh. This stormwater outfall conveys stormwater from JBLM and other offsite areas (Stantec 2018). As a result, discharge from this stormwater outfall has scoured a channel from the outlet across Bell Marsh to approximately the central portion of the wetland (Figure 2 and Appendix A).

Figure 2. Stormwater Outfall and Channelization



The photograph on the left captures the stormwater outfall that discharges into Bell Marsh. The photograph on the right captures the channelization that has occurred over time as a result of stormwater volume and velocity.

Based on the physical hydrologic connection to the Type F stream at the outlet of Bell Marsh, Stream PS-1 as well as Bell Marsh are classified as a Type F stream/feature. Mapped distribution of salmonids within PS-1, Bell Marsh, and the stream associated with the outlet of Bell Marsh is limited to resident coastal cutthroat trout (WDFW 2019a and 2019b). Furthermore, PS-1 and Bell Marsh are part of a mosaic wetland and stream complex that forms the headwaters of Sequalitchew Creek, which is only mapped (presumed and/or documented) as providing habitat for coho salmon (*Oncorhynchus kisutch*) and resident coastal cutthroat trout (WDFW 2019b). No state or federally listed salmonid species are mapped within the Sequalitchew Creek system.

Per DMC 25.105.050, all streams within the City of DuPont are subject to a 100-foot buffer.

5.3 Regulatory Considerations

Wetlands are regulated by agencies at the local, state, and federal levels. At the local level, wetlands and their associated buffers in City of Dupont are regulated under City's critical areas ordinance (Chapter 25.105 of the DMC).

At the state level, wetlands are regulated by the Washington Department of Ecology through the State Clean Water Act (Section 401). The requirement for a Water Quality Certification from Ecology for wetland impacts is triggered by an applicant's applying for a federal Clean Water Act Section 404 permit from the Corps. Ecology may also issue an Administrative Order, allowing them wetland regulatory authority without a federal nexus.

At the federal level, impacts (specifically dredging or filling) to wetlands are regulated by the Environmental Protection Agency through the US Army Corps of Engineers. The USACE administers the federal Clean Water Act (Section 404) for projects involving dredging or filling in Waters of the US (lakes, streams, marine waters, and most non-isolated wetlands).

While it is the regulatory agencies that make the final determination regarding jurisdictional status, project proponents can infer jurisdiction using the guidance provided by each agency or local government. This inference can be used to design a project based on the anticipated regulatory constraints within the project area. However, it is the project proponent's responsibility to contact each potential regulating agency and confirm their regulatory status and requirements.

5.4 Disclaimer

The findings and conclusions documented in this report have been prepared for specific application to this proposed project site. They have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. Our work was also performed in accordance with the terms and conditions set forth in our proposal. The conclusions and recommendations presented in this report are professional opinions based on an interpretation of information currently available to us and are made within the operation scope, budget, and schedule of this project. No warranty, expressed or implied, is made. In addition, changes in government codes, regulations, or laws may occur. Because of such changes, our observations and conclusions applicable to this site may need to be revised wholly or in part.

Wetland boundaries are based on conditions present at the time of the site visit and considered preliminary until the flagged wetland and/or drainage boundaries are validated by the appropriate jurisdictional agencies. Validation of the boundaries by the regulating agencies provide a certification, typically in writing, that the wetland boundaries verified are the boundaries that will be regulated by the agencies until a specific date or until the regulations are modified. Only the regulating agencies can provide this certification.

Since wetlands are dynamic communities affected by both natural and human activities, changes in wetland boundaries may be expected. Because of such changes, our observations and conclusions applicable to this site may need to be revised wholly or in part.

6 BIOLOGIST QUALIFICATIONS

6.1 Chad Wallin

Chad Wallin is a Biologist with extensive training in wetland science and ecology restoration. Chad also has professional experience in stream and fish restoration, marine monitoring, mitigation monitoring, and fish and wildlife assessments.

Chad has earned a Bachelor's of Arts degree in Environmental Studies from the University of Washington along with certificates in ecology restoration and wetland science.

For a list of representative projects, please contact him at Grette Associates.

7 REFERENCES

Environmental Laboratory (Corps). 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. Washington State Department of Ecology Publication # 14-06-029.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 Wetland Ratings. *Phytoneuron* 2016-30:1-17. Published 28 April 2016. ISSN 2153 733X.

Natural Resource Conservation Service (NRCS). 2019. United States Department of Agriculture. Web Soil Survey [map online]. Queried July 10, 2019. URL: <http://websoilsurvey.nrcs.usda.gov/>

Stantec Consulting Services, Inc. 2018. Independent Review of ARCO Fueling Facility Wetlands and Delineation Rating. Prepared for the City of DuPont. April 19, 2018.

U.S. Army Corps of Engineers (Corps). 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Research and Development Center.

U.S. Fish and Wildlife Service (USFWS). 2019. Wetland Mapper [map online]. National Wetlands Inventory Queried May 2, 2019. URL: <http://www.fws.gov/wetlands/Wetlands-Mapper.html> Interactive Layer = “Wetlands”.

Washington Department of Fish and Wildlife (WDFW). 2019a. PHS on the Web [map online]. Priority Habitats and Species Queried July 10, 2019. URL: <http://wdfw.wa.gov/mapping/phs/>.

Washington Department of Fish and Wildlife (WDFW). 2019b. SalmonScape [map online]. All SalmonScape Species. Queried May 2, 2019. URL: <http://wdfw.wa.gov/mapping/phs/>.

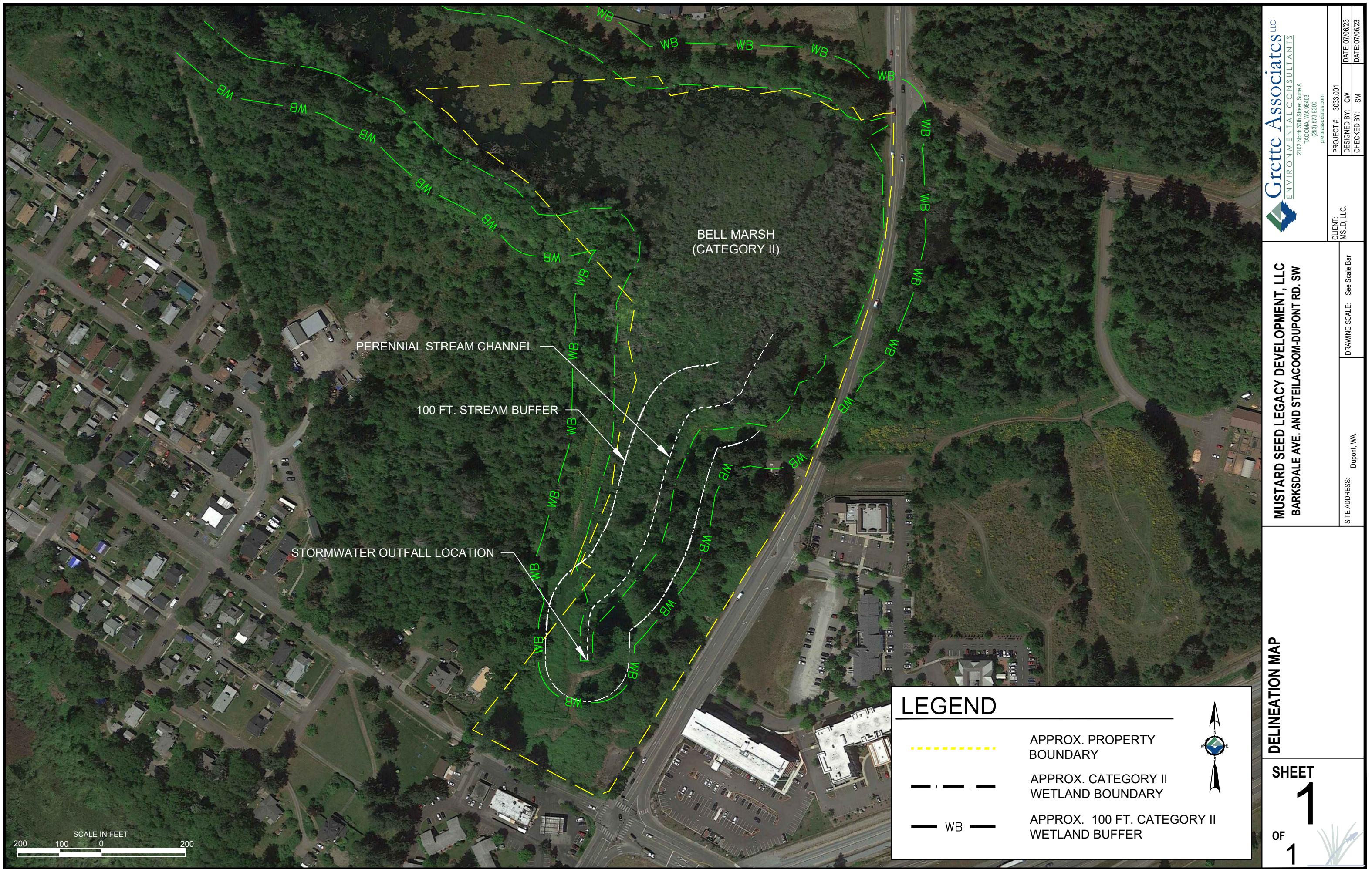
Washington Department of Natural Resources (WDNR). 2019. Forest Practices Application Mapping Tool [map online]. Streams and Water Type Breaks. Queried May 2, 2019. URL: <https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html>

Wetland & Wildlife, Inc. 2017. Critical Areas Report and Proposed Mitigation Plan: Arco Fueling Facility. Prepared for Barghausen Consulting Engineers. December 12, 2017.

