REVISED FINAL BP CHERRY POINT COGENERATION/ FACILITIES PROJECTS COMPENSATORY MITIGATION PLAN

BP Cherry Point

Prepared for
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URS

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EXECUTIVE SUMMARY

This revised wetland mitigation plan was prepared to ensure appropriate mitigation for the wetland impacts associated with the proposed construction of the Cherry Point Cogeneration Project (Cogeneration Project), a gas-fired, combined cycle cogeneration facility (power plant), and the Maintenance Service Complex (MSC) project at the BP Cherry Point property. This plan updates the plan that was previously approved and permitted for the Cogeneration Project and the laydown areas associated with it. The wetland impacts and mitigation approach associated with the above-referenced projects was addressed for the project development area under previous reviews and permit authorizations, as recorded in the Energy Facility Site Evaluation Council Site Certification Agreement (Application No. 2002-01) and the US Army Corps of Engineers 404 Permit (Corps Reference No. 200101283). This mitigation plan has been prepared in support of the necessary revisions to those permits. It addresses minor changes to the impacts and corresponding adjustments to the mitigation approach, as well as a proposed change in the sequencing of the on-site land uses.

The BP Cherry Point property is located near Blaine, Washington, in unincorporated Whatcom County. Corps Permit No. 200101283 authorizes 30.51 acres of permanent wetland impact and 4.86 acres of temporary wetland impact in connection with the Cogeneration Project. The permit amendment now requested would authorize an increase in permanent wetland impacts by 4.20 acres and would eliminate the temporary wetland impacts. Under the revised plan, 30.83 acres of wetlands will be filled permanently and 3.97 acres of wetlands will have the water inflow that sustains the wetland blocked, for a total wetland impact of 34.80 acres. The intent of the plan is to mitigate for these impacts by producing a net increase in wetland functional performance within the sub-basins that contain the proposed construction.

The proposed construction will disturb low-quality, historically degraded wetlands. Most of the area in the vicinity of the construction site is composed of broad fields drained by ditches and dominated by un-maintained pasture grass communities. Large portions of the wetlands are dominated by non-native, invasive vegetation, primarily reed canarygrass (*Phalaris arundinacea*).

Wetland impacts associated with the proposed projects will be mitigated via standard mitigation sequencing in compliance with the various regulatory provisions. Potential wetland impacts have been avoided and minimized by designing the location of construction areas away from delineated wetlands as much as possible, given engineering constraints and the prevalence of wetlands in the area. Any temporary or inadvertent impacts to wetlands that may occur during construction will be repaired and rehabilitated as appropriate.

Unavoidable impacts to wetlands will be compensated. The original wetland mitigation plan consisted of rehabilitating degraded wetlands on approximately 110 acres. In order to compensate for the slight increase in permanent wetland impacts associated with the revised proposal, the revised mitigation plan includes the creation of about 6.6 acres of wetlands and rehabilitation of approximately 116 acres of degraded wetlands and surrounding uplands located within designated mitigation areas of the BP Cherry Point property. These Compensatory Mitigation Areas (CMA1 and CMA2), are located just north of Grandview Road, to the east and west of Blaine Road. Both CMAs will have some wetland created from uplands and the remainder will be rehabilitated by restoring historic drainage patterns, plugging existing ditches, removing and suppressing

non-native, invasive plants such as reed canarygrass, and establishing native plant communities. On CMA2, stormwater runoff will be re-routed from the Cogeneration Project site via the installation of an inverted siphon under Grandview and Blaine Roads, a controlled outlet feature, and a shallow swale, rather than allowing the water to continue to follow the existing roadside ditch that travels directly to Terrell Creek. The re-routed stormwater will be used to provide hydrology to the rehabilitated and created wetland areas. Runoff from the MSC detention pond will be directed through an existing culvert to the existing Brown Road Material Storage Area Mitigation Area. The re-routed stormwater runoff will provide additional hydrologic storage and water quality treatment. The forest and shrub habitats that will develop in the CMAs will further improve hydrologic storage through increased evapotranspiration and interception of precipitation. Thus, hydrologic impacts as well as other types of wetland impacts will be compensated.

1.0 INTRODUCTION

This revision to the previously approved Final Cogeneration Project Compensatory Mitigation Plan (dated October 15, 2004) contains the following changes to streamline the report and address the proposed modifications:

- Updates the impact information (see Table 1 in Chapter 2) by revising the Cherry Point Cogeneration Project (Cogeneration Project) site boundaries (See Figure 1). Wetlands also have been re-rated in the impact area (Appendix A) according to the *Revised Washington State Wetland Rating System for Western Washington* (Ecology 2004).

- Eliminates proposed wetland restoration from the project.

- Eliminates Site Selection discussion.

- Increases the size the compensatory mitigation areas and creates additional wetlands to compensate for additional impacts to the project site, and re-rates the existing wetlands on the mitigation site (Appendix B).

- Adds an updated construction schedule (Section 10.1).

- Provides preliminary mitigation design drawings (Appendix C), as required by Article IV.B.3.f. of the Site Certification Agreement for the Cogeneration Project.

- Includes minor adjustments to planning methodology and timing, weed control, and hydrologic work plan elements based on recent experience at the adjacent Brown Road Materials Storage Area (BRMSA) Mitigation Area.

- Updates all figures and tables to reflect the above-mentioned changes.

Although the impacts have been divided into two separate projects, the Cogeneration Project (east of Blaine Road) and the Maintenance Services Complex (MSC) Project (west of Blaine Road), the mitigation for both is described in a single Revised Final Mitigation Plan. This is appropriate under the guidance for 'Consolidated Mitigation' in *Wetland Mitigation in Washington State – Part 1*, section 4.2.4 (Ecology et al. 2006) and under Whatcom County's Critical Areas Ordinance provisions for Alternative Mitigation Plans for major developments (Whatcom County Code 16.16.260E). In order to maintain continuity with the mitigation plan dated October 15, 2004 (URS 2004a), which this plan revises and replaces, only necessary items are changed. Analyses done for the original document have not been rewritten unless they are directly affected by the changes to the project and its proposed mitigation.

2.0 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The BP Cherry Point property is located near Blaine, Washington in unincorporated Whatcom County. Whatcom County is bordered by Skagit County to the south, Georgia Strait to the west, and British Columbia, Canada to the north. The BP property is generally between Aldergrove Road to the south, Bay Road to the north, Jackson Road to the west, and Kickerville Road to the east (Figure 1). The proposed construction area is approximately 2 miles east of Cherry Point and Georgia Strait in Sections 7 and 8 of Township 39 North, Range 1East.

The original Cogeneration Project permits authorize the construction of the cogeneration facility on a site to be located east of the existing refinery, south of Grandview Road, north of Brown Road and east of Blaine Road, and authorize a site west of Blaine Road and south of Grandview Road to be used initially for Cogeneration Project construction laydown and later for other refinery activities.

Under the revised proposal, the Cogeneration Project would still be located east of the existing refinery within the BP Cherry Point property, south of Grandview Road, north of Brown Road, and east of Blaine Road. However, the Cogeneration Project would use other developed areas for construction laydown and the site west of Blaine Road previously permitted for laydown would be used for the MSC Project.

Compensatory mitigation for the Cogeneration and MSC Projects will occur in the previously-approved Compensatory Mitigation Areas (CMAs), which are located north of Grandview Road on the BP Cherry Point property in Sections 5 and 6 of Township 39 North, Range 1 East. Figure 1 shows the areas that will be affected and used as compensatory mitigation. Some expansion of the CMAs has been proposed in accordance with previous discussions and site walks conducted with agency staff.

Additional information about the project site can be found in *Wetland Delineation Report BP Cherry Point Cogeneration Project [Revised]* (Golder and Schott 2003) and *BP Cherry Point Cogeneration Project Application for Site Certification* (Golder Associates 2003a).

2.2 RESPONSIBLE PARTIES

BP West Coast Products, LLC (BP) is the project proponent and permit applicant. The contact person at BP for this project is Jeff Chalfant, who is the lead on Cogeneration and MSC Project permitting for BP. His phone number and address are: 360-371-1825, BP Cherry Point Refinery, 4519 Grandview Road, Blaine, Washington 98230. Golder Associates Inc. and Schott and Associates were responsible for the 2003 wetland delineation (Golder and Schott 2003), and Northwest Ecological Services (2007) delineated wetlands along the utility corridor parallel with Grandview Road to be used for the MSC. URS Corporation is responsible for the Wetland Mitigation Plan and the delineation report of pre-existing conditions on the compensatory mitigation areas.

2.3 PROJECT DESCRIPTION

This section describes the Cogeneration and MSC Projects as revised by BP Cherry Point Refinery in 2007. Combined, the two project sites will occupy about 66 total acres of upland and wetland.

2.3.1 Cogeneration Project

The proposed Cogeneration Project is the construction of a gas-fired cogeneration electric power plant, associated facilities and access roads (Figure 2), which has been authorized by an EFSEC Site Certification Agreement and Corps Permit No. 200101283. Because the cogeneration facility will be an integral part of the refinery, it must be located in proximity to the refinery facilities. The power plant will be configured with combined-cycle combustion turbines, each driving an electric generator. Electricity and steam produced by the cogeneration facility will power refinery operations, greatly reducing the need for steam from existing refinery boilers. Excess electricity produced by the cogeneration facility will be provided to the Bonneville Power Administration electrical grid. A different US Army Corps of Engineers (Corps) permit for impacts on wetlands related to construction of a power line that will service the proposed power plant has been in place since 2000 (Corps Reference No. 199802349). The access roads and the area for the transmission tower pads have been constructed, but the towers and conductors have not been erected.

A stormwater detention pond will be constructed to collect runoff from the cogeneration facility. It will be located in the northwest corner of the cogeneration site. The pond will be designed to meet the applicable technical requirements to provide adequate water quality treatment and flow control for runoff from impermeable surfaces to be created by the proposed construction. Runoff from this detention pond will be piped northwest across Grandview Road and Blaine Road and dispersed across a large area within CMA2 (see Section 5.6.1 for additional details). Therefore, runoff from the Cogeneration Project site will be re-directed closer to its historic drainage areas, where it will enhance existing and created wetlands in CMA2 before draining to Terrell Creek. Section 5.6.1 also contains a more detailed description of the post-mitigation hydrologic scenario.

Under the revised proposal, the cogeneration facility, including site access roads and a visual buffer area, will encompass 37.91 acres, all of which will be converted to impervious surface area for the plant construction. Construction of the power plant and associated facilities (i.e., access roads) will permanently fill and/or cut off the hydrologic source for 12.19 acres of wetland (Table 1). The MSC project will occupy approximately 28 total acres and will fill 20.02 acres of wetlands and eliminate the water source for 2.59 acres. Between the two projects, 24.01 acres of Category III wetland and 10.79 acres of Category IV wetland will be lost.

Table 1
Cogeneration and MSC Projects: Wetland Impact Areas

Project	Total Impact Area (acres)	Permanent Direct Impact[a] (acres)	Permanent Indirect Impacts (acres)
Cogeneration Facility	12.19	10.81	1.38
MSC	22.61	20.02	2.59
Total	**34.80**	**30.83**	**3.97**

a. Direct impact = wetland fill

Under the revised proposal, the Cogeneration Project and the MSC Project would result in permanent impacts to 34.80 acres of wetlands. The existing permit already authorizes permanent impacts to 30.51 acres and temporary impacts to 4.86 acres of wetlands.

Figure 3 shows existing wetlands and Figure 4 shows where each wetland will be affected by the Cogeneration Project. No temporary fill or restoration is now anticipated. Over 10,000 cubic yards of material will be removed from the construction site for this project.

2.3.2 Maintenance Services Complex Project

The purpose of the MSC Project is to implement safety improvements at the BP Cherry Point Refinery. BP plans to relocate office and maintenance workers not essential for refinery operations further from potential hazards of the process plant. By moving maintenance facilities to the MSC project site, personnel would be located further away from fire and explosion hazards, providing safer working conditions while still maintaining the necessary support functions for refinery operations. Using the MSC project site is the most effective way for BP Cherry Point Refinery to relocate the above-referenced personnel because of the favorable location, as well as the existing planned compensatory mitigation available to offset permanent wetland impacts as a result of the project. Additionally, it should be noted that the previously approved Cogeneration Project laydown areas were originally intended and permitted to be utilized for other refinery uses, such as the MSC Campus, following construction of the Cogeneration Project.

The proposed MSC project would include constructing a number of new buildings, such as a maintenance service center, maintenance administration complex, warehouse, firehall, equipment storage, auto shop, paint shop, and electrical building (Figure 5). In addition, approximately 192,000 square feet of laydown area and approximately 124 parking spaces would be constructed in three different parcels. The laydown areas would be used for 1) temporary material storage during turnaround maintenance events or construction periods, or 2) temporary office trailer locations, and the parking would be for maintenance and contractors.

A stormwater detention pond would be constructed in the northwest corner of the MSC project site to capture and treat surface water runoff from the project site. The detention pond for the MSC site will be designed to meet the appropriate technical requirements to provide adequate water quality treatment and flow control for runoff from impermeable surfaces that would be created by the proposed construction. Runoff from the detention pond will discharge to an existing ditch south of Grandview Road, then flow under Grandview Road in the existing culvert, which discharges to the BRMSA Mitigation Area. Thus, runoff from the MSC project site will follow its historic drainage paths to Terrell Creek. Section 5.6.1 contains a more detailed description of the post-mitigation hydrologic scenario.

The location of existing wetlands and ditches on the MSC Project site are shown on Figure 6. Construction of the MSC Project will fill approximately 20.02 acres of wetlands and indirectly eliminate 2.59 acres of wetlands by removing the water source (Figure 7). The permanent wetland fill includes about 500 linear feet of ditch that has been labeled Wetland I and approximately 385 feet of a wetland ditch along Wetland H (Table 1).

The MSC Project also necessitates an update to Blaine Road and to the intersection of Grandview and Blaine Roads in order to address traffic issues. The proposal (based on discussion with and direction from

the Washington State Department of Transportation [WSDOT]) is to install a traffic "roundabout" at that intersection (Figure 8). Discussions are ongoing, and the final decision on the type of intersection update has not been made. However, other possible alternatives to the roundabout are expected to have the same or less impact on wetlands. Wetlands that exist around the intersection are shown in Figure 9. Wetland impacts from the roundabout are very small (totaling about 500 square feet), and are shown in Figure 10. The modification to Blaine Road is shown on Figure 5.

2.4 WETLAND DELINEATION OF COGENERATION AND MSC PROJECT SITES

The Cogeneration and MSC Project sites were delineated in May, June, and August 2001, and in January 2002 (Golder and Schott 2003).

3.0 ECOLOGICAL ASSESSMENT OF IMPACT SITE

This section summarizes ecological conditions of the proposed project sites, as determined in part by the findings of Golder Associates. Detailed descriptions of the environmental conditions of the proposed construction zones, including the existing vegetation, soil, water regime, and wildlife of the on-site wetlands and uplands are found in:

- *Wetland Delineation Report BP Cherry Point Cogeneration Project [Revised]* (Golder and Schott 2003)
- *Technical* Report *on Wetland Functions and Values Assessment BP Cherry Point Cogeneration Project [Revised]* (Golder Associates 2003b)

These reports describe the geographic extent, functions, and ratings of the wetlands delineated in the vicinity of the proposed construction areas.

3.1 EXISTING VEGETATION

Most of the area within the proposed construction site and vicinity is composed of wide fields dominated by pasture grasses. These fields are fallow agricultural land that has not been cultivated in over 15 years. Interspersed with the fields are hedgerows and patches of semi-mature forest plantations that were planted for pulpwood harvest. Tree species comprising these plantation areas include Douglas fir (*Pseudotsuga menziesii*) and hybrid poplar (*Populus trichocarpa* x *deltoides*). Mature forest that contains deciduous and coniferous trees that were planted or colonized the site naturally is located southeast of the proposed plant site. There are no existing structures within the proposed construction area.

A large proportion of these fields are composed of palustrine emergent (PEM) wetlands as defined by the classification system of Cowardin et al. (1979). The PEM wetlands primarily consist of non-native pasture grasses such as red top (*Agrostis stolonifera*), colonial bent grass (*Agrostis capillaris*), velvet grass (*Holcus lanatus*), and reed canarygrass (*Phalaris arundinacea*). Large amounts of soft rush (*Juncus effusus*) also occur in these wetlands. The vegetation within the PEM wetlands has not been mowed or grazed in over 10 years.

One 0.6-acre palustrine scrub-shrub (PSS) wetland area containing immature hybrid poplar trees and one 1.69 palustrine forest (PFO) wetland that supports semi-mature (at least 12 years old and over 20 feet tall) hybrid poplar trees also occur within the construction zones.

Upland areas within the project site are primarily dominated by Himalayan blackberry (*Rubus armeniacus*), but contain some evergreen blackberry (*Rubus laciniatus*) as well. Some young Douglas firs planted in these areas are present in some upland patches. Uplands also include some portions of the abandoned meadow area; these areas are dominated by colonial bentgrass and contain some stinging nettle (*Urtica dioica*), birdsfoot trefoil (*Lotus corniculatus*), and Canada thistle (*Cirsium arvense*). Some upland areas contain species found in the adjacent wetland areas including colonial bentgrass, reed canarygrass, and young red alders (*Alnus rubra*).

The area encompassing the BP Cherry Point property originally supported forest with coniferous evergreen and broad-leaf deciduous trees, as well as some marsh, but was logged at least 100 years ago. The land was then cultivated for the first half of the 20th century and used as pasture and cropland. The predominant agricultural use of these areas was cattle grazing, which fostered the spread of non-native pasture grasses.

3.2 EXISTING WATER REGIME

The primary sources of surface water and soil moisture to the construction site are precipitation and lateral drainage from adjacent areas. Vertical drainage through the soil is limited by the underlying clay till, especially where it is within 2 feet of the soil surface. Lateral drainage is limited by low relief. As a result, soil saturation above 18 inches is widespread through the wet season in both wetland and upland areas. However, most areas of the project site typically dry out substantially in the latter half of the growing season.

The drainage ditches that are present throughout the site were originally installed to facilitate drainage and expedite drying of the soil for farming. Some of the ditches, such as ones along roadways and ones that are part of controlled National Pollutant Discharge Elimination System outfalls, have been modified and maintained regularly to support current refinery functions. Other ditches continue to function, although they may not be maintained regularly.

3.3 EXISTING SOILS

Most of the soil in the area was derived from glaciomarine drift plains and is underlain by clay till starting at 10 to 30 inches below ground surface. Soil in the project site ranges from loam to silty clay loam, though some sandy soils and gravel that may not reflect native conditions are present in some of the upland areas. The finer-textured soils are mainly restricted to the wetlands.

The two soil series mapped as occurring within the construction site are Whitehorn silt loam, a hydric soil, and Birchbay silt loam, a nonhydric soil. As expected, the soils characteristic of Whitehorn silt loam are typically found in wetland areas, whereas the soils characteristic of Birchbay silt loam are found in the upland areas.

Whitehorn silt loam is a very deep soil considered by Goldin (1992) to be poorly drained. However, a wetland delineation that included intensive investigation of the Cogeneration Project site soils and hydrologic regime found high permeability and rapid lateral drainage within subsoil layers of soils that were characteristic of Whitehorn silt loam (ENSR Consulting and Engineering 1992). As a result, the study concluded that the Whitehorn silt loam within this area should be considered somewhat poorly drained rather than poorly drained (Golder and Schott 2003). This soil is moderately fertile, has a moderate amount of organic matter, and is slightly acidic in the surface layer. The soil series contains inclusions of non-hydric soils. The water table in this soil fluctuates between 1 foot above ground and 1 foot below ground from November to May.

In contrast, Birchbay silt loam is a very deep, moderately well drained soil. The surface layer of the Birchbay silt loam is moderately fertile, has a moderate amount of organic matter, and is slightly acidic. This soil series has better natural drainage than the other soil types in the study area and is not listed as a hydric soil. The water table in this soil typically varies between 2 and 4 feet deep from December through April.

Topographic relief is minimal, but the area generally slopes to the north and northwest. Topography in the area is rolling to flat as determined by recent geologic history. Historic cultivation for crops and hay disturbed the soil structure and smoothed what was likely rough micro-topography dominated by small hummocks.

3.4 EXISTING FAUNA

The broad fields provide habitat for the abundant field mice, voles, and various small rodents. The forested patches located nearby provide habitat for wildlife species commonly found in woodland edge habitat in western Washington. These species include coyote, black-tailed deer, and numerous resident and migratory birds such as red-tailed hawk, American robin, song sparrow, and common yellowthroat. No amphibians, reptiles, or fish are known to inhabit the construction site.

A great blue heron (*Ardea herodias*) breeding colony is located approximately 1 mile west of CMA2 and over 1 mile west of CMA1. This colony of between 200 and 400 breeding pairs (which fluctuates over time) represents one of four large colonies located in northwestern Washington and southwestern British Columbia. Individuals from this colony are known to use nearby open field habitats similar to those present on CMA1 and CMA2. These nearby fields are used for staging during the nesting season and for foraging for amphibians and small mammals throughout the year.

Colony nesting bird species, including great blue herons, are considered a priority species in the state of Washington (WDFW 2007). Whatcom County lists herons as a Priority Species in Appendix D, Table D-2 of its Critical Areas Code (Whatcom County 2005). For the adjacent BRMSA Mitigation Area, BP completed a *Great Blue Heron Habitat Management Plan* (URS 2004b) in spring 2004, addressing the impacts of current and future construction on their lands north of Grandview Road . A *Great Blue Heron Habitat Utilization Study* (Nahkeeta Northwest Wildlife Services 2006) was completed in 2006.

3.5 FUNCTIONS AND VALUES

The wetlands within the proposed project site are significantly degraded, but serve a variety of hydrologic functions such as improving water quality, reducing peak flow, and decreasing downstream erosion to some extent. In addition, they provide some habitat suitability functions for wildlife, mainly mammals and birds. A more detailed discussion of the current functional performance of the wetlands within the construction site can be found in the *Technical Report on Wetland Functions and Values Assessment BP Cherry Point Cogeneration Project [Revised]* (Golder Associates 2003b).

3.6 WATER QUALITY

Although no water quality monitoring has occurred on the site, the quality of surface water there is likely high. As stated earlier, the main source of moisture to the construction site is precipitation and drainage from adjacent areas. Since precipitation water quality is good and the adjacent areas that provide drainage are undeveloped and well vegetated, no water quality problems are expected.

3.7 BUFFERS

Undeveloped upland areas that serve as wetland buffer areas are scattered across the project site. These upland areas support various plant communities, including abandoned meadow, regularly-maintained grassland, Douglas fir/Himalayan blackberry patches, Himalayan blackberry patches without Douglas fir, semi-mature hybrid poplar plantation patches, and native mixed coniferous/deciduous forest. Upland portions of the abandoned meadow are found throughout the project site. The plantation and forested areas are mainly situated north and east of the proposed power plant and west of the northern portion of the MSC area. Grandview Road limits the buffer area north of the project site to the right-of-way (ROW) immediately south of the road. The area east of the plant site consists of hybrid poplar forest plantation and a small amount of mature forest dominated by both deciduous broad-leaved and coniferous needle-leaved trees. This area is over 2,000 feet wide (east-west). The area immediately south and southeast of the cogeneration facility site is composed of the portion of Wetland D that will not be affected by the proposed construction. Wetland D is a seasonally saturated/inundated PEM wetland dominated by non-native pasture grasses and other herbaceous species, and extends further to the east. The area southeast of Wetland D is a forested area that is mainly composed of mature upland forest dominated by paper birch (*Betula papyrifera*), big-leaf maple (*Acer macrophyllum*), Douglas fir, and black cottonwood (*Populus balsamifera* ssp. *trichocarpa*). This area also contains Wetland E, a PFO wetland, and a mosaic of small, forested wetland patches. The BRMSA is located between Wetland D and Brown Road.

Wetland H is located in a regularly maintained field dominated by pasture grasses that serves as a utility corridor for the BP Cherry Point property (Figure 3). Northwest of the MSC Project site is a 500-foot wide patch of mature mixed coniferous/deciduous forest. This area is bordered to the west by the main entrance road for the BP Cherry Point Refinery.

3.8 WETLAND RATING AND BUFFERS

Wetlands on the Cogeneration and MSC Project sites originally were rated in 2001 during the wetland delineation field work. Wetlands were re-rated by URS biologists in 2007 using the *Revised 2004 Ecology Rating System for Western Washington* (Ecology 2004). Whatcom County also uses this revised system to rate wetlands (Whatcom County 2005). Rating forms are provided in Appendix A. The wetland ratings are listed in Table 2. Under the new rating system, all wetlands were rated as Category III except Wetlands A, B1, G, H, and J, which were rated as Category IV.

Table 2
Cogeneration and MSC Projects: Wetland Ratings

Wetland[a]	Wetland Rating (2001)	Wetland Rating (2007)	Buffer Width (feet)
Wetland A	Category III	Category IV	50
Wetland B1	Category III	Category IV	50
Wetland B2	Category III	Category III	80
Wetland B3	Category III	Category III	80
Wetland C	Category III	Category III	80
Wetland D	Category III	Category III	80
Wetland F	Category III	Category III	80
Wetland G	Category III	Category IV	50
Wetland H	Category III	Category IV	50
Wetland I	Category III	Category III	150[b]
Wetland J	Category III	Category IV	50

a. Wetlands delineated by Golder Associates Inc.

b. The larger buffer is because of a higher wildlife habitat score.

The 2006 Whatcom County Critical Areas Ordinance, Section 16.16.630 designates buffers for wetlands based on adjacent land use intensity, wetland rating, and habitat function score. The buffer widths for the wetlands that will be directly affected by the projects are shown in Table 2.

3.9 POSITIONS AND FUNCTIONS OF THE WETLANDS IN THE LANDSCAPE

All wetlands in the project area except Wetland I have a Hydrogeomorphic (HGM) Classification of depressional. Depressional wetlands occur in depressions where elevations within the wetland are lower than the surrounding landscape. The shapes of depressional wetlands vary, but in all cases the movement of surface water and shallow subsurface water is toward the lowest point in the depression. The depression may have an outlet, but the lowest point in the wetland is somewhere within the boundary, not at the outlet. Wetland I is a combination of a slope wetland and a depressional wetland using the HGM methodology. Slope wetlands occur on hill or valley slopes where groundwater “daylights” and begins running along the surface, or immediately below the soil surface. Water in these wetlands flows only in one direction (down the slope) and the drain is steep enough that the water is not impounded.

These wetlands perform most hydrologic and habitat functions, albeit at low performance levels, as discussed in Section 5.4.4. The wetlands here have limited opportunities to perform some hydrologic functions, since the areas within their upgradient catchment areas are undeveloped, well vegetated, and do not produce exceptionally large outflows of water. As mentioned earlier, the main sources of moisture to these wetlands is precipitation and shallow subsurface drainage from adjacent uplands. Although the site is in the central part of the watershed, the on-site wetlands are situated in relatively small subcatchments and therefore receive limited amounts of subsurface drainage.

The project site and adjacent areas to the east are part of a corridor of undeveloped land between the Lake Terrell Wildlife Area, a 1,500-acre reserve managed by the Washington Department of Fish and Wildlife (WDFW), and the Terrell Creek riparian forest. Although this corridor is fragmented by roads and both abandoned and active pasture, it may provide ecological connections between these areas for a wide variety of wildlife, including large mammals such as blacktail deer and coyotes. The proposed construction is not expected to severely degrade these connections, since the on-site areas to the east will remain vegetated.

4.0 MITIGATION APPROACH

4.1 MITIGATION SEQUENCING

Although BP evaluated a number of project alternatives, they decided that the Cogeneration Project is the best option to provide reliable steam and electrical power to the BP Cherry Point Refinery and efficient and cost-effective electrical power to the region. The Cogeneration Project also will minimize the refinery's reliance on outside sources for electricity and minimize impacts to the environment. For more information see *Siting and Wetland 404(b)1 Alternatives Analysis, BP Cherry Point Cogeneration Project [Revised]* (Golder Associates 2003c).

BP also evaluated alternative sites for the Cogeneration Project based on the following criteria: sufficient acreage available, wetland impacts, proximity to the refinery and related infrastructure, security, and accessibility. Of the five possible alternative sites considered, only one that is large enough for the proposed project would affect less wetland area. However, that site was too far away from the refinery to be practicable for cogeneration, and also raised significant security concerns. Thus, the proposed site avoids and minimizes wetland impacts to the extent possible and meets the siting criteria best of all the sites considered.

In 2007, it was determined that the MSC would best occupy the space previously planned for laydown areas for the Cogeneration Project (which were planned for other refinery purposes after the construction of the Cogeneration Project). This change of use does not change the conclusions of the Alternatives Analysis, as the new combination would still be the least environmentally damaging practicable alternative, and all of the siting requirements for the Cogeneration Project remain the same. During construction of the cogeneration facility, the BRMSA will be used as a laydown area instead of the areas that will be occupied by the MSC.

The proposed plan is designed to mitigate wetland impacts by following the standard mitigation sequence as outlined in the Memorandum of Agreement between the US Environmental Protection Agency and the

Corps. This sequence and a brief summary of how each mitigation component will be accomplished is as follows:

1. **Avoidance:** The site chosen for construction avoids wetland impacts more than other practicable sites. For a detailed account of how wetland impacts have been avoided by the proposed project, see *Siting and Wetland 404(b)(1) Alternatives Analysis, BP Cherry Point Cogeneration Project [Revised]* (Golder Associates 2003c).

2. **Minimization:** Within the construction site, impacts to wetlands will be minimized by locating the construction areas away from delineated wetlands as much as possible, given engineering constraints. The proposed construction will disturb low-quality, historically degraded wetlands and avoid the high-quality, forested wetlands located on the property. In addition, project-specific Stormwater Pollution Prevention Plans will provide guidelines and requirements for preventing the discharge of fill material in wetlands and streams during both construction and operation.

3. **Compensation:** Unavoidable impacts to wetlands will be compensated by creating wetlands and rehabilitating degraded wetland and upland areas on a portion of the BP Cherry Point property that will not be directly affected by the proposed construction. For a detailed account of how compensatory mitigation will be achieved, see Section 5 of this report.

The plan for compensation incorporates recommendations from several resources, including *Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals* (Hruby and Brower 1994), *Restoring Wetlands in Washington* (Stevens and Vanbianchi 1993), and *Washington State Wetland Mitigation Study – Phase 1: Compliance* (Ecology 2000). In addition, existing wetland and upland forest patches on the BP Cherry Point property were used in part as reference sites for the compensatory mitigation planting plan.

This mitigation plan also builds upon the landscape approach to mitigation planning (Ecology 2005), which was a major basis for planning and implementing the adjacent BRMSA mitigation. Collectively, these areas form a mitigation block of more than 220 acres that is coordinated in terms of historic hydrologic pathway restoration, wildlife habitat functions, and overall ecological value.

4.2 GOALS

The goals of this revised mitigation plan are: (1) Create 6.6 acres of wetland, and (2) Rehabilitate approximately 115.7 acres of degraded wetlands and wetland buffers (uplands) within the two CMAs located on the BP Cherry Point property. Rehabilitation will occur by restoring historic drainage patterns via re-routing treated stormwater runoff and plugging existing ditches; removing and suppressing non-native, invasive plants such as reed canarygrass; and establishing emergent, scrub-shrub, and forested habitats dominated by native vegetation. Re-routing stormwater runoff will include installing pipes and an outlet channel with diffuse-flow design to direct runoff from one of the two proposed detention ponds across existing roads to a portion of the mitigation area, rather than let it continue to go through a roadside ditch directly to Terrell Creek.

In order to compensate for the slightly greater wetland impacts associated with the revised proposal, this revised mitigation plan increases the size of the compensatory mitigation areas by 12 acres, and includes an additional 6.6 acres of wetland creation.

4.3 OBJECTIVES AND PERFORMANCE STANDARDS

This section describes the specific objectives and performance standards for the revised mitigation proposed for this project. A summary of these performance standards is provided in Appendix D.

4.3.1 Wetland Hydrology

Objective A: Maintain wetland hydrology over the 82.3 acres of existing wetlands within the CMAs.

Performance Standard: The wetland hydrology performance standard for the CMAs is saturation at the soil surface or inundation to a depth not exceeding 6 inches for at least 22 consecutive days during the growing season. Measurement will be the documented presence of a free water surface within 12 inches of the soil surface over a continuous 22-day period during the growing season and will be part of the hydrologic monitoring program (URS 2004c). This performance standard meets the guidelines of wetland hydrology set by the *Corps of Engineers Wetlands Delineation Manual* (Corps 1987).

4.3.2 Vegetation

Objective A: Maintain survival of planted trees and shrubs during the first five years until adequate vegetation cover can be measured.

Performance Standard: A survival/replacement standard will apply to trees and shrubs for the first five years after implementation, before cover is large enough to provide a reasonable method of measurement. One hundred percent survival or replacement is required for the first year and 80 percent for years 2 through 5, or until woody species cover reaches 30 percent in areas planted to tree and shrub communities.

Measurement: Measurement will be by a sampling method consisting of plots located along transects that span the width of each CMA. As recommended by Krebs (1999), at least 1 percent of the total area to be monitored will be sampled directly.

Objective B: Establish a variety of forested, scrub-shrub, and emergent plant communities dominated by native vegetation in both wetlands and buffer areas (uplands) within the CMAs.

Performance Standard: The performance standards for cover of installed and volunteer woody (tree and shrub) and herbaceous vegetation outlined in Table 3 will be applied to all portions of the CMAs where tree and shrub communities will be planted. As explained in Section 5.6.5, some areas will remain free of installed trees and shrubs. Volunteer plants are those plants that establish on their own without direct planting or seeding. Herbaceous cover standards are much higher than the tree and shrub cover standards since herbaceous plants are expected to more rapidly colonize greater proportions of both the CMAs.

Table 3
Installed and Volunteer Plant Cover Standards

Criterion	Year 1	Year 2	Year 3	Year 5	Year 7	Year 10
Tree and shrub cover (%)	*	*	*	30	55	80
Herbaceous cover (%)	40	60	80	90	90	80

* = Tree and shrub survival, rather than cover, is measured during the first five years or until woody species cover reaches 30 percent in areas planted to tree and shrub communities.

Measurement: Measurement will be conducted by using a sampling method consisting of plots located along transects that span the width of each CMA. As recommended by Krebs (1999), at least 1 percent of the total area to be monitored will be sampled directly.

Objective C: Reduce and suppress cover by non-native, invasive plant species.

Performance Standard: The performance standards for non-native, invasive vegetation outlined in Table 4 will apply to all portions of the CMAs, including uplands and buffer areas. Those portions of the CMAs that currently have greater than 20 percent cover by reed canarygrass will have a performance standard of <20 percent through year 5. Portions of the CMAs that currently have less than 20 percent cover by reed canarygrass will have a performance standard of <10 percent. By year 7, all areas are to have less than 10 percent cover of invasive species.

Table 4
Non-Native, Invasive Species Cover Standards

Species	Year 1	Year 2	Year 3	Year 5	Year 7	Year 10
Himalayan blackberry and evergreen blackberry (%)	<10	<10	<10	<10	<10	<10
Reed canarygrass cover in areas with >20% pre-existing cover (%)[a]	<20	<20	<20	<20	<10	<10
Reed canarygrass cover in areas with <20% pre-existing cover (%)[a]	<10	<10	<10	<10	<10	<10

a. See Section 5.4.5, which discusses existing reed canarygrass cover distribution in the CMAs, and Figures 12A and 12B, which show existing reed canarygrass cover in the CMAs.

Measurement: Measurement will be conducted by using a sampling method consisting of plots located along transects that span the width of each CMA. As recommended by Krebs (1999), at least 1 percent of the total area to be monitored will be sampled directly.

The non-native, invasive plant species currently found in the CMAs include reed canarygrass, Himalayan blackberry, and evergreen blackberry. Of these species, only reed canarygrass is listed by the Washington State Noxious Weed Control Board as a noxious species in Whatcom County. Reed canarygrass is a Class C weed, which indicates that is widespread and is targeted for control to serve educational or biological efforts only.

5.0 REVISED COMPENSATORY MITIGATION PROPOSAL

The revised plan is designed to appropriately compensate for losses in wetland functional performance expected from the proposed construction of the Cogeneration Project and the MSC Project. To compensate for the unavoidable and permanent removal of 34.80 acres of wetland (12.19 from the Cogeneration Project and 22.61 from the MSC Project), BP proposes to create 6.6 acres of wetland and rehabilitate approximately 116 acres of wetland and wetland buffer degraded by historic agricultural practices.

5.1 MITIGATION SITE DESCRIPTION

The CMAs are located on the BP Cherry Point property north of Grandview Road, just north of the site of the proposed Cogeneration Project and MSC Project (Figure 1). CMA1 is 53.5 acres in size and is located east of Blaine Road, north of the proposed power plant site in the southwest quarter of Section 5 of Township 39 North, Range 1 East. CMA2 is 68.8 acres in size and is located west of Blaine Road and north of the proposed MSC Project in the southeast quarter of Section 6 of Township 39 North, Range 1 East. The geographic extent, location, and general character of the wetlands within CMA1 and CMA2 are described in the *Revised Compensatory Mitigation Areas Wetland Delineation Report* (URS 2003) and illustrated as updated in this mitigation plan (Figures 11A and 11B). This report shows results of investigations that have occurred from 2001 to 2002 and updates in 2007.

The borders of each CMA are 25 feet from the outer edge of the ROW for Blaine Road and 50 feet from the northern edge of the ROW for Grandview Road. The ROW for Blaine Road extends 30 feet east and 30 feet west of the road's centerline. The ROW for Grandview Road extends 65 feet north and 20 to 25 feet south of the road's centerline. The ROWs contain telephone lines, power lines, and ditches. The areas between the ROWs and the CMAs are considered setback areas and will be reserved for possible utility installation.

5.2 OWNERSHIP

The CMAs are within the BP Cherry Point property, which is owned by BP.

5.3 RATIONALE FOR MITIGATION

5.3.1 Mitigation Ratio

This revised plan proposes to create and rehabilitate wetlands and enhance buffers on the CMAs to compensate for the total project wetland impacts at an overall ratio greater than 3:1 (see Table 5).

Table 5
Compensatory Mitigation Acres, Ratios, and Credits Summary

Type of Compensatory Mitigation	Size of Proposed Compensatory Mitigation Areas (acres)	Proposed Mitigation Ratio	Mitigation Credit (acres) [a]
Wetland creation to compensate for permanent Category III wetland impacts	6.6	2:1	3.3
Rehabilitation via hydrologic restoration, weed control, and planting of existing degraded wetlands to compensate for temporary and permanent Category III wetland impacts	42.0	4:1	10.50
Rehabilitation via hydrologic restoration, weed control, and planting of existing degraded wetlands to compensate for temporary and permanent Category IV wetland impacts	40.3	2.4:1	16.79
Enhancement of wetland buffer areas (uplands) to compensate for wetland and buffer impacts	33.4	8:1	4.18
Total area	**122.3**	**3.52:1**	**34.77**

a. Mitigation credit is determined by dividing the acreage of each mitigation type by the proposed mitigation ratio.

The current guidance on mitigation ratios (Ecology et al. 2006) and Whatcom County's Critical Areas Ordinance indicate that Category III wetlands should be compensated for at a ratio of 2:1 and Category IV wetlands at a ratio of 1.5:1 for wetland creation or reestablishment. The ratio doubles for wetland rehabilitation and quadruples for wetland enhancement. Buffer impacts of approximately 12.5 acres would be compensated by enhancing upland buffers on the compensatory mitigation sites, per the Whatcom County Critical Areas Ordinance.

As shown in Table 5, the proposed mitigation is only slightly less than the guidance mitigation ratios. Since the total wetland impacts are very similar to what was approved for the original Cogeneration Project and the mitigation area is larger, it seems appropriate to reduce the guidance ratios slightly for the revised project. The proposed downward adjustment of the guidance mitigation ratios is appropriate in this situation for several additional reasons:

- BP initiated some steps toward implementing the mitigation plan in 2007 (e.g., weed eradication and partial ditch filling) and intends to proceed with implementation of the remaining portions as described in this revised plan. However, construction of the Cogeneration Project is not expected to begin until at least late 2008 and perhaps later. As a result, the impacts attributable to the Cogeneration Project would occur after the mitigation plan has been implemented and the functions established. The proportion of the mitigation that compensates for the Cogeneration Project impacts would be advanced mitigation.

- The wetland areas to be eliminated already have been greatly disturbed by historical agricultural practices. All the wetlands within the construction zones are rated as Category III wetlands, except Wetlands A, B1, G, H, and J, which are rated as Category IV under the *Revised Washington State Wetland Rating System for Western Washington* (Ecology 2004), and which provide only minimal

performance of wetland functions. The loss of such wetlands will constitute only minimal environmental impact. Accordingly, their functional performance can be more than fully replaced with lower ratios than those outlined in the Washington State Department of Ecology (Ecology) guidance.

- The wetland areas to be enhanced are Category III wetlands that have been greatly disturbed by historical agricultural practices. These areas have high potential for improvement via rehabilitation. The proposed compensatory mitigation will improve overall wetland functional performance on the mitigation site significantly and convert low-quality Category III wetlands into high-quality Category II wetlands within 25 years. Wetland ratings data forms for the CMAs under conditions predicted for 25 years following initial mitigation activity are presented in Appendix B.

- URS has the extensive experience and technical knowledge of the BP Cherry Point property necessary to achieve successful wetland creation and rehabilitation as proposed by this plan. URS designed and is currently monitoring enhancement of a 4.58-acre wetland area on the BP Cherry Point property that was initiated in fall 2000 (Dames & Moore 2000 and URS 2007a). URS has designed and has an oversight and monitoring role in the construction of the 94-acre BRMSA Mitigation Area, immediately west of CMA2. Initial planting of the BRMSA Mitigation Area occurred during winter 2007, and construction of civil features (hydrologic restoration conveyance, etc) was completed during summer of 2007.

As recommended by the Federal Committee on Characterization of Wetlands for wetland enhancement and restoration projects, the proposed enhancement will improve wetland functional performance and benefit the functional performance of the surrounding landscape (Lewis et al. 1995). Non-native, invasive plants (reed canarygrass, Himalayan blackberry, and evergreen blackberry) will be removed as much as possible. Stormwater runoff from the cogeneration facility's detention pond will be directed to a portion of one of the CMAs to improve water quality and restore historic drainage patterns. Stormwater from the MSC detention pond will be directed to the existing ponds and wetlands located on the BRMSA Mitigation Area, also contributing to the restoration of historic drainage patterns. A mosaic of wetland habitats with diverse species composition and structure will be established in the CMAs. Habitat features such as downed logs and wildlife brush shelters will be placed in various locations to provide additional cover and forage for wildlife.

5.3.2 Compensatory Mitigation Potential of the CMAs

The large meadow areas encompassing the CMAs are readily accessible to laborers and heavy machinery from adjacent roads. Laborers and heavy machinery will need to access the site during site preparation, planting, and maintenance operations. The ditches separating the roads from the sites can be temporarily bridged to permit all-terrain vehicles carrying mulch and plants to cross them.

The open meadows within CMA2 will facilitate construction of a culvert and inlet feature necessary to direct stormwater runoff to this area from the detention pond proposed for the plant site. Directing stormwater runoff to this area will restore historic drainage patterns and provide additional hydrologic storage and water quality treatment. The broad slope within the site will allow flow to disperse across a wide area, improving hydrologic storage and performance of hydrologic functions. Most portions of the ditches within the CMAs could be filled to reduce their overall drainage rates, thereby increasing hydrologic

storage. The forest and shrub habitats that will develop in the CMAs will further improve hydrologic storage through increased evapotranspiration and interception of precipitation.

Both CMAs and the adjacent meadow areas are considered to have high potential for establishing a wetland complex, including forest and shrub-dominated habitats based on an investigation conducted in 2000 as part of the original mitigation planning for the Cogeneration Project. Soils and hydrologic conditions present on site appear capable of supporting moderate to rapid growth of trees and shrubs, thus facilitating the re-establishment of forest and scrub-shrub habitat. Additionally, establishing forested and scrub-shrub habitat may encourage natural colonization by native trees and shrubs in meadow areas adjacent to the CMAs.

Growing conditions at the CMAs are adequate for establishing a variety of native plant communities despite some inherent problems. Although most of the soils are saturated or inundated long enough to become deoxygenated in the upper soil horizon during the early part of the growing season, virtually all areas become fairly dry and the soils well oxygenated as the season progresses. The runoff introduced to CMA2 will considerably increase inundation duration, but even the wettest areas here will continue to become fairly dry during the latter part of the growing season.

Although these areas have been degraded by past agricultural practices, the CMAs have not been cultivated and the ditches on site have not been maintained for at least 15 years. Soil structure (the arrangement of soil particles) has likely redeveloped to some degree over these past few years, improving soil drainage and aeration. Although most of the areas in the CMAs are covered with non-native grasses, native plants can be readily established using appropriate techniques.

Enhancing habitat types that have been eliminated or degraded by past agricultural practices may greatly bolster local ecological vigor. Re-establishing wetland habitats with mature, native vegetation will contribute to the re-establishment of a key component of the landscape's ecological integrity.

There is high potential for increasing connectivity between the CMAs and ecologically important areas located nearby. Enhancement of CMA1 will create a forested corridor between the Terrell Creek riparian forest and the mature upland forest located atop the hill just north of Grandview Road. Such a connection will improve ecological connectivity between the Terrell Creek riparian forest and the large forested areas south of Grandview Road. These forested areas south of Grandview Road extend south to the Lake Terrell Wildlife Area, a 1,500-acre reserve managed by WDFW. These intact forests currently support many native plant species and provide habitat for a variety of wildlife including large mammals such as blacktail deer and coyotes. Connecting these forested areas is also considered desirable for heron, which have been observed preferentially flying along tree lines to reach foraging areas.

Enhancing CMA2 will broaden the connection established by enhancement of CMA1 to include the area south of Terrell Creek and west of Blaine Road. CMA2 will extend west to the east edge of the existing 4-acre mitigation site initiated in 2000, connecting this area with the habitat network to be enhanced by the proposed compensatory mitigation. Enhancement of both CMA1 and CMA2 will facilitate wildlife migration and dispersal in the Terrell Creek watershed. Migration and dispersal habitat is especially important to areas like this portion of Whatcom County that retain forested areas heavily fragmented by development. Creation of this corridor will provide greater opportunities for native plants to exchange pollen and spread seed to and from intact forest and wetland habitats.

If no enhancement occurs in the CMAs, pioneering species such as red alder, hardhack (*Spiraea douglasii*), Himalayan blackberry, and evergreen blackberry will eventually colonize large portions of the seasonally saturated wetlands and upland meadows. The seasonally inundated portions of the wetlands may continue to be dominated by reed canarygrass and the few other herbaceous species present for a long time. Native forest and shrub-land communities may eventually dominate these areas, but not until many decades, perhaps centuries, have passed. Instead, successional processes can be accelerated artificially to produce forests and shrub-lands with a variety of native vegetation in much less time if appropriate techniques are applied.

5.3.3 Mitigation Experience

URS designed a 4.6-acre compensatory mitigation site located within the BP Cherry Point property north of Grandview Road (Corps Permit Reference #98-4-02349). This project involved rehabilitating part of a PEM wetland, including removing non-native, invasive plants, creating a 0.5-acre seasonally inundated area, and establishing a mosaic of native plant communities. URS has been monitoring this site for five years (URS 2007a).

URS also designed and has an oversight and monitoring role in the construction of the 94-acre BRMSA Mitigation Area, immediately west of CMA2. Initial planting of the BRMSA Mitigation Area occurred during winter 2007, and construction of civil features (hydrologic restoration conveyance, etc) was completed during summer of 2007.

5.4 ECOLOGICAL ASSESSMENT OF MITIGATION SITE

The *Revised Cogeneration Project Compensatory Mitigation Areas Wetland Delineation Report* (URS 2003) details existing conditions within the CMAs, including plant communities, soils, hydrology, wetland functions, buffers, and land use. Much of the information from this report is summarized in this section. Figures 11A and 11B show the existing areas of wetland and upland on the sites.

5.4.1 Plant Communities

The CMAs and surrounding lands are predominantly composed of grassy areas that were once cultivated for hay. These areas have been degraded by historic agricultural practices including plowing, planting with non-native grasses, and ditching. However, wetland conditions persist across most of the area. Of the 53.5 acres that make up CMA1, 39.1 acres (73.1 percent) were determined to be wetlands (Figure 11A). Of the 68.8 acres that make up CMA2, 43.2 acres (63.0 percent) were determined to be wetlands (Figure 11B). All wetlands are jurisdictional wetlands.

Most of the lands within the CMAs are PEM wetlands dominated by non-native pasture grasses. Approximately 68.5 percent of the wetlands found in the CMAs are PEM communities that are temporarily saturated, but not inundated (PEMA). Most PEMA wetland areas are dominated by colonial bentgrass, but contain some areas with dominant amounts of soft rush and/or reed canarygrass. The distribution of each species is very patchy, and patches in most areas are fairly small (100 to 1,000 square feet). PEMA communities contain a few subdominant species, including field horsetail, slough sedge (*Carex obnupta*), tall fescue (*Festuca arundinacea*), and other herbaceous species well adapted to moist, open conditions.

Nearly all of the remaining 31.5 percent of on-site wetlands are comprised by PEM communities that are seasonally flooded (PEMC). Most PEMC wetlands are dominated by reed canarygrass, soft rush, and/or creeping bentgrass. Species distribution in these communities is patchy. PEMC communities also contain creeping buttercup (*Ranunculus repens*), field horsetail, meadow foxtail, and slough sedge.

A patchy mix of immature trees, shrubs, and herbaceous species are found lining the several ditches that traverse the CMAs. Most of the ditches were excavated in wetland areas and thus are considered portions of those wetlands. Plant species most commonly found along these ditches include black cottonwood, hardhack, Himalayan blackberry, evergreen blackberry, clustered wild rose (*Rosa pisocarpa*), and red alder. Typically, these trees and shrubs are rooted adjacent to the ditch, whereas reed canarygrass and/or a few other hydrophytic herbaceous species are rooted within the ditch. Although these ditches are not maintained and are overgrown with vegetation, most ditches continue to facilitate drainage from the CMAs.

Upland areas are interspersed within the wetlands present on site. Upland areas compose 14.4 acres (26.9 percent) of CMA1 and 25.6 acres (37.0 percent) of CMA2. Most of this upland area is meadow that is difficult to distinguish from adjacent wetland meadow areas. Virtually all uplands present in the CMAs are slightly elevated above the wetlands that surround them or are situated on well-drained slopes. However, most uplands in the CMAs typically retain saturation near the soil surface for long periods during the wet season. Upland meadow areas are dominated by non-native pasture grasses, typically colonial bentgrass and common velvetgrass. Some upland meadow areas have substantial amounts of other pasture grasses, including quackgrass (*Elytrigia repens*), tall fescue, reed canarygrass, and sweet vernal grass. In addition, small patches of Himalayan blackberry and evergreen blackberry, two non-native, invasive shrubs, are found in both meadow and forested portions of the upland areas.

Exotic (Non-Native, Invasive) Species

The proposed mitigation will control the non-native, invasive plants growing in the CMAs. Non-native plants dominate most portions of the CMAs. Only reed canarygrass, Himalayan blackberry, and evergreen blackberry are considered invasive, which signifies that they can be highly competitive and difficult to control. Thus, these species will be the focus of the non-native, invasive species control program.

Most wetland areas in the CMAs are dominated by intergrading patches of reed canarygrass, bentgrass, and soft rush. Most of the upland areas are dominated by non-native pasture grasses such as colonial bentgrass, velvetgrass, and tall fescue. A few uplands contain patches of Himalayan and evergreen blackberry growing apart from and/or entangled with native trees and shrubs.

The existing distribution of reed canarygrass across the CMAs was mapped by use of a Global Positioning System (GPS) with sub-meter accuracy (Figures 12A and 12B). Three categories of reed canarygrass cover were defined to guide the mapping effort: 1) <20 percent cover, 2) 20 percent to 95 percent cover, and 3) >95 percent cover (Table 6). Cover categories used to gauge reed canarygrass distribution reflect actual conditions on site. The limited number of categories facilitated the mapping effort.

Table 6
Existing Reed Canarygrass Cover

Cover Category	CMA1 (acres)	CMA2 (acres)	Total (acres)
<20%	26.36	39.49	65.85
20-95%	15.39	12.14	27.53
>95%	9.57	9.87	19.44

The total area that supports >20 percent cover by reed canarygrass is 46.97 acres, which is about 38 percent of the total area encompassed by the CMAs. Although 15 acres smaller than CMA2, CMA1 has a larger amount of area with >20 percent reed canarygrass cover. This pattern correlates to the higher proportion of wetland area in CMA1. The vast majority of reed canarygrass found in the CMAs occurs in wetlands. However, a few on-site upland areas support reed canarygrass, including a few patches with greater than 20 percent cover.

5.4.2 Soils

Two of the three soil series that predominate in the CMAs are considered hydric, since they typically sustain saturation at or near the soil surface throughout extended periods of the growing season. All three soil types are moderately fertile and slightly acidic in the surface layer (Goldin 1992). A more detailed description of the soil types is in the wetland delineation report for the CMAs (URS 2003).

Most of the soil in this part of Whatcom County was formed in Bellingham Drift and is underlain by clay till (Goldin 1992). Bellingham Drift is the surface stratigraphic layer underlying a large area encompassing the proposed construction site and CMAs. This layer is 70 to 80 feet thick and is considered to be an aquitard, allowing relatively little water to percolate to Terrell Creek or to the aquifer located below the Bellingham Drift. The stratigraphic layers in the area are shown in Figure 3.3-5 of the *BP Cherry Point Cogeneration Project – Application for Site Certification* (Golder Associates 2003a) report.

5.4.3 Hydrology

A very high proportion of precipitation falling across this area is stored in the soil and surface depressions, or becomes runoff that enters Terrell Creek as surface water during the wet season and the early part of the dry season. As a result, the main source of water for Terrell Creek is surface water runoff from the 20.8-square-mile drainage area, including runoff from Lake Terrell. Although mean annual flow in the lower portion of Terrell Creek (west of the Jackson Road crossing) is estimated to be 20 to 30 cubic feet per second (cfs) (Barry Wenger, personal communication), the creek has been known to dry up completely most summers (State of Washington Department of Water Resources 1960).

The clay till and low relief found throughout the area greatly decreases vertical and lateral drainage, fostering widespread near-surface saturation and/or shallow inundation during the wet season. The surface soil layers in most areas on the mitigation sites are saturated at or near the surface during most of the wet season. As shown in Figures 11A and 11B, large portions of the CMAs support shallow inundation (typically 1 to 3 inches deep) that persists through most of the wet season. Water depths and soil moisture in the CMAs steadily decline during the latter part of the wet season and the early part of the dry season via

evaporation, transpiration, and infiltration. The vast majority of the CMAs retain low to moderate moisture levels by the end of the growing season. No areas within the CMAs consistently support surface water throughout the year.

Figures 13A and 13B show existing hydrologic pathways and surface flow rates within and downgradient of each CMA. The surface water pathways within the CMAs occur in ditches and natural channels as well as in broad swales where surface water may be dispersed across swales as semi-concentrated flow, or across very broad swales as sheet flow. Subsurface pathways were estimated as occurring within the topsoil near the soil surface. This type of flow path is termed interflow. To determine locations of hydrologic pathways, ditches and swales were walked and water was pumped into one important ditch to observe its flow. Observations of topography and observations of water flow during storm events contributed to identifying hydrologic pathways. Various flow observations were compared to rainfall data collected by the BP meteorological station.

Flow rates at various locations were estimated during a six-month, 24-hour storm event that occurred December 13, 2001. These estimates were confirmed by calculations made using the US Department of Agriculture Soil Conservation Service (SCS) method to predict runoff that would occur on the mitigation site during the six-month, 24-hour storm event. The SCS method, or the SCS Curve-Number Method, was created by the SCS and is a commonly used approach for predicting runoff from watersheds (USDA SCS 1973).

CMA1 drains northward to Terrell Creek (Figure 13A). The hydrologic input for the ditch is precipitation that falls on the land immediately within CMA1 and the west-facing part of the hill immediately east of CMA1. The hillslope in the southeastern part of the site faces northwest at approximately 3.5 percent grade. The rest of the site is nearly flat, but slopes gently (<1 percent grade) to the north. A broad, shallow ditch carries surface water north across the site. The ditch is 5 to 20 feet wide and 1 to 1.5 feet below the elevation of land immediately surrounding it.

The ditch contains slowly-flowing water during the wet season and shallow standing water and/or no standing water from June through October. The ditch rapidly becomes a well-defined channel after it exits CMA1 to the north. This channel leads through the steeply sloped riparian forest to join Terrell Creek.

A smaller and much shallower ditch is present in CMA1 as well. This ditch extends from the west edge of the site to the main ditch in the northwestern part of the site. This ditch is situated on a relatively flat grade and does not appear to support any flowing water, except perhaps during very large winter storm events. The ditch is approximately 2.5 feet wide and 1 foot below the elevation of the land surrounding it. A portion of this ditch appears to have been filled and is now only a hedgerow.

CMA2 drains westward to the extensive wetland system off-site (part of the BRMSA Mitigation Area), which in turn drains to Terrell Creek near the crossing at Jackson Road (Figure 13B). The easternmost 350 feet of CMA2 is fairly flat, but the remaining portions, including the “panhandle,” slope west at an approximately 2.25 percent grade. The panhandle is the unofficial title for the northwestern portion of CMA2, which is located west of the finger of forest extending north from the large forest situated along the western boundary of CMA2’s main section (Figure 11B). The panhandle generally slopes west at an approximately 2.5 percent grade, but contains some areas as steep as 6 percent. As with CMA1, historic

cultivation has substantially disturbed the site, including the creation of ditches that continue to facilitate site drainage. Most of the site is sloped so that subsurface moisture seeps toward the ditch system that leads west across the site.

Two ditches of moderate depth carry surface water north and west across CMA2. The ditch leading north along the western boundary of CMA2 is 2 to 3 feet wide (bottom width) and 2 to 4 feet below the elevation of land immediately surrounding it. The northern portion of this ditch is just within the large upland forest community. The ditch leading west across the site is 2 to 3 feet wide (bottom width) and 1 to 2 feet deep. This ditch crosses the northern portion of the forest patch located just outside CMA2. The confluence of the two ditches is at the western edge of the forest, at the southeastern corner of the panhandle. Below the confluence, the ditch continues west along the southern edge of the CMA2 panhandle and extends off site.

Once off site, the ditch runs through the large forested area west of CMA2. From this point, flows split, with some leading north as sheetflow through a large PEM wetland, then west to Terrell Creek just east of Jackson Road, and the remaining flow following the ditch to two large ponds that drain to Terrell Creek under Jackson Road.

A small but substantial amount of water from the west-flowing ditch currently leads north and disperses across a wide portion of the CMA2 panhandle. Some surface water travels north from this ditch through the seasonally-inundated wetland area located northwest of the existing forest patch. Some of this water seeps westward through the adjacent upland, which slopes to the west and transmits groundwater at moderate rates through a subsurface soil layer. Near the southern portion of this seasonally-inundated area is another location where some flow splits from the ditch to the north. Most of this semi-concentrated flow travels west to a swale that directs flow northward. Surface water in the swale then seeps westward through the adjacent upland, as with the sloped upland discussed above. As a result of this seepage, the seasonally-inundated area at the western edge of CMA2 and the forested wetland to the south remain shallowly inundated and/or saturated throughout most of the wet season. Most of the water here seeps west to the ditch that runs north along the east edge of an existing compensatory mitigation site that was established in 2000 (Corps Permit Reference #98-4-02349).

Currently, runoff from the plant site and a much larger area to the south is directed to the ditch along the east side of Blaine Road. Water flow in the ditch occurs mainly during the wet season and has been observed to be typically greater than 1 cfs during the wet season. The ditch is lined with rip-rap for most of its length, but does contain enough soil in some spots to support hydrophytic plants. The ditch leads to a concrete culvert that is 3 feet outside diameter and is located south of Terrell Creek. The culvert leads north by northeast down through a narrow thicket of Himalayan blackberry and into the mature, deciduous, broad-leaved riparian forest. The culvert descends a 20 to 40 percent slope and leads to a 50-foot-long gravel channel, then connects with Terrell Creek just upstream of the large culvert under Blaine Road. Both the culvert and the channel appear stable and likely do not contribute much sediment to Terrell Creek.

Stormwater runoff from a large part of the refinery is detained in a detention pond and subsequently pumped to the Strait of Georgia near Cherry Point. Runoff from over 50 acres of undeveloped forest and shrub-land in the northwest portion of the refinery property is directed off-site via ditches and culverts to a Terrell Creek tributary located west of Jackson Road. Stormwater runoff on the northeastern portion of the

refinery is routed through a culvert under Grandview Road that leads to a series of ponds and wetlands in the undeveloped area west of CMA2.

The BRMSA Mitigation Area, which is west of CMA2, contains four ponds connected by wetlands and seasonally flowing channels, which were enhanced in 2007. The ponds are all permanently inundated and of varying size and shape. The first two ponds in the pond series were constructed by WDFW in the 1990s. The first pond is relatively small (0.25 acre), and the second pond is fairly large (4.5 acres). Outflow from both ponds is controlled by weirs located at each pond's outlet. Although the ponds are intended to provide habitat for waterfowl, these ponds induce water quality treatment by providing approximately 200,000 to 250,000 cubic feet of hydrologic dead storage each winter. Surface water released from the large pond flows through a wide, densely vegetated channel that leads west. A few small wetlands may receive some flow from this channel, but most of the flow enters the third pond after joining runoff from the ditch that leads west of CMA2. Surface water from the third pond, which is approximately 3.5 acres in size, drains through a culvert to the fourth pond, which is approximately 2.5 acres in size. The fourth pond drains to Terrell Creek through a culvert under Jackson Road.

Soil moisture levels vary greatly between the wet and dry seasons, because the difference in precipitation between these periods is exacerbated by the poorly-drained soils and their high rates of runoff. Moreover, historical cultivation of clayey soils combined with ditch drainage likely caused the hydrologic regime to fluctuate more than it did prior to cultivation. However, the gentle topography combined with the soil structure redevelopment that likely occurred during the past few years without cultivation may have allowed soils in the CMAs to regain some of their inherent permeability and storage capacity, thereby allowing them to moderate hydrologic fluctuation to some degree.

Comprehensive monitoring of the site's hydrologic regime began in 2006. On CMA1, three shallow wells were installed to capture current versus post-mitigation surface and subsurface hydrologic change associated with the ditches. On CMA2, where the hydrologic changes are expected to be greater, 11 wells were installed. An explanation of the methods, data collection, and results garnered are described in the *Pre-Mitigation Hydrology Assessment* (URS 2007b) (Appendix E). The information will be used to improve design and implementation of the mitigation and to provide a means for assessing hydrologic conditions before and after surface water diversions are made. They will be monitored frequently through the end of the mitigation monitoring period. In addition to determining the site's hydroperiod (water level fluctuation) and its spatial variation, monitoring will determine locations and rates of existing and post-mitigation flowpaths, both above the surface and as shallow groundwater.

5.4.4 Wetland Functions

The functional assessment discussed in this section was conducted in 2003/2004 and has not been updated with the 2007 changes in the project impacts and the mitigation. It is assumed to be appropriately illustrative of the positive changes that will result from the implementation of the mitigation plan. The changes in the mitigation plan (especially the increased wetland creation, now up to 6.6 acres, and the addition of 12 acres of mitigation area) will even further increase the functional performance beyond what is described below.

Wetland functions are defined as the biogeochemical, hydrological, and ecological processes and manifestations of these processes that occur within wetlands. Wetland functions tend to exert a relatively strong influence over the functional performance of the surrounding landscape.

The functional assessment method applied to wetlands on site is detailed in the *Methods for Assessing Wetland Functions* (Ecology 1999), which is based on the HGM approach for assessing wetland functions. The Corps and other federal and state agencies have implemented the HGM approach to wetland functional assessment through the development of regional guidebooks. The possible range of index values for each function is 1 to 10, with 10 representing the highest level of performance. Thirteen wetland functions were evaluated for each wetland area assessed. Since the on-site wetlands receive subsurface flow from adjacent uplands and are open basins with seasonal outflow, they are classified as depressional outflow wetlands.

Acre-points are determined by multiplying the wetland functional performance index by the wetland acreage. Although the wetland functional performance is influenced by wetland size, acre-points is a metric that essentially gives equal importance to wetland functional performance and wetland size. Acre-points (also called functional units) can be used to compare gain and loss of functional performance for each function, but should not be added together to account for each wetland's gain and loss of overall functional performance.

The proposed rehabilitation is predicted to significantly improve the performance of several wetland functions. Functional performance of the wetlands under current conditions is documented in the delineation report for the CMAs (URS 2003).

The wetlands within the vicinity of the compensatory mitigation were broken into multiple assessment units to more accurately evaluate their functional performance. The assessment units are divided by differences in contributing basin and hydrologic regime.

The assessment unit associated with CMA1 is the wetland area within CMA1. Although this wetland extends beyond CMA1 to the east, drainage within CMA1 either leads to the main ditch or to two intermittently flowing channels that are just east of the main ditch. Surface water in the wetland area east of CMA1 drains away from CMA1 and enters a seasonally flowing channel that leads to Terrell Creek several hundred feet upstream of where surface water from CMA1 enters the creek. The contributing basin for the CMA1 assessment unit comprises CMA1 and a small upland area southeast of CMA1.

