SECTION 8 REFERENCES

GIS Data Sources

Exhibit 2-1

All data from base data referenced below.

Exhibit 2-2

WSDOT (Washington State Department of Transportation). 2006 – 2007. I-405 Staff; Corridor Mile Post, Lane Striping,

Noise Wall, Retaining Wall, Stormwater Feature, Pavement, Existing Right-of-Way, Proposed Right-of-Way, Culvert

Exhibit 3-1

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Exhibit 4-3

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Exhibit 4-15

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Exhibit 4-17

WSDOT (Washington State Department of Transportation). 2006 – 2007. I-405 Staff; corridor mile post, existing right-of-way, proposed right-of-way, wetland, culvert.

Exhibit 4-19

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Exhibit 5-6

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APPENDIX A STREAM HABITAT SURVEY METHODOLOGIES

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To: I-405 Team
MAP Team

From: Derek Koellmann

Date: March 21, 2005

Re: Recommended Stream Survey Protocols

Overview

The I-405 Bellevue and Renton Improvement Project study areas cross or are located within the proximity of a variety of streams and rivers. As such, various elements of the projects have the potential to affect these waterbodies. To help determine the nature and extent of these effects, the habitat in these waterbodies must be assessed to quantitatively and qualitatively document in-stream and riparian conditions. This document describes the methodology that will be used to collect information on the physical characteristics of the streams and rivers in the study areas.

The specific habitat variables to be assessed in this study include:

a. Existing stream geomorphology
b. In-stream habitat type
c. Riparian vegetation
d. Substrate composition
e. Abundance of large woody debris
f. Quality of pools

The information collected will be used in conjunction with existing fisheries information (i.e., from existing reports and data, interviews, etc.) for the study areas to assess the quality and quantity of fish spawning, migration, and rearing habitat and provide information on the current and potential fish and other aquatic species use of the streams and rivers.

This methodology has been developed to document existing habitat in the study area in a manner that can be repeated so that future habitat conditions can be assessed post project construction.

Mercer Slough is located within the Bellevue study area, but does not fall under the definition of a stream or river per this section, nor would the protocols recommended herein be appropriate to assess the habitat values in Mercer Slough. A separate method for documenting habitat values in Mercer Slough is proposed at the end of this memo.

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Stream Survey Approach

Stream surveys will be performed on all streams and rivers that are crossed by I-405 and SR 167 or are located within the immediate proximity of the project area. The surveys will be conducted from approximately 300 feet upstream and 1,320 feet downstream (1/4 mile) of the proposed project footprint.

Up to eleven transects will be laid out perpendicular to stream flow at regularly spaced intervals along the streams to be surveyed. The minimum distance between transects will be 50 feet and the maximum distance will be 300 feet. The distance between transects will be based upon the bankfull width of the stream to be surveyed. For some streams that run parallel to I-405 or SR 167, such as Gilliam and Panther Creeks, two sets of transects may be established to ensure that habitat values throughout the stream reach are appropriately documented. Slightly different protocols will be used in wadeable versus non-wadeable streams and rivers.

At and in-between each transect qualitative and quantitative descriptions of in-stream and riparian habitat will be collected. A summary of the protocols to be used and habitat variables to be assessed is described further below. A field training day is scheduled prior to initiating the full field effort. It is anticipated that some minor adjustments to the protocols may be needed based on this training. Protocol adjustments would be considered where applicable to improve the characterization of target parameters and/or to improve sampling efficiency.

Summary of Habitat Variables and Associated Protocols

The following protocols will be used to quantify the various habitat variables.

Existing Stream Geomorphology

Existing stream geomorphology information will be collected using protocols detailed in the US Environmental Protection Agency's (EPA) document *Quantifying Physical Habitat in Wadeable Streams* by Kaufmann et al. (1999) (Quantifying Physical Habitat).

Quantifying Physical Habitat details the concepts, rationale, and analytical procedures for characterizing physical habitat in wadeable streams based on raw data generated from methods similar or equal to those of Kaufmann and Robison (1998) that are used by the U.S. Environmental Protection Agency (USEPA) in its Environmental Monitoring and Assessment Program (EMAP). Guidance is provided for calculating measures or indices of stream size and gradient, sinuosity, substrate size, habitat complexity and cover, riparian vegetation cover and structure, and anthropogenic disturbances. Two-person crews typically complete EMAP habitat measurements in 1.5 to 3.5 hours of field time per sampling reach. While this time commitment

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is greater than that required for more qualitative methods, these more quantitative methods are more repeatable (i.e., more precise).

