Wetland Report Update

Briggs Village West Residential Phase 1 Site
Olympia, WA

February 2018

SCJ ALLIANCE
CONSULTING SERVICES

Briggs Village West Residential Phase 1 Wetland Report Update –

Olympia, Washington

Project Information

Project:	**Briggs Village West Residential Phase 1 Wetland Report Update**
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Reviewing Agency

Jurisdiction:	City of Olympia

Project Representative

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Project Reference:	SCJ # 2293.02

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

The purpose of this report is to describe results of onsite wetland delineation and conditions that are required to rate the wetlands on the Briggs Village West parcel north of Yelm Highway (Figure 1). The original wetland report from around 2000 would be embedded in the Briggs Village EIS, which was final in May 2003. The wetland boundary used in this report is the same as from that delineation, because it is no longer possible to directly access the wetland. This will be discussed in more detail below.

The 20.15-acre project parcel for Briggs Village West (TPN 37030000015) is bordered by multi-family residential to the east, park/open space to the north, single-family residential to the west, and Yelm Highway to the south. Briggs Re-Development LP has proposed the development of 45 single-family residential lots, an extension of Eagle Bend Drive SE, a vehicular site access onto Yelm Highway, and utilities within the proposed street right-of-ways.

SCJ Alliance wetland scientists, Lisa Palazzi, CPSS, PWS, and Timothy J. Haderly, PES, carried out a wetland reconnaissance on June 7, 2017 in the base of the South Kettle in the southern portion of the subject site. Entry into the bottom of the South Kettle to the wetland edge was constrained by a 6-foot high chain-link fence with restrictive signage from the state Dept. of Ecology barring entry. However, the wetland edge was visible downslope from the fence, and an assessment of hydrology and vegetation conditions was possible.

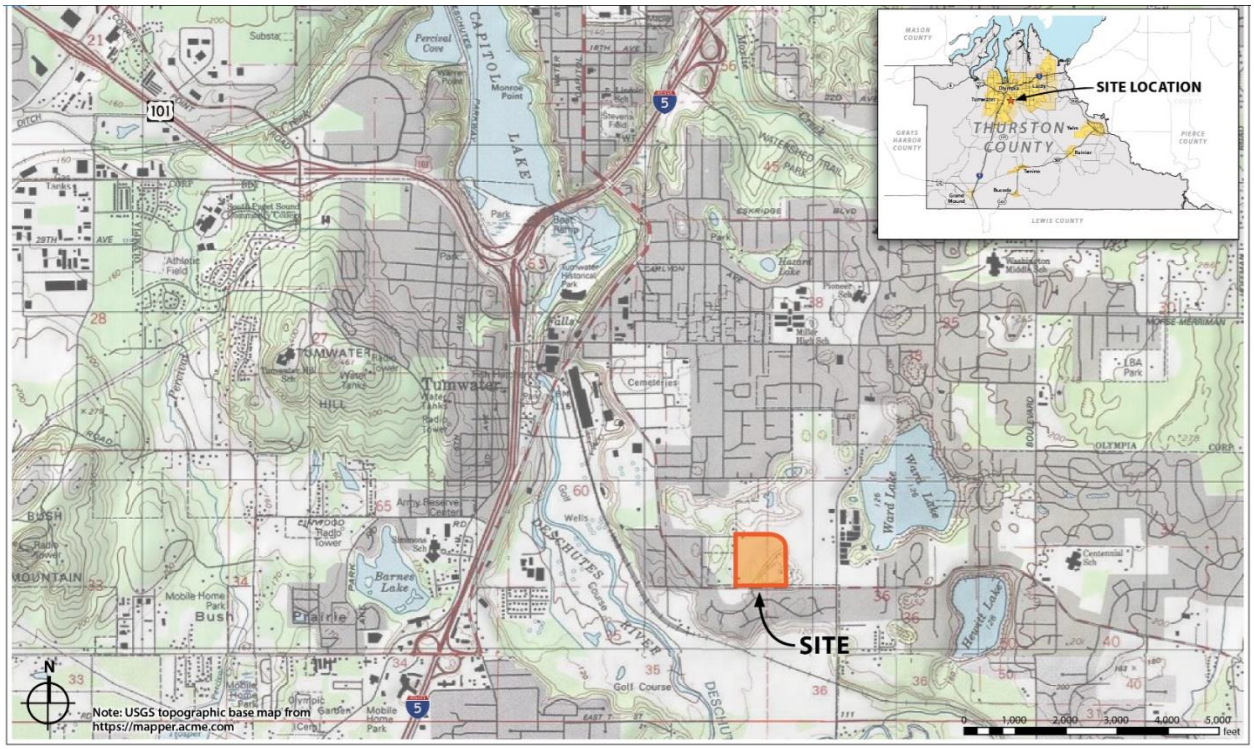

Figure 1. Site Vicinity Map

The rainfall for 2-3 weeks prior to the site visit fell within a normal range; however, precipitation totals over the previous winter were significantly above average. Based on visual observations from vantage points behind the fence, there was no surface water in the kettle base (about 10+ feet lower than the fence location), but dry algal mats on the base and water /sediment staining on tree trunks about one foot above the soil surface in the kettle base was observed – indicating that there was a long-duration water table about 1 foot deep during the past winter and into the spring.

The South Kettle wetland was originally delineated by Lyndon Lee & Associates (LLA) in 1996 when the Briggs Nursery was first evaluating potential for conversion from nursery to residential development in the late 1990s and early 2000s. Because it is not possible to directly access the wetland edge in the South Kettle due to barrier fencing, the boundary defined by LLA in the original delineation work from 1996 is used as an adequate representation of the current condition. The rating result from the 1996 work applied a different rating system than what is used currently. That result indicated that the South Kettle wetland was a Category III system with a 100 ft buffer.

Applying currently accepted technical standards, the South Kettle Wetland is classified as a Depressional system (Hydrogeomorphic [HGM] Classification System), and as a Palustrine Scrub-Shrub (PSS)/ Palustrine Forested (PFO) system (Cowardin Classification System). Under the recently updated 2014 Western Washington Wetland Rating System (WWWRS) and current City of Olympia Critical Area regulations, the South Kettle Wetland rates as a Category III system with a total score of 18 points, and a Habitat score of 5 points. Guidance provided in the City of Olympia Director's Determination Regarding the 2014 Wetland Rating System Memorandum (December 31, 2014) was used to determine the standard wetland buffer width. A wetland with a Habitat score of 5 points is assigned a standard buffer of 140 feet width. The proposed site layout does not infringe on the 140-foot wetland buffer with any stormwater facilities or trail systems; therefore, no mitigation is needed.

2.0 METHODS

2.1 WETLAND DELINEATION REGULATIONS (FEDERAL AND STATE)

Under the Washington Administrative Code (WAC) section 173-22-035, the Washington State Department of Ecology (Ecology) requires wetland identification and delineation be completed following the approved federal wetland delineation manual and applicable regional supplements, including but not limited to the 1987 Corps of Engineers Wetland Delineation Manual and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (U.S. Army Corps of Engineers 2010).

2.2 WETLAND RATING, CLASSIFICATION, AND BUFFERS

City of Olympia Municipal Code defines Wetland Protection Standards in Chapter 18.32.500, which includes requirements for rating the wetland and making buffer width determinations based on rating score results. These regulations have been updated and in response to a new rating protocol developed and published by the State Dept. of Ecology (effective January 1, 2015). A City of Olympia Director's Determination Regarding the 2014 Wetland Rating System Memorandum (December 31, 2014) updated the City of Olympia Critical Areas Ordinance language to adopt the new wetland rating system, and provided a revised wetland buffer width determination table.

As required by City of Olympia code, wetlands were rated according to the most recent version of the *Washington State Wetland Rating System for Western Washington* (Ecology Publication #14-06-029, replacing #04-06-025). This system scores wetlands based on the functions of water quality, hydrology, and habitat. This system also reviews the wetland's sensitivity to disturbance and rare or non-replaceable wetland characteristics.

Wetlands identified as part of this project were classified according to the USFWS Cowardin classification system (Cowardin et al. 1979) and the USACE Hydrogeomorphic (HGM) classification system (Brinson 1993).

2.3 BACKGROUND MATERIALS

To help determine the site conditions that might affect delineation and rating results, SCJ Alliance staff reviewed the following information to provide site information:

- Thurston County GeoData mapping system (Thurston County 2017)
- US Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map (USFWS 2017)
- US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic database online Web Soil Service. (WEBS Soil Survey 2017)
- Precipitation data (US Climate Data 2017)
- Washington State Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) Database (WDFW PHS 2017)
- Washington State Department of Natural Resources (DNR) FPARS stream mapping system (DNR 2017).
- Google Earth historic timeline aerial photos of the project area

2.4 ASSESSING WETLANDS AND SOILS ONSITE

SCJ Alliance staff, Lisa Palazzi, CPSS, PWS, and Timothy J. Haderly, Principal Environmental Scientist carried out the onsite wetlands assessment on June 7, 2017. The South Kettle Wetland is surrounded by a 6-foot high woven wire fence with no gates or other points of entry; therefore, the assessment was carried out from the fence line.

3.0 FINDINGS

3.1 General Project and Site Description

The Briggs Village West Residential Project site is on a 20.15-acre parcel (TPN 37030000015) owned by Briggs Re-Development LP, located northwest of the intersection of Yelm Highway SE and Briggs Drive SE (Figure 2). The site is bordered by multi-family residential to the east, park/open space to the north, single-family residential to the west, and Yelm Highway to the south.

Briggs Re Development LP has proposed the development of 45 single-family residential lots; an extension of Eagle Bend Drive SE; a vehicular site access onto Yelm Highway; and utilities within the proposed street right-of-way.

SCJ Alliance wetland scientist, Lisa Palazzi, CPSS, PWS, and Timothy J. Haderly, Principal Environmental Scientist assessed the South Kettle Wetland on June 7, 2017. The rainfall for 2-3 weeks prior to the site visit was slightly above average for the time of year, but acceptable for assessment of wetland conditions. The previous winter recorded above average precipitation.

