Memorandum

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To: Jenny Ngo, Senior Planner
City of Woodinville

From: Shelby Petro, Wetland Scientist
Kevin O'Brien, Senior Ecologist

Copies: Chad Weiser, File

Date: April 8, 2015

Subject: Modi Short Plat Third Party Wetland Review

Project No.: 32204L

Executive Summary

Otak conducted a site visit to the Modi parcel (#0622100060) in Woodinville, WA on March 30, 2015 to assess the wetland delineation conducted by ACERA in January 2014 (ACERA 2015). The Modi parcel contains a slope wetland, Wetland A. As a result of this site visit, Otak determined that the wetland delineation from ACERA did not include all areas within the parcel determined to be wetland. Otak recommends that the City of Woodinville require a supplemental wetland delineation to be conducted during the growing season to better define the boundaries of the wetland on the parcel.

Furthermore, Otak determined that ACERA's wetland rating was incorrect, as the on-site Wetland A rated as a Category III wetland based on Ecology's rating system (Hruby 2004) and a Class 1 wetland based on Woodinville Municipal Code (WMC) 21.24.320(2)(a).

Document Review

Otak staff reviewed documentation provided by the City of Woodinville on March 25, 2015 to gain an understanding of the project and to review the methodology and results of the wetland assessment prepared by ACERA. These documents included:

- Stream and Wetland Assessment Report and Buffer Reduction Plan, prepared by ACERA, May 2014
- SEPA checklist for Modi Short Plat, dated June 9, 2014
- E-mail from Karen Walter (Muckleshoot Indian Tribe) to Jenny Ngo (City of Woodinville), *Modi Reasonable Use, ACE14001; SEP140123, Notice of Application*, December 9, 2014

- Stream and Wetland Assessment Report and Buffer Reduction Plan, prepared by ACERA, January 2015 (supersedes May 2014 Plan)
- Technical Memorandum, prepared by ACERA, *Response to City of Woodinville Additional Information Request for Modi Reasonable Use Permit (CAE14001 and SEP14023)*, January 24, 2015
- Preliminary Technical Information Report for the Modi Short Plat, Beyler Consulting, October 21, 2014, Revised February 18, 2015

Wetland Delineation

Otak generally agrees with the northern, eastern, and southern boundaries of ACERA's delineation of Wetland A from January 2014. In addition, the Ordinary High Water Mark (OHWM) flags appeared to be correctly placed to delimit the OHWM for Little Bear Creek. However, during the site visit on March 30, 2015, Otak determined that the western boundary of Wetland A extends beyond that of ACERA's delineation in January 2014. Evidence of wetland hydrology, soils, and obligate hydrophytic vegetation extend approximately 25-feet upslope from the delineated wetland edge (see Appendix A, Photographs). These undelineated lobes of slope wetlands had numerous flow paths where groundwater expressed to the surface and flowed downslope into Wetland A and eventually to Little Bear Creek. The soils were inundated with standing water in some areas, and were saturated to the surface in areas that did not contain standing water. These undelineated wetland lobes were lined with skunk cabbage (*Lysichitum americanum*), an obligate wetland species, and surrounded by other dominant facultative species including salmonberry (*Rubus spectabilis*) and false lily of the valley (*Maianthemum dilatatum*) (Appendix B, Data Sheet). The Otak site visit was conducted during the growing season.

The observations of wetland conditions extending beyond the delineated wetland edge, particularly wetland hydrology, were corroborated by the Robinson Noble, Inc. geotechnical report for the site. Both the Test Pit 1 (TP-1) and Hand Augur 1 (HA-1) samples in the Robinson Noble report indicated moist or wet soils, containing a peat component, within 1.5 to 2.0 feet of the surface during their July sampling. Groundwater was encountered at depths of 2.0 to 3.0 feet during the sampling. The mapped locations of TP-1 and HA-1 are considerably upslope and outside of the boundaries of Wetland A delineated by ACERA. Groundwater levels would be expected to show on-site evidence of being higher during the spring growing season, outside of the summer months—further suggesting that Wetland A is more extensive than the current delineation indicates. In fact, the March 30, 2015 site visit by Otak determined that surface water was present at TP-1, along with skunk cabbage and clearly hydric soils.