The assessment unit associated with CMA2 includes the wetland within CMA2 and the area north and south of the CMA2 panhandle. This area is estimated to be approximately 68 acres in size and does not include the two ponds created by WDFW, the channels leading to them from the culvert under Grandview Road, or the existing mitigation area (Figure 13B). The assessment unit contains the portion of the large contiguous wetland extending west to the floodplain for Terrell Creek near Jackson Road that generally slopes west at an average 2.5 percent grade. As a result, most surface water flows west at relatively rapid velocities. The vast majority of the part of this wetland that lies outside the assessment unit slopes west at an approximately 1 percent grade and has relatively slow flow velocities. As a result of the gentle slope, ditch flooding and sheet flow is much more common in the area outside the assessment unit (URS 2003). The contributing basin for the CMA2 assessment unit under current conditions consists of the area within the assessment unit itself. For post-mitigation conditions, the contributing basin also includes the cogeneration facility

(approximately 33 acres). The wetlands within the two assessment units both classify as Depressional Outflow wetlands (Appendix B).

The assessment method also was applied to the assessment units under current conditions and under conditions that are expected to develop 25 years after compensatory mitigation is initiated. The completed data sheets for these assessments are presented in Appendix F. The results of this evaluation are summarized in Tables 7 and 8.

The ability of the CMA1 and CMA2 assessment units to remove sediment from surface water inputs are rated moderate, whereas their ability to remove nutrients is rated moderately low. According to the results of the functional assessment, sediment and nutrient sequestration is limited by the lack of permanent water, low permeability of the soils, and low level of outlet constriction in each CMA. Sediment and nutrient capture is aided by the high cover of herbaceous vegetation and presence of seasonally inundated areas.

According to the results of the assessment, the performance of these functions will not change 25 years after compensatory mitigation is initiated. Performance is not predicted to change in CMA1, since the proposed topographic and hydrologic manipulations there will not greatly constrict outflow. Although inundation frequency, duration, and magnitude will increase considerably in CMA2, the model does not predict any increase in performance of sediment and nutrient removal functions, due to the expected decrease in herbaceous cover from shading by forest and scrub-shrub vegetation. Since all the runoff from CMA1 is from well-vegetated areas that will remain relatively undisturbed, the opportunity for CMA1 to enact its potential to remove sediments and/or nutrients will be low. Since most sediments in the runoff from the plant site will be removed by the proposed detention pond and oil/water separator, the opportunity for CMA2 to enact its potential to remove sediments and/or nutrients will be low to moderate.

Table 7
Functional Performance of the Assessment Unit Associated with CMA1 (38.4 Acres) Under Current Conditions and 25 Years After Compensatory Mitigation is Initiated

Wetland Function	Existing Condition (performance index/ acre-points)	25 Years Post Mitigation (performance index/ acre-points)	Explanation
Potential for Removing Sediments	4/ 153.6	3/ 115.2	Decrease (-38.4 acre points) predicted since area of herbaceous vegetation cover will decrease.
Potential for Removing Nutrients	2/ 76.8	2/ 76.8	No change predicted since the size of seasonally inundated area will not change substantially.
Potential for Removing Heavy Metals and Toxic Organics	4/ 153.6	3/ 115.2	Decrease (-38.4 acre-points) predicted due to decrease in cover by herbaceous vegetation.
Potential for Reducing Peak Flows	4/ 153.6	4/ 153.6	No change predicted since ditch plugging will occur only in the upper portion of the ditch.
Potential for Decreasing Downstream Erosion	5/ 192.0	7/ 268.8	Increase (+76.8 acre-points) predicted due to increase in percent covered by forest and shrub vegetation.
Potential for Recharging Groundwater	3/ 115.2	3/ 115.2	No change predicted since vertical drainage in this area will remain slow.
General Habitat Suitability	3/ 115.2	5/ 230.4	Increase (+76.8 acre-points) predicted due to increase in area with canopy closure, maximum number of strata, number of snags, vegetation class interspersion, large woody debris, water and vegetation interspersion, and number of native plant species.
Habitat Suitability for Invertebrates	2/ 76.8	4/ 153.6	Increase (+76.8 acre-points) predicted due to increase in exposed substrate, vegetation class interspersion, large woody debris, maximum number of vegetation strata present.
Habitat Suitability for Amphibians	2/ 76.8	3/ 115.2	Increase (+38.4 acre-points) predicted due to increase in surface substrate types, water and vegetation interspersion, and large woody debris.
Habitat Suitability for Anadromous Fish	NA	NA	No anadromous fish can or will be able to access the site.
Habitat Suitability for Resident Fish	NA	NA	No resident fish can or will be able to access the site.
Habitat Suitability for Birds	4/ 153.6	5/ 192.0	Increase (+38.4 acre points) predicted with increase in number of snags, vegetation class interspersion, special habitat features, index for invertebrate habitat suitability, and index for amphibian habitat suitability
Habitat Suitability for Mammals	3/ 115.2	4/ 153.6	Increase (+38.4 acre-points) predicted due to increase in water and vegetation interspersion and forest cover.
Native Plant Richness	1/ 38.4	3/ 115.2	Increase (+76.8 acre-points) predicted due to increase in maximum number of strata, number of native plant species, and decrease in area dominated by non-native plant species.
Potential for Primary Production and Organic Export	6/ 230.4	7/ 268.8	Increase (+38.4 acre-points) predicted due to increase in area covered by woody vegetation.

Table 8
Functional Performance of the Assessment Unit Associated with CMA2 (64 Acres)
Under Current Conditions and 25 Years After Compensatory Mitigation is Initiated

	Existing Conditions	25 Years Post Mitigation	
Wetland Function	**(performance index/ acre-points)**		**Explanation**
Potential for Removing Sediments	4/ 256	4/ 256	No change predicted despite increase in seasonally inundated area due to decrease in cover by herbaceous vegetation.
Potential for Removing Nutrients	2/ 128	2/ 128	No change predicted despite increase in seasonally inundated area due to decrease in cover by herbaceous vegetation and no change in soil type.
Potential for Removing Heavy Metals and Toxic Organics	4/ 256	3/ 192	Decrease (-64 acre-points) predicted due to the decrease in cover by herbaceous vegetation despite the increase in seasonally inundated area.
Potential for Reducing Peak Flows	4/ 256	4/ 256	No change predicted since increase in size of seasonally inundated area will not be accompanied by a great increase in outlet constriction.
Potential for Decreasing Downstream Erosion	5/ 320	7/ 448	Increase (+128 acre-points) predicted due to increase in percent area covered by forest and shrub vegetation.
Potential for Recharging Groundwater	2/ 128	3/ 192	Increase (+64 acre-points) predicted due to increase in seasonally inundated area.
General Habitat Suitability	3/ 192	6/ 384	Substantial increase (+192 acre-points) predicted due to increase in area with canopy closure, maximum number of strata, number of snags, vegetation class interspersion, large woody debris, number of water regimes, number of water depth categories, water and vegetation interspersion, and number of native plant species.
Habitat Suitability for Invertebrates	3/ 192	6/ 384	Increase (+192 acre-points) predicted due to increase in exposed substrate, vegetation class interspersion, large woody debris, water and vegetation interspersion, maximum number of vegetation strata present, and inundation depth and persistence.
Habitat Suitability for Amphibians	2/ 128	4/ 256	Increase (+128 acre-points) predicted due to increase in water and vegetation interspersion and large woody debris.
Habitat Suitability for Anadromous Fish	NA	NA	No anadromous fish can or will be able to access the site.
Habitat Suitability for Resident Fish	NA	NA	No resident fish can or will be able to access the site.
Habitat Suitability for Birds	4/ 256	6/ 384	Increase (+128 acre-points) predicted due to increase in number of snags, vegetation class interspersion, special habitat features, index for invertebrate habitat suitability, and index for amphibian habitat suitability.
Habitat Suitability for Mammals	3/ 192	4/ 256	Increase (+64 acre-points) predicted due to increase in forested cover and connection to high quality forested habitat.
Native Plant Richness	1/ 64	5/ 320	Increase (+256 acre-points) predicted due to increase in maximum number of strata and number of native plant species, and decrease in area dominated by non-native plant species.
Potential for Primary Production and Organic Export	6/ 384	7/ 448	Increase (+64 acre-points) predicted due to increase in seasonally inundated area and area covered by woody vegetation.

The assessment results show moderate potential for removing heavy metals for both wetland areas. Since precipitation provides the vast majority of the water for these wetlands, few toxins enter these wetlands. Thus, toxin removal is a function the wetlands currently have little opportunity to perform. The performance of this function is predicted to slightly decrease below its current level 25 years after compensatory mitigation is initiated. The decreases are predicted for both CMAs due to the expected decrease in cover by herbaceous vegetation. CMA1 and the portion of the assessment unit associated with CMA2 unaffected by runoff piped from the plant site will continue to have little opportunity to perform this function in the future. In contrast, the opportunity for the portion of CMA2 that will receive stormwater runoff to perform this function will increase to some degree.

The ability of the wetlands to reduce peak flows and decrease downstream erosion are rated moderate according to the results of the assessment. These functions are limited within the CMAs by the moderate amount of seasonally inundated areas, low amount of woody vegetation, and low level of outlet constriction. However, the high ratio of wetland area to contributing basin area enhances the performance of these functions. The opportunity for these functions to be performed is moderate since there is a moderate amount of runoff from the wetlands. Opportunities for the CMAs to reduce peak flows and decrease downstream erosion are currently low to moderate at these sites.

Despite the proposed hydrologic modifications, the model does not predict that the potential to reduce peak flows in the CMAs will change. Although the proposed topographic and hydrologic modifications will increase hydrologic storage and reduce peak runoff rates to some degree, the flooding depth, outlet constriction, and ratio of inundated area to sub-catchment area will not increase substantially for either CMA. Although the inundated area within the assessment unit associated with CMA2 will nearly double in size, the inundated area to sub-catchment area ratio does not increase dramatically because the plant site (approximately 33 acres) will become part of CMA2's catchment area. As a result, the model does not predict any increase in the ability of either CMA to reduce peak flow. However, directing stormwater to CMA2 will substantially decrease peak runoff rates delivered from the plant site to Terrell Creek. Instead of being directed through a large ditch along the east edge of Blaine Road that leads directly to the creek, runoff piped to CMA2 will be stored on site and in the large area downgradient before reaching Terrell Creek near its crossing with Jackson Road. The opportunity for CMA1 to reduce peak flows will continue to be low to moderate, but will be moderate to high in CMA2 due to the inflow of detention pond runoff.

The ability to decrease downstream erosion is predicted to improve to some degree in both CMAs. Although the peak runoff reduction and downstream erosion control functions are closely related, only the erosion-control function is predicted by the model to improve, due to the substantial increase in forest and scrub-shrub vegetation. The woody vegetation will improve hydrologic storage and increase hydraulic roughness, thereby reducing runoff and associated erosion from the CMAs. Despite the establishment of woody vegetation, surface water inputs to the CMAs (especially in CMA2, post mitigation) will continue to overwhelm soil storage capacity, thereby perpetuating the relatively high surface water runoff from the sites. The opportunity for CMA1 to decrease downstream erosion will continue to be low to moderate, but will increase to a moderate to high level in CMA2 where runoff will be delivered from the plant site. Hydrologic storage in CMA2 will reduce the erosive power of the plant site runoff, which would be much higher if all of it was funneled to the large ditch east of Blaine Road.

The potential for the assessment units to recharge groundwater is rated to be moderately low due to the poor vertical drainage of their soils. Because of the more widespread inundation in CMA1, this area is rated to have slightly higher potential to recharge groundwater than CMA2 assessment unit. Infiltration rates are very slow within the BP Cherry Point property and surrounding areas because of the soils here are underlain by a thick stratigraphic layer high in clay and silt (Bellingham glaciomarine drift). Terrell Creek receives virtually no base flow from groundwater sources (State of Washington Department of Water Resources 1960).

Results of the assessment predict that the potential for the CMA1 to recharge groundwater will remain at the current level, yet the potential for CMA2 to recharge groundwater will increase slightly. CMA1's potential is not expected to change since the increase in inundation due to the proposed topographic and hydrologic modifications will not be very large. In contrast, the extent of seasonally inundated area in the assessment unit associated with CMA2 is expected to nearly double. This increased inundation will cause greater amounts of groundwater to be stored in the soil within and downgradient of CMA. Given the very low permeability and infiltration capacity of the soils in the area, the opportunity to recharge groundwater stored in stratigraphic layers below the soil will remain low for both CMAs.

The proposed rehabilitation will substantially improve habitat suitability functions on site. Suppression of non-native, invasive plants and establishment of native vegetation will enhance wildlife habitat and increase primary production and organic export. Establishing native plant communities will create more habitat structure and diversity, which will likely augment both wildlife and plant diversity. Given the proximity of relatively intact habitats such as mature forests, streams, lakes, and coastal habitats, the opportunity for these wetlands to perform the habitat suitability functions will be moderate to high.

The increased extent of inundation to occur in CMA2 and the native emergent vegetation and woody debris to be established in inundated portions of both CMAs will provide increased opportunities for aquatic insects and amphibians to find cover, food, and breeding sites. The absence of surface water in late summer will continue to prevent colonization by organisms such as bullfrogs, a non-native amphibian species that preys upon amphibian larvae (Richter 1999). Pacific chorus frogs and red-legged frogs are present in nearby areas and will likely colonize the enhanced wetlands in only a few years following their installation.

Other wildlife likely to benefit from the proposed compensatory mitigation include mammals and birds. Mammals that rely upon woodland and woodland/meadow edge habitat such as blacktail deer, coyotes, Douglas squirrels, raccoons, and porcupines will benefit from the establishment of forest and scrub-shrub communities. A wide variety of birds will likely find nesting and/or foraging habitat in the CMAs 25 years following initial mitigation activity, including warblers, sparrows, swallows, woodpeckers, hawks, and shrikes.

Upon reaching maturity, the trees and shrubs to be installed will provide habitat for a variety of wildlife including mammals, birds, and amphibians. The forested and scrub-shrub areas will provide shelter and thermal insulation for many species, which is especially important during winter. These habitats will permit nesting and breeding for a variety of species incapable of utilizing the open meadows for such activities. The wooded areas also will serve as a migration and dispersal corridor connecting the forested areas south of Grandview Road with the riparian forest surrounding Terrell Creek to the north. Migration and dispersal

habitat is especially important to areas like this portion of Whatcom County, where forested areas are severely fragmented by development.

The forested and scrub-shrub areas will encourage the establishment and growth of native mid-story and understory vegetation and suppress invasion by non-native, invasive plants. The forested and scrub-shrub communities to be established on site may eventually expand into adjacent unimproved areas, thereby further enhancing habitat value for the area. However, the model predicts that the increase in native, woody vegetation will suppress improvement of bird habitat suitability, causing no score increase in CMA1 and only an increase of two performance points in CMA2.

Aquatic insects, amphibians, and other animals attracted to the enhanced wetlands and uplands will provide increased foraging opportunities for a variety of birds including passerines (perching birds), waterfowl, raptors, and great blue herons. Herons forage for amphibians and small mammals in the shallow ponds and fallow fields north of Grandview Road (Ann Eissinger, personal communication 2001). Significant areas of open field habitat will be maintained for heron foraging. The quality of these foraging areas will be much improved over their current condition. Herons will profit from the increase in inundated areas with surface water less than 50 cm (20 inches) deep that support amphibians (Short and Cooper 1985). Converting the extensive reed canarygrass on CMA1 and CMA2 to another herbaceous cover also will benefit herons searching for small mammals. Herons have been observed avoiding the tall dense cover that reed canarygrass presents (Ann Eissinger, personal communication 2003). No threatened or endangered species are expected to benefit directly from the proposed compensatory mitigation.

Since the wetlands currently do not provide fish habitat and will not provide fish habitat after mitigation activity is complete, the functional performance for Habitat Suitability for Anadromous Fish and Habitat Suitability for Resident Fish cannot be evaluated. Thus, the scores for the mitigation wetlands are shown as "NA" (not applicable).

The wetland communities to be established on site will continue to generate relatively high rates of primary productivity and release organic matter to downstream areas at moderate rates via the seasonally flowing channels. A substantial increase in primary production and organic export is predicted to result from the proposed rehabilitation. As a result, the proposed mitigation is predicted to cause more biomass to be retained on site (locked up in trees and shrubs) and also produce an increased rate of organic matter release.

In summary, the model predicts that the proposed mitigation will cause generally slight increases in the performance of hydrologic functions and substantial increases in the performance of wetland habitat functions. For CMA1, the index for one hydrologic function (Decreasing Downstream Erosion) will increase, the index for another hydrologic function (Removing Heavy Metals and Toxic Organics) will decrease slightly, and the indices for the remaining four hydrologic functions will not change. For CMA2, the indices for two hydrologic functions (Decreasing Downstream Erosion, and Recharging Groundwater) will increase slightly, whereas the remaining four hydrologic functions will not change. Performance of all habitat functions will increase in both CMAs, but increases will be slightly larger in the CMA2 assessment unit. The greater performance increase predicted for the assessment unit associated with CMA2 is attributed to the dramatic increase in inundation and the relatively moderate decrease in herbaceous vegetation.

Gains and losses in functional performance from the proposed mitigation have been calculated in acre-points, which is the product of wetland functional performance index and wetland acreage. The *Washington State Methods for Assessing Wetland Functions* (Ecology 1999) suggests measuring functional performance in terms of acre-points. Although the wetland functional performance is influenced by wetland size, this measurement essentially gives equal importance to wetland functional performance and wetland size. Acre-points or functional units can be used to compare gain and loss in overall wetland functional performance.

The cumulative loss of wetland functional performance that will occur as a result of the proposed construction has been calculated. The results of this calculation are shown in Table 9. A total of ten wetland areas will be eliminated (filled or drained).

Table 9
Wetland Functional Performance Indices and Acre-Points for Existing Wetland Areas to be Permanently Eliminated by the Proposed Construction

Function	Wetland A (1.69 ac)	Wetland B (2.81 ac)	Wetland C (0.88 ac)	Wetland D (5.92 ac)	Wetland F (8.75 ac)		Wetland G (5.46 ac)	Wetland H (0.23 ac)	Wetland I (0.15 ac)	Wetland J (4.39 ac)	Total (30.58 ac)
					AU-1 (8.15 ac)	AU-2 (0.6 ac)					
Potential for Removing Sediment	4/ 6.76	4/ 11.24	4/ 3.52	5/ 5.45	5/ 40.75	5/ 3.0	4/ 21.84	4/ 0.92	5/ 0.75	5/ 21.95	116.18
Potential for Removing Nutrients	2/ 3.38	2/ 5.62	2/ 1.76	3/ 17.76	3/ 24.45	2/ 1.2	2/ 10.92	3/ 0.69	5/ 0.75	3/ 13.17	79.7
Potential for Removing Heavy Metals and Toxic Organics	4/ 6.76	4/ 11.24	4/ 3.52	5/ 5.45	5/ 40.75	4/ 2.4	5/ 27.3	5/ 1.15	5/ 0.75	5/ 21.95	121.27
Potential for Reducing Peak Flows	2/ 3.38	2/ 5.62	2/ 1.76	4/ 23.68	4/ 32.6	2/ 1.2	2/ 10.92	3/ 0.69	5/ 0.75	3/ 13.17	93.77
Potential for Decreasing Downstream Erosion	2/ 3.38	2/ 5.62	3/ 2.64	5/ 29.6	5/ 40.75	4/ 2.4	3/ 16.38	3/ 0.69	8/ 1.2	3/ 13.17	115.83
Potential for Recharging Groundwater	3/ 5.07	3/ 8.43	3/ 2.64	5/ 29.6	5/ 40.75	2/ 1.2	4/ 21.84	5/ 1.15	1/ 0.15	5/ 21.95	132.78
General Habitat Suitability	2/ 3.38	2/ 5.62	2/ 1.76	2/ 11.84	2/ 16.3	2/ 1.2	1/ 5.46	1/ 0.23	3/ 0.45	2/ 8.78	55.02
Habitat Suitability for Invertebrates	1/ 1.69	1/ 2.81	0/ 0	0/ 0	2/ 16.3	1/ 0.6	1/ 5.46	1/ 0.23	1/ 0.15	1/ 4.39	31.63
Habitat Suitability for Amphibians	2/ 3.38	2/ 5.62	1/ 0.88	1/ 5.92	2/ 16.3	2/ 1.2	1/ 5.46	1/ 0.23	1/ 0.15	1/ 4.39	43.53
Habitat Suitability for Anadromous Fish	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Habitat Suitability for Resident Fish	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Habitat Suitability for Wetland- Associated Birds	4/ 6.76	3/ 8.43	3/ 2.64	3/ 17.76	3/ 23.85	2/ 1.2	2/ 10.92	2/ 0.46	2/ 0.3	3/ 13.17	85.49
Habitat Suitability for Wetland- Associated Mammals	2/ 3.38	2/ 5.62	2/ 1.76	2/ 11.84	1/ 8.15	1/ 0.6	1/ 5.46	1/ 0.23	2/ 0.3	2/ 8.78	46.12
Native Plant Richness	1/ 1.69	0/ 0	0/ 0	0/ 0	1/ 8.15	0/ 0	0/ 0	0/ 0	3/ 0.45	0/ 0	10.29
Primary Production and Export	6/ 10.14	6/ 16.86	6/ 5.28	7/ 41.44	6/ 48.9	8/ 4.8	7/ 38.22	7/ 1.61	9/ 1.35	7/ 30.73	199.33

Wetland E and Wetland K will not be affected by the proposed project.
Acreages indicate the impact area for each wetland listed.
The scores for functional performance are averaged for all wetlands to be affected by the proposed project; the score for Wetland F is the sum of its assessment unit's scores weighted by acreage.

Predicted gains in wetland functional performance from the proposed mitigation were compared to predicted losses in wetland functional performance from the proposed construction (Table 10). With the exception of decreasing downstream erosion, the method predicts that there will be a net loss in the performance of hydrologic functions as a result of the proposed construction and mitigation. With the exception of primary production and export, the method predicts that the proposed construction and mitigation will lead to a net increase in performance of habitat functions.

Table 10
Expected Gross and Net Gains and Losses of Acre-Points

Hydrologic Functions				Habitat Functions			
Function	**Gains from Mitigation**	**Losses from Construction**	**Expected Net Gain or Loss (+ or -)**	**Function**	**Gains from Mitigation**	**Losses from Construction**	**Expected Net Gain or Loss (+ or -)**
Potential for Removing Sediment	33.74	116.18	-82.44	General Habitat Suitability	278.12	55.02	+223.1
Potential for Removing Nutrients	9.32	79.7	-70.38	Habitat Suitability for Invertebrates	278.12	31.63	+246.49
Potential for Removing Heavy Metals and Toxic Organics	-107.06	121.57	-228.33	Habitat Suitability for Amphibians	166.4	43.53	+122.87
Potential for Reducing Peak Flows	4.66	93.77	-89.11	Habitat Suitability for Anadromous Fish	NA	NA	NA
Potential for Decreasing Downstream Erosion	218.78	115.83	+102.95	Habitat Suitability for Resident Fish	NA	NA	NA
Potential for Recharging Groundwater	64.0	132.78	-68.78	Habitat Suitability for Wetland-Associated Birds	171.06	85.49	+86.57
				Habitat Suitability for Wetland-Associated Mammals	102.4	46.12	+56.28
				Native Plant Richness	346.78	10.29	+336.49
				Primary Production and Export	107.06	199.33	-92.27

Despite widespread acceptance of the functional assessment method used for this assessment, the accuracy of its results is limited. As indicated in the method's guidelines, the indices do not denote actual functional performance, but only an estimate of performance based on readily observable aspects of a given site and the relationship between these aspects and the various functions. Many of the relationships between site aspects and wetland functions are simply hypothesized relationships because specific information regarding the relationships may be lacking (Ecology 1999). The validity of these relationships may be especially weak for the hydrologic functions.

Analysis of the CMA's hydrostratigraphy and soils combined with various observations of the site's hydrologic regime have provided further insight into the factors affecting hydrologic functions. The conclusions regarding performance of hydrologic functions that were drawn from these analyses and observations differ to some degree from the results of the functional assessment using Ecology's methods. In particular, it was shown that sloping topography, poor vertical drainage, and long-term saturation and inundation recurring across the construction site and the CMAs combine to severely limit the potential to reduce peak flows or recharge groundwater in these areas. Other wetland functions, such as the potential to remove sediments, nutrients, and toxins, also are limited to some degree by the combination of topographic, soil, and hydrologic factors at these sites. Thus, results of the functional assessment may overestimate current performance levels of most hydrologic functions in the construction site and the CMAs.

Although the rehabilitation proposed for the CMAs is expected to improve performance of these and other hydrologic functions, the functional assessment model does not predict large increases in performance. These predictions underestimate the actual improvement expected because the model lacks the sensitivity adequate to account for the changes in site conditions that will be caused by the proposed mitigation. For instance, adding the plant site (33 acres) to the assessment unit associated with CMA2 has no effect on the scores for the hydrologic functions.

In addition, the model fails to incorporate the mitigating effect of the proposed detention ponds on the changes in project site's hydrologic regime. Because the ponds are being designed using updated techniques and will include dead storage, they will mitigate performance losses of all hydrologic functions except the potential to for recharging groundwater, a function which is not significant on the BP Cherry Point property due to the underlying aquitard.

Thus, the actual performance losses of hydrologic function due to the proposed construction will be less than indicated by the functional assessment results, whereas the expected gains will be as great as or greater than indicated by the functional assessment results. As a result, the proposed mitigation will adequately offset the losses of hydrologic function performance to be caused by the proposed construction (including detention pond construction).

The proposed mitigation will greatly improve ecological integrity and functionality of the wetlands within the CMAs. Applying Ecology's wetland rating system to the CMA wetlands under conditions predicted to occur 25 years following initial mitigation activity results in Category II wetlands with very high scores, indicating a highly valuable Category II wetland. The existing wetlands within the CMAs are rated as Category III wetlands (Ecology 2004). The completed wetland ratings data forms for the CMAs under current and predicted conditions are presented in Appendix B.

5.4.5 Buffers

The upland areas scattered across various portions of the CMAs share borders with the wetland areas within the CMAs and are thus considered wetland buffers. Most of these areas are upland meadows that are only slightly higher in elevation than the wetlands and retain saturation for long periods during the wet season. The upland forest communities to be established within these meadow areas will improve their service as wetland buffers, thereby enhancing performance of both hydrologic and habitat wetland functions.

There are some upland shrub and/or forest buffer areas within the new additions to the CMAs (added in 2007). The southeastern corner of CMA1 contains Himalayan blackberry. Two patches of mature forest are now included in CMA2. These forests are mainly composed of deciduous broad-leaved trees, but have several native coniferous trees approaching canopy level. Some of these forested upland areas are anticipated to get wetter after implementation of mitigation.

The riparian forest associated with Terrell Creek will provide a buffer to most of the northern border of the CMAs. Only the westernmost portion of CMA2 does not border this mature mixed deciduous/coniferous forest.

In areas along Blaine Road and Grandview Road, wetlands extend to the edge of the ROW or beyond. In these areas there is no opportunity for designating upland buffers. In other areas of the CMAs, the wetland continues beyond the boundary of the CMA, and these areas likewise have no opportunity for wetland buffers. The latter areas border on other BP property with no active land use, and the functions often provided by buffers are less important or are provided by the wetland.

5.4.6 Land Use

Although the BP Cherry Point property north of Grandview Road is zoned for "light impact industrial" development, BP intends to maintain this area in a natural state for the creation of compensatory mitigation areas. As stated earlier, the CMAs primarily contain abandoned pasture that has not been cultivated in over 15 years. These areas are currently used by the WDFW to produce grain for ring-necked pheasants, which are released here each autumn for the relatively few hunters that pursue them. These areas see only occasional human traffic. WDFW, in conjunction with Ducks Unlimited, has constructed two ponds, both of which provide habitat for waterfowl. The grain-production areas and ponds are located over several hundred feet from the proposed CMAs and no major conflicts with hunters are expected (Tom Reed, personal communication).

Until 2007, most of CMA1 was open to cattle grazing under a five-year contract with a dairy farmer that began in 2001. Typically, 60 cows and 25 calves have wintered in CMA1, usually in upland areas. However, the cattle have been free to enter wetlands through a gate that is open for most of the growing season. During this time, the cattle have grazed virtually all the herbaceous species present, including slough sedge. Observations of the grazed area in October 2002 found that herbaceous plant species diversity has increased substantially since before the grazing began. In addition, the surface layer of the soil appears slightly disturbed by the trampling effect of the cattle. Grazing in CMA1 ceased during 2007.

The meadow areas west of CMA2 and east of CMA1 are within the BP Cherry Point property and therefore will be retained as undeveloped areas. The riparian forest to the north serves as the buffer area for Terrell Creek and thus is off-limits to development.

Current and expected future land uses in the area near the CMAs are not likely to deter enhancement of the CMAs or degrade their functional performance over time. Air quality modeling indicates that emissions from the cogeneration facility will not significantly affect current ambient air quality in the area (Golder Associates 2003a). Although residential development may increase to some degree over the next few decades, the areas adjacent to the CMAs will likely retain their rural character. The nearest properties to the CMAs outside BP ownership are north of Terrell Creek and are approximately 0.25 mile away. Although it

currently conveys light to moderate traffic, Blaine Road and the portion of Grandview Road east of the intersection with Blaine Road (also known as State Route 548) are not likely to be expanded in the foreseeable future. Since the portion of Grandview Road west of its intersection with Blaine Road conveys only light traffic, this area is not likely to be expanded either.

5.5 CONSTRAINTS

Vandalism by trespassers may be the only constraint to mitigation success that is outside the owner's control. However, no vandalism has occurred to the existing mitigation site located just west of CMA2 or to the BRMSA mitigation site, and none is expected to occur in the CMAs. The mitigation sites are within BP Cherry Point property near the refinery and undergo regular security checks by the existing security contractor.

5.6 SITE PLAN

5.6.1 Hydrologic Modifications

Cogeneration Project Mitigation Site Plan

The hydrologic modifications proposed for both CMAs include plugging (filling) portions of some ditches and grading shallow swales and broad contours to ensure that stormwater runoff disperses across the widest possible area. Treated runoff will be conveyed to CMA2 from the detention pond that will be constructed on the cogeneration plant site. These modifications will contribute to the restoration of historic drainage patterns, further improve the quality of the runoff from the detention pond, and reduce downslope drainage efficiency, thereby increasing hydrologic storage.

Appendix C contains the plan drawings showing modifications proposed for CMA1 and CMA2 and contains cross-section drawings detailing proposed ditch plugging.

The current locations of the main ditches within CMA1 and CMA2 are shown in Figures 13A and 13B. Native soil will be used to fill the primary north-south ditch in CMA1, and the shallow east-west ditch in the northwestern area of CMA1 will be eliminated. The upper (eastern) portion of the east-west ditch in CMA2 and the north-south ditch along the west boundary of CMA2 also will be filled.

To the extent practicable, soil previously cast adjacent to existing ditches during their original construction will be used to fill the ditches. Soil excavated to create new contours and broad swales will be used to fill existing ditches and to create berms and other conveyance features across low areas, as needed. The areas immediately surrounding the ditches to be filled may be recontoured to further simulate historical topography. The areas recontoured as a part of filling ditches or regrading for other features will be planted and seeded with native plants.

Some additional runoff will be redirected into CMA1 from the westerly-flowing roadside ditch located on the north side of Grandview Road. This ditch will be intercepted near the southeast corner of CMA1 and the flow will be redirected north for dispersion within CMA1. However, the primary hydrologic restoration within CMA1 will be accomplished by removing drainage features previously constructed to enhance

commercial farming and grazing land uses. The restoration of surface contours in a manner that replicates original configurations, together with restoration of native plants and habitat features within the graded areas, will provide substantial hydrologic and wildlife enhancement of 53.5 acres within CMA1.

The original historic surfacewater flow pattern crossing what is now Grandview Road will be replicated to benefit CMA2 by conveying runoff from the cogeneration plant site across Grandview Road to the southeast corner of CMA2. This conveyance will involve direct piping of all runoff discharged from the proposed detention pond located on the cogeneration plant site. Due to relatively flat grades created long ago during construction of Grandview Road, the conveyance piping will be designed as an inverted siphon flowing by gravity pressure. It will be sized for the peak discharge of the detention pond during a 100-year event. The piping will be buried and run westerly across Blaine Road from the controlled outlet of the detention pond and then northerly across Grandview Road to CMA2. The treated cogeneration runoff will then be discharged at ground surface level near the upper end of the proposed broad dispersion system of shallow ponds and swales within CMA2. This additional surface flow, together with the restoration of native plants and habitat features within the graded areas, will provide substantial hydrologic and wildlife enhancement for 68.8 acres within CMA2.

MSC Project Mitigation Site Plan

Development of the MSC site will not change the location, quantity, or quality of stormwater runoff being discharged under predevelopment site conditions. Runoff from the site currently drains into a drainage swale flowing northerly across Grandview Road into the BRMSA Mitigation Area through an existing 36-inch reinforced concrete culvert. The culvert discharges within the mitigation area into a northwesterly-flowing watercourse following a broad, irregular, meandering route that terminates in an outlet-controlled downstream pond.

The developed MSC site runoff will be directed into the BRMSA Mitigation Area using the same 36-inch reinforced concrete culvert described above. No further improvements within the BRMSA Mitigation Area are proposed. However, the MSC site development plan includes construction of an additional detention pond to be located at the northwest corner of the site. All runoff from the impervious areas of the MSC site will be conveyed to this pond. The pond will be designed to conform to current standards for detention volume, treatment, and controlled rate of discharge.

Post-Mitigation Hydrologic Pathways and Rates

Figures 14A and 14B show the expected post-mitigation hydrologic pathways within and down gradient of CMA1 and CMA2 as a result of the proposed hydrologic modifications. As with existing conditions, post-mitigation flow will occur in ditches, natural channels, over wide areas as sheet flow, and through subsurface pathways. Stormwater runoff from the two detention ponds proposed for construction within the Cogeneration and MSC Project areas will be directed to areas north of Grandview Road and west of Blaine Road.

CMA1 stormwater runoff flows north and joins with Terrill Creek east of Blaine Road. Hydrologic pathways within CMA1 will be broadened considerably and drainage rates reduced by filling the main north-south and minor east-west ditches on the site. The extent of seasonally inundated area is expected to increase substantially, even though the general direction of flow will remain largely unchanged. Flow

attenuation will be enhanced further by surface contouring and the restoration of native plant communities. Some minor ditching and recontouring within the southeast area of CMA1 will intercept southwesterly-flowing upland runoff and the westerly-flowing roadside ditch along Grandview Road, and redirect it more beneficially toward the northwest.

CMA2 runoff will be supplemented with piped discharges from the cogeneration site detention pond through a 20-inch inverted siphon constructed to cross under Blaine Road and then under Grandview Road just west of its intersection with Blaine Road. The pond will be designed so that all controlled outlet discharges up to and including that expected to occur during a 100-year, 24-hour storm will be piped directly to CMA2. Only the runoff above a 100-year event would be allowed to follow the predevelopment drainage path of ditches and culverts flowing north across Grandview Road toward Terrill Creek within the roadside ditch on the east side of Blaine Road. According to preliminary calculations derived from the original detention pond design work (Golder Associates 2002), the peak stormwater outflow from the cogeneration detention pond being diverted to CMA2 during each event is expected to be:

1-year event	2-year event	10-year event	25-year event	100-year event
1.56 cfs	1.84 cfs	8.25 cfs	9.22 cfs	13.19 cfs

MSC site development will not change the location, quantity, or quality of stormwater runoff being discharged under predevelopment site conditions. All discharges from the MSC detention pond will continue to drain into the existing drainage swale flowing northerly to the existing 36-inch reinforced concrete pipe culvert crossing Grandview Road near the northwest corner of the MSC site. The 36-inch culvert discharges to a series of ponds and wetlands connected by well-vegetated channels and swales within the BRMSA Mitigation Area on the north side of Grandview Road.

The increase in flow rate in ditches and channels downgradient from the input points near Grandview Road is predicted to be somewhat less than the increase in flow rate at the input points, due to flow attenuation by soil and depressional storage. Although flow will be progressively reduced as it travels downgradient, these reductions will not be equally progressive across the CMAs due to variations in topography and vegetative roughness.

The proposed hydrologic modifications will generally increase constrictions to surface water flow in both CMAs. Filling large portions of existing ditches will reduce the rate of surface water drainage, thereby increasing the extent of seasonal inundation. The frequency, duration, and magnitude of inundation will increase substantially in low-lying areas immediately upgradient from the portions of the ditches that will be filled.

In CMA1, the increased seasonally inundated area is expected to be most apparent along the main north-south drainage pathway, particularly south of the existing quaking aspen stand (Figure 14A), in addition to the area in the northwestern corner of CMA1.

In CMA2, the increase in seasonally inundated area will be greatest in the area surrounding and downgradient from the 20-inch piped discharge along the proposed system of controlled shallow swales located south and east of the forested patch (Figure 14B).

Cogeneration runoff released from the proposed 20-inch inverted siphon at the southeast corner of CMA2 will be directed across a wide portion of the CMA and downgradient areas. From the point of discharge, surface water will flow west and north as sheet flow and semi-concentrated flow.

Westerly flows crossing the southern area of CMA2 will continue off-site to the south of the large forested patch located just west of the main body of CMA2. This water will then continue north and west across a broad meadow area until it enters the relatively flat wetland just east of the large WDFW pond. Surface and groundwater flow that would have been intercepted and directed north by the existing ditch along the west edge of CMA2 will instead go further west due to the proposed ditch plugging and regrading.

Northerly flows along the easterly area of CMA2 will lead to larger seasonally inundated areas located east and north of the large forested patch. The additional surface water introduced to existing seasonally inundated areas will cause them to have increased duration, magnitude, and frequency of inundation. Regrading for shallow channel pathways and linked low-area connections will create additional seasonally inundated areas that will drain to the portion of the west-flowing ditch that runs through the northern part of the large forest patch. Flow in the west-flowing ditch follows a somewhat complex path, but most flow eventually joins Terrell Creek near Jackson Road.

A substantial amount of water from the west-flowing ditch currently leads north to become dispersed across a wide portion of the CMA2 panhandle. It is expected that a substantial amount of water introduced by the 20-inch inverted siphon will follow these existing pathways and increase moisture levels across a wide portion of the CMA2 panhandle. Minor topographic modifications were designed to expand these areas into adjacent uplands. As a result, the extent of seasonally inundated area in the panhandle will increase in areas where shallow inundation currently occurs.

Drainage pathways west of CMA2 are complex and extend for over 0.5 mile through ponds, connecting channels, and wetlands before entering Terrell Creek near Jackson Road. Thus, runoff delivered to these areas will more closely follow historic drainage patterns rather than being ditched or tightlined directly to the creek. In addition, the potential to improve water quality of this runoff will be maximized. The runoff will also provide additional surface water to the ponds, most of which have their levels controlled by artificial structures such as culverts and weirs.

It should be noted that within CMA1 at least 1.8 acres of existing upland area is expected to become wetland. These areas will be located within the shallow broad contour pathways designed to replace the existing ditches that are to be filled and adjacent areas.

In addition, approximately 4.8 acres of existing upland area scattered across the main body of CMA2 are expected to become wetland. These areas are mainly on slightly elevated ground near areas that will be subjected to increased soil saturation and inundation because of topographic modification and the extra water. Part of this wetland conversion area consists of the shallow conveyance areas that will be excavated through the existing upland areas across the southern and eastern portions of the site.

5.6.2 Proposed Control of Non-Native Species

Control of non-native, invasive plant species will consist of a three-pronged approach: 1) initial removal, 2) subsequent maintenance for short-term control, and 3) establishment of native plant communities for long-

term control. This approach will be applied to all areas within the CMAs. The first two prongs of the three-pronged approach will be applied to the areas between the CMAs and the ditches within the ROWs.

Removal will occur through a combination of mowing, tilling, and herbicide application. Subsequent maintenance will mainly employ hand-pulling and herbicide application, but may involve some mowing as well. Native trees and shrubs will eventually provide enough shade and organic litter to suppress growth of non-native, shade-intolerant plants from large portions of the site.

Those areas that have greater than 20 percent cover by reed canarygrass will be regularly mowed for two growing seasons prior to the initial phase of planting. Frequent mowing during this time will diminish the reed canarygrass population in these areas by removing aboveground plant matter, depleting carbohydrate reserves, and suppressing seed production. Any small patches of reed canarygrass found within areas mapped as having <20 percent cover by reed canarygrass will be mowed or sprayed with herbicide.

Clumps of Himalayan and evergreen blackberry that are not intertwined with native trees and shrubs will be mowed with a brush-cutter. Blackberry that is intertwined with trees will be removed by hand to prevent damage to native vegetation. Cut stems may be mechanically chopped to pieces less than 0.5 foot in length with a crop chopper and may be left on site to serve as mulch.

Those areas that contain greater than 20 percent cover by reed canarygrass will be tilled. Tilling will occur after mowing during the growing season prior to the initial phase of planting. A large rototiller pulled by a tractor will till soils to a 6-inch depth. These portions of the site will then be disked to further break up the clods and kill rhizomes that survived the mowing. Areas with less than 20 percent cover by reed canarygrass will not be tilled, since tilling is not necessary or practical to suppress reed canarygrass in these areas and tilling is not critical to establishing native trees and shrubs. However, any stands of reed canarygrass found in these areas will be mowed and subsequently sprayed with herbicide.

Tilling and disking will fatally damage many of the reed canarygrass rhizomes, but will likely encourage buried seeds and undamaged rhizomes to resprout. Reed canarygrass that does resprout will be sprayed with herbicide. The herbicide applied on site will consist of glyphosate plus surfactants and will only be applied to areas free from inundation and unlikely to support inundation within two weeks of application. Herbicide will be applied by state-licensed applicators. This sequence of mowing, tilling, disking, and spraying herbicide will work to exhaust energy supplies of the reed canarygrass population. The herbaceous seed mix selected for the tilled areas has been recommended by the Corps because it has proven to be effective at competing with reestablishing reed canarygrass.

Weed control will occur through a combination of mechanical removal and herbicide application after native plants are installed and the seed mix applied. Although such maintenance is expected to occur throughout most of the 10-year monitoring and maintenance period, the intensity of the maintenance effort should decrease over time. Eventually, native vegetation will serve to suppress non-native plants over large portions of the site by shading and soil resource competition.

The road ROWs and the setback areas between the CMAs and the road ROWs will be mowed regularly throughout the 10-year monitoring period. This will suppress reed canarygrass and any other exotic plants from producing and disseminating propagules to the CMAs from these areas.

URS will monitor the success of non-native, invasive species control each year of the 10-year period. Contingencies will be made if control methods fail to attain performance standards, as necessary. For reed canarygrass, the contingency measures consist of targeted efforts to control outbreaks such as manual removal of invasive species, additional spot applications of herbicide, more frequent mowing, and additional plantings and/or seedings in problem areas.

Non-Native Species Control to Date

Non-native species control was initiated in 2007. CMA2 was initiated in the spring. A solution of 41 percent Glysphosate (Roundup) was used on reed canarygrass. Approximately 5 acres were sprayed on April 20th, and another 4 acres on June 27th. Weed control on CMA1 did not begin until later in the summer because cattle were still present. On September 27th and 28th, approximately 5.5 acres of reed canarygrass was sprayed on CMA1. Crossbow (triclopyr + 2,4-D ester) was used in September to treat a total of 2 acres of blackberries on CMA1 and CMA2.

5.6.3 Soil

The native soils within the CMAs will serve as an adequate growing medium for the plants to be installed. Most of this soil typically consists of a silt loam or loam surface layer that is 10 to 14 inches deep. Subsoil layers are typically silt loam or sandy loam that are 8 to 16 inches thick. See the *Revised Cogeneration Project Compensatory Mitigation Areas Wetland Delineation Report* (URS 2003) for more information about on-site soils.

Soil disturbed by tilling or filling may be covered with mulch or erosion-control matting to prevent soil erosion. These areas will then be replanted with native vegetation as soon as practicable. The created swales and filled ditches in both CMAs will be designed to encourage colonization by vegetation and will be seeded with the native seed mix.

5.6.4 Habitat Features

A number of habitat features will be distributed across the CMAs. The habitat features planned for the site will provide structure to encourage habitat utilization by native wildlife species.

At least 366 downed logs (three per acre) will be placed across the CMAs. Logs will likely be derived from sources on the BP Cherry Point Refinery property. In addition, approximately 55 non-native cedar (*Cupressaceae* family) trees will be cut from a windbreak that protects an abandoned orchard plot located just north of CMA2. The windbreak trees are approximately 30 feet tall with an 8-inch diameter at breast height. The proposed tree cutting will reduce the tree density to 9 feet on-center, which will allow the remaining trees to accelerate their lateral and vertical growth. The logs will act as habitat features by providing foraging opportunities, cover, and perching or haul-out sites for small mammals, birds, and amphibians (Stevens and Vanbianchi 1993).

A number of artificial snags (dead-standing trees) and wildlife brush shelters will be erected on site. In addition, woody branches will placed in seasonally inundated areas. The logs to be used as artificial snags will be at least 20 feet tall and will have a diameter at breast height of greater than 12 inches. The base of each snag will be installed at least 4 feet below ground surface and stabilized with cement. A 10-foot long

cross-beam may be attached to each snag to provide perches for red-tail hawks and other birds. The hawks and other predatory birds will prey on mice and voles, which might otherwise jeopardize the installed plants by gnawing and girdling.

Wildlife brush shelters will be placed away from areas that will be seasonally inundated. The base of each shelter will be composed of large, preferably rot-resistant boughs or logs that are 10 to 15 feet long and 4 to 6 inches in diameter. These pieces will be stacked criss-cross with parallel logs spaced approximately 2 feet from each other until the structure is 1 to 2 feet high. Branches of a smaller diameter will be placed between and above the base logs in teepee style to form a more compact weave. Coniferous evergreen branches with needles still attached should be added to each pile to enhance shelter cover. The end product will be a sturdy, dome-like structure 4 to 6 feet high that has adequate space for small mammals to move about. Wildlife brush shelters provide heavy cover close to the ground, which can attract a variety of wildlife including rabbits, mice, voles, small birds, and amphibians (Monroe 2001, Connecticut Wildlife Division 1999).

In addition, plants like rushes and sedges will be placed in the shallow areas of each area expected to be seasonally inundated to provide ovideposition sites for native amphibians. These could be supplemented with branches or twigs with less than 8 mm (0.3 inch) diameter (Richter 1999) installed deep in pond substrate to prevent them from being dislodged by the rise and fall of water levels. The ovideposition sites provided by the branches will supplement those sites provided by the emergent vegetation that will become established in shallowly inundated areas.

Several small (<0.5 acre) seasonally inundated shallow ponds will be established on CMA1 and CMA2 to promote native amphibian production. Seasonally inundated ponds dry up during the dry season, making it impossible for non-native bullfrogs to successfully breed because of their two-year tadpole cycle.

Habitat features are designed to benefit the local breeding great blue heron population. Woody debris, eradication of invasive vegetation, and establishment of small seasonal ponds all provide increased opportunity for heron foraging.

5.6.5 Vegetation Establishment

The distribution of plant communities to be established in CMA1 and CMA2 are shown in the Preliminary Mitigation Site Construction Plan Set (Appendix C). The plant communities planned for the CMAs are explained below. Plant species composition, spacing, condition, and size for these communities are shown in Tables 11 through 14.

For Tables 11, 12, and 13, the average spacing is given for trees, shrubs, and herbaceous plants to be installed in each community. To improve habitat heterogeneity, planting densities will not be uniform throughout each zone. Instead, the zones will contain patches with a relatively high density, patches with moderate density, and patches with a relatively low density. The variety in density will allow planting in areas most suitable for their establishment and growth. The locations of the patches will be determined in the field.

Table 11
Planting Plan for Upland Communities

Scientific Name	Common Name/Wetland Indicator Status	Spacing	Condition & Size
Alnus rubra	Red alder/FAC	Intersperse the various tree species so that overall spacing on center = 12 ft	bare-root, 1.5'-3'
Betula papyrifera	Paper birch/FAC		bare-root, 1.5'-3 '
Prunus emarginata	Bitter cherry/FACU		bare-root, 12-18"
Pseudotsuga menziesii	Douglas fir/FACU		bare-root, 1.5'-3'
Salix scouleriana	Scouler willow/FAC		rooted cutting, 1.5'-3'
Thuja plicata	Western red cedar/FAC		bare-root, 1.5'-3'
Tsuga heterophylla	Western hemlock/FACU-		bare-root, 1.5'-3'
Crataegus douglasii	Douglas hawthorn/FAC	Intersperse the various shrub species so that overall spacing on center = 8 ft	bare-root, 1.5'-3'
Holodiscus discolor	Oceanspray/NI		bare-root, 1.5'-3'
Oemleria cerasiformis	Indian plum/FACU		bare-root, 1.5'-3'
Rosa nutkana	Nootka rose/FAC-		bare-root, 1.5'-3'
Sambucus racemosa	Red elderberry/FACU		bare-root, 1.5'-3'
Symphoricarpos albus	Common snowberry/FACU		bare-root, 1.5'-3'

FAC – facultative
FACU – facultative upland
NI – non-indicator
- = wetland slightly drier than rating

Overall spacing for the upland community is at a lower density than the seasonally saturated or seasonally inundated community types, since far less reed canarygrass is found in upland areas. Planting densities are set higher in the seasonally saturated and seasonally inundated communities to help suppress cover by reed canarygrass by increased competition and shading. Although their overall densities will be equal, the seasonally inundated communities will have a higher ratio of shrubs to trees than the seasonally saturated communities, since native shrubs are better able to withstand greater levels of hydrologic fluctuation.

No trees or shrubs will be planted in a few patches within the upland and seasonally inundated communities. In the upland communities, these patches will be constricted to areas that have less than 20 percent reed canarygrass prior to initial mitigation activity. In the seasonally inundated communities, these communities will be restricted to areas that are expected to have long periods of shallow (<1.5-foot) inundation.

Upland communities will be established in some the portions of the CMAs that were delineated as upland by Golder and Schott (2003). These communities may be saturated near or at the soil surface for a few months during the wet season. The overall tree and shrub spacing for the upland communities will be approximately 985 plants per acre, which requires an overall spacing of 6.65 feet on-center.

Table 12
Planting Plan for Seasonally Saturated Wetland Communities

Scientific Name	Common Name/Wetland Indicator Status	Spacing	Condition & Size
Alnus rubra	Red alder/FAC	Intersperse the various tree species so that overall spacing on center = 9 ft	bare-root, 1.5'-3'
Betula papyrifera	Paper birch/FAC		bare-root, 1.5'-3'
Picea sitchensis	Sitka spruce/FAC		bare-root, 1.5'-3'
Populus balsamifera ssp. *trichocarpa*	Black cottonwood/FAC		bare-root, 1.5'-3'
Salix lucida var. *lasiandra*	Pacific willow/FACW+		rooted cutting, 1.5'-3'
Salix scouleriana	Scouler willow/FAC		rooted cutting, 1.5'-3'
Thuja plicata	Western red cedar/FAC		bare-root, 1.5'-3'
Cornus sericea	Red-osier dogwood/FACW	Intersperse the various shrub species so that overall spacing on center = 6.5 ft	bare-root, 1.5'-3'
Crataegus douglasii	Douglas hawthorn/FAC		bare-root, 1.5'-3'
Malus fusca	Western crabapple/FACW		bare-root, 1.5'-3'
Physocarpus capitatus	Pacific ninebark/FACW-		bare-root, 1.5'-3'
Rosa nutkana	Nootka rose/FAC-		bare-root, 1.5'-3'
Rosa pisocarpa	Clustered wild rose/FAC		bare-root, 1.5'-3'
Rubus spectabilis	Salmonberry/FAC+		bare-root, 1.5'-3'
Salix piperi	Piper's willow/FACW		rooted cutting, 1.5'-3'
Salix sitchensis	Sitka willow/FACW		rooted cutting, 1.5'-3'
Camassia quamash	Common camas/FACW	Install patches of herbaceous species where overall spacing on center = 1.5 ft over 1% of SS	plugs
Carex obnupta	Slough sedge/OBL		plugs
Deschampsia caespitosa	Tufted hairgrass/FACW		plugs
Eleocharis palustris	Creeping spike-rush/OBL		plugs
Juncus ensifolius	Daggerleaf rush/FACW		plugs

FAC – facultative
FACW – facultative
OBL – obligate
SS – seasonally saturated
+ = wetland slightly wetter than rating
- = wetland slightly drier than rating

Seasonally saturated communities will be established in wetland areas that will be seasonally saturated, but typically retain no saturation near the soil surface during the dry season. Some of these areas may retain shallow inundation for one to three months during the wet season. The overall tree and shrub density for the seasonally saturated communities will be approximately 1,565 plants per acre, which requires an overall spacing of 5.3 feet on-center.

Seasonally inundated communities will be established in wetland areas that are seasonally inundated, but retain low levels of soil moisture during the latter half of the dry season. These areas will typically retain shallow inundation for more than three months during the wet season and will likely remain saturated for a longer periods than the seasonally saturated communities during the early part of the growing season. The overall tree and shrub density for the seasonally inundated communities will be approximately 1,430 plants per acre, which requires an overall spacing of 5.5 feet on-center.

Table 13
Planting Plan for Seasonally Inundated Wetland Communities

Scientific Name	Common Name/Wetland indicator status	Spacing	Condition & Size
Fraxinus latifolia	Oregon ash/FACW	Intersperse the various tree species so that overall spacing on center = 14.5 ft	bare-root, 1.5'-3'
Salix lucida var. *lasiandra*	Pacific willow/FACW+		rooted cutting, 1.5'-3'
Populus balsamifera ssp. *trichocarpa*	Black cottonwood/FAC		bare-root, 1.5'-3'
Populus tremuloides	Quaking aspen/FAC+	Create small groves with 4.5 ft. on center over 2% of SI	bare-root, 1.5'-3'
Cornus sericea	Red-osier dogwood/FACW	Intersperse the various shrub species so that overall spacing on center = 6.5 ft	bare-root, 1.5'-3'
Lonicera involucrata	Black twinberry/FAC+		bare-root, 1.5'-3'
Physocarpus capitatus	Pacific ninebark/FACW-		bare-root, 1.5'-3'
Rosa pisocarpa	Clustered wild rose/FAC		bare-root, 1.5'-3'
Salix piperi	Piper's willow/FACW		bare-root, 1.5'-3'
Salix sitchensis	Sitka willow/FACW		bare-root, 1.5'-3'
Carex stipata	Sawbeak sedge/OBL	Install patches of herbaceous species where overall spacing on center = 1.5 ft over 1% of SS	plugs
Carex utriculata	Beaked sedge/OBL		plugs
Carex obnupta	Slough sedge/OBL		plugs
Eleocharis palustris	Creeping spike-rush/OBL		plugs
Juncus bolanderi	Bolander's rush/OBL		plugs
Scirpus americanus	American bulrush/OBL		plugs
Scirpus microcarpus	Small-fruited bulrush/OBL		plugs

FAC – facultative
FACW – facultative wet
OBL – obligate
SI – seasonally inundated
SS – seasonally saturated
+ = wetland slightly wetter than rating
- = wetland slightly drier than rating

Table 14
Native Seed Mix

Scientific Name	Common Name/Wetland Indicator Status	Estimated Quantity (% by weight)
Agrostis stolonifera	Creeping bentgrass/FACW	35
Alopecurus aequalis	Short-awn foxtail/OBL	2.5
Alopecurus geniculatus	Water foxtail/OBL	17.5
Danthonia intermedia	Timber oatgrass/FACU+	2.5
Festuca rubra	Red fescue/FAC	40
Hordeum brachyantherum	Meadow barley/FACW-	2.5

FACU – facultative upland
FACW – facultative wet
OBL – obligate
+ = wetland slightly wetter than rating
- = wetland slightly drier than rating

Herbaceous plants will be installed in various patches covering approximately 1 percent of the seasonally saturated communities and 1 percent of the seasonally inundated communities. The planting density for these patches will be approximately 1.5 feet on-center, which is roughly equal to 9,670 plants per acre.

Planting will be accomplished in a multi-phase approach. Year 1 of the mitigation site development will include civil construction, site grading, and installing habitat features during the dry season. Tilling and seeding will occur in areas of ground disturbance and where required for weed control after the completion of civil construction, which would be towards the end of the dry season, in late September or early October. During Year 2 of mitigation site development, approximately 50 percent of the bare root trees and shrubs would be installed during the late winter and early spring, when plants are dormant. Also during Year 2, additional seeding would occur late in the dry season in the areas between installed plants. Irrigation would occur during the summer of year 2. During the late part of year 2 or early part of year 3, water may be introduced to the newly created inlet feature, depending on the stability of the earth and vegetation. During the late winter or early spring of year 3, the remaining 50 percent of bare root plants would be installed. Irrigation would continue through the summer of year 3. Observations of the new hydrologic regime will help guide placement, species composition, and condition of the plants that will be installed during this time.

The species in the seed mix (Table 14) are native grasses tolerant of a broad range of hydrologic regimes. As discussed in Section 5.6.2, tilling will occur prior to the initial planting phase in all of the 47 acres mapped as having $\geq$20 percent reed canarygrass cover. The total seeding rate will be 50 pounds per acre, which is a relatively high seeding rate for mitigation areas.

Nurseries specializing in wetland restoration will provide the plant stock. Trees and shrubs will be derived from local sources so that they are best adapted to the on-site conditions. All cuttings will be obtained from one- to two-year old wood, will be >3/8-inch in diameter, and will be >3 feet long. The quality and quantity of plants will be verified by a URS biologist.

An installment contractor with experience in wetland rehabilitation will be responsible for plantings and seedings. Each plant community zone will be staked in the field, and placement of plants will be verified by a URS biologist. Plants will be installed during late winter or early spring when bare-root plant stock is still dormant. Seeding will be done in spring or fall to enhance the chances of establishment and survival and minimize the need for irrigation.

Each installed planting will receive a ring of imported mulch that will be at least 4 feet in diameter and 3 to 4 inches thick. However, mulch should be kept at least 1 inch away from the base of each plant to prevent pathogen and pest infestation. The mulch will be wood and bark-based with very few weed seeds. Mulch rings will help to suppress invasion by non-native plants, retain soil moisture, and contribute organic matter to the soil over time.

A minimum of water-soluble, slow-release, cold-weather tolerant fertilizer pellets will be applied to the soil pit where each tree and shrub is installed. Fertilizer pellets will be placed 3 to 4 inches below the ground surface adjacent to installed plant roots. In addition, a powder form of fertilizer will be applied to the ground surface at the base of each planting. This fertilizer will be a moderate- to rapid-release fertilizer to promote establishment and growth. Care will be taken to place the powder form of fertilizer only on the

exposed soil at the base of the plant and not on the mulch, where the high carbon:nitrogen ratio could cause much of the fertilizer to be rapidly depleted by micro-organisms.

Except for some cuttings, all installed plants will be protected from foraging mammals by plastic seedling protection tubes. In addition, plastic mesh exclusions may be constructed over patches of herbaceous plants to protect them from predation by geese, ducks, or mammals. These protections may be very important in preventing widespread mortality of newly installed plants.

5.6.6 Irrigation

All portions of the CMAs where trees and shrubs are installed will receive irrigation. Water for irrigation will be derived from tapped water sources at the BP Cherry Point property. Irrigation will supply water during the latter half of the growing season to counter seasonal drought. Irrigation will likely enhance survivability of installed trees and shrubs, but may encourage the growth of non-native, invasive plants such as reed canarygrass.

Irrigation water will be distributed by large “guns” that have a spray diameter of approximately 100 feet. The irrigation guns will be placed on carts that travel automatically at slow, consistent speeds to ensure even distribution. Temporary paths less than 10 feet wide and spaced 200 feet apart will be made for the carts to travel across the CMAs. Irrigation will continue through the second and possibly third growing seasons after planting is initiated. Irrigation equipment will be monitored and maintained by trained personnel. URS will be informed of irrigation equipment performance and will advise adjustments to the irrigation system as necessary.

The system will supplement rainfall to ensure that installed plants are provided with 0.5 inch of water per week from June or July through October, the driest portion of the year. Rainfall rates will be monitored on a weekly basis by checking data gathered by the weather station on the BP Cherry Point property.

6.0 CONSTRUCTION SPECIFICATIONS & AS-BUILT REPORT

Installation of topographic and hydrologic modifications, habitat features, plants, seeds, mulch, soil amendments, erosion control matting, and other features within the mitigation areas will be achieved by local contractors with proven experience.

Upon completion of the mitigation areas construction, an as-built report will be generated documenting the final grading, hydrologic pathways, and planting schemes. The report will include the elements recommended by Hruby and Brower (1994). The as-built report will provide a time zero baseline comparing the actual changes in site hydrology, identifying the success of invasive vegetation eradication, and the final woody and herbaceous plantings layout. The report also will include photographs of the wetlands taken from permanent reference points. The baseline information will be used for calculating the success of the performance standards in subsequent monitoring reports and assist in identifying required planting replacements, if needed.

The primary source for plant materials and fertilizer is likely to be Fourth Corner Nurseries, which is located in Bellingham. The plants that they provide are primarily derived from stock taken from lowland areas in Whatcom County.

As with the existing compensatory mitigation site, the primary contractor that will supply maintenance for the mitigation areas will likely be Berry Acres. Berry Acres is a professional landscaping company that has been providing landscape maintenance services to BP Cherry Point for several years. URS will communicate regularly with the contractors who will carry out maintenance tasks. The maintenance crew will be responsible for operating the irrigation system, controlling exotic plant populations, providing plant protection (replacing seedling protection tubes), and regularly reporting to URS ecologists who will make recommendations for adjusting the maintenance regime as necessary.

7.0 SITE PROTECTION

A restrictive covenant on the deed has been applied to the CMAs to ensure that they remain in their respective natural states in perpetuity. No development of the CMA portions of the BP Cherry Point property will be allowed for any purpose by any entity whatsoever. The restrictive covenant on deeds pertaining to the mitigation areas shall restrict all activities except those associated with maintenance of utilities and their corridors. Any clearing, grading, or filling will be prohibited except to achieve changes required to meet mitigation requirements or further improve performance of wetland functions. No deposition of materials or fills as a result of any clearing, grading, or development of any property will be allowed. The restrictive covenant will run with the land and inure to the benefit of and be binding upon BP, their successors, and assigns.

To temporarily protect the restored areas from human trespass, brightly colored rope fences will be strung on wooden stakes around the perimeter of each CMA. The fences will be intended to discourage people from disturbing the installed plants through physical harm and incidental introduction of non-native, invasive grass seed. The fences will remain in place for five years or until it is judged that the installed plants within the mitigation areas no longer require such protection. Small signs explaining the intent of the fences and the mitigation project will be erected at strategic locations along the borders of each mitigation area.

The portions of the BP Cherry Point property north of Grandview Road, which encompasses the CMAs, will continue to be open to the public. The majority of the people that access these areas are the hunters that pursue ring-neck pheasants released here during early autumn. BP will continue to allow pheasant hunting and other activities in these areas as long as they cause no harm to the CMAs.

Cattle, or any other domestic animals, will not be allowed to graze in any of the mitigation areas. The grazing contract for the area overlapping with CMA1 has been revoked or modified to prevent cattle from grazing within 100 feet of this area.

Regular security checks by the existing security contractor will discourage vandalism in the CMAs, although it is not expected to be a problem.

8.0 MONITORING PLAN

The purpose of monitoring and maintenance is to ensure that mitigation plan goals are met. Construction of the power plant and the MSC project will be monitored to ensure that wetland impacts are avoided and minimized according to plan. The CMAs will be monitored over a 10-year period to ensure that these areas function as designed.

Monitoring of the proposed compensatory mitigation will be guided by the conditions contained in this plan including pre-established performance standards. A 10-year monitoring plan will be implemented to assess the degree to which objectives and performance standards (Section 4.3) are being met. Monitoring will be conducted by a URS biologist immediately following the initial planting, and during years 1, 2, 3, 5, 7, and 10.

Maintenance will be guided by maintenance actions required by this plan (Section 9) and any recommended contingencies made following implementation of the plan. The majority of maintenance activity will be directed toward removing non-native plants that resprout after initial suppression. However, other maintenance actions tending to the proposed hydrologic modifications and the installed plants may be necessary. Contingency measures will be recommended and subsequently implemented if site conditions fail to attain expectations. Expectations of site performance are elucidated by the performance standards (Section 4.3).

8.1 CONSTRUCTION MONITORING

A URS scientist will monitor construction operations at CMA1 and CMA2 regularly during the time of construction. The scientist will monitor operations to ensure that impacts occur only in areas where they have been designated to occur. Vegetation clearing and fill placement will be monitored regularly.

Contingencies will be made if the extent of impacts is greater than expected. All unexpected impacts will be compensated by enhancements of equal or greater value to the compensatory mitigation. Monitoring results will be compiled in a construction monitoring report. The report will be sent to the Corps, Ecology, and the Energy Facility Site Evaluation Council (EFSEC). Any discrepancies between expected and actual impacts will be mentioned in the report. In addition, contingencies used to compensate for these unexpected impacts will be mentioned.

8.2 COMPENSATORY MITIGATION MONITORING

Monitoring will determine whether site conditions are meeting performance standards and are likely to continue meeting performance standards throughout the monitoring period.

8.2.1 Wetland Hydrology

Monitoring will assess the hydrologic regime of the CMAs. This monitoring effort will determine whether a wetland hydrologic regime is occurring and will generally characterize the hydrologic regime of both uplands and wetlands in the CMAs. Pre-construction monitoring results will be compared to post-construction results to determine the magnitude of the hydrologic changes. During 2007, three monitoring

wells were installed in CMA1, and 11 were installed in CMA2. Details of the installation, as well as the first year of monitoring, are in Appendix E. Wells will consist of a screened (perforated) pipe installed to the depth of the fine-grained substrate that forms an aquitard and sealed at the soil surface with bentonite and/or grout.

Depth to soil saturation and free water surface within the wells will be measured during the early part of the growing season, which is the time when soil saturation will most likely be present within wetlands in western Whatcom County.