Figure 2. Project Site and South Kettle wetland.

3.2 SCJ Wetland Evaluation Overview

A single wetland (South Kettle Wetland) was evaluated in the southern portion of the project site (Figure 3). Due to access being blocked by a 6-foot high woven wire fence[1] with signs indicating entry was barred, detailed delineation and flagging of the South Kettle Wetland boundary was not possible. Following their wetland delineation work across the Briggs Nursery site in 1996, Lyndon Lee & Associates (LLA) provided additional wetland assessment reports in the early 2000s. Soil and water quality testing in the kettle bases indicated that some of the sediments were polluted. The State Dept. of Ecology eventually deemed that the safest and least impactful solution was to fence the kettles at the edge of the wetland buffer and allow no further entry. For that reason, the wetland boundary in all onsite kettles has been inaccessible since the early 2000s.

Based on visual observations from the perimeter fence, SCJ staff determined the current wetland boundary was either somewhat smaller or not significantly changed from a previous delineation carried out by LLA in 1966, with one significant difference. LLA described a separate "wetland mosaic" with 25% wetland area extending northeast of the main ponded wetland. The boundary of that extended area is noted in the Plat Map as the "wetland high water line" (adapted for Figure 3). Under current regulations, to be defined as a mosaic, wetland must cover at least 50% of an area to qualify. Therefore, an area with 25% wetland area would not be defined as a mosaic under current technical standards. But

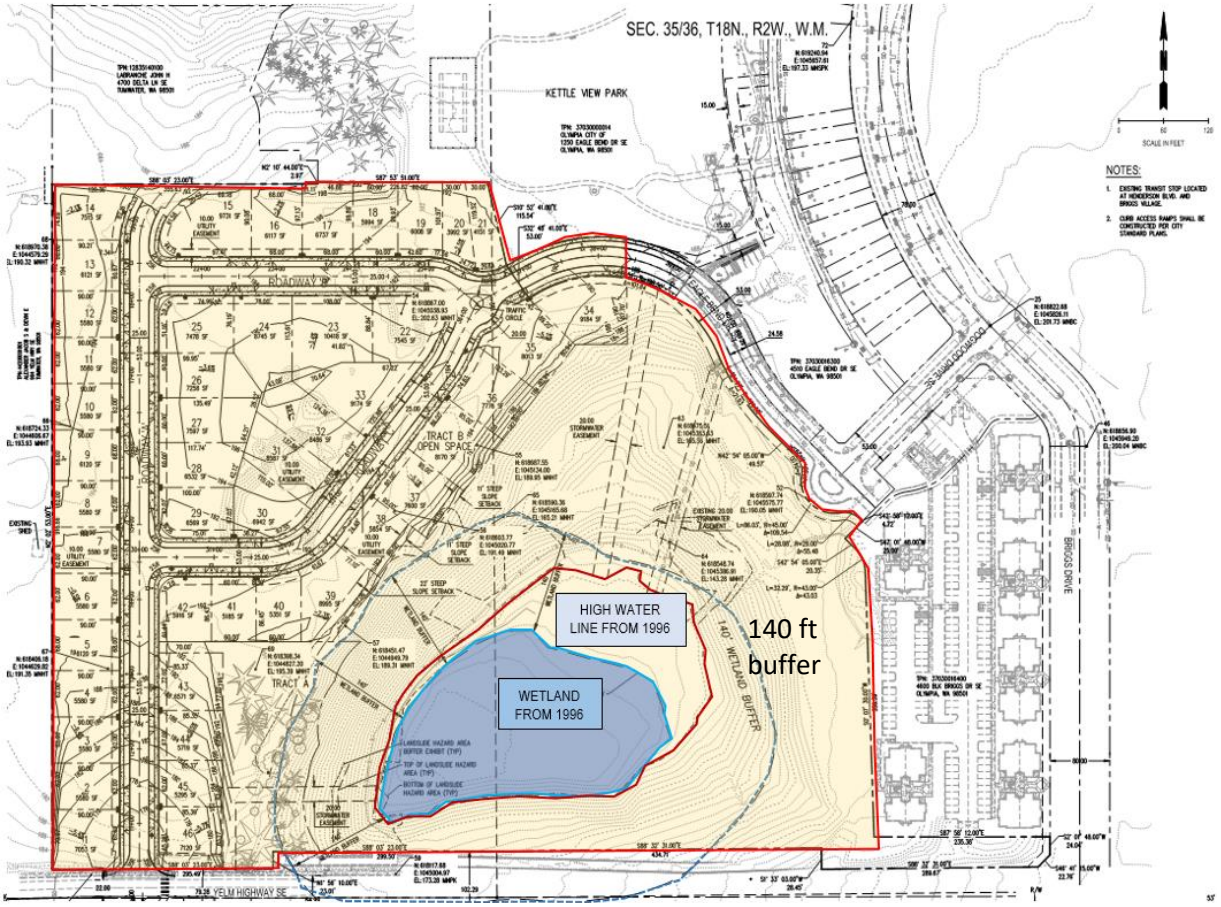

Figure 3. Adaptation of Plat Map, showing project outline and South Kettle wetland.

[1] The fence was installed in the early 2000s at the edge of the 100-ft buffer, to restrict entry into the kettle base.

more important, there is no evidence of any current wetland conditions in that zone. The high-water line and previously described wetland mosaic was likely a result of excess stormwater water being sent to the South Kettle in the past; the lack of current hydrology in that area is most likely a result of improved management of onsite stormwater with more infiltration and detention in upland areas. Under current conditions, only the area described as "ponded" by LLA in 1996 is a jurisdictional wetland.

3.3 Stormwater Outfalls

The pre-development stormwater outfalls from the nursery were all removed and/or abandoned as the Briggs site was redeveloped over time. The new stormwater system infiltrates and detains stormwater, but does allow for some treated overflow to be directed toward the kettles bases. The intent of this is to ensure that the wetlands still receive enough hydrology to maintain wetlands in the kettle base, but also to ensure that water quality is high. There is an existing stormwater outfall from previous phases of the Briggs development which was designed to be released at the edge of the previously defined 100-ft buffer. Any new stormwater outfalls will end outside of the new 140-ft buffer.

The stormwater outfall to the west is located in the buffer.

Yelm Highway runs along the southern edge of the South Kettle. The highway was widened in the early 2000s, and as a result, a vertical retaining wall was built along the northern side of the highway, in the upper side slope of the South Kettle. City stormwater maps indicate that two short piped outfalls from the Highway were apparently directed into the drain system behind the retaining wall, presumably to retain the pre-development hydrologic regime to the wetland. No detailed design work for those outfalls was reviewed, but they would have been designed to meet treatment and release standards in place at that time. However, the great majority runoff from the Yelm Highway, which is under the jurisdiction of the City of Tumwater in that area, is collected and sent into stormwater facilities south of the highway.

There are no piped outfalls that release stormwater directly into the wetland base, and any water sent toward the South Kettle through wetland buffers is already treated.

3.4 South Kettle Wetland Description

The South Kettle Wetland is located within a natural kettle in the southern portion of the greater Briggs Nursery site (Figure 1). Wetland vegetation visible from the barrier fence line indicates the wetland is dominated by *Populus balsamifera* (black cottonwood), *Alnus rubra* (red alder), *Carex obnupta* (slough sedge) and Phalaris arundinacea (reed canarygrass). The wetland buffer is dominated by red alder, *Acer macrophyllum* (big leaf maple), *Corylus cornuta* (beaked hazel nut), and *Rubus armeniacus* (Himalayan blackberry). It is classified as a Depressional System (HGM Classification system), and Palustrine Scrub-Shrub/Palustrine Forested wetland (PSS/PFO, Cowardin Classification system), and rates as a Category III wetland system under the 2014 Western Washington Wetland Rating System.

The source of hydrology is dominantly groundwater, but with contributions from directly incident rainfall and minor possible surface water contributions during periods of extend rainfall.

Table 1. Soil Map Unit Descriptions at Project Site (Figure 4 Soil Map)		
Soil Map Unit	Dominant Soil Series Name	Dominant Soil Characteristics
69	Mukilteo muck, 0% slopes	Deep, very poorly drained soils formed in deep organic deposits, located mainly in depressional areas on glacial uplands. Water is expected at or above the surface in winter and into the spring.
46, 48	Indianola loamy sand, 0-5% and 15-30% slopes	Very deep, somewhat excessively drained soils formed in sandy glacial drift, on hills, terraces, terrace escarpments, eskers, and kames of drift or outwash plains. No water table is expected within 6 feet of the soil surface.
76	Norma silt loam, 0-3% slopes	Deep, poorly drained soils formed in old alluvium in depressions on glacial till plains and drainageways. Winter water table expected to pond or persist into spring within 1 foot of the surface.
126, 127, 128	Yelm fine sandy loam, 0-3%, 3-15% and 15-30% slopes	Very deep, moderately well drained soils formed in glacial outwash in relict glacial lacustrine lakes and drainageways on terraces. Seasonal water may perch over fine layers in this soil within 6 feet of the surface, but is nt expected to persist for long duration periods of time.

Figure 4. Soil Map of Project Area

Soils within the South Kettle Wetland are mapped as Mukilteo muck (#69) with adjacent upland soils mapped as Yelm fine sandy loam (#126-128) (Figure 3, Table 1). Indianola loamy sands are mapped nearby to the southwest and southeast and may also occur onsite as inclusions within the Yelm fine sandy loam map unit. The Norma silt loam is mapped in a different kettle base east of Harrison Blvd., near Ward Lake.

Based on visual observations from the fence perimeter at the South Kettle, SCJ staff determined that the wetland was possibly slightly smaller than when the past wetland boundary delineation was carried out in 1996. However, the toeslope western wetland boundary location adjacent to the proposed development to the west is unlikely to have changed significantly due to steeper terrain along that side

of the wetland. Because it is not possible to enter the fence to carry out more detailed site work, the previous wetland boundary may be used as a reasonable proxy for current wetland conditions.