Otak recommends that a supplemental delineation be conducted at the site during the growing season so that all areas that meet the Army Corps of Engineers (ACOE) definition of a wetland (USACE 1987) are included in the wetland delineation.

Wetland Rating

Otak disagrees with ACERA's rating of Wetland A as a Category IV slope wetland per Ecology (Hruby 2004) and as a Class 3 wetland per Woodinville Municipal Code (WMC) 21.24.320. Otak also disagrees with ACERA's rationale that a Class 3 wetland per WMC was the closest class to Ecology's Category 4 and that Wetland A is not a Class 1 wetland per WMC because it is "neither proximal (in the center of the creek); nor is it hydrologically influenced by Little Bear Creek" (ACERA 2015, pg 7).

WMC 21.24.320(1) states that "wetlands shall be rated similarly to the Department of Ecology Wetland Rating System found in the Washington State Wetland Rating System document, Western Washington, Ecology Publication No. 93-74." Publication No. 93-74 is the rating system published by Ecology in 1997 and has been superseded by the 2004 revision (Hruby 2004). As the WMC states that wetlands shall be rated *similarly* to the 1997 system, Otak used the 2004 revised system to rate the wetland on site. The 2004 revised system was the rating system used by ACERA to rate Wetland A, as well. In order to provide consistency, Wetland A was rated as a slope wetland type, per the ACERA classification.

Otak determined that Wetland A is a Category III slope wetland per Ecology (Appendix C, Wetland Rating Form). Wetland A has the opportunity for water quality improvement as it intercepts both surface runoff and groundwater that flows between adjacent residential units and Little Bear Creek. Wetland A also provides hydrologic functions as it is located within the floodplain of Little Bear Creek, which has known flooding problems downstream of the site. During large flood events when water extends into the floodplain, the portion of Wetland A closest to the creek will be inundated with floodwaters and will slow and store water during and after the event. Wetland A, including the undelineated lobes that extend upslope of the delineated boundary, provides a moderately interspersed habitat with scrub-shrub and emergent strata and multiple water regimes throughout the wetland. Located within the landscape adjacent to Little Bear Creek and within the floodplain and vegetated corridor associated with Little Bear Creek, Wetland A has the opportunity to provide habitat for a number of wildlife species that rely on wetland and riparian habitat.

Otak further determined that Wetland A is a Class 1 wetland per WMC 21.24.320(1)(a). "Class 1 wetlands are those wetlands that meet any of the following criteria: (*i*) Documented habitat for Federal or State listed endangered or threatened fish, animal, or plant species; or (*ii*) Wetlands documents as high quality habitats in the natural Heritage Information System; or (*iii*) Wetlands of exceptional local significance or irreplaceable ecological functions, including sphagnum bogs and fens or natural forest swamps; or (*iv*) Wetlands proximal to and influenced by the main stem of the Sammamish River or Little Bear Creek" (WMC 21.24.320(1)(a). Wetland A does not meet the criteria *i-iii* for a Class 1 wetland; however, Wetland A meets criteria *iv* as it is proximal to Little Bear Creek and influenced by Little Bear Creek. Slope river proximal wetlands are those wetlands that are upslope of riverine wetlands or those that are positioned in the landscape "immediately above the

floodprone area of the active river channel" and extend 200' upslope (Powell *et al.* 2003). Slope riverine proximal wetlands also "have surface or shallow subsurface hydrologic connections with the river" (Lee *et al.* 2008). Wetland A occurs within the 100-year floodplain of Little Bear Creek, immediately above and well within the floodprone area of the active channel. Wetland A is subject to inundation from flood flows and will provide flood storage functions during such flooding events. Furthermore, Wetland A is fed by groundwater surfacing along the slope and discharges into Little Bear Creek with both a surface and subsurface hydrologic connection (Appendix A, Photograph 6). During the site visit, shallow subsurface water flowing from Wetland A into Little Bear Creek was observed. In addition, clear evidence of a surface water connection between Wetland A and Little Bear Creek was noted as small channelization and rills leading from Wetland A directly into Little Bear Creek.