Variables to be surveyed using Quantifying Physical Habitat

1) Wetted width
2) Bankfull width
3) Bankfull height
4) Stream depth
5) Reach Length
6) Sinuosity of Reach
7) Slope of Reach
8) Bank angles

Existing Stream Geomorphology Metrics

1) Mean and standard deviation (SD) of wetted width, bankfull width, bankfull height, stream depth, reach slope, and bank angles
2) Reach Sinuosity

In-Stream Habitat Type

In-Stream Habitat Type will be quantified using the *Timber Fish and Wildlife* (TFW) *Monitoring Program Method Manual for the Habitat Unit Survey* by Pleus et al (1999). (Habitat Unit Survey) and the EPA's *Rapid Bioassessment Protocols for Use in Streams and Rivers* by Plafkin et al. (1989) (Bioassessment Protocols).

The Habitat Unit Survey provides methods for identifying habitat units, measuring their surface area, and collecting information on residual pool depth and pool-forming factors. Other information produced includes pool:riffle ratio, length of side channels, and the frequency distribution of residual pool depths and pool-forming factors.

The Bioassessment Protocols were originally developed in the 1980's to provide cost-effective, efficient biological survey techniques. The assessment is done using a visually-based approach to characterizing the physical habitat structure of the stream site. The concepts underlying the Bioassessment Protocols are:

- Cost-effective, scientifically valid procedures for biological surveys,
- Provisions for multiple site investigations in a field season,

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- Quick turn-around of results for management decisions, and
- Scientific reports easily translated to management and the public.

Variables to be surveyed using the Habitat Unit Survey

1) Stream Discharge
2) Core Habitat Units (e.g. pool & riffle sequences)
3) Surface Area Measurements of Core Habitat Units
4) Residual Pool Depths
5) Pool Forming Factors (e.g. LWD, boulder, etc)

Variables to be surveyed using Bioassessment Protocols

1) Epifaunal substrate/available cover
2) Channel Alteration (including armoring)

In-Stream Habitat Type Metrics

1) Stream discharge (cfs)
2) % of Core Habitat Units
3) Habitat Units per Kilometer and Bankfull Width
4) Pools per Kilometer
5) Factors contributing to pool formation (PFF)
   a) % of units
   b) % of primary PFF
   c) % of pool surface area
6) Mean and SD residual pool depth
7) Mean and SD % epifaunal substrate/available cover
8) % Altered channel
9) % Streambank armoring

Riparian Vegetation

Riparian vegetation will be quantified using a combination of protocols from Quantifying Physical Habitat and Bioassessment Protocols.

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Variables to be surveyed using Quantifying Physical Habitat

1) Canopy Cover
2) Riparian Vegetative Structure

Variables to be surveyed using Bioassessment Protocols

1) Bank Stability
2) Bank Vegetative Protection
3) Riparian Vegetative Zone Width

Riparian Vegetation Metrics

1) Mean and SD of canopy densiometer values
2) % ground cover, mid layer vegetation cover, and canopy level cover, % total ground, mid layer vegetation, and canopy level cover, and % invasives
3) Mean and SD % Bank Stability
4) Mean and SD % Bank Vegetative Protection
5) Mean and SD % Riparian Vegetative Zone Width

Substrate Composition

Substrate composition information will be collected using protocols detailed in *Quantifying Physical Habitat* and *Methods for Evaluating Riparian Habitats with Applications to Management* by Platts et al. (1987) (Evaluating Riparian Habitats). For smaller stream segments where there is not adequate stream length to apply this method, a Wolman pebble count will be conducted to determine substrate composition. (Wolman 1954).

Evaluating Riparian Habitats is a comprehensive compilation of methods for resource specialists to use in managing, evaluating, and monitoring riparian conditions adjacent to streams, lakes, ponds, and reservoirs.

Variables to be surveyed using Quantifying Physical Habitat

1) Substrate Size
2) Substrate Composition

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Variables to be surveyed using Evaluating Riparian Habitats

1) Substrate Embeddedness (%)

NOTE: In non-wadeable systems, such as the Green River, substrate sizes will be estimated either visually (where possible) or by using the drag method as prescribed by Lazorchak et al. (2000) in the *Field Operations and Methods for Measuring the Ecological Condition of Non-Wadeable Rivers and Streams.*

Substrate Composition Metrics

1) Mean and SD of substrate size class
2) 75th percentile of substrate size class
3) Substrate median size class
4) 25th percentile of substrate size class
5) % breakdown of substrate size classes
6) Mean and SD % embeddedness

Abundance of Large Woody Debris

Abundance of Large Woody Debris (LWD) will be quantified using the Level 1 survey method from the TFW Monitoring Program (LWD Method) method manual for the large woody debris survey by Schuett-Hames et al.(1999).

The LWD Method provides methods for documenting the number, volume and characteristics of large woody debris pieces in stream channels. The Level 1 survey involves a rapid tally of pieces by size category and produces information on total and key LWD pieces per channel width.