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APPENDIX A: WETLAND DELINEATION MAP



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APPENDIX B: WETLAND SUMMARY

WETLAND A/BELL MARSH SUMMARY	
Approximate Size (Acres):	18
Cowardin Classification¹:	PAB/EM/SS
HGM Classification²:	Depressional
Wetland Category³:	II
Wetland Buffer Width⁴:	100 ft.
Sample Plot Total⁵:	5
Hydrophytic Vegetation Present?	Yes
Hydric Soil Indicators Present?	Yes
Wetland Hydrology Present?	Yes
Summary of Findings	
Dominant Vegetation:	Vegetation within Bell Marsh is largely dominated by black cottonwood and willows with an understory largely dominated by reed canarygrass.
Soil Profile:	Soils observed within Bell Marsh generally consisted of an upper layer (0-18 inches) of very dark brown (10YR2/2) mucky material. While no carbon testing was completed, based on the observed soil textures (greasy and lack of fiber content), the soils observed met the <i>Histosol</i> hydric soil indicator (USACE 2010).
Primary Hydrological Support:	Hydrologic support for Wetland A is primarily provided by groundwater and stormwater flow from the adjacent stream/stormwater outlet.
Wetland Data Plot:	Upland Data Plot:
	
<p>Notes:</p> <p>¹ Classification based on Cowardin et al. (1979).</p> <p>² HGM classification based on Brinson, M.M. (1993).</p> <p>³ Wetland rating was determined based on the guidelines defined in the local municipal code.</p> <p>⁴ Wetland buffer was determined based on the local municipal code.</p> <p>⁵ Sample plot total includes the collective amount of wetland and upland samples plots examined to define the wetland boundary.</p>	

MUSTARD SEED LEGACY DEVELOPMENT, LLC

CRITICAL AREAS REPORT

APPENDIX C: WETLAND DATASHEETS

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

Project/Site: Mustard seed City/County: Dupont / Pierce Sampling Date: SP 1
 Applicant/Owner: _____ State: WA Sampling Point: 4/30/19
 Investigator(s): TP Section, Township, Range: 36, 19 N, 01 E
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Convex Slope (%): _____
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Everett-Spokane-Spokane NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>10 m</u>) 1. <u>Cottonwood</u> <u>30</u> <u>Y</u> <u>FAC</u> 2. _____ 3. _____ 4. _____	<u>Absolute % Cover</u> <u>Dominant Species?</u> <u>Indicator Status</u> <u>30</u> <u>Y</u> <u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
<u>Sapling/Shrub Stratum</u> (Plot size: <u>5 m</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____		<u>30</u> = Total Cover	
<u>Herb Stratum</u> (Plot size: <u>2 m</u>) 1. <u>Phalaris arundinacea</u> <u>90</u> <u>Y</u> <u>FACW</u> 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____		<u>90</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 = _____
<u>Woody Vine Stratum</u> (Plot size: _____) 1. _____ 2. _____		<u>90</u> = Total Cover	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum _____		<u>Hydrophytic Vegetation Present?</u> Yes <input checked="" type="checkbox"/> No _____	
Remarks:			

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

Project/Site: Mustard seed City/County: Douglas / Pierce Sampling Date: 4/30

Applicant/Owner: 11 State: WA Sampling Point: SP2

Investigator(s): TP Section, Township, Range: 36, 19 N, 01 E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Evergreen - Sparsely - Sparsely NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?
Hydric Soil Present?	Yes <u>X</u> No <u> </u>	Yes <u>X</u> No <u> </u>
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>	
Remarks:		

VEGETATION – Use scientific names of plants.

<p><u>Tree Stratum</u> (Plot size: <u>10 m</u>)</p> <p>1. _____ 2. _____ 3. _____ 4. _____</p> <p><u>Sapling/Shrub Stratum</u> (Plot size: <u>5 m</u>)</p> <p>1. _____ 2. _____ 3. _____ 4. _____ 5. _____</p> <p><u>Herb Stratum</u> (Plot size: <u>2 m</u>)</p> <p>1. <u>Phalaris arundinacea</u> <u>100</u> <u>Y</u> <u>FACW</u> 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____</p> <p><u>Woody Vine Stratum</u> (Plot size: _____)</p> <p>1. _____ 2. _____</p> <p>% Bare Ground in Herb Stratum _____</p>	<p>Absolute % Cover Dominant Indicator Species? Status</p> <p>= Total Cover</p> <p>Hydrophytic Vegetation Indicators:</p> <p><input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ <input type="checkbox"/> 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation¹ (Explain)</p> <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <p>Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u></p> <p>Remarks:</p>
---	--

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

Project/Site: Mustard seed City/County: Olympia, Pierce Sampling Date: 4/30/19
 Applicant/Owner: WA State: WA Sampling Point: SP 3
 Investigator(s): TP Section, Township, Range: 36 19N, 01E
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Everett - Spawaway - Spava NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>10 m</u>) 1. _____ 2. _____ 3. _____ 4. _____ <u>Sapling/Shrub Stratum</u> (Plot size: <u>5 m</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ <u>Herb Stratum</u> (Plot size: <u>2 m</u>) 1. <u>Phalaris arundinacea</u> <u>95</u> <u>Y</u> <u>FACW</u> 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ <u>Woody Vine Stratum</u> (Plot size: _____) 1. _____ 2. _____ % Bare Ground in Herb Stratum _____	Absolute % Cover Dominant Indicator Species? Status = Total Cover = Total Cover = Total Cover = Total Cover	<p>Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>1</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)</p> <p>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 = _____</p> <p>Hydrophytic Vegetation Indicators:</p> <ul style="list-style-type: none"> ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is $\leq 3.0^1$ ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants¹ ___ Problematic Hydrophytic Vegetation¹ (Explain) <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p>
		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
Remarks:		

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

Project/Site: Mustard seed City/County: Dupont / Pierce Sampling Date: 4/30
 Applicant/Owner: _____ State: WA Sampling Point: SP4
 Investigator(s): RP Section, Township, Range: 36, 19N, 01 E
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Convex Slope (%): _____
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Forest - Sparsely - Sparsa NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (AB)	
1.	_____	_____	_____			
2.	_____	_____	_____			
3.	_____	_____	_____			
4.	_____	_____	_____			
Sapling/Shrub Stratum (Plot size: <u>5 m</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 = _____			
1. <u>Salix hookeriana</u>	<u>20</u>	<u>Y</u>			<u>FACW</u>	
2.	_____	_____			_____	
3.	_____	_____			_____	
4.	_____	_____			_____	
Herb Stratum (Plot size: _____)		= Total Cover	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			
1. <u>RUBI</u>	<u>25</u>	<u>Y</u>			<u>FAC</u>	
2. <u>Jewel weed? Impatiens spp.</u>	<u>35</u>	<u>Y</u>			<u>FACW</u>	
3. <u>Phalaris arundinacea</u>	<u>45</u>	<u>Y</u>			<u>FACW</u>	
4.	_____	_____			_____	
5.	_____	_____			_____	
6.	_____	_____			_____	
7.	_____	_____			_____	
8.	_____	_____			_____	
9.	_____	_____			_____	
10.	_____	_____			_____	
11.	_____	_____	_____			
Woody Vine Stratum (Plot size: _____)		= Total Cover	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____			
1.	_____	_____			_____	
2.	_____	_____	_____			
% Bare Ground in Herb Stratum _____		= Total Cover	Remarks:			

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

Project/Site: Mustard Seed City/County: Imperial / Pierce Sampling Date: 4/30

Applicant/Owner: _____ State: WA Sampling Point: 3P5

Investigator(s): TP Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Concave Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Everett - Sprawaway - Spruce NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

VEGETATION – Use scientific names of plants.