As a result of the site visit, Otak confirmed the proximity and hydrologic connection between Wetland A and Little Bear Creek. Otak determined that Wetland A rated as a Category III wetland based on Ecology's rating system (Hruby 2004) and a Class 1 wetland based on WMC 21.24.320(2)(a).

References

ACERA. January 2015. *Stream and Wetland Assessment Report and Buffer Reduction Plan.*

Hruby, T. 2004. *Washington State Wetland Rating System for Western Washington – Revised.* Washington State Department of Ecology Publication # 04-06-15. http://www.ecy.wa.gov/pubs/0406025.pdf

Lee, L.C., K.L Fetherston, A.K. Know, and P.L. Fiedler. 2008. *Draft Guidebook to Assessment of Riverine, Slope and Depressional Waters/Wetlands in the City of Mount Vernon, Washington.* Prepared for the City of Mount Vernon by WSP Environment & Energy.

Powel, J. E., D'Amore, D.V., Thompson, R., Huberth P., Bigelow, B., Walter, M. T., and Brock, T. *Wetland Functional Assessment Guidebook, Operational Draft Guidebook for Assessing the Functions for Riverine and Slope River Proximal Wetlands in Coastal Southeast and Southcentral Alaska Using the HGM Approach.* State of Alaska Department of Environmental Conservation June 2003/U.S. Army Corps of Engineers Waterways Experiment Station Technical Report: WRP-DE-__.

USACE. 1987. US Army Corps of Engineers. *Corps of Engineers Wetland Delineation Manual.* Environmental Laboratory Wetlands Research Program Technical Report Y-87-1, U.S. Army Corps of Engineers, Engineer Waterways Experiment Station, Vicksburg, Mississippi.

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

Woodinville Municipal Code (WMC). Accessed April 2015.
http://www.codepublishing.com/wa/woodinville/