Observations of standing surface water and groundwater levels also will be made in the CMAs, both before and after the hydrologic modifications are made. In addition to well monitoring, groundwater observations will be made by excavating temporary unlined boreholes with a soil corer to depths not more than 18 inches. The holes created by a soil corer are typically less than 3 inches in diameter and thus have very little impact on the site. Boreholes will be excavated across various portions of the mitigation areas that lack standing water during the time of investigation. Depth to soil saturation and free water surface will be measured within each borehole. These observations will be made during the early and middle portions of the growing season.

8.2.2 Hydrologic Modifications

Hydrologic modifications, including the diversion of detention pond runoff from the plant site to CMA2 and the various ditch plugs to be installed across both CMAs, will be monitored for proper operation. These modifications will be inspected at least once every winter or spring while surface water is flowing through the inlet channel and once during the vegetation monitoring event of each monitoring year. Inspectors will determine the structural integrity and stability of channels, pipes, energy dissipaters, and other structures used for the proposed modifications.

Surface water flow and evidence of surface water flow will be observed to determine whether the actual altered hydrologic regime approximates the design. Any unexpected and harmful erosion or flooding will be recorded and appropriate contingencies to reduce and repair damage will be recommended. Monitoring of the modified hydrologic regime will be especially careful and frequent during the first two years after installation. Results of this monitoring, combined with rainfall data analysis, will help guide the location and species composition of any new plants to be placed in areas where the hydrologic regime has been altered.

8.2.3 Vegetation

URS will locate plots along transects that span the width of each CMA. Transect locations will be dispersed across the sites using a stratified random approach to prevent biased plot placement. Both transect and plot locations will be recorded by a GPS unit with sub-meter accuracy. The GPS unit also will be used to determine the planned plant community (upland, seasonally saturated wetland, or seasonally inundated wetland) and the pre-mitigation cover by reed canarygrass (<20 percent, 20-95 percent, or >95 percent) for each plot.

Each transect will be oriented longitudinally (north-south) and randomly situated within 100-meter wide (328-foot wide) bands. Each band will be spaced 10 meters apart. Transects will be broken into 100-meter

long (328-foot-long) segments, which also will be spaced 10 meters apart. Sample plot centers will be selected randomly along each segment during each sampling event (Figure 15).

Plots will consist of an inner circle with a 2-meter (6.56-foot) radius encompassed by an outer circle with an 8-meter (26.24-foot) radius. Cover of herbaceous vegetation will be gauged within the inner circle, and cover of installed woody vegetation will be assessed within the outer circle.

Vegetative survival and cover will be visually estimated by experienced URS ecologists. Woody vegetation success will be gauged by percent survival during the first five years and by percent cover during the remaining five years of mitigation monitoring. Herbaceous vegetation will be measured by percent cover throughout the entire monitoring period. Cover of volunteer plants (vegetation not planted or seeded during any planting events) will be measured for both herbaceous and woody species found within the plots. Cover of trees and shrubs, herbaceous plants, and each plant species will be recorded for each plot. Plant cover will be assessed using a geometric cover classification system with the following categories: 0-2 percent, 2-4 percent, 4-8 percent, 8-16 percent, 16-32 percent, 32-64 percent, >64 percent. This system facilitates precise assessment of plant cover in the lower ranges, which is especially important for monitoring the spread of recently established vegetation.

As recommended by Krebs (1999), at least 1 percent of the total area to be monitored will be sampled directly. Since each plot will cover approximately 2,162 square feet (0.05 acre), at least 60 plots will be used to sample the CMAs.

Since invasion by non-native, invasive plants will likely be aggressive, monitoring the cover of non-native, invasive species will be persistent and intensive. In addition to monitoring by plot method, URS ecologists will observe and record the distribution and abundance of non-native, invasive plants each spring and summer in every year of the 10-year monitoring period. Eradication of non-native species will be maintained in all mitigation areas, including uplands and buffer areas.

Those portions of the CMAs that currently have greater than 20 percent cover by reed canarygrass will have a performance standard of <20 percent. Portions of the CMAs that currently have less than 20 percent cover by reed canarygrass will have a performance standard of <10 percent. As recommended by Krebs (1999), at least 1 percent of the total area to be monitored will be sampled directly.

Areas with levels of non-native, invasive plants that appear to be approaching or exceeding performance thresholds will be marked in the field so that the maintenance crew can more accurately target their treatment practices. These unacceptable patches will be mapped by URS ecologists with a GPS unit with sub-meter accuracy. Results of this monitoring will guide recommendations given by URS to maintain cover by non-native, invasive plants below thresholds set by the performance standards.

Although predation of installed plants has not been a problem at the existing mitigation site, URS ecologists will document any evidence of predation that may occur within the mitigation areas. URS will observe the condition of seedling protection tubes and any other protections provided to installed plants. The effectiveness of these protections will be monitored. URS will ensure that seedling protection tubes or any other protections provided to installed plants will be in working condition.

8.2.4 Photographs

Photographs taken from several permanent photo-points will be used to aid the monitoring effort. Several panoramic photographs showing a maximum amount of each CMA will be included. Each permanent photo-point will have its respective Universal Transverse-Mercator point as recorded by GPS and a detailed narrative description referencing its location relative to existing landmarks. Photos from the permanent photo-points will be taken during each vegetation monitoring event in years 0, 1, 2, 3, 5, 7, and 10 of the monitoring period. For year 0, photographs will be taken prior to and during initial mitigation activity. Other photographs may be taken during spring to better document each site's flow regime during the wet season. The photos and their respective narrative descriptions will be provided in each monitoring report.

9.0 MAINTENANCE AND CONTINGENCY PLAN

As mentioned earlier, the primary sub-contractor that will supply maintenance crews will likely be Berry Acres, a crew of landscape professionals with experience in native plant installment and exotic plant control. Sub-contractors will report regularly to URS ecologists, who will make recommendations for adjusting the maintenance regime as necessary.

The CMAs will be rehabilitated under an adaptive management strategy. This strategy will entail responding to monitoring results to appropriately and efficiently maintain or improve site conditions.

If monitoring results demonstrate that site conditions fail to meet performance standards, contingencies will be implemented. For instance, if one of the non-native, invasive species attains cover values that exceed their acceptable thresholds, a more aggressive approach to weed control will be taken. Such an approach may include more frequent applications of herbicide, more frequent hand-removal, and/or more frequent mowing. These actions may be complemented with additional plantings and/or seedings in problem areas.

If a performance standard is not met for any given year, URS will analyze the cause of failure, propose corrective actions, and present a time frame for implementing these actions. A letter report will be sent to the Corps and Ecology for their approval before implementing the corrective actions.

Even if all performance standards are met, corrective actions may still be implemented if monitoring reveals problems that could lead to poor performance or future problems. For instance, if a breach in the inlet channel is causing erosive flows to be directed through a part of CMA2, the breach will be repaired to restore sheet flow and the eroded area mended with seed mix, mulch, and/or new plantings, as necessary. Descriptions of such problems and corrective actions taken to solve them will be included in the monitoring reports.

The timing of maintenance/contingency measures will be based on the stage of plant growth when the measures will be most effective. The timing will be affected by weather patterns that affect the growing season and plant growth. If conditions and circumstances require maintenance/contingency activities to occur more than five days out of 30 between February 15 and July 31 (the WDFW-recommended period to protect against disturbing heron nesting and rearing activities), then Whatcom County Planning and Development Services will be notified, and appropriate monitoring and protective measures will be agreed upon before the maintenance activity proceeds.

Example problems expected during the maintenance period and the corrective actions that will likely be taken to solve them are as follows:

1. **Wetland hydrology.** If wetland hydrology (free water to within 12 inches of soil surface over 22 contiguous days) is not maintained in the existing wetlands within the CMAs, further topographic or hydrologic modifications will be made to ensure that these objectives are met. Topographic modifications may include re-grading portions of the site to effectively raise the groundwater in these areas. Hydrologic modifications may include adjusting the adjustable weirs to be installed so that more surface flow could enter an area that is not meeting the minimum requirements of wetland hydrology.

2. **Flow dispersal.** If flow is not evenly distributed along the shallow swale of CMA2, then the log weirs within the channel will be adjusted to maximize flow distribution. If flow is evenly distributed within the swale, but is not adequately dispersed across the main portion of CMA2, then URS will recommend grading appropriate to maximize flow dispersal. Any grading that occurs after the initial planting will be accomplished during the dry season and with a small grader or shovels to avoid damaging native plants. To prevent erosion, grading would occur during the dry season and the native seed mix would be applied to areas that have been disturbed.

3. **Invasion by non-native, invasive plants.** Weed control maintenance will occur frequently and aggressively to combat invasions before cover by non-native, invasive plants approach or exceed performance thresholds. As discussed earlier, distribution and abundance of weeds will be monitored every year of the 10-year monitoring period by URS. Those parts of the CMAs that currently have greater than 20 percent cover by reed canarygrass will have a performance standard of <20 percent. Portions of the CMAs that currently have less than 20 percent cover by reed canarygrass will have a performance standard of <10 percent. Monitoring results will guide recommendations given by URS to maintain cover by non-native, invasive plants below the above thresholds. Although removal of non-native, invasive plants is expected to occur throughout the 10-year period, the intensity of the maintenance effort should decrease over time. Following any monitoring year when standards are not being met, additional control and replacement measures will be added to maintenance activities. More information about the weed control program is in Section 5.6.2.

4. **Mortality of installed vegetation.** The multi-phase approach to planting described in Section 5.6.5 also follows an adaptive management strategy. URS ecologists will closely observe the various limitations to plant growth that may be present or may develop during the first few years after the initial planting. These observations will effectively guide placement, species composition, and condition of the plants that will be installed during this time. Special attention will be paid to site conditions in those parts of the mitigation areas affected by the proposed topographic and hydrologic modifications. If, during the monitoring period, the woody species survival or areal cover percentage or the herbaceous community percent cover falls below the established performance standard, additional plantings will be used to bring survival and / or percent cover up to stated goals.

If predation on installed plants by wildlife becomes a substantial source of plant mortality (i.e., the performance standards are not met as a result), corrective action will be taken. If predation is generally restricted to those seedlings that have lost their protection tubes, URS will recommend that these plants be replaced with protection tubes fitted so that they are less likely to fall off. Tubes that have not fallen off their respective plants but appear unstable will be stabilized. BP will budget funds as required to pay for planning, implementing, and monitoring any contingency procedures that may be required to achieve the mitigation goals. The budget will equal approximately 20 percent of the total cost of the proposed mitigation, which is estimated to be $1.75 million. Thus, the total value of the maintenance and contingency budget will be $350,000. The parent company guarantee, as described in Section 11, will be in the total amount that it is estimated that the compensatory mitigation will cost, and thus will be sufficient to ensure that funds necessary for maintenance and to repair problems will be available.

5. **Reporting.** Results of the monitoring will be compiled in monitoring reports that will be delivered to the Corps, EFSEC, and Ecology by October of years 1, 2, 3, 5, 7, and 10 for each monitoring period. Reports will state monitoring methods, show monitoring results including photographs, compare these results with performance standards, and discuss the site conditions observed. The current year's results will be compared with the performance standards and results from previous years. If monitoring results are below performance standards, maintenance and contingency recommendations necessary to improve success will be made.

Regular maintenance activity and any contingency actions made during the year will be reported. The effectiveness of these actions will be gauged during site monitoring. The effectiveness of these actions will be evaluated in the reports.

Record drawings showing topography, hydrologic modifications, and plant communities of the CMAs will be drafted after the initial mitigation activity, including the initial planting, is complete. These drawings will be submitted to the Corps, EFSEC, and Ecology within 60 days of initial planting of each mitigation area.

10.0 IMPLEMENTATION SCHEDULE

10.1 CONSTRUCTION SCHEDULE

The starting time for constructing the MSC and Cogeneration Projects and installing their associated mitigation depends on when the revised permits are issued. Mitigation activities conducted in 2007 (weed control and partial ditch filling) were conducted under existing permits. Although the chronological order and seasonal timing of mitigation actions will occur as discussed below, exact dates for these actions cannot yet be determined, given the uncertainty regarding the timing of permit issuance. Earthwork is expected to be conducted during the dry months of late summer and early fall, and therefore within the WDFW-recommended construction window for protection of heron nesting colonies (July 31 to February 15). Initial planting also is expected to be completed within this window. However, if conditions or circumstances require work outside that window, then Whatcom County Planning and Development Services will be notified and appropriate monitoring and protective measures will be agreed upon before the

planting proceeds. The dates provided below assume that project construction for the MSC project will begin in early 2008 and the Cogeneration Project and the associated mitigation will begin in 2009.

The intent (conditional on permits) is to continue implementation of the revised mitigation plan in 2008 and proceed to completion. In the CMAs, activities of the weed control program that do not entail mechanized clearing of wetlands and therefore do not require the above-mentioned permits may begin a few months prior to the construction start date. Such activities, including mowing and herbicide application, will begin in spring 2008. Tilling would be anticipated to occur in spring and early autumn 2008. Non-native, invasive plant removal would continue through the growing season of 2009. Removal would continue as maintenance for short-term control throughout the monitoring period.

The proposed topographic and hydrologic modifications will be implemented and habitat features would be installed in summer 2008 (possibly extending into 2009 if permits are delayed). The initial phase of planting in the CMAs would be implemented in winter/spring of 2009 (or adjusted to accommodate the earthwork schedule if that is delayed). The initial phase of herbaceous plugs would be installed in late spring 2009 (again, depending on completion of earthwork). The remaining plants would be installed during the same season the following year (2010). Runoff from the cogeneration detention pond would not be diverted to CMA2 until at least 2010, which would allow the initial-phase plants to have established to some degree.

10.2 MONITORING SCHEDULE

As discussed earlier, some form of monitoring will occur during every year of the 10-year monitoring period. Formal monitoring of wetland hydrology and vegetation will occur in years 1, 2, 3, 5, 7, and 10.

Wetland hydrology will be observed throughout the monitoring period. Formal monitoring will include measurements of free water surface elevations in the monitoring wells to be installed in the mitigation areas. These measurements will be taken on a weekly basis for at least four weeks from the second or third week of March on or after March 12 to the second or third week of April during years 1, 2, 3, 5, 7, and 10. Extrapolations between weekly measurements will determine whether soil saturation in the wetland areas meets the wetland hydrology criterion.

Native, non-native, invasive, and volunteer vegetation will be observed throughout the monitoring period. Formal monitoring will include estimates of cover using circular plots. These estimates will be made during the early part of summer to ensure that flowering plants will be readily identifiable and data collected will not be skewed by seasonal variation. Vegetation monitoring would likely occur between June 1 and July 30 of years 1, 2, 3, 5, 7, and 10.

10.3 REPORTING SCHEDULE

As stated in Section 10, monitoring results will be reported to the Corps, EFSEC, Ecology, and Whatcom County by October of years 1, 2, 3, 5, 7, and 10 for each monitoring period.

11.0 PARENT COMPANY GUARANTEE

BP Corporation North America Inc, parent company to BP West Coast Products LLC, will provide a written corporate guarantee to the Corps to ensure that funds are available to construct or complete the construction of, and for monitoring and maintenance of, the compensatory wetland mitigation associated with the BP Cherry Point Cogeneration Project. A parent company guarantee becomes a financial obligation of the parent company to provide funds for a commitment should the subsidiary company fail to fulfill the commitment. The Parent Company Guarantee will be used instead of a performance bond to ensure BP's accountability for the proposed mitigation. The Parent Company Guarantee will be issued in favor of the Corps, to whom the commitment for wetland mitigation has been made.

BP will provide the Parent Company Guarantee to the Corps 60 days prior to beginning site preparation activities. The amount of the guarantee will equal the estimated dollar amount that the compensatory mitigation will cost. The preliminary cost estimate of the proposed mitigation, and therefore the proposed amount of the guarantee, is $2.3 million.

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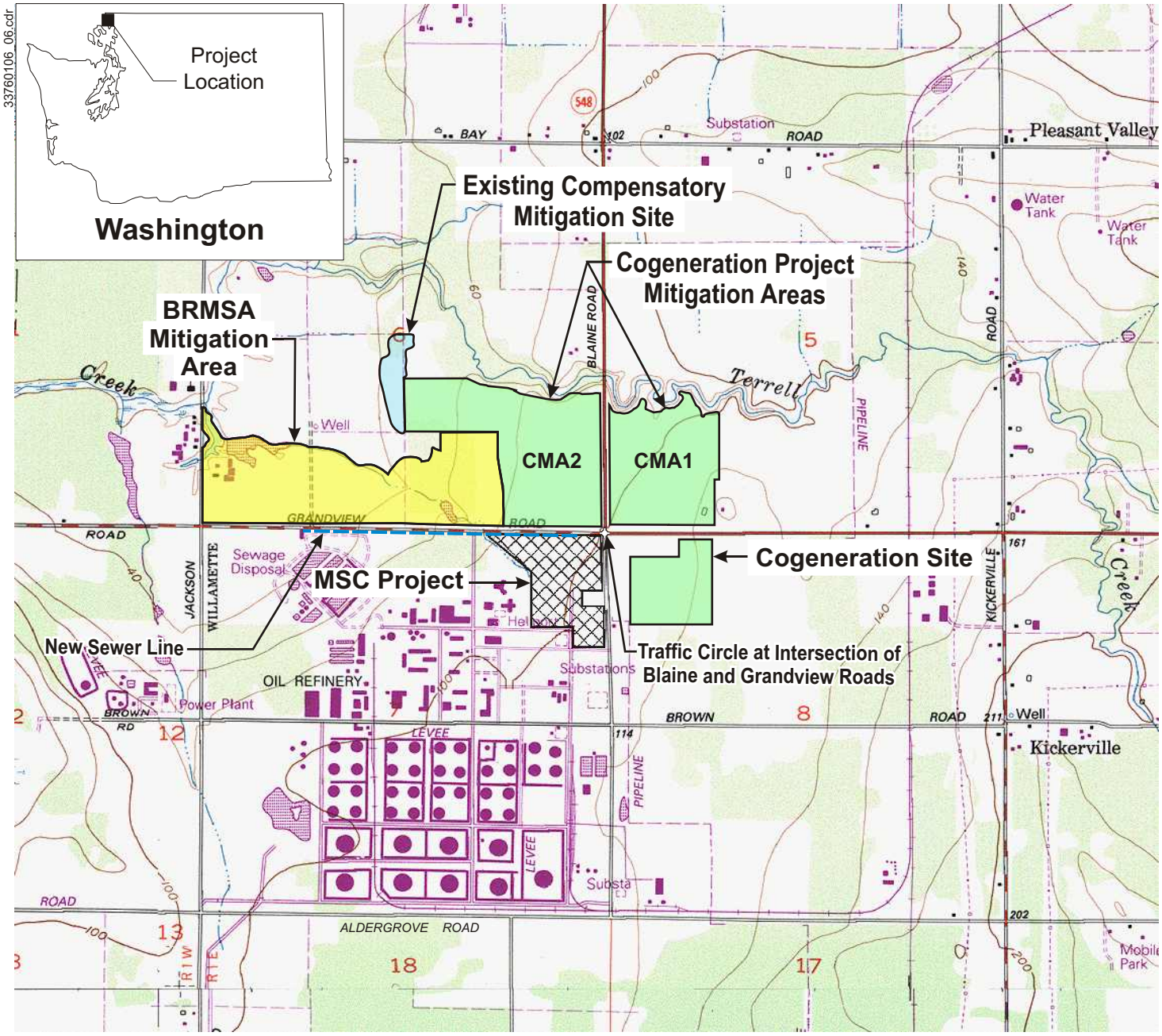
FIGURES



Map created with TOPO!™ © 1997 Wildflower Productions, www.topo.com, based on USGS topographic map

0 0.5 1.0

Scale in Miles

Job No. 33760106

Figure 1

Site Vicinity

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point
January 15, 2008

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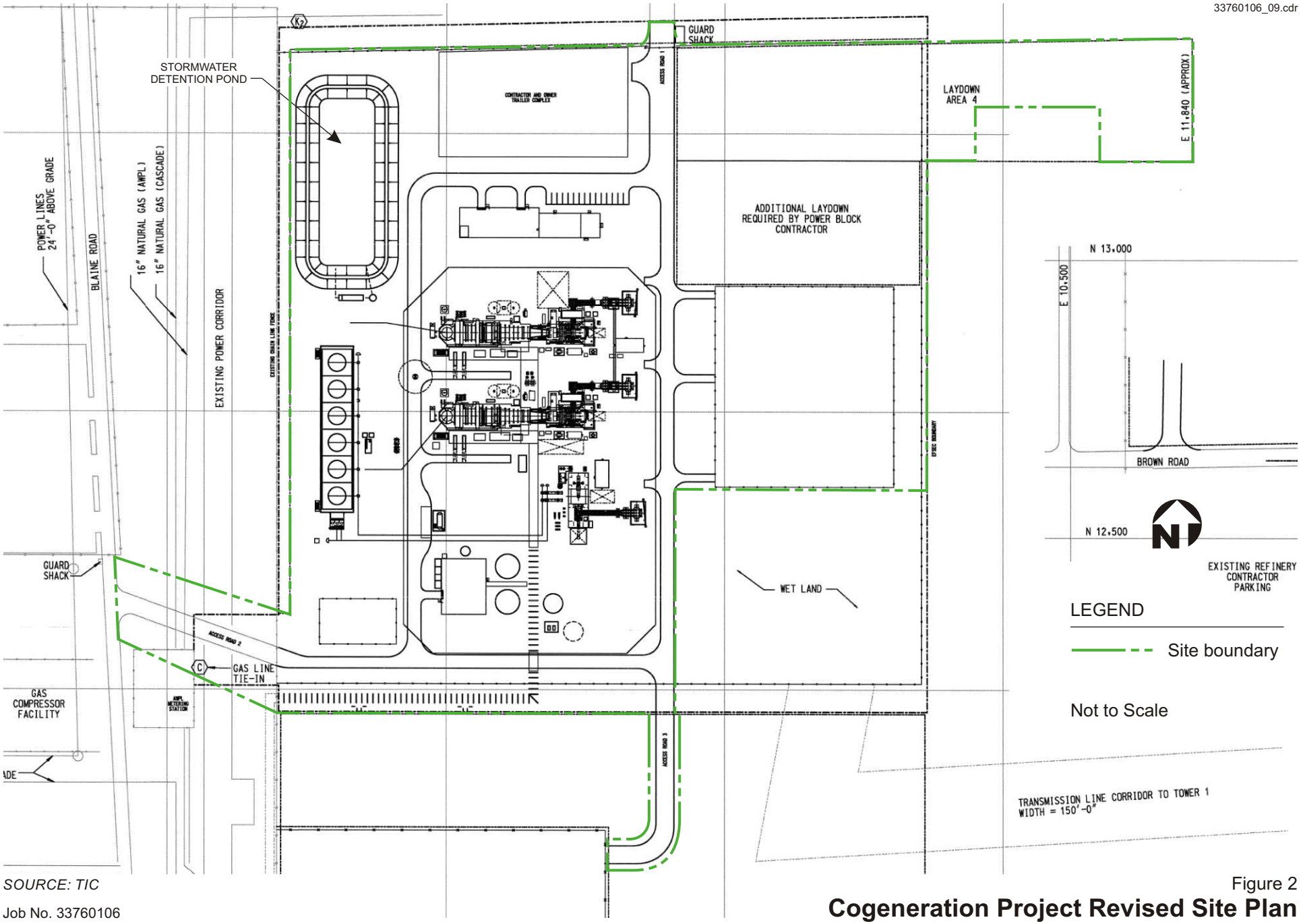

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Figure 2

Cogeneration Project Revised Site Plan

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point
January 15, 2008

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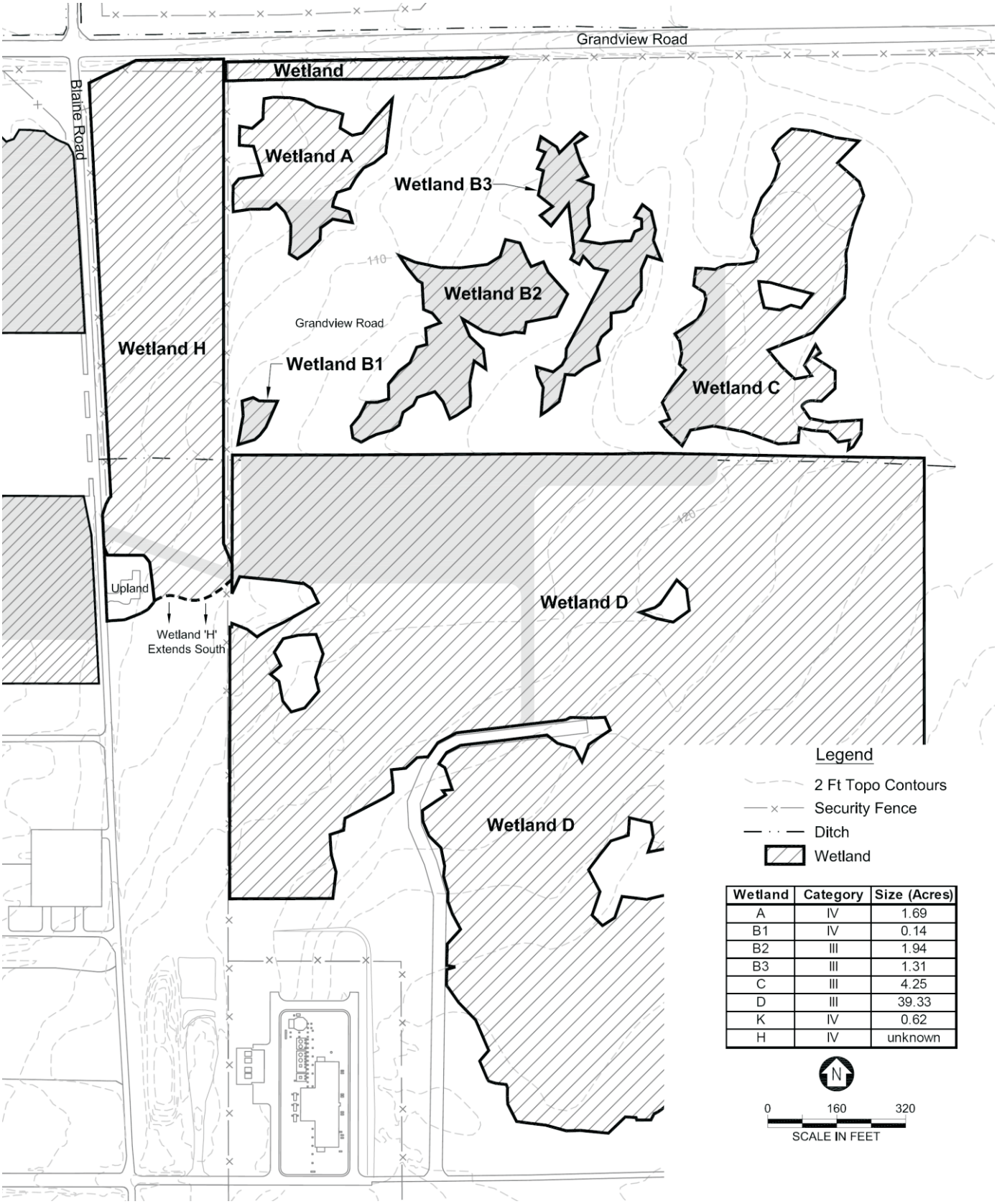

Wetland	Category	Size (Acres)
A	IV	1.69
B1	IV	0.14
B2	III	1.94
B3	III	1.31
C	III	4.25
D	III	39.33
K	IV	0.62
H	IV	unknown

Figure 3

Cogeneration Facility Wetlands – Existing Conditions

Job No. 33760106

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point
January 15, 2008

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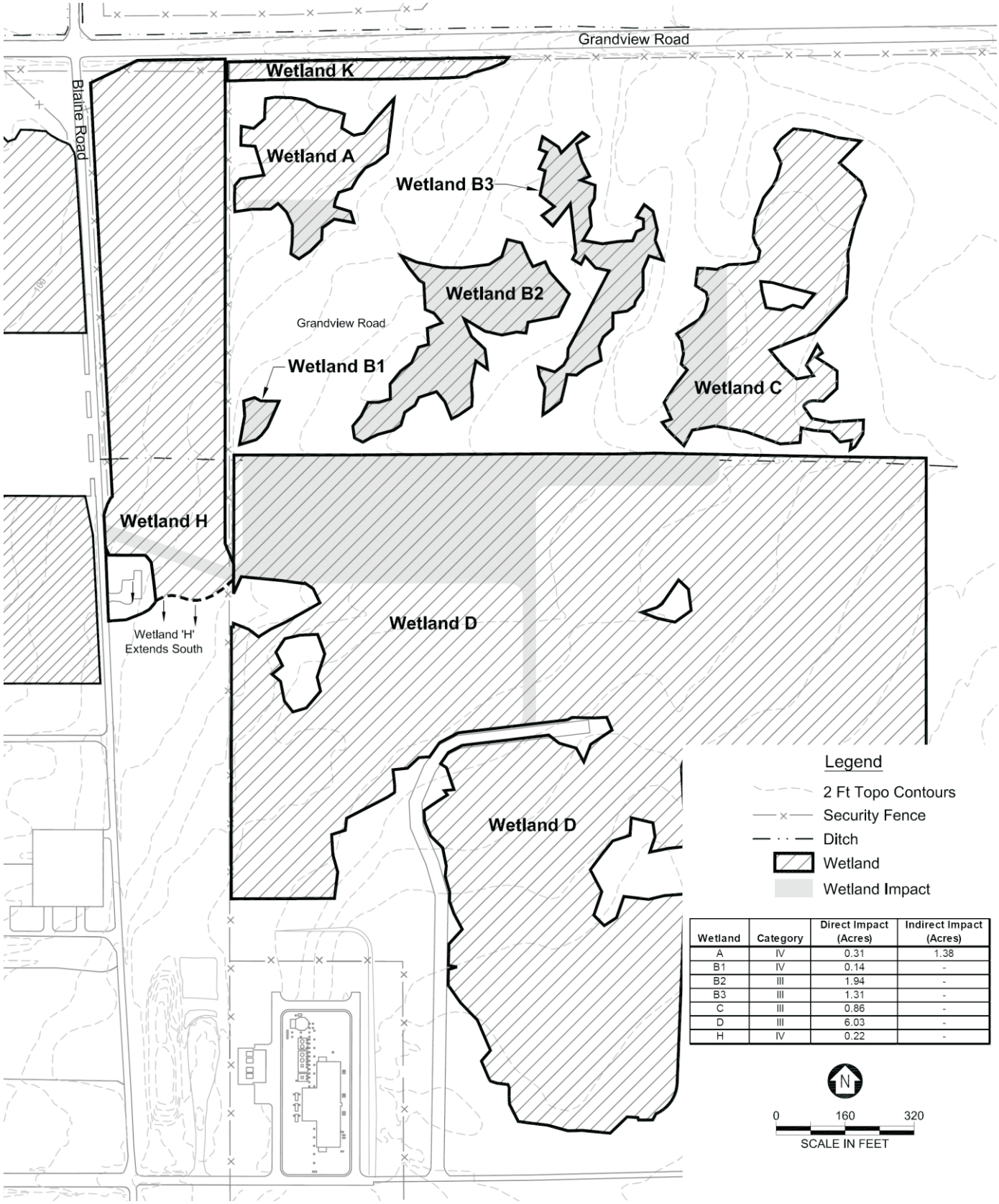

Wetland	Category	Direct Impact (Acres)	Indirect Impact (Acres)
A	IV	0.31	1.38
B1	IV	0.14	-
B2	III	1.94	-
B3	III	1.31	-
C	III	0.86	-
D	III	6.03	-
H	IV	0.22	-

Figure 4

Cogeneration Facility Wetland Impacts

Job No. 33760106

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point
January 15, 2008

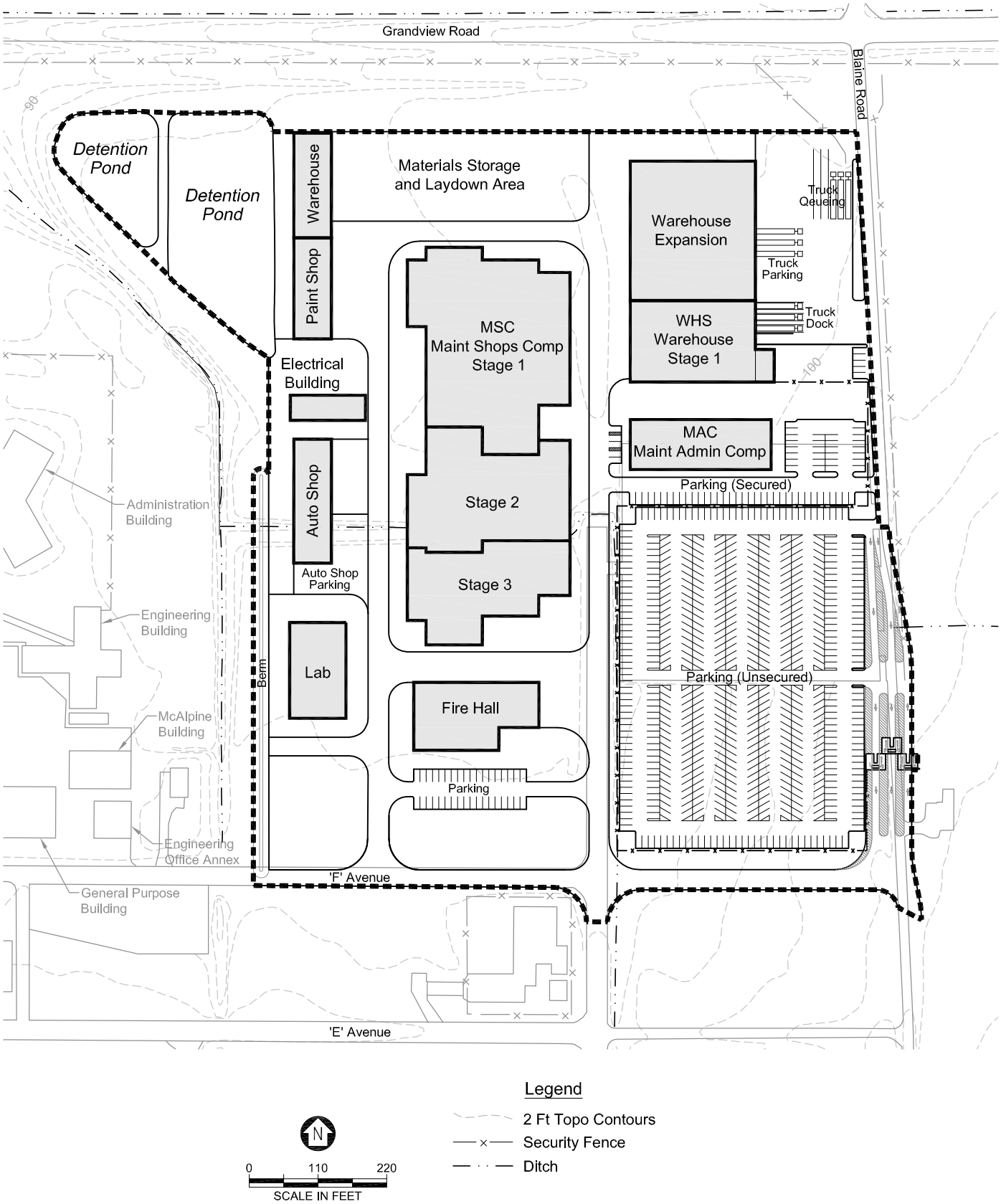

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Figure 5
MSC Site Development Plan

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point Refinery
January 15, 2008

Legend

- 2 Ft Topo Contours
- Security Fence
- Ditch
- Wetland

N

0 110 220

SCALE IN FEET

Wetland	Category	Size (Acres)
F	III	13.72
G	IV	4.27
I	III	0.15
J	IV	4.39

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URS

Figure 6

MSC Project Wetlands Existing Conditions

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point Refinery
January 15, 2008

Legend

- 2 Ft Topo Contours
- Security Fence
- Ditch
- Wetland
- Wetland Imapct

N

0 110 220

SCALE IN FEET

Wetland	Category	Direct Impact (Acres)	Indirect Impact (Acres)
F	III	12.39	1.33
G	IV	3.26	1.01
I	III	0.13	0.02
J	IV	4.16	0.23
H	IV	0.08	0

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Figure 7

MSC Wetland Impacts

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point Refinery
January 15, 2008

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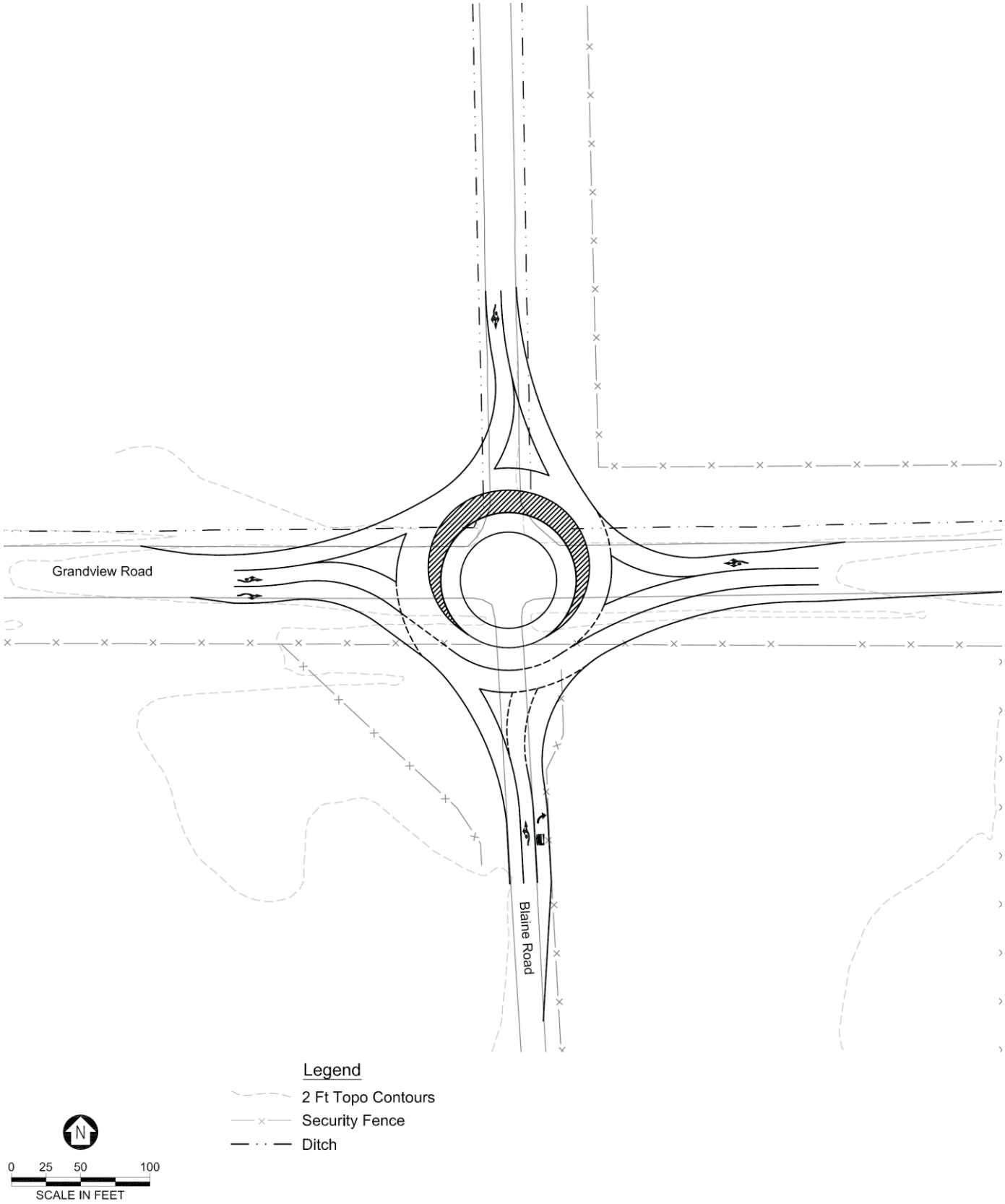

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Figure 8
Traffic Circle Site Development Plan

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point
January 15, 2008

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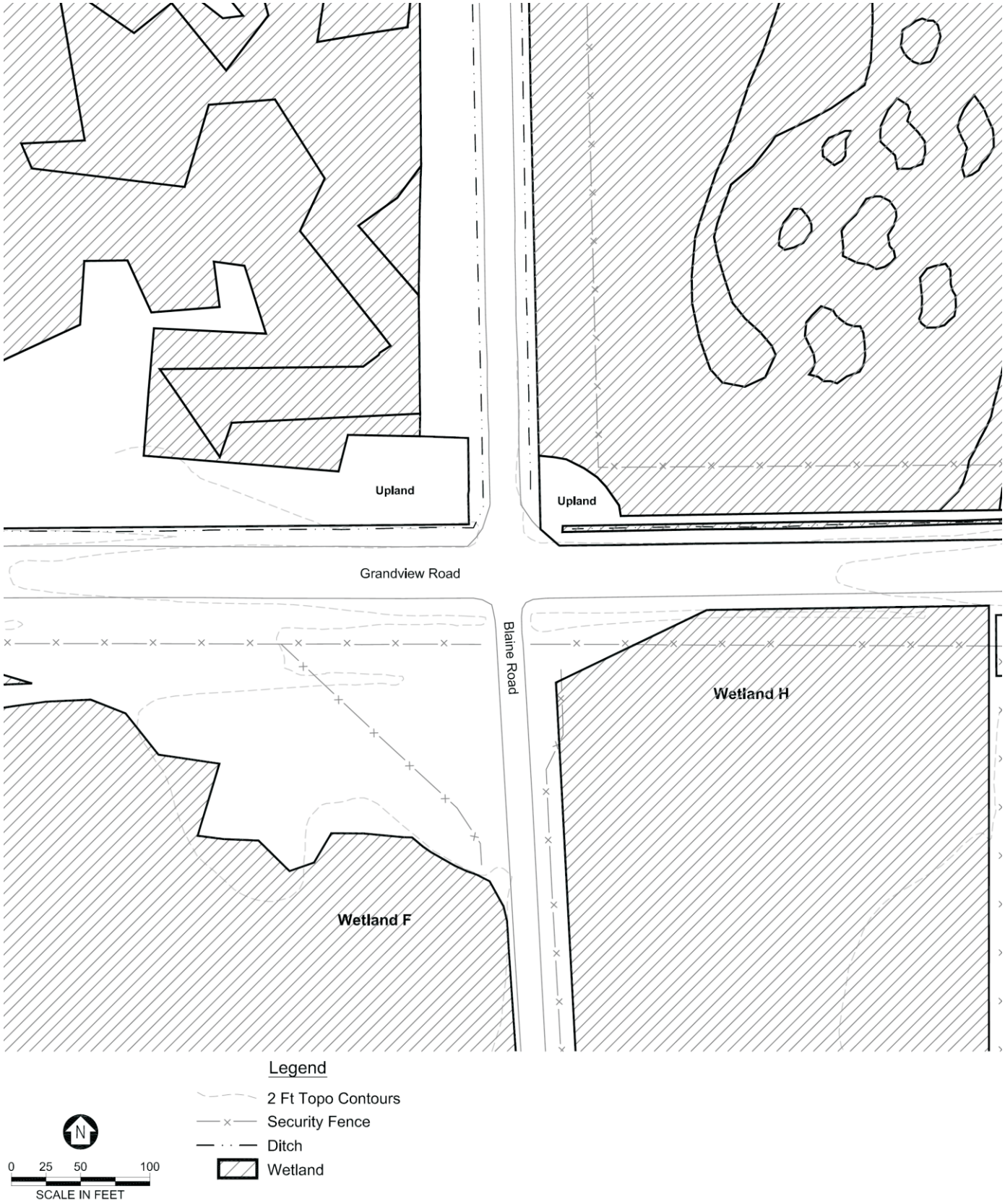

Job No. 33760106

Figure 9
Traffic Circle Existing Conditions

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point
January 15, 2008

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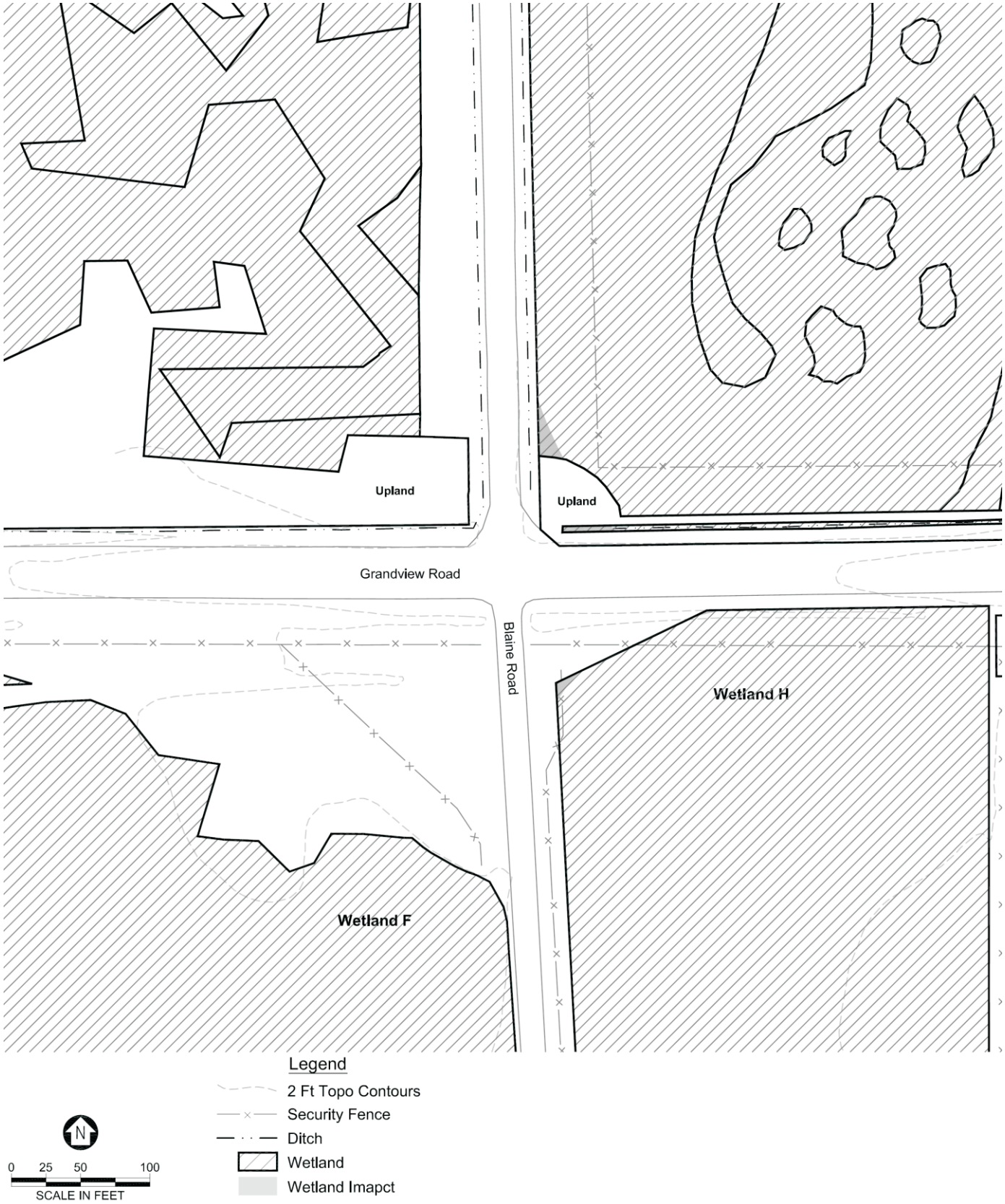
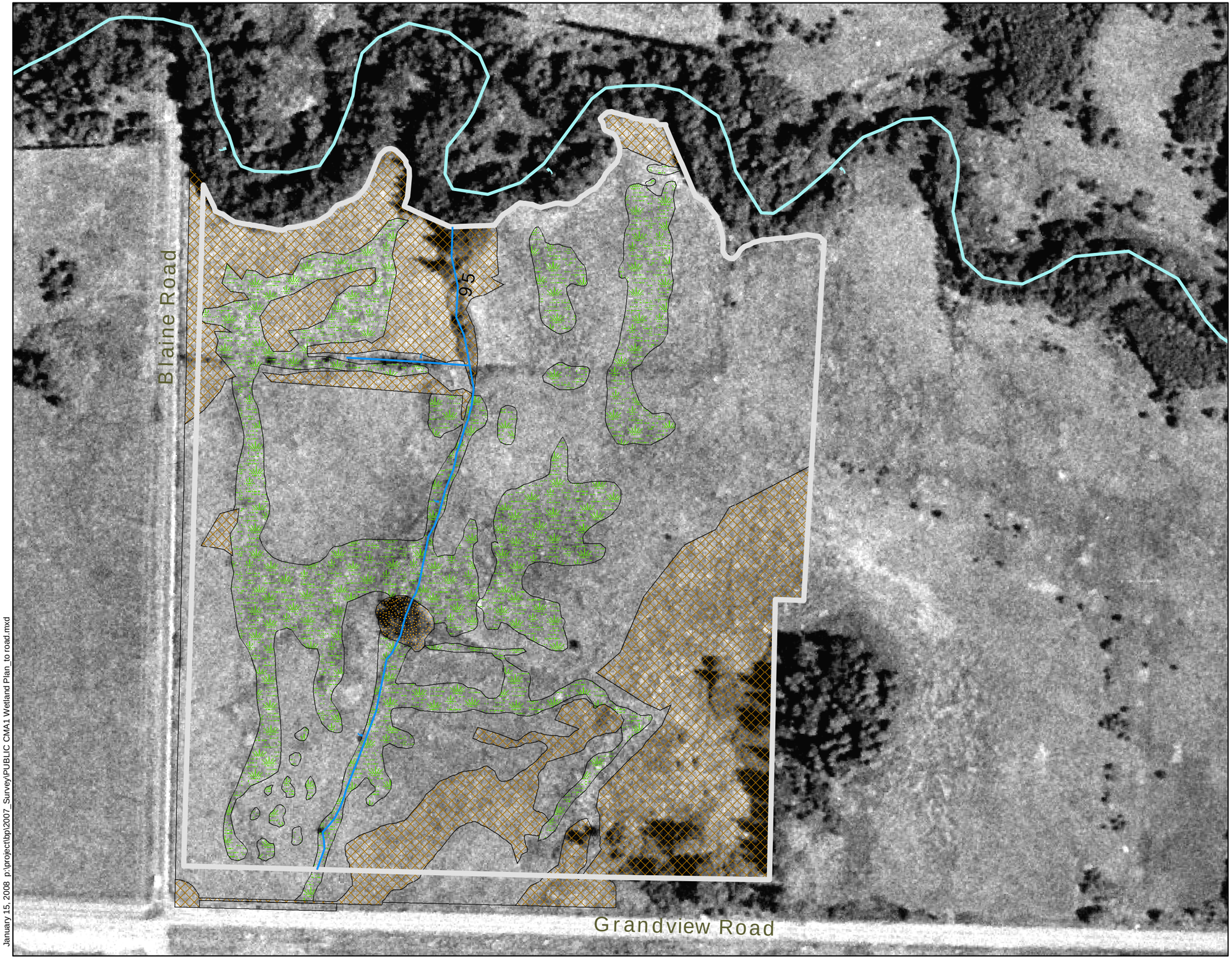


Job No. 33760106

Figure 10
Traffic Circle Wetland Impacts

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point
January 15, 2008



CMA1

Legend

- Ditch
- Terrell Creek
- Mitigation Area Boundary
- Upland
- PFOC Wetland Community
- PEMA Wetland Community
- PEMC Wetland Community

0 225 450
Feet

1 inch equals 225 feet

Figure 11A
CMA1 Existing Conditions
Revised Final Cogeneration/Facilities
Project Compensatory Mitigation Plan
BP Cherry Point Refinery
January 15, 2007

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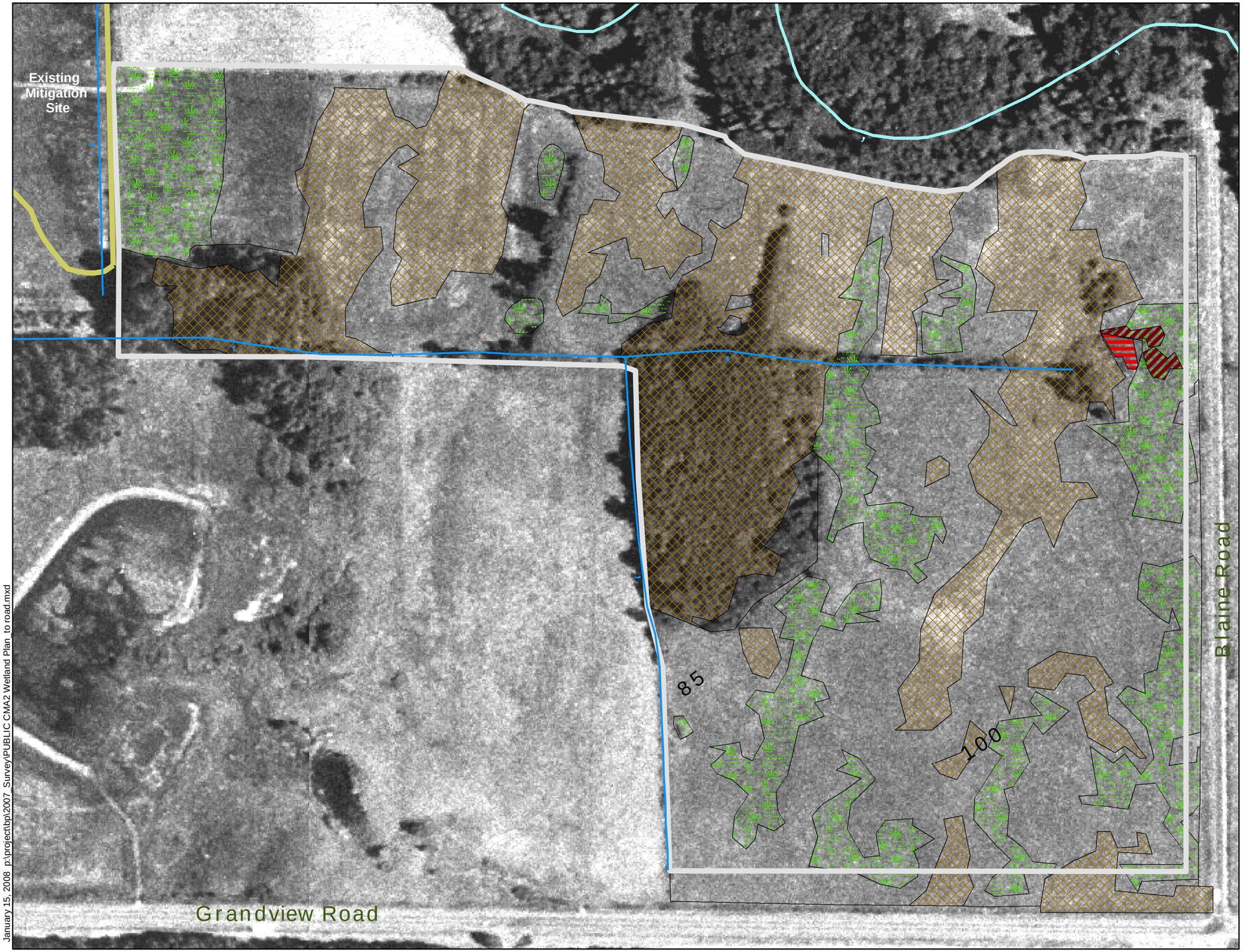

CMA2

Legend

- Ditch
- Terrell Creek
- Mitigation Area Boundary
- Upland
- PFOC Wetland Community
- PEMA Wetland Community
- PEMC Wetland Community
- PSSA Wetland Community
- PSSC Wetland Community

0 225 450
Feet

1 inch equals 225 feet

Figure 11B
CMA2 Existing Conditions

Revised Final Cogeneration/Facilities
Project Compensatory Mitigation Plan
BP Cherry Point Refinery
January 15, 2008

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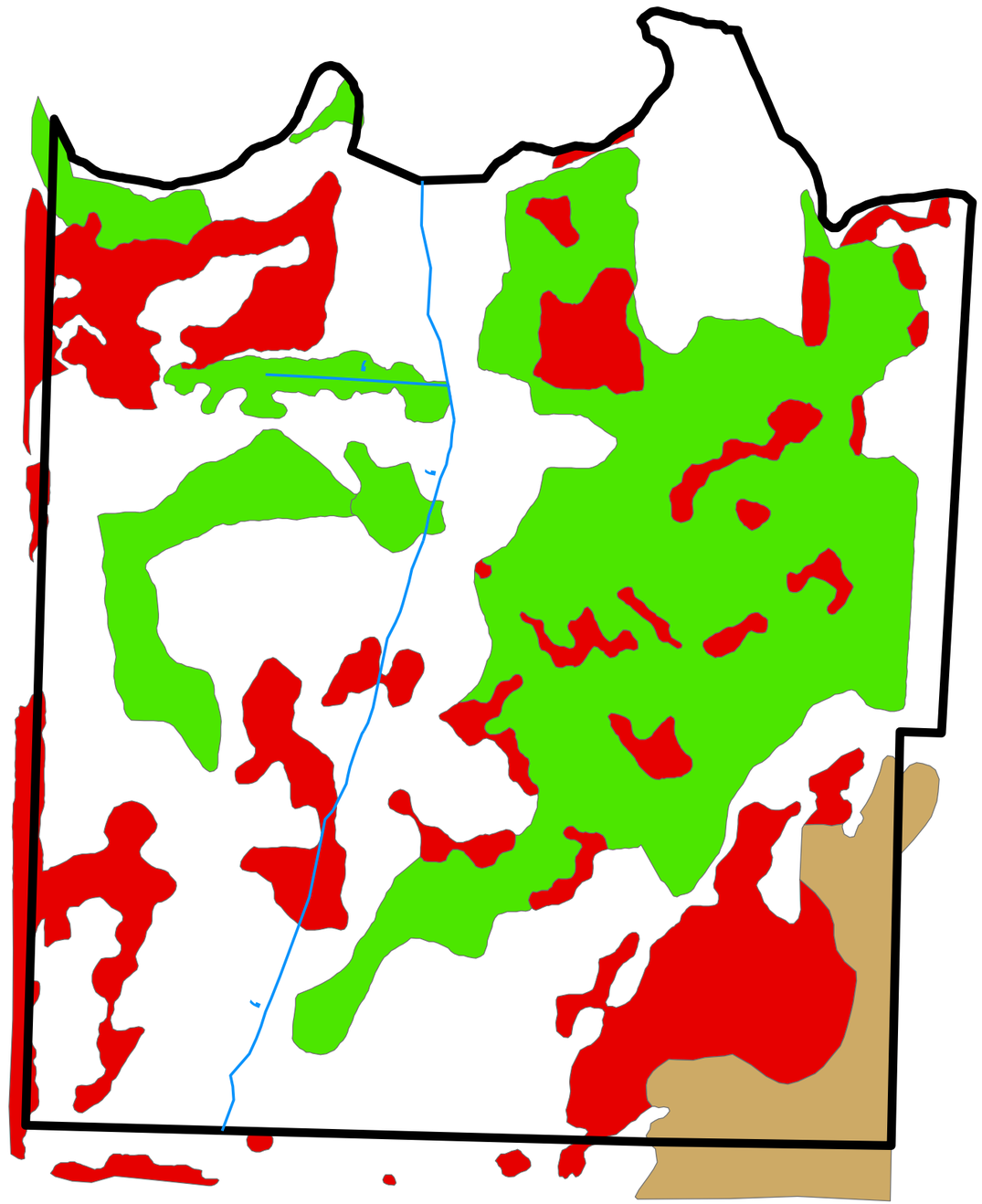

CMA1

Legend

Ditch

Mitigation Area Boundary

Reed Canarygrass Cover Categories

< 20%

20-95%

> 95%

Himalayan Blackberry

>75%

0 225 450

Feet

1 inch equals 225 feet

Figure 12A

CMA1 Reed Canarygrass and Himalayan Blackberry Cover Distribution

Revised Final Cogeneration/Facilities Project Compensatory Mitigation Plan
BP Cherry Point Refinery
January 15, 2008

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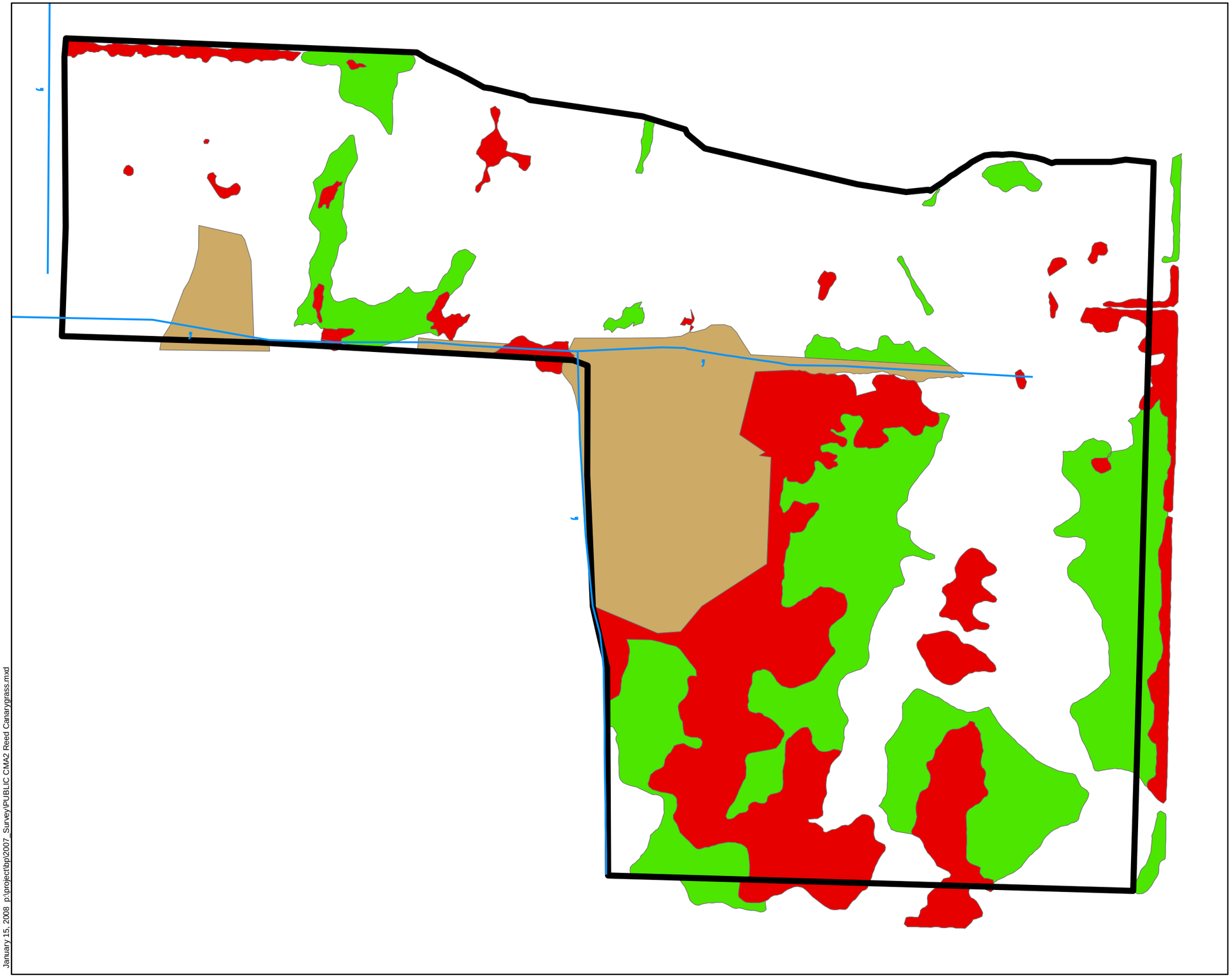

Figure 12B
CMA2 Reed Canarygrass and Himalayan Blackberry Cover Distribution

Revised Final Cogeneration/Facilities Project Compensatory Mitigation Plan
BP Cherry Point Refinery
January 15, 2008

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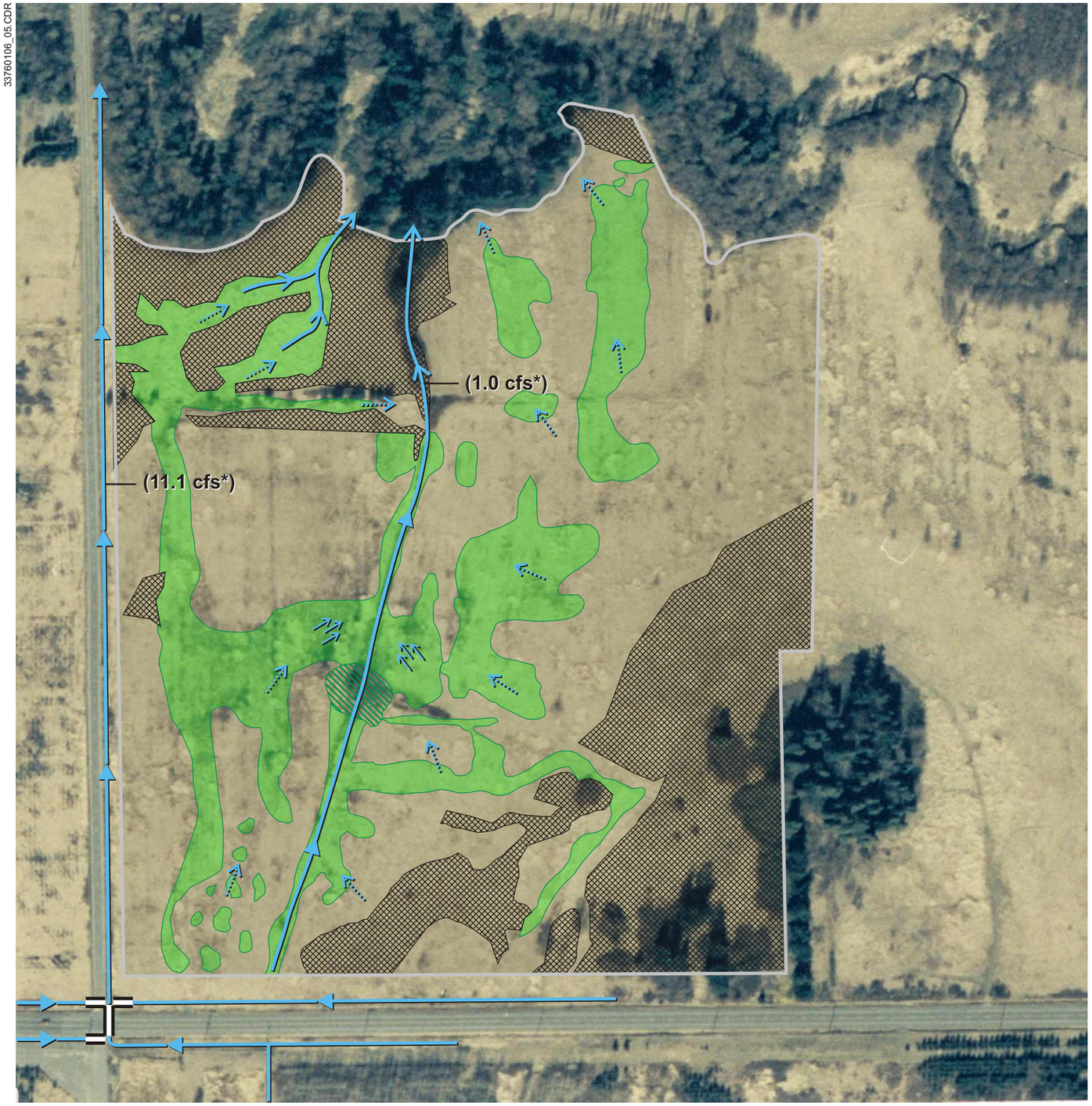

LEGEND

- CMA2 site boundary
- Upland
- PFOC wetland community
- PEMA wetland community
- PEMC wetland community
- Direction of interflow (shallow groundwater flow)
- Direction of semi-concentrated flow that becomes pooled
- Direction of concentrated and semi-concentrated flow in natural channels and swales
- Direction of concentrated flow in ditches
- Direction of sheet flow
- Culvert

N

0 250 500

Approximate Scale in Feet

* Estimated peak flow during a 6-month, 24-hour storm event. Estimates for the channel outlet spillways based on design calculations for the proposed detention ponds for the Cherry Point Cogeneration Project. All other estimates based on this estimate and various site observations.