<p><u>Tree Stratum</u> (Plot size: <u>10 in</u>)</p> <p>1. _____ 2. _____ 3. _____ 4. _____</p> <p><u>Sapling/Shrub Stratum</u> (Plot size: <u>5 in</u>)</p> <p>1. <u>Scotch broom</u> 2. _____ 3. _____ 4. _____ 5. _____</p> <p><u>Herb Stratum</u> (Plot size: <u>2 in</u>)</p> <p>1. <u>Oxichid grass, Dactylis glomerata</u> 2. <u>Rubus</u> 3. <u>Gallium aparine</u> 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____</p> <p><u>Woody Vine Stratum</u> (Plot size: _____)</p> <p>1. _____ 2. _____</p> <p>% Bare Ground in Herb Stratum _____</p>	<p>Absolute % Cover Dominant Species? Indicator Status</p> <p>1. _____ 2. _____ 3. _____ 4. _____</p> <p>= Total Cover</p> <p>1. <u>Scotch broom</u> 2. _____ 3. _____ 4. _____ 5. _____</p> <p>= Total Cover</p> <p>1. <u>Oxichid grass, Dactylis glomerata</u> 2. <u>Rubus</u> 3. <u>Gallium aparine</u> 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____</p> <p>= Total Cover</p> <p>1. _____ 2. _____</p> <p>= Total Cover</p> <p>Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>3</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)</p> <p>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)</p> <p>Prevalence Index = B/A = _____</p> <p>Hydrophytic Vegetation Indicators:</p> <ul style="list-style-type: none"> — 1 - Rapid Test for Hydrophytic Vegetation — 2 - Dominance Test is >50% — 3 - Prevalence Index is $\leq 3.0^1$ — 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) — 5 - Wetland Non-Vascular Plants¹ — Problematic Hydrophytic Vegetation¹ (Explain) <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <p>Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/></p> <p>Remarks:</p>
---	--

SOIL

Sampling Point: SP5

HYDROLOGY

Wetland Hydrology Indicators:

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

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Surface Soil Cracks (B6)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

Secondary Indicators (2 or more required)

<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B)
<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C)
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:

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

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

Saturation Present? Yes No Depth (inches): _____
(includes capillary fringe)

Wetland Hydrology Present? Yes No

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

Remarks:

MUSTARD SEED LEGACY DEVELOPMENT, LLC

CRITICAL AREAS REPORT

APPENDIX D: WETLAND RATING FORM

Wetland name or number _____

RATING SUMMARY – Western Washington

Name of wetland (or ID #): _____ Date of site visit: _____

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

HGM Class Used for Rating _____ Unit has multiple HGM classes? Y N

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

Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY _____ (based on functions or special characteristics)

1. Category of wetland based on FUNCTIONS

_____ Category I - Total score = 23 – 27

_____ Category II - Total score = 20 - 22

_____ Category III - Total score = 16 - 19

_____ Category IV – Total score = 9 - 15

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

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY			
Estuarine	I II			
Wetland with high conservation value	I			
Bog	I			
Mature Forest	I			
Old Growth Forest	I			
Coastal Lagoon	I II			
Interdunal	I II III IV			
None of the above				

Wetland name or number _____

Maps and figures required to answer questions correctly (Western Washington).

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D1.4	
Boundary of 150 ft buffer (<i>can be added to another figure</i>)	D 2.2, D 5.2	
Polygon of area 1km from wetland edge - Including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	D 3.1, D 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of 150 ft buffer (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Polygon of area 1km from wetland edge -Including polygons for accessible habitat and undisturbed habitat	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	R 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake-fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of 150 ft buffer (<i>can be added to another figure</i>)	L 2.2	
Polygon of area 1km from wetland edge (Including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	L 3.1	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants (<i>can be added to figure above</i>)	S 4.1	
Boundary of 150 ft buffer (<i>can be added to another figure</i>)	S 2.1, S 5.1	
Polygon of area 1km from wetland edge (Including polygons for accessible habitat and undisturbed habitat)	H 2.1, H2.2	
Screen capture of map of 303d listed waters in basin (from Ecology web site)	S 3.1, S 3.2	
Screen capture of list of TMDL's for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetlands in Western Washington

For questions 1-7 the criteria described must apply to the entire unit being rated.

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

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO – go to 2

YES – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

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 an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3

YES – The wetland class is **Flats**

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

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

The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 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**?

NO - go to 5

YES – The wetland class is **Slope**

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

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

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

The overbank flooding occurs at least once every two years.

Wetland name or number _____

NO - go to 6

YES – The wetland class is **Riverine**

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

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

NO – go to 7

YES – The wetland class is **Depressional**

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

NO – go to 8

YES – The wetland class is **Depressional**

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

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

HGM Classes Within the Wetland Unit Being Rated	HGM Class to Use in Rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake-fringe	Depressional
Riverine + Lake-fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

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

Wetland name or number _____

DEPRESSATIONAL AND FLATS WETLANDS

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

D 1.0 Does the wetland unit have the potential to improve water quality?

D 1.1 Characteristics of surface water flows out of the wetland:

Unit is a depression or “flat depression” (QUESTION 7 on key) with no surface water leaving it (no outlet) points =3

Unit has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2

Unit has an unstricted, or slightly constricted, surface outlet that is permanently flowing points = 1

Unit is a “flat” depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1

D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions)

YES: points = 4

NO: points = 0

D 1.3 Characteristics of persistent plants (emergent, shrub, and/or forest Cowardin class)

Unit has persistent, ungrazed, plants \geq 95% of area points = 5

Unit has persistent, ungrazed, plants \geq 1/2 of area points = 3

Unit has persistent, ungrazed plants \geq 1/10 of area points = 1

Unit has persistent, ungrazed plants $<$ 1/10 of area points = 0

D 1.4 Characteristics of seasonal ponding or inundation

This is the area of the wetland unit that is ponded for at least 2 months. See description in manual.

Area seasonally ponded is $>$ 1/2 total area of wetland points = 4

Area seasonally ponded is $>$ 1/4 total area of wetland points = 2

Area seasonally ponded is $<$ 1/4 total area of wetland points = 0

Total for D 1

Add the points in the boxes above

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

D 2.0 Does the landscape have the potential to support the water quality function at the site?

D 2.1 Does the Wetland unit receive stormwater discharges? Yes = 1 No = 0

D 2.2 Is $>$ 10% of the buffer within 150 ft of wetland unit in land uses that generate pollutants Yes = 1 No = 0

D 2.3 Are there septic systems within 250 ft of the wetland unit? Yes = 1 No = 0

D 2.4 Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1 – D 2.3?
Source _____ Yes = 1 No = 0

Total for D 2

Add the points in the boxes above

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

D 3.0 Is the water quality improvement provided by the site valuable to society?

D 3.1 Does the unit discharge directly (i.e.. within 1 mile) to a stream, river, or lake that is on the 303d list? Yes = 1 No = 0

D 3.2 Is the unit in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0

D 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? (answer YES if there is a TMDL for the basin in which unit is found) Yes = 2 No = 0

Total for D 3

Add the points in the boxes above

Rating of Value If score is: **2-4 = H 1 = M 0 = L** Record the rating on the first page

Wetland name or number _____

DEPRESSATIONAL AND FLATS WETLANDS

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

D 4. 0 Does the wetland unit have the potential to reduce flooding and erosion?		
D 4.1 Characteristics of surface water flows out of the wetland:		
Unit is a depression or “flat depression” with no surface water leaving it (no outlet)	points = 4	
Unit has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Unit is a “flat” depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
Unit has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	
D 4.2 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 if dry, the deepest part.</i>		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
The wetland is a “headwater” wetland”	points = 3	
Unit is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 inches)	points = 0	
D 4.3 Contribution of unit to storage in the watershed <i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i>		
The area of the basin is less than 10 times the area of the unit	points = 5	
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
Entire unit is in the FLATS class	points = 5	
Total for D 4	Add the points in the boxes above	

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

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

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

D 6.0 Are the hydrologic functions provided by the site valuable to society?		
D 6.1 The unit is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.		
<ul style="list-style-type: none"> • The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g., salmon redds), <ul style="list-style-type: none"> ○ Damage occurs in sub-basin that is immediately down-gradient of unit. points = 2 ○ Damage occurs in a sub-basin further down-gradient. points = 1 • Flooding from groundwater is an issue in the sub-basin. points = 1 • The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why _____ points = 0 • There are no problems with flooding downstream of the unit. points = 0 		
D 6.2 Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2	No = 0
Total for D 6	Add the points in the boxes above	

Rating of Value If score is: **2 - 4 = H** **1 = M** **0 = L** Record the rating on the first page

Wetland name or number _____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat.