Variables to be surveyed using the LWD Method

1) Number of LWD Pieces
2) Identification of Key LWD Pieces
3) Distribution of LWD in stream corridor
4) LWD jam composition

Large Woody Debris Metrics

1) % LWD pieces by size class and channel zone

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2) % key LWD pieces
3) LWD pieces per channel width
4) LWD pieces per kilometer
5) LWD jam composition by % size class

Quality of Pools

Quality of Pools will be measured using methods described in *Monitoring Protocols to Evaluate Water Quality Effects of Grazing Management on Western Rangeland Streams* by Bauer and Burton (1993) (Water Quality Effects).

Water Quality Effects describes a monitoring system to assess grazing impacts on water quality in streams o the western United States. The monitoring methods were selected for application by natural resource professionals with backgrounds in soils, range, hydrology, fisheries biology, and water quality. Though designed to be used in an agricultural environment, many of the protocols in this document (such as assessment of pool quality) can be applied over a broad geographic range.

<u>Variables to be surveyed using the Water Quality Effects</u>

1) Pool depth (in conjunction with the Habitat Unit Survey)
2) Substrate
3) Overhead Cover
4) Submerged Cover
5) Bank Cover

NOTE: The individual variables surveyed will be assimilated into a pool quality index that will detail habitat values for individual pools.

<u>Quality of Pool Metrics</u>

1) Mean and SD pool quality index

Ordinary High Water Mark (OHWM)

OHWM measurements will be conducted in accordance with the protocols contained in *A Guide for Field Identification of Bankfull Stage in the Western United States* by the USDA, Forest Service, Stream Systems Technology Center Rocky Mountain Research Station.

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The OHWM for each stream will be marked for 60 lineal feet along the stream from the proposed toe of slope of impact line. In instances where the OHWM is located more than 60 lineal feet from the proposed toe of slope of impact line OHWM will not be marked and it will be documented in a technical memorandum that the distance to the OHWM exceeds 60 lineal feet.

Establishing Reference Points

A handheld GPS unit will be used to establish reference points at the upstream and downstream end of each surveyed stream reach to allow for future surveys to be conducted within the same reach.

Photographic Documentation

Photographs will be taken at the upstream end, downstream end, and mid-point of each survey reach. In addition, significant features (e.g. LWD jams, culvert outlets, etc) will also be photographed.

Mercer Slough

Mercer Slough is a unique feature within the Bellevue study area. Several streams in the study area outlet into the slough, however the slough itself is a lacustrine (lake influenced), rather than a riverine, system. The slough is used by a variety of aquatic species and acts as a migration corridor and rearing area for salmonids in various life stages.

To assess the habitat values of Mercer Slough, habitat survey crews will determine the extent of inundated vegetated areas and deeper channel areas (those with no vegetation breaking the surface of the slough). A Differential Global Position System (DGPS) will be used to collect data along the outer margin of the wetted perimeter and deeper channel areas of Mercer Slough within the study area. This approach will provide information on the extent of the two main habitat types in Mercer Slough. A discussion of how these habitats could be affected by the project and/or used by fish could be prepared as part of the Bellevue Nickel Improvement Project Fisheries and Aquatic Resources Discipline Report. Existing information will be used to determine fish use in Mercer Slough.

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Memorandum

Date: 10/21/2010

To: Bill Jordan

From: I-405 Stream Survey Team

RE: Modified Stream Survey Approach

Background
In 2005, the I-405 environmental team developed a stream survey methodology (2005 Stream Survey Protocol) that was intended for use on all streams within the study areas of I-405 projects. This methodology collects extensive data in the following categories:

- Geomorphology
- In-stream habitat type
- Riparian vegetation
- Substrate composition
- Abundance of large woody debris
- Quality of pools

Between 9 and 19 parameters are surveyed for each of the categories listed above at up to 26 different locations (transects) in each stream. Qualitative evaluations may be necessary between some transects. The 2005 Stream Survey Protocol identified the area of analysis to be 300 feet upstream and 1,320 feet (1/4 mile) downstream of the project footprint.

Issue
The 2005 Stream Survey Protocol provides extensive, detailed analysis of streams. This level of analysis is appropriate when considering streams that will be directly impacted by a project, and in identifying suitable mitigation for those direct impacts.

The I-405, Bellevue to Lynnwood Project area between SR 527 and I-5 has been designed to avoid all direct stream impacts. In addition, two more resources have been identified between SR 520 and SR 527 since the 2007 survey effort. These resources will not be impacted, but are within the project area and should be described. Given the absence of direct stream impacts, a modified stream survey protocol may be appropriate for these resources.