Job No. 33760106

Figure 13A

Existing Surface & Subsurface (Interflow) Hydrologic Pathways In and Downslope of CMA1

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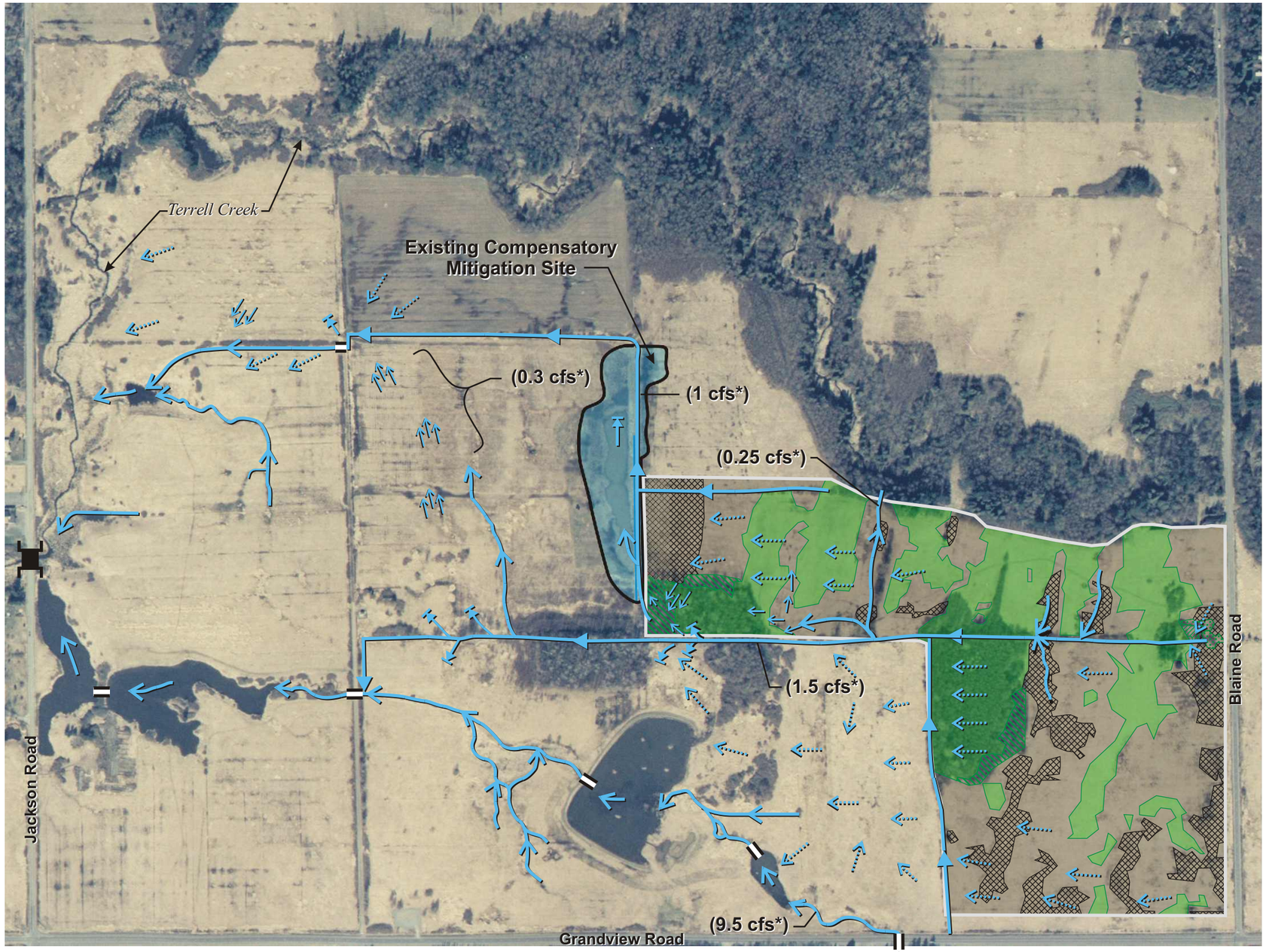

Connects to the stormwater collection system in the BP Cherry Point Refinery

LEGEND

- CMA2 site boundary
- Upland
- PFOC wetland community
- PEMA wetland community
- PEMC wetland community
- PSSA wetland community
- PSSC wetland community
- Direction of interflow (shallow groundwater flow)
- Direction of semi-concentrated flow that becomes pooled
- Direction of concentrated and semi-concentrated flow in natural channels and swales
- Direction of concentrated flow in ditches
- Direction of sheet flow
- Culvert
- Bridge

* Estimated peak flow during a 6-month, 24-hour storm event. These estimates are based on runoff calculations using the SCS method and observations made during various site visits.

N

0 500 1,000

Approximate Scale in Feet

Figure 13B

Existing Surface and Subsurface (Interflow) Hydrologic Pathways In and Downslope of CMA2

Job No. 33760106

URS

Revised Final Cogeneration/Facilities Projects Mitigation Plan
BP Cherry Point
January 15, 2008

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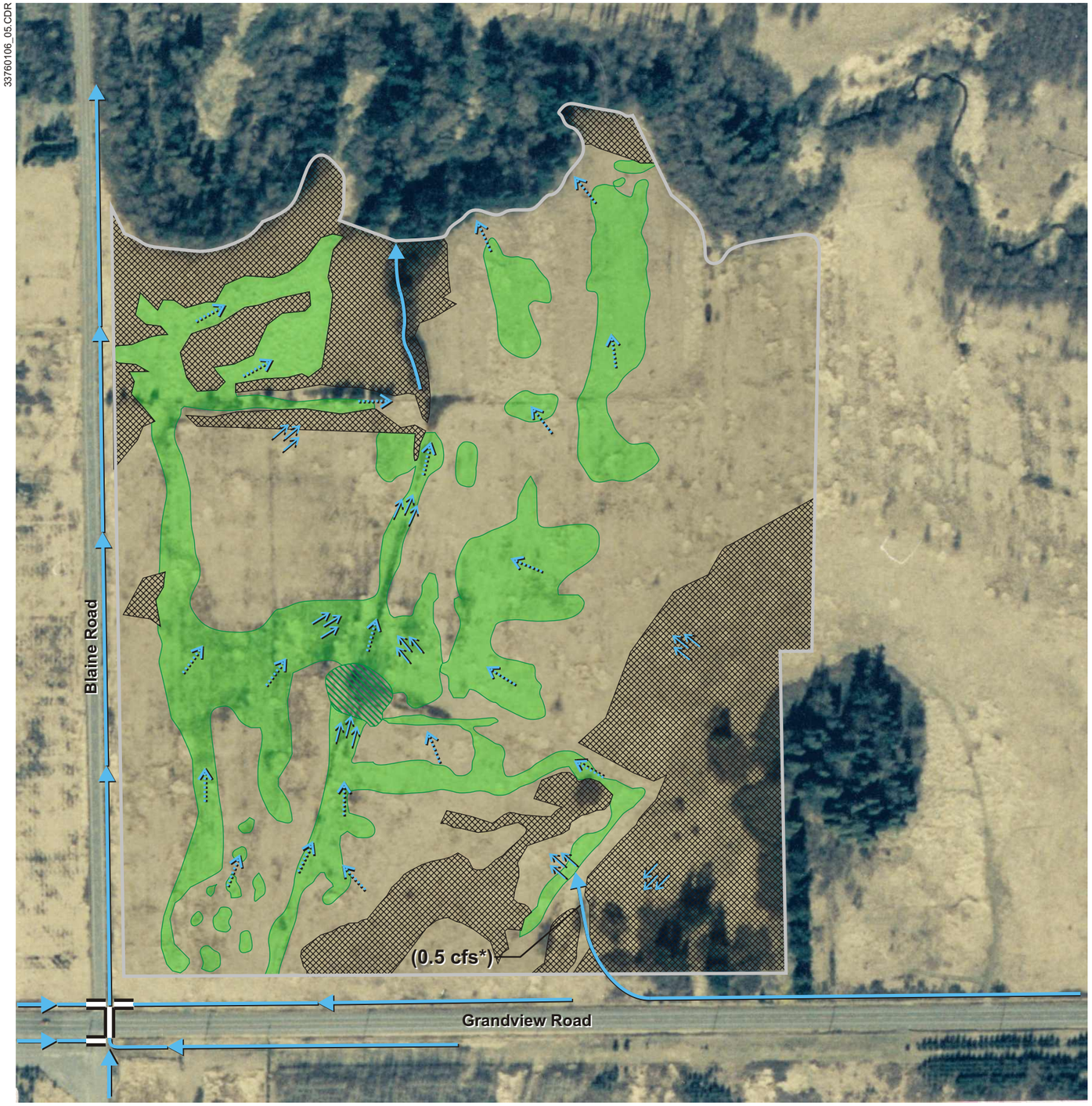


LEGEND

- CMA2 site boundary
- Upland
- PFOC wetland community
- PEMA wetland community
- PEMC wetland community
- Direction of interflow (shallow groundwater flow)
- Direction of semi-concentrated flow that becomes pooled
- Direction of concentrated and semi-concentrated flow in natural channels and swales
- Direction of concentrated flow in ditches
- Direction of sheet flow
- Culvert

N

0 250 500

Approximate Scale in Feet

* Estimated peak flow during a 6-month, 24-hour, storm event

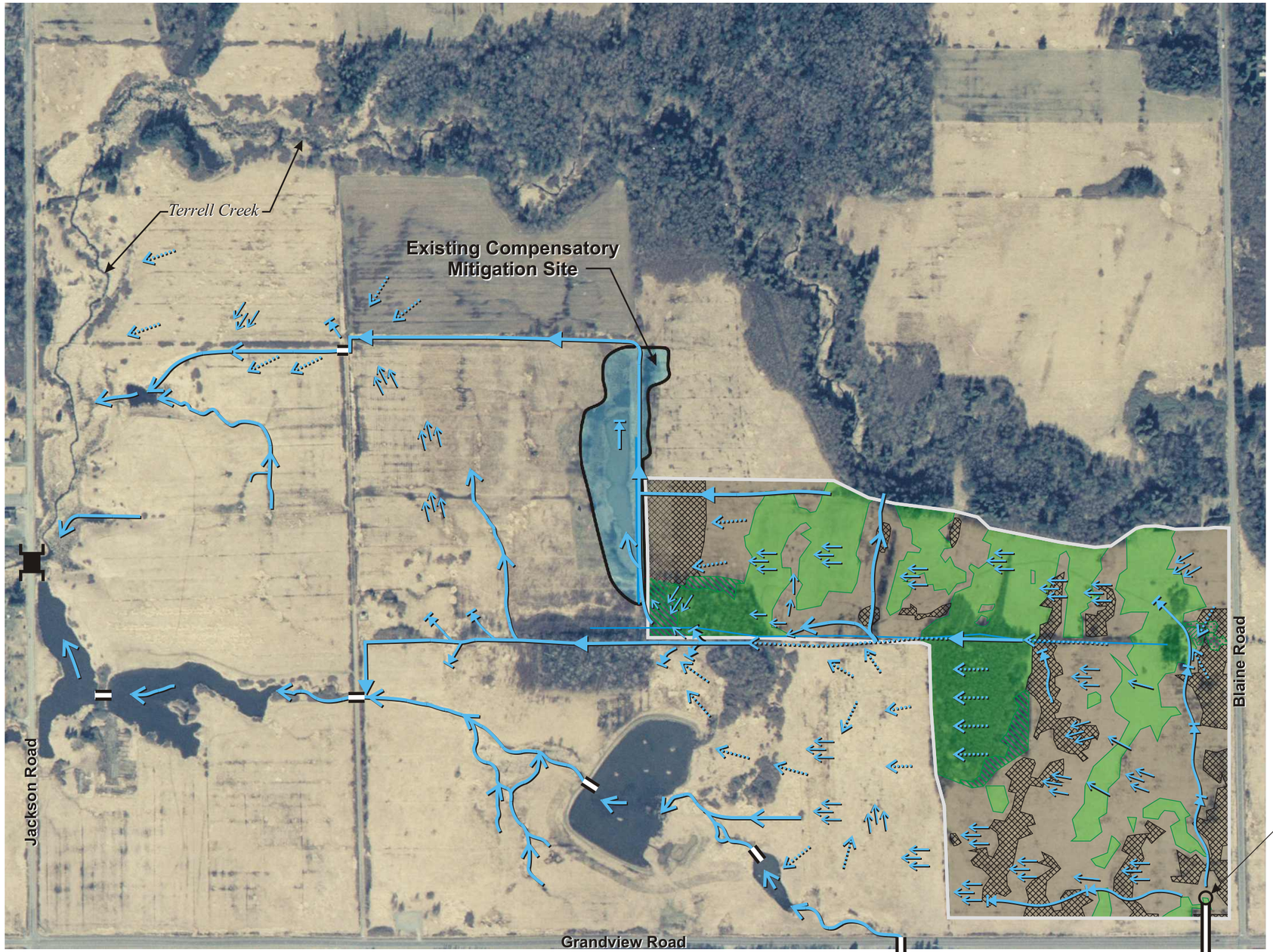
Job No. 33760106

Figure 14A

Post-Mitigation Surface and Subsurface (Interflow) Hydrologic Pathways In and Downslope of CMA1

URS

33760106_04.CDR



LEGEND

- CMA2 site boundary
- Upland
- PFOC wetland community
- PEMA wetland community
- PEMC wetland community
- PSSA wetland community
- PSSC wetland community
- Direction of interflow (shallow groundwater flow)
- Direction of semi-concentrated flow that becomes pooled
- Direction of concentrated and semi-concentrated flow in natural channels and swales
- Direction of concentrated flow in ditches
- Direction of sheet flow
- Culvert
- Bridge

Peak Discharge
1-Year = 1.56 cfs
100-Year = 13.19 cfs

0 500 1,000
Approximate Scale in Feet

36" RCP Culvert connects to the stormwater collection ditch in the BP Cherry Point Refinery that receives discharges from the proposed MSC Detention Pond

20" Inverted Siphon discharges outflow from the controlled outlet of the proposed COGEN Detention Pond by direct pipeline connection.

COGEN

Figure 14B

Post-Mitigation Surface and Subsurface (Interflow) Hydrologic Pathways In and Downslope of CMA2

Job No. 33760106

URS

33760106_12.CDR

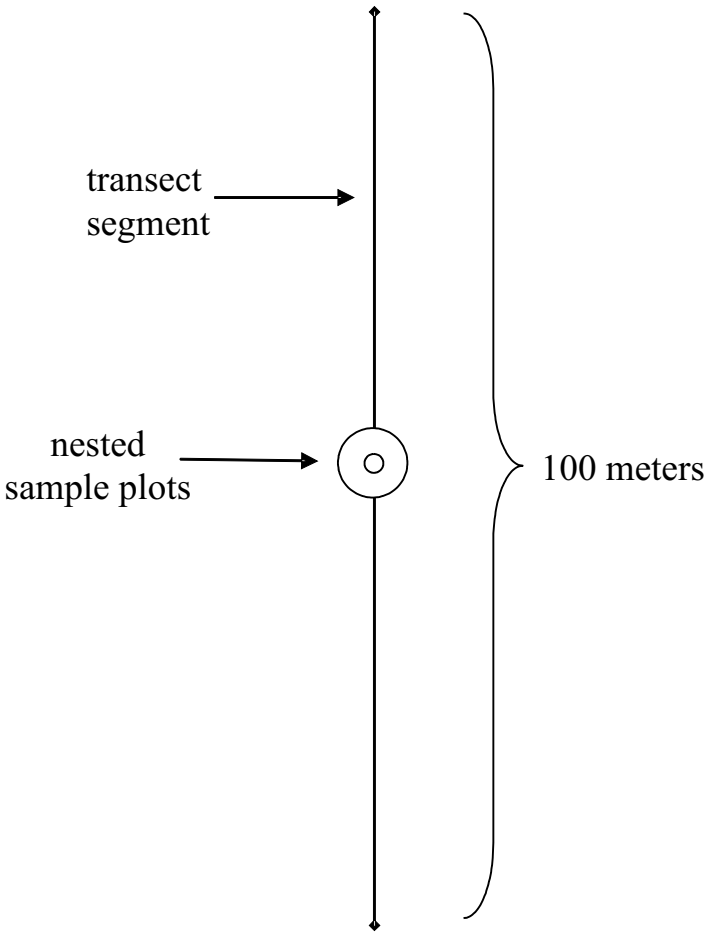


Figure 15

Transect Segment With Randomly Selected, Nested Sample Plots

Job No. 33760106

URS

APPENDIX A

COGENERATION AND MSC PROJECT SITE WETLAND RATING FIELD DATA FORMS

Wetland name or number A

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Wetland A Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes Y No___ Date of training 18-19 Apr 06

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ___ Estimated size 1.69 acres

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	7
Score for Hydrologic Functions	8
Score for Habitat Functions	14
TOTAL score for Functions	29

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply Y

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number A

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number A

A

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
X The wetland is on a slope (*slope can be very gradual*),
___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
___The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number A

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number A

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 0
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	7

flow spots not drain to ditch (

receives no input from refinery or nearby roads

Wetland name or number A

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	*(see p.46)*
D	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 = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

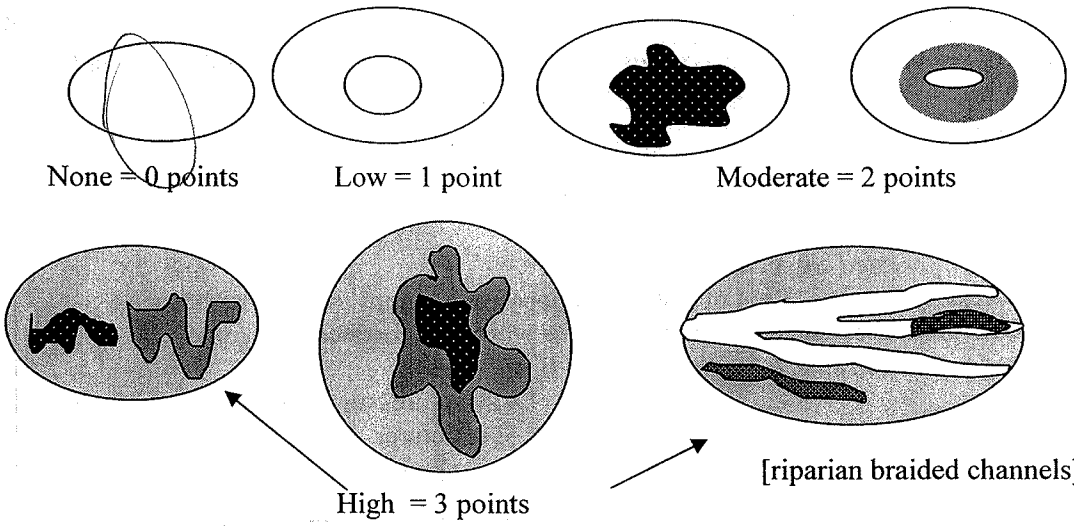
see D11

Wetland name or number A

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed ____Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) X Forested (areas where trees have >30% cover) canopy ground cover (emergent) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** ∅
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 ____Seasonally flooded or inundated — 3 types present — points = 2 X Occasionally flooded or inundated — 2 types present — point = 1 X Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland*** **= 2 points** ____ ***Freshwater tidal wetland*** **= 2 points** Map of hydroperiods	**Figure ___** 1
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 < 5 species — points = 0 *List species below if you want to:* thistle aspen buttercup agrostis fescue RCG blackberry unknown herb (dead annual) other grasses soft rush quackgrass	1

Total for page 2

Wetland name or number A

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ Ø
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 (>4in. diameter and 6 ft long). ____ 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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____ At least ¼ 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)* ____ 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.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3

Comments

Wetland name or number A

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** X 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 4
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 6

Wetland name or number A

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number A

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	14

Wetland name or number A

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number A

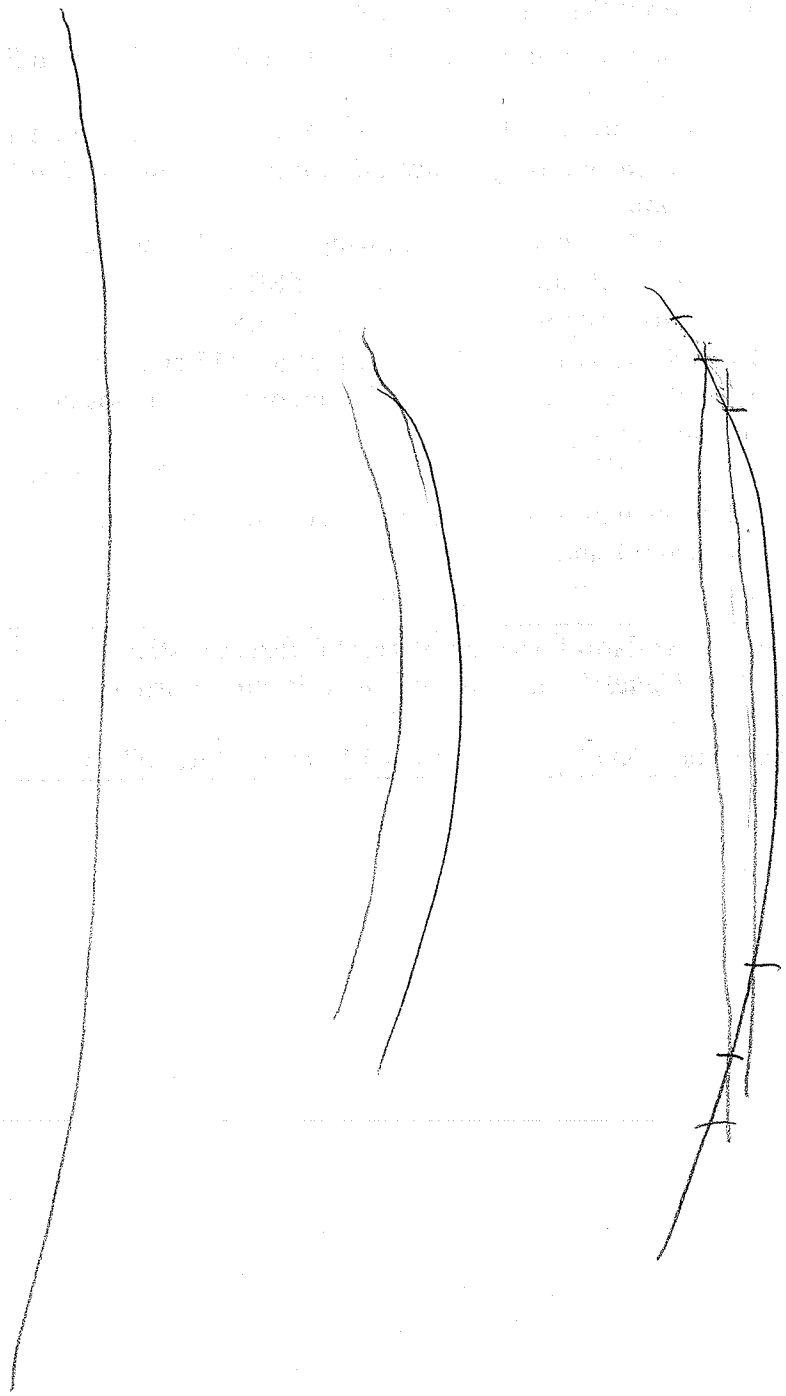
SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being 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 3.2 (NO ___) SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 (No - go to Q. 2) 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number A

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number A

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	



Wetland name or number B1

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): B1 Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size 0.14

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	7
Score for Hydrologic Functions	6
Score for Habitat Functions	16
TOTAL score for Functions	29

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number B1

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number B1

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO - go to 5 **YES** – The wetland class is **Slope**

Wetland name or number B1

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number B1

D	**Depressional and Flats Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	0
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ Ø
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other ___ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	7

no upstream inputs

Wetland name or number B1

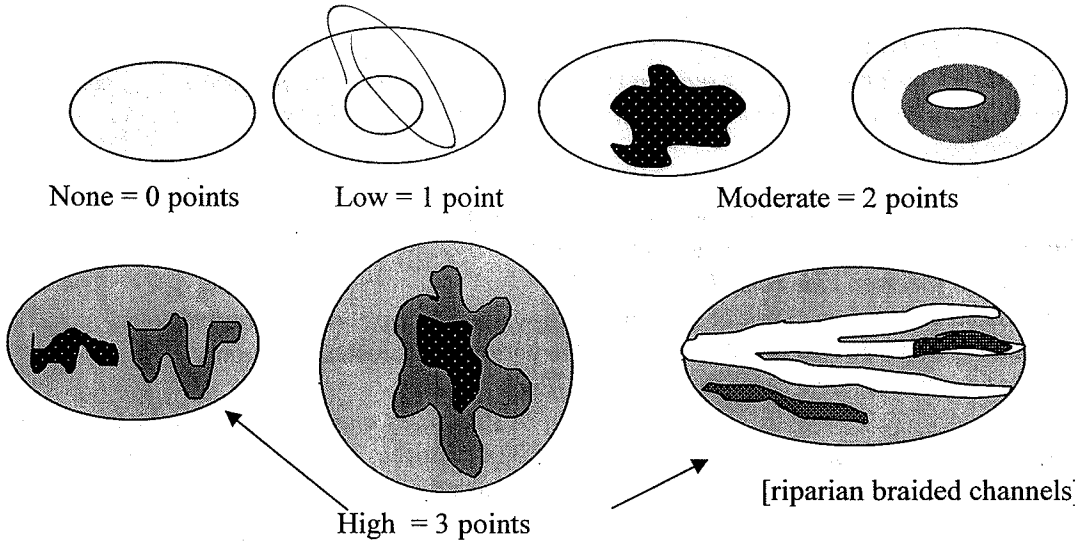
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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
D	**Total for D 3** *Add the points in the boxes above*	6
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	6

Wetland name or number B1

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____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:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 ____Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland*** **= 2 points** ____***Freshwater tidal wetland*** **= 2 points** Map of hydroperiods	**Figure ___** 1
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 < 5 species — points = 0 *List species below if you want to:* thistle Elytrigia cottonwood RCG soft rush tapertip rush velvet grass 2 agrostis blackberry	1

Total for page 3

Wetland name or number B1

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	1
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number B1

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number B1

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	0

Wetland name or number B1

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number B1

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number B1

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number B1

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number B1

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number B2

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Wetland B2 Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size 1.94

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	7
Score for Hydrologic Functions	8
Score for Habitat Functions	17
TOTAL score for Functions	32

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number B2

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number B2

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number B2

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number B2

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	**Figure ___** Ø
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	7

no upstream inputs

mostly direct precip

Wetland name or number B2

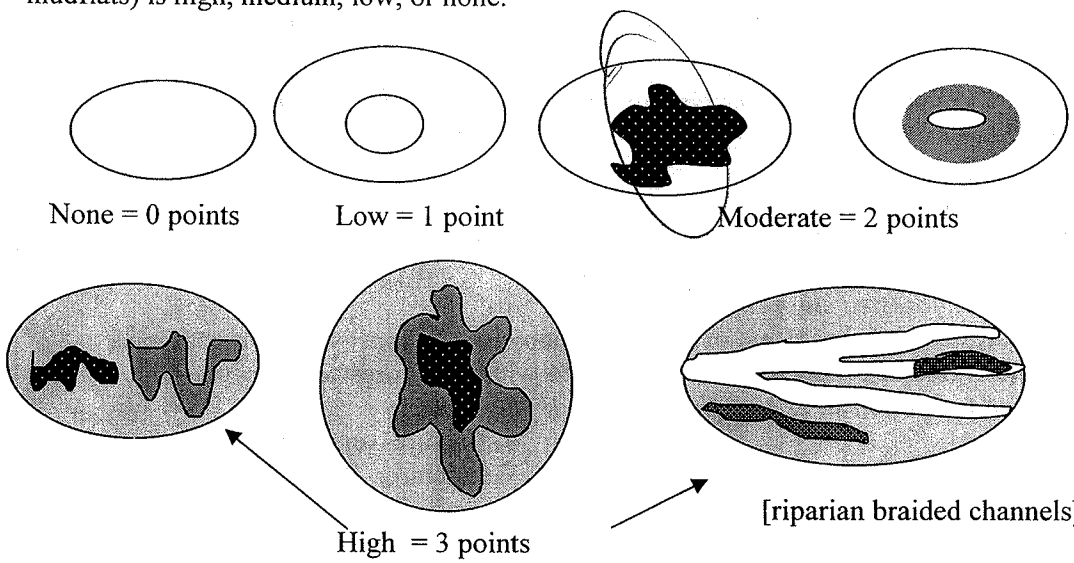
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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 Same as D1.1	2
D	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number B2

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ 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) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 ____Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____***Lake-fringe wetland*** **= 2 points** ____***Freshwater tidal wetland*** **= 2 points** Map of hydroperiods	**Figure ___** 1
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 < 5 species — points = 0 *List species below if you want to:* blackberry, soft rush, ~~aspen~~, buttercup, dock, RCG, 2-agrostis, velvetgrass, dogwood, thistle, ~~pepta~~, cottonwood	1

Total for page 3

Wetland name or number B2

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ 2
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	5

Comments

Wetland name or number B2

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number B2

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	5
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	17

Wetland name or number B2

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number B 2

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number B2

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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)	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number B2

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number B3

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): B3 Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size 1.31

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	8
Score for Habitat Functions	16
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number B3

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number B3

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO - go to 5 **YES** – The wetland class is **Slope**

Wetland name or number B3

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number B3

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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~~	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

no upstream inputs

Wetland name or number B3

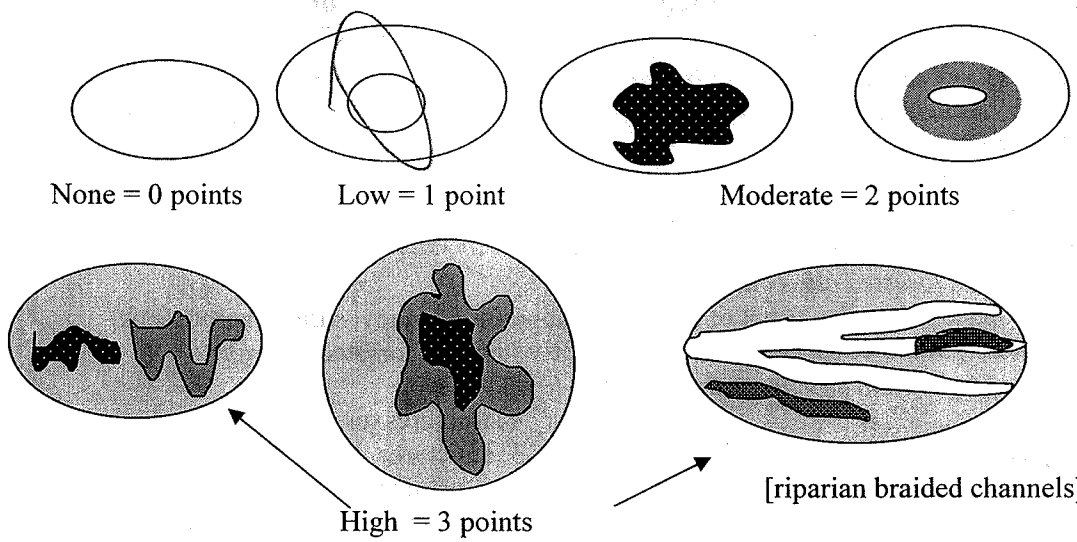
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit 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 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 — 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**	***(see p. 49)*** multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number B3

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ 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) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 X Seasonally flooded or inundated — 3 types present — points = 2 ____Occasionally flooded or inundated — 2 types present — point = 1 X Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 1
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 < 5 species — points = 0 *List species below if you want to:* velvetgrass, thistle, dock, buttercup, cottonwood, RCG, blackberry, soft rush, 2 agrostis	1

Total for page 3

Wetland name or number B3

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	1
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number B3

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? ~~**OR a**~~ **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number B3

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	0

Wetland name or number B3

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number B3

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number B3

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 (NO ___) SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 (No - go to Q. 2) 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number B3

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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 ___	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number B3

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number C

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): C Date of site visit: 1 Nov 2007

Rated by Bill Ridder Trained by Ecology? Yes X No___ Date of training April 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	8
Score for Habitat Functions	16
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number C

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number C

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number C

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number C

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

no upstream input

Wetland name or number C

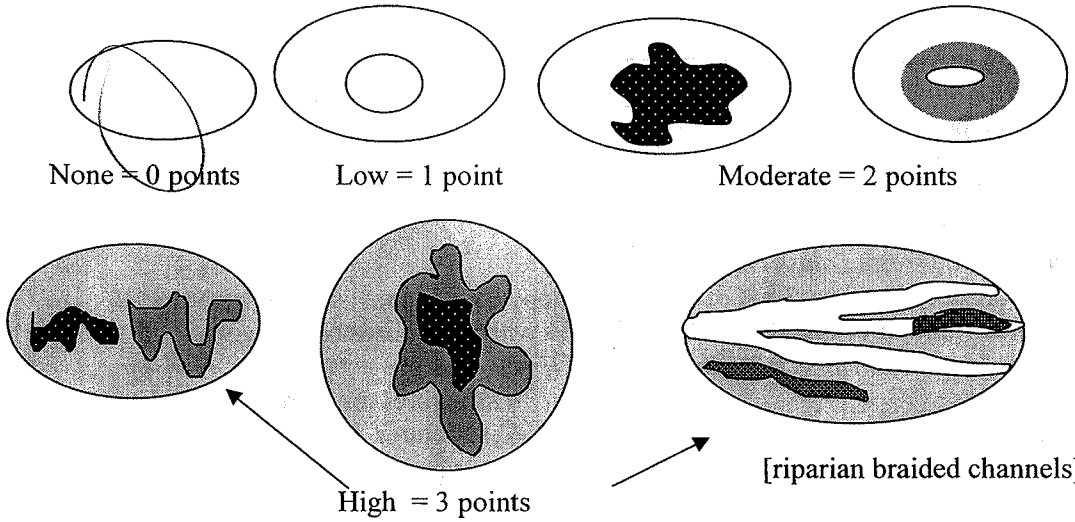
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number C

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ 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) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_ Seasonally flooded or inundated — 3 types present — points = 2 ____Occasionally flooded or inundated — 2 types present — point = 1 _X_ Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 1
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 < 5 species — points = 0 *List species below if you want to:* slough sedge, spirea, cottonwood, alder, buttercup, RCG, agrostis, soft rush, blackberry	1

Total for page 3

Wetland name or number C

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Ø
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* X At least ¼ 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)* ____ 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.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number C

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number C

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number C

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number C

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number C

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ___	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number C

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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___	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number C

SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number D

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): D Date of site visit: 1 Nov 2007

Rated by Bill Ridder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	8
Score for Habitat Functions	16
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number D

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number D

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number D

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number D

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	0
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

no upstream inputs

Wetland name or number D

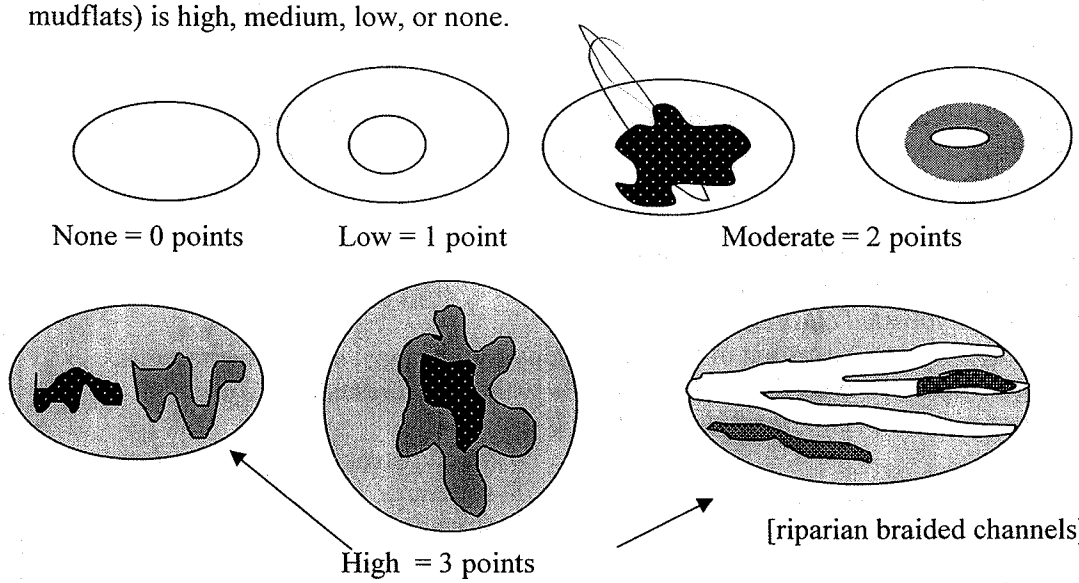
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number D

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____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:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** 0
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated _X_Seasonally flooded or inundated _X_Occasionally flooded or inundated _X_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 — point = 1 1 type present — points = 0 Map of hydroperiods	**Figure ___** 2
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 < 5 species — points = 0 *List species below if you want to:* thistle slough sedge cottonwood blackberry RCG soft rush agrostis velvetgrass spirea	1

Total for page 3

Wetland name or number D

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	2
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	5

Comments

Wetland name or number D

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 80)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** X 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 4
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 6

Wetland name or number D

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number D

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	5
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number D

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number D

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 (NO ___) SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 (No - go to Q. 2) 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number D

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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 ___	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number D

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number F

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): F Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	5
Score for Hydrologic Functions	8
Score for Habitat Functions	20
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number F

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number F

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO - go to 5 **YES** – The wetland class is **Slope**

Wetland name or number F

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number F

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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~~	0
D	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 ___** 1
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	**Figure ___** 2
D	**Total for D 1** *Add the points in the boxes above*	5
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	5

Wetland name or number _____

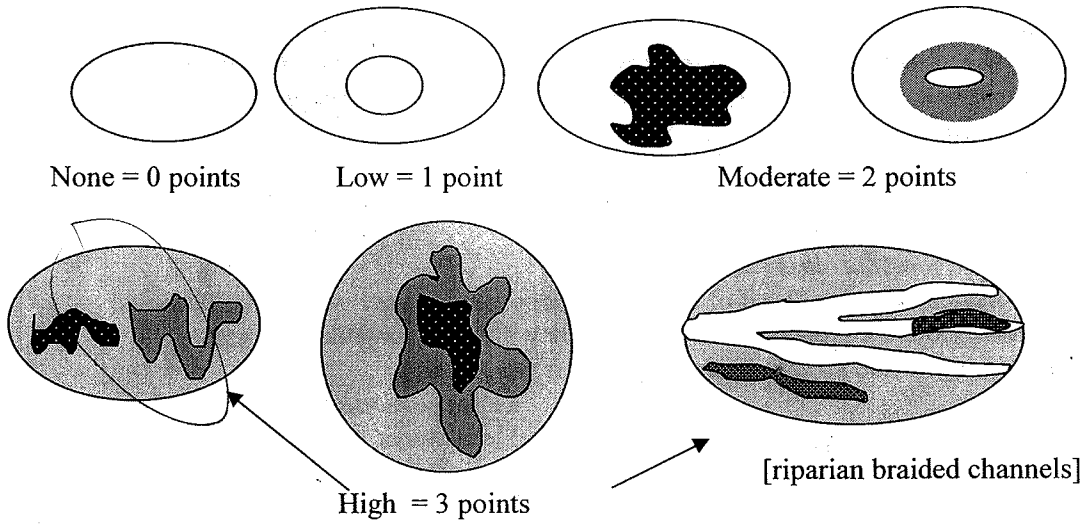
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	***(see p. 49)*** multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number F

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ 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) ____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 structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	Figure ___ 2
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present points = 3 X Seasonally flooded or inundated — 3 types present points = 2 X Occasionally flooded or inundated — 2 types present point = 1 X Saturated only — 1 type present points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland X 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 < 5 species points = 0 *List species below if you want to:* slough sedge, willow, spiraea, other grasses, aspen, RCG, plantain, agrostis, alder, cottonwood	2

Total for page 7

Wetland name or number F

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	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.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	10

Comments

Wetland name or number F

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

Total for page 4

Wetland name or number F

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number F

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
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 14	10
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	20

Wetland name or number F

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number F

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number F

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number F

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number 6

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 6 Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	3
Score for Hydrologic Functions	7
Score for Habitat Functions	8
TOTAL score for Functions	18

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number G

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number 6

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
(NO) – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** **NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
(NO) – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
(NO) - go to 5 **YES** – The wetland class is **Slope**

Wetland name or number 6

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number 6

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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 X 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 ___ 1
D	S 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	Ø
D	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 ___ Ø
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	3
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	3

Wetland name or number G

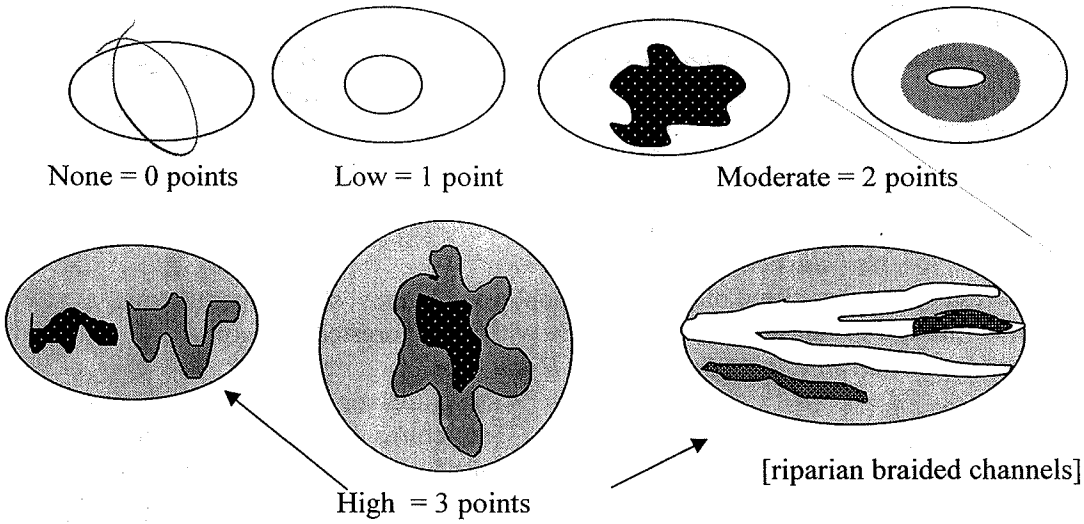
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	1
D	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 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 X Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	7
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	7

Wetland name or number 6

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** Ø
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland*** **= 2 points** ____***Freshwater tidal wetland*** **= 2 points** Map of hydroperiods	**Figure ___** 2
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 < 5 species — points = 0 *List species below if you want to:* RCG thistle agrostis fescue velvetgrass	1

Total for page 3

Wetland name or number G

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Ø
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3

Comments

Wetland name or number 6

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** X Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 1
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

Total for page 2

Wetland name or number G

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number 6

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	5
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	8

Wetland name or number G

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number G

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number G

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number 6

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number H

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): H Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	6
Score for Habitat Functions	14
TOTAL score for Functions	29

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number H

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number H

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number H

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number H

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

Wetland name or number H

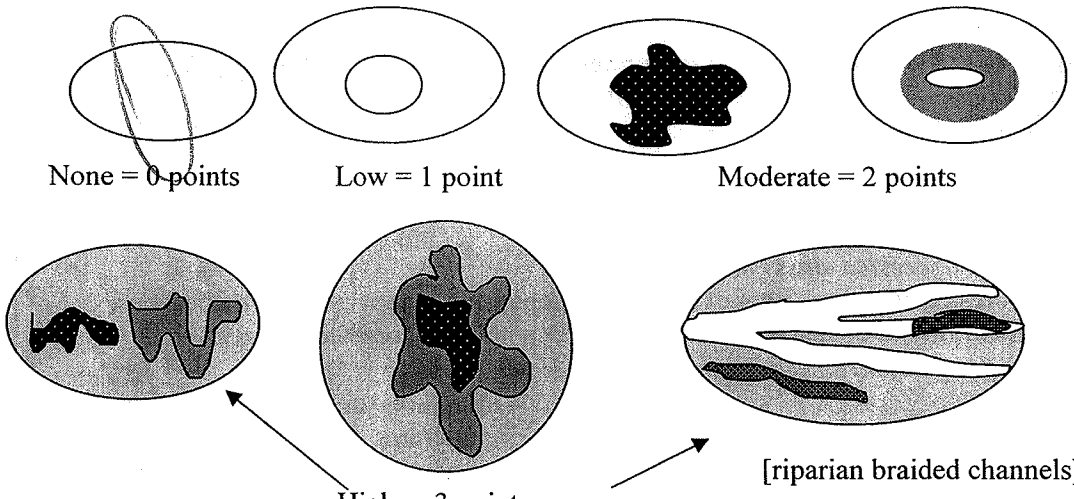
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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
D	**Total for D 3** *Add the points in the boxes above*	6
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	6

Wetland name or number H

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed X Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ 0
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 X Seasonally flooded or inundated — 3 types present — points = 2 X Occasionally flooded or inundated — 2 types present — point = 1 X Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 2
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 *List species below if you want to:* 5 - 19 species — points = 1 < 5 species — points = 0	1

Total for page 3

Wetland name or number H

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Ø
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3

Comments

Wetland name or number H

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** X 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 4
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 6

Wetland name or number H

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number H

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	14

Wetland name or number H

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number H

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number H

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number H

SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number I

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): I Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	18
Score for Hydrologic Functions	5
Score for Habitat Functions	20
TOTAL score for Functions	43

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	X
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number 1

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number I

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
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.
X The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO - go to 5 **YES** – The wetland class is **Slope**

Wetland name or number I

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number I

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the potential to improve water quality?**	*(see p.64)*
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	3
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	Ø
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ___ 6
S	**Total for S 1** *Add the points in the boxes above*	9
S	**S 2. Does the wetland unit 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 150ft X Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other _____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.67)* multiplier 2
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	18

Comments

Wetland name or number I

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	*(see p.68)*
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	3
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	2
S	*Add the points in the boxes above*	5
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other_____ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 70)* multiplier 1
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	5

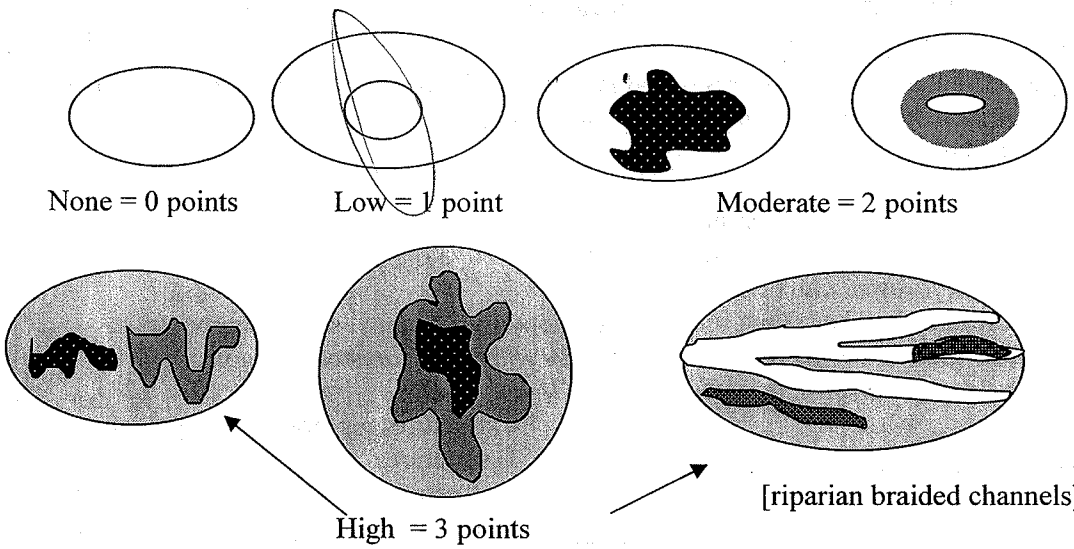
Comments

Wetland name or number I

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed ____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 structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	Figure ___ 2
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present points = 3 _X_Seasonally flooded or inundated — 3 types present points = 2 ____Occasionally flooded or inundated — 2 types present point = 1 _X_Saturated only — 1 type present points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland _X_ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 2
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 < 5 species points = 0 *List species below if you want to:* willow slough sedge cottonwood spiraea alder RCG blackberry grasses	1

Total for page 5

Wetland name or number I

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ 1
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 (>4in. diameter and 6 ft long). ___ 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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ___ At least ¼ 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.*	2
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	8

Comments

Wetland name or number I

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** *(go to H 2.3)* NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number I

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number I

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	8
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	20

Wetland name or number I

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number I

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number I

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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 ___	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number I

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number J

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): J Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	4
Score for Hydrologic Functions	8
Score for Habitat Functions	11
TOTAL score for Functions	23

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number J

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number J

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** **NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

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

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

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

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

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

____The water leaves the wetland **without being impounded**?

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

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

Wetland name or number J

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number J

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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 ___ Ø
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	4
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	4

no inputs ditches on all sides

Wetland name or number J

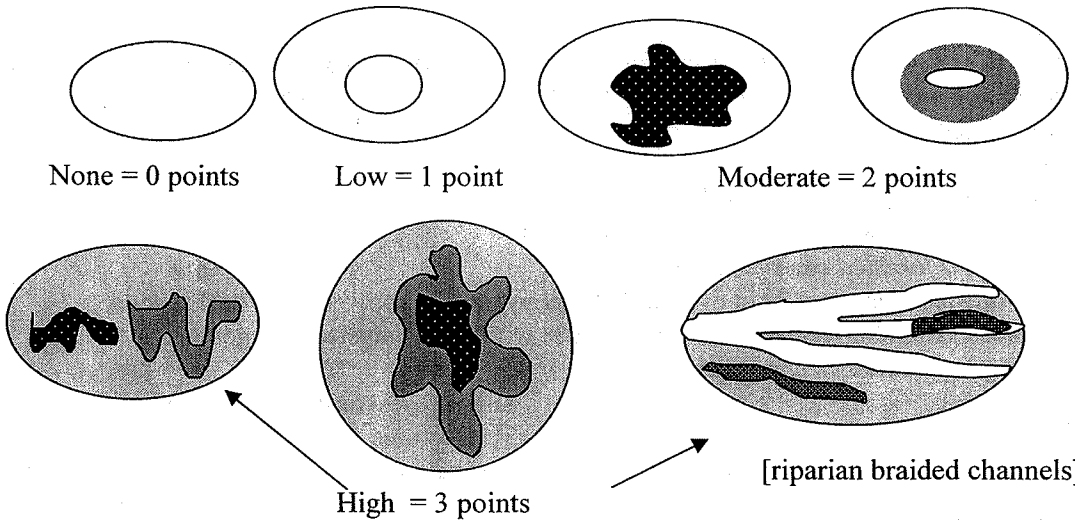
D	Depressional and Flats Wetlands HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	Points (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number J

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed X Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ Ø
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 X Seasonally flooded or inundated — 3 types present — points = 2 X Occasionally flooded or inundated — 2 types present — point = 1 X Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland X 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 < 5 species — points = 0 *List species below if you want to:* various grasses buttercup	1

Total for page 4

Wetland name or number J

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Ø
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number J

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** X No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 2
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 4

Wetland name or number J

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number J

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	11

Wetland name or number J

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number J

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number J

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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)	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number J

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number A

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Wetland A Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training 18-19 Apr 06

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ___ Estimated size 1.69 acres

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	7
Score for Hydrologic Functions	8
Score for Habitat Functions	14
TOTAL score for Functions	29

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number A

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number A

A

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** **NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
X The wetland is on a slope (*slope can be very gradual*),
___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
___The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number A

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number A

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 0
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	7

flow spots not drain to ditch

receives no input from refinery or nearby roads

Wetland name or number A

D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	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 = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?** *(see p. 49)* Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

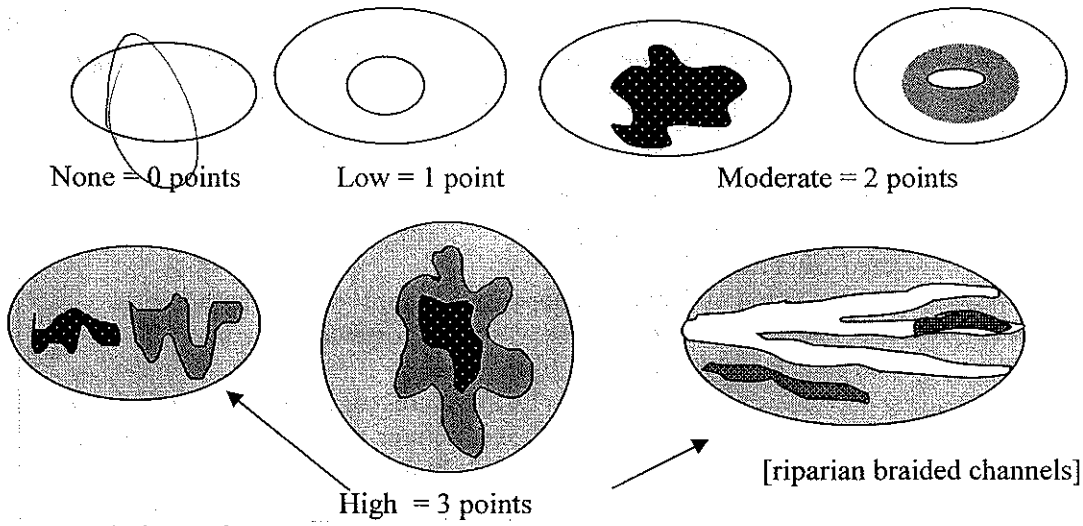
see D11

Wetland name or number A

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed ____Emergent plants canopy ____Scrub/shrub (areas where shrubs have >30% cover) ground cover (emergent) X Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	Figure ___ ∅
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present points = 3 ____Seasonally flooded or inundated — 3 types present points = 2 X Occasionally flooded or inundated — 2 types present point = 1 X Saturated only — 1 type present points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 1
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 < 5 species points = 0 *List species below if you want to:* thistle, aspen, buttercup, agrostis, fescue, RCG, blackberry, unknown herb (dead annual) other grasses, soft rush, quackgrass	1

Total for page 2

Wetland name or number A

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ Ø
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 (>4in. diameter and 6 ft long). ____ 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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____ At least ¼ 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)* ____ 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.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3

Comments

Wetland name or number A

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** X 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 4
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 6

Wetland name or number A

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number A

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	14

Wetland name or number A

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number A

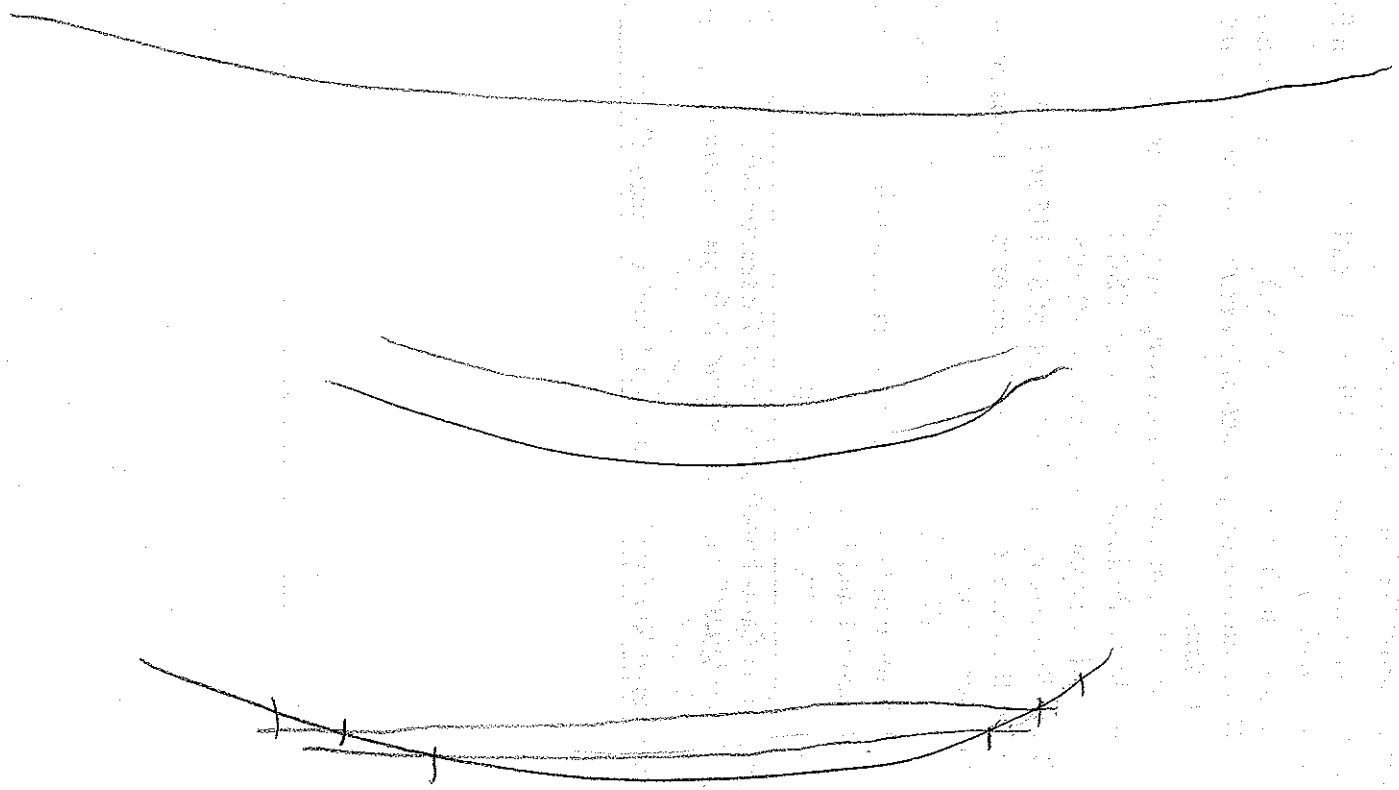
SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being 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 3.2 (NO ___) SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 (No - go to Q. 2) 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number A

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number A

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	



Wetland name or number B1

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): B1 Date of site visit: 1 Nov 2007

Rated by Bill Ridder Trained by Ecology? Yes X No___ Date of training Apr 2008

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size 0.14

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	7
Score for Hydrologic Functions	6
Score for Habitat Functions	16
TOTAL score for Functions	29

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number B1

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number B1

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** **NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

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

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

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

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

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

____The water leaves the wetland **without being impounded**?

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

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

Wetland name or number B1

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number B1

D	**Depressional and Flats Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	0
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ Ø
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	7

no upstream inputs

Wetland name or number B1

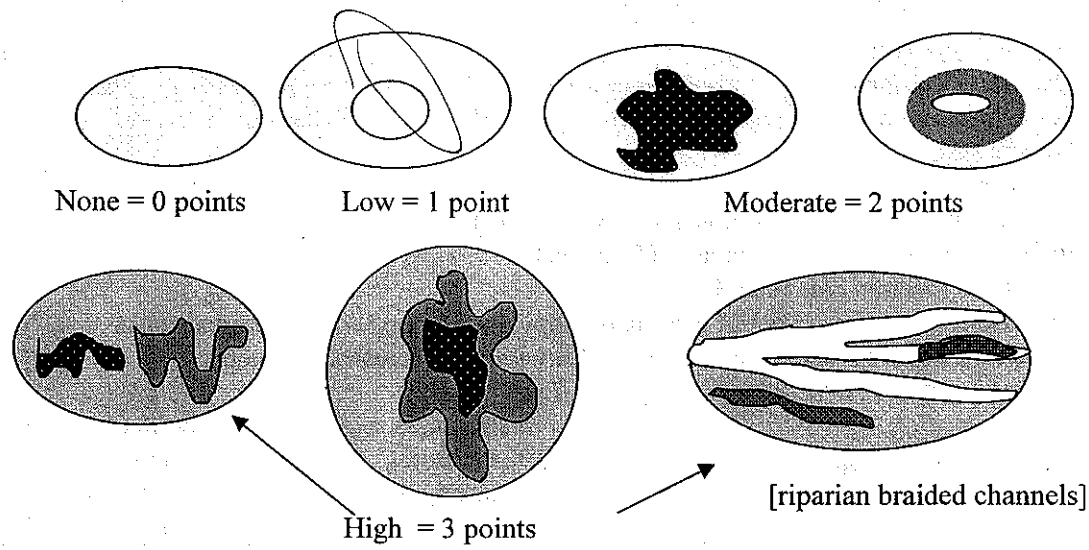
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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
D	**Total for D 3** *Add the points in the boxes above*	6
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	6

Wetland name or number B1

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	Points (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____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:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ 1
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 ____Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 1
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 < 5 species — points = 0 *List species below if you want to:* thistle Elytrigia cottonwood RCG soft rush tapertip rush velvet grass 2 agrostis blackberry	1

Total for page 3

Wetland name or number B1

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	1
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number B1

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number B1

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	0

Wetland name or number B1

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number B1

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number B1

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number B1

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number B1

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number B2

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Wetland B2 Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size 1.94

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	7
Score for Hydrologic Functions	8
Score for Habitat Functions	17
TOTAL score for Functions	32

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number B2

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number B2

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number B2

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number B2

D	**Depressional and Flats Wetlands** **WATER QUALITY FUNCTIONS** - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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 BUT (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	Figure ___ 2
D	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ Ø
D	**Total for D 1** *Add the points in the boxes above*	7
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	7

no upstream inputs

mostly direct precip

Wetland name or number B2

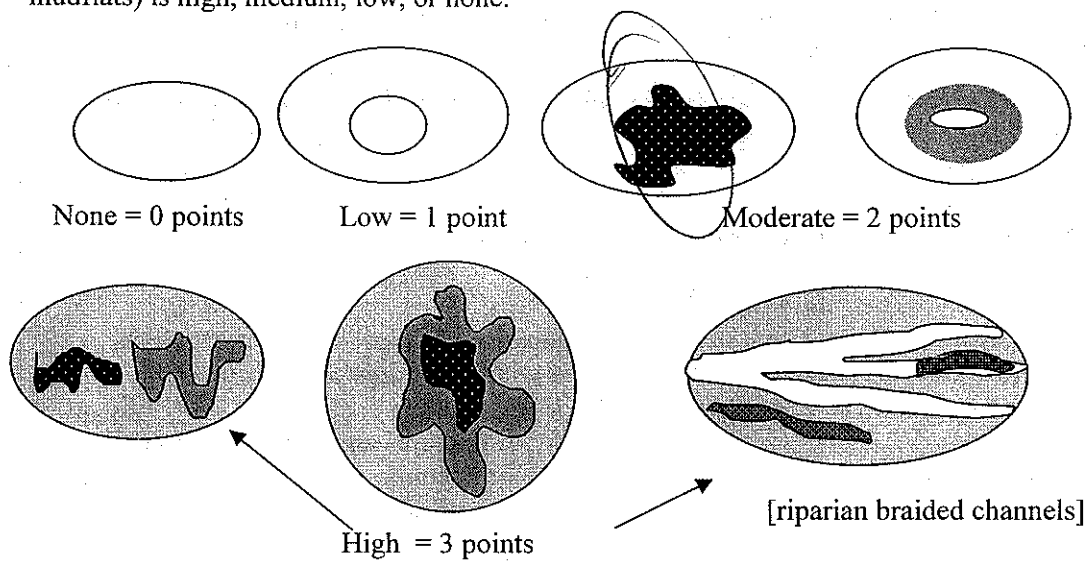
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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 Same as D1.1	2
D	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number B2