H 1. Does the wetland unit have the potential to provide habitat for many species?

H 1.1 Structure of plant community – *indicators are Cowardin classes and layers in forest*. Check the Cowardin plant classes in unit – *Polygons for each class must total ¼ acre, or more than 10% of the unit if it is smaller than 2.5 acres*.
Add the number of structures checked

<input type="checkbox"/> Aquatic bed	4 structures or more	points = 4
<input type="checkbox"/> Emergent plants	3 structures	points = 2
<input type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover)	2 structures	points = 1
<input type="checkbox"/> Forested (areas where trees have > 30% cover)	1 structure	points = 0

If the unit has a forested class check if:

The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon

H 1.2. Hydroperiods

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

<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3
<input type="checkbox"/> Seasonally flooded or inundated	3 types present	points = 2
<input type="checkbox"/> Occasionally flooded or inundated	2 types present	points = 1
<input type="checkbox"/> Saturated only	1 type present	points = 0
<input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland		
<input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland		
Lake-fringe wetland = 2 points		
Freshwater tidal wetland = 2 points		

H 1.3. Richness of Plant Species

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

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

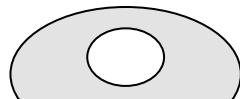
If you counted:	> 19 species	points = 2
	5 - 19 species	points = 1
	< 5 species	points = 0

H 1.4. Interspersion of habitats

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



None = 0 points

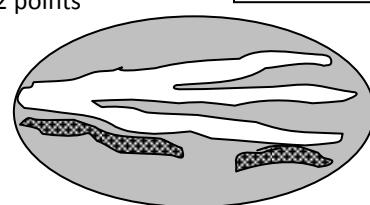


Low = 1 point

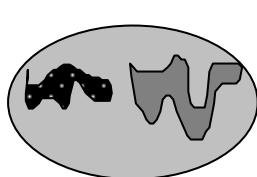


Moderate = 2 points

NOTE: If you have four or more classes or three plants classes and open water the rating is always "high."



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



Wetland name or number _____

<p>H 1.5. Special Habitat Features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points</i></p> <p><input type="checkbox"/> Large, downed, woody debris within the unit (>4 inches diameter and 6 ft long).</p> <p><input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) within the unit</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2m) and/or overhanging plants 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 weathered where wood is exposed</i>)</p> <p><input type="checkbox"/> At least ¼ acre of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated. (<i>structures for egg-laying by amphibians</i>)</p> <p><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)</p>		
<p>H 1. TOTAL Score - potential for providing habitat</p>		

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

<p>H 2.0 Does the landscape have the potential to support habitat at the site?</p>										
<p>H 2.1 Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2] = _____</p>										
<p>If total accessible habitat is:</p> <table> <tr> <td>> 1/3 (33.3%) of 1 km circle (~100 hectares or 250 acres)</td> <td>points = 3</td> </tr> <tr> <td>20 - 33% of 1 km circle</td> <td>points = 2</td> </tr> <tr> <td>10 - 19% of 1 km circle</td> <td>points = 1</td> </tr> <tr> <td><10% of 1 km circle</td> <td>points = 0</td> </tr> </table>		> 1/3 (33.3%) of 1 km circle (~100 hectares or 250 acres)	points = 3	20 - 33% of 1 km circle	points = 2	10 - 19% of 1 km circle	points = 1	<10% of 1 km circle	points = 0	
> 1/3 (33.3%) of 1 km circle (~100 hectares or 250 acres)	points = 3									
20 - 33% of 1 km circle	points = 2									
10 - 19% of 1 km circle	points = 1									
<10% of 1 km circle	points = 0									
<p>H 2.2 Undisturbed habitat in 1 km circle around unit.</p> <table> <tr> <td>Undisturbed habitat > 50% of circle</td> <td>points = 3</td> </tr> <tr> <td>Undisturbed habitat 10 - 50% and in 1-3 patches</td> <td>points = 2</td> </tr> <tr> <td>Undisturbed habitat 10 - 50% and > 3 patches</td> <td>points = 1</td> </tr> <tr> <td>Undisturbed habitat < 10% of circle</td> <td>points = 0</td> </tr> </table>		Undisturbed habitat > 50% of circle	points = 3	Undisturbed habitat 10 - 50% and in 1-3 patches	points = 2	Undisturbed habitat 10 - 50% and > 3 patches	points = 1	Undisturbed habitat < 10% of circle	points = 0	
Undisturbed habitat > 50% of circle	points = 3									
Undisturbed habitat 10 - 50% and in 1-3 patches	points = 2									
Undisturbed habitat 10 - 50% and > 3 patches	points = 1									
Undisturbed habitat < 10% of circle	points = 0									
<p>H 2.3 Land use intensity in 1 km circle. If: > 50% of circle is high intensity land use points = (- 2) < =50% of circle is high intensity points = 0</p>										
<p>Total for H 2 Add the points in the boxes above</p>										

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

<p>H 3.0 Is the Habitat provided by the site valuable to society?</p>		
<p>H3.1 Does the site provides habitat for species valued in laws, regulations or policies? (<i>choose only the highest score</i>)</p>		
<p>Site meets ANY of the following criteria:</p> <ul style="list-style-type: none"> • It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) • It is a “priority area” for an individual WDFW species • It is a Wetland With a High Conservation Value as determined by the Department of Natural Resources • It has 3 or more priority habitats within 100m (see next page) • It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan 		points = 2
<p>Site has 1 or 2 priority habitats within 100m (see next page)</p>		points = 1
<p>Site does not meet any of the criteria above</p>		points = 0

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

Wetland name or number _____

WDFW Priority Habitats

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

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

Aspen Stands: Pure or mixed stands of aspen greater than 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%; 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 – see web link above*).

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

Westside Prairies: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

Nearshore: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).

Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

Cliffs: Greater than 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.

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

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

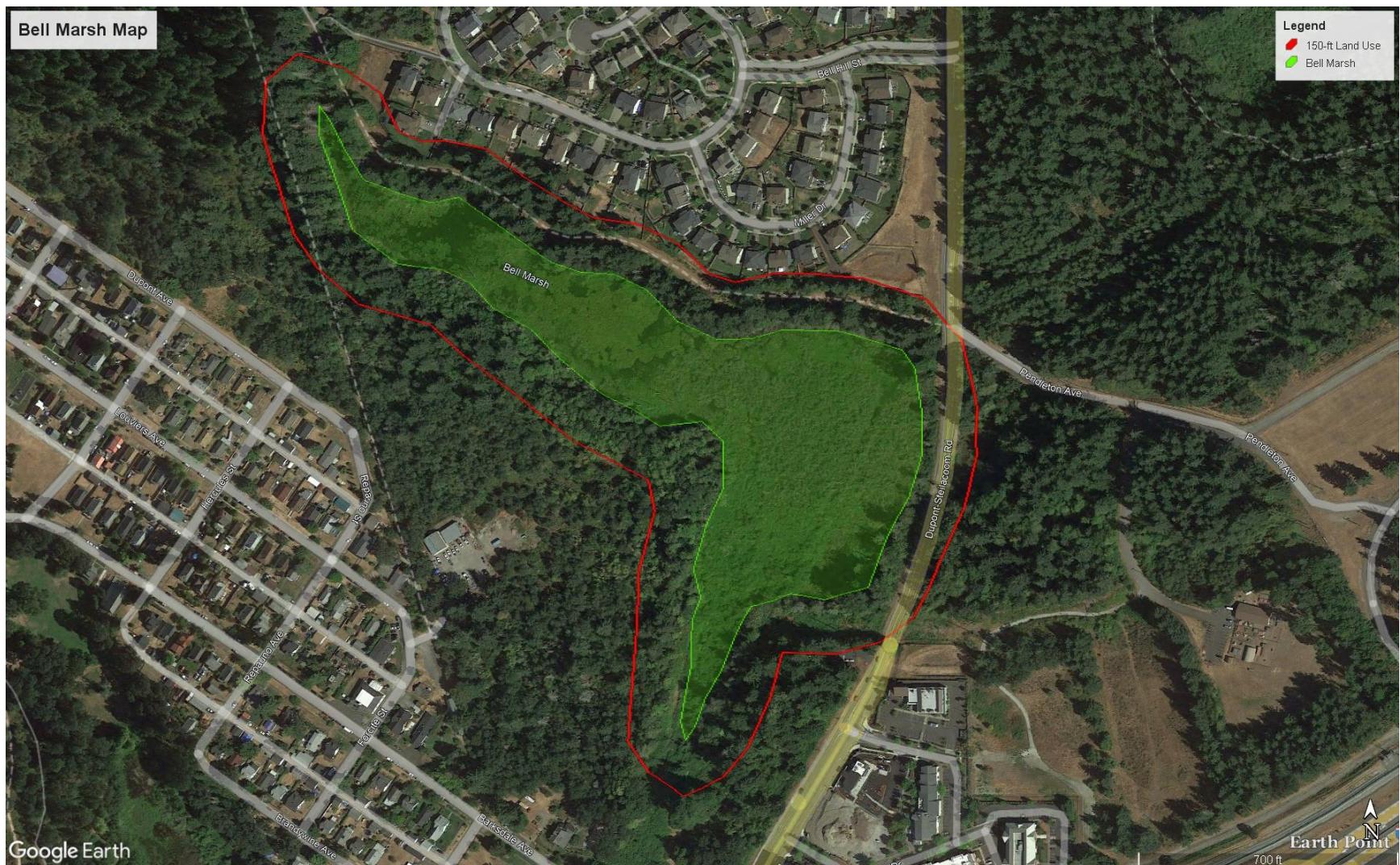
Wetland Type	Category
SC 1.0 Estuarine wetlands Does the wetland unit meet the following criteria for Estuarine wetlands? <ul style="list-style-type: none"> — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt. 	
YES = Go to SC 1.1 NO not an estuarine wetland	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? 	YES = Category I NO go to SC 1.2
	Cat. I
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? <ul style="list-style-type: none"> — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25) — At least ¼ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. 	YES = Category I NO = Category II
	Cat. I Cat. II
SC 2.0 Wetlands with High Conservation Value (WHCV) SC 2.1 Has the Department of Natural Resources updated their web site to include the list of Wetlands with High Conservation Value? 	YES - Go to SC 2.2 NO – Go to SC 2.3
SC 2.2 Is the wetland unit you are rating listed on the DNR database as having a High Conservation Value? 	YES = Category I NO = not a WHCV
SC 2.3 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf	
YES – contact WNHP/DNR and go to SC 2.4 NO = not a WHCV	
SC 2.4 Has DNR identified the wetland within the S/T/R as a wetland with High Conservation value and is listed on their web site? 	YES = Category I NO = not an WHCV
SC 3.0 Bogs 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. If you answer YES you will still need to rate the wetland based on its functions.</i>	
SC 3.1 Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? 	YES - go to Question SC 3.3 NO - go to Question SC 3.2
SC 3.2 Does an area within the wetland unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? 	YES - go to Question SC 3.3 NO - Is not a bog
SC 3.3 Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? 	YES – Is a Category I BOG NO - go to Question SC 3.4
NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species are present in Table 4, the wetland is a bog.	
SC 3.4 Is an area with peats or mucks forested (> 30% cover) with Sitka Spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy. 	YES – Is a Category I BOG NO - Is not a bog
	Cat. I