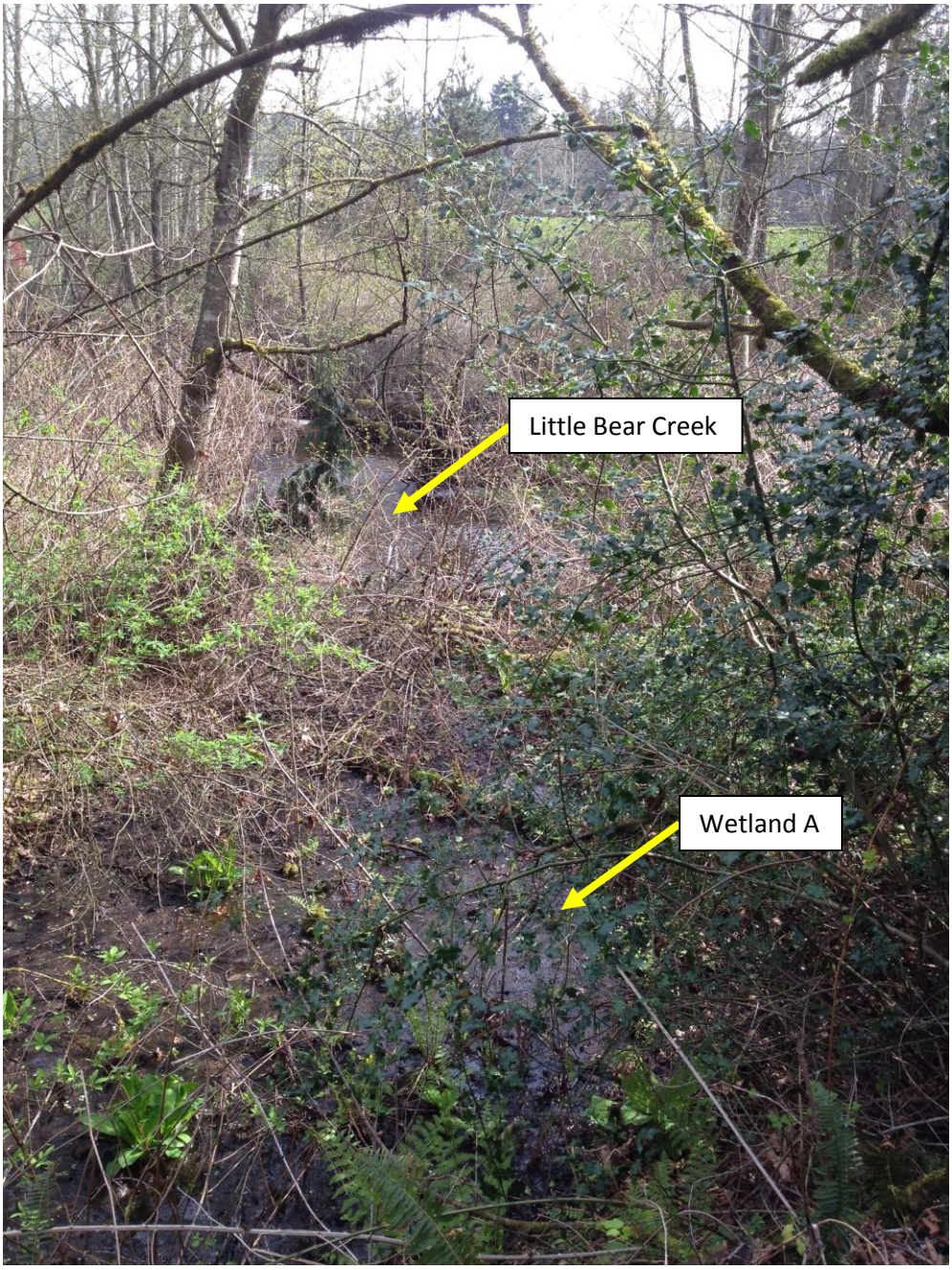
Appendix A – Photographs

Photograph 1: Photo was taken standing approximately 25 feet upslope of the delineated wetland. The pink flag in the background marks the edge of the delineated boundary. In the foreground is skunk cabbage growing in drainage with surface water flowing downslope into the wetland. There is also a pipe installed in the drainage to carry water downslope. Otak filled out a wetland data sheet at this location and the area met all three indicators (vegetation, soils, and hydrology) to qualify as a wetland. Therefore, this slope wetland should be included in the delineation and be afforded a buffer.

Photograph 2: Outlet of the pipe from Photograph 1, directly into the delineated wetland. Delineated wetland is in the background and continues east to Little Bear Creek.

Photograph 3: In foreground is the wetland delineation flag marking the delineated boundary. In background is an area extending approximately 25 feet upslope of the delineated wetland boundary with skunk cabbage and salmonberry with groundwater expressing to the surface. This area should also be included in the wetland delineation and be afforded a buffer.

Photograph 4: Shown here is another area upslope and outside of the delineated wetland with skunk cabbage and salmonberry with groundwater expressing to the surface. This area should also be included in the wetland delineation and be afforded a buffer.



Photograph 5: Delineated wetland in foreground and Little Bear Creek in background.

Photograph 6: Photo shows the delineated edge of the wetland (pink flag), the outlet of the wetland to Little Bear Creek, and the edge of Little Bear Creek. Water was flowing from Wetland A into Little Bear Creek during the site visit on March 30, 2015 as shallow subsurface flow. The arrow, photo-left, also shows small rill features indicative of surface flows.