3.5 Wetland Rating and Buffer Requirements

South Kettle Wetland is rated as a Category III wetland with an overall score of 18 points. Water quality scored 8, hydrology scored 5, and habitat scored 5 (see Appendix B). Category III wetlands, with a Habitat Score of 5 points, are assigned a standard buffer of 140 feet according to December 31, 2014 updates to OMC 18.32.535.

The proposed site layout does not infringe on the 140-foot wetland buffer, and no trails or stormwater outfalls in the buffer are proposed; therefore, no mitigation is needed.

4.0 SUMMARY AND CONCLUSIONS

SCJ staff evaluated a single wetland in the base of the South Kettle, located in the southern portion of the project site. The wetland is fenced with signage barring entry; thus, access to the wetland edge for re-delineation and flagging is not possible.

The South Kettle wetland was previously delineated in 1996 by Lyndon Lee & Associates, and a wetland boundary was defined in the kettle base. The source of previous hydrology was direct runoff from the Briggs Nursery site, but the nursery has not been in operation since the early 2000s, and surface hydrology is no longer directed to this wetland. For that reason, it is possible that the wetland is smaller than is was previously. However, there is enough natural hydrology under current conditions to support a wetland in the Kettle base.

Because there is no way to directly assess the wetland edge, the boundary of the ponded wetland in the kettle base from the 1996 delineation and survey is used as a proxy for the current condition.

The wetland was re-rated, using the required 2014 update to the Western Washington Wetland Rating protocol, and wetland buffers were assigned applying guidance provided in the December 31, 2014 Director's Memorandum. Rerating indicated the wetland is a Category III system (score of 18 points out of 27 possible), with a 140 ft wetland buffer (based on a Habitat Score of 5 points). The proposed site layout does not infringe on the 140-foot wetland buffer; therefore, no mitigation is needed.

5.0 REFERENCES

Brinson, M., Final Report: *A Hydrogeomorphic Classification for Wetlands.* Wetlands Research Program Technical Report. WRP-DE-4. East Carolina University, Biology Department. Greenville, North Carolina. Prepared for US Army Corps of Engineers, August 1993.

City of Olympia Critical Areas Ordinance, Wetlands and Small Lakes Chapter 18.32.500 http://www.codepublishing.com/wa/olympia/html/Olympia18/Olympia1832.html#18.32.535

City of Olympia Director's Determination Regarding the 2014 Wetland Rating System Memorandum (December 31, 2014)

Cowardin, Lewis M. et al, Classification of Wetlands and Deepwater Habitats of the United States, US Fish and Wildlife Service, 1979.

Hruby, T., *Washington State Wetland Rating System for Western Washington – Revised.* Publication Number 14-06029. Washington State Department of Ecology, 2014.

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US Climate Data, 2014 http://www.usclimatedata.com/climate/tacoma/washington/united-states/uswa0441/0441/2014/1.

USDA Natural Resources Conservation Service Plants Database, 2017 (for hydrophytic plant classification): http://plants.usda.gov/ .

US Fish and Wildlife Service National Wetlands Inventory Mapper, 2017 (for NWI wetland mapping): http://www.fws.gov/wetlands/Data/Mapper.html .

Washington Department of Fish and Wildlife Priority Habitats and Species Maps 2017 http://wdfw.wa.gov/mapping/phs/.

APPENDIX A

WETLAND FIELD DATA FORMS

NO FIELD DATA FORMS WERE FILLED OUT AS IT WAS NOT POSSIBLE TO DELINEATE THE WETLAND EDGE INSIDE THE FENCED AREA

APPENDIX B

WETLAND RATING FIGURES AND FORMS

FigureA-5. Cowardin Plant Classes

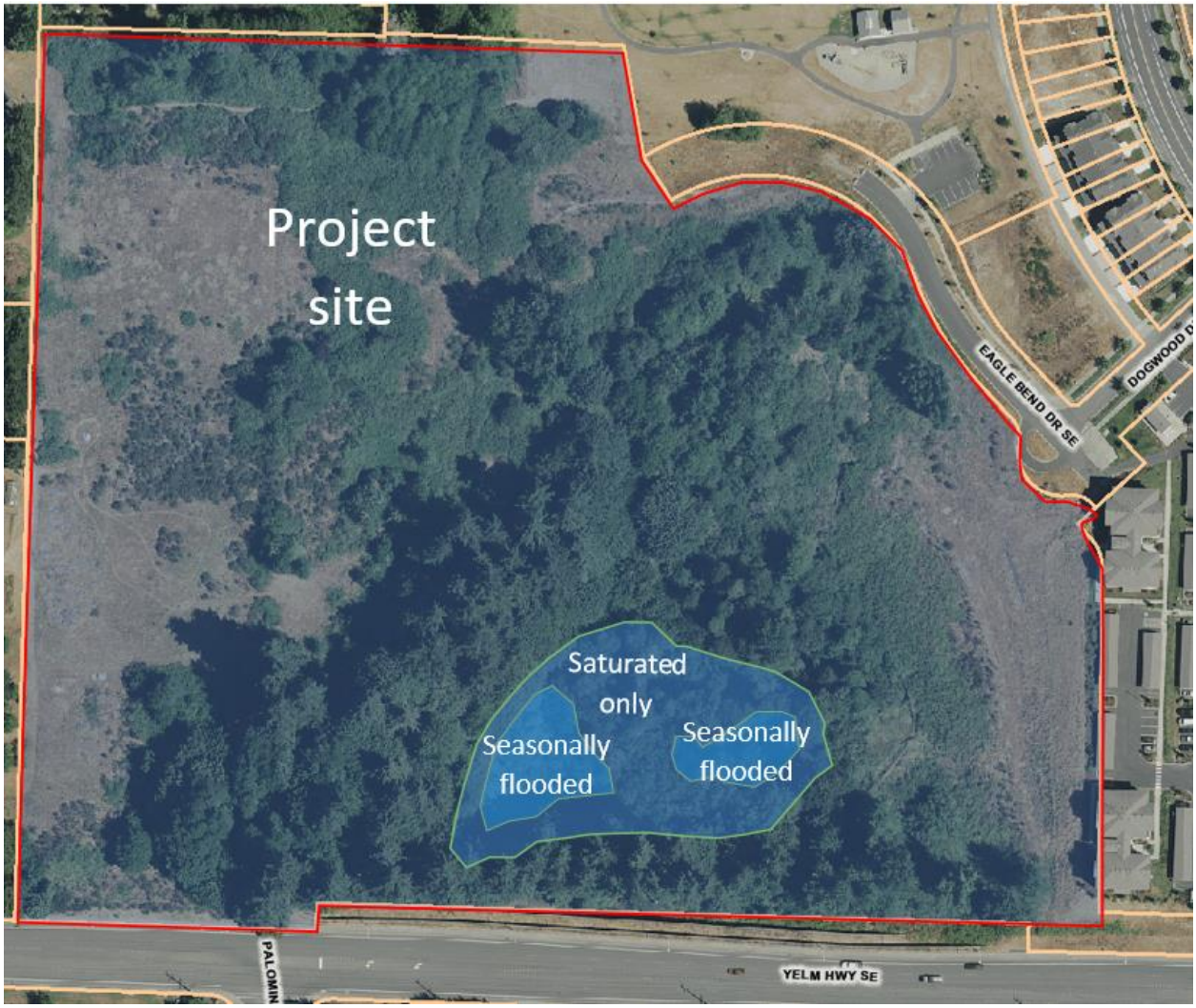
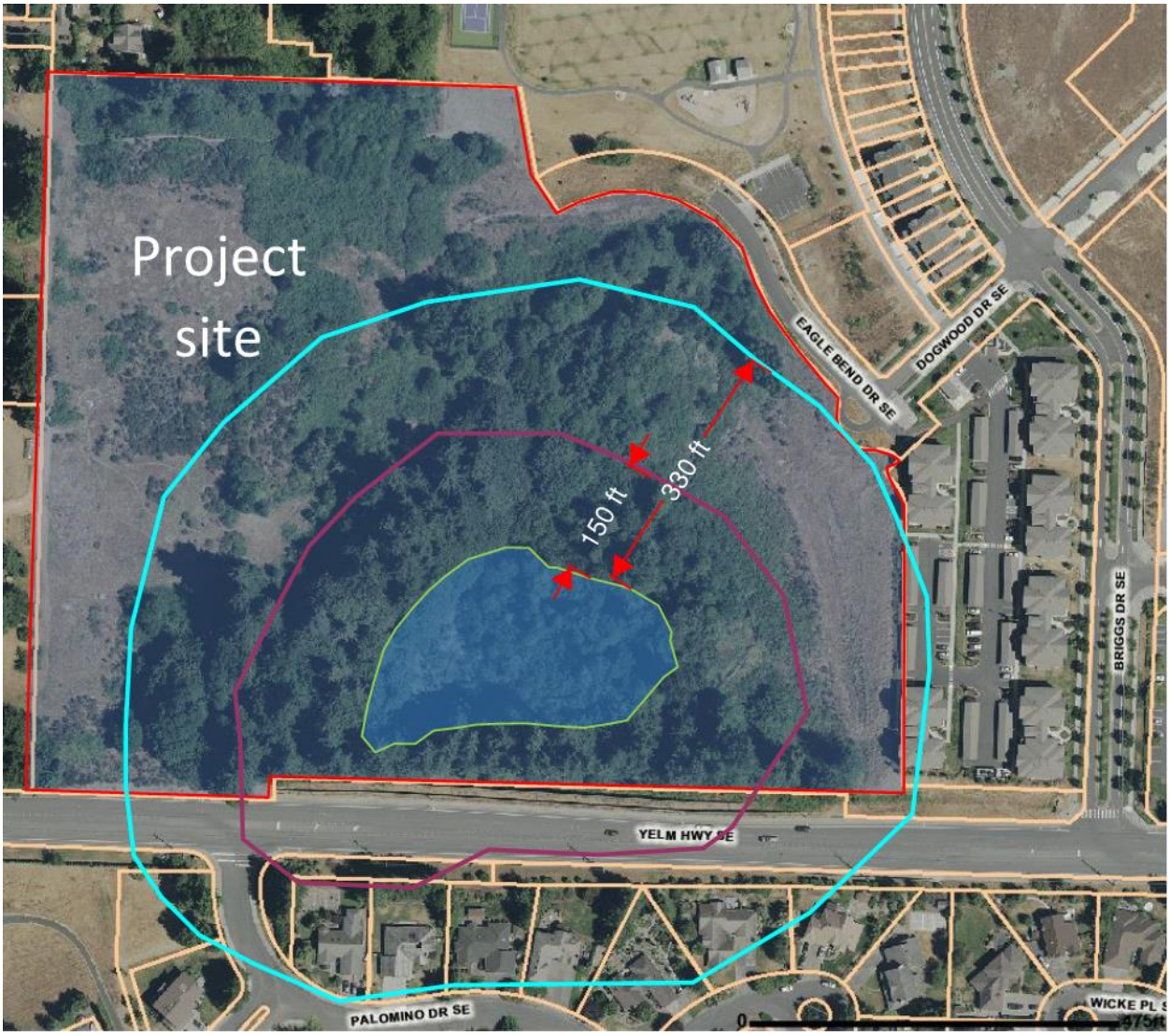


Figure A-6. Hydroperiods (estimated from photo signature)



FigureA-7. 150’ and 330’ setbacks

Figure A-8. Wetland basin area.