Wetland name or number _____

<p>SC 4.0 Forested Wetlands</p> <p>Does the wetland unit have at least <u>1 contiguous acre</u> 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> <ul style="list-style-type: none"> — Old-growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/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. — Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 inches (53cm). <p style="text-align: center;">YES = Category I NO - not a forested wetland for this section</p>	Cat. I
<p>SC 5.0 Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>) <p style="text-align: center;">YES = Go to SC 5.1 NO- not a wetland in a coastal lagoon</p> <p>SC 5.1 Does the wetland meets all of the following three conditions?</p> <ul style="list-style-type: none"> — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 99). — At least $\frac{1}{4}$ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than 1/10 acre (4350 square feet) <p style="text-align: center;">YES = Category I NO = Category II</p>	Cat. I Cat. II
<p>SC 6.0 Interdunal Wetlands</p> <p>Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p style="text-align: center;">YES - go to SC 6.1 NO - not an interdunal wetland for rating</p> <p><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> • Long Beach Peninsula- lands west of SR 103 • Grayland-Westport- lands west of SR 105 • Ocean Shores-Copalis- lands west of SR 115 and SR 109 <p>SC 6.1 Is the wetland one acre or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</p> <p style="text-align: center;">YES = Category I NO – go to SC 6.2</p> <p>SC 6.2 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger?</p> <p style="text-align: center;">YES = Category II NO – go to SC 6.3</p> <p>SC 6.3 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 style="text-align: center;">YES = Category III NO – Category IV</p>	Cat I Cat. II Cat. III Cat. IV
<p>Category of wetland based on Special Characteristics</p> <p>If you answered NO for all types enter "Not Applicable" on Summary Form</p>	











Pierce County

[Ecology homepage](#) > [Water & Shorelines](#) > [Water improvement](#) > [Total Maximum Daily Load process](#) > [Directory of projects](#) > Pierce County

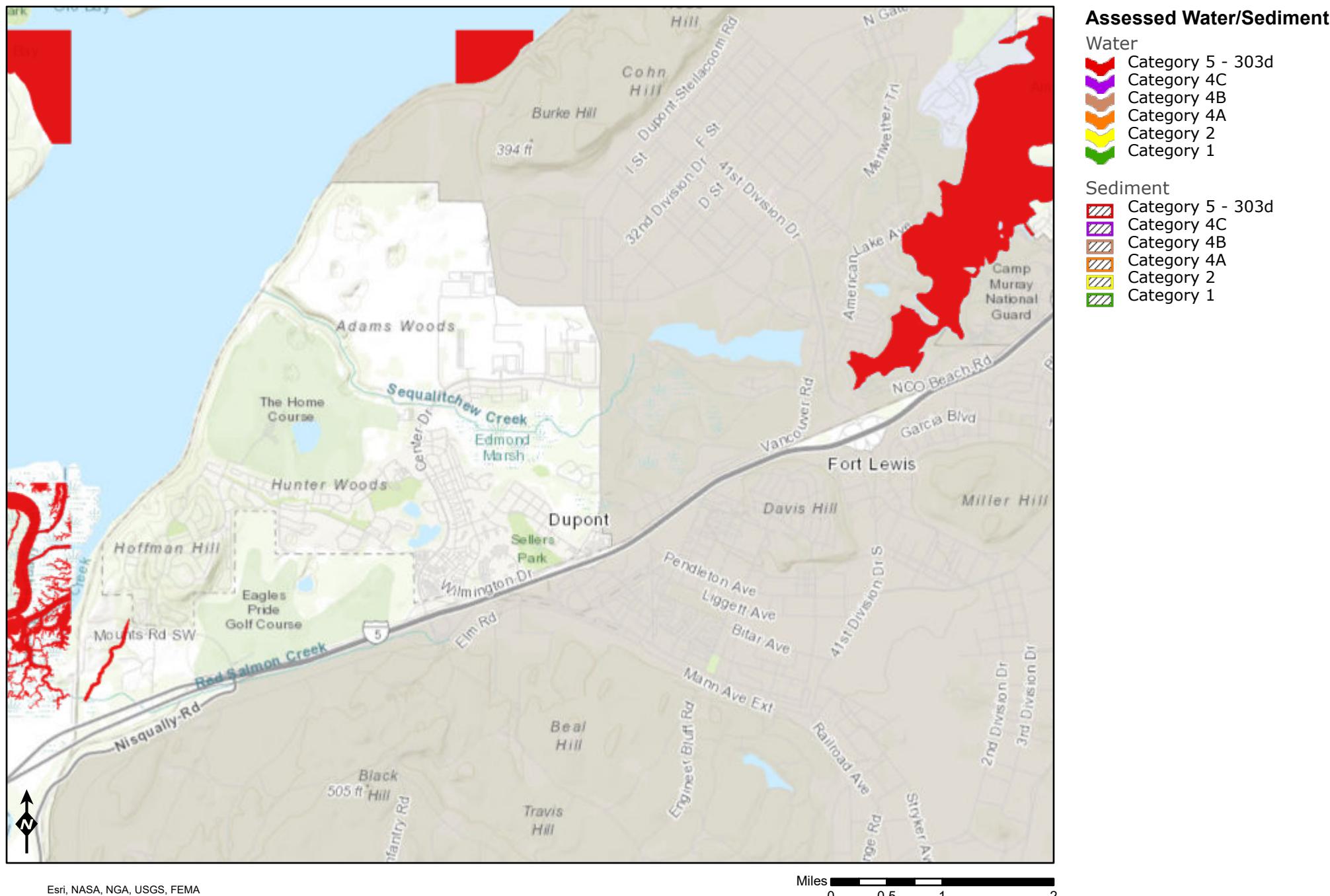
Water quality improvement projects

Select the waterbody or pollutant name to find more information about the specific project.