Option
The I-405 Stream Survey Team has identified a modified stream survey approach for the streams assessed:

- Geomorphology will be assessed by measuring the wetted width, ordinary high watermark width, slope, and bearing at 3 to15 locations in the downstream reaches and at 3 to 6 locations in the upstream reach. Measurements will be taken at bends in the stream or at visual obstructions that prevent slope and bearing measurements.
- In-stream habitat will be assessed by measuring stream wetted depth at multiple locations within a reach.
- Riparian vegetation will be discussed qualitatively by reach, noting the primary overstory, understory and emergent vegetation, but not quantifying the percent cover by type or species.
- Substrate composition will be assessed by noting the typical substrate in areas where other measurements such as wetted width and bank-full width are taken.
- Large woody debris will be quantified by size in each stream reach.

Where possible, the I-405 Stream Survey Team will use existing WSDOT stream survey data and descriptions when the existing data provides a similar level of analysis.

Concurrence to use modified stream survey approach as described above:

28 Oct 2010

Bill Jordan, I-405 Environmental Manager — Date

APPENDIX B WETLAND DATA SHEETS AND RATING FORMS

The following describes the abbreviation used to describe the mottle abundance, mottle size, and mottle contrast when examining soils. The abbreviations were used on the routine wetland delineation forms which were completed in the field:

Mottle Abundance:
f - Few (<20%)
c- Common (2%-20%)
m - Many (> 20%)

Mottle Size:
f - Fine (0-5mm)
m - Medium (5-15mm)
c - Coarse (>15mm)

Mottle Contrast:
f - Faint
d - Distinct
p - Prominent

Routine Wetland Determination

DATA FORM 1 *(Revised)*

WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site: 520 - I-5 Applicant/owner: WSDOT Investigator(s): Thiele Pursky	Date: 8/24/06 County: King State: WA S/T/R: 17/25N/R5E
Do normal circumstances exist on the site? ☑ Yes ☐ No Is the site significantly disturbed (atypical situation)? ☐ Yes ☑ No Is the area a potential problem area? ☐ Yes ☑ No Explanation of atypical or problem area:	Community ID: Transect ID: Plot ID: SP-1 16.2R

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	% cover	Indicator	Dominant Plant Species	*Stratum	% cover	Indicator
Bigleaf Maple	T	80%	FACU	Acer Circinatum	S	25%	FAC-
Cedar	T	5%	FAC	Lady Fern	H	20%	FAC
Doug fir	T	5%	FACU	Sword fern	H	20%	FACU
Sambucus Racemosa	S	10%	FACU	Bracken fern	H	5~~0~~%	FACU
Vaccinium Parvifolium ~~Ovatum~~	S	5%	FACU	Herb Robert	H	20%	NI
Rubus Spectabilis	S	20	FAC-	Trailing blackberry	H	30%	FACU

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC: 50% 3/3

Check all indicators that apply and explain below:

- ☐ Visual observation of plant species growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☐ Technical Literature
- ☐ Physiological/reproductive adaptations
- ☑ Wetland plant database
- ☑ Personal knowledge of regional plant communities
- ☐ Other (explain)

Hydrophytic vegetation present? ☑ Yes ☐ No

Rationale for decision/Remarks: Although the plot meets 50% coverage for FAC - This plot is in atypical upland Community

HYDROLOGY

Is it the growing season? ☑ Yes ☐ No Based on: ☐ Soil temp (record temp) ☑ Other (explain) August	Water Marks: ☐ Yes ☑ No on	Sediment Deposits: ☐ Yes ☑ No
	Drift Lines: ☐ Yes ☑ No	Drainage Patterns: ☐ Yes ☑ No
Depth of inundation: — inches Depth to free water in pit: — Depth to saturated soil: —	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☑ No FAC Neutral: ☐ Yes ☑ No	Local Soil Survey: ☐ Yes ☑ No Water-stained Leaves: ☐ Yes ☑ No
Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):	

Wetland hydrology present? ☐ Yes ☑ No

Rationale for decision/remarks:

No hydrology Apparent

SOILS

Map Unit Name (Series and Phase): Alderwood gravelly Sandy loam 6 to 15 % slopes

Drainage Class

Field observations confirm mapped type? ☐ Yes ☑ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-16		7.5YR 3/3	—	—	Loam	
14-18		10YR 4/1	10YR 3/4		[illegible]	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☐ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☐ Yes ☑ No

Rationale for decision/Remarks: No hydric characters

Wetland Determination

Hydrophytic vegetation present?	☑ Yes	☐ No
Hydric soils present?	☐ Yes	☑ No
Wetland hydrology present?	☐ Yes	☑ No
Is the sampling point within a wetland?	☐ Yes	☑ No

Rationale/Remarks: ~~Although~~ Hydrophytic veg meets criteria, this plant community is a typical upland community in Puget Sound.