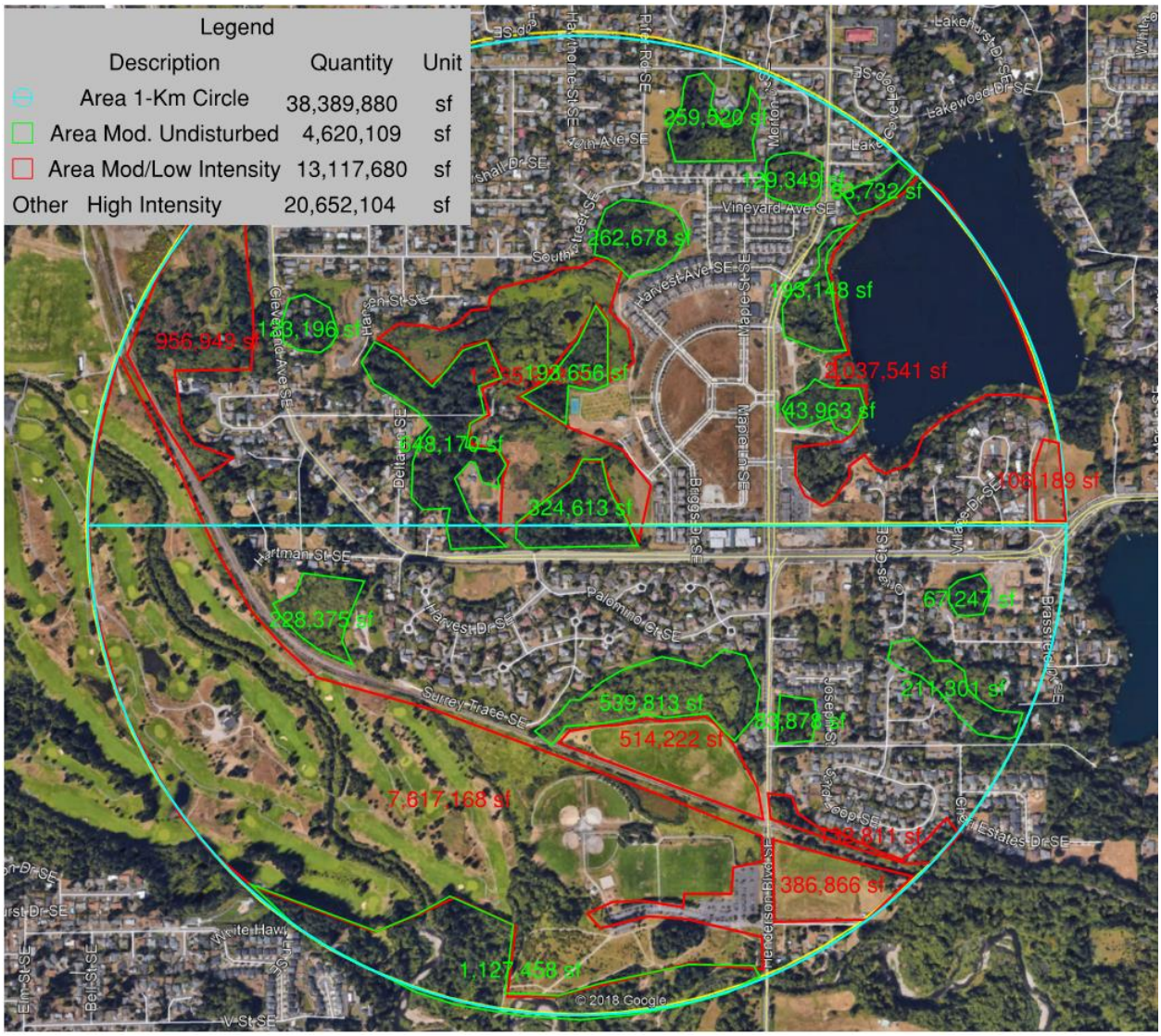


Figure A-9. Habitat within 1-km of site wetlands

Figure A-10. 303D Waters Map

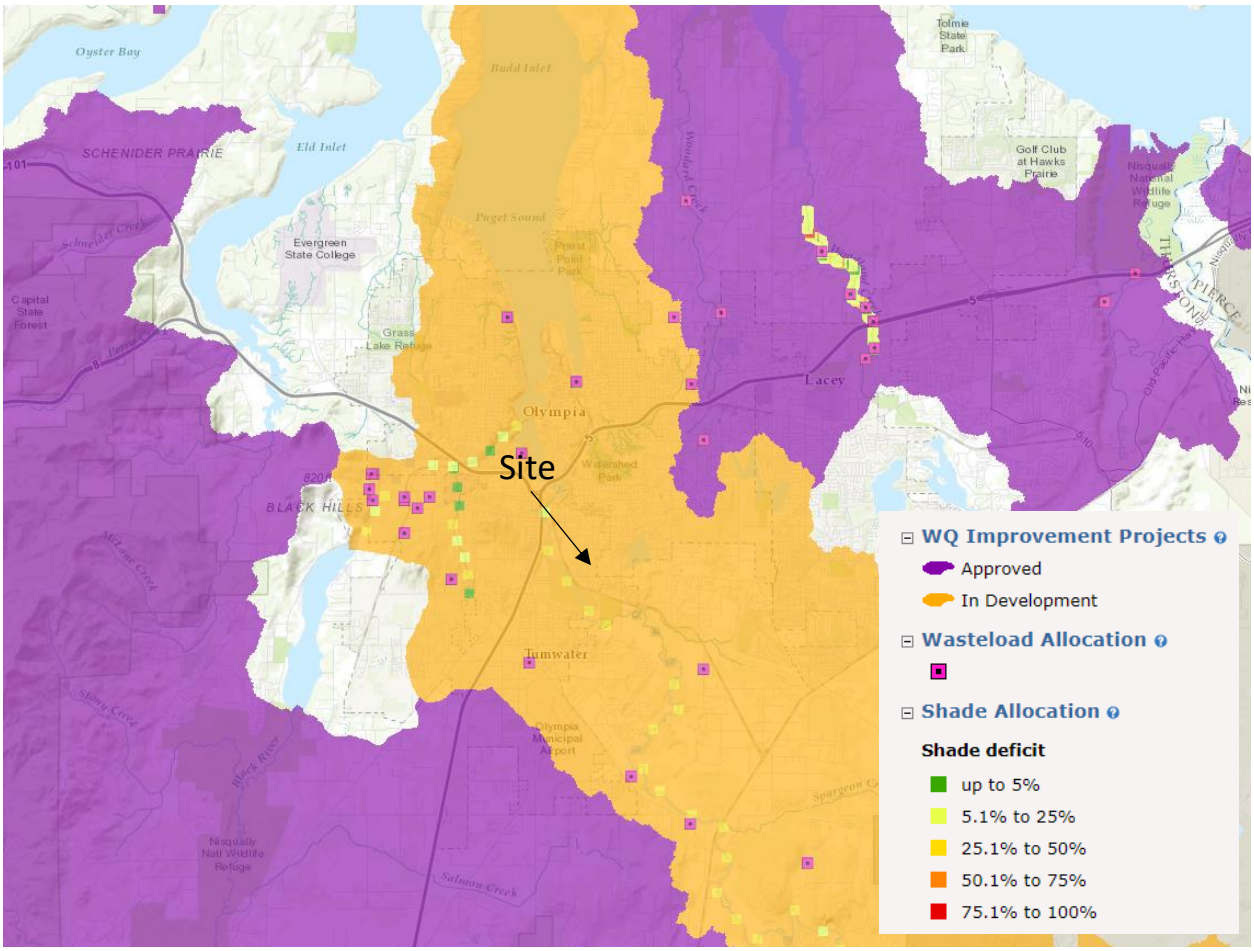


Figure A-11. TMDL Map

Wetland name or number Briggs South Kettle

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Briggs South Kettle Date of site visit: June 7, 2017

Rated by Lisa Palazzi and Tim Haderley Trained by Ecology? ☑ Yes ☐ No Date of training 2004-2014

HGM Class used for rating Depressional Wetland has multiple HGM classes? ☐ Y ☑ N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map GoogleEarth and Thurston County Geodata

OVERALL WETLAND CATEGORY III (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

- ____ **Category I** – Total score = 23 - 27
- ____ **Category II** – Total score = 20 - 22
- xx **Category III** – Total score = 16 - 19
- ____ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H ☑ M ☐ L ☐	H ☐ M ☑ L ☐	H ☐ M ☑ L ☐	
Landscape Potential	H ☐ M ☑ L ☐	H ☐ M ☑ L ☐	H ☐ M ☐ L ☑	
Value	H ☑ M ☐ L ☐	H ☐ M ☐ L ☑	H ☐ M ☑ L ☐	**TOTAL**
Score Based on Ratings	8	5	5	18

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	

Wetland name or number Briggs South Kettle

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	A-5
Hydroperiods	D 1.4, H 1.2	A-6
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	NA
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	A-7
Map of the contributing basin	D 4.3, D 5.3	A-8
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	A-9
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	A-10
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	A-11

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number Briggs South Kettle

HGM Classification of Wetlands in Western Washington

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

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

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

☑ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe** – go to 1.1

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

☑ **NO – Saltwater Tidal Fringe (Estuarine)** ☐ **YES – Freshwater Tidal Fringe**
*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

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

☑ NO – go to 3 ☐ **YES** – The wetland class is **Flats**
*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

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

4. Does the entire wetland unit **meet all** of the following criteria?
☐ The wetland is on a slope (*slope can be very gradual*),
☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
☐ The water leaves the wetland **without being impounded**.