Waterbody Name(s)	Pollutant(s)	Status	Project Lead(s)
Clarks and Meeker Creeks	Dissolved Oxygen Sediment Fecal Coliform	EPA approved and Has an implementation plan	Donovan Gray 360-407-6407
Clover Creek	Dissolved Oxygen Fecal Coliform Temperature	Under development	Donovan Gray 360-407-6407
Commencement Bay	Dioxin	EPA approved	Donovan Gray 360-407-6407
Puyallup River Watershed	Fecal Coliform	EPA approved and Has implementation plan	Donovan Gray 360-407-6407
Puyallup River Watershed	Multi-parameter Ammonia-N BOD (5-day)	EPA approved	Donovan Gray 360-407-6407
Puyallup River: Upper White River	Sediment Temperature	EPA approved	Donovan Gray 360-407-6407
Puyallup River: Puyallup River Watershed> Lower White River	pH	Under development	Donovan Gray 360-407-6407
South Prairie Creek	Fecal Coliform Temperature	EPA approved and Has an implementation plan	Donovan Gray 360-407-6407
Wapato Lake	Total Phosphorus	EPA approved	Donovan Gray 360-407-6407

To request ADA accommodation, call Ecology at 360-407-7668, 711 (relay service), or 877-833-6341 (TTY). More about our [accessibility services](#).

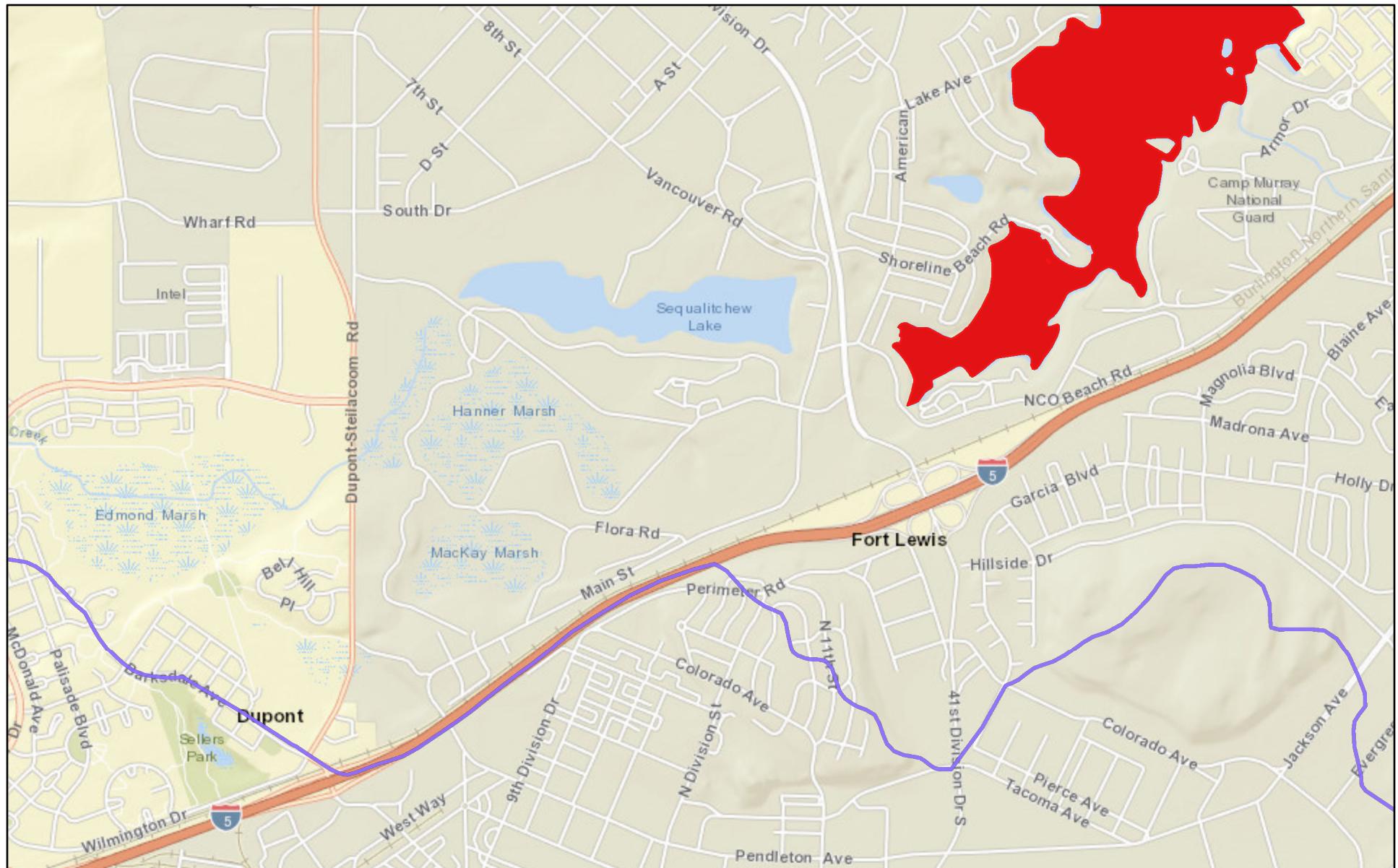
Bell Marsh 303(d) Map



MUSTARD SEED LEGACY DEVELOPMENT, LLC

CRITICAL AREAS REPORT

APPENDIX E: QUERIED DATABASE FIGURES

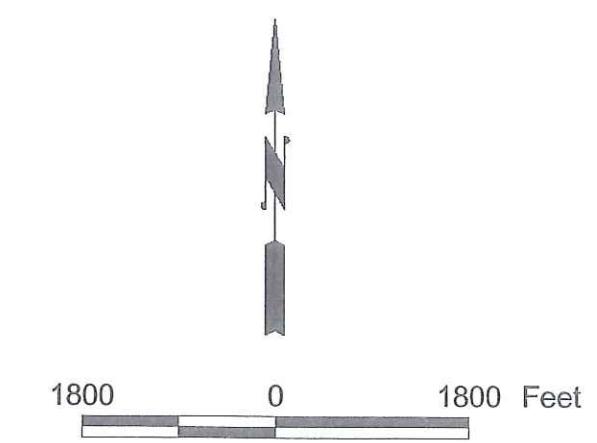
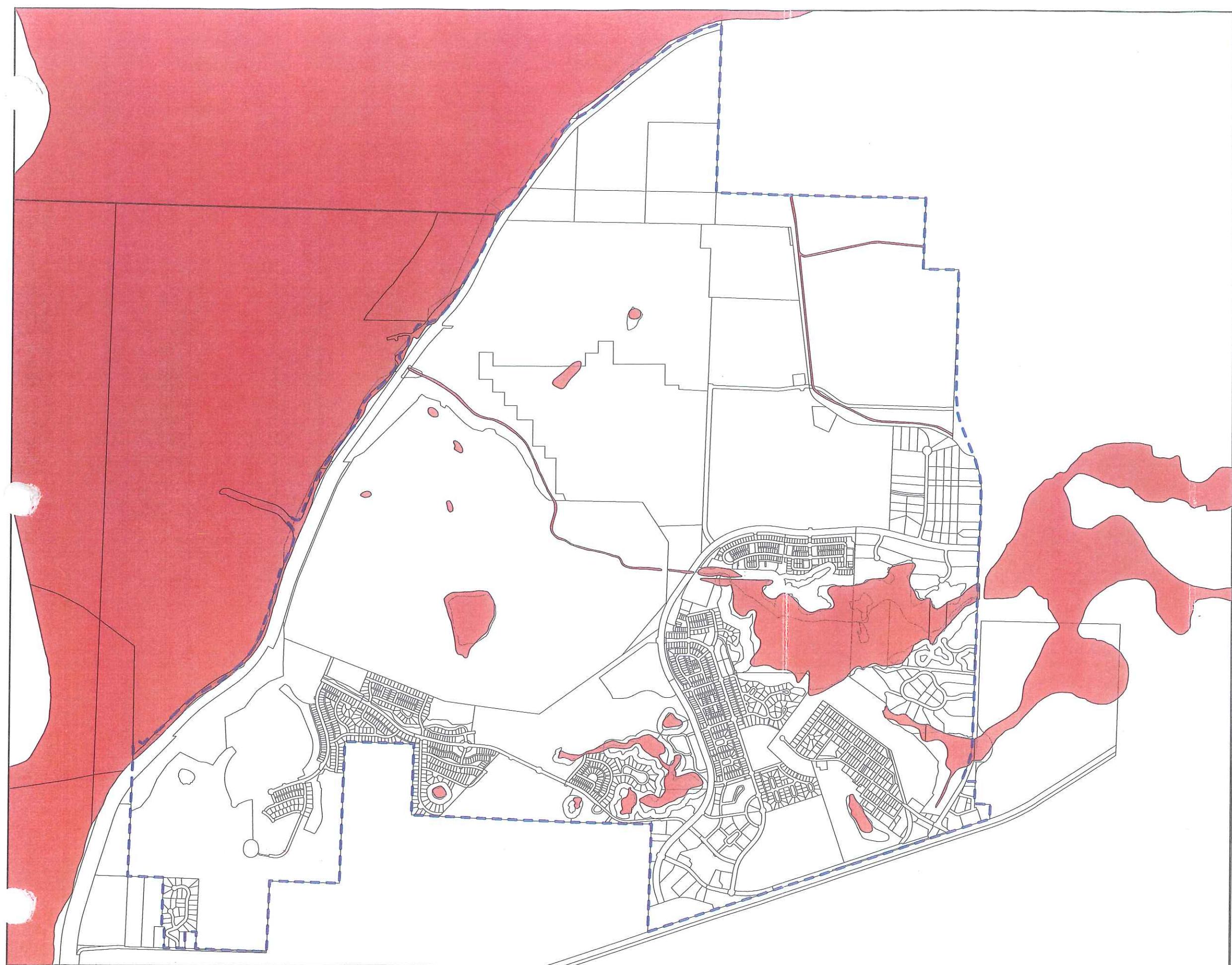