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ 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) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 ____Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____***Lake-fringe wetland*** **= 2 points** ____***Freshwater tidal wetland*** **= 2 points** Map of hydroperiods	**Figure ___** 1
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 < 5 species — points = 0 *List species below if you want to:* blackberry, thistle, soft rush, ~~poplar~~, ~~aspen~~, cottonwood, buttercup, dock, RCG, 2-agrostis, velvetgrass, dogwood	1

Total for page 3

Wetland name or number B2

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ 2
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	5

Comments

Wetland name or number B2

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number B2

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number B2

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	5
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	17

Wetland name or number B2

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number B 2

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number B2

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number B2

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number B3

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): B3 Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size 1.31

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	8
Score for Habitat Functions	16
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number B3

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number B3

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

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

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

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

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

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

____The water leaves the wetland **without being impounded**?

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

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

Wetland name or number B3

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number B3

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

no upstream inputs

Wetland name or number B3

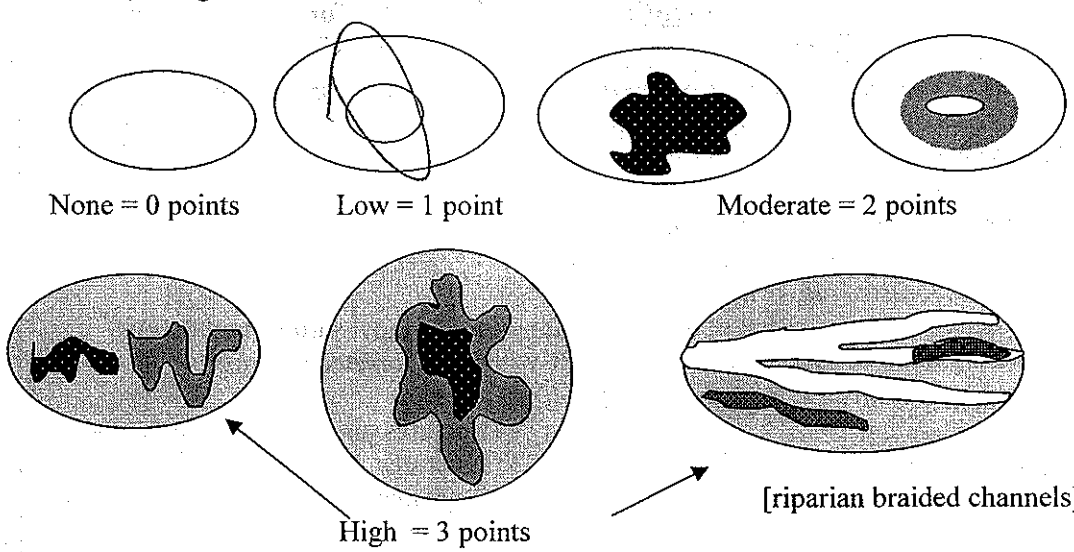
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	***(see p. 49)*** multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number B3

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ 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) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** 1
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 ____Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 1
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 < 5 species — points = 0 *List species below if you want to:* velvetgrass, thistle, dock, buttercup, cottonwood, RCG, blackberry, soft rush, 2 agrostis	1

Total for page 3

Wetland name or number B3

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ 1
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number B3

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number B3

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	0

Wetland name or number B3

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number B3

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number B3

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 (NO)___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 (No) - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number B3

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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 ___	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number B3

SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number C

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): C Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training April 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	8
Score for Habitat Functions	16
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number C

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number C

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number C

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number C

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

no upstream input

Wetland name or number C

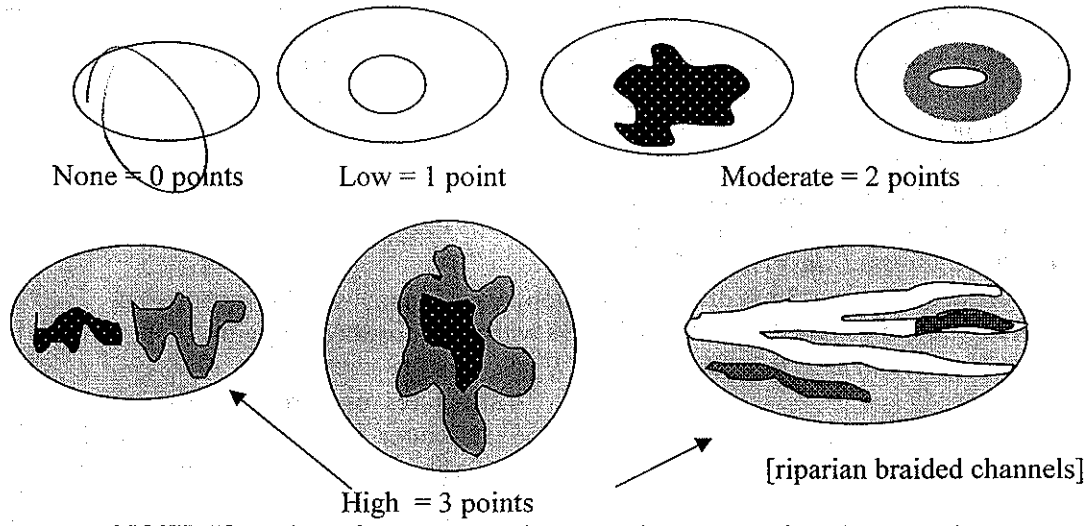
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number C

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	Points (only 1 score per box)
H 1. Does the wetland unit 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 ¼ 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) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ 1
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 ____Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 1
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 < 5 species — points = 0 *List species below if you want to:* slough sedge, spirea, cottonwood, alder, buttercup, RCG, agrostis, soft rush, blackberry	1

Total for page 3

Wetland name or number C

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Ø
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* _X_At least ¼ 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)* ____ 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.*	1
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number C

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number C

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number C

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number C

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number C

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ___	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number C

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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___	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number C

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number D

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): D Date of site visit: 1 Nov 2007

Rated by Bill Ridder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	8
Score for Habitat Functions	16
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number D

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number D

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number D

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number D

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	0
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

no upstream inputs

Wetland name or number D

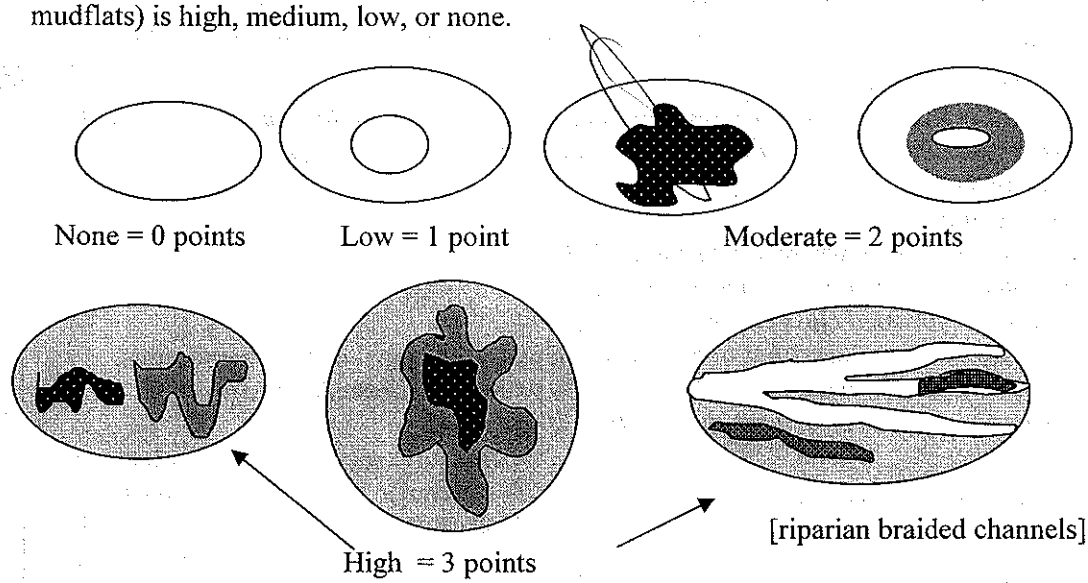
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number D

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____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:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ 0
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 2
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 < 5 species — points = 0 *List species below if you want to:* thistle slough sedge cottonwood blackberry RCG soft rush agrostis velvetgrass spirea	1

Total for page 3

Wetland name or number D

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ 2
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ___Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	5

Comments

Wetland name or number D

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** X 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 4
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 6

Wetland name or number D

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number D

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	5
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	16

Wetland name or number D

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number D

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 (NO ___) SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 (No - go to Q. 2) 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number D

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number D

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number F

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): F Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	5
Score for Hydrologic Functions	8
Score for Habitat Functions	20
TOTAL score for Functions	33

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number F

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number F

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO - go to 5 **YES** – The wetland class is **Slope**

Wetland name or number F

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number F

D	**Depressional and Flats Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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** ___ 1
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	**Figure** ___ 2
D	**Total for D 1** *Add the points in the boxes above*	5
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other ___ **YES** multiplier is **2**. **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	5

Wetland name or number _____

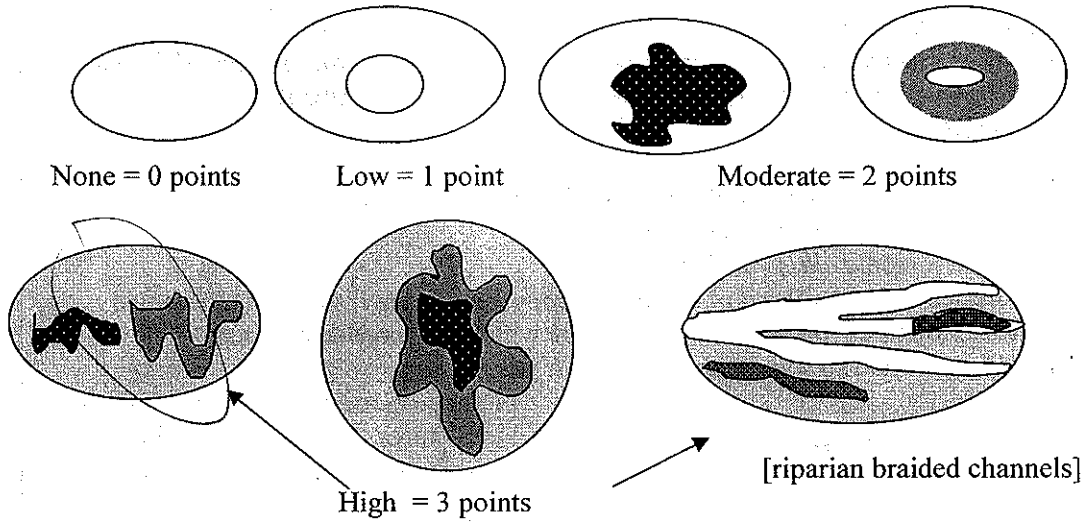
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number F

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	Points (only 1 score per box)
H 1. Does the wetland unit 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 ¼ 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) ____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 structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes	Figure ___ 2
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present points = 3 X Seasonally flooded or inundated — 3 types present points = 2 X Occasionally flooded or inundated — 2 types present point = 1 X Saturated only — 1 type present points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland X 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 < 5 species points = 0 *List species below if you want to:* slough sedge, willow, spiraea, other grasses, aspen, RCG, plantain, agrostis, alder, cottonwood	2

Total for page 7

Wetland name or number F

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation 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.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	10

Comments

Wetland name or number F

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

Total for page 4

Wetland name or number F

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number F

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
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 14	10
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	20

Wetland name or number F

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number F

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number F

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number F

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number 6

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 6 Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	3
Score for Hydrologic Functions	7
Score for Habitat Functions	8
TOTAL score for Functions	18

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number G

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number G

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
(NO) – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
(NO) – go to 3 **YES** – The wetland class is **Flats**

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

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

___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

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

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

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

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

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

____The water leaves the wetland **without being impounded**?

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

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

Wetland name or number 6

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number 6

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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 X 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 ___ 1
D	S 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	Ø
D	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 ___ Ø
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	3
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	3

Wetland name or number 6

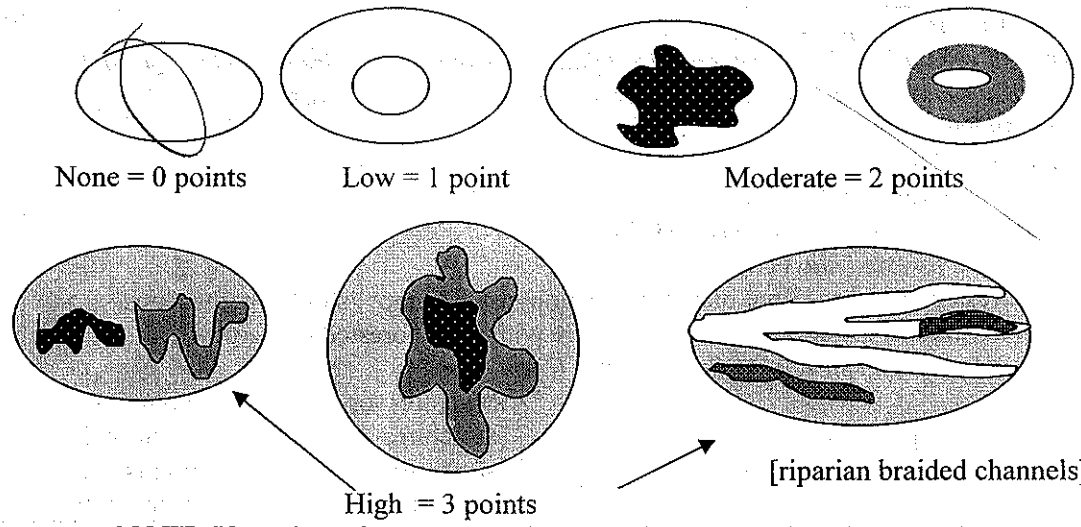
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	1
D	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 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 X Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	7
D	**D 4. Does the wetland unit 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 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 — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	7

Wetland name or number 6

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** Ø
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland*** **= 2 points** ____ ***Freshwater tidal wetland*** **= 2 points** Map of hydroperiods	**Figure ___** 2
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 < 5 species — points = 0 *List species below if you want to:* RCG thistle agrostis fescue velvetgrass	1

Total for page 3

Wetland name or number G

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Ø
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3

Comments

Wetland name or number 6

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** X Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 1
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

Total for page 2

Wetland name or number G

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number 6

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	5
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	8

Wetland name or number G

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number 6

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number G

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number G

SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number H

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): H Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	6
Score for Habitat Functions	14
TOTAL score for Functions	29

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number H

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number H

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number H

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number H

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	0
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

Wetland name or number A

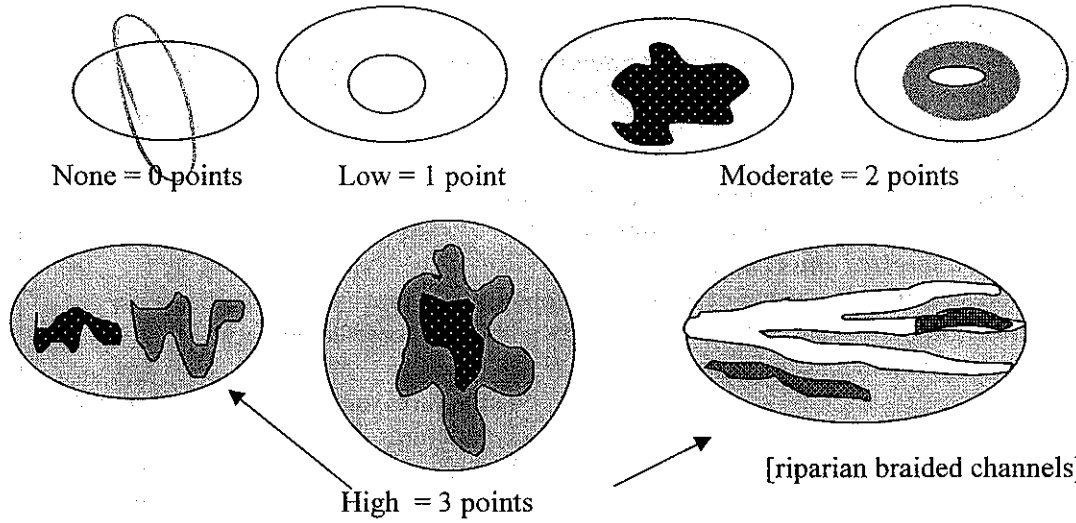
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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
D	**Total for D 3** *Add the points in the boxes above*	6
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	***(see p. 49)*** multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	6

Wetland name or number H

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	**Figure ___** Ø
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	**Figure ___** 2
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 *List species below if you want to:* 5 - 19 species — points = 1 < 5 species — points = 0	1

Total for page 3

Wetland name or number H

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Ø
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3

Comments

Wetland name or number H

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** X 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 4
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 6

Wetland name or number H

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number H

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	11
TOTAL for H 1 from page 14	3
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	14

Wetland name or number H

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number H

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number H

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number H

SC 6.0 Interdunal Wetlands *(see p. 93)* Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number I

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): I Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	18
Score for Hydrologic Functions	5
Score for Habitat Functions	20
TOTAL score for Functions	43

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	X
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number 1

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number I

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
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.
X The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO - go to 5 **YES** – The wetland class is **Slope**

Wetland name or number I

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number I

S	**Slope Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
S	**S 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	*(see p.64)*
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	3
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	Ø
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > ½ of area points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ___ 6
S	**Total for S 1** *Add the points in the boxes above*	9
S	**S 2. Does the wetland unit have the <u>opportunity</u> 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 150ft X Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland — Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.67)* multiplier 2
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	18

Comments

Wetland name or number I

S	**Slope Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	S 3. Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?	*(see p.68)*
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	3
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions ~~that~~ can retain water over at least 10% of its area. YES points = 2 NO points = 0	2
S	*Add the points in the boxes above*	5
S	**S 4. Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other_____ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 70)* multiplier 1
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	5

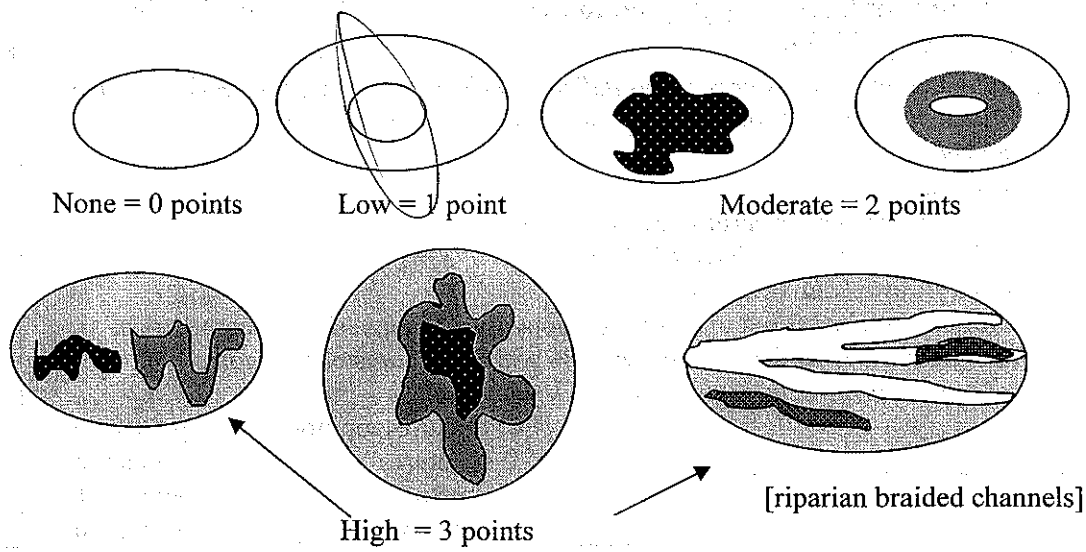
Comments

Wetland name or number I

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed ____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 structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ 2
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_ Seasonally flooded or inundated — 3 types present — points = 2 ____Occasionally flooded or inundated — 2 types present — point = 1 _X_ Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland _X_ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____ ***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 2
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 < 5 species — points = 0 *List species below if you want to:* willow slough sedge cottonwood spiraea alder RCG blackberry grasses	1

Total for page 5

Wetland name or number I

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points [riparian braided channels] High = 3 points NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ 1
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 (>4in. diameter and 6 ft long). ___ 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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ___ At least ¼ 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.*	2
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	8

Comments

Wetland name or number I

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
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."* X 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 5
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 7

Wetland name or number I

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)* Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number I

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	12
TOTAL for H 1 from page 14	8
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	20

Wetland name or number I

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number I

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number I

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number I

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1 NO X 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number J

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): J Date of site visit: 1 Nov 2007

Rated by Bill Kidder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III___ IV X

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

Score for Water Quality Functions	4
Score for Hydrologic Functions	8
Score for Habitat Functions	11
TOTAL score for Functions	23

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number J

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe** **NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

___The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

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

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

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

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

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

____The water leaves the wetland **without being impounded**?

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

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

Wetland name or number J

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number J

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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 ___ Ø
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 2
D	**Total for D 1** *Add the points in the boxes above*	4
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	4

no inputs ditches on all sides

Wetland name or number J

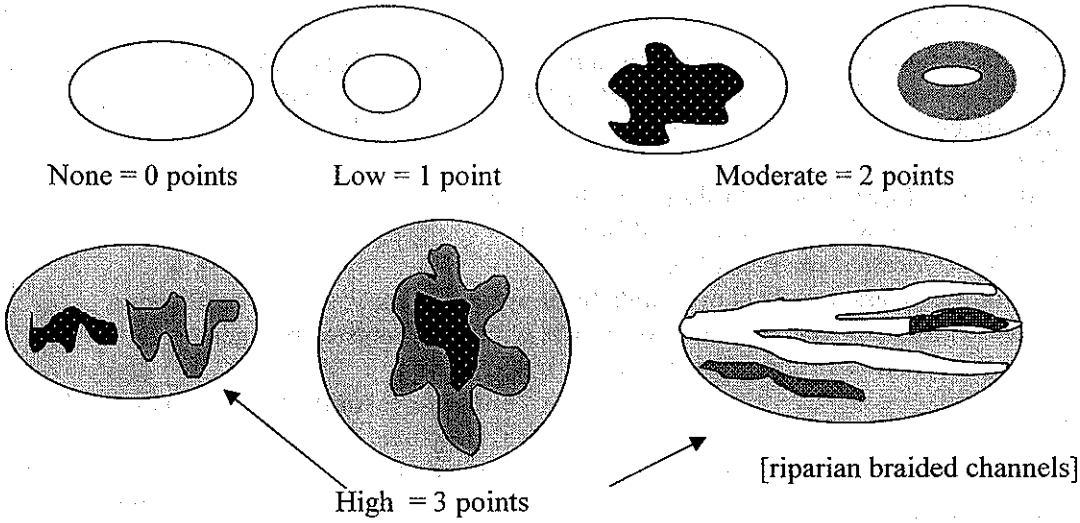
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	1
D	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	5
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	*(see p. 49)* multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	8

Wetland name or number J

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ Ø
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland _X_ 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 < 5 species — points = 0 *List species below if you want to:* various grasses buttercup	1

Total for page 4

Wetland name or number J

	Figure ___
H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Ø
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number J

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** X No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 2
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 4

Wetland name or number J

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* ____**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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	Ø

Wetland name or number J

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	11

Wetland name or number J

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number J

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number J

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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)___	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number J

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

APPENDIX B

CMA1 AND CMA2 WETLAND RATING FIELD DATA FORMS

Wetland name or number CMA1

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): CMA1 Date of site visit: 3 Dec 2007

Rated by Bill Ridder Trained by Ecology? Yes X No___ Date of training April 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	12
Score for Hydrologic Functions	10
Score for Habitat Functions	12
TOTAL score for Functions	34

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number CMA1

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number CMA1

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*

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

Wetland name or number CMA 1

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number CMA1

D	Depressional and Flats Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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 ___ Ø
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	Figure ___ 4
D	**Total for D 1** *Add the points in the boxes above*	6
D	**D 2. Does the wetland unit 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.* X 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 2
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	12

Wetland name or number CMA1

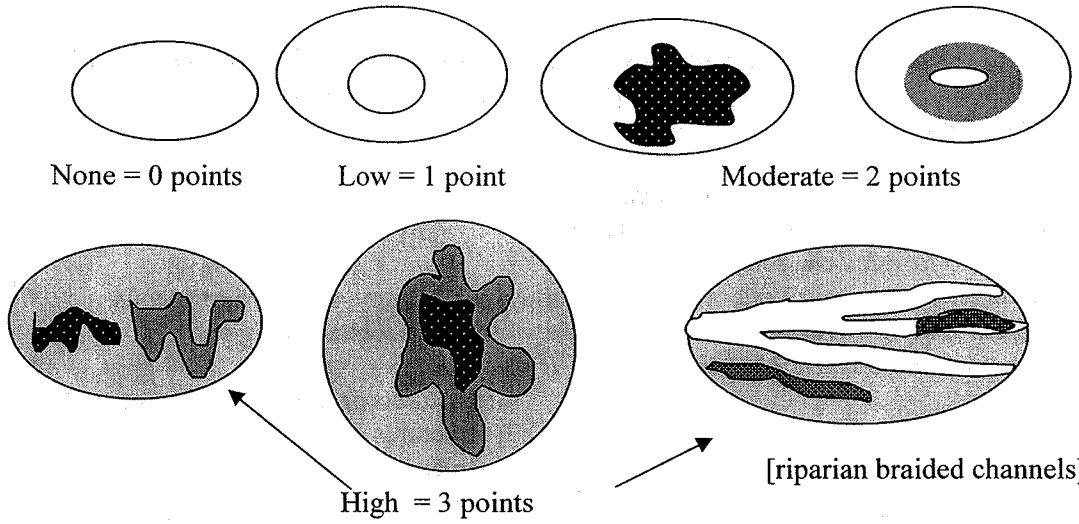
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	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	5
D	**Total for D 3** *Add the points in the boxes above*	10
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	***(see p. 49)*** multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	10

Wetland name or number CMA1

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ 1
H 1.2. Hydroperiods ***(see p. 73)*** *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland*** **= 2 points** ____***Freshwater tidal wetland*** **= 2 points** Map of hydroperiods	Figure ___ 2
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 < 5 species — points = 0 *List species below if you want to:*	1

Total for page 4

Wetland name or number CMA1

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ 1
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	0
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	5

Comments

Wetland name or number CMA1

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** X Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 1
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	2

Total for page 3

Wetland name or number CMA 1

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see p. 82)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* *These are DFW definitions. Check with your local DFW biologist if there are any questions.* 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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age. ____**Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**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%. ____**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 0.5ppt. 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 **2** priority habitats = **3 points** If wetland has **1** priority habitat = **1 point** No habitats = 0 points *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	1

Wetland name or number CMA 1

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	7
TOTAL for H 1 from page 14	5
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	12

Wetland name or number CMA1

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number CMA 1

SC 2.0 Natural Heritage Wetlands ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 (NO)___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs ***(see p. 87)*** Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 (No) - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

Wetland name or number CMA1

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

Wetland name or number CMA1

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

Wetland name or number CMA2

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): CMA2 Date of site visit: 3 Dec 2007

Rated by Bill Ridder Trained by Ecology? Yes X No___ Date of training Apr 2006

SEC: ___ TWNSHP: ____ RNGE: ____ Is S/T/R in Appendix D? Yes___ No___

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III X IV___

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

Score for Water Quality Functions	9
Score for Hydrologic Functions	10
Score for Habitat Functions	~~20~~ 18
TOTAL score for Functions	~~39~~ 37

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ Does not Apply X

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

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics		Wetland HGM Class used for Rating	
Estuarine		**Depressional**	X
Natural Heritage Wetland		**Riverine**	
Bog		**Lake-fringe**	
Mature Forest		**Slope**	
Old Growth Forest		**Flats**	
Coastal Lagoon		**Freshwater Tidal**	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

Wetland name or number CMA2

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

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

Check List for Wetlands That May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
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 I 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 into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number CMA2

Classification of Wetland Units in Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.
NO – go to 3 **YES** – The wetland class is **Flats**

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

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

4. Does the entire wetland unit **meet all** of the following criteria?
____The wetland is on a slope (*slope can be very gradual*),
____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
____The water leaves the wetland **without being impounded**?
NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*
NO – go to 5 **YES** – The wetland class is **Slope**

Wetland name or number CMA2

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. 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 if you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number CMA 2

D	**Depressional and Flats Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	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	S 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	Ø
D	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	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* 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 Map of Hydroperiods	**Figure** ___ 2
D	**Total for D 1** *Add the points in the boxes above*	9
D	**D 2. Does the wetland unit 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 — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier 1
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	9

Wetland name or number CMA2

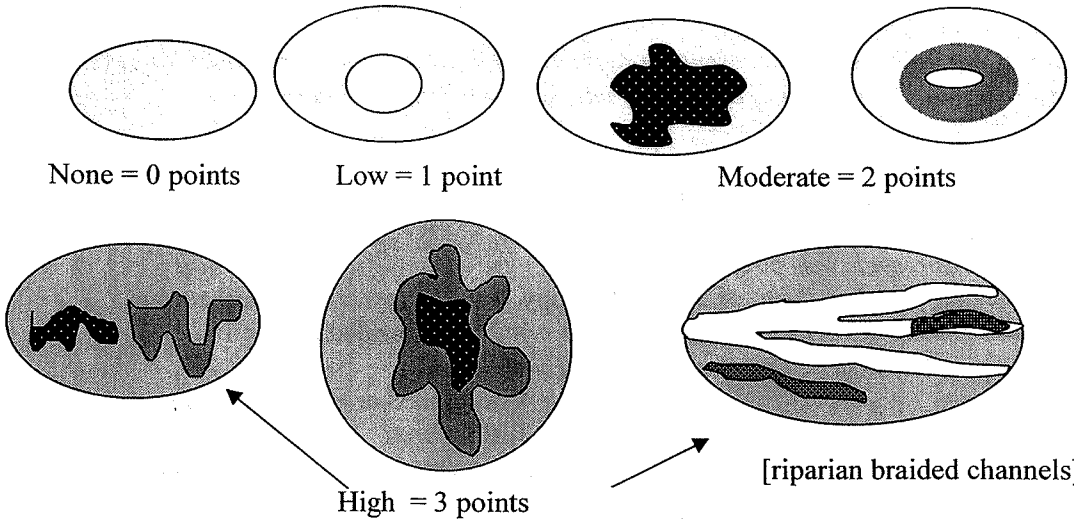
D	**Depressional and Flats Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.46)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 3 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	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 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 Unit 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	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	5
D	**Total for D 3** *Add the points in the boxes above*	10
D	**D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — 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**	***(see p. 49)*** multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	10

Wetland name or number CMA2

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	Points (only 1 score per box)
H 1. Does the wetland unit 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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ____Aquatic bed _X_Emergent plants ____Scrub/shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ____The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more — points = 4 3 structures — points = 2 2 structures — points = 1 1 structure — points = 0 Map of Cowardin vegetation classes	Figure ___ Ø
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ____Permanently flooded or inundated — 4 or more types present — points = 3 _X_Seasonally flooded or inundated — 3 types present — points = 2 _X_Occasionally flooded or inundated — 2 types present — point = 1 _X_Saturated only — 1 type present — points = 0 ____ Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____ ***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** Map of hydroperiods	Figure ___ 2
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 *List species below if you want to:* 5 - 19 species — points = 1 < 5 species — points = 0	1

Total for page 3

Wetland name or number CMA2

H 1.4. Interspersion of habitats *(see p. 76)* Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  None = 0 points Low = 1 point Moderate = 2 points High = 3 points [riparian braided channels] NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes	Figure ___ 1
H 1.5. Special Habitat Features: *(see p. 77)* *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). ____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 (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ____At least ¼ 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)* ____ 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.*	Ø
H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4

Comments

Wetland name or number CMA2

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** X 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or 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 (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 4
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 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 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = 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 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	4

Total for page 8

Wetland name or number CMA2

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)*

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

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 7.6 m (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) > 81 cm (32 in) dbh or > 200 years of age.

X **Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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 grasses and/or forbs form the natural climax plant community.

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

____**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%.

____**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 0.5ppt. 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 **2** priority habitats = **3 points**

If wetland has **1** priority habitat = **1 point** No habitats = 0 points

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

4

1

Wetland name or number CMA2

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 ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	14
TOTAL for H 1 from page 14	4
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	18

Wetland name or number CMA2

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.*	**Category**
SC 1.0 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. I**
SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three 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 the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. — 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 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** **Cat. II** **Dual rating I/II**

Wetland name or number CMA2

SC 2.0 Natural Heritage Wetlands *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit 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 3.2 NO ___ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as or as a site with state threatened or endangered plant species? YES = Category I NO ____	**Cat. I**
SC 3.0 Bogs *(see p. 87)* Does the wetland unit (**or any part of the unit**) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer yes you will still need to rate the wetland based on its functions.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3 No - go to Q. 2 2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 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 Q. 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. *1.* Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* 2. YES = Category I No___ Is not a bog for purpose of rating	**Cat. I**

SC 4.0 Forested Wetlands ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *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/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 average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 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 ___	**Cat. I**
SC 5.0 Wetlands in Coastal Lagoons ***(see p. 91)*** Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — 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 meets 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 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 acre (4350 square feet) YES = Category I NO = Category II	**Cat. I** **Cat. II**

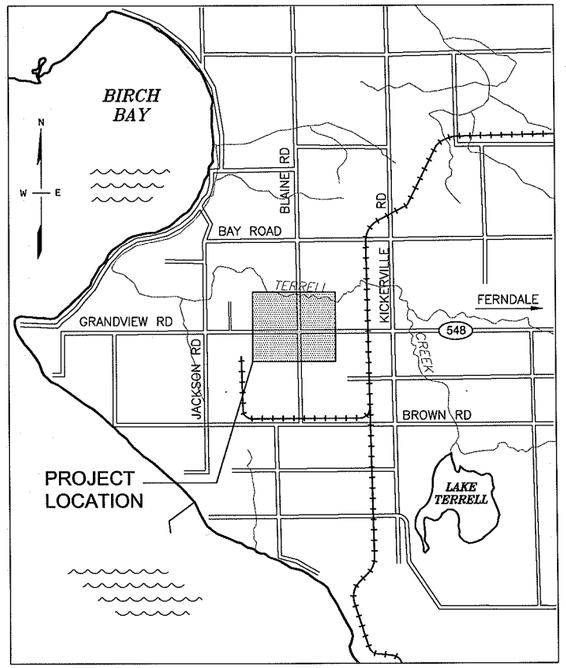
Wetland name or number CMA2

SC 6.0 Interdunal Wetlands ***(see p. 93)*** Is the wetland unit 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 once acre or larger? YES = Category II NO – go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? 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	

APPENDIX C

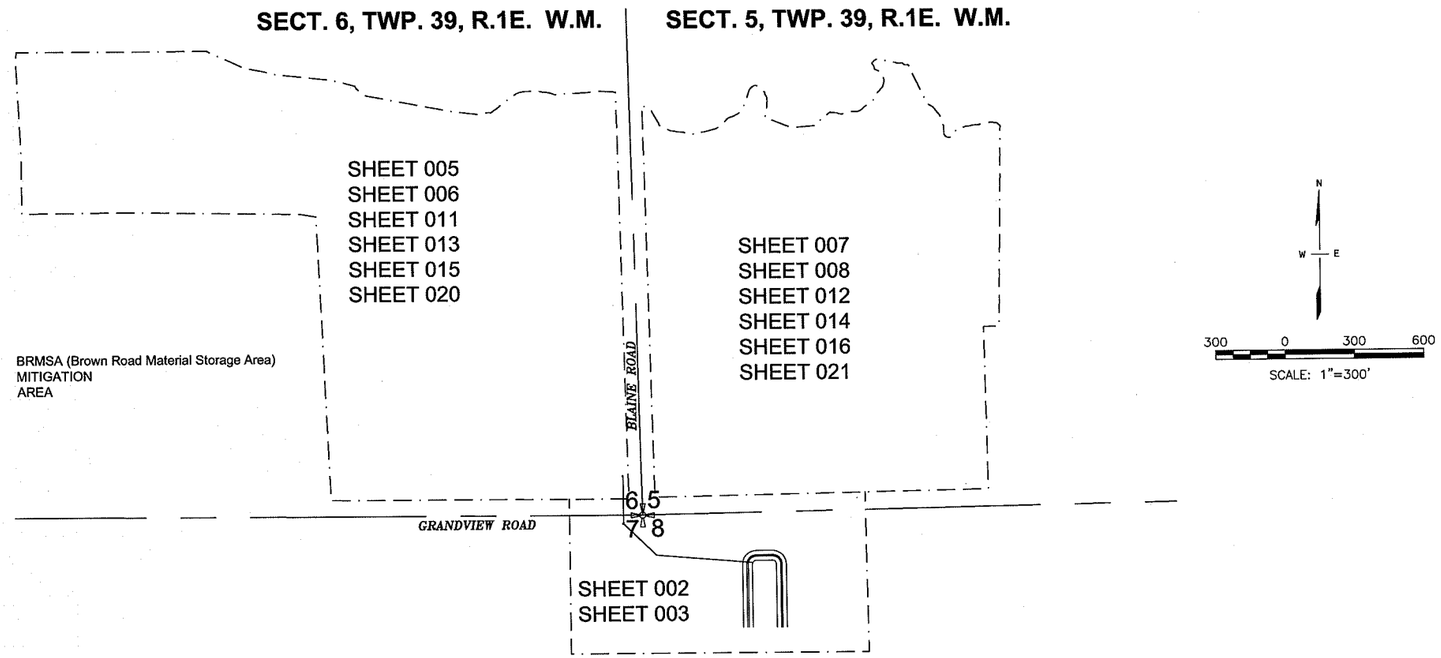
PRELIMINARY MITIGATION SITE CONSTRUCTION PLAN SET

BP CHERRY POINT
COGEN/FACILITIES MITIGATION PROJECT



VICINITY MAP

SCALE: 1" = 4000'



GENERAL NOTES

1. THE 2008 STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, PREPARED JOINTLY BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) AND THE WASHINGTON STATE CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION (APWA) AND SPECIFICALLY INCLUDING AS A PART OF THE CONTRACT DOCUMENTS, AS THOUGH QUOTED IN THEIR ENTIRETY AND SHALL APPLY EXCEPT AS AMENDED, SUPPLEMENTED OR SUPERSEDED BY THE CONTRACT DRAWINGS OR THE WHATCOM COUNTY DEVELOPMENT STANDARDS, CHAPTER 5 "ROAD STANDARD" (MAY 2004).
2. EXCAVATION, TRENCHING AND SHORING SHALL MEET ALL APPLICABLE FEDERAL, STATE (WAC 295-155 PART N) AND LOCAL SAFETY REGULATIONS.
3. WHENEVER REFERENCE IS MADE IN THE ABOVE STANDARD SPECIFICATIONS TO THE CONTRACTING AGENCY, SUCH REFERENCE SHALL BE CONSTRUED TO MEAN BP WEST COAST PRODUCTS LLC. WHERE REFERENCE IS MADE TO THE ENGINEER, SUCH REFERENCE SHALL BE CONSTRUED TO MEAN THE ENGINEER OR DULY AUTHORIZED ASSISTANTS OR REPRESENTATIVES DESIGNATED BY BP WEST COAST PRODUCTS LLC DURING CONSTRUCTION.
4. ALL PROJECT MATERIALS, CONSTRUCTION REQUIREMENTS AND METHOD OF CONSTRUCTION SHALL CONFORM WITH THE STANDARD SPECIFICATIONS, CONTRACT DRAWINGS, AND THE WHATCOM COUNTY DEVELOPMENT STANDARDS, CHAPTER 5 "ROAD STANDARDS (MAY 2004).

INDEX TO SHEETS

DWG. No.	CONTENTS
001	VICINITY MAP AND TABLE OF CONTENTS
002	20" INVERTED SIPHON - PLAN
003	20" INVERTED SIPHON - PROFILE
004	20" INVERTED SIPHON - DETAILS
005	GRADING PLAN - CMA 2A
006	GRADING PLAN - CMA 2B
007	GRADING PLAN - CMA 1A
008	GRADING PLAN - CMA 1B
009	GRADING PLAN - DETAILS
010	GRADING PLAN - COORDINATES
011	PONDS AND DITCH PLUGS - CMA2
012	PONDS AND DITCH PLUGS - CMA1
013	TILLING AND SEEDING AREAS - CMA2
014	TILLING AND SEEDING AREAS - CMA1
015	PLANTING DISTRIBUTION - CMA2
016	PLANTING DISTRIBUTION - CMA1
017	PLANTING NOTES - A
018	PLANTING NOTES - B
019	TYPICAL PLANTING DETAILS
020	HABITAT FEATURE LOCATIONS - CMA2
021	HABITAT FEATURES LOCATIONS - CMA1

ABBREVIATIONS

ACP	ASPHALT CONCRETE PAVEMENT
BGS	BELOW GROUND SURFACE
DIA	DIAMETER
EL	ELEVATION
EOP	EDGE OF PAVEMENT
EOS	EDGE OF SHOULDER
GRND	GROUND
HP	HIGH PRESSURE
IN	INCHES
INV	INVERT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
NTS	NOT TO SCALE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
R/W	RIGHT OF WAY
TYP	TYPICAL
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

HORIZONTAL AND VERTICAL DATUM
BASED ON "BP CHERRY POINT REFINERY"
LOCAL COORDINATE GRID

VERTICAL EQUATION
BP DATUM + 3.947 FT
= WSDOT & WHATCOM COUNTY
(NOTE: WSDOT = NAVD '88)

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.
	–		–	–	–	–	–

DWG. NO.
DR. HWJ/TP
CKD. JFG
APPROVALS
OPER.

REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
VICINITY MAP AND TABLE OF CONTENTS

DATE PRELIM. 12-21-07 | SCALE AS NOTED | AUTH 008LW
ENGINEERING CONTRACTOR URS CORPORATION
PROJECT NO: 4006A0
DWG. NO. 001
REVISION 0

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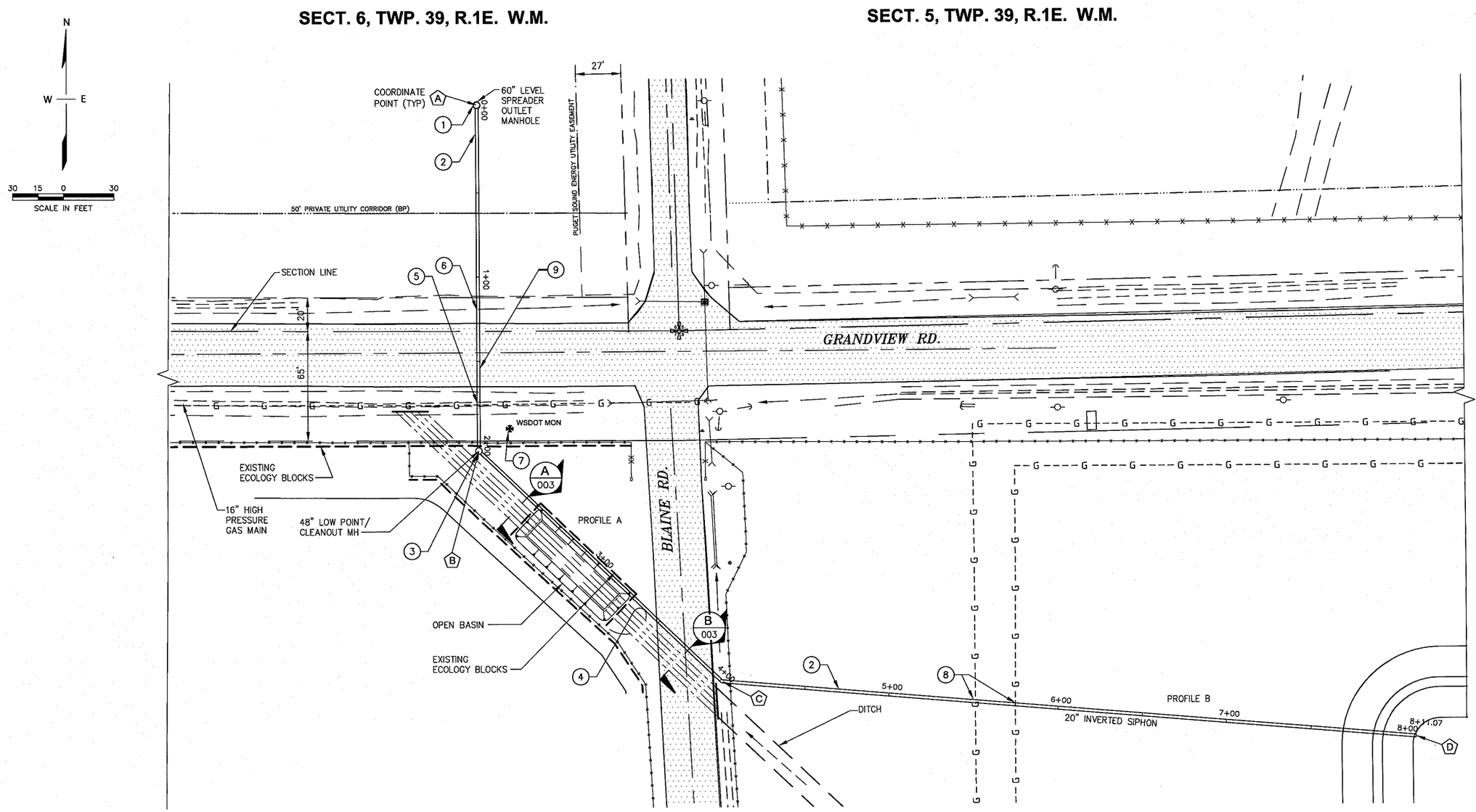

KEY NOTES:

1. INSTALL 60" LEVEL SPREADER MH TYPE 2, SEE SHEET 004/DETAIL 3.
2. INSTALL 20" DIA C905 PVC INVERTED SIPHON STORM DRAIN.
3. INSTALL 48" LOW POINT/CLEANOUT MH TYPE 2, SEE SHEET 004/DETAIL 4.
4. FIVE CULVERTS FOR BROWN ROAD MITIGATION PROJECT (NOT IN CONTRACT).
5. 16" GAS MAIN CROSSING. SEE PROFILE A ON DWG 003 FOR ACTUAL CLEARANCE.
6. MAINTAIN 6" MIN. COVER OVER SIPHON IN DITCH. SEE SHEET 009/ DETAIL 5.
7. WSDOT MONUMENT.
8. 16" GAS MAIN CROSSING SEE PROFILE B ON DWG 003 FOR COVER AND CLEARANCES.
9. SEE SHEET 004/DETAIL 6 FOR TRENCH REPAIR.

INVERTED SIPHON COORDINATES				
POINT	STATION	NORTHING	EASTING	DESCRIPTION
A	0+00	15426.3616	9723.8484	60" LEVEL SPREADER MH
B	2+03	15221.1803	9723.8953	48" LOW POINT/CLEANOUT MH
C	4+01	15084.0089	9866.6915	45° HORIZONTAL BEND
*D	8+11	15049.2368	10276.6923	INLET OF 20" INVERTED SIPHON

* CONNECT TO 20" DISCHARGE PIPE AT DETENTION POND NO.1
SEE SHEET 003 FOR ELEVATIONS

PLAN
SCALE: 1" = 30'-0"

DETENTION POND NO.1:

TOP OF BERM	= EL. 108.00
HIGH WTR/OVERFLOW	= EL. 107.00
20" DISCHARGE PIPE	= I.E. 101.00

HORIZONTAL AND VERTICAL DATUM BASED ON "BP CHERRY POINT REFINERY" LOCAL COORDINATE GRID

VERTICAL EQUATION
BP DATUM + 3.947 FT
= WSDOT & WHATCOM COUNTY
(NOTE: WSDOT = NAVD '88)

JOHN F. GILLESPIE, STATE OF WASHINGTON, 31993, REGISTERED PROFESSIONAL ENGINEER, 1-11-08
EXPIRES: 9/10/09

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.
–	–	–	–	–	–CO–CEN–		

OPER. –

DWG. NO.
DR. HWJ/TP
CKD. JFG
APPROVALS –

REFERENCE DRAWINGS
–
–

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
20" INVERTED SIPHON – PLAN

DATE PRELIM. 12–21–07 | SCALE AS NOTED | AUTH 008LW
ENGINEERING CONTRACTOR: URS CORPORATION
PROJECT NO: 4006A0
DWG. NO. 002
REVISION 0

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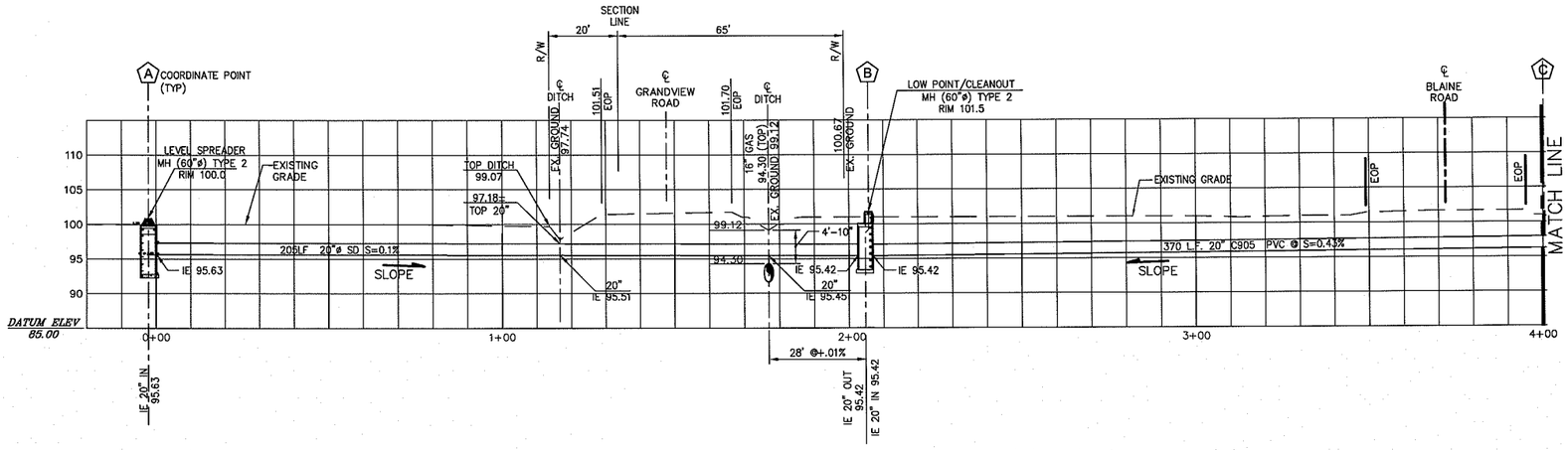


PROFILE A

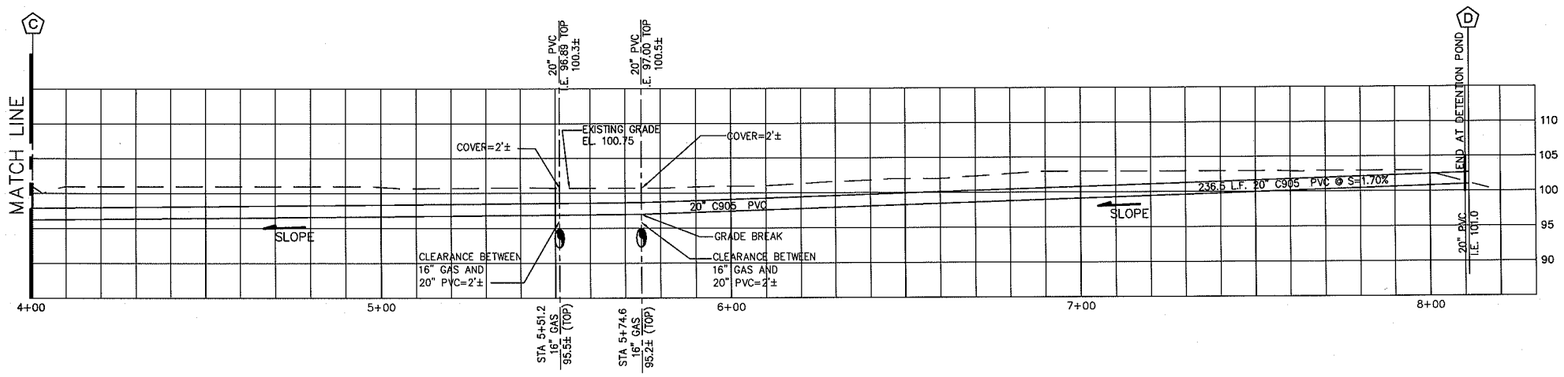
SCALE: AS SHOWN

0 5 10 20
1" = 5' (VER.)

0 10 20 30
1" = 10' (HOR.)

NOTE:

1. SEE INVERTED SIPHON COORDINATE TABLE ON SHEET 002.

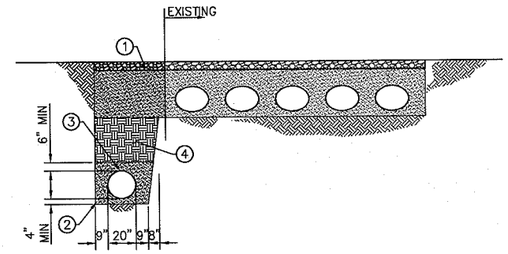


PROFILE B

SCALE: AS SHOWN

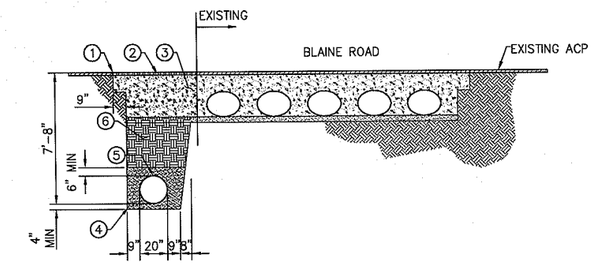
0 5 10 20
1" = 5' (VER.)

0 10 20 30
1" = 10' (HOR.)



1. CRUSHED SURFACING BASE COURSE OF GRAVEL AREA WITHIN FENCE (6 TO 12 INCHES THICK MIN.) COMPACT TO 90% OF MAXIMUM DENSITY AS PER SECTION 2-03.3(14) OF THE WSDOT STANDARD SPECIFICATIONS 2008. FOR TRENCH REPAIR IN NON-PAVED AND NON-GRAVEL AREAS, BACKFILL WITH NATIVE MATERIAL, AS PER SECTION 7-08.3(3) IN WSDOT STANDARD SPECIFICATIONS 2008.
2. PIPE BEDDING MATERIAL SHALL BE FURNISHED, PLACED AND COMPACTED IN CONFORMANCE WITH THE REQUIREMENTS OF SECTIONS 7-08.3(3) AND 9-03.12(3) IN WSDOT STANDARD SPECIFICATIONS 2008.
3. C905 PVC (20") INVERTED SIPHON STORMWATER PIPELINE FOR THE CO-GEN PROJECT.
4. SUITABLE BACKFILL MATERIAL, THICKNESS VARIES, SHALL BE FURNISHED, PLACED AND COMPACTED IN CONFORMANCE WITH THE REQUIREMENTS OF SECTION IN WSDOT STANDARD SPECIFICATIONS 2008.

SECTION A / 002
SCALE: N.T.S.



1. THE EXISTING PAVEMENT SHALL BE SAWCUT AND THE PAVEMENT REMOVED SO AS TO PROVIDE A FIRM, NEAT, STRAIGHT, VERTICAL EDGE TO JOIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE EDGE. A TACK COAT SHALL BE UNIFORMLY APPLIED TO ALL EDGES TO BE JOINED AND LAPPING SIX (6) INCHES OVER THE EXISTING PAVEMENT. THE LINES FROM THE NEW ASPHALT PAVEMENT SHALL BE RAKED OVER THE TOP COAT, FEATHERED AND ROLLED OR TAMPERED TO SEAL THE JOINT. THE JOINT SHALL BE SEALED PER SECTION 5-04 OF THE WSDOT STANDARD SPECIFICATIONS 2008 ADDITIONAL CUTS MAY BE REQUIRED TO PROTECT BROKEN OR DAMAGED EDGES.
2. CLASS B ASPHALT CONCRETE, 3 INCHES THICK (MIN), SHALL BE FURNISHED, PLACED AND COMPACTED IN CONFORMANCE WITH SECTION 5-04 OF THE WSDOT STANDARD SPECIFICATIONS 2008.
3. CONTROLLED DENSITY FILL (CDF) SHALL BE FURNISHED AND PLACED IN CONFORMANCE WITH THE REQUIREMENTS OF SECTION 2-09.3(1)E IN WSDOT STANDARD SPECIFICATIONS 2008. CDF SHALL BE USED UNDER BLAINE ROAD AND GRANDVIEW ROAD.
4. PIPE BEDDING MATERIAL SHALL BE FURNISHED, PLACED AND COMPACTED IN CONFORMANCE WITH THE REQUIREMENTS OF SECTIONS 7-08.3(3) AND 9-03.12(3) IN WSDOT STANDARD SPECIFICATIONS 2008.
5. C905 PVC (20") INVERTED SIPHON STORMWATER PIPELINE FOR THE CO-GEN PROJECT.
6. SUITABLE BACKFILL MATERIAL, THICKNESS VARIES, SHALL BE FURNISHED, PLACED AND COMPACTED IN CONFORMANCE WITH THE REQUIREMENTS OF SECTION IN WSDOT STANDARD SPECIFICATIONS 2008.

SECTION B / 002
SCALE: N.T.S.

HORIZONTAL AND VERTICAL DATUM
BASED ON 'BP CHERRY POINT REFINERY'
LOCAL COORDINATE GRID

VERTICAL EQUATION
BP DATUM + 3.947 FT
= WSDOT & WHATCOM COUNTY
(NOTE: WSDOT = NAVD '88)

JOHN F. GILLESPIE
STATE OF WASHINGTON
31993
REGISTERED PROFESSIONAL ENGINEER
1-11-08
EXPIRES: 9/10/09

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.
-	-	-	-	-	-CO-GEN-		

DWG. NO.
DR. HWJ/TP
CKD. JFG
APPROVALS
OPER.

REFERENCE DRAWINGS

BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

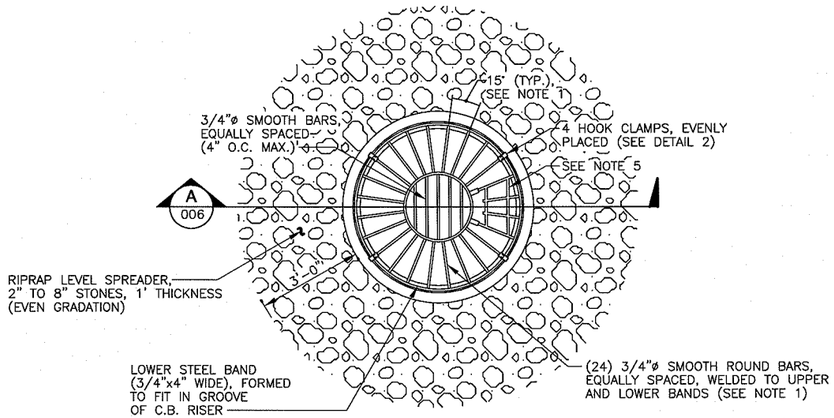
OFFSITES-UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
20" INVERTED SIPHON - PROFILE

DATE PRELIM. 12-21-07 | SCALE AS NOTED | AUTH 008LW

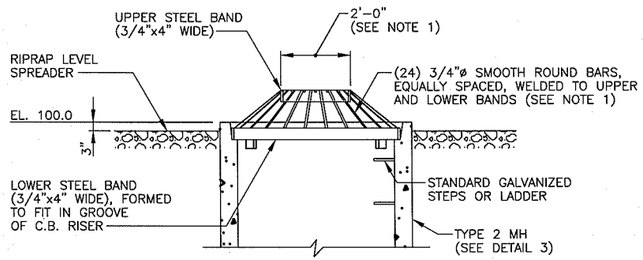
ENGINEERING CONTRACTOR
URS CORPORATION
PROJECT NO: 4006A0

DWG. NO. 003
REVISION 0

P:\ACAD\PROJECT\BP\COGEN\R04\Sheet 3.dwg Jan 14, 2008 - 8:36am



PLAN



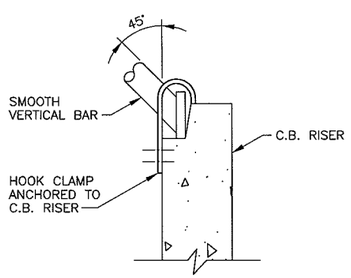
SECTION A

NOTES:

1. DIMENSIONS ARE FOR ILLUSTRATION ON 54"ø C.B.. FOR DIFFERENT DIAMETER C.B.s, ADJUST TO MAINTAIN 45° ANGLE ON "VERTICAL" BARS AND 7" O.C. MAXIMUM SPACING OF BARS AROUND LOWER STEEL BAND.
2. METAL PARTS MUST BE CORROSION RESISTANT; STEEL BARS MUST BE GALVANIZED.
3. THIS DEBRIS BARRIER IS ALSO RECOMMENDED FOR USE ON THE INLET TO ROADWAY CROSS-CULVERTS WITH HIGH POTENTIAL FOR DEBRIS COLLECTION (EXCEPT ON TYPE 2 STREAMS).
4. THIS DEBRIS BARRIER IS FOR USE OUTSIDE OF ROAD RIGHT-OF-WAY ONLY.
5. PROVIDE MAINTENANCE ACCESS BY WELDING 4 CROSSBARS TO 4 VERTICAL BARS AS SHOWN. HINGE UPPER ENDS WITH FLANGE BOLTS AND PROVIDE LOCKING MECHANISM (PADLOCK) ON LOWER END. LOCATE STEPS DIRECTLY BELOW.

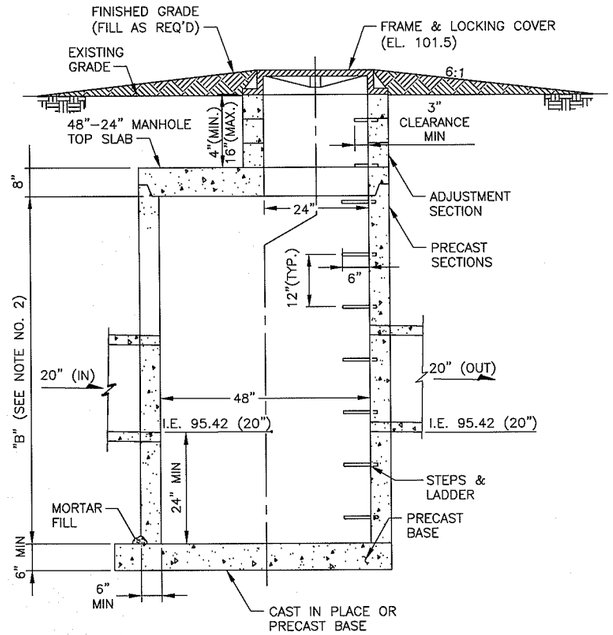
LEVEL SPREADER MANHOLE

DETAIL 1/002
SCALE: N.T.S.



HOOK CLAMP

DETAIL 2/006
SCALE: N.T.S.

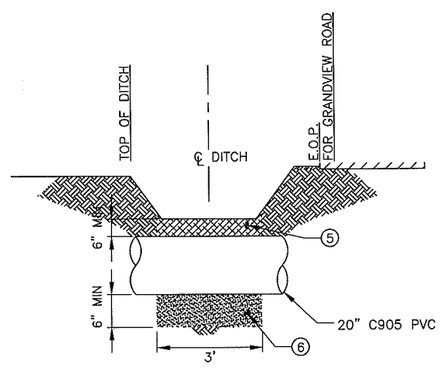


NOTES:

1. WALL OPENING REQUIREMENTS FOR PIPE:
   A. HOLE SIZE TO EQUAL PIPE O.D. PLUS MANHOLE WALL THICKNESS.
   B. 8" MINIMUM BETWEEN HOLES.
   C. MAXIMUM HOLE SIZE 36".
2. NO STEPS REQUIRED WHEN "B" IS 4' OR LESS.
3. PLACE AND COMPACT A 4-INCH THICK GRAVEL BASE BELOW MANHOLE. USE FOUNDATION GRAVEL (TYPE D) AND EXTEND A MINIMUM OF 12" BEYOND MANHOLE.

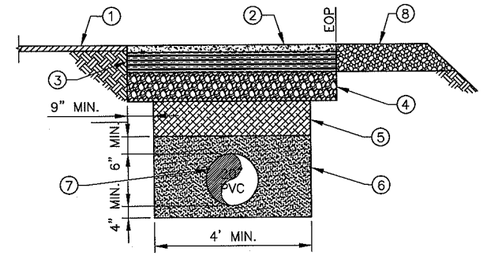
TYPE 2- 48"Ø LOW POINT/CLEANOUT MANHOLE

DETAIL 4/002
SCALE: N.T.S.



DITCH CROSSING
NORTH SIDE GRANDVIEW

DETAIL 5/002
SCALE: N.T.S.