NOTES:

Revised 4/97

Routine Wetland Determination

DATA FORM 1 *(Revised)*

WA State Wetland Delineation Manual or 1987 Corps Wetland Delineation Manual)

Project/Site: 520-I-5 Applicant/owner: WSDOT Investigator(s): Thiele, Pursley	Date: 8/24/06 County: King State: WA S/T/R: 17/25N/R5E
Do normal circumstances exist on the site? ☑ Yes ☐ No Is the site significantly disturbed (atypical situation)? ☐ Yes ☑ No Is the area a potential problem area? ☐ Yes ☑ No Explanation of atypical or problem area:	Community ID: Transect ID: Plot ID: SP-2 16.2R

VEGETATION (For *strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	*Stratum	% cover	Indicator	Dominant Plant Species	*Stratum	% cover	Indicator
Red Alder	T	30	FAC				
Salmonberry	S	50	FAC-				
Lady fern	H	20	FAC				

HYDROPHYTIC VEGETATION INDICATORS: Note - Hemlock, Salal, Vine maple growing on nurse logs

% of dominants OBL, FACW, & FAC: 100%

Check all indicators that apply and explain below:

- ☐ Visual observation of plant species growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☐ Technical Literature
- ☐ Physiological/reproductive adaptations
- ☑ Wetland plant database
- ☑ Personal knowledge of regional plant communities
- ☐ Other (explain)

Hydrophytic vegetation present? ☑ Yes ☐ No

Rationale for decision/Remarks: Wetland veg present

HYDROLOGY

Is it the growing season? ☑ Yes ☐ No	Water Marks: ☐ Yes ☑ No on	Sediment Deposits: ☐ Yes ☑ No
Based on: ☐ Soil temp (record temp) ☐ Other (explain) August	Drift Lines: ☐ Yes ☑ No	Drainage Patterns: ☐ Yes ☑ No
Depth of inundation: — inches	Oxidized Root (live roots) Channels <12 in.: ☐ Yes ☑ No	Local Soil Survey: ☐ Yes ☐ No
Depth to free water in pit: — 16 Depth to saturated soil: 11	FAC Neutral: ☐ Yes ☑ No	Water-stained Leaves: ☑ Yes ☐ No
Check all that apply & explain below: ☐ Stream, lake or gage data ☐ Aerial photographs ☐ Other	Other (explain):	

Wetland hydrology present? ☑ **Yes** ☐ **No**

Rationale for decision/remarks:

Water stained leaves - Free water in pit in August

SOILS

Map Unit Name (Series and Phase): Alderwood gravelly Sandy loam 6 to 15% Slopes

Drainage Class

Field observations confirm mapped type? ☐ Yes ☑ No

Taxonomy (subgroup)

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size and contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)
0-11		10YR 2/1	—	—	Peat	
11-16		10YR 3/2	—	—	Sandy loam	

Hydric Soil Indicators: (check all that apply)

- ☐ Histosol
- ☑ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma (=1) matrix
- ☐ Matrix chroma ≤ 2 with mottles
- ☐ Mg or Fe Concretions
- ☑ High Organic Content in Surface Layer of Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on National/Local Hydric Soils List
- ☐ Other (explain in remarks)

Hydric soils present? ☑ **Yes** ☐ **No**

Rationale for decision/Remarks:

Wetland Determination

Hydrophytic vegetation present?	☑ **Yes**	☐ **No**
Hydric soils present?	☑ **Yes**	☐ **No**
Wetland hydrology present?	☑ **Yes**	☐ **No**
Is the sampling point within a wetland?	☑ **Yes**	☐ **No**

Rationale/Remarks: Wetland Conditions

NOTES:

Revised 4/97

Wetland name or number 16.2R

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 16.2 R Date of site visit: 8/24/06

Rated by: Thiele, Trained by Ecology? Yes X No_____ Date of training: May 2005

SEC: 17 TWNSHP: 25N RNGE: R5E Is S/T/R in Appendix D? Yes_____ No ✓

Map of wetland unit: Figure_____ **Estimated size** 3.0 acres

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	30
Score for Hydrologic Functions	16
Score for Habitat Functions	25
TOTAL Score for Functions	71

Category based on SPECIAL CHARACTERISTCS of Wetland I_____ **II**_____ **Does not apply**_____

Final Category (choose the "highest" category from above") I

Summary of basic information about the wetland unit.