May 2, 2019

1:36,112

0 0.2 0.4 0.8 mi
0 0.33 0.65 1.3 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand),



CITY LIMITS (UGA)

FLOOD PLAIN:

100 YEAR

CITY OF DUPONT
WATER COMPREHENSIVE PLAN
FIGURE 1-4
FEMA 100 YEARS FLOOD PLAIN MAP


Gray & Osborne, Inc.
CONSULTING ENGINEERS, INC.

Forest Practice Activity Map

S26 T19.0N R01.0E, S36 T19.0N R01.0E, S35 T19.0N R01.0E
S25 T19.0N R01.0E

Application #: _____



Date: 5/2/2019

NAD 83

Time: 1:31:42 PM

Scale: 1:12,000

Contour Interval: 40 Feet



U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands



May 2, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

PRIORITY HABITATS AND SPECIES REPORT

SOURCE DATASET: PHSPlusPublic
REPORT DATE: 07/10/2019 10.53

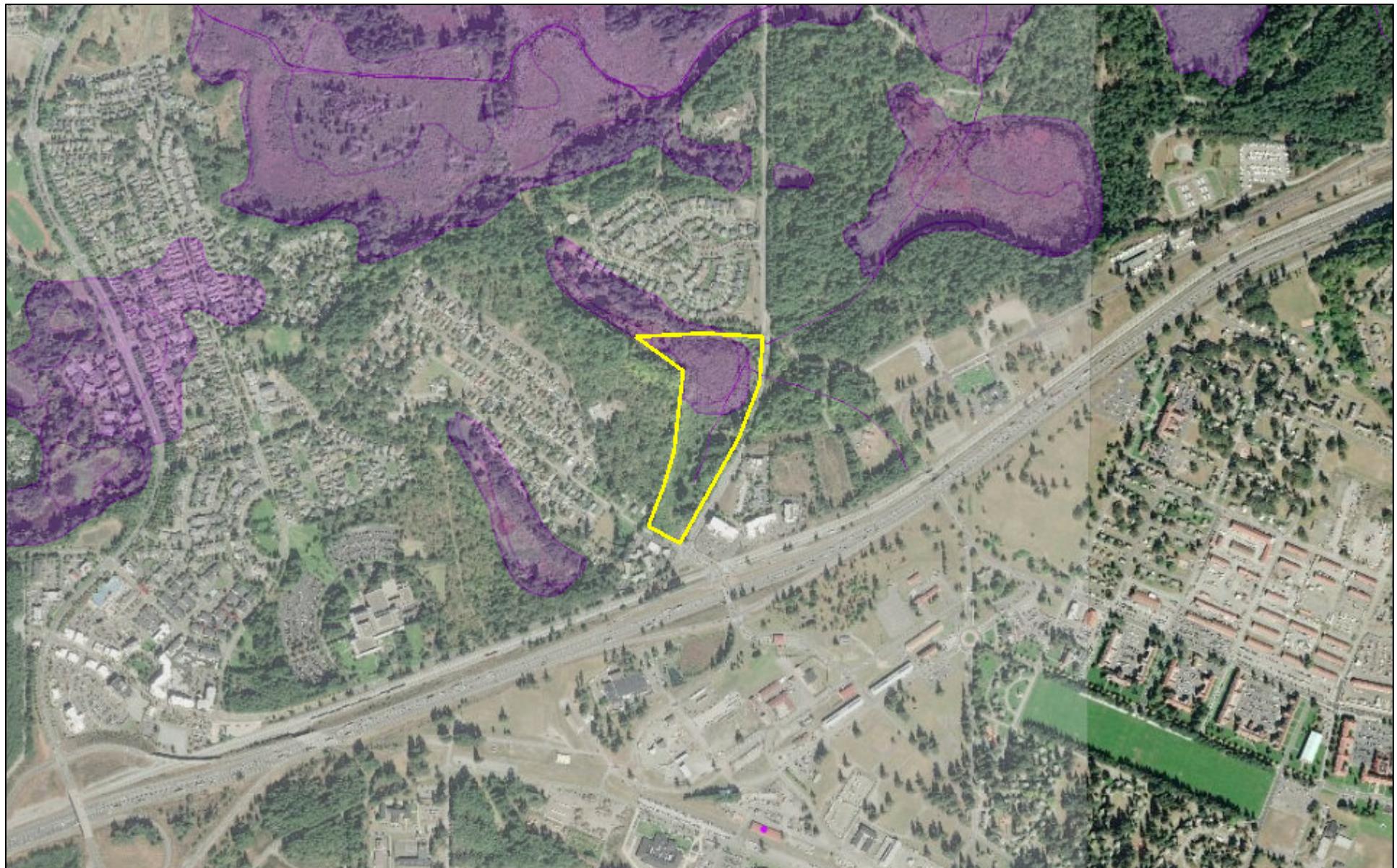
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Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Big brown bat Eptesicus fuscus	WS_OccurPoint 114876 April 30, 1992	Breeding Area Biotic detection http://wdfw.wa.gov/publications/pub.php?	Map 1:24,000 <= 40	N/A N/A PHS LISTED	Y TOWNSHIP	WA Dept. of Fish and Wildlife Points
Big brown bat Eptesicus fuscus	WS_OccurPoint 147563 July 18, 2018	Breeding Area Biotic detection http://wdfw.wa.gov/publications/pub.php?	GPS	N/A N/A PHS LISTED	Y TOWNSHIP	WA Dept. of Fish and Wildlife Points
Big brown bat Eptesicus fuscus	WS_OccurPoint 114875 June 01, 2010	Breeding Area Biotic detection http://wdfw.wa.gov/publications/pub.php?	GPS	N/A N/A PHS LISTED	Y TOWNSHIP	WA Dept. of Fish and Wildlife Points
Freshwater Emergent	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Freshwater Forested/Shrub	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Freshwater Forested/Shrub	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa.	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Little Brown Bat Myotis lucifugus	WS_OccurPoint 131068 August 12, 2012	Breeding Area Biotic detection http://wdfw.wa.gov/publications/pub.php?	GPS	N/A N/A PHS LISTED	Y TOWNSHIP	WA Dept. of Fish and Wildlife Points

Common Name Scientific Name	Site Name Source Dataset Source Record	Priority Area Occurrence Type More Information (URL)	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Notes	Source Date	Mgmt Recommendations				
Resident Coastal Cutthroat <i>Oncorhynchus clarki</i>	SWIFD 49801	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Resident Coastal Cutthroat <i>Oncorhynchus clarki</i>	SWIFD 49930	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Waterfowl Concentrations	PIERCE COUNTY - NON PHSREGION 902564	Regular Concentration Regular concentration http://wdfw.wa.gov/publications/pub.php?	1/4 mile (Quarter)	N/A N/A PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Polygons
Wetlands	SEQUALICHEW CREEK PHSREGION 902594	Aquatic Habitat N/A http://www.ecy.wa.	1/4 mile (Quarter)	N/A N/A PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Polygons
<i>Yuma myotis</i> <i>Myotis yumanensis</i>	WS_OccurPoint 131069 August 12, 2012	Breeding Area Biotic detection http://wdfw.wa.gov/publications/pub.php?	GPS	N/A N/A PHS LISTED	Y TOWNSHIP	WA Dept. of Fish and Wildlife Points

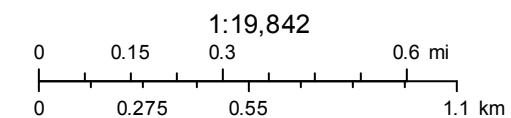
DISCLAIMER. This report includes information that the Washington Department of Fish and Wildlife (WDFW) maintains in a central computer database. It is not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife. This information only documents the location of fish and wildlife resources to the best of our knowledge. It is not a complete inventory and it is important to note that fish and wildlife resources may occur in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted. Site specific surveys are frequently necessary to rule out the presence of priority resources. Locations of fish and wildlife resources are subject to variation caused by disturbance, changes in season and weather, and other factors. WDFW does not recommend using reports more than six months old.