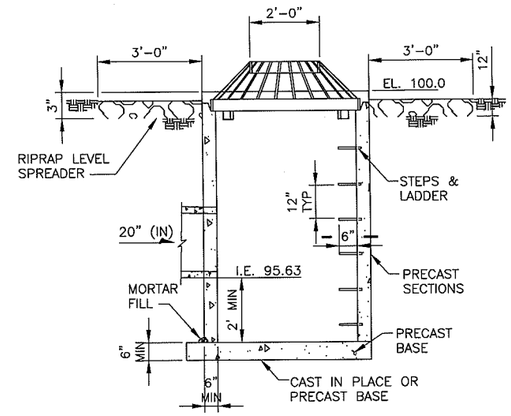


GRANDVIEW ROAD TRENCH REPAIR

DETAIL 6/002
SCALE: NTS

NOTES

1. FOR TRENCH REPAIR OUTSIDE OF PAVED AREA AND GRAVEL SHOULDER, EXTEND SUITABLE BACKFILL MATERIAL TO WITHIN 6 INCHES OF FINISH GRADE AND PLACE SUITABLE TOP SOIL IN THE TOP 6-INCHES.



NOTES:

1. WALL OPENING REQUIREMENTS FOR PIPE:
   A. HOLE SIZE TO EQUAL PIPE O.D. PLUS MANHOLE WALL THICKNESS.
   B. 8" MINIMUM BETWEEN HOLES.
   C. MAXIMUM HOLE SIZE 36".
2. NO STEPS REQUIRED WHEN "B" IS 4' OR LESS.
3. PLACE AND COMPACT A 4-INCH THICK GRAVEL BASE BELOW MANHOLE. USE FOUNDATION GRAVEL (TYPE D) AND EXTEND A MINIMUM OF 12" BEYOND MANHOLE.

TYPE 2 - 60"Ø OUTLET MANHOLE
LEVEL SPREADER MH

DETAIL 3/002
SCALE: N.T.S.

KEY:

1. THE EXISTING PAVEMENT SHALL BE SAWCUT AND THE PAVEMENT REMOVED SO AS TO PROVIDE A FIRM, NEAT, STRAIGHT, VERTICAL EDGE TO JOIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE EDGE. A TACK COAT SHALL BE UNIFORMLY APPLIED TO ALL EDGES TO BE JOINED AND LAPPING SIX (6) INCHES OVER THE EXISTING PAVEMENT. THE LINES FROM THE NEW ASPHALT PAVEMENT SHALL BE RACKED OVER THE TACK COAT, FEATHERED AND ROLLED OR TAMPERED TO SEAL THE JOINT. THE JOINT SHALL BE SEALED PER THE WSDOT STANDARD SPECIFICATIONS 2008. ADDITIONAL CUTS MAY BE REQUIRED TO PROTECT BROKEN OR DAMAGED EDGES.
2. CLASS B ASPHALT CONCRETE, 3 INCHES THICK (MIN.), SHALL BE FURNISHED, PLACED AND COMPACTED IN CONFORMANCE WITH THE WSDOT STANDARD SPECIFICATIONS 2008.
3. ASPHALT TREATED BASE, 7-INCHES THICK (MIN.), SHALL BE FURNISHED, PLACED AND COMPACTED IN CONFORMANCE WITH WSDOT STANDARD SPECIFICATIONS 2008.
4. AGGREGATE FOR GRAVEL BASE, 10-INCHES THICK (MIN.), SHALL BE FURNISHED, PLACE AND COMPACTED IN CONFORMANCE WITH THE WSDOT/APWA STANDARD SPECIFICATIONS 2006. MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 9-03.10 IN WSDOT STANDARD SPECIFICATIONS 2008.
5. SUITABLE BACKFILL MATERIAL, THICKNESS VARIES, SHALL BE FURNISHED, PLACE AND COMPACTED IN CONFORMANCE WITH THE REQUIREMENTS OF SECTION 7-08.3(3) IN WSDOT STANDARD SPECIFICATIONS 2008.
6. PIPE BEDDING MATERIAL SHALL BE FURNISHED, PLACED AND COMPACTED IN CONFORMANCE WITH THE REQUIREMENTS OF SECTIONS 7-08.3(3) AND 9-03.12(3) IN WSDOT STANDARD SPECIFICATIONS 2008.
7. FURNISH AND INSTALL THE 20-INCH DIAMETER C905 PVC SIPHON PIPE, IN CONFORMANCE WITH THE REQUIREMENTS OF SECTIONS 7-04 AND 9-30.1(5)A IN WSDOT STANDARD SPECIFICATIONS 2008.
8. CRUSHED SURFACING BASE COURSE OR GRAVEL BASE AT SHOULDERS (10 INCHES THICK MIN.). FURNISH, PLACE, AND COMPACT AS PER WSDOT STANDARD SPECIFICATIONS 2008.

LEGEND:

- PIPE BEDDING
- BACKFILL MATERIAL
- GRAVEL BASE
- ATB
- CLASS "B" ACP
- CR. SURFACING BASE COURSE
- EXISTING GROUND
- RIP RAP
- EXISTING PAVEMENT

JOHN E. GILLESPIE, STATE OF WASHINGTON, 9993, REGISTERED PROFESSIONAL ENGINEER, 1-17-08
EXPIRES: 9/10/09

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

DWG. NO.
DR. TP
CKD. JAP
APPROVALS
OPER.

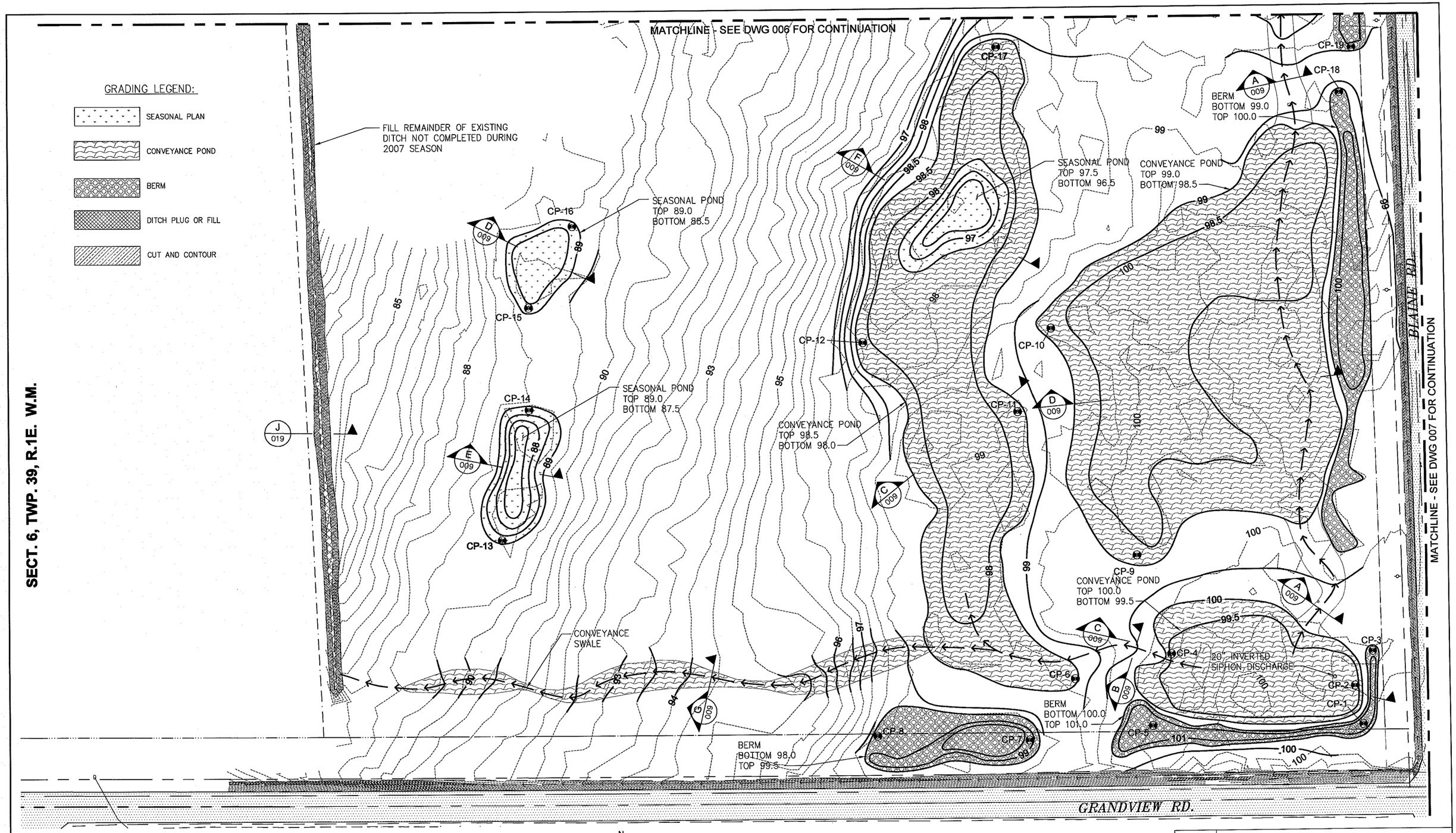
REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES-UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
20" INVERTED SIPHON - DETAILS

DATE PRELIM. 12-21-07 | SCALE AS NOTED | AUTH 008LW
ENGINEERING CONTRACTOR URS CORPORATION
PROJECT NO: 4006A0
DWG. NO. 004
REVISION 0

P:\ACAD\PROJECT\BP\COGEN\R04\Sheet 4.dwg Jan 14, 2008 - 8:36am



NOTE:
CONTOURS=0.5 FT INTERVALS

HORIZONTAL AND VERTICAL DATUM BASED ON 'BP CHERRY POINT REFINERY' LOCAL COORDINATE GRID

VERTICAL EQUATION
BP DATUM + 3.947 FT
= WSDOT & WHATCOM COUNTY
(NOTE: WSDOT = NAVD '88)

LEGEND
CONVEYANCE SWALE
EXISTING FENCE

SCALE 1" =50 FEET (50 0 50 100)

N — W — E

CMA 2B | CMA 1B | CMA 2A | CMA 1A

DARREL J. GUERRERO, STATE OF WASHINGTON, 30392, REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 08/21/07

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.
–	–	–	–		–CO-GEN–		

DWG. NO.
DR. HWJ/TP
CKD. JFG
APPROVALS
–
OPER. –

REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
GRADING PLAN – CMA 2A

DATE PRELIM. 12–21–07 | SCALE AS NOTED | AUTH 009LW

ENGINEERING CONTRACTOR
URS CORPORATION
PROJECT NO: 4006A0

DWG. NO. 005 | REVISION 0

P:\ACAD\PROJECT\BP\COGEN\R04\Sheet 5.dwg Jan 14, 2008 – 9:09am

SEASONAL POND
TOP 67.0
BOTTOM 65.5

BERM
BOTTOM 75.5
TOP 76.5

CP-40

CP-37

SEASONAL POND
TOP 75.5
BOTTOM 75.0

CONVEYANCE CUT
TOP 72.5
BOTTOM 72.0

CP-39

CP-38

CP-36

SEASONAL POND
TOP 89.5
BOTTOM 89.0

BERM
BOTTOM 94.0
TOP 94.5

CP-32

CP-33

CP-34

CP-35

SEASONAL POND
TOP 92.5
BOTTOM 91.0

CP-30

CP-31

SEASONAL POND
TOP 97.0
BOTTOM 96.5

CP-29

BERM
BOTTOM 96.0
TOP 97.0

CP-28

CP-27

STAGING
AREA
(TEMP.)

CP-26

BERM
BOTTOM 97.0
TOP 98.0

CP-25

CONVEYANCE POND
TOP 97.0
BOTTOM 96.5

CP-24

CP-23

BERM
BOTTOM 98.0
TOP 98.5

CP-21

CP-20

CP-22

CONVEYANCE POND
TOP 97.5
BOTTOM 97.0

FILL REMAINDER OF EXISTING
DITCH NOT COMPLETED DURING
2007 SEASON

SECT. 6, TWP. 39, R.1E. W.M.

MATCHLINE - SEE DWG 008 FOR CONTINUATION

MATCHLINE - SEE DWG 005 FOR CONTINUATION

NOTE:
CONTOURS=0.5 FT INTERVALS

HORIZONTAL AND VERTICAL DATUM
BASED ON "BP CHERRY POINT REFINERY"
LOCAL COORDINATE GRID

VERTICAL EQUATION
BP DATUM + 3.947 FT
= WSDOT & WHATCOM COUNTY
(NOTE: WSDOT = NAVD '88)

LEGEND
CONVEYANCE SWALE
EXISTING FENCE

SCALE 1" =50 FEET

CMA 2B | CMA 1B | CMA 2A | CMA 1A

EXPIRES: 08/21/07

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.
–	–	–	–		–CO–GEN–		

OPER. –

DWG. NO.
DR. HWJ/TP
CKD. JFG
APPROVALS

REFERENCE DRAWINGS

BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
GRADING PLAN – CMA 2B

DATE PRELIM. 12–21–07 | SCALE AS NOTED | AUTH 008LW

ENGINEERING CONTRACTOR
URS CORPORATION

PROJECT NO: 4006A0

DWG. NO. 006

REVISION 0

P:\ACAD\PROJECT\BP\COGEN\R04\Sheet 6.dwg Jan 14, 2008 – 9:09am

MATCHLINE - SEE DWG 008 FOR CONTINUATION

SEASONAL POND
TOP 98.0
BOTTOM 96.5

SEASONAL POND
TOP 98.5
BOTTOM 97.0

SEASONAL POND
TOP 98.0
BOTTOM 96.5

SEASONAL POND
TOP 98.5
BOTTOM 97.0

CP-74
CP-77
CP-73
CP-72
CP-71
CP-70
CP-69
CP-66
CP-67
CP-65
CP-64
CP-3
CP-60
CP-62
CP-63
CP-61

PLUG SWALE TO
DIRECT FLOW
TO NORTH

BLAINE RD.

GRANDVIEW RD.

MATCHLINE - SEE DWG 006 FOR CONTINUATION

SECT. 5, TWP. 39, R.1E. W.M.

NOTE:
CONTOURS=0.5 FT INTERVALS

HORIZONTAL AND VERTICAL DATUM
BASED ON 'BP CHERRY POINT REFINERY'
LOCAL COORDINATE GRID

VERTICAL EQUATION
BP DATUM + 3.947 FT
= WSDOT & WHATCOM COUNTY
(NOTE: WSDOT = NAVD '88)

LEGEND
CONVEYANCE SWALE
EXISTING FENCE

PLAN
50 0 50 100
SCALE 1" =50 FEET

N
W — E

CMA 2B | CMA 1B
CMA 2A | CMA 1A

DARIA J. GUERRERO
STATE OF WASHINGTON
MSA
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 08/21/07

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.
–	–	–	–	–	–CO–GEN–		

OPER. –

DWG. NO.
DR. HWJ/TP
CKD. JFG
APPROVALS
–

REFERENCE DRAWINGS
–
–
–

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
GRADING PLAN – CMA 1A

DATE PRELIM. 12–21–07 | SCALE AS NOTED | AUTH 008LW

ENGINEERING CONTRACTOR
URS CORPORATION

PROJECT NO: 40060

DWG. NO. 007

REVISION 0

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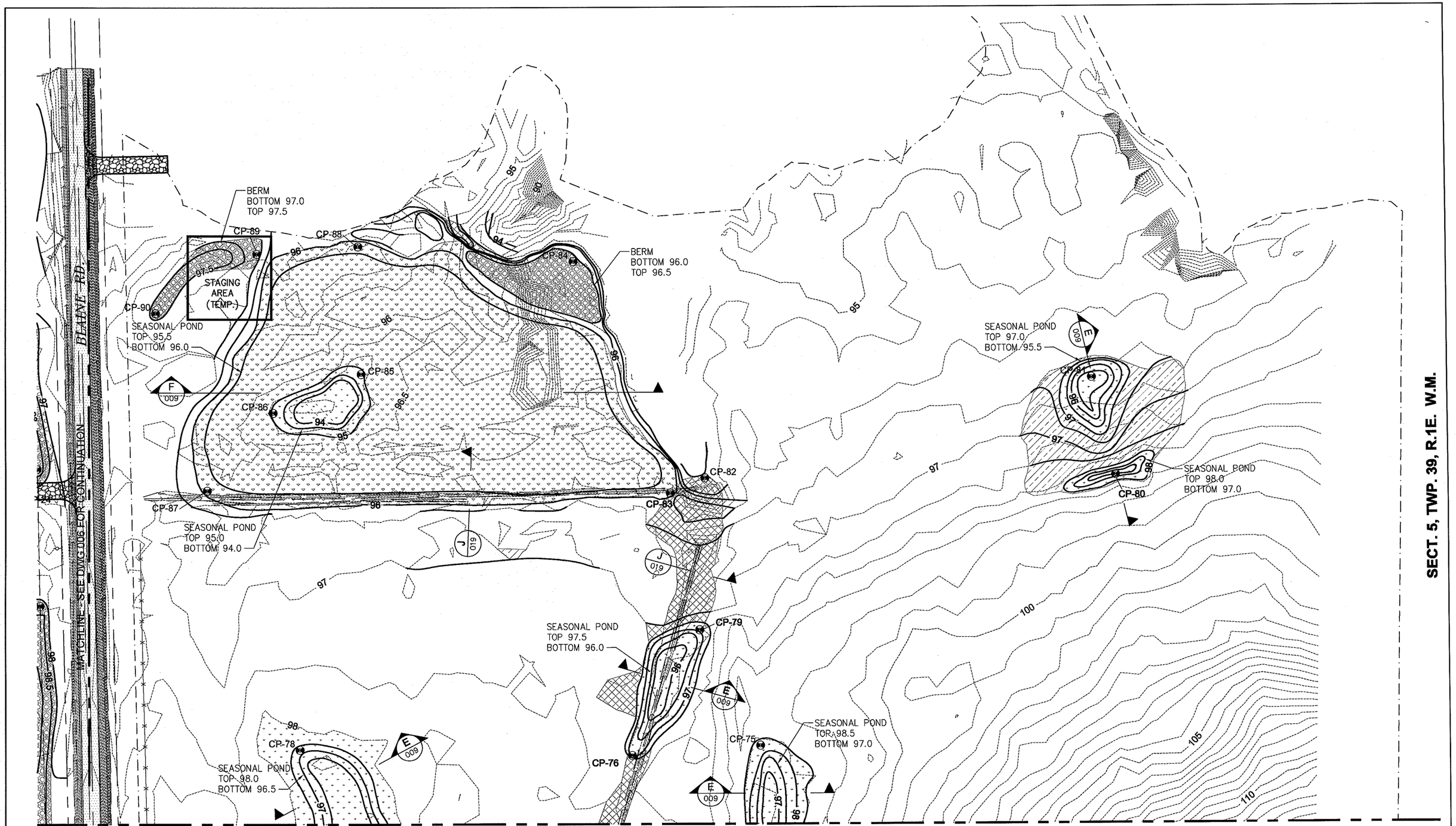


NOTE:
CONTOURS=0.5 FT INTERVALS

HORIZONTAL AND VERTICAL DATUM
BASED ON 'BP CHERRY POINT REFINERY'
LOCAL COORDINATE GRID

VERTICAL EQUATION
BP DATUM + 3.947 FT
= WSDOT & WHATCOM COUNTY
(NOTE: WSDOT = NAVD '88)

LEGEND
CONVEYANCE SWALE
EXISTING FENCE

50 0 50 100
SCALE 1" =50 FEET

N
W — E

CMA 2B | CMA 1B
CMA 2A | CMA 1A

DARLA J. GUARERO
STATE OF WASHINGTON
PROFESSIONAL ENGINEER
EXPIRES: 08/21/07

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

-CD-OEN-

OPER. —

DWG. NO.
DR. HWJ/TP
CKD. JFG
APPROVALS

REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES-UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
GRADING PLAN - CMA 1B

DATE PRELIM. 12-21-07 | SCALE AS NOTED | AUTH 008LW

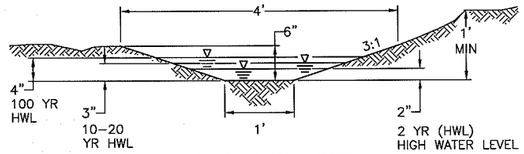
ENGINEERING CONTRACTOR
URS CORPORATION

PROJECT NO: 4006A0

DWG. NO. 008

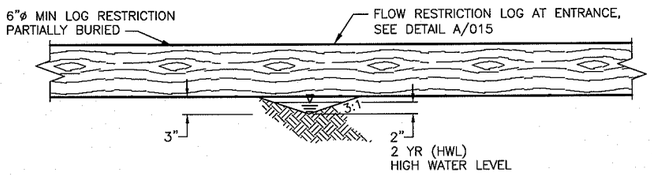
REVISION 0

P:\ACAD\PROJECT\BP\COGEN\R04\Sheet 8.dwg Jan 14, 2008 - 9:09am



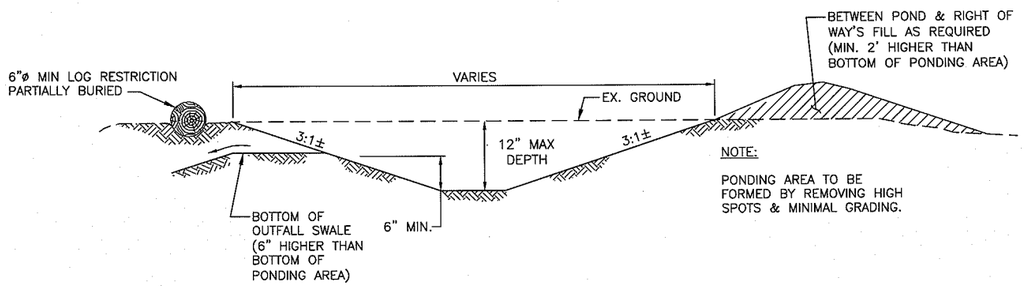
TYPICAL SWALE CROSS-SECTION

SECTION A
SCALE: NTS
A 005/006



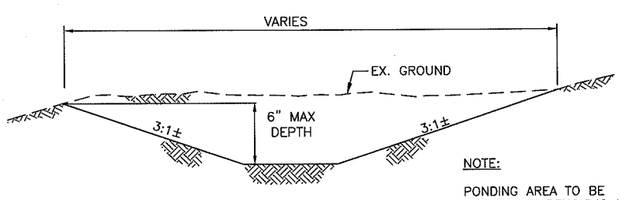
FLOW RESTRICTION CROSS-SECTION

SECTION B
SCALE: NTS
B 005



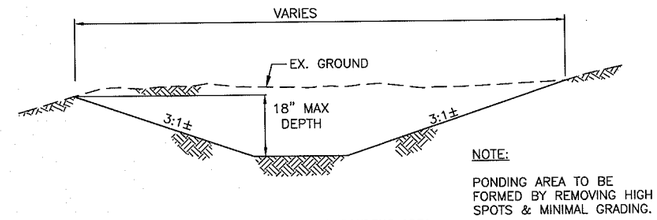
CONVEYANCE POND CROSS-SECTION

SECTION C
SCALE: NTS
C 005



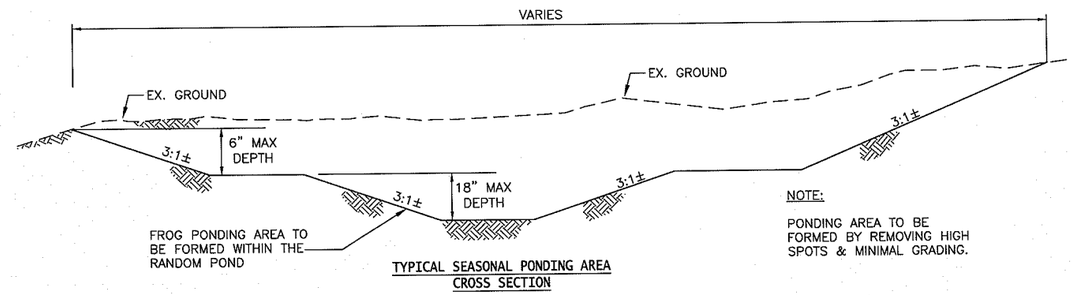
TYPICAL SEASONAL PONDING AREA
CROSS SECTION

SECTION D
SCALE: NTS
D 005/006



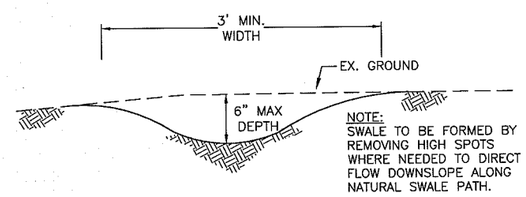
TYPICAL SEASONAL PONDING AREA
CROSS SECTION

SECTION E
SCALE: NTS
E 004/005/006/007/008



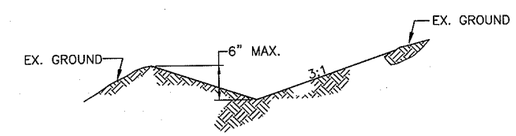
TYPICAL SEASONAL PONDING AREA
CROSS SECTION

SECTION F
SCALE: NTS
F 004/005/006/008



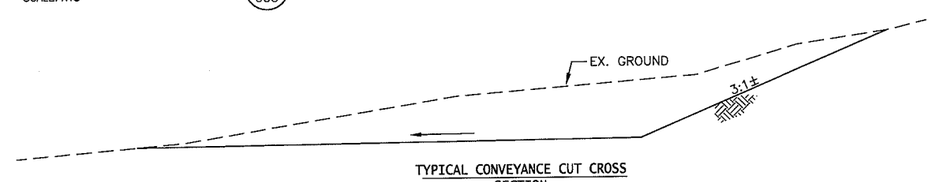
SWALE CROSS SECTION

SECTION G
SCALE: NTS
G 005



SWALE CROSS SECTION

SECTION H
SCALE: NTS
H 007



TYPICAL CONVEYANCE CUT CROSS
SECTION

SECTION I
SCALE: NTS
I 006

HORIZONTAL AND VERTICAL DATUM
BASED ON 'BP CHERRY POINT REFINERY'
LOCAL COORDINATE GRID

VERTICAL EQUATION
BP DATUM + 3.947 FT
= WSDOT & WHATCOM COUNTY
(NOTE: WSDOT = NAVD '88)

DARLA J. GUERRERO
STATE OF WASHINGTON
PROFESSIONAL ENGINEER
EXPIRES: 08/21/07

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.
–			–	–	–	–	–

DWG. NO.
DR. HWJ/TP
CKD. RS
APPROVALS
OPER.

REFERENCE DRAWINGS

BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
GRADING PLAN – SECTIONS

DATE PRELIM. 12-21-07 | SCALE AS NOTED | AUTH 008LW

ENGINEERING CONTRACTOR
URS CORPORATION
PROJECT NO: 4006A0

DWG. NO. 009
REVISION 0

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GRADING COORDINATES – CMA2		
POINT #	NORTHING	EASTING
CP–1	15368.9937	9757.5941
CP–2	15415.3109	9748.3611
CP–3	15457.0426	9770.3503
CP–4	15455.9165	9527.3012
CP–5	15369.5283	9503.4615
CP–6	15426.9120	9410.9193
CP–7	15353.6811	9354.9004
CP–8	15360.1766	9172.4223
CP–9	15575.2810	9486.9668
CP–10	15849.8696	9387.2006
CP–11	15749.6105	9345.6282
CP–12	15834.6908	9160.6305
CP–13	15599.6110	8724.1606
CP–14	15756.7752	8758.1217
CP–15	15879.7485	8758.7766
CP–16	15977.9300	8812.0368
CP–17	16189.5838	9325.5276
CP–18	16130.9737	9739.6986
CP–19	16185.0448	9755.3732
CP–20	16486.5008	9759.2210
CP–21	16508.0004	9648.4618
CP–22	16448.6211	9512.8241
CP–23	16551.4494	9653.5518
CP–24	16650.9744	9755.5413
CP–25	16763.9213	9661.4881
CP–26	16832.5752	9743.3066
CP–27	16940.1975	9707.0507
CP–28	17083.1723	9734.1231
CP–29	16935.3058	9543.2617
CP–30	17067.0169	9448.3303
CP–31	16926.2782	9315.8401
CP–32	16969.9203	9204.2854
CP–33	16865.9712	9049.7390
CP–34	16712.9649	9135.9446
CP–35	16668.9028	8952.5369
CP–36	16980.6240	8980.0335
CP–37	17088.8446	8516.5340
CP–38	16874.5519	8456.8246
CP–39	16862.8615	8356.0928
CP–40	17045.4784	8169.5012

GRADING COORDINATES – CMA1		
POINT #	NORTHING	EASTING
CP–60	15355.8933	10202.2875
CP–61	15323.5549	11006.0815
CP–62	15342.0236	11036.2545
CP–63	15330.5376	11058.1422
CP–64	15562.0204	10580.4416
CP–65	15746.3780	10317.3383
CP–66	15792.6099	10151.9526
CP–67	15684.1037	10023.8154
CP–69	15927.9813	10369.3391
CP–70	15921.5550	10593.4542
CP–71	15926.1913	10655.3830
CP–72	15990.1591	10440.3646
CP–73	16049.9665	10613.6946
CP–74	16216.2909	11272.6087
CP–75	16318.7337	10620.2017
CP–76	16306.8472	10467.1518
CP–77	16147.2427	10106.6661
CP–78	16314.1487	10069.3084
CP–79	16457.5603	10548.6471
CP–80	16642.6565	11048.2492
CP–81	16759.6753	11020.7567
CP–82	16639.9779	10555.6260
CP–83	16621.8138	10514.3370
CP–84	16900.2923	10399.9319
CP–85	16765.2154	10144.8128
CP–86	16718.5556	10038.6634
CP–87	16625.1132	9959.5871
CP–88	16918.4548	10141.4112
CP–89	16909.5828	10019.6486
CP–90	16838.3834	9897.9076

DARIA J. GUERRERO
STATE OF WASHINGTON
38828
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 08/21/07

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

DWG. NO.
DR. TP
CKD. JAP
APPROVALS
OPER.

REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
GRADING PLAN – COORDINATES

DATE PRELIM. 12–21–07 SCALE AS NOTED AUTH 008LW

ENGINEERING CONTRACTOR
URS CORPORATION
PROJECT NO: 40068A0

DWG. NO. 010

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OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
PONDS AND DITCH PLUGS – CMA2

DATE PRELIM.12-21-07 | SCALE AS NOTED | AUTH. 008LW

ENGINEERING CONTRACTOR
URS CORPORATION

PROJECT NO: 4006A0

DWG. NO. 011

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LEGEND

CUT = 934 CU.YDS CUT

FILL = 920 CU.YDS FILL

PROJECT SITE BOUNDARY

NOTE

1. SEE SHEET 010 FOR COORDINATE LOCATIONS

N

W — E

100' 50' 0 100'

SCALE: 1"=100'

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bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
PONDS AND DITCH PLUGS – CMA1

DATE PRELIM. 12–21–07 | SCALE AS NOTED | AUTH 008LW

ENGINEERING CONTRACTOR
URS CORPORATION

PROJECT NO: 4006A0

DWG. NO. 012

REVISION 0

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LEGEND

2008 TILLING AND SEEDING AREAS

NOTE

1. TILLING AND SEEDING AREAS WILL BE FIELD ADJUSTED BASED ON RESULTS OF 2007 WEED CONTROL ACTIVITIES.

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100' 50' 0 100'
SCALE: 1"=100'

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

DWG. NO.
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REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
TILLING AND SEEDING AREAS – CMA2

DATE PRELIM.12–21–07 | SCALE AS NOTED | AUTH 008LW

ENGINEERING CONTRACTOR
URS CORPORATION

PROJECT NO: 4006A0

DWG. NO. 013

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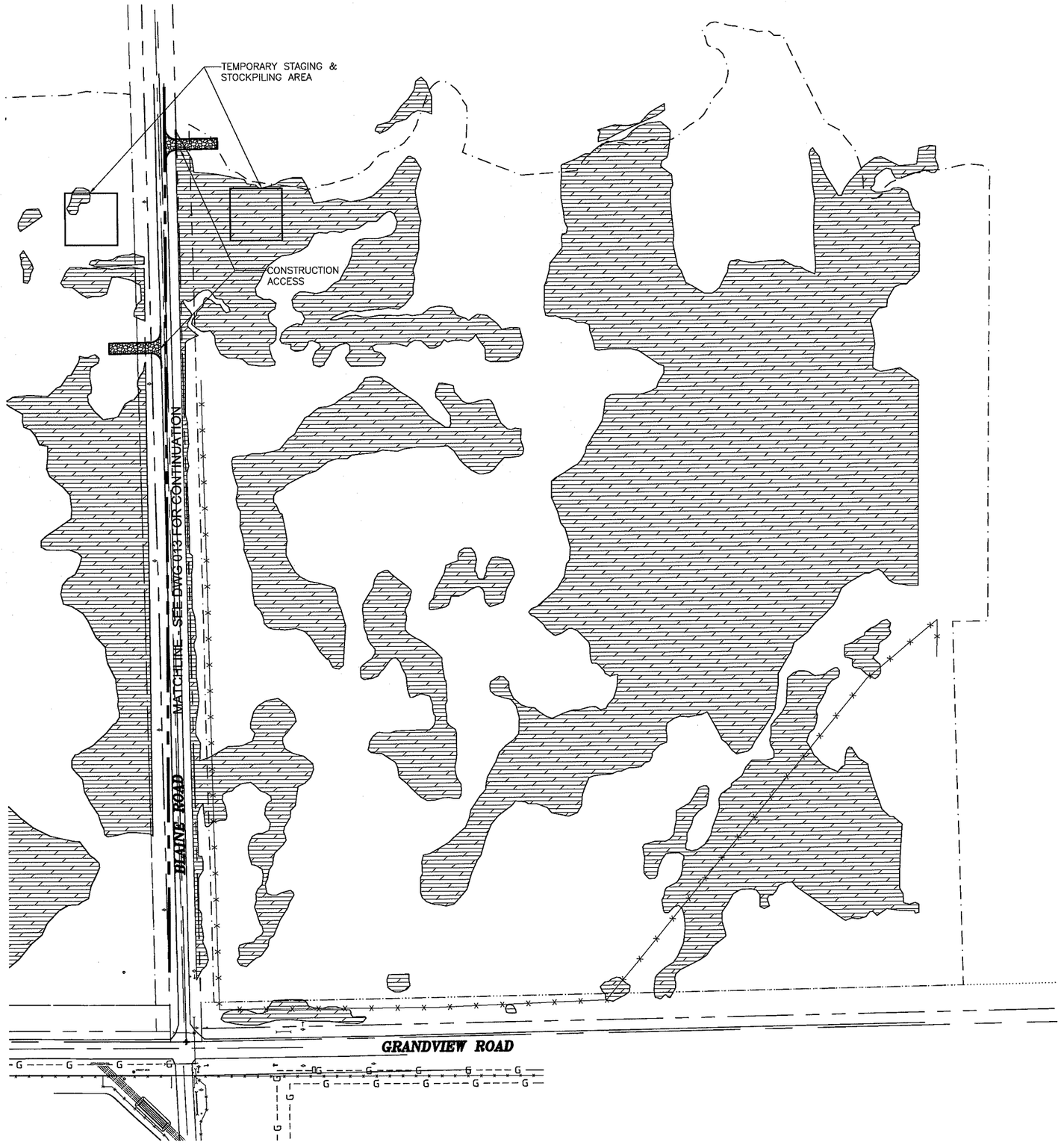

LEGEND

2007 TILLING AND SEEDING AREAS

NOTE

1. TILLING AND SEEDING AREAS WILL BE FIELD ADJUSTED BASED ON RESULTS OF 2007 WEED CONTROL ACTIVITIES.

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100' 50' 0 100'
SCALE: 1"=100'

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

OPER.

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Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
TILLING AND SEEDING AREAS – CMA1

DATE PRELIM.12–21–07 | SCALE AS NOTED | AUTH 008LW

ENGINEERING CONTRACTOR
URS CORPORATION

PROJECT NO: 4006A0

DWG. NO. 014

REVISION 0

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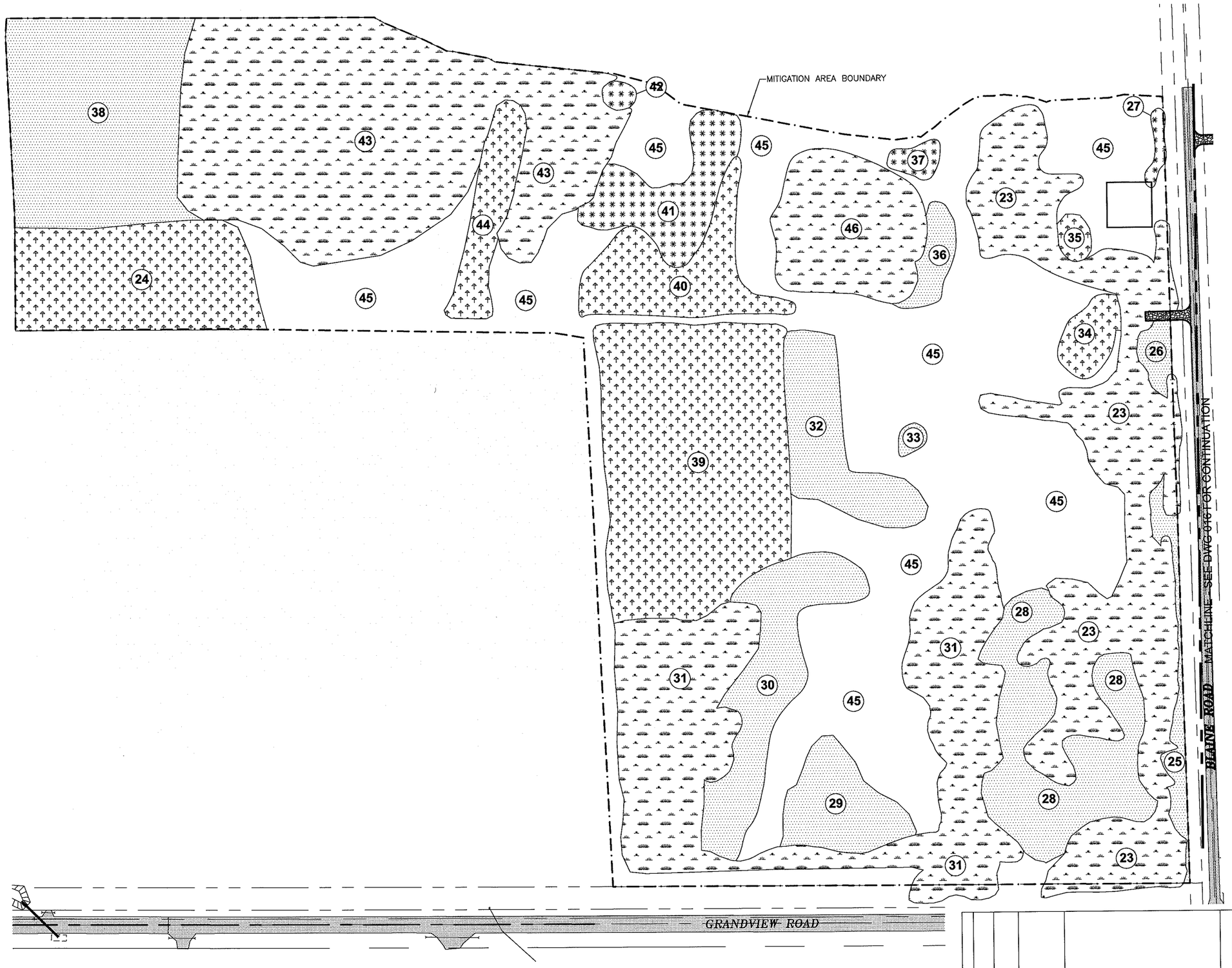

LEGEND

- HERBACEOUS–SEEDED ONLY
- EXISTING VEGETATION–NO PLANTING
- SEASONALLY SATURATED FOREST
- SEASONALLY INUNDATED FOREST
- UPLAND FOREST
- (25) PLANTING UNIT IDENTIFICATION NUMBER (SEE TABLE 2 ON SHEET 17)
- SITE BOUNDARY

N
W — E

100' 50' 0 100'
SCALE: 1"=100'

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

DWG. NO.
DR. TP
CKD. JAP
APPROVALS
OPER.

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Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
PLANTING DISTRIBUTION – CMA2

DATE PRELIM.12-21-07 | SCALE AS NOTED | AUTH 008LW
ENGINEERING CONTRACTOR URS CORPORATION
PROJECT NO: 4006A0
DWG. NO. 015
REVISION 0

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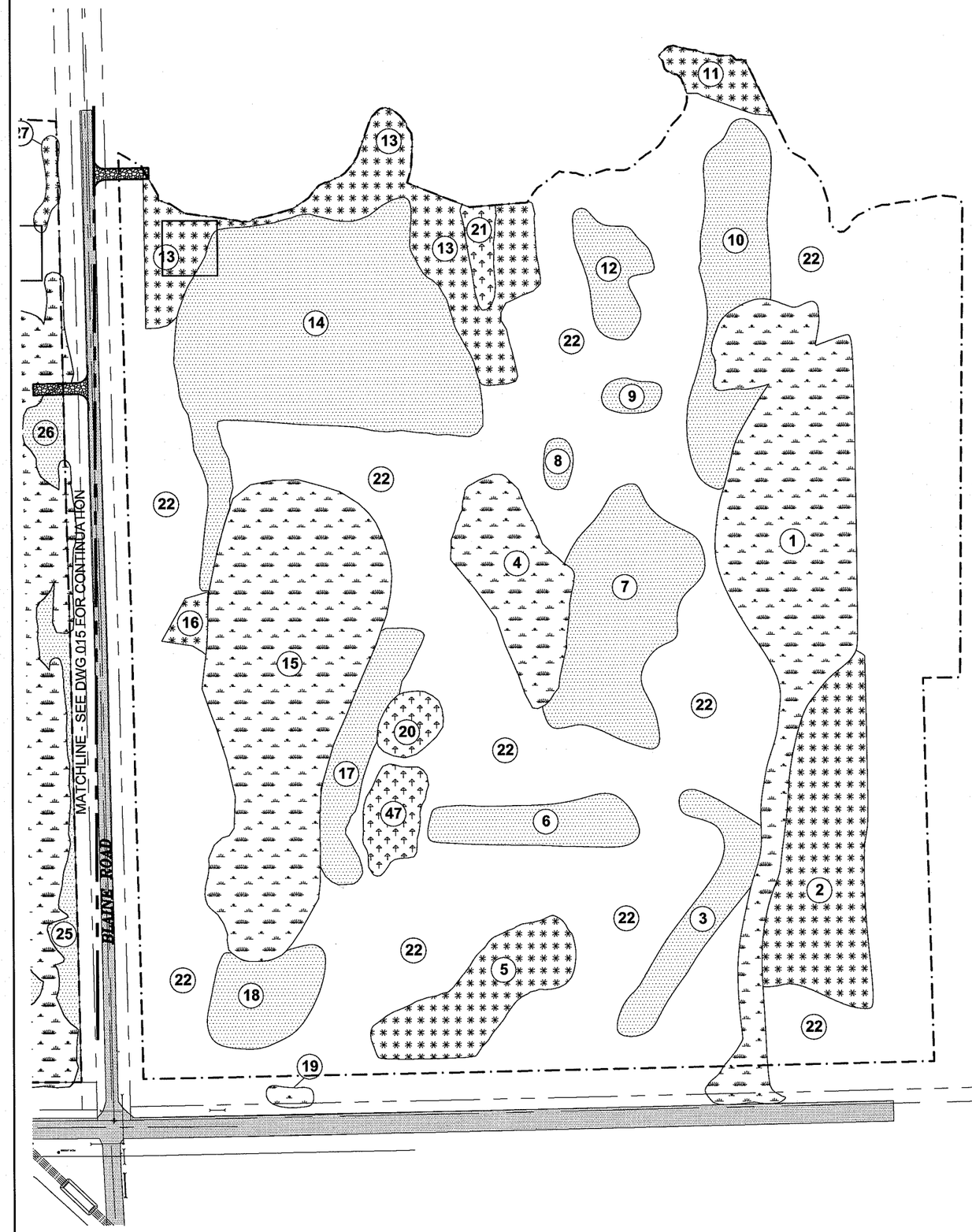

LEGEND

- HERBACEOUS–SEEDED ONLY
- EXISTING VEGETATION–NO PLANTING
- SEASONALLY SATURATED FOREST
- SEASONALLY INUNDATED FOREST
- UPLAND FOREST
- (25) PLANTING UNIT IDENTIFICATION NUMBER (SEE TABLE 2 ON SHEET 17)
- SITE BOUNDARY

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100' 50' 0 100'
SCALE: 1"=100'

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Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
PLANTING DISTRIBUTION – CMA1

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ENGINEERING CONTRACTOR
URS CORPORATION
PROJECT NO: 40060

DWG. NO. 016

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DESCRIPTION

THE BP CHERRY POINT COGENERATION/FACILITIES/ PROJECTS COMPENSATORY WETLAND MITIGATION PROJECT INCLUDES WETLAND RESTORATION ON APPROXIMATELY 122 ACRES OF LAND. THE PROJECT SITE CONSISTS OF TWO PARCELS, CMA1 AND CMA2, WHICH HAVE BEEN HISTORICALLY DEGRADED BY AGRICULTURAL PRACTICES, ROAD BUILDING, AND CONSTRUCTION OF DITCHES AND OTHER FACILITIES. THE PROJECT WILL INCLUDE RESTORING HISTORIC HYDROLOGIC PATTERNS BY DIVERTING SURFACE WATER RUNOFF AWAY FROM EXISTING DITCHES AND DIRECTING IT TO THE SITE. IN ADDITION, EXISTING DITCHES WITHIN THE SITE WILL BE PLUGGED TO ENCOURAGE RE-DEVELOPMENT OF A MORE NATURAL DRAINAGE PATTERN. NATIVE PLANT COMMUNITIES WILL REPLACE THE NONNATIVE VEGETATION THAT DOMINATES THE SITE AND HABITAT FEATURES THAT BENEFIT NATIVE WILDLIFE WILL BE INSTALLED.

1.0 GENERAL PROVISIONS

SECTION 1.1 PROTECTION OF RESOURCES.

CONTRACTOR SHALL CONFINE ALL ACTIVITIES TO AREAS DEFINED BY THE PLANS. PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, CONTRACTOR SHALL BE AWARE OF THE LAND RESOURCES TO BE PRESERVED WITHIN THE WORK AREA. EXCEPT IN AREAS INDICATED ON THE DRAWINGS OR SPECIFIED TO BE CLEARED, CONTRACTOR SHALL NOT REMOVE, CUT, DEFACE, INJURE, OR DESTROY LAND RESOURCES INCLUDING TREES, SHRUBS, VINES, GRASSES, TOPSOIL, WETLANDS, AND LAND FORMS WITHOUT PERMISSION. CONTRACTOR SHALL PROVIDE EFFECTIVE PROTECTION FOR LAND AND VEGETATION RESOURCES AT ALL TIMES. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL MARK EXISTING MONITORING WELLS WHICH ARE NOT TO BE DISTURBED, AS IDENTIFIED IN THE FINAL MITIGATION. THESE AREAS SHALL BE PROTECTED BEFORE CONSTRUCTION OPERATIONS COMMENCE. CONTRACTOR'S PERSONNEL SHALL BE KNOWLEDGEABLE OF THE PURPOSE FOR MARKING AND/OR PROTECTING PARTICULAR OBJECTS.

SECTION 1.2 TEMPORARY STORAGE AREA.

IN ORDER TO MINIMIZE POTENTIAL DISTURBANCE TO EXISTING VEGETATION, THE CONTRACTOR WILL LIMIT THE STORAGE OF CONSTRUCTION EQUIPMENT, PLANT MATERIALS, AND ANY OTHER SUPPLIES TO A TEMPORARY STORAGE AREA, IDENTIFIED ON THE PLANS. IF ADDITIONAL STORAGE AREA IS NEEDED, IT MUST BE DOCUMENTED AND APPROVED BY BP PROJECT ENGINEER.

SECTION 1.3 STABILIZED CONSTRUCTION ENTRANCE.

CONTRACTOR SHALL CONSTRUCT AND MAINTAIN STABILIZED CONSTRUCTION ENTRANCES AT THE LOCATIONS SHOWN ON THE SWPPP.

SECTION 1.4 CLEANUP OF ROADWAYS.

CONTRACTOR SHALL MAINTAIN ROADS AND PARKING AREAS TRAVELED BY CONSTRUCTION EQUIPMENT FREE OF DEBRIS, TRACKED MUD, AND SPILLAGE. CLEANUP OF ROADWAYS SHALL BE PERFORMED AS DOCUMENTED IN THE SWPPP. ANY DAMAGE TO PUBLIC ROADWAYS CAUSED BY CONTRACTOR'S EQUIPMENT SHALL BE RESTORED AT CONTRACTOR'S EXPENSE.

SECTION 1.5 CONTRACTOR FACILITIES AND WORK AREAS.

CONTRACTOR'S FIELD OFFICES, STAGING AREAS, STOCKPILE STORAGE, AND TEMPORARY BUILDINGS SHALL BE PLACED IN AREAS DESIGNATED ON THE PLANS. TEMPORARY MOVEMENT OR RELOCATION OF CONTRACTORS FACILITIES SHALL BE MADE ONLY WHEN APPROVED BY BP PROJECT ENGINEER. SPOIL AREAS SHALL BE MANAGED AND CONTROLLED TO LIMIT SPOIL INTRUSION INTO AREAS DESIGNATED ON THE PLANS AND TO PREVENT EROSION OF SOIL OR SEDIMENT FROM ENTERING NEARBY WATERS. SPOIL AREAS SHALL ONLY BE DEVELOPED AS IDENTIFIED IN THE SWPPP.

SECTION 1.6 EQUIPMENT, FUELING AND HAZARDOUS MATERIAL.

EQUIPMENT USED FOR THIS PROJECT SHALL BE WELL MAINTAINED AND TO THE MAXIMUM EXTENT POSSIBLE PREVENTED FROM LEAKING PETROLEUM-BASED PRODUCTS THAT COULD RESULT IN ENVIRONMENTAL CONTAMINATION. CONTRACTOR SHALL TAKE SUFFICIENT MEASURES TO PREVENT SPILLAGE OF ANY MATERIALS OF CONSTRUCTION CONTAINING HAZARDOUS AND TOXIC MATERIALS DURING OPERATIONS (I.E. HYDRAULIC FLUID, ETHYLENE GLYCOL, ETC.). SPILLS OF HAZARDOUS OR TOXIC MATERIALS SHALL BE REPORTED TO THE BP PROJECT ENGINEER AND BP ENVIRONMENTAL IMMEDIATELY AND WASTE MATERIALS SHALL BE HANDLED IN ACCORDANCE WITH REFINERY WASTE DISPOSAL MEASURES.

SECTION 1.7 PROTECTION OF FISH AND WILDLIFE.

CONTRACTOR SHALL MINIMIZE INTERFERENCE WITH, DISTURBANCE TO, AND DAMAGE OF FISH AND WILDLIFE. TRASH SHALL BE REMOVED FROM THE WORK SITE ON A DAILY BASIS TO MINIMIZE THE ATTRACTION OF WILDLIFE TO THE WORK AREA.

SECTION 1.8 ENVIRONMENTAL EDUCATION.

CONTRACTOR SHALL ADVISE HIS PERSONNEL REGARDING ENVIRONMENTAL PROTECTION REQUIRED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL CONDUCT A BRIEF FIELD TRAINING SESSION FOR PERSONNEL WITH A REPRESENTATIVE OF BP ENVIRONMENTAL AT THE OUTSET OF EACH PROJECT PHASE. THE TRAINING SHALL INCLUDE METHODS OF DETECTING AND AVOIDING POLLUTION, PROPER FUELING TECHNIQUES AT THIS SITE, AND INSTALLATION AND CARE OF VEGETATIVE COVERS.

SECTION 1.9 PERMIT CONDITIONS

THE CONTRACTOR SHALL ABIDE BY ALL CONDITIONS AND REQUIREMENTS STATED IN THE FOLLOWING REFERENCE DOCUMENTS:

A. URS, 2007. FINAL REVISED BP CHERRY POINT COGENERATION/FACILITIES PROJECT COMPENSATORY WETLAND MITIGATION PLAN.

B. U.S. ARMY CORPS OF ENGINEERS, 2005. REGULATORY PERMIT FOR THE COGENERATION FACILITY AT BP CHERRY POINT REFINERY. PERMIT NO. 200101283. OCTOBER 21.

C. ENERGY FACILITY SITE EVALUATION COUNSEL, 2004. SITE CERTIFICATION AGREEMENT FOR THE CHERRY POINT COGENERATION PROJECT. DECEMBER 21.

D. WHATCOM COUNTY LAND DISTURBANCE PERMIT (PENDING).

E. WHATCOM COUNTY RIGHT-OF-WAY ENCROACHMENT PERMIT.

SECTION 2.0 PLANTING PLAN

2.1 MATERIALS

A. PROCUREMENT
PLANT AND SEED MATERIALS WILL BE PROVIDED BY BP CHERRY POINT REFINERY THROUGH ITS CONTRACTOR ANVIL CORPORATION. ALL OTHER MATERIALS AND EQUIPMENT SHALL BE PROVIDED BY THE CONTRACTOR.

B. NOMENCLATURE
BOTANICAL IDENTIFICATION OF PLANT AND SEED MATERIAL SHALL BE BASED ON DESCRIPTIONS BY HITCHCOCK AND CRONQUIST IN "FLORA OF THE PACIFIC NORTHWEST". BOTANICAL IDENTIFICATION AND NOMENCLATURE OF PLANT MATERIAL NOT FOUND IN FLORA SHALL BE REFERENCED IN THE PLANS.

C. QUALITY ASSURANCE
THE BP PROJECT ENGINEER SHALL BE IN CHARGE OF INSPECTING PLANT MATERIAL THAT IS DELIVERED FROM THE PLANT AND SEED VENDORS. SHOULD THE CONTRACTOR SUBSEQUENTLY IDENTIFY ANY DAMAGED OR UNHEALTHY PLANT OR SHRUB MATERIAL, THE CONTRACTOR SHALL NOTIFY THE BP PROJECT ENGINEER AS SOON AS POSSIBLE. HEALTHY OR UNDAMAGED PLANTS OR SHRUBS ARE THOSE THAT ARE VIGOROUS AND WELL FORMED, WITH WELL DEVELOPED, FIBROUS ROOT SYSTEMS, FREE FROM DEAD BRANCHES OR ROOTS. PLANTS SHOULD BE FREE FROM EXCESS MOISTURE, INSECTS, DISEASE AND MECHANICAL INJURY. PLANTS SHOULD NOT BE DRY OR WILTED. PLANTS IN LEAF SHALL BE WELL FOLIATED AND OF GOOD COLOR. TREES SHOULD NOT HAVE A DAMAGED, CROOKED, OR BROKEN LEADER. WOODY PLANTS SHOULD BE FREE FROM ABRASIONS OF THE BARK OR SUNSCALD. NO PLANT MATERIAL SHALL BE INSTALLED UNTIL IT HAS BEEN APPROVED BY THE BP PROJECT ENGINEER.

D. HANDLING
PLANT MATERIAL SHALL NOT BE HANDLED BY THE TRUNK, LIMBS, OR FOLIAGE BUT ONLY BY THE CONTAINER, BOX, OR OTHER PROTECTIVE STRUCTURE. BAREROOT PLANTS SHALL BE KEPT IN BUNDLES UNTIL PLANTING AND THEN HANDLED CAREFULLY BY THE TRUNK OR STEM.

2.2 SCHEDULE

A. RESTRICTIONS
UNDER NO CIRCUMSTANCES WILL PLANTING DURING FREEZING WEATHER OR IN FROZEN GROUND BE PERMITTED. ANY EXCEPTIONS TO THESE CONDITIONS MUST BE APPROVED IN ADVANCE BY BP PROJECT ENGINEER.

B. BAREROOT TREE AND SHRUB AND CONTAINER PLANTING
PLANTING OF BAREROOT TREES AND SHRUBS SHALL BE CONDUCTED DURING THE WINTER DORMANCY PERIOD. EXACT TIMING OF THE AVAILABILITY AND DELIVERY OF NURSERY STOCKS SHALL BE COORDINATED WITH THE VENDOR. THE APPROXIMATE TIME PERIOD IS EXPECTED TO BE FEBRUARY 1 TO APRIL 1 EACH YEAR. PLANTS SHOULD BE PLANTED AS SOON AS POSSIBLE AFTER DELIVERY TO THE SITE.

C. HERBACEOUS SPECIES PLANTING
PLANTING OF HERBACEOUS PLUGS SHALL OCCUR DURING THE SPRING, APPROXIMATELY APRIL 15 TO MAY 31.

D. WILLOW STAKE PLANTING
PLANTING OF LIVE WILLOW STAKES SHALL OCCUR BETWEEN NOVEMBER 15 AND MARCH 1, WITH THE PREFERRED PERIOD BETWEEN NOVEMBER 15 AND DECEMBER 31.

E. SEEDING
SEEDING OF BARE GROUND SHALL OCCUR IN THE SUMMER OR EARLY FALL AND MAY REQUIRE IRRIGATION. THE APPROXIMATE TIME PERIOD SHALL BE AUGUST 15 TO SEPTEMBER 15. SEE SECTION 2.5 OF NOTES FOR MORE DETAILS ON SEEDING.

2.3 CONSTRUCTION REQUIREMENTS

A. PROTECTION OF PLANT MATERIAL
THE CONTRACTOR SHALL ENSURE ADEQUATE AND PROPER CARE OF ALL PLANT MATERIAL AND WORK DONE ON THIS PROJECT UNTIL ALL PLANT ESTABLISHMENT PERIODS REQUIRED BY THE CONTRACT ARE COMPLETE OR UNTIL PHYSICAL COMPLETION OF THE PROJECT, WHICHEVER IS LAST. EXISTING VEGETATION SHALL NOT BE DISTURBED UNLESS REQUIRED BY THE CONTRACT OR APPROVED BY THE BP PROJECT ENGINEER. ADEQUATE AND PROPER CARE SHALL INCLUDE, BUT IS NOT LIMITED TO, KEEPING ALL PLANT MATERIAL IN A HEALTHY, GROWING CONDITION BY WATERING, CULTIVATING, AND PRUNING. PLANTS STORED UNDER TEMPORARY CONDITIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. PLANTS STORED ON THE PROJECT SITE SHALL BE PROTECTED AT ALL TIMES FROM EXTREME WEATHER CONDITIONS BY INSULATING ROOTS, ROOT BALLS, OR CONTAINERS WITH SAWDUST, SOIL, COMPOST, BARK OR WOOD CHIPS, OR OTHER APPROVED MATERIAL, AND SHALL BE KEPT MOIST AT ALL TIMES PRIOR TO PLANTING. LIVE CUTTINGS OR WILLOW STAKES TO BE STORED ON SITE PRIOR TO INSTALLATION SHALL BE BUNDLED, LAID HORIZONTALLY, AND COMPLETELY BURIED UNDER 6 INCHES OF WATER, MOIST SOIL, OR PLACED IN COLD STORAGE AT A TEMPERATURE OF 34 F AND 90% HUMIDITY. CUTTINGS THAT ARE NOT PLANTED WITHIN 24 HOURS OF CUTTING SHALL BE SOAKED IN WATER FOR 24 HOURS PRIOR TO PLANTING. CUTTINGS SHALL CONTINUALLY BE SHADED AND PROTECTED FROM WIND.

B. WEED CONTROL PLAN
ANY TOP SOIL, PLANT OR MULCH MATERIAL IMPORTED TO THE COGENERATION/FACILITIES PROJECTS MITIGATION SITE SHALL BE AS WEED FREE AS IS FEASIBLE. THIS INCLUDES, BUT IS NOT LIMITED TO, EROSION CONTROL MATERIALS SUCH AS STRAW OR HAY (LOOSE OR IN WATTLES), BARK, WOOD CHIPS, SAWDUST, COMPOST, MULCH OR OTHER AMENDMENTS, AND TOPSOIL. IT IS RECOMMENDED THAT THE CONTRACTOR WASH AND INSPECT ALL VEHICLES AND HEAVY EQUIPMENT FOR WEED SEEDS AND PLANT PARTS PRIOR TO BRINGING THEM ONTO THE JOB SITE. THE CONTRACTOR MAY WASH, OR USING AN AIR COMPRESSOR, BLOW CLEAN ALL VEHICLES (INCLUDING TIRES AND UNDERCARRIAGE) THAT MAY HAVE ENTERED WEED-INFESTED AREAS PRIOR TO ENTERING UNINFESTED AREAS OF THE JOB SITE. THE CONTRACTOR MAY RESTRICT VEHICLES OR OTHER TRAFFIC THAT MAY TRANSPORT WEED SEEDS OR PLANT MATERIAL FROM ENTERING THE JOB SITE UNLESS THEY ARE FIRST WASHED. ANY WEED INFESTED TOPSOIL THAT IS TO BE EXCAVATED AS PART OF EARTHWORK SHALL BE STOCKPILED IN AREA DESIGNATED ON SHEET 5. NO WEED BEARING TOPSOIL SHALL BE MOVED TO UNINFESTED AREAS.

2.4 PLANTING

THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A LOCAL PLANTING CONTRACTOR WITH KNOWLEDGE OF LOCAL CLIMATE, SITE CONDITIONS, AND PROVEN EXPERIENCE INSTALLING THE SPECIFIED NATIVE PLANTS.

A. SPACING
THREE DIFFERENT PLANT COMMUNITIES WILL BE PLANTED ON THE PROJECT SITE, WHICH ARE: UPLAND, SEASONALLY INUNDATED, AND SEASONALLY SATURATED. EACH COMMUNITY HAS ONE OR MORE SUB-TYPES OF VEGETATION (I.E. TREES, SHRUBS, OR HERBACEOUS). EACH COMMUNITY AND SUB-TYPE HAS DIFFERENT SPACING AND AREAS OF COVERAGE, WHICH IS REPRESENTED IN TABLE 1. THE DISTRIBUTION OF EACH COMMUNITY TO BE PLANTED IS SHOWN ON PLANS AND ITEMIZED ON TABLE 2.

TABLE 1
OVERVIEW OF PLANT COMMUNITY TYPES, AREA AND SPACING

COUMMUNITY TYPE	SUB-TYPE	PROPORATION COVERAGE	SPACING	TOTAL AREA (ACRES)
UPLAND	TREES	100	12 FT OC	7.2
UPLAND	SHRUBS	100	8 FT OC	7.2
SEASONALLY SATURATED	TREES	99	9 FT OC	49.6
SEASONALLY SATURATED	SHRUBS	99	6.5 FT OC	49.6
SEASONALLY SATURATED	HERBACEOUS	1	1.5 FT OC	0.5
SEASONALLY INUNDATED	TREES	97	14.5 FT OC	22.9
SEASONALLY INUNDATED	QUAKING ASPEN	2	4.5 FT OC	0.5
SEASONALLY INUNDATED	SHRUBS	97	6.5 FT OC	22.9
SEASONALLY INUNDATED	HERBACEOUS	1	1.5 FT OC	0.2
NATIVE SEED MIX 2008	HERBACEOUS	100	50 POUNDS PER ACRE	

NOTES:

[1] INTERSTITIAL AREAS BETWEEN TREES AND SHRUBS

TABLE 2
PLANT COMMUNITY DISTRIBUTION, SIZE AND YEAR OF INSTALLATION

UNIT NO.	COMMUNITY	CMA	AREA (ACRES)	YEAR
1	HERBACEOUS	CMA1	4.32	2008
2	UPLAND	CMA1	2.06	2009
3	INUNDATED	CMA1	0.76	2009
4	HERBACEOUS	CMA1	0.40	2008
5	UPLAND	CMA1	1.05	2009
6	INUNDATED	CMA1	0.66	2009
7	INUNDATED	CMA1	1.86	2009
8	INUNDATED	CMA1	0.10	2009
9	INUNDATED	CMA1	0.13	2009
10	INUNDATED	CMA1	1.32	2009
11	UPLAND	CMA1	0.31	2009
12	INUNDATED	CMA1	0.48	2009
13	UPLAND	CMA1	2.03	2009
14	INUNDATED	CMA1	4.47	2010
15	HERBACEOUS	CMA1	4.63	2008
16	UPLAND	CMA1	0.13	2009
17	INUNDATED	CMA1	0.74	2009
18	INUNDATED	CMA1	0.70	2009
19	HERBACEOUS	CMA1	0.07	2008
20	EXISTING VEG	CMA1	0.25	N/A
21	EXISTING VEG	CMA1	0.20	N/A
22	SATURATED	CMA1	29.07	2009
23	HERBACEOUS	CMA2	7.31	2008
24	EXISTING VEG	CMA2	2.85	N/A
25	INUNDATED	CMA2	0.45	2009
26	INUNDATED	CMA2	0.22	2009
27	UPLAND	CMA2	0.10	2009
28	INUNDATED	CMA2	2.66	2010
29	INUNDATED	CMA2	1.08	2010
30	INUNDATED	CMA2	1.98	2010
31	HERBACEOUS	CMA2	6.65	2008
32	INUNDATED	CMA2	1.48	2010
33	UPLAND	CMA2	0.08	2009
34	EXISTING VEG	CMA2	0.41	N/A
35	EXISTING VEG	CMA2	0.15	N/A
36	INUNDATED	CMA2	0.35	2010
37	UPLAND	CMA2	0.16	2009
38	INUNDATED	CMA2	4.09	2009
39	EXISTING VEG	CMA2	5.83	N/A
40	EXISTING VEG	CMA2	1.54	N/A
41	UPLAND	CMA2	1.25	2009
42	UPLAND	CMA2	0.09	2009
43	HERBACEOUS	CMA2	9.03	2008
44	EXISTING VEG	CMA2	0.88	N/A
45	SATURATED	CMA2	21.01	2010
46	HERBACEOUS	CMA2	2.18	2008
47	HERBACEOUS	CMA1	1.22	2009

B. SPECIES COMPOSITION, CONDITION AND SIZE
EACH SPECIES TO BE PLANTED SHALL BE OF A GIVEN SIZE AND CONDITION, WHICH IS IDENTIFIED IN THE FOLLOWING THREE TABLES.