Wetland Unit has Special Characteristics	
Estuarine	
Natural Heritage Wetland	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	

Wetland HGM Class used for Rating	
Depressional	X
Riverine	
Lake-fringe	
Slope	
Flats	
Freshwater Tidal	
Check if unit has multiple HGM classes present	✓

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		X
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 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		X
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.		X

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

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

Wetland name or number 16.2R

16.2R

Classification of Vegetated Wetlands for Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   NO – go to 2 **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   YES – Freshwater Tidal Fringe **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a "Flats" wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland meet both of the following criteria?
   _____The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   _____At least 30% of the open water area is deeper than 6.6 (2 m)?
   NO – go to 4 **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   __X__The wetland is on a slope *(slope can be very gradual).*
   __X__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
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   NO – go to 5 **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   _____The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   _____The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   NO – go to 6 **YES** – The wetland class is **Riverine**

may be depressional

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of the year. This means that any outlet, if present is higher than the interior of the wetland.
   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.
   No – go to 8 YES – The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	*HGM Class to Use in Rating*
Slope + Riverine	~~Riverine~~
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

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

Wetland name or number 16.2a 16

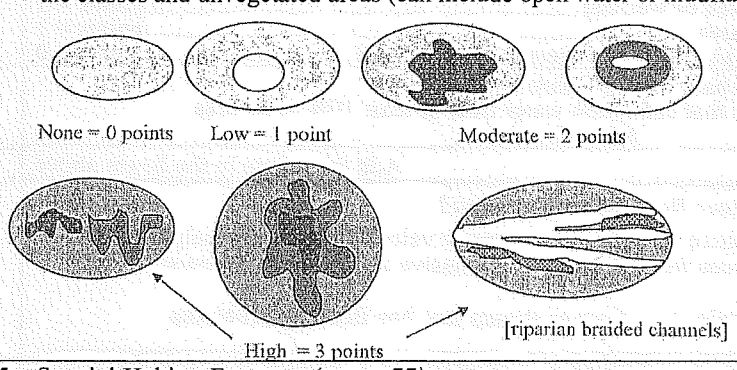
D	Depressional and Flat Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
D 1	**Does the wetland have the potential to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ....points = 3 • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet....points = 2 • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*)....points = 1 • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ....points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure ___** 2
	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	4
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area....points = 5 • Wetland has persistent, ungrazed vegetation > = 1/2 of area....points = 3 • Wetland has persistent, ungrazed vegetation > = 1/10 of area....points = 1 • Wetland has persistent, ungrazed vegetation < 1/10 of area....points = 0 **Map of Cowardin vegetation classes**	**Figure ___** 5
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • 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 **Map of Hydroperiods**	**Figure ___** 4
	Total for D 1 *Add the points in the boxes above*	15
D 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ___ Grazing in the wetland or within 150 ft ___ Untreated stormwater discharges to wetland ___ Tilled fields or orchards within 150 ft. of wetland ___ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging X Residential, urban areas, golf courses are within 150 ft. of wetland ___ Wetland is fed by groundwater high in phosphorus or nitrogen X Other Receives runoff from highway & streets **YES** multiplier is 2 **NO** multiplier is 1	*(see p. 44)* Multiplier 2
◆	**TOTAL – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	30
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ....points = 4 • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet....points = 2 • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ....points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)*....points = 0	2
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet....points = 7 • The wetland is a "headwater" wetland....points = 5 • Marks of ponding between 2 ft. to < 3 ft. from surface or bottom of outlet....points = 5 • Marks are at least 0.5 ft. to < 2 ft. from surface or bottom of outlet....points = 3 • Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water.points = 1 • Marks of ponding less than 0.5 ft....points = 0	3
	D 3.3 Contribution of wetland unit to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* • The area of the basin is less than 10 times the area of unit....points = 5 • The area of the basin is 10 to 100 times the area of the unit....points = 3 • The area of the basin is more than 100 times the area of the unit....points = 0 • Entire unit is in the FLATS class....points = 5	3
	Total for D 3 *Add the points in the boxes above*	8
D 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from	*(see p. 49)* Multiplier 2

Wetland name or number 16.2R

	groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ___ Wetland is in a headwater of a river or stream that has flooding problems. _X_ Wetland drains to a river or stream that has flooding problems ___ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ___ Other _____ **YES** multiplier is 2 **NO** multiplier is 1	
◆	**TOTAL – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	16

Comments:

Wetland name or number 16.2 A

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	Points (only 1 score per box)
H 1 Does the wetland have the potential to provide habitat for many species?	
H 1.1 Vegetation structure *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ___ Aquatic Bed X Emergent plants X Scrub/shrub (areas where shrubs have > 30% cover) X Forested (areas where trees have > 30% cover) *If the unit has a forested class check if:* X 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:* **Map of Cowardin vegetation classes** 4 structures or more .....points = 4 — 3 structures .....points = 2 2 structures .....points = 1 — 1 structure.....points = 0	**Figure ___** 4
H 1.2 Hydroperiods *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* X Permanently flooded or inundated — 4 or more types present points = 3 X Seasonally flooded or inundated — 3 or more types present ..... points = 2 ___ Occasionally flooded or inundated — 2 types present ..... points = 1 X Saturated only — 1 type present..... points = 0 X Permanently flowing stream or river in, or adjacent to, the wetland ___ Seasonally flowing stream in, or adjacent to, the wetland ___ **Lake-fringe wetland .....= 2 points** ___ **Freshwater tidal wetland .....= 2 points** **Map of hydroperiods**	**Figure ___** 3
H 1.3 Richness of Plant Species *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(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 _____ _____ _____ _____	2
H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure ___** 3
H 1.5 Special Habitat Features *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* X Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) X Standing snags (diameter at the bottom > 4 inches) in the wetland ___ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ___ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* X Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	3
H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	15