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

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

5. Does the entire wetland unit **meet all** of the following criteria?
☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
☐ The overbank flooding occurs at least once every 2 years.

Wetland name or number Briggs South Kettle

☑ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

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

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

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

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

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

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

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

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

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

Wetland name or number Briggs South Kettle

DEPRESSIONAL AND FLATS WETLANDS

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

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*. Yes = 4 No = 0	4
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 The ponded area in the wetland is not large, and might be less than 1/4 of the wetland base. For this reason, we assessed it with both 0 and 2 points. It made not difference to the score.	2/0
Total for D 1 — Add the points in the boxes above	14/12

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

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? See comment below ☐ Yes = 1 No = 0 ☑	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? ☑ Yes = 1 No = 0 ☐	1
D 2.3. Are there septic systems within 250 ft of the wetland? ☐ Yes = 1 No = 0 ☑	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source No current direct surface inflow or pollutant discharge into WL ☐ Yes = 1 No = 0 ☑	0
Total for D 2 — Add the points in the boxes above	1

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

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? ☐ Yes = 1 No = 0 ☑	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? ☑ Yes = 1 No = 0 ☐	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? ☑ Yes = 2 No = 0 ☐	2
Total for D 3 — Add the points in the boxes above	3

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

Response to Q D 2.1. There are stormwater discharge pipes that release to the upper edge of the kettle from previously developed area in the Briggs Village, but the end of the outfall is about 185 feet from the edge of the wetland, and outside of the wetland buffer. There are two outfalls from the edge of the Yelm Highway. They were installed in the early 2000, and would have met design requirements at that time. They appear to be directed to a drain behind the retaining wall, likely to support hydrologic functions in the wetland.

Wetland name or number Briggs South Kettle

DEPRESSIONAL AND FLATS WETLANDS

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

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland:

Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	4
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	

Does not appear to have more than 2 ft of ponding. No outlet

D 4.3. Contribution of the wetland 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 the unit	points = 5	3
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 wetland is in the Flats class	points = 5	

Measured at 26x the area of the unit

Total for D 4 Add the points in the boxes above	10

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

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges? No current direct surface inflow	☐ Yes = 1 ☑ No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	☑ Yes = 1 ☐ No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	☑ Yes = 1 ☐ No = 0	1
Total for D 5 Add the points in the boxes above		2

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

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*

The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):

• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = 2 ☐	0
• Surface flooding problems are in a sub-basin farther down-gradient.	points = 1 ☐	
Flooding from groundwater is an issue in the sub-basin.	points = 1 ☐	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why*	points = 0 ☐	
There are no problems with flooding downstream of the wetland.	points = 0 ☑	

No outlet, Water level is below surface elevation

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	☐ Yes = 2 ☑ No = 0	0
Total for D 6 Add the points in the boxes above		0

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

Wetland name or number Briggs South Kettle

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- ☐ Aquatic bed
- ☑ Emergent
- ☑ Scrub-shrub (areas where shrubs have > 30% cover)
- ☑ Forested (areas where trees have > 30% cover)

4 structures or more: points = 4
3 structures: points = 2
2 structures: points = 1
1 structure: points = 0

If the unit has a Forested class, check if:

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

4

H 1.2. Hydroperiods

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

- ☐ Permanently flooded or inundated
- ☑ Seasonally flooded or inundated
- ☐ Occasionally flooded or inundated
- ☑ Saturated only
- ☐ 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**

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 type present: points = 0

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

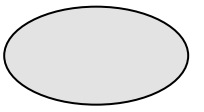
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

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

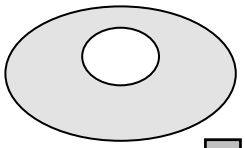
2

H 1.4. Interspersion of habitats

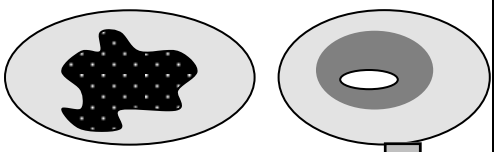
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points ☐

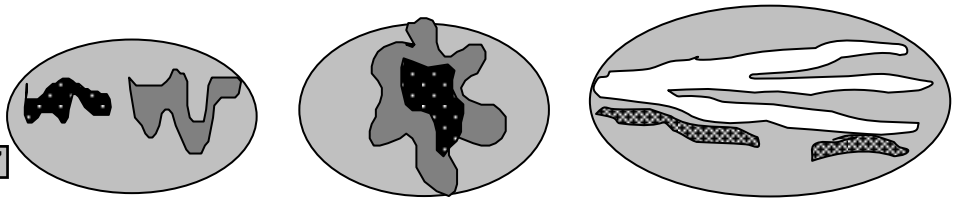


Low = 1 point ☐



Moderate = 2 points ☐

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



3

Wetland name or number Briggs South Kettle

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ☑ Standing snags (dbh > 4 in) within the wetland ☐ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ 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 weathered where wood is exposed)* ☑ At least ¼ ac of thin-stemmed persistent plants 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 every stratum of plants (*see H 1.1 for list of strata*)	3
Total for H 1 Add the points in the boxes above	13

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?

H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 4 + [(% moderate and low intensity land uses)/2] 2 = 6 % If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed hab 11.5 + [(% moderate and low intensity land uses)/2] 17 = 28.5 % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

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

H 3.0. Is the habitat provided by the site valuable to society?

H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ☐ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan ☑ Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 ☐ Site does not meet any of the criteria above points = 0	1

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

Wetland name or number Briggs South Kettle

WDFW Priority Habitats

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

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

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

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

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

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

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

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

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

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), 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 > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

Wetland name or number Briggs South Kettle

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland 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= **Not an estuarine wetland**	NA
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☑ No - Go to **SC 1.2**	**Cat. I** ☐
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	**Cat. I** ☐ **Cat. II** ☐
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes – Go to **SC 2.2** ☑ No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☑ No = **Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes – **Contact WNHP/WDNR and go to SC 2.4** ☑ No = **Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☑ No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☑ Yes – Go to **SC 3.3** ☐ No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes – Go to **SC 3.3** ☑ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☑ No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐ Yes = **Is a Category I bog** ☑ No = **Is not a bog**	**Cat. I** ☐

Wetland name or number Briggs South Kettle

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA 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 functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

☐ Yes = **Category I** ☑ No = **Not a forested wetland for this section** — ☐ **Cat. I**

SC 5.0. Wetlands in Coastal Lagoons

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 ponded 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)* — ☐ **Cat. I**

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 aggressive, opportunistic plant species (see list of species on p. 100). — ☐ **Cat. II**

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

☐ Yes = **Category I** ☐ No = **Category II**

SC 6.0. Interdunal Wetlands

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat 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 — ☐ **Cat I**

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109

☐ Yes – Go to **SC 6.1** ☑ No = **not an interdunal wetland for rating**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? — ☐ **Cat. II**

☐ Yes = **Category I** ☐ No – Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

☐ Yes = **Category II** ☐ No – Go to **SC 6.3** — ☐ **Cat. III**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

☐ Yes = **Category III** ☐ No = **Category IV** — ☐ **Cat. IV**

Category of wetland based on Special Characteristics

If you answered No for all types, enter "Not Applicable" on Summary Form

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APPENDIX C

SOUTH KETTLE WETLAND DESCRIPTION AND RATING FORM FROM 1996

V. Results and Discussion

All four kettles have been impacted by human manipulation. All receive irrigation flow from the Briggs Property, and the South, Central, and Northwest Kettles have been cleared and graded to some extent. Hence, none qualifies as a Category I wetland. Further, none of the four kettles qualifies as a Category IV wetland since none is less than 1 acre and hydrologically isolated and comprised of one vegetated class dominated by one species from the list of species provided in the Washington State Wetlands Rating System (1993). Therefore, the analysis in this report focuses on determining whether the kettle wetlands are Category II or Category III wetlands.

A. South Kettle

1. Overall Description

The South Kettle is located on the southwest corner of the Briggs Property (Figures 2 and 4). A forested buffer 100 feet wide occurs on the steep kettle slopes to the west and south. The kettle buffer on the north consists of grassy slopes 250-300 feet wide, and on the east the buffer is100' wide and is vegetated with grasses and some shrubs. Two distinct wetland areas were identified: (1) the ponded kettle bottom approximately 1.5 acres in size and (2) the northeast mosaic roughly 0.7 acres, of which approximately 25 percent (0.18 acres) meets the hydrologic criteria for jurisdictional wetlands. Therefore, there are approximately 1.68 acres of waters/wetlands, in the South Kettle.
The South Kettle contains recently deposited fill materials from nearby highway construction, and wedges of stratified alluvium that have washed off this fill. The fill is unsorted glacial drift including till. The recent alluvium is predominantly fine sandy and silty-sandy mixtures (Figure 5).