TABLE 3
PLANTING PLAN FOR UPLAND COMMUNITIES

SCIENTIFIC NAME	COMMON NAME	APPROXIMATE QUANTITY	SPACING	CONDITION & SIZE
ALNUS RUBRA	RED ALDER	314	INTERSPERSE THE VARIOUS TREE SPECIES SO THAT OVERALL SPACING ON CENTER=12 FT	BARE-ROOT, 1.5'-3'
BETULA PAPYRIFERA	PAPER BIRCH	"		BARE-ROOT, 1.5'-3'
PRUNUS EMARGINATA	BITTER CHERRY	"		BARE-ROOT, 12-18"
PSEUDOTSUGA MENZIESII	DOUGLAS FIR	"		BARE-ROOT, 1.5'-3'
SALIX SCOULERIANA	SCOULER WILLOW	"		ROOTED CUTTING, 1.5'-3'
THUJA PLICATA	WESTERN RED CEDAR	"		BARE-ROOT, 1.5'-3'
TSUGA HETEROPHYLLA	WESTERN HEMLOCK	"		BARE-ROOT, 1.5'-3'
CRATAEGUS SUKDORFII	DOUGLAS HAWTHORN	458	INTERSPERSE THE VARIOUS SHRUB SPECIES SO THAT OVERALL SPACING ON CENTER=8 FT	BARE-ROOT, 1.5'-3'
HOLODISCUS DISCOLOR	OCEANSPRAY	"		BARE-ROOT, 1.5'-3'
OEMLERIA CERASIFORMIS	INDIAN PLUM	"		BARE-ROOT, 1.5'-3'
ROSA NUTKANA	NOOTKA ROSE	"		BARE-ROOT, 1.5'-3'
SAMBUCUS RACEMOSA	RED ELDERBERRY	"		BARE-ROOT, 1.5'-3'
SYMPHORICA RPOS ALBUS	COMMON SNOWBERRY	"		BARE-ROOT, 1.5'-3'

TABLE 4
PLANTING PLAN FOR SEASONALLY SATURATED WETLAND COMMUNITIES

SCIENTIFIC NAME	COMMON NAME	APPROXIMATE QUANTITY	SPACING	CONDITION & SIZE
ALNUS RUBRA	RED ALDER	3,393	INTERSPERSE THE VARIOUS TREE SPECIES SO THAT OVERALL SPACING ON CENTER=9 FT	BARE-ROOT, 1.5'-3'
BETULA PAPYRIFERA	PAPER BIRCH	"		BARE-ROOT, 1.5'-3'
PICEA SITCHENSIS	SITKA SPRUCE	"		BARE-ROOT, 1.5'-3'
POPULUS BALSAMIFERA SSP. TRICHOCARPA	BLACK COTTONWOOD	"		BARE-ROOT, 1.5'-3'
SALIX LUCIDA VAR. LASIANDRA	PACIFIC WILLOW	"		ROOTED CUTTING, 1.5'-3'
SALIX SCOULERIANA	SCOULER WILLOW	"		ROOTED CUTTING, 1.5'-3'
THUJA PLICATA	WESTERN RED CEDAR	"		BARE-ROOT, 1.5'-3'
CORNUS SERICEA	RED-OSIER DOGWOOD	3,094	INTERSPERSE THE VARIOUS SHRUB SPECIES SO THAT OVERALL SPACING ON CENTER=6.5 FT	BARE-ROOT, 1.5'-3'
CRATAEGUS DOUGLASII	DOUGLAS HAWTHORN	"		BARE-ROOT, 1.5'-3'
MALUS FUSCA	WESTERN CRABAPPLE	"		BARE-ROOT, 1.5'-3'
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	"		BARE-ROOT, 1.5'-3'
ROSA NUTKANA	NOOTKA ROSE	"		BARE-ROOT, 1.5'-3'
ROSA PISOCARPA	CLUSTERED WILD ROSE	"		BARE-ROOT, 1.5'-3'
RUBUS SPECTABILIS	SALMONBERRY	"		BARE-ROOT, 1.5'-3'
SALIX PIPERI	PIPER'S WILLOW	"		ROOTED CUTTING, 1.5'-3'
SALIX SITCHENSIS	SITKA WILLOW	"		ROOTED CUTTING, 1.5'-3'
CAMASSIA LEICHTLINII	COMMON CAMAS	1,940	INSTALL PATCHES OF HERBACEOUS SPECIES WHERE OVERALL SPACING ON CENTER = 1.5 FT OVER 1% OF COMMUNITY	
CAREX ABNUPTA	SLOUGH SEDGE	"		
DESCHAMPSIA CAESPITOSA	TUFTED HARGRASS	"		
ELEOCHARIS PALUSTRIS	CREEPING SPIKE-RUSH	"		
JUNCUS ENSIFOLIUS	CAMASSIA QUAMASH	"		

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

DWG. NO.
DR. TP
CKD. JAP
APPROVALS
OPER.

REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES-UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
PLANTING NOTES - A

DATE PRELIM. 7-11-07 | SCALE AS NOTED | AUTH 008LW
ENGINEERING CONTRACTOR URS CORPORATION
PROJECT NO: 4006A0
DWG. NO. 017
REVISION 0

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TABLE 5
PLANTING PLAN FOR SEASONALLY INUNDATED WETLAND COMMUNITIES

SCIENTIFIC NAME	COMMON NAME	APPROXIMATE QUANTITY	SPACING	CONDITION & SIZE
FRAXINUS LATIFOLIA	OREGON ASH	1,583	INTERSPERSE THE VARIOUS TREE SPECIES SO THAT OVERALL SPACING ON CENTER=12 FT	BARE-ROOT, 1.5'-3'
SALIX LUCIDA VAR. LASIANDRA	PACIFIC WILLOW	"		ROOTED CUTTING, 1.5'-3'
POPULUS BALSAMIFERA SSP. TRICHOCARPA	BLACK COTTONWOOD	"		BARE-ROOT, 1.5'-3'
POPULUS TREMULOIDES	QUAKING ASPEN	1050	CREATE SMALL GROVES WITH 4.5 FT. ON CENTER OVER 2% OF COMMUNITY	BARE-ROOT, 1.5'-3'
CORNUS SERICEA	RED-OSIER DOGWOOD	3,142	INTERSPERSE THE VARIOUS SHRUB SPECIES SO THAT OVERALL SPACING ON CENTER=6.5 FT	BARE-ROOT, 1.5'-3'
LONICERA INVOLUCRATA	BLACK TWINBERRY	"		BARE-ROOT, 1.5'-3'
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	"		BARE-ROOT, 1.5'-3'
ROSA PISOCARPA	CLUSTERED WILD ROSE	"		BARE-ROOT, 1.5'-3'
SALIX PIPERI	PIPER'S WILLOW	"		BARE-ROOT, 1.5'-3'
SALIX SITCHENSIS	SITKA WILLOW	"		BARE-ROOT, 1.5'-3'
CAREX STIPATA	SAWBEAK SEDGE	657	INSTALL PATCHES OF HERBACEOUS SPECIES WHERE OVERALL SPACING ON CENTER=1.5 FT OVER 1% OF COMMUNITY	PLUGS
CAREX UTRICULATA	BEAKED SEDGE	"		PLUGS
CAREX OBNUPTA	SLOUGH SEDGE	"		PLUGS
ELEOCHARIS PALUSTRIS	CREEPING SPIKE-RUSH	"		PLUGS
JUNCUS BOLANDERI	BOLANDERS RUSH	"		PLUGS
SCIRPUS AMERICANUS	AMERICAN BULRUSH	"		PLUGS
SCIRPUS MICROCARPUS	SMALL-FRUITED BULRUSH	"		PLUGS

C. PHASING OF PLANTING
PLANTING WILL BE ACCOMPLISHED IN A MULTI-PHASE APPROACH, OVER 2 YEARS AND SEVERAL SEASONS. LIMITED PORTIONS OF THE SITE THAT WILL BE LEAST AFFECTED BY THE PROPOSED HYDROLOGIC MODIFICATIONS WILL BE PLANTED IN THE FIRST YEAR. THE REMAINDER OF THE SITE WILL BE PLANTED IN THE SECOND YEAR. TABLE 2 SUMMARIZES THE ACREAGE OF EACH COMMUNITY TYPE TO BE PLANTED IN THE FIRST AND SECOND YEARS.

THE CONTRACTOR SHALL COORDINATE AND SEQUENCE THE INSTALLATION OF PLANTS WITH EXCAVATIONS AND OTHER EARTHWORK THAT ARE ALSO PART OF THE PROJECT. SUCH EARTHWORK INCLUDES PLUGGING OR FILLING PORTIONS OF EXISTING DIRCHES AND THE CREATION OF SHALLOW SEASONAL PONDS IN CMA1 AND CMA2, AND THE EXCAVATION OF SHALLOW CHANNELS OR SWALES FOR THE CONVEYANCE AND DISTRIBUTION OF SURFACE WATER RUNNOFF THROUGHOUT CMA1 AND CMA2 AS SHOWN ON THE DRAWINGS.

D. PLANT MATERIAL
BP CHERRY POINT WILL PROVIDE PLANT MATERIALS FOR THE CONTRACTOR.

E. SUBSTITUTIONS
ANY SUBSTITUTION OF PLANT MATERIALS MUST BE APPROVED BY THE BP PROJECT ENGINEER.

F. PLANTING METHODOLOGY
FOR ALL TREES AND SHRUB COMMUNITIES, THE EXISTING HERBACEOUS LAYER WILL BE MOWED AS NEEDED PRIOR TO PLANTING. ALL PLANT MATERIAL SHALL BE SET PLUMB AND HELD IN POSITION UNTIL SUFFICIENT SOIL HAS BEEN FIRMLY PLACED AROUND ROOT SYSTEM OR BALL. THE BASE OF THE PLANT SHALL BE LEVEL WITH THE SURROUNDING GROUND.

G. BARE ROOT TREES AND SHRUBS
A MECHANICAL AUGER MOUNTED ON THE BACK OF A TRUCK WILL BE USED TO CREATE HOLES IN GROUND FOR TREES AND SHRUBS. DIG THE PLANTING HOLE 2-3" SHALLOWER THAN ROOT DEPTH. THE HOLE DIAMETER SHOULD BE 1.5 TO 2 TIMES THE DIAMETER OF ROOT SPREAD. THE TREE SHALL BE SET IN THE CENTER OF THE HOLE. TREES AND SHRUBS WILL THEN BE PLANTED BY HAND IN INDIVIDUAL HOLES, BACKFILLED, STAKED AND PROTECTORS INSTALLED. BACKFILL WITH SOILS FROM THE PLANTING HOLE. WATER SHALL BE USED TO PACK OR SETTLE THE SOIL AROUND THE ROOTS TO SECURE THE PLANT. ADDITIONAL BACKFILL MATERIAL MAY BE REQUIRED AND WOULD UTILIZE ON SITE SOILS FROM THE CONVEYANCE SWALE AREA.

ROOTS OF BARE ROOT STOCK SHALL NOT BE BUNCHED, CURLED, TWISTED OR UNREASONABLY BENT WHEN PLACED IN THE PLANTING HOLE. ALL BARE ROOT PLANT MATERIAL SHALL BE DORMANT AT THE TIME OF PLANTING. THE PLANTING MATERIAL SHALL BE HANDLED IN SUCH A MANNER THAT THE ROOT SYSTEMS ARE KEPT COVERED AND DAMP AT ALL TIMES.

H. CONTAINERIZED PLANTS
PLANT PITS FOR CONTAINER PLANT MATERIAL SHALL BE DUG TO A DEPTH EQUAL TO THE HEIGHT OF THE ROOT MASS AS MEASURED FROM THE BASE OF THE ROOT MASS TO THE BASE OF THE PLANT TRUNK. PLANT PITS SHALL BE DUG AT LEAST TWICE AS WIDE AS THE ROOT MASS OR ROOT SYSTEM TO ALLOW FOR ROOT EXPANSION.

CONTAINER PLANTS SHALL BE REMOVED FROM THEIR CONTAINERS AND THE ROOT MASS GENTLY LOOSENED TO PREVENT ROOT-BOUND CONDITIONS. NO MATERIAL SHALL BE LEFT IN THE PLANTING HOLE, INCLUDING BUT NOT LIMITED TO BURLAP, PULP POTS, AND WIRE BASKETS. THE BASE OF THE CONTAINERIZED PLANTS SHALL BE SET AT THE SAME GRADE AS THE SURROUNDING SOIL; NO ROOTS SHOULD BE EXPOSED AFTER PLANTING. PRIOR TO SETTLING THE PLANT IN THE PIT, A MAXIMUM OF ONE-FOURTH OF THE ROOT MASS, MEASURED FROM THE BOTTOM, SHALL BE SPREAD APART TO PROMOTE NEW ROOT GROWTH. DO NOT COMPACT SOIL AROUND PLANT. WATER EACH PLANT THOROUGHLY AFTER INSTALLATION, ENSURING ROOTS BECOME SATURATED. CONTRACTOR SHALL ADD SOIL AS NECESSARY TO REPLACE ANY FILL THAT SETTLES BELOW FINAL GRADE DURING WATERING.

THE ROOT SYSTEM OF ALL CONTAINER PLANT MATERIAL SHALL BE MOIST AT THE TIME OF PLANTING. IN THEIR FINAL POSITION, THE PLANTS SHALL HAVE THE SAME RELATIONSHIP TO THE FINISHED GRADE AS WHEN GROWING IN THE NURSERY OR CONTAINER.

I. HERBACEOUS PLUGS
HERBACEOUS PLUGS FOR TREE AND SHRUB COMMUNITIES WILL BE INSTALLED BY HAND.

J. WILLOW STAKES
WILLOW STAKES OR OTHER LIVE CUTTINGS SHALL BE PLANTED WITHIN SEVEN DAYS OF HARVEST. THE CONTRACTOR SHALL COORDINATE WITH THE BP PROJECT ENGINEER TO DETERMINE THE EXACT DATE OF PLANTING. WILLOW STAKES WILL BE PLANTED BY HAND. A SMALL HOLE WILL BE INITIATED WITH REBAR (SLIGHTLY SMALLER DIAMETER THAN CUTTING) IF REQUIRED. CUTTINGS SHALL BE INSERTED, ANGLED END DOWN 18 INCHES BELOW GROUND LEAVING 6 INCHES ABOVE GROUND, OR A MINIMUM OF ONE TO TWO DORMANT BUDS ABOVE GROUND.

K. SOIL FERTILZER
ANY FETRTILIZER USED ON THE MITIGATION SITE SHALL BE PLACED IN THE PLANTING HOLE IN UPLAND AREAS ONLY AS IDENTIFIED IN THE FINAL PROJECT PERMITS. FERTILIZER SHALL NOT BE BROADCAST ON THE SOIL SURFACE, AS SPECIFIED BY PROJECT PERMITS.

L. LAYOUT OF PLANTING
THE CONTRACTOR SHALL LAYOUT THE DISTRIBUTION OF PLANT COMMUNITIES TO BE ESTABLISHED IN CMA1 AND CMA2 AS SHOWN IN THE DRAWINGS. NO DEVIATIONS SHALL BE ALLOWED UNLESS SPECIFICALLY AUTHORIZED OR DIRECTED BY THE OWNER'S REPRESENATATIVE.

ALL LOCATION LAYOUT AND STAKING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, SUBJECT TO APPROVAL OF THE BP PROJECT ENGINEER BEFORE PLANTING OF EACH AREA BEGINS. TREE AND SHRUB LOCATIONS SHOWN IN THE PLANS SHALL BE CONSIDERED APPROXIMATE UNLESS SHOWN WITH STATIONING AND OFFSET DISTANCE.

M. STAKING, PRUNING, WRAPPING
EACH TREE AND SHRUB SHALL BE WRAPPED WITH A PLASTIC PROTECTION TUBE APPROXIMATELY 9 INCHES IN LENGTH. EACH TREE AND SHRUB WILL ALSO BE STAKED BEFORE THE COMPLETION OF BACKFILLING IN ACCORDANCE WITH THE DETAILS SHOWN IN THE PLANS.

N. CHEMICAL CONTROL RING
AT THE COMPLETION OF PLANTING, A RING OF CHEMICAL HERBICIDE SHALL BE APPLIED AROUND THE BASE OF EACH TREE OR SHRUB.

O. PLANT PIT SETTLING
WHEN SETTLING OCCURS TO THE BACKFILL SOIL, ADDITIONAL BACKFILL SOIL SHALL BE ADDED TO THE PLANT PIT OR PLANT BED UNTIL THE BACKFILL LEVEL IS EQUAL TO THE SURROUNDING GRADE. SERIOUS SETTLING THAT AFFECTS THE SETTING OF THE PLANT IN RELATION TO THE MAXIMUM DEPTH AT WHICH IT WAS GROWN REQUIRES REPLANTING IN ACCORDANCE WITH SECTION 2.4. A SAND/DIRT OR WOOD MULCH MAY BE USED AS AN AMENDMENT.

P. WATERING
ALL PLANTINGS SHALL BE WATERED IMMEDIATELY AFTER BACKFILLING, UNTIL SATURATED.

Q. MAINTENANCE DURING PLANTING
PLANT MATERIAL SHALL BE MAINTAINED IN A HEALTHY GROWING CONDITION DURING INSTALLATION. INSTALLED PLANTS SHALL BE MAINTAINED TO FOSTER ESTABLISHMENT AND GROWTH. THE MAINTENANCE INCLUDES WATERING AND ADJUSTING PLANT POSITION TO COUNTERACT SETTLING.

2.5 SEEDING

A. GENERAL PROVISIONS
SEEDING SHALL BE CONDUCTED BASED ON BEST PRACTICES, AS FOLLOWS: THE RATE OF APPLICATION SHALL BE 50 POUNDS PER ACRE. SEED THAT HAS BECOME WET, MOLDY, OR OTHERWISE DAMAGED IN TRANSIT OR STORAGE SHALL NOT BE USED. SEEDING OPERATIONS SHALL NOT BE PERMITTED WHEN WIND VELOCITIES EXCEED 15 MILES PER HOUR. SEED SHALL BE SOWN ONLY WHEN SOIL IS MOIST AND IN PROPER CONDITION TO INDUCE GROWTH. NO SEEDING SHALL BE DONE WHEN THE GROUND IS UNDULY WET, OR OTHERWISE NOT IN TILLABLE CONDITION. SEEDING SHALL OCCUR AS SOON AS POSSIBLE AFTER WORK IS COMPLETED AND ACCORDING TO THE SWPPP AND TESC.

B. LOCATION OF SEEDING
SEEDING SHALL OCCUR IN THE FOLLOWING AREAS AS SPECIFIED ON THE PLANS;
1. TILLED AND DISKED AREAS, WHERE REED CANARYGRASS CURRENTLY HAS >20% COVER. THIS EQUALS APPROXIMATELY 47 ACRES OF THE MITIGATION SITE.
2. ALL EXCAVATED SWALES AND PONDS; FILLED DITCHES; AND SPOILS.
3. BARE GROUND OR HERBICIDE TREATED SPOTS, AS NEEDED.
4. AREAS WHERE THE EXISTING GROUND COVER HAS BEEN SIGNIFICANTLY DISTURBED DUE TO MOVEMENT OF HEAVY EQUIPMENT OR OTHER CONSTRUCTION RELATED DISTURBANCE.
5. AREAS TO BE SEEDED THAT ARE NOT INDICATED ON THE PLANS OR MENTIONED ABOVE ARE TO BE APPROVED BY THE BP PROJECT ENGINEER.

C. PHASING OF SEEDING
SEEDING SHALL BE TIMED TO ALLOW PROPER GERMINATION AND GROWTH CONDITIONS. SEEDING SHALL BE COORDINATED WITH TREE AND SHRUB PLANTINS, AND WEED CONTROL OPERATIONS. INITIAL WEED CONTROL ACTIVITIES INCLUDE TILLING AND DISKING PORTIONS OF THE SITE WHERE REED CANARYGRASS HAS GREATER THAN 20% COVER. ALL OF THESE TILLED AREA SHALL BE SEEDED IN THE LATE SUMMER/EARLY FALL PRIOR TO THE FIRST YEAR OF PLANTING TREES AND SHRUBS. A SECOND SEEDING SHALL OCCUR IN THE SPRING FOLLOWING TREE AND SHRUB INSTALLATION. THIS SEEDING SHALL OCCUR BETWEEN MULCH RINGS.

D. COMPOSITION OF SEED MIX
THE COMPOSITION OF THE SEED MIX IS IN TABLE 6. A QUICK GERMINATING STERILE SEED, SUCH AS REGREEN WHEAT, MAY BE ADDED TO THE WET SWALE OR UPLAND SEED MIX AT 10% OF WEIGHT IN ORDER TO ENHANCE STABILIZATION OF EXPOSED SOILS. ANY SUBSTITUTION TO THE MIX MUST BE APPROVED BY THE BP PROJECT ENGINEER IN WRITING.

TABLE 6
NATIVE PLANT SEED MIX

SCIENTIFIC NAME	COMMON NAME	PERCENT COMPOSITION (BY WEIGHT)
AGROSTIS STOLONIFERA	CREEPING BENTGRASS	35%
ALOCPECURUS AEQUALIS	SHORT-AWN FOXTAIL	2.5%
ALOPECURUS GENICULATUS	WATER FOXTAIL	17.5%
DANTHONIA INTERMEDIA	TIMBER OATGRASS	2.5%
FESTUCA RUBRA VAR. RUBRA	RED FESCUE (NATIVE)	40%
HORDEUM BRACHYANTHERUM	MEADOW BARLEY	2.5%

E. SEED BED PREPARATION
THE GROUND TO BE SEEDED SHALL BE FREE OF LARGE CLODS, ROOT AND OTHER MATERIAL. HAND PICKING MAY BE REQUIRED. SEEDING SHALL NOT COMMENCE UNTIL THE BP PROJECT ENGINEER HAS ACCEPTED THE CONDITIONS OF THE PREPARED AREAS.

F. SOIL BINDER OR TACKING AGENT
TACKIFIER SHALL BE USED AS A TIE-DOWN FOR THE SEED MIXTURE. TACKIFIER SHALL BE DERIVED FROM NATURAL ORGANIC PLANT SOURCES CONTAINING NO GROWTH OR GERMINATION INHIBITING MATIERALS. TACKIFIER SHALL HYDRATE IN WATER AND READILY BLEND WITH OTHER SLURRY MATERIALS.

G. HYDROSEEDING
SEED AND TACKIFIER SHALL BE ADDED TO WATER AND THOROUGHLY MIXED. THE SEED, TACKIFIER, AND WATER SHALL BE THOROUGHLY MIXED TO PRODUCE A HOMOGENOUS SLURRY. WHILE THE SOIL IS STILL LOOSE AND MOIST, THE SEED, TACKIFIER AND WATER SLURRY SHALL BE UNIFORMLY BROADCAST UNDER PRESSURE OVER THE SPECIFIED AREAS AT A SEEDING RATE OF 40 POUNDS PER ACRE USING A HYDROSEEDING APPARATUS. THE RATE OF FLOW SHALL BE CAREFULLY REGULATED; THE AREA SHOULD BE COVERED TWICE WITH ½ OF THE MIXTURE EACH TIME. THE SECOND APPLICATION SHALL BE APPLIED IN THE OPPOSING DIRECTION FROM THE FIRST APPLICATION TO ENSURE UNIFORMITY.

H. WATERING
NEWLY SEEDED AREAS SHALL NOT BE WATERED TO FORCE SEED GERMINATION, BUT ONLY TO SUSTAIN GROWTH. VEGETATED AREA SHALL BE WATERED SO AS TO PROVIDE OPTIMUM GROWTH CONDITIONS FOR THE ESTABLISHMENT OF GRASS. RUN-OFF AND PUDDLING SHALL BE PREVENTED DURING WATERING.

I. PROTECTION AND CARE OF SEEDED AREAS
AFTER THE COMPLETION OF SEEDING, THE CONTRACTOR SHALL ENSURE THAT NO HEAVY EQUIPMENT OR VEHICLES ENTER THE SEEDED AREA THROUGHOUT THE REMAINDER OF CONSTRUCTION SEASON ON THE PROJECT SITE.

2.6 IRRIGATION

A. IRRIGATION SCHEDULE
TREES AND SHRUBS MAY RECEIVE IRRIGATION TO SUPPLEMENT RAINFALL DURING THE SUMMER OF THEIR FIRST YEAR TO ENSURE THAT PLANTS RECEIVE APPROXIMATELY 0.5 INCH OF WATER PER WEEK, AS NEEDED, FROM JUNE THROUGH SEPTEMBER, THE DRIEST PORTION OF THE YEAR. THE AMOUNT OF WATER APPLIED WILL DEPEND ON WATER AVAILABILITY AS DETERMINED BY RECENT RAINFALL AND LOSSES VIA EVAPOTRANSPIRATION. THE CONTRACTOR WILL WORK WITH THE FIELD COORDINATOR TO DETERMINE THE TIMING AND VOLUME OF REQUIRED IRRIGATION. IRRIGATION WILL CONTINUE ONLY IF NEEDED THROUGH THE SECOND AND POSSIBLY THIRD GROWING SEASONS AFTER PLANTING IS INITIATED.

B. IRRIGATION METHODS
IRRIGATION MAY BE APPLIED TO PORTIONS OF THE COMPENSATORY MITIGATION SITE THAT WILL BE SEEDED, DEPENDING ON THE AMOUNT OF WATER AVAILABLE VIA PRECIPITATION AFTER THE DATE OF SEEDING. IRRIGATION SHALL BE PROVIDED TO ENSURE GERMINATION OF SEEDS AND ESTABLISHMENT PRIOR TO THE RAINY SEASON, IF NECESSARY.
THE AMOUNT OF WATER APPLIED WILL DEPEND ON WATER AVAILABILITY AS DETERMINED BY RECENT RAINFALL AND LOSSES VIA EVAPOTRANSPIRATION. IRRIGATION WILL CONTINUE ONLY AS NEEDED. THE CONTRACTOR SHALL COORDINATE WITH THE BP PROJECT ENGINEER TO DETERMINE IRRIGATION NEEDS.

C. WATER SOURCE
WATER FOR IRRIGATION SHALL BE DERIVED FROM THE FIRE WATER SYSTEM AT BP CHERRY POINT REFINERY OR ON-SITE SOURCES AND TRANSPORTED TO THE MITIGATION SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING TRANSPORTATION FROM THE REFINERY TO THE MITIGATION SITE. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WATERING DATES AND TIMES WITH BP CHERRY POINT REFINERY UTILITIES DEPARTMENT. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING AN EMERGENCY SHUTOFF CONTINGENCY PLAN, TO BE APPROVED BY THE BP PROJECT ENGINEER.

D. RECORD OF IRRIGATION
THE CONTRACTOR SHALL MAINTAIN A LOG OF DATES, TIMES, LOCATIONS, AND APPROXIMATE VOLUMES OF IRRIGATION WATER APPLIED TO THE MITIGATION SITE.

2.7 HABITAT FEATURES

A. DOWNED LOG FEATURES THAT WILL IMPROVE THE SITE'S HABITAT VALUE WILL BE DISTRIBUTED ACROSS THE SITE. THIS WILL CONSIST OF DOWNED LOGS THAT ARE AT LEAST 20 FEET LONG AND AT LEAST 1 FOOT AVERAGE DIAMETER. A PORTION THE HABITAT FEATURES INSTALLED MAY CONSIST OF STUMPS THAT HAVE A LOG SECTION ATTACHED THAT IS AT LEAST 1 FOOT DIAMETER. AT LEAST 366 DOWNED LOGS AND STUMPS (3 PER ACRE FOR TERRESTRIAL AREAS) WILL BE PLACED ACROSS THE SITE.

B. AT LEAST THREE BRUSH SHELTERS WILL BE INSTALLED ON EACH CMA AND WOODY BRANCHES WILL BE PLACED IN SEASONALLY INUNDATED AREAS. THESE SHELTERS WILL BE PLACED AWAY FROM AREAS THAT WILL BE SEASONALLY INUNDATED. THE BASE OF EACH SHELTER WILL BE COMPOSED OF LARGE, PREFERABLY ROT-RESISTANT BOUGHS OR LOGS THAT ARE 10 TO 15 FEET LONG AND 4 TO 6 INCHES IN DIAMETER. THESE PIECES WILL BE STACKED CRISS-CROSS WITH PARALELL LOGS SPACED APPROXIMATELY 2 FEET FROM EACH OTHER UNTIL THE STRUCTURE IS 1 TO 2 FEET HIGH. BRANCHES OF A GRADUALLY SMALLER DIAMETER WILL BE PLACED BETWEEN AND ABOVE THE BASE LOGS IN TEE-PEE STYLE TO FORM

A MORE COMPACT WEAVE. CONIFEROUS EVERGREEN BRANCHES WITH NEEDLES STILL ATTACHED SHOULD BE ADDED TO EACH PILE TO ENHANCE SHELTER COVER. THE END PRODUCT WILL BE A STURDY, DOME LIKE STRUCTURE 4 TO 6 FEET HIGH THAT HAS ADEQUATE SPACE FOR SMALL MAMMALS TO MOVE ABOUT.

C. AT LEASDT 3 ARTIFICIAL SNAGS SHALL BE ERECTED ON EACH CMA. CEDAR SHALL BE THE PREFERRED MATERIAL. EACH SNAG WHALL BE AT LEAST 20 FEET TALL AND DBH OF 10 INCHES OR GREATER. THE BASE OF EACH SNAG WILL BE INSTALLED AT LEAST 4 FEET BELOW GROUND SURFACE. A 10-FOOT LONG CROSS BEAM MAY BE ATTACHED TO EACH SNAG NEAR THE TOP TO PROVIDE PERCHES FOR RAPTORS AND OTHER BIRDS.

D. BP CHERRY POINT WILL PROVIDE MATERIAL FOR HABITAT FEATURES FROM OTHER LOCATIONS AT THE REFINERY AND TRANSPORT THEM TO A CENTRAL DROP LOCATION AT THE PROJECT SITE. THE CONTRACTOR WILL BE RESPONSIBLE FOR RELOCATING THE HABITAT FEATURES THROUGHOUT THE SITE, AT THE DIRECTION OF THE BP PROJECT ENGINEER.

2.8 MAINTENANCE

MAINTENANCE SHALL BE UNDER A SEPARATE CONTRACT TO BP CHERRY POINT REFINERY.

2.9 PLANT QUANTITIES

SEE TABLE 7 FOR APPROXIMATE QUANTITIES OF PLANTS FOR THE FIRST YEAR OF PLANTING.

TABLE 7
APPROXIMATE NUMBER OF FIRST YEAR PLANTINGS

SPECIES	NO. PLANTS	SIZE
ALNUS RUBRA	2,285	18-36"
BETULA PAPYRIFERA	2,285	18-36"
CAMASSIA LEICHTLINII	1,130	BULBS
CAREX OBNUPTA	1,451	PLUGS
CAREX STIPATA	321	PLUGS
CAREX UTRICULATA	321	PLUGS
CORNUS SERICEA	3,309	18-36"
CRATAEGUS SUKSDORFII	458	18-36"
ELEOCHARIS PALUSTRIS	1,451	PLUGS
DESCHAMPSIA CAESPITOSA	1,130	PLUGS
FRAXINUS LATIFOLIA	783	18-36"
HOLODISCUS DISCOLOR	458	18-36"
JUNCUS BOLANDERI	321	PLUGS
JUNCUS ENSIFOLIUS	1,130	PLUGS
LONICERA INVOLUCRATA	1,542	18-36"
MALUS FUSCA	1,767	18-36"
OEMLERIA CERASIFORMIS	458	18-36"
PHYSOCARPUS CAPITATUS	3,309	18-36"
PICEA SITCHENSIS	1,971	18-36"
POPULUS BALSAMIFERA SSP. TRICHOCARPA	2,754	18-36"
POPULUS TREMULOIDES	500	18-36"
PRUNUS EMARGINATA	314	12-18"
PSEUDOTSUGA MENZIESII	314	18-36"
ROSA NUTKANA	2,225	18-36"
ROSA PISOCARPA	3,309	18-36"
RUBUS SPECTABILIS	1,767	18-36"
SALIX LUCIDA VAR. LASIANDRA	2,754	CUTTINGS 36-48"
SALIX PIPERI (S. HOOKERIANA)	3,309	CUTTINGS 36-48"
SALIX SCOULERIANA	2,285	CUTTINGS 36-48"
SALIX SITCHENSIS	3,309	CUTTINGS 36-48"
SAMBUCUS RACEMOSA	458	18-36"
SCIRPUS AMERICANUS	321	PLUGS
SCIRPUS MICROCARPUS	321	PLUGS
SYMPHORICARPOS ALBUS	458	18-36"
THUJA PLICATA	2,285	18-36"
TSUGA HETEROPHYLLA	314	1 GALLON
TOTAL	52,877	

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

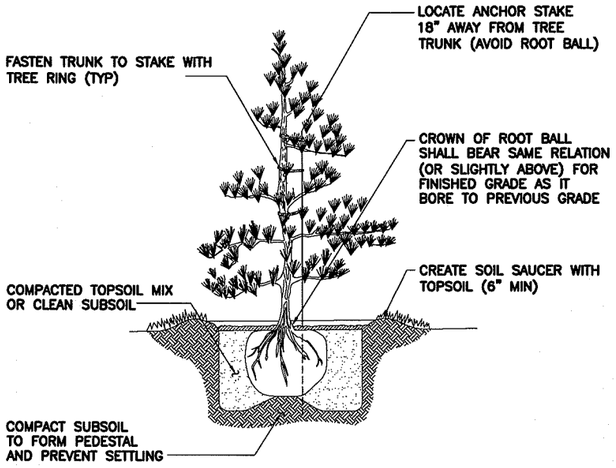
DWG. NO.
DR. TP
CKD. JAP
APPROVALS
OPER.

REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES-UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
PLANTING NOTES - B

DATE PRELIM. 12-21-07 | SCALE AS NOTED | AUTH 008LW
ENGINEERING CONTRACTOR URS CORPORATION
PROJECT NO: 4006A0
DWG. NO. 018
REVISION 0



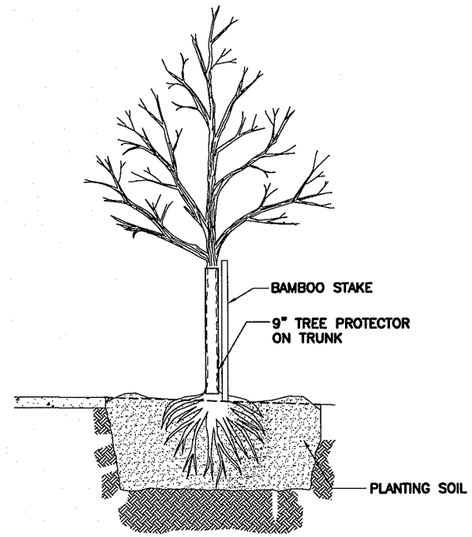
NOTES

1. DO NOT DAMAGE MAIN ROOTS OR DESTROY ROOT BALL WHEN INSTALLING TREE STAKE.
2. WATER THOROUGHLY SUBSEQUENT TO INSTALLATION.

CONTAINER TREE PLANTING

DETAIL 1/–

SCALE: NTS



BARE ROOT TREE AND SHRUB

DETAIL 2/–

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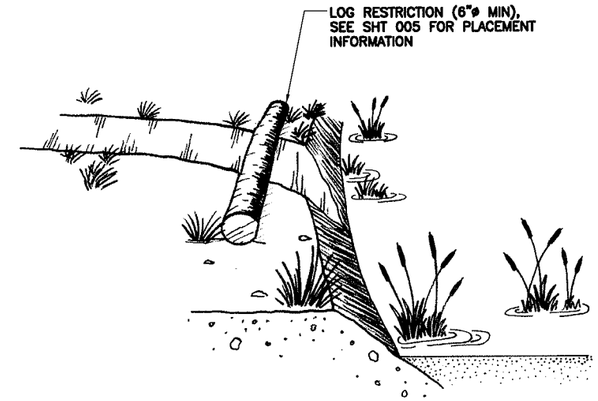

TYPICAL LOG RESTRICTION DETAIL

DETAIL B/005

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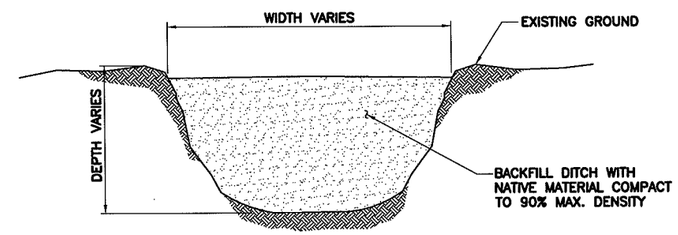


TYPICAL DITCH PLUG DETAIL

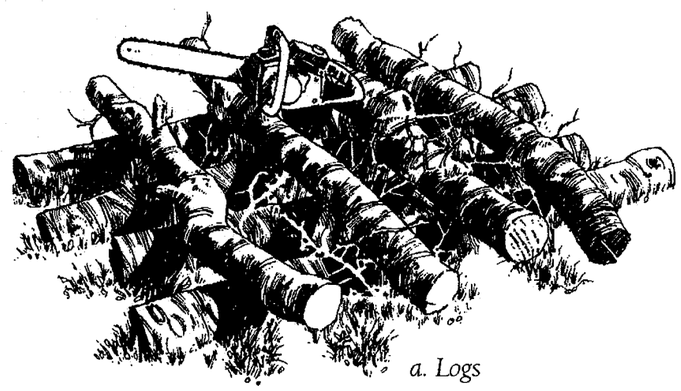
DETAIL J/007/008

SCALE: NTS

FINISHED BRUSH SHELTER

DETAIL 3/–

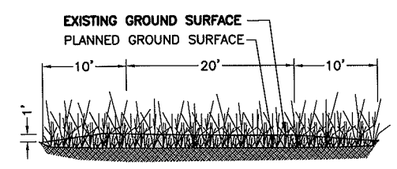
SCALE: NTS



BRUSH SHELTER BASE

DETAIL 4/–

SCALE: NTS



TYPICAL SEASONAL POND CROSS SECTION

DETAIL 5/–

SCALE: 1" = 10'

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.
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OPER. –

DWG. NO. –

REFERENCE DRAWINGS –

DR. HWJ/TP

CKD. JAP

APPROVALS –

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
TYPICAL PLANTING DETAILS

DATE PRELIM. 12–21–07 | SCALE AS NOTED | AUTH 008LW

ENGINEERING CONTRACTOR URS CORPORATION

PROJECT NO: 4006A0

DWG. NO. 019

REVISION 0

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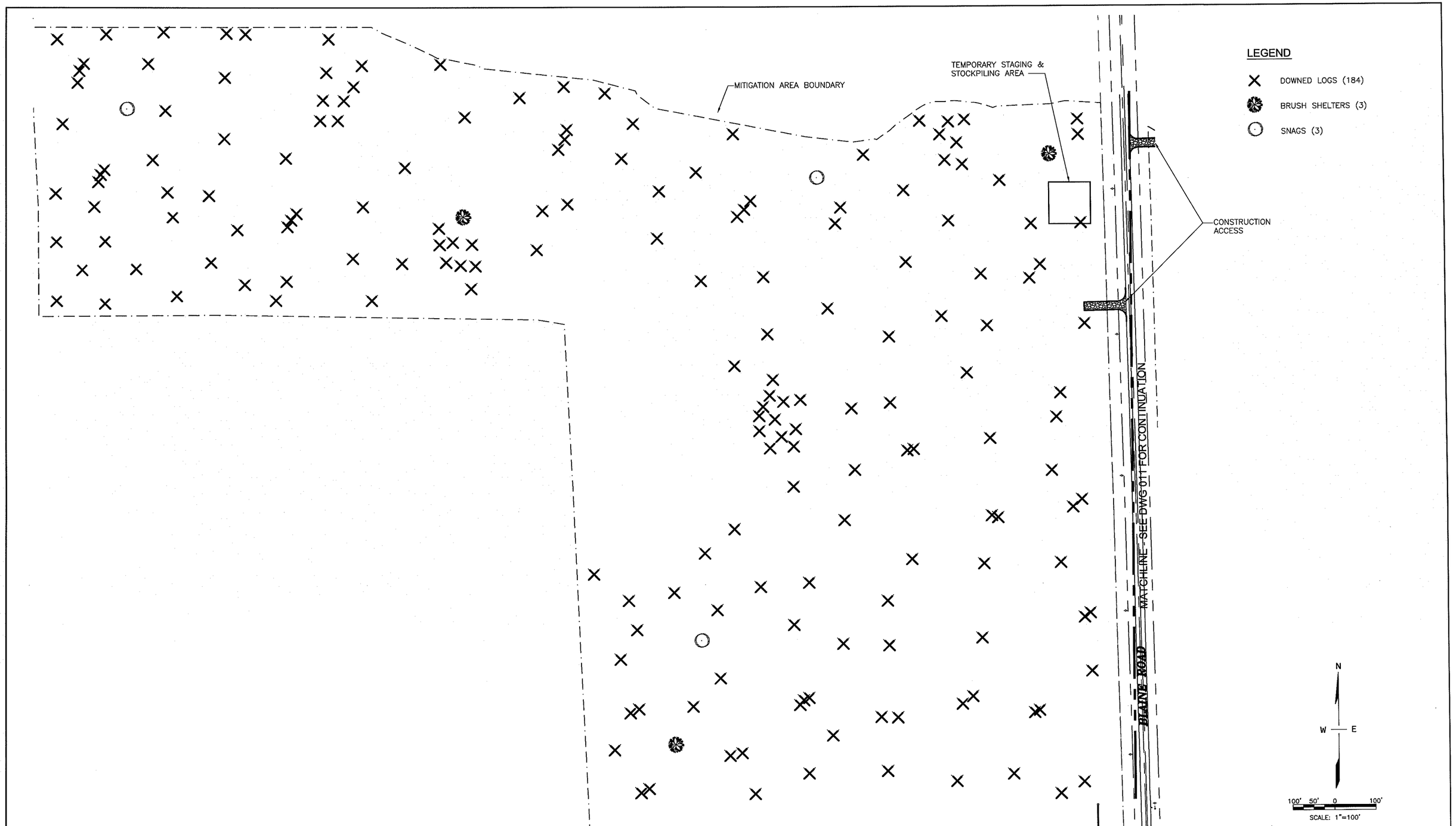

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

DWG. NO.
DR. TP
CKD. JAP
APPROVALS
OPER.

REFERENCE DRAWINGS

bp BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
HABITAT FEATURE LOCATIONS – CMA2

DATE PRELIM.12-21-07 | SCALE AS NOTED | AUTH 008LW

ENGINEERING CONTRACTOR
URS CORPORATION

PROJECT NO: 4006A0

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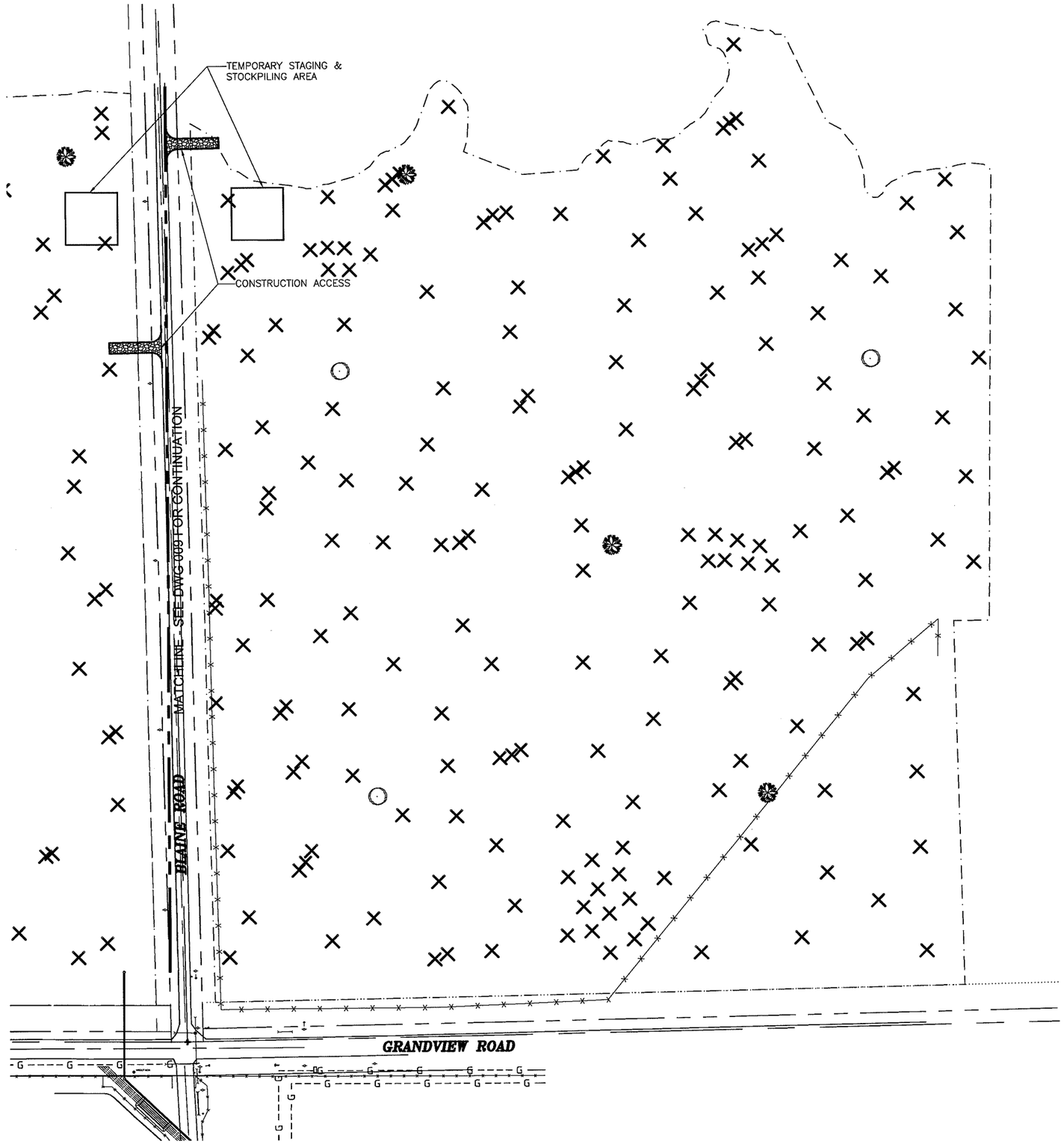

LEGEND

- DOWNED LOGS (182)
- BRUSH SHELTERS (3)
- SNAGS (3)

N
W — E

100' 50' 0 100'
SCALE: 1"=100'

REV.	DATE	AUTH.	PROJ. ENGR.	DESCRIPTION	BY	CKD.	APP.

DWG. NO.
DR. TP
CKD. JAP
APPROVALS
OPER.

REFERENCE DRAWINGS

BP WEST COAST PRODUCTS LLC.
Cherry Point Refinery

OFFSITES–UNIT 40
COGEN/FACILITIES MITIGATION PROJECT
HABITAT FEATURE LOCATIONS – CMA1

DATE PRELIM.12-21-07 | SCALE AS NOTED | AUTH OOBLW

ENGINEERING CONTRACTOR
URS CORPORATION
PROJECT NO: 4006A0

DWG. NO. 021

REVISION 0

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APPENDIX D

CMA PERFORMANCE STANDARDS

D.1. Wetland Hydrology

Objective A: Maintain wetland hydrology over the 82.3 acres of existing wetlands within the CMAs.

Performance Standard: The wetland hydrology performance standard for the CMAs is saturation at the soil surface or inundation to a depth not exceeding 6 inches for at least 22 consecutive days during the growing season. Measurement will be the documented presence of a free water surface within 12 inches of the soil surface over a continuous 22-day period during the growing season and will be part of the hydrologic monitoring program (URS 2004c). This performance standard meets the guidelines of wetland hydrology set by the *Corps of Engineers Wetlands Delineation Manual* (Corps 1987).

D.2. Vegetation

Objective A: Maintain survival of planted trees and shrubs during the first five years until adequate vegetation cover can be measured.

Performance Standard: A survival/replacement standard will apply to trees and shrubs for the first five years after implementation, before cover is large enough to provide a reasonable method of measurement. One hundred percent survival or replacement is required for the first year and 80 percent for years 2 through 5, or until woody species cover reaches 30 percent in areas planted to tree and shrub communities.

Measurement: Measurement will be by a sampling method consisting of plots located along transects that span the width of each CMA. As recommended by Krebs (1999), at least 1 percent of the total area to be monitored will be sampled directly.

Objective B: Establish a variety of forested, scrub-shrub, and emergent plant communities dominated by native vegetation in both wetlands and buffer areas (uplands) within the CMAs.

Performance Standard: The performance standards for cover of installed and volunteer woody (tree and shrub) and herbaceous vegetation outlined in Table D-1 will be applied to all portions of the CMAs where tree and shrub communities will be planted. As explained in Section 5.6.5 of the Compensatory Mitigation Plan, some areas will remain free of installed trees and shrubs. Volunteer plants are those plants that establish on their own without direct planting or seeding. Herbaceous cover standards are much higher than the tree and shrub cover standards since herbaceous plants are expected to more rapidly colonize greater proportions of both the CMAs.

Table D-1
Installed and Volunteer Plant Cover Standards

Criterion	Year 1	Year 2	Year 3	Year 5	Year 7	Year 10
Tree and shrub cover (%)	*	*	*	30	55	80
Herbaceous cover (%)	40	60	80	90	90	80

* = Tree and shrub survival, rather than cover, is measured during the first five years or until woody species cover reaches 30 percent in areas planted to tree and shrub communities.

Measurement: Measurement will be conducted by using a sampling method consisting of plots located along transects that span the width of each CMA. As recommended by Krebs (1999), at least 1 percent of the total area to be monitored will be sampled directly.

Objective C: Reduce and suppress cover by non-native, invasive plant species.

Performance Standard: The performance standards for non-native, invasive vegetation outlined in Table D-2 will appluy to all portions of the CMAs, including uplands and buffer areas. Those portions of the CMAs that currently have greater than 20 percent cover by reed canarygrass will have a performance standard of <20 percent through year 5. Portions of the CMAs that currently have less than 20 percent cover by reed canarygrass will have a performance standard of <10 percent. By year 7, all areas are to have less than 10 percent cover of invasive species.

Table D-2
Cover of Non-Native, Invasive Species

Species	Year 1	Year 2	Year 3	Year 5	Year 7	Year 10
Himalayan blackberry and evergreen blackberry (%)	<10	<10	<10	<10	<10	<10
Reed canarygrass cover in areas with >20% pre-existing cover (%)*	<20	<20	<20	<20	<10	<10
Reed canarygrass cover in areas with <20% pre-existing cover (%)*	<10	<10	<10	<10	<10	<10

* See Section 5.4.5, which discusses existing reed canarygrass cover distribution in the CMAs, and Figures 12A and 12B, which show existing reed canarygrass cover in the CMAs.

Measurement: Measurement will be conducted by using a sampling method consisting of plots located along transects that span the width of each CMA. As recommended by Krebs (1999), at least 1 percent of the total area to be monitored will be sampled directly.

The non-native, invasive plant species currently found in the CMAs include reed canarygrass, Himalayan blackberry, and evergreen blackberry. Of these species, only reed canarygrass is listed by the Washington State Noxious Weed Control Board as a noxious species in Whatcom County. Reed canarygrass is a Class C weed, which indicates that is widespread and is targeted for control to serve educational or biological efforts only.

APPENDIX E

PRE-MITIGATION HYDROLOGY ASSESSMENT
COGENERATION/FACILITIES PROJECTS MITIGATION SITE

Pre-Mitigation Hydrology Assessment

Cogeneration/Facilities Projects Mitigation Areas

BP Cherry Point

Prepared for:

BP Cherry Point Refinery
4519 Grandview Road
Blaine, WA 98230

December 21, 2007

URS

1501 Fourth Avenue, Suite 1400
Seattle, WA 98101-1616
(206) 438-2700

Job No. 33760106

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2.0 PHYSICAL SETTING 1
3.0 MONITORING SETUP AND METHODS..... 2
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4.0 FINDINGS 4
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Figure 3 – CMA1 Existing Hydrologic Pathways
Figure 4 – CMA2 Existing Hydrologic Pathways
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Figure 6 – CMA2 Monitoring Well Locations
Figure 7 – NRCS Soils Map Revisions

APPENDICES

A Monitoring Well Data Illustrating Groundwater Trends

1.0 INTRODUCTION AND PROJECT BACKGROUND

The proposed Maintenance Services Complex (MSC) and Cogeneration Project would permanently convert about 75 acres of vacant open space and 3 acres of gravel parking lot into impervious surfaces. Approximately 38 acres of wetlands would be permanently filled (URS 2007).

The Final Facility/Cogeneration Project Compensatory Wetland Mitigation Plan (URS 2007) addresses the mitigation required for the project's proposed wetland impacts. This includes enhancing 122 acres of fallow pasture wetlands and uplands to higher quality habitats within 2 compensatory mitigation areas (CMA1 and CMA1). Enhancements include reducing invasive species presence, improving the native vegetation communities, and rerouting water from the project's stormwater facility and from roadside ditches to the mitigation areas to reduce erosive storm flows in Terrell Creek. The concepts of this mitigation design were guided by a previously implemented and successful mitigation project on an adjacent site and by current and historic landscape patterns in the mitigation area vicinity.

A pre-mitigation hydrology assessment was requested by regulatory agency staff to identify the existing soils and hydrologic conditions in the proposed mitigation area. Results of this study would be used to guide the final mitigation design and to provide baseline data on which to compare the wetland mitigation performance standard achievement.

2.0 PHYSICAL SETTING

The CMAs and surrounding lands north of Grandview Road are composed of former agricultural grazing land and are bounded to the north, east, and west by undeveloped BP property. Some of these lands are set aside as wetland mitigation lands. Blaine Road divides CMA1 from CMA2 (Figure 1). Terrell Creek is located north of the mitigation area. The distance to Terrell Creek ranges from 150 to 400 feet north of the mitigation area. Terrell Creek is contained within a ravine as much as 30 feet at the Blaine Road crossing and by over 50 feet north of CMA2.

The site slopes gently from southeast to west/northwest with over 25 feet of topographic relief in CMA1 and greater than 55 feet of elevation change across CMA2. Roadside drainage ditches along Grandview Road and Blaine Road and three shallow ditches in the mitigation areas promote drainage of the surface and shallow groundwater soils in both CMAs (Figures 3 and 4). The landscape of the Birch Bay vicinity is underlain by a thick, relatively impermeable subsurface layer known as the Bellingham Drift. The impervious shallow Bellingham Drift, along with topographic and drainage features, control the mitigation area hydrologic patterns. A shallow surface layer of more permeable soils overlaying the Bellingham Drift ranges from zero to about 8 feet deep in the vicinity of the CMAs (Figure 2). The surface soils are comprised mostly of silts or silty clays but contain inclusions of more permeable sand or gravel lenses that help drain soils downslope. Certain soil types contain inclusions of sand that may be quite permeable to

infiltration and groundwater transport. The speed of groundwater movement is determined by both the slope of the controlling surface and the permeability of the soils through which the water moves.

Two of the three soil series that predominate in the CMAs are considered hydric since they typically sustain saturation at or near the soil surface throughout extended periods of the growing season. A more detailed description of the soil types is in the wetland delineation report for the CMAs (URS 2003a).

Generally, the mitigation site soil hydrology follows a seasonal wet / dry pattern. The trend is for surface soils to become saturated as autumn rains accumulate faster than water can drain away, evaporate, or transpire through vegetation. Soils have shown to be saturated after a series of heavy rainfalls then begin to dry out between rain events. The gentle slope and shallow depressions tend to slow the arrival and broaden the flow rate curve of runoff in major drainageways. Those portions of the mitigation site on higher elevations, having greater slopes, and/or containing more permeable soils will dry out fastest and most completely. Areas at the bottom of slopes, where outflow is limited, and/or in flat areas, remain wet longer. These areas typically contain high soil moisture well into the growing season and qualify as wetlands.

3.0 MONITORING SETUP AND METHODS

3.1 Soil Borings

URS retained Cascade Drilling Inc, of Woodinville, Washington, to advance soil borings at the CMA1 and CMA2 study sites with a truck-mounted geoprobe direct-push drill rig (geoprobe). The geoprobe was capable of accessing most areas within the study sites, except those areas overgrown by dense thick vegetation or beyond abrupt transitions of grade (i.e. ditches or steep slopes).

Soil samples were collected by advancing an approximately 4 foot long stainless steel sampler with a hammer mounted on the geoprobe. The sampler was lined with a 2-inch diameter tubular acetate liner that collected soil as it was advanced into the subsurface. After reaching the desired or maximum depth of 4 feet, the sampler was removed from the borehole. The liner was then removed from the sampler and sliced open to inspect and log the soils retrieved. A new liner was placed in the sampler, and the sampler was inserted back into the existing borehole. The sampler was advanced in consecutive 4 foot intervals by using additional stainless steel rods until the desired depth at each location was encountered. The boreholes, in general, stayed open which minimized the amount of sloughed material collected in each subsequent sample liner used in the boring. The maximum depth advanced to in the CMAs was approximately 16 feet below ground surface (bgs). Typical boring depths ranged between 8 to 12 feet bgs in order to confidently define subsurface lithologic conditions. Refusal conditions were commonly encountered beyond a depth of 12 feet. Upon completion of each boring, the borehole was backfilled with hydrated bentonite chips in order to prevent a conduit assisting overland water flow entering the subsurface. Soils accumulated from each borehole were disposed of onto the ground near each boring location.

URS completed a total of 60 soil borings in the CMA1 and CMA2 study sites in order to characterize the subsurface soil stratigraphy that controls the movement and distribution of water in the proposed mitigation area. The soil boring program occurred between September 11th and 15th, 2006.

3.2 Groundwater Monitoring Wells

URS installed shallow groundwater monitoring wells to monitor CMA1 and CMA2's existing shallow groundwater regime. Determination of well placement was based on the mitigation area's differing soil characteristics and the locations of wetlands and uplands. A total of 14 wells were installed with the geoprobe rig driving the casing into the ground to the desired depth. This method produced a minimally destructive technique that was applied to depths of up to approximately 6 ¾ feet bgs. Monitoring wells are constructed of either 1 ½ to 2 foot sections of wire wrapped stainless steel screens approximately 1 inch in diameter joined to galvanized pipe lengths with threaded couplers. The wells were driven so that the bottom of the screen was at or slightly below the bottom of the permeable soil layer where it contacts the relatively impermeable Bellingham Drift. No filter pack was installed so the piezometers are screened in direct contact with the soil. A screen size of 0.010 inch was used to reduce the infiltration of fines into the screens. The wells were installed within a few feet of soil borings so that well depths could be confirmed against to the soil boring. The wells are capped with PVC slip caps and a small amount of bentonite clay was applied around the surface of the well to minimize surface infiltration. Monitoring well placements are illustrated in Figure 5 and 6.

A total of 14 monitoring wells were installed at key locations within the CMA1 and CMA2 mitigation areas. Wells 2 and 7 are located in upland areas not likely to undergo hydrologic changes resulting from the mitigation work. Wells 1, 4, 8, 9, and 13 are located in upland areas where hydrologic mitigation is anticipated to increase the duration and/or the depth of the water from the baseline monitoring period. Wells 11 and 14 are placed in wetlands where hydrology is likely to change after mitigation. Wells 3, 5, 6, 10, and 12 are placed in wetlands which will not likely experience great changes in hydrology after the completion of mitigation.

3.4 Survey Work

BP conducted the surveying to locate final monitoring well and soil boring locations. Survey results were recorded in BP's survey control coordinate system. The data was plotted by URS on existing base maps using CADD.

3.6 Deviations from Work Plan

URS endeavored to complete the system setup and monitoring activities as close to the work plan as possible. Adaptations and deviation were required as the project progressed, including abandoning the use of staff gauges, lysimeters and tensiometers from the project scope. It was determined upon initial investigation that the monitoring wells could capture the water depths in some on-site ditches while other ditches did not

display evidence of significant flows. Tensiometer and lysimeters were determined to be inappropriate for this study.

URS modified the preliminary soil borings layout to accommodate soil conditions that were more homogenous than anticipated. URS conducted 60 borings of the planned 65. Sufficient coverage was attained to characterize the soils and their effects on hydrology.

Generally, the shallow piezometers and transducers were installed and continue to function as described in the work plan.

4.0 FINDINGS

4.1 Soils

URS previously conducted shallow soil test pits (down to 18-inches in depth) while conducting the wetland delineation for the CMA1 and CMA2 mitigation area design. Detailed results from this wetland investigation are available in the Cogeneration Mitigation Area Wetland Delineation Report (URS 2003). Deeper borings were identified by Golder Associates in 2002 as part of a separate project for the BP Cherry Point Refinery Complex (Golder 2003). These borings indicate the general stratigraphy of the area consists of a shallow surficial layer of reworked sediments overlying the glaciomarine derived Bellingham Drift. The low permeability Bellingham Drift can be as thick as 70 feet and overlies the Deming Sand and the low permeability Kulshan Drift. The Deming Sand is approximately 30 feet thick and the Kulshan unit is approximately 15 feet thick. The Esperance Sand is the deepest identified unit of glacial deposits and is approximately 45 feet thick. Beneath these glacial units are either additional undifferentiated deposits or bedrock units depending on the boring.

Soil Classifications

The soils encountered throughout the site are more or less consistent with the soil series described by the NRCS in the Soil Survey of Whatcom County Area, Washington (Figure 7; Goldin 1992). Soils were catalogued according to the texture, relative grain size, and presence of mottling and gravels by a URS geologist for their effect on the site hydrology and any evidence of variability from the NRCS soils map. The dominant soils in CMA1 and CMA2 fall within one of the following classifications - Birchbay silt loam, La Bounty silt loam, and Whitehorn silt loam. Bellingham silty clay loam is located in four soil borings defining the far western end of the CMA2 panhandle. Also present in one boring each was Kickerville silt loam and Whatcom silt loam.

Bellingham soils are poorly drained soils formed in hydric conditions but containing inclusions of nonhydric soil types. Bellingham soils typically display a silty clay loam surface 10 inches deep over a 14 inch deep silty clay loam subsoil. The clay loam substratum typically begins at 24 inches below ground surface (bgs). In some areas the substratum has 20 to 30 percent clay while other areas commonly contain 60 percent clay or more. Occasionally the substratum contains sand lenses. Permeability in the

Bellingham soil is slow, and the effective rooting depth is limited by a seasonal high water table that is typically at or near the soil surface from November to April.

Birchbay silt loams are nonhydric and moderately well drained. Birchbay silt loams typically have a loam or silt loam surface layer that is 8 to 12 inches thick. The subsoil is a gravelly silt loam about 6 to 20 inches thick. The upper 18 inches of the substratum is very gravelly sand, whereas the lower part of the substratum to a depth of 60 inches has a high percentage of clay. The depth from the soil surface to the sand substratum in the survey area is typically 14 to 18 inches. Permeability in the Birchbay soil is moderate in the surface layer, very rapid in the sandy upper part of the substratum, and slow in the lower part of the substratum. This soil type, which developed under forests, may be saturated for long periods outside the growing season and may remain saturated for a small portion of the growing season.

La Bounty silt loam is a hydric, poorly drained soil. Typically found in depressions on glaciomarine driftplains. Drainage is usually a result of artificial intervention. The surface layer is typically a very dark grayish brown silt loam extending to 10 inches. The upper 6 inches of substratum is grayish brown and light brownish gray. The substratum to 60 inches is gray loam. The available water in this unit is high while the rooting depth is constrained by the poor drainage and the seasonally high water table.

Whitehorn soils are listed as poorly drained soils by the *Soil Survey for the Whatcom County Area* (Goldin 1992). They are largely hydric but contain inclusions of nonhydric soils. These soils have horizons with low vertical hydraulic conductivity that restricts downward percolation of water. This low infiltration sustains saturation near the soil surface throughout most of the wet season. Whitehorn silt loams typically have a silt loam surface layer that is 10 to 16 inches deep. The upper 8 inches of the subsoil is loam and very fine sandy loam, whereas the lower 8 inches of the subsoil is gravelly sandy loam. The substratum typically begins 26 inches bgs and consists of a loam that has a high percentage of clay. In some areas, the substratum contains sandy lenses, pebbles, or both.

Site Soil Characteristics

The CMA1 study site has two general soil/topography sections, approximately corresponding to the southeastern corner areas and the site's remaining areas. The southeastern corner, approximately one-sixth of the study site, is typically the steepest sloping portion of the project area dipping to the northwest. This area is predominantly uplands and extends westward along the southern boundary and northward along the eastern boundary. At the northwestern corner of CMA1 is another chiefly upland area that slopes southward. The remainder of CMA1 is predominantly composed of wetlands with slight east to west topographic undulations (Figure 3). Soil borings generally confirmed the presence of LaBounty silt loams across most of CMA1 with Birch Bay or Whitehorn silt loams in the southeast quarter as mapped by the NRCS Whatcom County soil survey (Figure 7).

The depth of the low permeability Bellingham Drift is between 1 and 6 ½ feet bgs, with the contact typically being a weathered silt or clay layer. The typical profile is approximately ½ to 1 ½ feet of dark brown to brown organic silt over a ½ to 2 ½ feet of brownish gray to gray sand. In general, the sand contains organic material, oxidation, trace silt, and trace gravels up to 1 inch in size. Beneath the sand at depths starting from 1 to 6 ½ feet bgs is gray clay or silt and clay with oxidation mottles, and significantly decreased organics and trace course material. This layer is interpreted to be the Bellingham Drift as it usually dries out within a couple of feet of the contact and was uniform throughout the site. Lateral movement of water downslope through the soil layers above the Bellingham Drift is expressed by groundwater discharge seeps on the lower slopes.