WDFW Test Map



July 10, 2019

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



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

PublicGIS





May 2, 2019

1:18,056

0 0.15 0.3 0.6 mi
0 0.25 0.5 1 km

— All SalmonScape Species

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
WDFW

Soil Map—Pierce County Area, Washington



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

7/10/2019
Page 1 of 3

MAP LEGEND**Area of Interest (AOI)**
 Area of Interest (AOI)
Soils
 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points
Special Point Features
 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features
Water Features
 Streams and Canals
Transportation
 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads
Background
 Aerial Photography
MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pierce County Area, Washington

Survey Area Data: Version 14, Sep 10, 2018

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

Date(s) aerial images were photographed: Apr 1, 2016—Sep 27, 2016

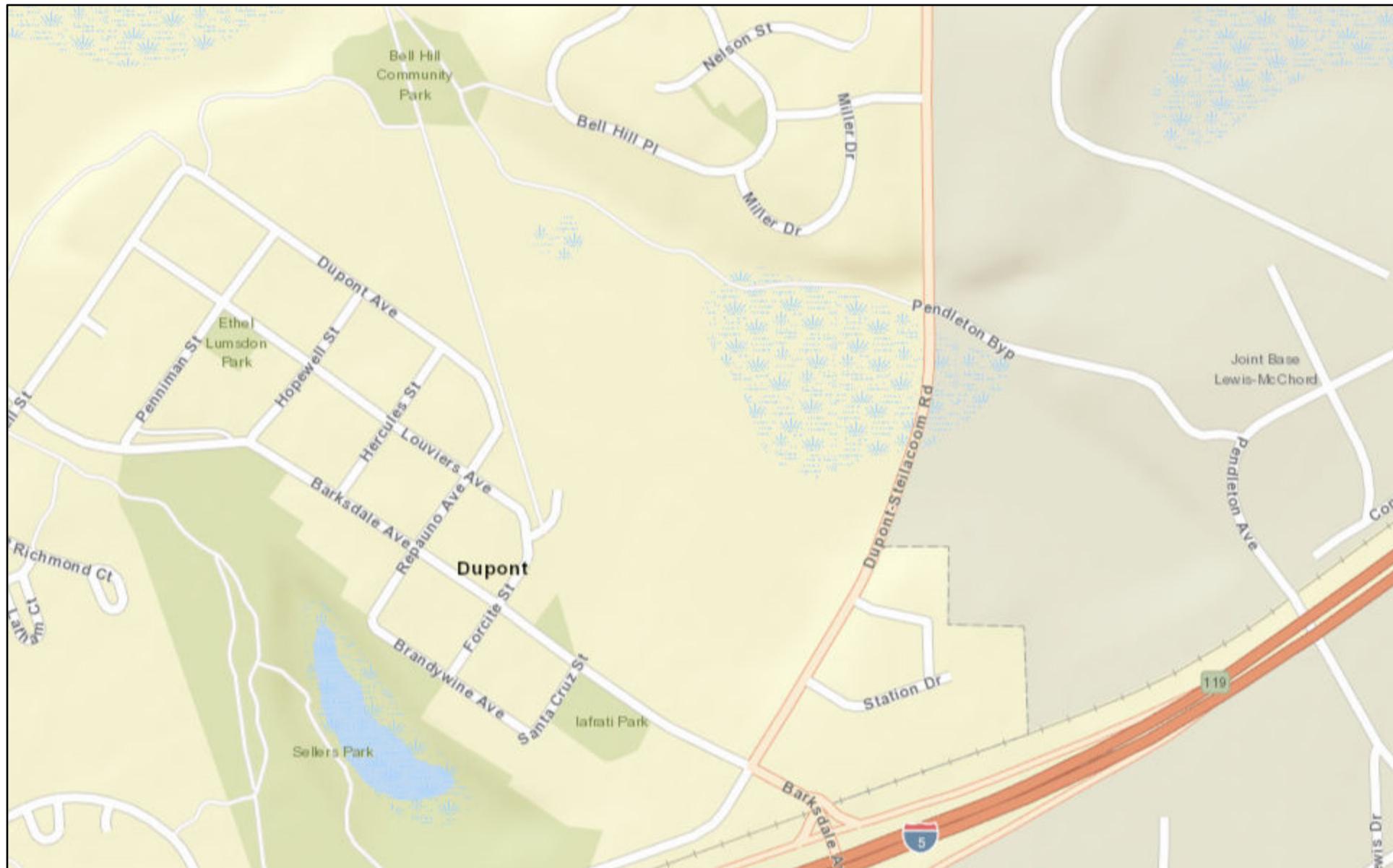
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
12A	Dupont muck	8.2	42.0%
41A	Spanaway gravelly sandy loam	1.5	7.4%
3112	Everett-Spanaway-Spana complex, 0 to 30 percent slopes	9.9	50.5%
Totals for Area of Interest		19.6	100.0%

WA Wetlands of High Conservation Value



7/23/2019, 10:42:14 AM

Counties

1:9,028

0 0.05 0.1 0.15 0.2 mi
0 0.07 0.15 0.2 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan,

Washington Natural Heritage Program

Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, NGA, USGS | U.S. Fish and Wildlife Service, National Standards and Support Team, wetlands_team@ fws.gov | Washington Natural Heritage Program <http://www.dnr.wa.gov/natural-heritage>

MUSTARD SEED LEGACY DEVELOPMENT, LLC

CRITICAL AREAS REPORT

APPENDIX F: SITE PHOTOGRAPHS

Photograph 1. Bell Marsh Wetland looking east toward project site



Photograph 2. Bell Marsh looking north along west side of the wetland



Photograph 3. Looking east from wetland toward project site



Photograph 4. Stream channel just downstream from concrete culvert apron (note chain link fence to left)



Figure 5. Stream channel within wetland looking downstream, project site to right

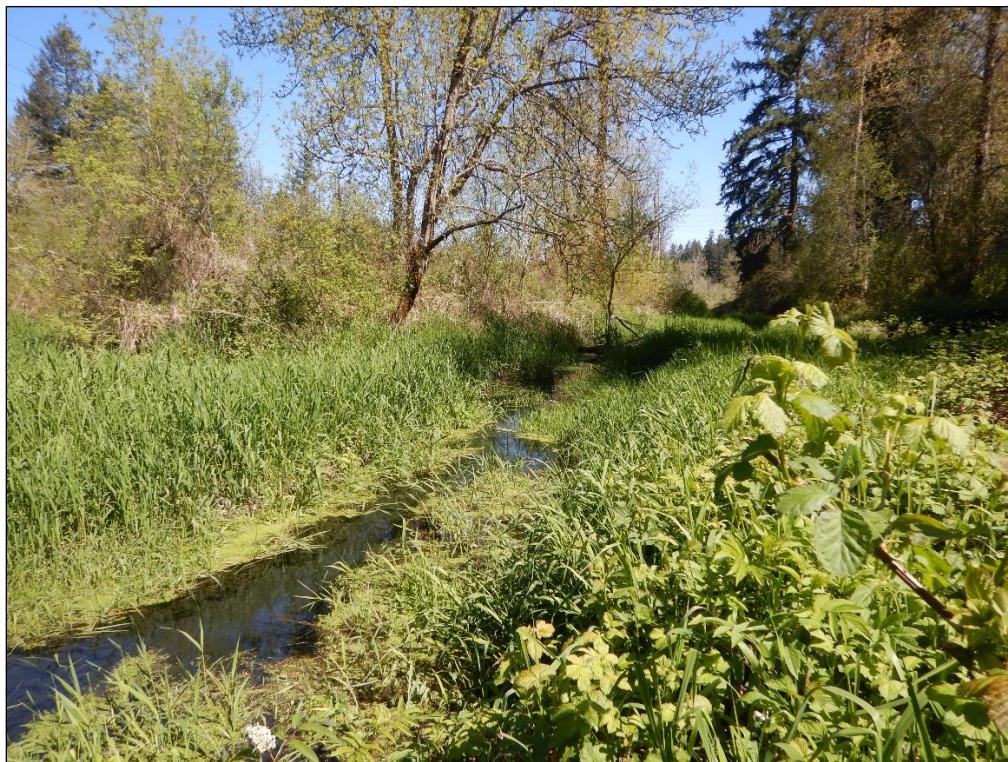


Figure 6. Wetland edge looking south, project site to left