2. Hydrology

Field observations suggest that the kettle bottom and the northeast mosaic have different hydrologic regimes. The nearly level kettle bottom is a winter- and spring-ponded depressional system related to regional groundwater levels. Little irrigation water reaches the kettle in winter. In contrast, the northeast mosaic is a complex slope system with discharge of groundwater, surface and transient subsurface flows from both stormwater and irrigation return water. Shallow groundwater, including perched layers, is the dominant form of active hydrology in the mosaic. Some areas were saturated on most visits, and also had clearly

Figure 4. Geographic Extent of Waters of the U.S., Including Wetlands at the Briggs Property, South Kettle

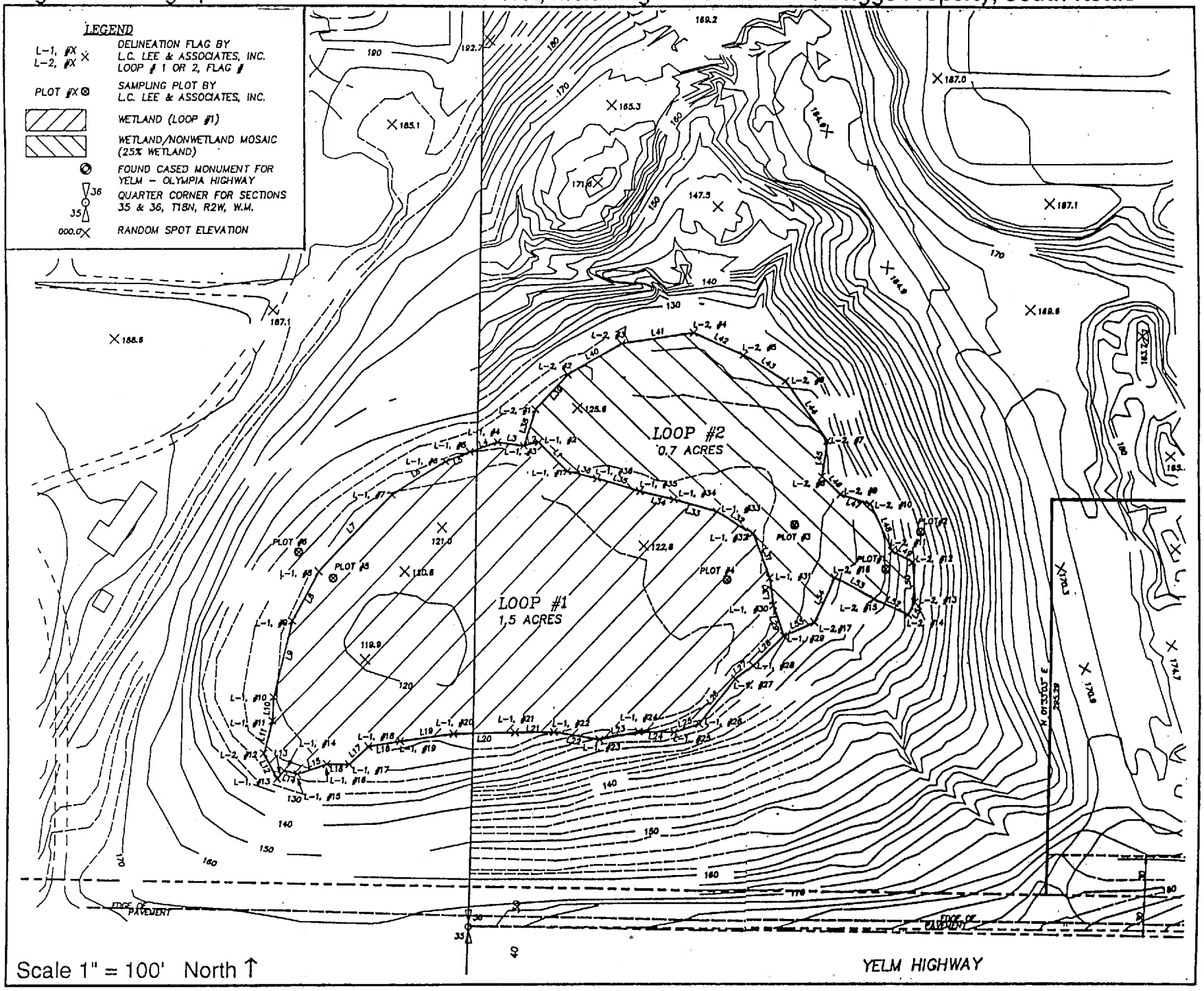


Figure 5. Forested Wetland Plant Community in South Kettle.

developed hydric soils in recent deposits. Most areas, however, were saturated on only one or two visits and had few relatively subtle morphologic indicators of hydric soils.

3. Soil

The Thurston County soil survey shows two mapping units for the South Kettle area on a 1:24,000 scale map (Figure 3) (Pringle *et al.*1990). The kettle bottom is mapped as Mukilteo muck, and the surrounding slopes and terraces are mapped together as Yelm fine sandy loam (0 to 3 percent slopes).

Soils within the ponded kettle area were classified as hydric soils using criterion 3 of the National Technical Committee for Hydric Soils (NTCHS 1995): "Soils that are frequently ponded for long or very long duration during the growing season." Soils within the ponded area revealed numerous hydric soils indicators (*e.g.*, sulfidic odor, gleyed or low-chroma colors, presence of redoximorphic concentrations and/or depletions). Soils sampled near the edges of the pond had stratified layers of recently deposited silts and sands. Some layers retained high chroma colors from uplands, but most had been reduced *in situ.*

Soils within the northeast mosaic exhibited a complex pattern of hydric, transitional, and non-hydric soils. The northeast mosaic was mantled with recently deposited materials, all of which appeared to have come from uplands. Shallow groundwater affects these sediments and, as confirmed in the field, has produced a number of hydric soils field indicators within them. However, most retained upland soils features. The most persistently wet areas had clearly developed into hydric soils: they were gleyed or low chroma, and had morphology indicating reduced conditions. Such soils comprised about 20 to 30 percent of the area.

Approximately 40 to 50 percent of the northeast mosaic had developed some hydric soil field indicators, but retained upland soil characteristics. These transitional soils were stratified with high and low chroma strata, and contained redoximorphic concentrations. Those soils dominated by low chroma matrix strata and containing redoximorphic depletions, perhaps about 10 percent of the total mosaic area, could be classified as hydric soils based on a combination of morphology and current hydrology. It was determined that the remaining transitional soils could be classified as hydric only with strong evidence of active wetland hydrology.

Approximately 35% of the northeast mosaic area had hydric soils and another approximately 35% of the area had transitional soils that could potentially be classified as hydric with additional data. Additional systematic transecting of the soils with detailed descriptions of morphology and active hydrology would be needed to better quantify these estimates.

4. Vegetation

Steep slopes surround the South Kettle wetland. The southwest slope supports an upland forest dominated by Douglas-fir (*Pseudotsuga menziesii*), Big-leaf Maple (*Acer macrophyllum*), Hazelnut (*Corylus cornuta*), and Sword Fern (*Polystichum munitum*). The remaining slopes are vegetated by upland grasses, Himalayan Blackberry (*Rubus discolor*), Douglas-fir (*Pseudotsuga menziesii*) and Red Alder (*Alnus rubra*) seedlings. The kettle bottom is composed primarily of open water, although a variety of species can be found around the edges (Table 1). The wetland mosaic is primarily a Sitka Willow (*Salix sitchensis*)-dominated forested community (Table 2).

Table 1. Partial Plant Species List for the South Kettle Bottom.

STRATUM	COMMON NAME	SCIENTIFIC NAME	INDICATOR STATUS
T	Vine Maple	*Acer circinatum*	FAC-
T	Big-Leaf Maple	*Acer macrophyllum*	FACU
T	Beaked Hazelnut	*Corylus cornuta*	FACU
T	Douglas Fir	*Pseudotsuga menziesii*	FACU
T	Scouler Willow	*Salix scouleriana*	FAC
T	Sitka Willow	*Salix sitchensis*	FACW
SA	Indian Plum	*Oemleria cerasiformis*	FACU
S	Barberry	*Berberis nervosa*	NL
S	Douglas' Spiraea	*Spiraea douglasii*	FACW
H	Sweet-scent Bedstraw	*Galium triflorum*	FACU
H	Siberian Springbeauty	*Montia sibirica*	FACW
H	Water-parsely	*Oenanthe sarmentosa*	OBL
H	Reed Canary Grass	*Phalaris arundinaceae*	FACW
H	Sword-fern	*Polystichum munitum*	FACU

Table 2. Partial Plant Species List for the South Kettle Northeast Mosaic.

STRATUM	COMMON NAME	SCIENTIFIC NAME	INDICATOR STATUS
T	Beaked Hazelnut	*Corylus cornuta*	*FACU*
T	Sitka Willow	*Salix sitchensis*	*FACW*
S	Himalayan Blackberry	*Rubus discolor*	*FACU*
S	Douglas' Spiraea	*Spiraea douglasii*	*FACW*
H	Bull Thistle	*Cirsium vulgare*	*FACU*
H	Field Horsetail	*Equisetum arvense*	*FAC*
H	Reed Canary Grass	*Phalaris arundinaceae*	*FACW*
H	Climbing Nightshade	*Solanum dulcamara*	*FAC+*
H	Stinging Nettle	*Urtica dioica*	*FAC+*

5. Rating

For the purposes of rating the South Kettle using the Washington Wetland Rating System, the following features indicated that the wetland is a Category III wetland. The South Kettle is 1.68 acres (2 points), and is composed of two vegetation classes: open water and forested (3 points). Species diversity within the forested wetland consisted of greater than four species (3 points). Structural diversity of the vegetation within the forested wetland includes trees 20-49' tall, shrubs, and herbaceous groundcover, and the presence of open water immediately proximate to the forested area (4 points). Interspersion among the wetland classes was low (1 points). With respect to habitat features, the South Kettle had at least 3 downed logs per acre with a diameter greater than 6 inches for at least 10 feet in length (1 point). The wetland is not connected to any stream (0 points). Buffers of forest, scrub, grassland or open water are present for more than 100' around 95% of the circumference of the South Kettle (5 points). However, the South Kettle is not connected by a forested, scrub-shrub, or riparian corridor to another habitat area. Hence, the score of the South Kettle with respect to Washington State Wetland Rating System is 19 points and it is classified as a Category III wetland.