Wetland name or number 16.202

H 2	Does the wetland have the opportunity to provide habitat for many species?	(only 1 score per box)
	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".* ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference ..... **points = 4** ____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference ..... **points = 4** ____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... **points = 3** ____ 50m (170 ft) 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 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK ..... **points = 2** ____ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK ..... **points = 2** ____ Heavy grazing in buffer..... **points = 1** ____ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% 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** **Arial photo showing buffers**	**Figure ___** 3
	H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* **YES = 4 points** (go to H 2.3) **NO** = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **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 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR **YES** = 1 point • Within 1 mile of a lake greater than 20 acres? **NO** = 0 points	1

Comments:

Wetland name or number 16,202

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82):
Which of the following priority habitats are within 330 ft. (100m) of the wetland? *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.*

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

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

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

___ **Old-growth forests**: (Old growth west of Cascade Crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings, with at least 20 trees/ha (8 trees/acre) > 81cm (32 in) dbh or > 200 years of age.

___ **Mature forests**: Stands with average diameters exceeding 53cm (21 in) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 – 200 years old west of the Cascade Crest.

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

___ **Talus**: Homogenous areas of rock rubble ranging in average size 0.15 – 2.0m (0.5 – 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

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

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

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

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

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

If wetland has 3 or more priority habitats . = 4 points If wetland has 1 priority habit... = 1 point
If wetland has 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. (Nearby wetlands are addressed in question H 2.4).

3

H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)*

- 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 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*	10
	TOTAL for H 1 from page 8	15
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	25

Comments:

Wetland name or number 16.2R

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

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

Wetland name or number 16.26

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ____ **Old-growth forests:** (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ____ **Mature forests:** (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. **YES** = Category I **NO** = X not a forested wetland with special characteristics	**Cat. I**
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ____ 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 surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* **YES** = Go to SC 5.1 **NO** ____ not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland. ____ The wetland is larger than 1/10 acre (4350 square ft.) **YES** = Category I **NO** = Category II	**Cat. I** **Cat. II**
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? **YES** = Go to SC 6.1 **NO** ____ not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • 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 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? **YES** = Category II **NO** = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? **YES** = Category III	**Cat. II** **Cat. III**
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered **NO** for all types enter "Not Applicable" on p. 1	

Comments:

Plate 26[1]
WETLAND FIELD DATA FORM

16.2R

WETLAND FIELD DATA FORM

BEGIN BY CHECKING ANY OF THE FOLLOWING (a. – e.) THAT APPLY:

a. The wetland is contiguous to Lake Washington;
b. The wetland contains at least 1/4 acre of organic soils, such as peat bogs or mucky soils;
c. The wetland is equal to or greater than 10 acres in size and having three or more wetland classes, as defined by the U.S. Fish & Wildlife Service (Cowardin et al., 1979), one of which is open water;
d. The wetland has significant habitat value to state or federally listed threatened or endangered wildlife species; or
e. The wetland contains state or federally listed threatened or endangered plant species.

IF ANY OF THE CRITERIA LISTED ABOVE ARE MET, THEN THE WETLAND IS CONSIDERED TO BE TYPE 1. IF THAT IS THE CASE, PLEASE CONTINUE TO COMPLETE THE ENTIRE FORM, BUT DO NOT ASSIGN POINTS.
IF THE WETLAND DOES NOT MEET THE CRITERIA LISTED ABOVE FOR TYPE 1, COMPLETE THE ENTIRE FORM, USING THE ASSIGNED POINTS TO DETERMINE IF IT IS A TYPE 2 OR TYPE 3 WETLAND.

Type 2 wetlands typically have at least two wetland vegetation classes, are at least partially surrounded by buffers of native vegetation, connected by surface water flow (perennial or intermittent) to other wetlands or streams, and contain or are associated with forested habitat.

1. Total wetland area

Estimate wetland area and score from choices	Acres		Point Value	Points
	>20.00	=	6	
	10-19.99	=	5	
	5-9.99	=	4	
	1-4.99	=	3	
	0.1-0.99	=	2	
	<0.1	=	1	

2. Wetland classes: Determine the number of wetland classes that qualify, and score according to the table.

	# of Classes		Points
Open Water: If the area of open water is >1/3 acre or >10% of the total wetland area	1	=	
Aquatic Beds: If the area of aquatic beds is >10% of the open water area or >1/2 acre	2	=	3
Emergent: If the area of emergent class is >1/2 acre or >10% of the total wetland area	3	=	5
Scrub-Shrub: If the area of scrub-shrub class is >1/2 acre or >10% of the total wetland area	4	=	7
Forested: If the area of forested class is >1/2 acre or >10% of the total wetland area	5	=	10

16.2R

3. Plant species diversity.

For all wetland classes which qualified in 2 above, count the number of different plant species and score according to the table below. You do not have to name them.

e.g., if a wetland has an aquatic bed class with 3 species, and emergent class with 4 species and a scrub-shrub class with 2 species, you would circle 2, 2, and 1 in the second column (below).