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

Project Site: Modi Short Plat, Parcel No. 0622100060 City/County: Woodinville/King Sampling Date: 3/30/2015
Applicant/Owner: Prakash Modi State: WA Sampling Point: W1
Investigator(s): Shelby Petro, Kevin O'Brien Section, Township, Range: 03, 26N, 05E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 1-15
Subregion (LRR): A - NW Forest Lat: 47 46' 05.15" N Long: 122 46' 27.35" W Datum: WGS 84
Soil Map Unit Name: Everett gravelly sandy loam, 5 to 15 percent slopes NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Data plot was taken on a slope wetland that connects to the delineated depresional wetland. Multiple slope wetlands with similar hydrology and vegetation exist on the site. Soil pits were not dug at other slope features.

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	30	yes	FAC
2. *Alnus rubra*	25	yes	FAC
3.			
4.			
50% = 27.5, 20% = 11	55	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m)			
1. *Rubus spectabilis*	20	yes	FAC
2.			
3.			
4.			
5.			
50% = 10, 20% = 4	20	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. *Lysichitum americanum*	40	yes	OBL
2. *Maianthemum dilatatum*	15	yes	FAC
3. *Athyrium filix-femina*	trace	no	FAC
4. *Tellima grandiflora*	10	no	FACU
5. *Stachys cooleyae*	5	no	NL (UPL)
6.			
7.			
8.			
9.			
10.			
11.			
50% = 35, 20% = 14	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. *absent*			
2.			
50% = _____, 20% = _____	0	= Total Cover	

% Bare Ground in Herb Stratum 30

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	5	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x1 =	40
FACW species	0	x2 =	0
FAC species	90	x3 =	270
FACU species	10	x4 =	40
UPL species	5	x5 =	25
Column Totals:	145 (A)		375 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

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

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

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

Remarks:

Project Site: Modi Short Plat, Parcel No. 0622100060

SOIL

Sampling Point: W1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	99	7.5YR 4/6	1	C	M	sand silt loam	
12-16	G1 5/N	99	2.5YR 4/8	1	C	M	sandy clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☒	No	☐	Depth (inches):	surface
Water Table Present?	Yes	☒	No	☐	Depth (inches):	4
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	surface

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

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

Remarks: slope seep with drainage pattern, additional surface water present adjacent to soil pit, water re-directed into pit during survey

Wetland name or number: A

WETLAND RATING FORM - WESTERN WASHINGTON

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

Name of wetland (if known): A Date of site visit: 3/30/15
Rated by Shelby Petro, Kevin O'Brien Trained by Ecology? Yes ☑ No ☐ Date: 3/1/15
SEC: 3 TWNSHP: 26N RNGE: 5E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure _____ **Estimated size:** _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland:

I ☐ **II** ☐ **III** ☑ **IV** ☐

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

Score for Water Quality Functions	10
Score for Hydrologic Functions	6
Score for Habitat Functions	18
TOTAL score for functions	**34**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ **II** ☐ **Does not Apply** ☑

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

Check the appropriate type and class of wetland being rated.

Wetland Type	
Estuarine	☐
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☑

Wetland Class	
Depressional	☐
Riverine	☐
Lake-fringe	☐
Slope	☑
Flats	☐
Freshwater Tidal	☐
Check if multiple HGM classes are present	☐

Comments:

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below, you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

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

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

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

Classification of Vegetated Wetlands in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e., except during floods)?

☑ NO - go to 2 ☐ YES - the wetland class is **Tidal Fringe**

If YES, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ YES - **Freshwater Tidal Fringe** ☐ NO - **Saltwater Tidal Fringe (Estuarine)**

If your wetland can be classified as a Freshwater Tidal Fringe, use the forms for Riverine wetlands. If it is Saltwater Tidal Fringe, it is rated as an Estuarine wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Saltwater Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is being kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. xx).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water

☑ NO - go to 3 ☐ YES - the wetland class is **Flats**

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

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

☐ The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) where at least 20 acres (8 ha) are permanently inundated (ponded or flooded);

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

☑ NO - go to 4 ☐ YES - the wetland class is **Lake-fringe (Lacustrine Fringe)**

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

☑ The wetland is on a slope (*slope can be very gradual*).