Size	1.68 acres	2 points
Wetland Classes Present	2 classes	3 points
Species Diversity	forested >4 species	3 points
Structural Diversity	key elements	4 points
Interspersion	low	1 points
Habitat Features	downed logs	1 point
Surface Water Connection	absent	0 points
Buffers	> 100' for 95%	5 points
Habitat Corridor Connection	absent	0 points
TOTAL		***19 points***

E 1 D

Wetlands Rating Office Data Form

Background Information:

Name of Rater: ELLIS/COSHOW Affiliation: L.C. LEE & ASSOC. Date: 10/20/96

Name of wetland (if known): South Kettle

Government Jurisdiction of wetland: Wash State, Federal, Thurston County

Location: 1/4 S: _____ of 1/4 S: ~~NE~~ NW SEC: 36 TWNSHP: 18N RNGE: 2W

SOURCES OF INFORMATION: (Check all sources that apply)

Site visit: X USGS Topo Map: X NWI map: X Aerial Photo: X Soils survey: X

Other: X Describe: Juris. Delineation 1996 Wash. Dept. of Fish & Wildlife
Wash. State Dept of Natural Resources

When office and/or field data forms are completed enter Category here: III

ANSWER ALL QUESTIONS BELOW. If the source agency identifies the wetland as satisfying any of the questions below, circle the category in "CATEGORY" column.	Data Source	Catagory (the highest qualifies)
Category I Questions		
A. Is the wetland in a Section and Subsection that has been documented as a habitat that performs a life support function for any State or Federally listed Threatened or Endangered plant or animal species? For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. *NOTE:* The rating of a wetland is incomplete in most cases without this documentation.	DNR - Natural Heritage; and WDW	Yes: Next Question (No:) Go to Question D
B. Does the wetland contain individuals of Federal or State-listed Threatened or Endangered plant species; OR Does the wetland contain documented occurences of federal or state-listed Threatened or Endangered wildlife and species managed by the Washington Department of Wildlife?	DNR-Natural Heritage WDW	Yes: Category I (No:) Next Question
C. Does the wetland contain documented occurences of State or Federally listed Threatened or Endangered fish species, OR races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries?	WDW; WDF	Yes: Category I (No:) Next Question

Wetlands Rating Office Data Form (continued)		
D. Is the wetland already on record with the Washington Natural Heritage Program as a high quality native wetland?	DNR-Natural Heritage	Yes: Category I (No:) Next Question
E. Does the wetland contain documented regionally significant waterfowl or shorebird concentration areas?	WDW	Yes: Category I (No:) Next Question
F. Is the wetland documented as a Category I Wetland of Local Significance?	Local Government	Yes: Category I (No) Next Question
Category II Questions		
G. Is the wetland in a Township, Section and Subsection that has been documented as a habitat for any State listed Sensitive plant or animal species?	DNR-Natural Heritage Program; and WDW	Yes: Next Question (NO) Go to Question K
H. Does the wetland contain individuals of State-listed Sensitive plant species?	DNR Natural Heritage	Yes: Cat. II (No:) Next Question
I. Does the wetland contain documented occurences of federally or state-listed sensitive wildlife species?	WDW	Yes: Cat. II (No:) Next Question
J. Does the wetland contain documented occurences of state or federally listed Sensitive fish species?	WDF WDW	Yes: Cat. II (No) Next Question
K. Does the wetland contain priority species or habitats documented by Washington Department of Wildlife's Priority Habitats and Species Program ?	WDW	Yes: Cat. II (No) Next Question
L. Is the wetland documented as a Category II Wetland of Local Significance?	Local Government	Yes: Cat. II (No) Next Question
Category III Questions		
M. Is the wetland documented as a Category III wetland of local significance.	Local Government	Yes: Cat. III (No:) go to Rating Field Data Form

Wetlands Rating Field Data Form

Background Information:

Name of Rater: COSHOW/ ELLIS Affiliation: L.C. LEE & ASSOC. Date: 10/28/96

Name of wetland (if known): South Kettle

Government Jurisdiction of wetland: Federal, WA state; Thurston County

Location: 1/4 Section: NE of 1/4 S: NW Section: 35 36 Township: 18N Range: 2W

Sources of Information: (Check all sources that apply)

Site visit: X USGS Topo Map: X NWI map: X Aerial Photo: X Soils survey: X

Other: X Describe: Juris Delineation 1996, WA Dept of Fish & Wildlife Wash State Dept of Natural Resources

When The Field Data form is complete enter Category here: III

Q.1. High Quality Natural Wetland

Circle Answers

Answer this question if you have adequate information or experience to do so. If not find someone with the expertise to answer the questions. Then, if the answer to questions 1a, 1b and 1c are all NO, contact the Natural Heritage program of DNR.

1a. Human caused disturbances.

Is there significant evidence of human-caused changes to topography or hydrology of the wetland as indicated by any of the following conditions? Consider only changes that may have taken place in the last 5 decades. The impacts of changes done earlier have probably been stabilized and the wetland ecosystem will be close to reaching some new equilibrium that may represent a high quality wetland.

1a1. Upstream watershed > 12% impervious.	Yes: go to Q.2
1a2. Wetland is ditched and water flow is not obstructed.	Yes: go to Q.2
1a3. Wetland has been graded, filled, logged.	Yes: go to Q.2
1a4. Water in wetland is controlled by dikes, weirs, etc.	Yes: go to Q.2
1a5. Wetland is grazed.	Yes: go to Q.2
1a6: Other indicators of disturbance (list below)	Yes: go to Q.2
	No: go to 1b.

Irrigation return flow from the Briggs nursery contributes a considerable amount of water to the wetland

Trash dumped in west side buffer area

Exotic plants: Rubus discolor, Phalaris arundinacea

SOUTH KETTLE

1b Are there populations of non-native plants which are currently present, cover more than 10% of the wetland, and appear to be invading native populations? Briefly describe any non-native plant populations and Information source(s): Site visit: Rubus discolor, Phalaris arundinaceae	(YES) go to Q.2 No: go to 1c.
1c. Is there evidence of human-caused disturbances which have visibly degraded water quality. Evidence of the degradation of water quality include: direct (untreated) runoff from roads or parking lots; presence, or historic evidence, of waste dumps; oily sheens; the smell of organic chemicals; or lifestock use. Briefly describe: Irrigation Return flow from nursery operations	(YES:) go to Q.2 NO: Possible Cat. I contact DNR
Q.2. Irreplaceable Ecological Functions: Does the wetland: ⊕ have at least 1/4 acre of organic soils deeper than 16 inches and the wetland is relatively undisturbed; OR [IIf the answer is NO because the wetland is disturbed briefly describe: Indicators of disturbance may include: - Wetland has been graded, filled, logged; - Organic soils on the surface are dried-out for more than half of the year; - Wetland receives direct stormwater runoff from urban or agricultural areas.]; OR	(NO to all) go to Q.3) YES go to 2a
⊕ have a forested class greater than 1 acre; OR	YES: Go to 2b
⊕ have characteristics of an estuarine system; OR	YES: Go to 2c
⊕ have eel grass, floating or non-floating kelp beds?	YES: Go to 2d
2a. Bogs and Fens Are any of the three following conditions met for the area of organic soil?	
2a.1. Are Sphagnum mosses a common ground cover (>30%) and the cover of invasive species (see Table 3) is less than 10%?	---
Is the area of sphagnum mosses and deep organic soils > 1/2 acre? Is the area of sphagnum mosses and deep organic soils 1/4-1/2 acre?	YES: Category I YES: Category II
	NO: Go to 2a.3
2a.2. Is there an area of organic soil which has an emergent class with at least one species from Table 2, and cover of invasive species is < 10% (see Table 3)?	
Is the area of herbaceous plants and deep organic soils > 1/2 acre? Is the area of herbaceous plants and deep organic soils 1/4-1/2 acre?	YES: Category I YES: Category II
	NO: Go to 2a.3

SOUTH KETTLE

2a.3. Is the vegetation a mixture of only herbaceous plants and Sphagnum mosses with no scrub/shrub or forested classes? Is the area of herbaceous plants, Sphagnum, and deep organic soils > 1/2 acre? Is the area of herbaceous plants, Sphagnum, and deep organic soils 1/4-1/2 acre?	YES: Category I YES: Category II NO: Go to Q.3.
Q.2b. Mature forested wetland. 2b.1. Does 50% of the cover of upper forest canopy consist of evergreen trees older than 80 years or deciduous trees older than 50 years? *Note:* The size of trees is often not a measure of age, and size cannot be used as a surrogate for age (see guidance). 2b.2. Does 50% of the cover of forest canopy consist of evergreen trees older than 50 years, AND is the structural diversity of the forest high as characterized by an additional layer of trees 20'-49' tall, shrubs 6' - 20', tall, and a herbaceous groundcover? 2b.3. Does < 25% of the areal cover in the herbaceous/groundcover or the shrub layer consist of invasive/exotic plant species from the list on p. 19?	YES: Category I NO: Go to 2b.2 YES: Go to 2b.3 NO: Go to Q.3 YES: Category I NO: Go to Q.3
Q.2c. Estuarine wetlands. 2c1. Is the wetland listed as National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park, or Educational, Environmental or Scientific Reserves designated under WAC 332-30-151? . . . . . 2c.2. Is the wetland > 5 acres; . . . . . . *Note:* If an area contains patches of salt tolerant vegetation that are 1) less than 600 feet apart and that are separated by mudflats that go dry on a Mean Low Tide, or 2) separated by tidal channels that are less than 100 feet wide; all the vegetated areas are to be considered together in calculating the wetland area. or is the wetland 1-5 acres; . . . . . . or is the wetland < 1 acre?.	YES: Category I NO: Go to 2c.2 YES: Category I YES: Go to 2c.3 YES: Go to 2c.4

SOUTH KETTLE

2c.3. Does the wetland meet at least 3 of the following 4 criteria: . . . . . - minimum existing evidence of human related disturbance such as diking, ditching, filling, cultivation, grazing or the presence of non-native plant species (see guidance for definition); - surface water connection with tidal saltwater or tidal freshwater; - at least 75% of the wetland has a 100' buffer of ungrazed pasture, open water, shrub or forest; - has at least 3 of the following features: low marsh; high marsh; tidal channels; lagoon(s);woody debris; or contiguous freshwater wetland.	YES: Category I NO: Category II
2c.4. Does the wetland meet all of the four criteria under 2c3. (above)?. .	YES: Category II NO: Category III
Q.2d. Eel Grass and Kelp Beds. 2d.1. Are eel grass beds present?.	YES: Category I NO: go to 2d.2
2d.2. Are there floating or non-floating kelp bed(s) present with greater than 50% macro algal cover in the month of August or September?	YES: Category I NO: Category II
Q.3. Category IV wetlands. 3a. Is the wetland: less than 1 acre and, hydrologically isolated and, comprised of one vegetated class that is dominated (> 80% areal cover) by one species from Table 3 (page 19) or Table 4 (page 20)	YES: Category IV (NO:) go to 3b
3b. Is the wetland: less than two acres and, hydrologically isolated, with one vegetated class, and > 90% of areal cover is any combination of species from Table 3 (page 19)	YES: Category IV (NO: go to 3c
3c. Is the wetland excavated from upland and a pond smaller than 1 acre without a surface water connection to streams, lakes, rivers, or other wetland, and has < 0.1 acre of vegetation.	YES: Category IV (NO) go to Q.4

SOUTH KETTLE

Q.4. Significant habitat value.