Class	# of Species	Point Value	Class	# of Species	Point Value
Aquatic Bed	1-2	= 1	Scrub-Shrub	1-2	= 1
	3	= 2		3-4	= 2
	>3	= 3		>4	= 3
Emergent	1-2	= 1	Forested	1-2	= 1
	3-4	= 2		3-4	= 2
	>4	= 3		>4	= 3

4. Structural diversity.

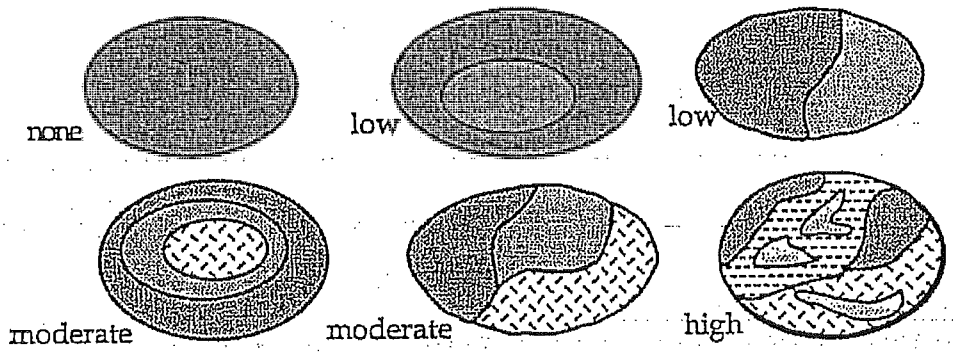
If the wetland has a forested class, add 1 point for each of the following attributes present:

Trees >50' tall	= 1
Trees 20' to 49' tall	= 1
shrubs	= 1
Herbaceous ground cover	= 1

5. Interspection between wetland classes.

Decide from the diagrams below whether interspection between wetland classes is high, moderate, low or none

3 = High
2 = Moderate
1 = Low
0 = None



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6. Habitat features

Add points associated with each habitat feature listed:

Is there evidence of current use by beavers?	= 3
Is a heron rookery located within 300'?	= 2
Are raptor nest(s) located within 300'?	= 1
Are there at least 2 standing dead trees (snags) per acre?	= 1
Are there any other perches (wires, poles, or posts)?	= 1
Are there at least 3 downed logs per acre?	= 1

7. Connection to streams

Is the wetland connected at any time of the year via surface water? **(score one answer only)** NO

Is the wetland connected at any time of the year via surface water?	
To a perennial stream or a seasonal stream *with* fish	= 5
To a seasonal stream *without* fish	= 3
Is not connected to any stream	0

8. Buffers

Step 1: Estimate (to the nearest 5%) the percentage of each buffer or land-use type (below) that adjoins the wetland boundary. Then multiply these percentages by the factor(s) below and enter result in the column to the right.

	% of Buffer		Step 1	Width Factor	Step 2
Roads, buildings or parking lots	25 %	X 0 =	0		= 0
Lawn, grazed pasture, vineyards or annual crops	%	X 1 =			=
Ungrazed grassland or orchards	%	X 2 =			=
Open water or native grasslands	%	X 3 =			=
Forest or shrub	75 %	X 4 =	300	3	= 900
				Add buffer total	900

Step 2: Multiply result(s) of step 1:

By 1 if buffer width is 25-50'

By 2 if buffer width is 50-100'

By 3 if buffer width is >100'

Enter results and add subscores

Step 3: Score points according to the following table:

Buffer Total

900-1200 = 4

600-899 = 3

300-599 = 2

100-299 = 1

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9. Connection to other habitat areas:

Is there a riparian corridor to other wetlands within 0.25 of a mile, or a corridor >100′ wide with good forest or shrub cover to any other habitat area? = 5

Is there a narrow corridor <100′ wide with good cover or a wide corridor >100′ wide with low cover to any other habitat area? = 3

Is there a narrow corridor <100′ wide with low cover or a significant habitat area within 0.25 mile but no corridor? = 1

Is the wetland and buffer completely isolated by development and/or cultivated agricultural land? = 0

10. Scoring

Add the scores to get a total:_____

Question: Is the total greater than or equal to 22 points?

Answer:

Yes = Type 2

No = Type 3

TYPE 1