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

☑ The water leaves the wetland **without being impounded.**
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 feet in diameter and less than 1 foot deep).*

☐ NO - go to 5 ☑ YES - the wetland class is **Slope**

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 once every two years.

☐ NO - go to 6 ☐ YES - the wetland class is **Riverine**

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

☐ NO - go to 7 ☐ YES - the wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no stream or river running through it and providing water? The unit seems to be maintained by higher ground water in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO - go to 8 ☐ YES - the wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide.) Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the second class 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 a Delineated Wetland Boundary	***Class to Use in Rating***	
Slope + Riverine	Riverine	☐
Slope + Depressional	Depressional	☐
Slope + Lake-fringe	Lake-fringe	☐
Depressional + Riverine along stream within boundary	Depressional	☐
Depressional + Lake-fringe	Depressional	☐
Saltwater Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics	☐

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

S Slope Wetlands

WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality.

		Points
S 1.	**Does the wetland unit have the <u>potential</u> to improve water quality?** ***(see p. 64)***	
S 1.1	Characteristics of average slope of the unit: ☐ Slope is 1% or less (*a 1% slope has a 1-foot vertical drop for every 100 ft. horizontal distance*) **Points = 3** ☐ Slope is 1% - 2% **Points = 2** ☑ Slope is 2% - 5% **Points = 1** ☐ Slope is greater than 5% **Points = 0**	1
S 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES = 3 points NO = 0 points	3
S 1.3	Characteristics of the vegetation in the wetland that trap sediments and pollutants: *choose the points appropriate for the description that best fits vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation >90% of wetland area **Points = 6** Dense, uncut, herbaceous vegetation >1/2 of wetland area **Points = 3** Dense, woody vegetation >1/2 of wetland area **Points = 2** Dense, uncut, herbaceous vegetation >1/4 of wetland area **Points = 1** Does not meet any of the criteria above for vegetation **Points = 0** Aerial photo or map with vegetation polygons	1 **Figure __**
	Total for S 1 *Add the points in the boxes above*	5
S 2.	**Does the wetland unit have the <u>opportunity</u> to improve water quality?** ***(see p. 67)*** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes, or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources but any single source would qualify as an opportunity.* ☐ Grazing in the wetland or within 150 feet of the wetland ☐ Untreated stormwater discharges to the wetland ☐ Tilled fields, logging, or orchards within 150 feet of the wetland ☑ Residential, urban areas, or golf courses are within 150 feet upslope of wetland ☐ Other: YES - multiplier is **2** NO - multiplier is **1**	Multiplier 2
TOTAL - Water Quality Functions	Multiply the score from S 1. by S 2. ***Add score to table on p. 1***	10