Answer all questions and enter data requested.

4a. Total wetland area

Estimate area, select from choices in the near-right column, and score in the far column:

Enter acreage of wetland here: 1.68 acres, and source: SURVEYED JURISDICTIONAL J.D. 1996 DELINEATION

Circle scores that qualify	
acres	points
> 200	6
40- 200	5
10 - 40	4
5 - 10	3
1 - 5	(2)
0.1 - 1	1
< 0.1	0

4b. **Wetland classes:** Circle the wetland classes below that qualify:

(Open Water:) if the area of open water is > 1/4 acre

Aquatic Beds: if the area of aquatic beds > 1/4 acre,

Emergent: if the area of emergent class is > 1/4 acre,

Scrub-Shrub: if the area of scrub-shrub class is > 1/4 acre,

(Forested:) if area of forested class is > 1/4 acre,

Add the number of wetland classes, above, that qualify, and then score according to the columns at

e.g. If there are 4 classes (aquatic emergent & scrub- shrub), you would circle mn.

LOOK CAREFULLY THIS IS A KEY ONE

# of classes	Points
1	0
(2)	(3)
3	6
4	8
5	10

4c. Plant species diversity.

For each wetland class (at rig 4b above, count the number you can find that cover mor You do not have to name th

Score in column at far rig

e.g. If a wetland has an aquatic cies, an emergent class with 4 species and a sc b class with 2 species you would circle 2, 2, and 1 in the far column.

Note: Any plant species with a cover of > 5% qualifies for points within a class, even those that are not of that class.

Class	# species in class	Points
Aquatic Bed	1	0
	2	1
	3	2
	> 3	3
Emergent	1	0
	2-3	1
	4-5	2
	> 5	3
Scrub-Shrub	1	0
	2	1
	3-4	2
	>4	3
Forested	1	0
	2	1
	3-4	2
	(>4)	(3)

SOUTH KETTLE

4d. Structural diversity.

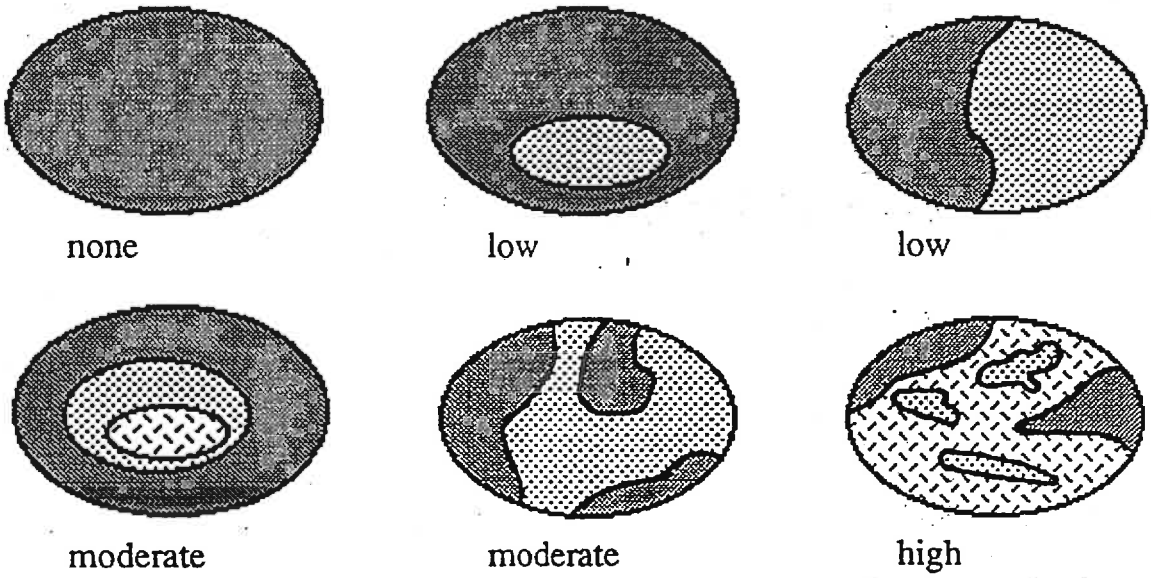
If the wetland has a forested class, add 1 point if each of the following classes is present within the forested class and is larger than 1/4 acre:

-trees > 50' tall . . . . . YES - 1
-trees 20'- 49' tall . . . . . YES - 1
-shrubs. . . . . YES - 1
-herbaceous ground cover. . . . . YES - 1

Also add 1 point if there is any "open water" or "aquatic bed" class immediately next to the forested area (ie. there is no scrub/shrub or emergent vegetation between them). YES - 1

4e. Decide from the diagrams below whether interspersion between wetland classes is high, moderate, low or none? If you think the amount of interspersion falls in between the diagrams score accordingly (i.e. a moderately high amount of insterspersion would score a 4, while a moderately low amount would score a 2)

High - 5
Moderate - 3
Low - 1
None - 0



none low low

moderate moderate high

4f. Habitat features.

Answer questions below, circle features that apply, and score to right:

Is there evidence that the open or standing water was caused by beavers	YES = 2
Is a heron rookery located within 300'?	YES = 1
Are raptor nest/s located within 300'?	YES = 1
Are there at least 3 standing dead trees (snags) per acre greater than 10" in diameter at "breast height" (DBH)?.	YES = 1
Are there at least 3 downed logs per acre with a diameter > 6" for at least 10' in length?	YES = 1
Are there areas (vegetated or unvegetated) within the wetland that are ponded for at least 4 months out of the year, and the wetland has not qualified as having an open water class in Question 4b. ?	YES = 2

SOUTH KETTLE

4g. Connection to streams. (Score one answer only.) 4g.1. Does the wetland provide habitat for fish at any time of the year AND does it have a perennial surface water connection to a fish bearing stream.	No to all YES = 6
4g.2 Does the wetland provide fish habitat seasonally AND does it have a seasonal surface water connection to a fish bearing stream.	YES = 4
4g.3 Does the wetland function to export organic matter through a surface water connection at all times of the year to a perennial stream.	YES = 4
4g.4 Does the wetland function to export organic matter through a surface water connection to a stream on a seasonal basis?	YES = 2
4h. Buffers. Score the existing buffers on a scale of 1-5 based on the following four descriptions. If the condition of the buffers do not exactly match the description, score either a point higher or lower depending on whether the buffers are less or more degraded.	
Forest, scrub, native grassland or open water buffers are present for more than 100' around 95% of the circumference.	Score = 5
Forest, scrub, native grassland, or open water buffers wider than 100' for more than 1/2 of the wetland circumference, or a forest, scrub, grasslands, or open water buffers for more than 50' around 95% of the circumference.	Score = 3
Forest, scrub, native grassland, or open water buffers wider than 100' for more than 1/4 of the wetland circumference, or a forest, scrub, native grassland, or open water buffers wider than 50' for more than 1/2 of the wetland circumference.	Score = 2
No roads, buildings or paved areas within 100' of the wetland for more than 95% of the wetland circumference.	Score = 2
No roads, buildings or paved areas within 25' of the wetland for more than 95% of the circumference, or No roads buildings or paved areas within 50' of the wetland for more than 1/2 of the wetland circumference.	Score = 1
Paved areas, industrial areas or residential construction (with less than 50' between houses) are less than 25 feet from the wetland for more than 95% of the circumference of the wetland.	Score = 0

SOUTH KETTLE

4i. Connection to other habitat areas: Select the description which best matches the site being evaluated. -Is the wetland connected to, or part of, a riparian corridor at least 100' wide connecting two or more wetlands; or, is there an upland connection present >100' wide with good forest or shrub cover (>25% cover) connecting it with a Significant Habitat Area?	YES = 5
- Is the wetland connected to any other Habitat Area with either 1) a forested/shrub corridor < 100' wide, or 2) a a corridor that is > 100'wide, but has a low vegetative cover less than 6 feet in height?	YES = 3
-Is the wetland connected to, or a part of, a riparian corridor between 50 - 100' wide with scrub/shrub or forest cover connection to other wetlands?	YES = 3
- Is the wetland connected to any other Habitat Area with narrow corridor (<100') of low vegetation (< 6' in height)?	YES = 1
- Is the wetland and its buffer (if the buffer is less than 50' wide) completely isolated by development (urban, residential with a density greater than 2/acre, or industrial)?	(YES = 0)

Now add the scores circled (for Q.5a - Q.5i above) to get a total.
Is the Total greater than or equal to 22 points? YES = Category II
NO = Category III

South Kettle p32

4a	2	size
4b	3	classes
4c	3	species
4d	4	structural diversity
4e	1	
4f	1	
4g.	0	
4h	5	
4i	0	19