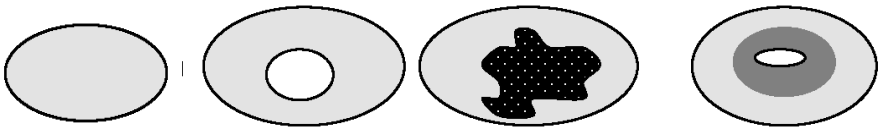
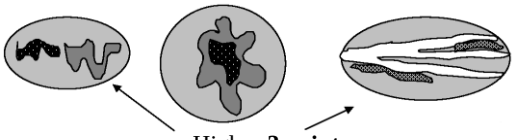
S Slope Wetlands HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion.	
S 3. Does wetland unit have the <u>potential</u> to reduce flooding/erosion? ***(see p. 68)***	**Points**
S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have truoble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* ☐ Dense, uncut, **rigid** vegetation covers >90% of wetland area **Points = 6** ☐ Dense, uncut, **rigid** vegetation covers >1/2 of wetland area **Points = 3** ☑ Dense, uncut, **rigid** vegetation covers >1/4 of wetland area **Points = 1** ☐ More than 3/4 of area is grazed, mowed, tilled, or vegetation is not rigid **Points = 0**	1
S 3.2 Characteristics of the slope wetland that holds back small amounts of flood flows: *the slope wetland has small surface depressions that can retain water over at least 10% of its area* YES = **2 points** NO = **0 points**	2
Record the points from the boxes above	3
S 4. Does wetland unit have the opportunity to reduce flooding and erosion? ***(see p. 70)*** Is the wetland in a landscape position where the reduction in water velocity it provides help to protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ☑ Wetland has surface runoff that drains to a river or stream that has flooding problems ☐ Other: _____	Multiplier 2
YES - multiplier is **2** NO - multiplier is **1**	
TOTAL - Hydrologic Functions Multiply the score from S 3. by S 4. ***Add score to table on p. 1***	6

These questions apply to wetlands of all HGM classes

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

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

Total for page 5

		Points
H 1.4	Interspersion of Habitats ***(see p. 76)*** *Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1) or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.*  None = **0 points** Low = **1 point** Moderate = **2 points**  [riparian braided channels] High = **3 points** NOTE: If you have four or more vegetation types or three vegetation types and open water, the rating is always "high". **Use map of Cowardin vegetation classes.**	2
H 1.5	Special Habitat Features ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (>4 inches in diameter and 6 feet long). ☐ Standing snags (diameter at the bottom >4 inches) in the wetland. ☐ Undercut banks are present for at least 6.6 feet (2 m) and/or overhanging vegetation extends at least 3.3 feet (1 m) over a stream (or ditch) in or contiguous with the wetland, for at least 33 feet (10 m). ☐ Stable steep banks of fine material that might be used by beaver/muskrat for denning (>30° slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet turned brown/gray*). ☐ At least 1/4 acre of thin-stemmed presistent vegetation or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*). ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants.	0
	Note: The 20% stated in early printings of the manual on page 78 is an error.	
	H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	7

Comments:

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

Total for page 4

H 2.3	Near or Adjacent to Other Priority Habitats Listed by WDFW ***(see p. 82)***	**Points**
	Which of the following priority habitats are within 330 feet (100 m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed. These are DFW definitions. Check with your local DFW biologist if there are any questions.* ☐ **Aspen stands:** Pure or mixed stands of aspen >0.4 ha (1 acre). ☑ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over ☐ **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/acre) >81 cm (32 in) dbh or > 200 years of age. (Mature forests) S ☐ **Oregon white Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is 25% (*full descrptions in WDFW PHS report p. 158*). ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ☑ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life hsitory requirements for instream ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coastal Nearshore, and Puget Sound Nearshore. (*full descriptions of* ☐ **Caves**: 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 occuring below 5,000 ft. ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☑ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has: **3+** priority habitats = **4 points** **1** priority habitat = **1 point** **2** priority habitats = **3 points** No habitats = **0 points** Note: all vegetated wetlands are by definition a priority habitat but are not included in this list.	4

Nearby wetlands are addressed in question H 2.4	
Choose the **one** description of the landscape around the wetland that best fits. ☐ There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development). **Points = 5** ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other Lake-fringe wetlands within 1/2 mile. **Points = 5** ☑ There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. **Points = 3** ☐ The wetland is Lake-fringe on a lake **with** disturbance, and there are 3 other Lake-fringe wetlands within 1/2 mile. **Points = 3** ☐ There is at least 1 wetland within 1/2 mile. **Points = 2** ☐ There are no wetlands within 1/2 mile. **Points = 0**	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	11
Total Score for Habitat Functions - add the points for H1 and H2, and record the result on p. 1	18