The CMA2 study site has two general soil/topography types sections, which correspond to identified upland and wetland areas. The study site gently slopes from east to west with diffused undulating benches that step down with respect to elevation westward. At the low points of these undulations are identified north to south trending wetland areas, which are adjacent to similar trending upland areas along the high points (Figure 7). CMA2 study site is bisected by an east to west draining ditch (Figure 4). Soils mapped throughout CMA2 are typical of the Birch Bay or Whitehorn silt loams and approximately match the NRCS soil survey's mapped soils distribution (Figure 7). The far western corner of CMA2 is composed of the mapped Bellingham silty clay loam. Whitehorn silt loams were located as mapped along the eastern edge of CMA2 next to Blaine Road.

The seasonally perched water table extends from the contact with the Bellingham Drift to the surface. The depth of the low permeability Bellingham Drift is between approximately 1 to 5 feet bgs, with the contact typically being a weathered silt or clay layer. The typical profile is approximately ¼ to 1 ¾ feet of dark brown to brown organic silt over an 1/3 to 3 ½ feet of brownish gray to gray sand. In general, the sand contains organic material, oxidation, trace silt, and trace gravels up to 1 inch in size. Beneath the sand at depths ranging from 1 to 5 feet bgs is gray clay or silt and clay with oxidation mottles, and significantly decreased organics and trace course material. This layer is interpreted to be the Bellingham Drift as it usually dries out within a couple of feet of the contact and was uniform throughout the site. Within borings B1 through B5, there were no sand layers encountered. Additionally, a sand lens from 6 ½ to 9 ½ feet was encountered in soil boring B14. Rock fragments were encountered as an approximately 2 inch layer in several soil borings at the sand layer to Bellingham Drift transition at depths ranging between 12 to 22 inches, respectively. Lateral movement of water downslope through the soil layers above the Bellingham Drift is expressed by groundwater discharge seeps on the lower slopes.

4.3 Hydrology

The CMAs hydrologic storage and flow patterns effectively follow seasonal and storm specific weather events. The shallow clay till and low relief decreases vertical and lateral drainage, fostering widespread near-surface saturation and/or shallow inundation during much of the wet season. The wet season closely corresponds to increasing rain and

decreasing evapotranspiration. From October through April, the mitigation area soils are fully charged and contain saturation, inundation, and/or runoff in extensive shallow depressions closely corresponding to the mapped wetland areas (Figure 3 and 4). The fourteen monitoring wells installed to record the mitigation area hydrologic conditions support these observations as well as the rapid response of the mitigation area to the daily and weekly weather patterns (Appendix A).

The varying extent and duration of inundation and surface saturation of soils during the wet season is strongly dependent on the daily and weekly weather patterns (Appendix A). This variation results from the low volumes of water held in the shallow soils above the clay till aquitard along with lateral water movement through relatively porous sand or gravel lenses identified in the soils throughout the mitigation area. The dry summer season from late April through late September provides minimal precipitation that is not capable of maintaining surface inundation, saturation, or flows in any portion of the CMAs.

Figures 3 and 4 show existing hydrologic pathways within and downgradient of each CMA as confirmed by visual observation of the mitigation areas during pedestrian surveys between 2004 and 2007. The hydrologic pathways within the CMAs occur along natural topographic pathways where surface water may drain as dispersed sheet flow or through swales and ditches as semi-concentrated flow. To determine locations of hydrologic pathways, ditches and swales were walked during the wet winter periods on days of heavy rain when the system was fully charged. Because the aquitard layer topography is very shallow and similar to the surface topography, and the surface and groundwater appear follow the same hydrologic cycles and pathways, the hydrology discussion will not differentiate the surface and groundwater discussions and will focus on major features that affect hydrologic movements.

CMA1 hydrology originates from direct precipitation and some minimal runoff from a small slope to the east. Roadside ditches capture water from adjacent roads and upslope areas that may otherwise enter CMA1. The roadside ditches likely also capture some groundwater discharging from the soils along the west edge of CMA1. The hillslope in the southeastern portion of the site faces northwest at approximately 3.5% grade. The rest of the site is nearly flat, but slopes gently (<1% grade) to the north. A shallow ditch very slowly drains water north across CMA1 to Terrell Creek, but the CMA1 remains inundated with a couple inches of water throughout most of the wet season (Figure 3). The ditch is about 5 feet wide and varies between 1 to 1.5 feet below the immediately surrounding grade. Vegetation hinders flows through the ditch in several locations. A second small ditch in the northwest quarter is the site and is mostly filled in by hedgerow plants drains to the larger north draining ditch. The ditches may contain shallow standing water and/or no standing water from June through October depending on the quantity of precipitation during specific rain events. The ditch rapidly becomes a well-defined channel after it exits CMA1 and drains north through the steeply sloped riparian forest to join Terrell Creek.

CMA2 hydrology originates from direct precipitation. Water drains generally west across the site through an extensively linked mosaic of shallow depressions and swales

(Figure 4). The easternmost 350 feet of CMA2 is fairly flat, but the remaining portions, including the panhandle, slope west at approximately 2.25% grade. The panhandle generally slopes west at approximately 2.5% grade, but it does contain some areas as steep as 6%. As with CMA1, historic cultivation has substantially disturbed the site, including the creation of ditches that continue to facilitate site drainage.

Two ditches varying in depth capture and carry surface water north and west along CMA2's western and southwestern boundary. The ditch leading north along the western boundary of CMA2 is 2 to 3 feet wide (bottom width) and 2 to 4 feet deep. The northern portion of this ditch runs just inside a large upland forest community surrounding by CMA2. The ditch leading west across the mitigation area is 2 to 3 feet wide (bottom width) and 0 to 2 feet deep. This ditch crosses the northern portion of the forest patch surrounded by CMA2. The confluence of the two ditches is located at the northwestern edge of the exclusion forest at the southeastern corner of the panhandle. Below the confluence, the ditch continues west as a very small shallow (<1 foot deep) surface flow pathway along the southern edge of the CMA2 panhandle before draining to lands west of CMA2. Waters flowing off CMA2 and adjacent lands eventually drain through a series of pathways to Terrell Creek.

5.0 OPPORTUNITIES

The *Revised Final BP Cherry Point Facilities/Cogeneration Project Mitigation Plan* (URS 2007) calls for a series of hydrologic improvements that create and/or increase the extent, duration, and frequency of saturation and inundation across the mitigation site. Site alterations will include:

- Adding up to 13 cfs of treated stormwater from an inlet in the southeast corner of CMA2, via a culvert under Grandview Road.
- Constructing a shallow conveyance swale that redirects the added stormwater to the north and west of the inlet point.
- Filling shallow ditches that drain water away from the CMAs.
- Constructing small seasonal ponds to create native amphibian breeding, dispersal, and forage habitat. These ponds will not be deep enough or hold water permanently that would otherwise provide breeding habitat for bullfrogs.
- Filling a large ditch along CMA2's west border to allow excess surface runoff from the Cogen mitigation area to continue downhill onto the Brown Road Material Storage Area mitigation site.

REFERENCES

Golder Associates Inc. 2003. *BP Cherry Point Cogeneration Project, Application for Site Certification (Revised)*. Prepared for Washington State Energy Facility Site Evaluation Council on behalf of BP West Coast Products, LLC. Portland, Oregon.

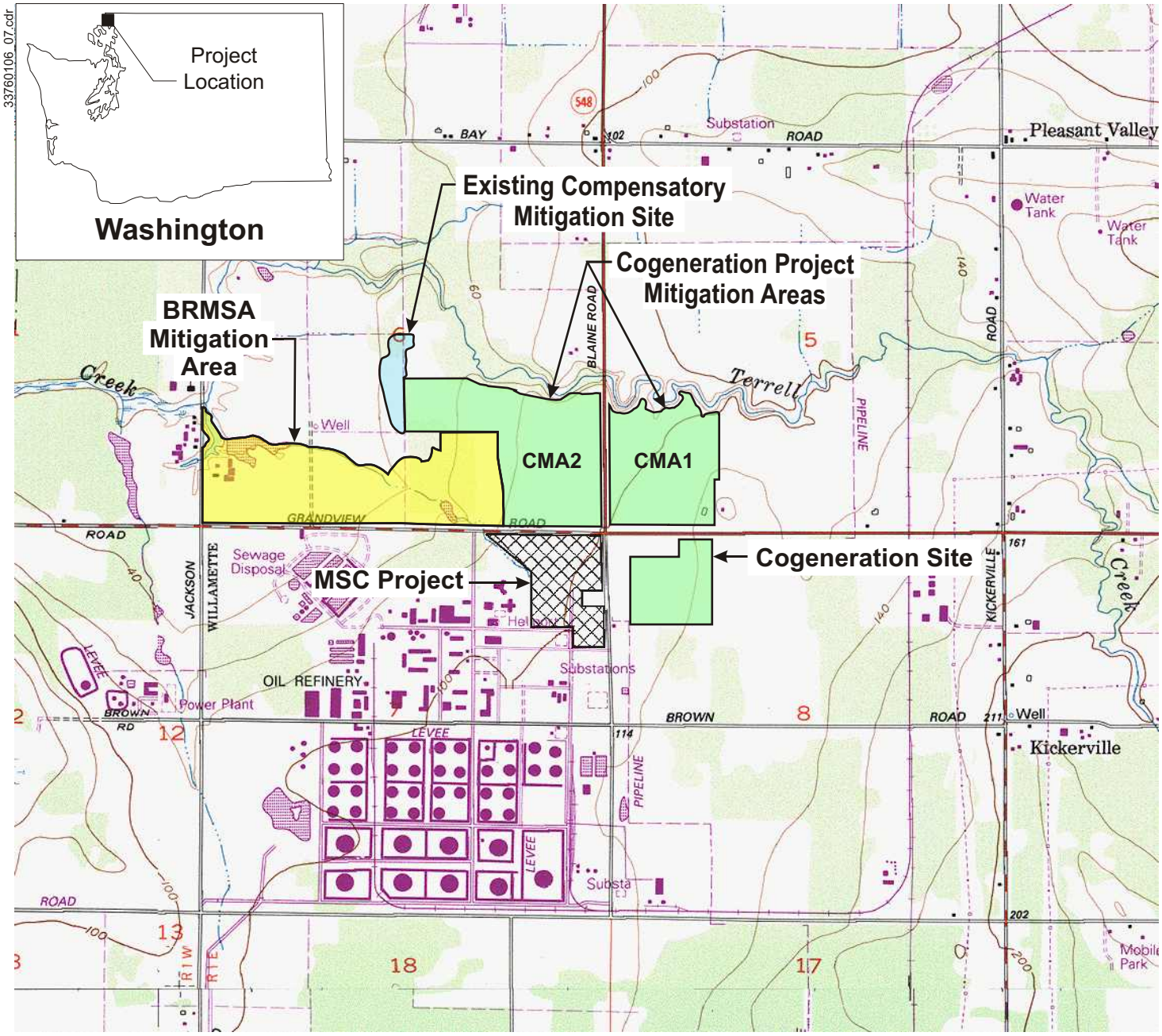
Goldin, Alan. 1992. *Soil survey of Whatcom County area, Washington*. U.S. Department of Agriculture, Natural Resources Conservation Service, Washington, D.C.

URS Corporation. 2003b. Revised Cogeneration Project Compensatory Mitigation Areas Wetland Delineation Report. Seattle, Washington.

———. 2004a. Hydrologic Monitoring Work Plan, Cogeneration Project. Seattle, Washington.

———. 2007. Revised Final BP Cherry Point Facilities/Cogeneration Project Compensatory Mitigation Plan. Seattle, Washington. December.

FIGURES



Map created with TOPO!™ © 1997 Wildflower Productions, www.topo.com, based on USGS topographic map

0 0.5 1.0

Scale in Miles

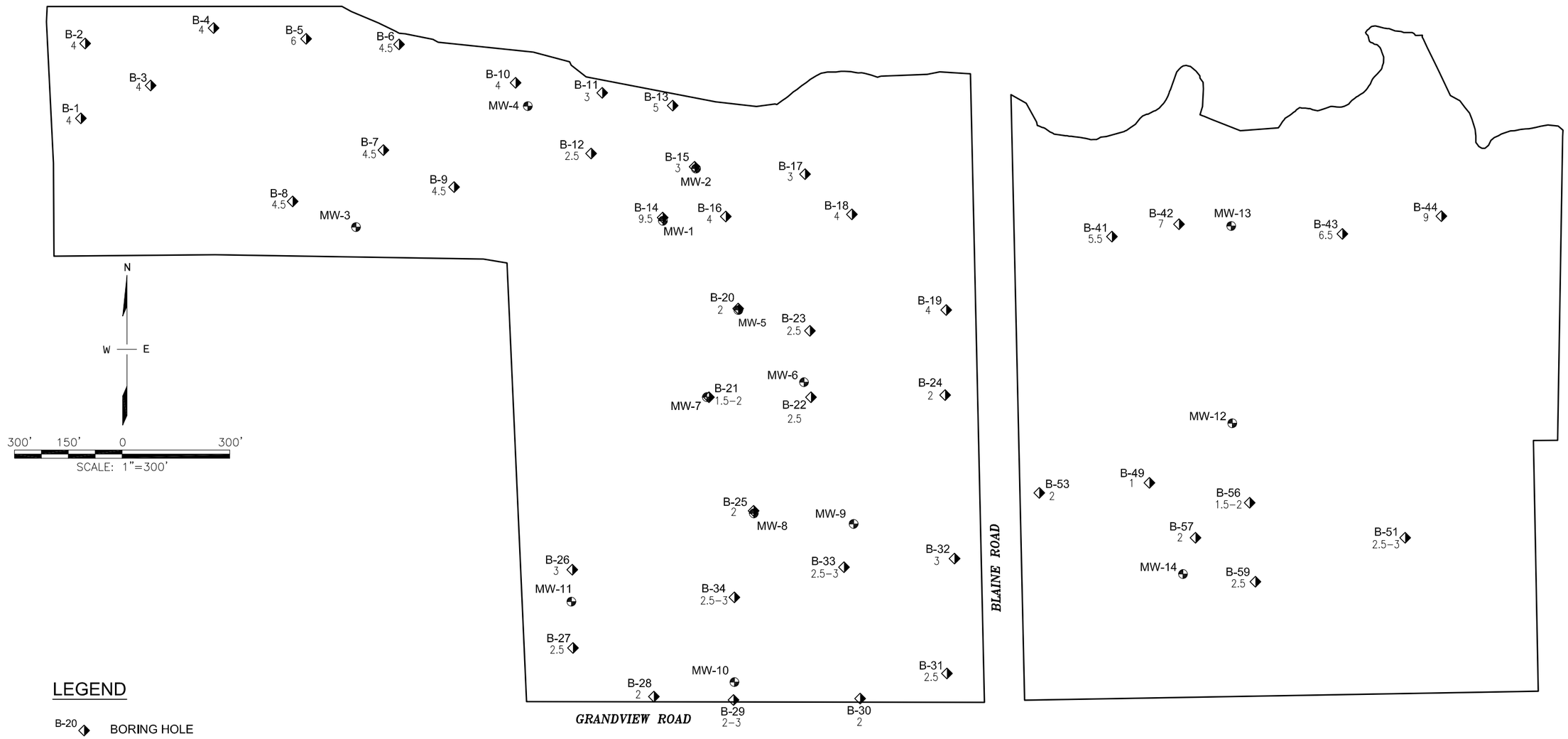
Job No. 33760106

Figure 1

Site Vicinity

URS

Pre-Mitigation Hydrology Assessment
Facilities/Cogeneration Project Wetland Mitigation
BP Cherry Point Refinery



LEGEND

B-20 BORING HOLE

4.5 BORING DEPTHS

MW-5 MONITORING WELL

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Job No. 33760106

URS

Figure 2

Soil Boring Depths to Clay

Pre-mitigation Hydrology Assessment
Facilities/Cogeneration Project Wetland Mitigation
BP Cherry Point

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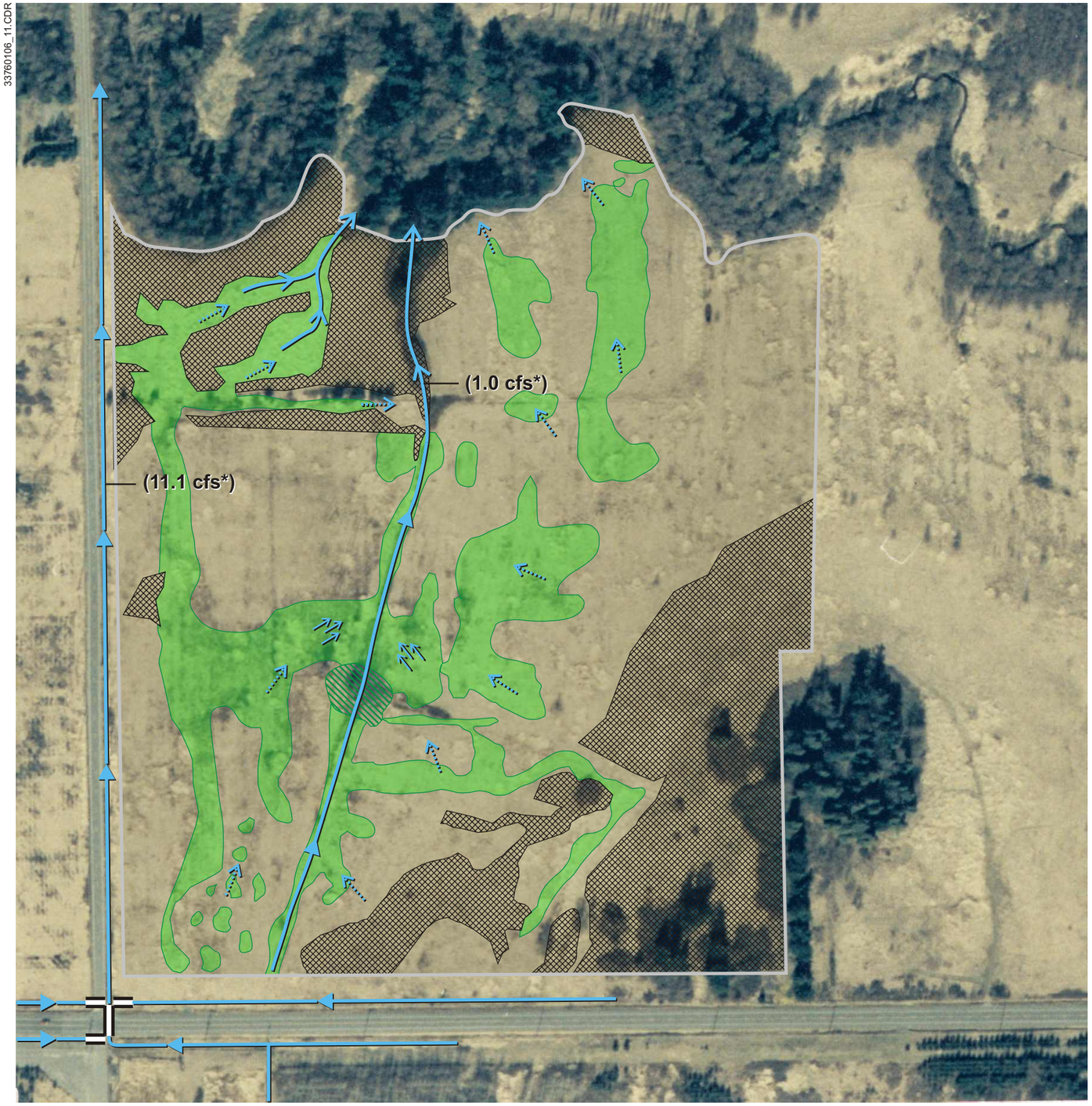


LEGEND

- CMA2 site boundary
- Upland
- PFOC wetland community
- PEMA wetland community
- PEMC wetland community
- Direction of interflow (shallow groundwater flow)
- Direction of semi-concentrated flow that becomes pooled
- Direction of concentrated and semi-concentrated flow in natural channels and swales
- Direction of concentrated flow in ditches
- Direction of sheet flow
- Culvert

N

0 250 500

Approximate Scale in Feet

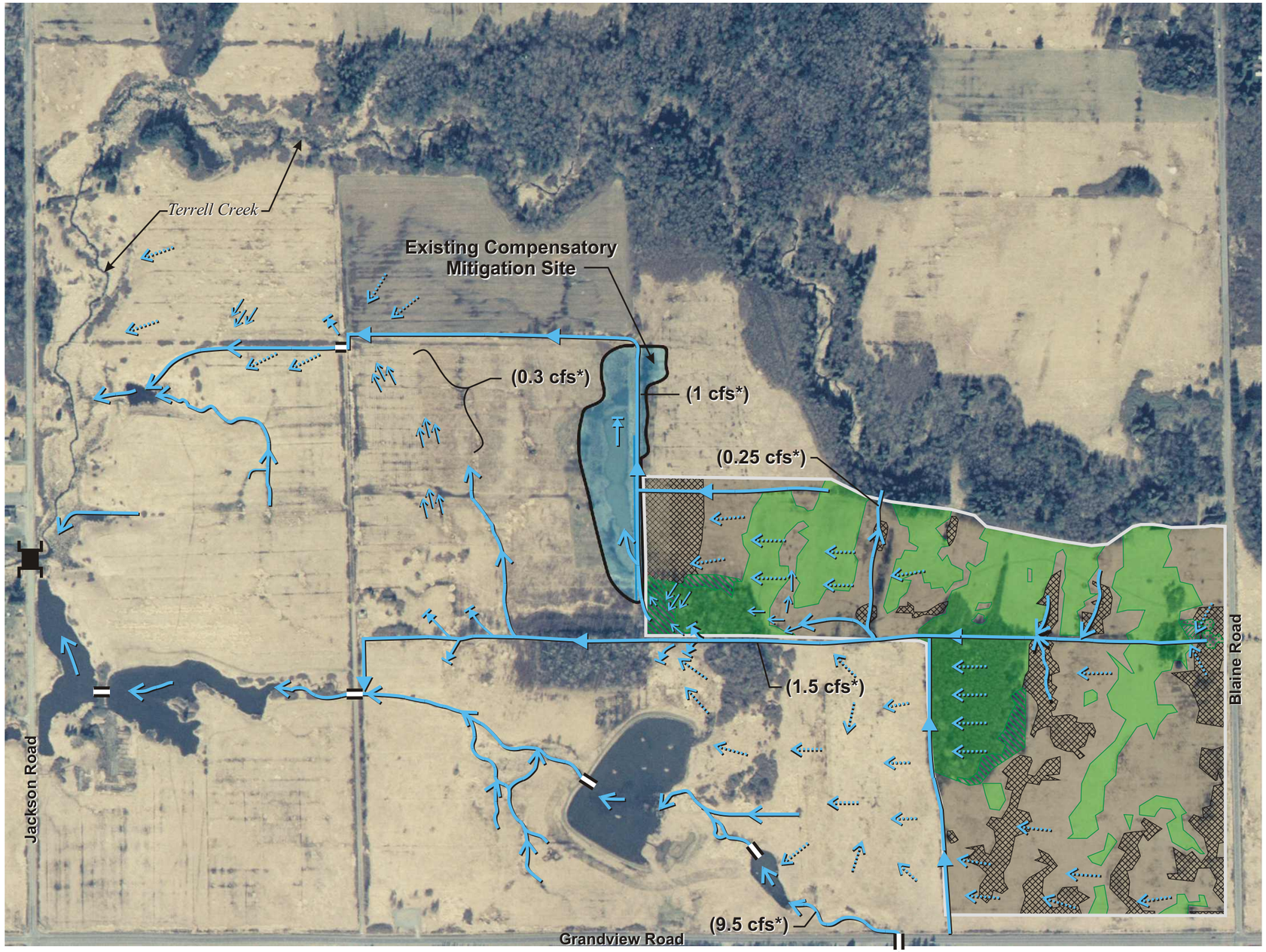
* Estimated peak flow during a 6-month, 24-hour storm event. Estimates for the channel outlet spillways based on design calculations for the proposed detention ponds for the Cherry Point Cogeneration Project. All other estimates based on this estimate and various site observations.

Job No. 33760106

Figure 3

CMA1 Existing Surface & Subsurface (Interflow) Hydrologic Pathways In and Downslope of CMA1

33760106_10.CDR



Connects to the stormwater collection system in the BP Cherry Point Refinery

LEGEND

- CMA2 site boundary
- Upland
- PFOC wetland community
- PEMA wetland community
- PEMC wetland community
- PSSA wetland community
- PSSC wetland community
- Direction of interflow (shallow groundwater flow)
- Direction of semi-concentrated flow that becomes pooled
- Direction of concentrated and semi-concentrated flow in natural channels and swales
- Direction of concentrated flow in ditches
- Direction of sheet flow
- Culvert
- Bridge

* Estimated peak flow during a 6-month, 24-hour storm event. These estimates are based on runoff calculations using the SCS method and observations made during various site visits.

N

0 500 1,000

Approximate Scale in Feet

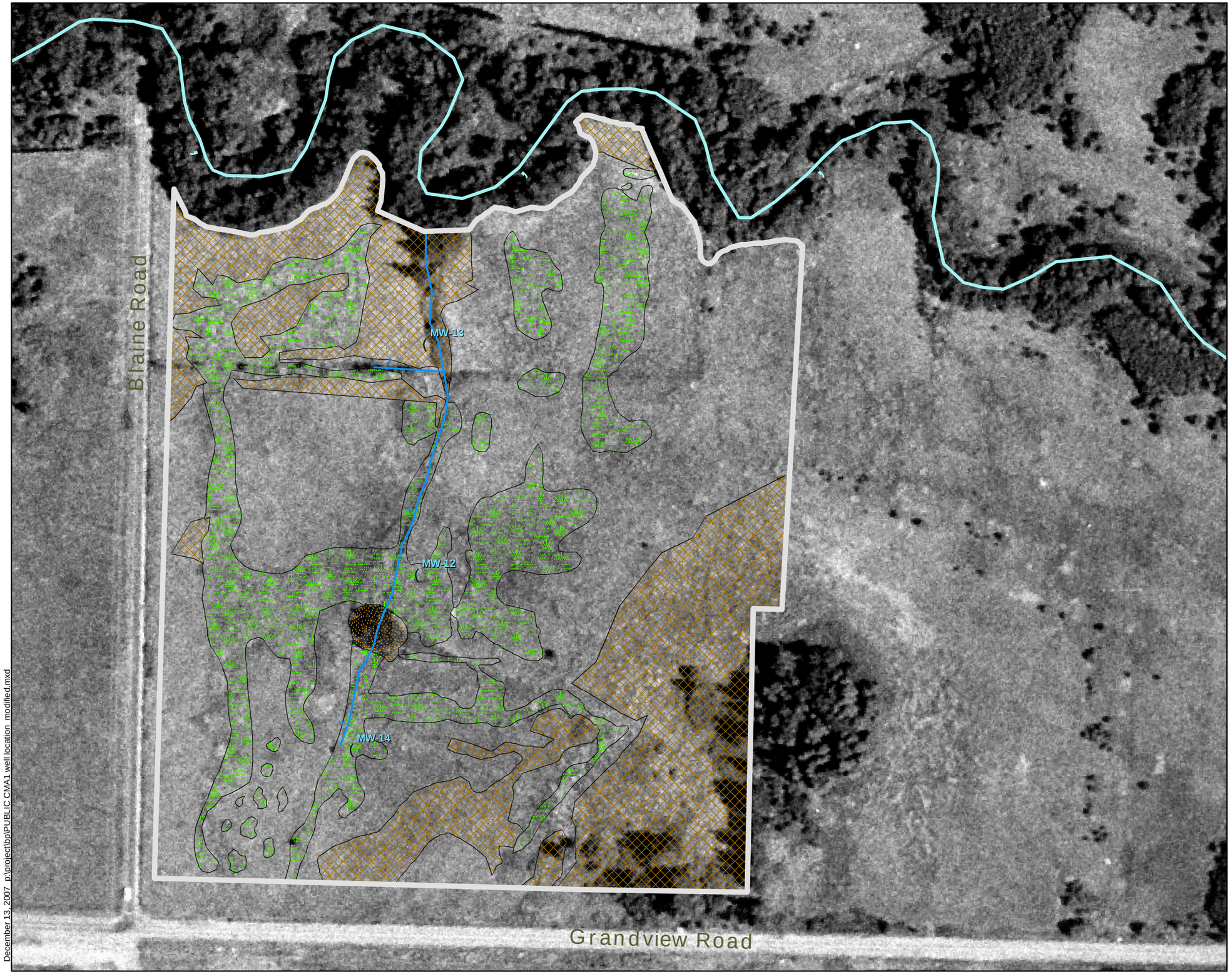
Figure 4

CMA2 Existing Surface and Subsurface (Interflow) Hydrologic Pathways In and Downslope of CMA2

Job No. 33760106

URS

Pre-Mitigation Hydrology Assessment
BP Cherry Point
December 21, 2007



CMA1

Legend

- Well Locations
- Terrell Creek
- Drainage Ditch
- Mitigation Area Boundary
- Upland
- PFOC Wetland Community
- PEMA Wetland Community
- PEMC Wetland Community

* Well locations are approximate and subject to field conditions

0 225 450
Feet

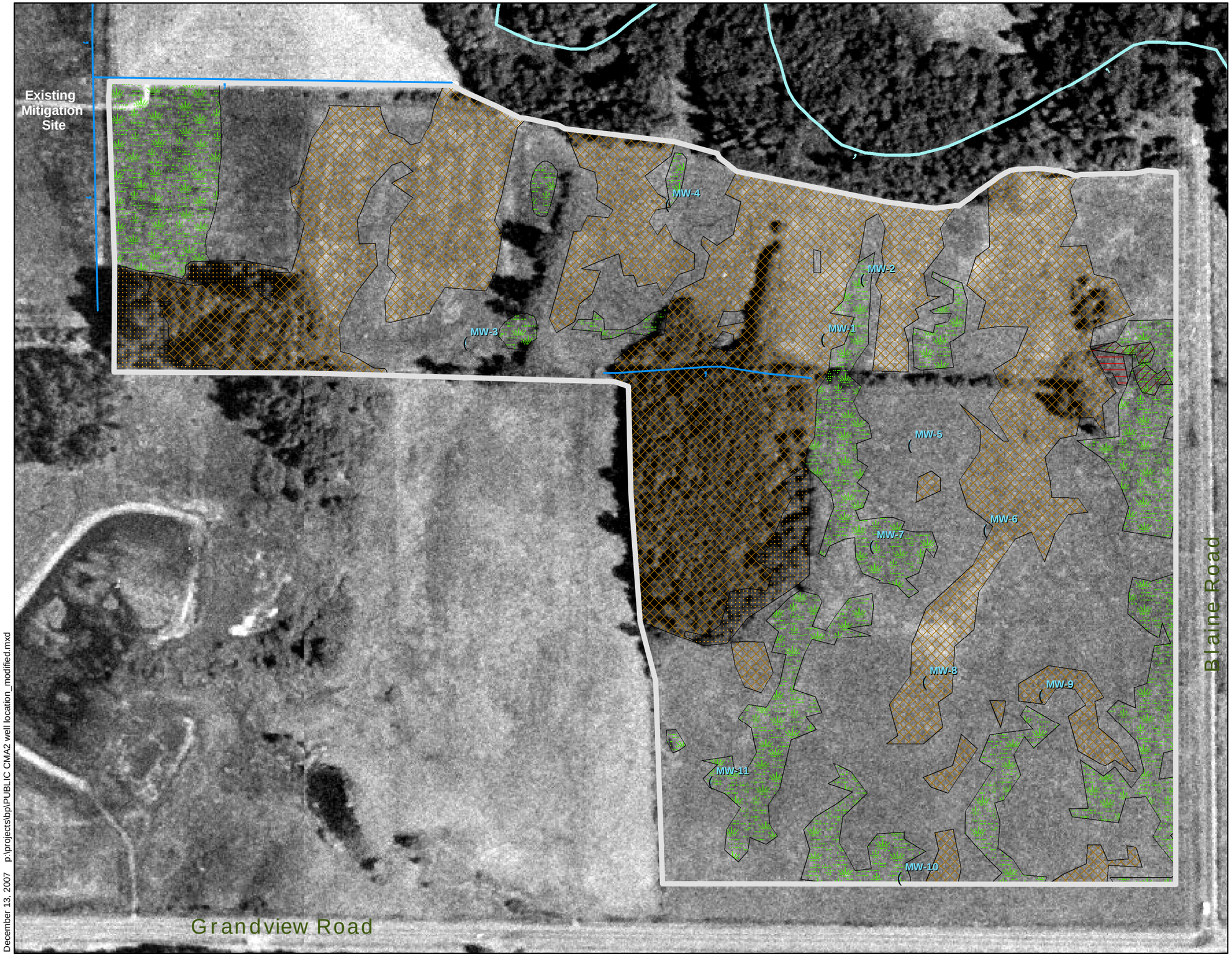
1 inch equals 225 feet

Figure 5

CMA1 with Well Locations

Pre-Mitigation hydrology Assessment
Facilities/Cogeneration Mitigation Plan
BP Cherry Point Refinery

December 13, 2007 p:\project\bp\PUBLIC CMA1 well location modified.mxd



CMA2

Legend

- Well Locations
- Terrell Creek
- Drainage Ditch
- Mitigation Area Boundary
- Upland
- PFOC Wetland Community
- PEMA Wetland Community
- PEMC Wetland Community
- PSSA Wetland Community
- PSSC Wetland Community

* Well locations are approximate and subject to field conditions

0 225 450
Feet

1 inch equals 225 feet

Figure 6

CMA2 with Well Locations

Pre-Mitigation hydrology Assessment
Facilities/Cogeneration Mitigation Plan
BP Cherry Point Refinery

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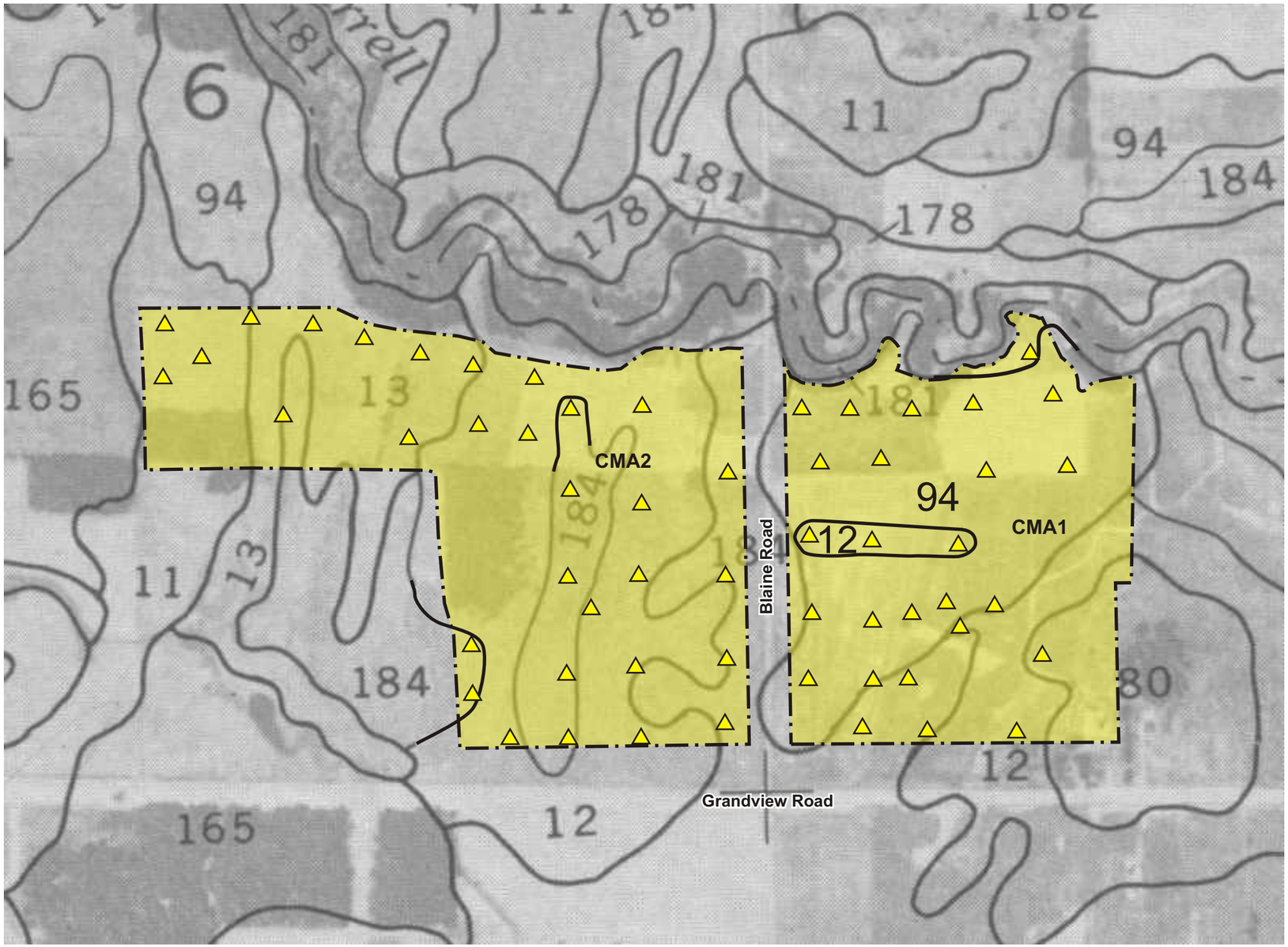


Legend

- Approximate boring location
- Site boundary

Soils

11	Bellingham silty clay loam
12 & 13	Birch Bay silt loam
22	Briscot silt loam
80	Kickerville silt loam
94	LaBounty silt loam
149	Skipopa Blainsgate complex
165	Tromp loam
181	Whatcom silt loam
184	Whitehorn silt loam

N

0 500 1,000

Approximate Scale in Feet

Source: "Soil Survey of Whatcom County Area, Washington" by U.S. Department of Agriculture, Soil Conservation Service, dated May 1992.

Job No. 33760106

Figure 7

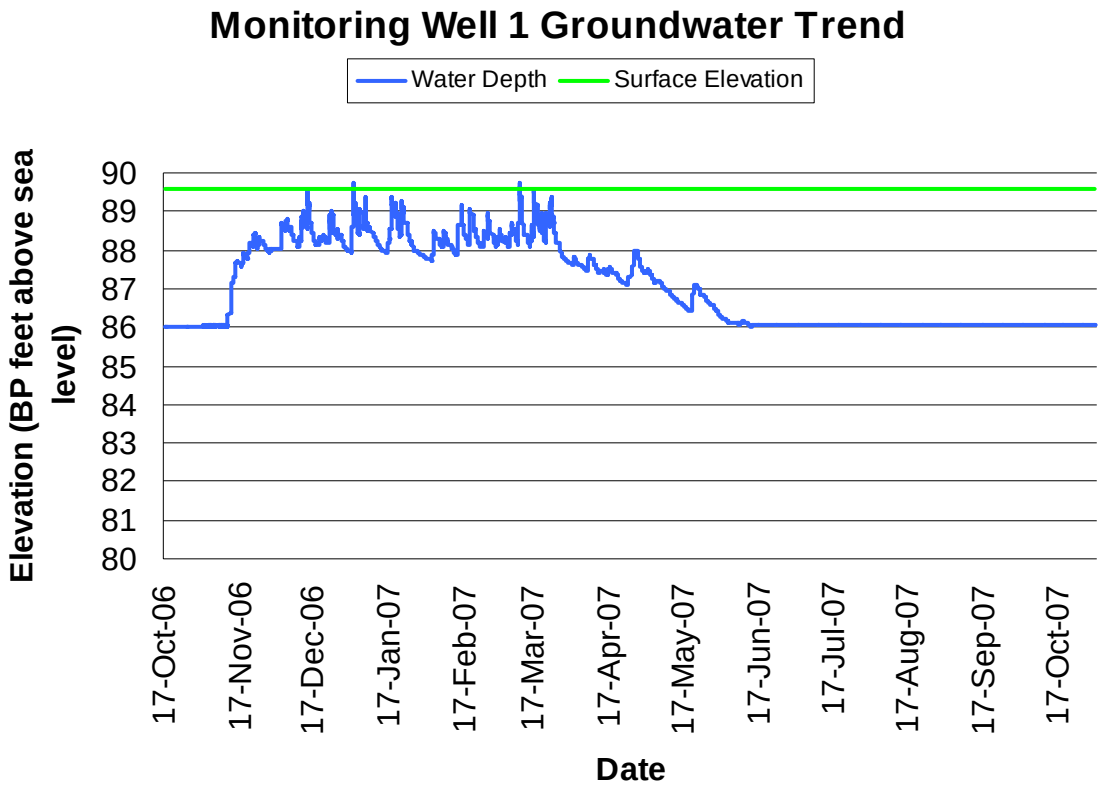
NRCS Soils Map Revisions

URS

Pre-Mitigation Hydrology Assessment
Facilities/Cogeneration Project Wetland Mitigation
BP Cherry Point Refinery

APPENDIX A

Monitoring Well Graphs Illustrating Groundwater Trends


Monitoring Well 1 Groundwater Trend
Water Depth
Surface Elevation
Elevation (BP feet above sea level)
90
89
88
87
86
85
84
83
82
81
80
17-Oct-06
17-Nov-06
17-Dec-06
17-Jan-07
17-Feb-07
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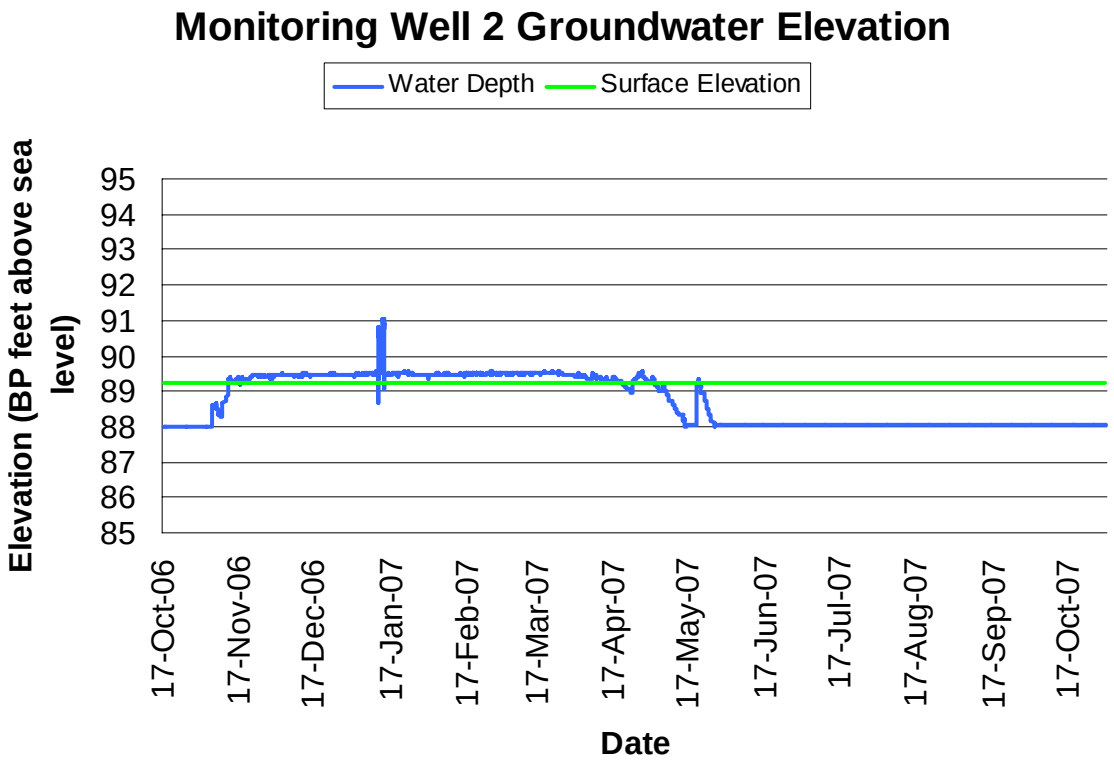
17-Sep-07
17-Oct-07
Date


Monitoring Well 2 Groundwater Elevation
Water Depth
Surface Elevation
Elevation (BP feet above sea level)
95
94
93
92
91
90
89
88
87
86
85
17-Oct-06
17-Nov-06
17-Dec-06
17-Jan-07
17-Feb-07
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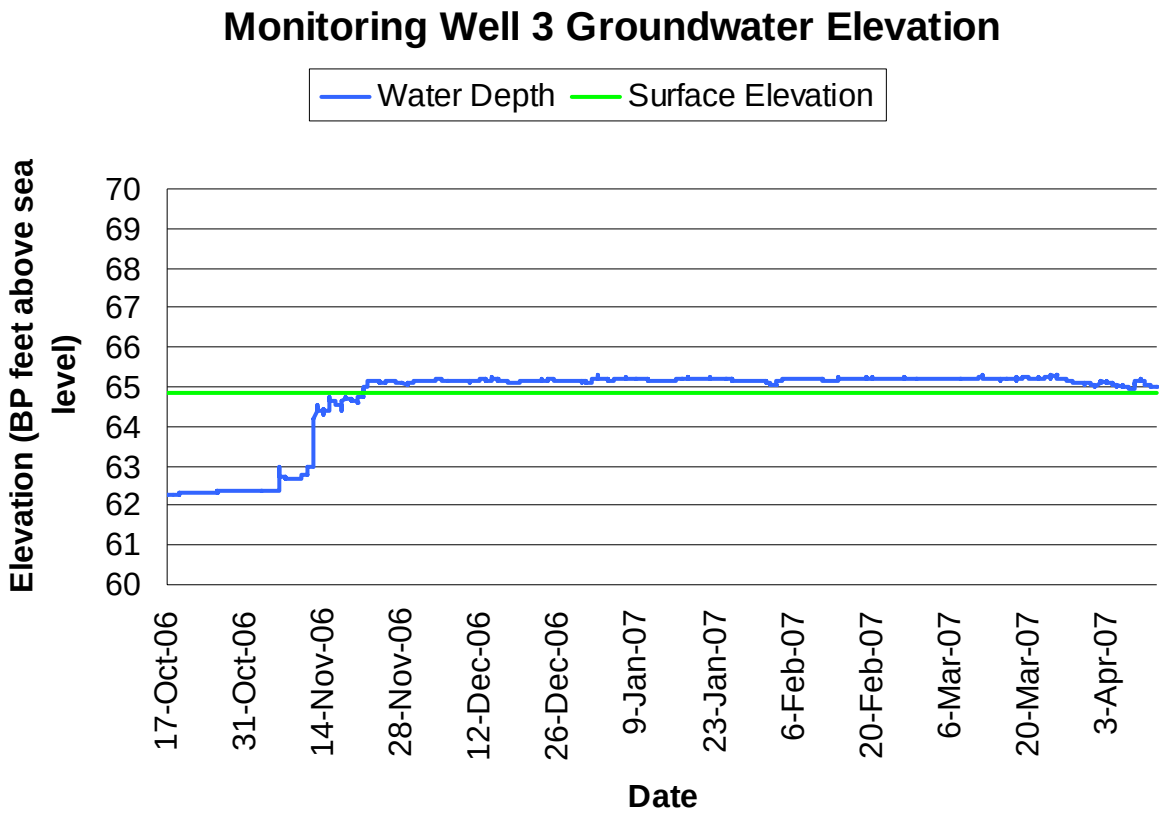
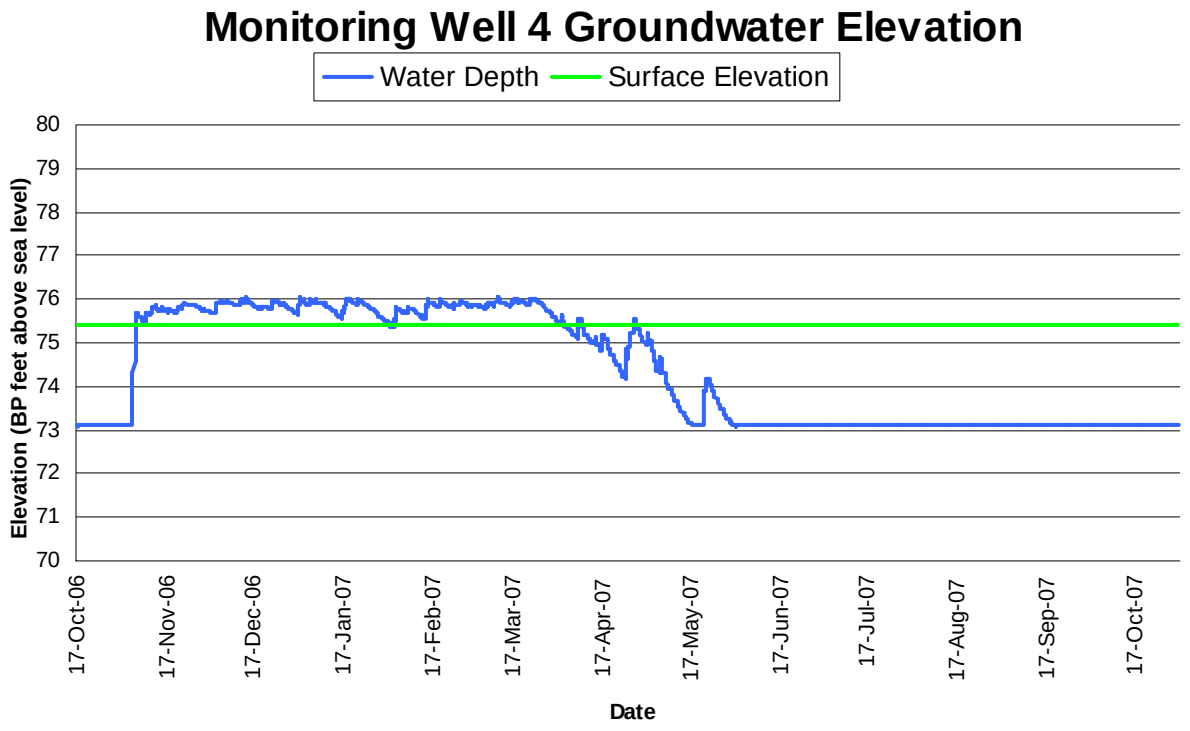
17-Oct-07
Date


Monitoring Well 3 Groundwater Elevation
Water Depth
Surface Elevation
Elevation (BP feet above sea level)
70
69
68
67
66
65
64
63
62
61
60
17-Oct-06
31-Oct-06
14-Nov-06
28-Nov-06
12-Dec-06
26-Dec-06
9-Jan-07
23-Jan-07
6-Feb-07
20-Feb-07
6-Mar-07
20-Mar-07
3-Apr-07
Date


Monitoring Well 4 Groundwater Elevation
Water Depth
Surface Elevation
Elevation (BP feet above sea level)
80
79
78
77
76
75
74
73
72
71
70
17-Oct-06
17-Nov-06
17-Dec-06
17-Jan-07
17-Feb-07
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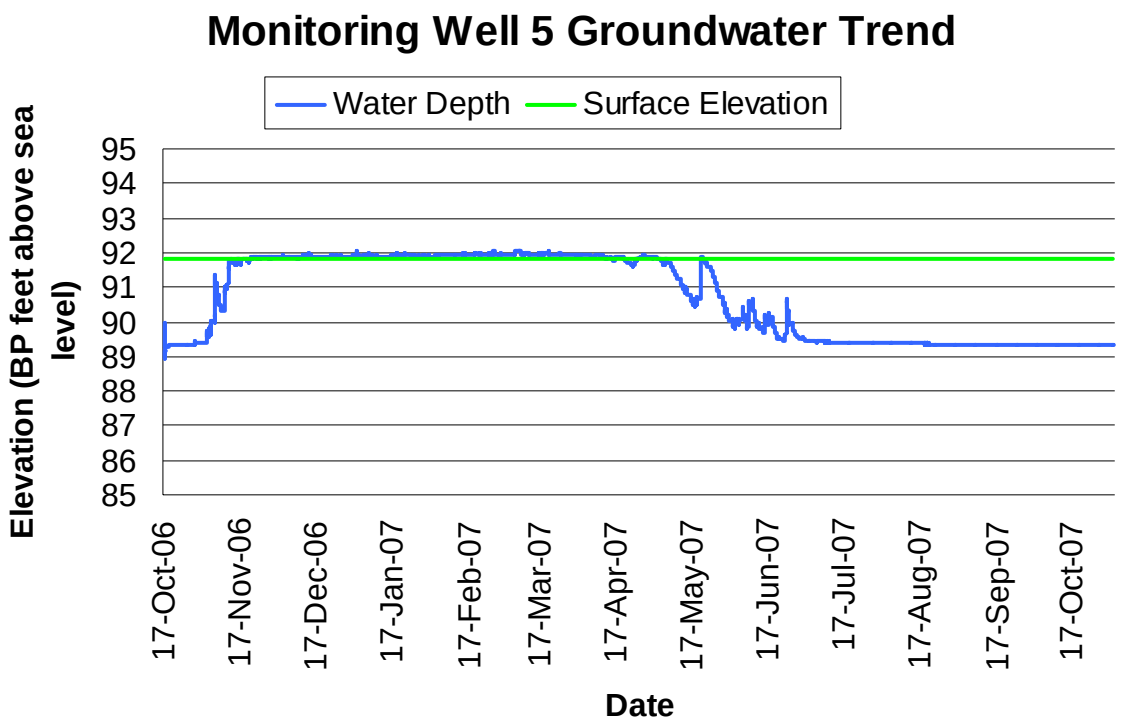
Date


Monitoring Well 5 Groundwater Trend
Water Depth
Surface Elevation
Elevation (BP feet above sea level)
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94
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85
17-Oct-06
17-Nov-06
17-Dec-06
17-Jan-07
17-Feb-07
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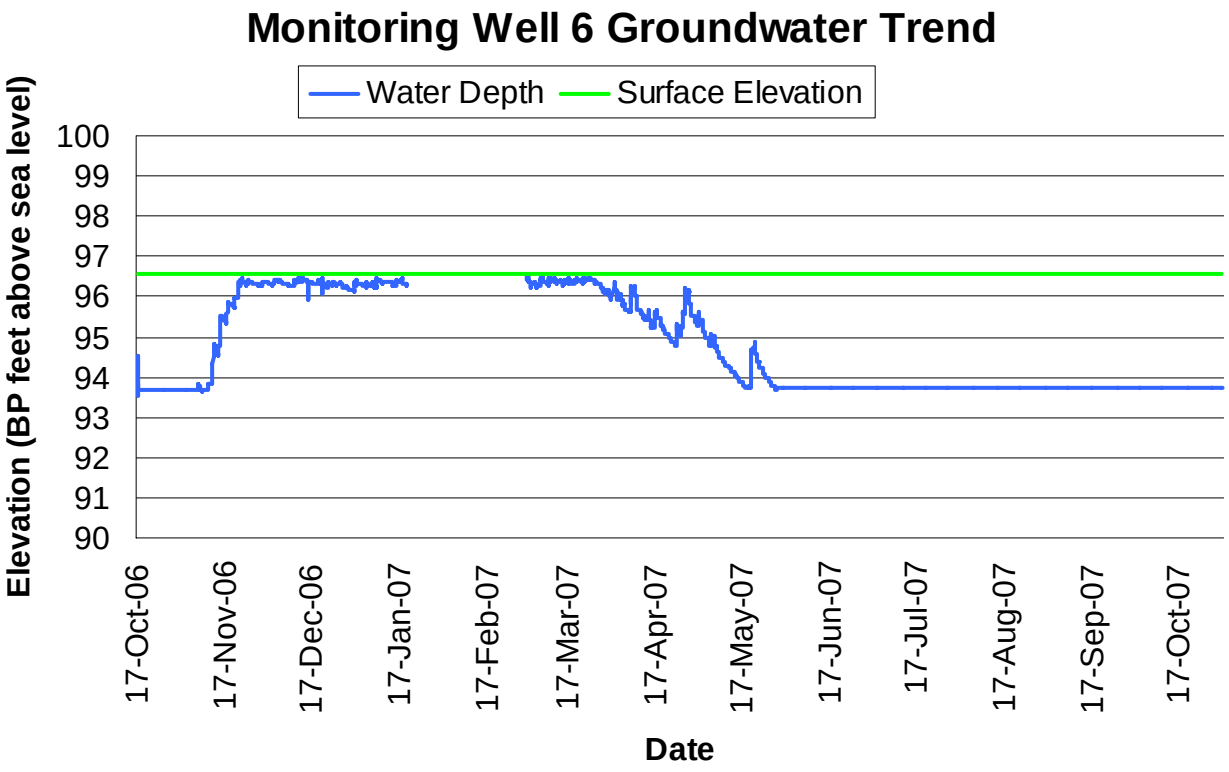
Monitoring Well 6 Groundwater Trend
Water Depth
Surface Elevation
Elevation (BP feet above sea level)
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99
98
97
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17-Oct-06
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17-Dec-06
17-Jan-07
17-Feb-07
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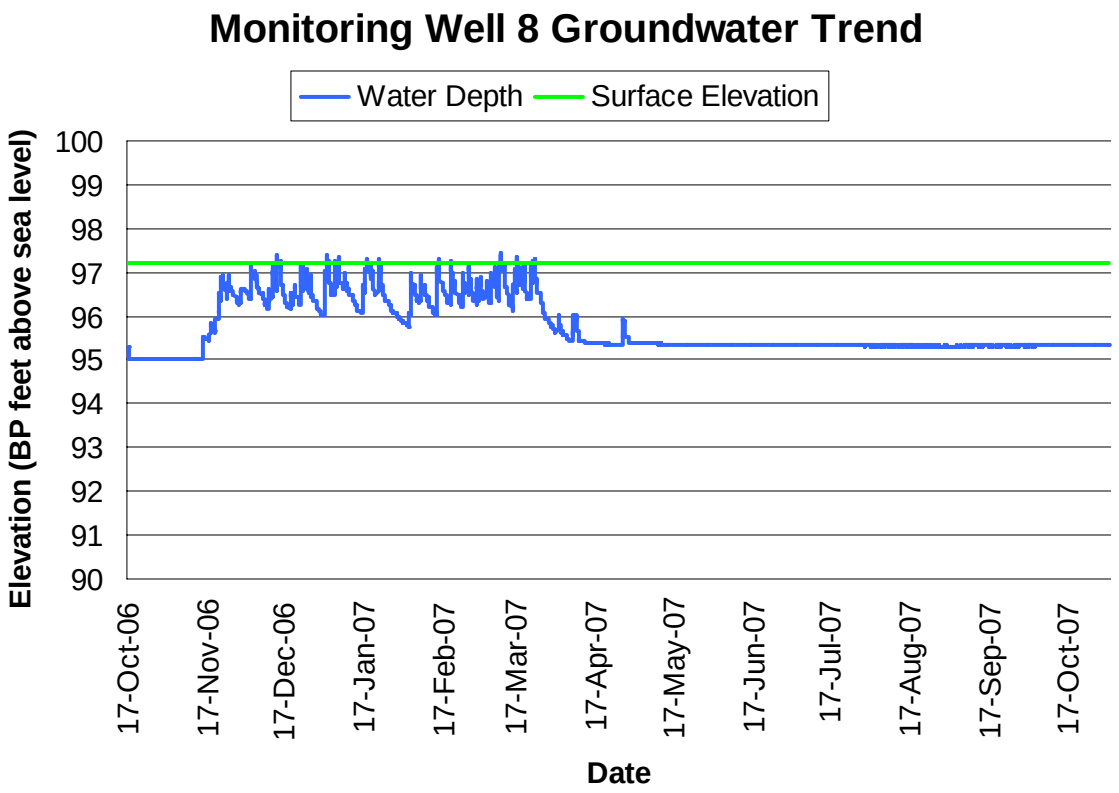
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Water Depth
Surface Elevation
Elevation (BP feet above sea level)
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17-Nov-06
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17-Feb-07
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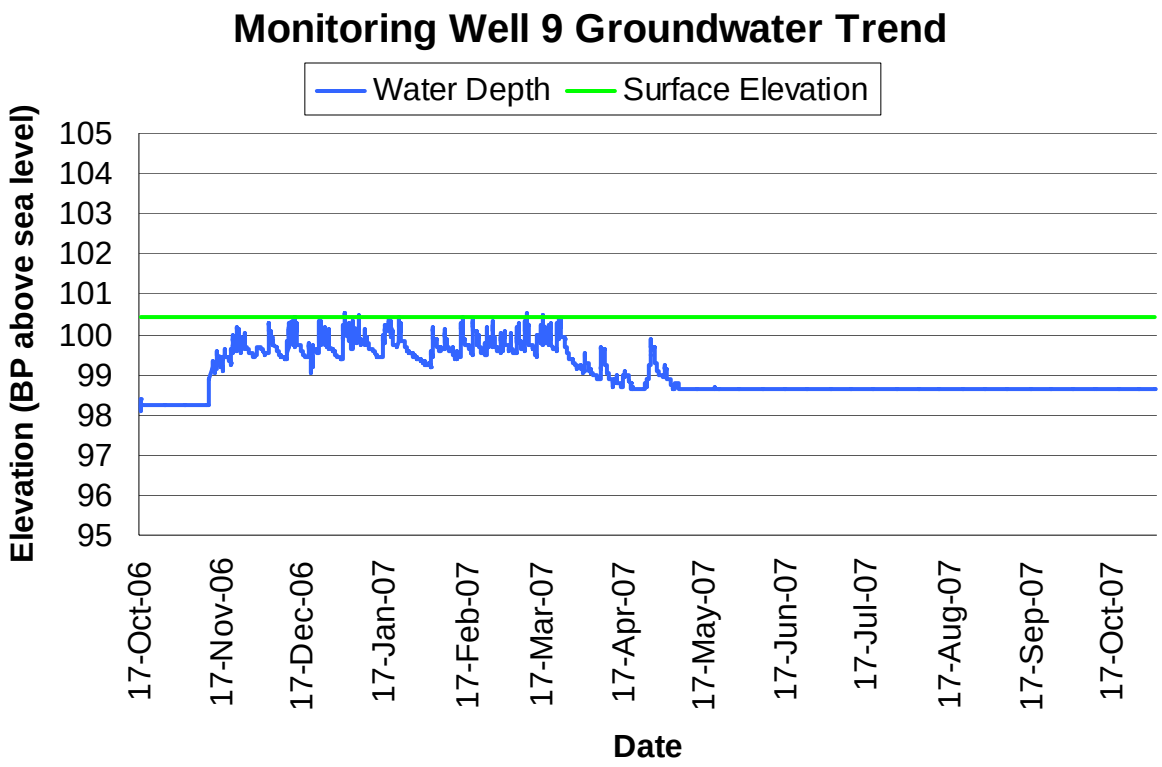
Date


Monitoring Well 9 Groundwater Trend
Water Depth
Surface Elevation
Elevation (BP above sea level)
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104
103
102
101
100
99
98
97
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95
17-Oct-06
17-Nov-06
17-Dec-06
17-Jan-07
17-Feb-07
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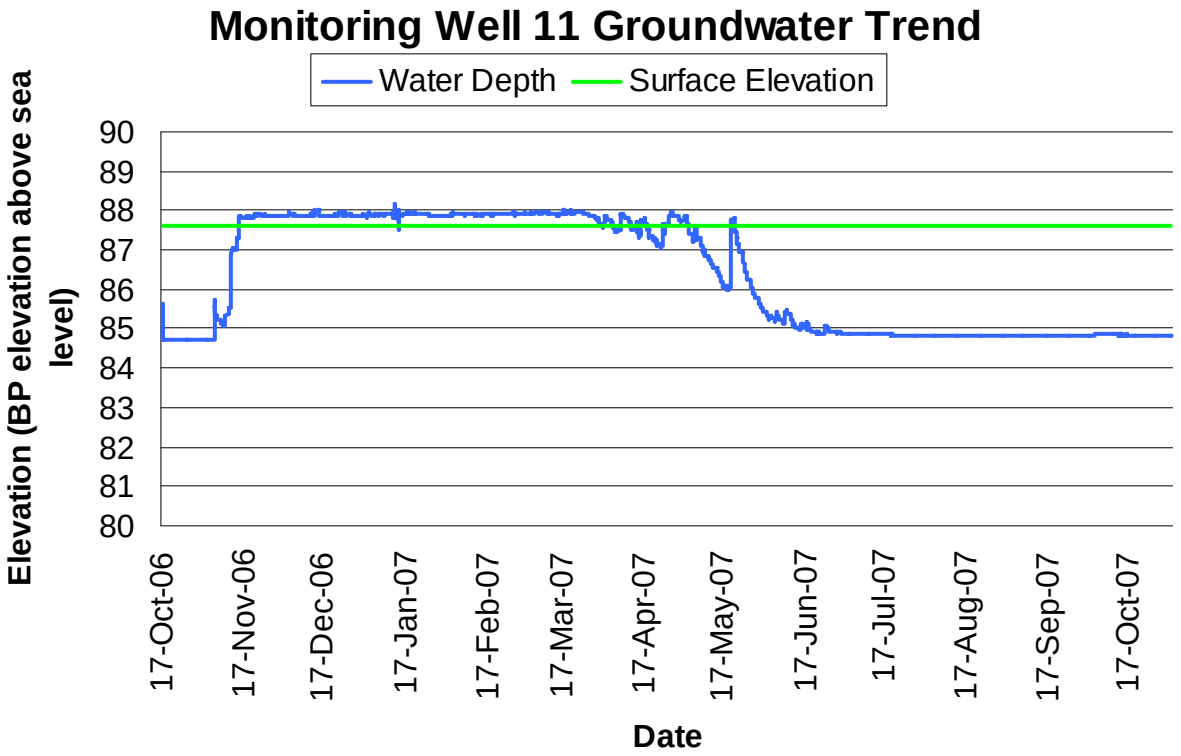
Monitoring Well 11 Groundwater Trend
Water Depth
Surface Elevation
Elevation (BP elevation above sea level)
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17-Oct-06
17-Nov-06
17-Dec-06
17-Jan-07
17-Feb-07
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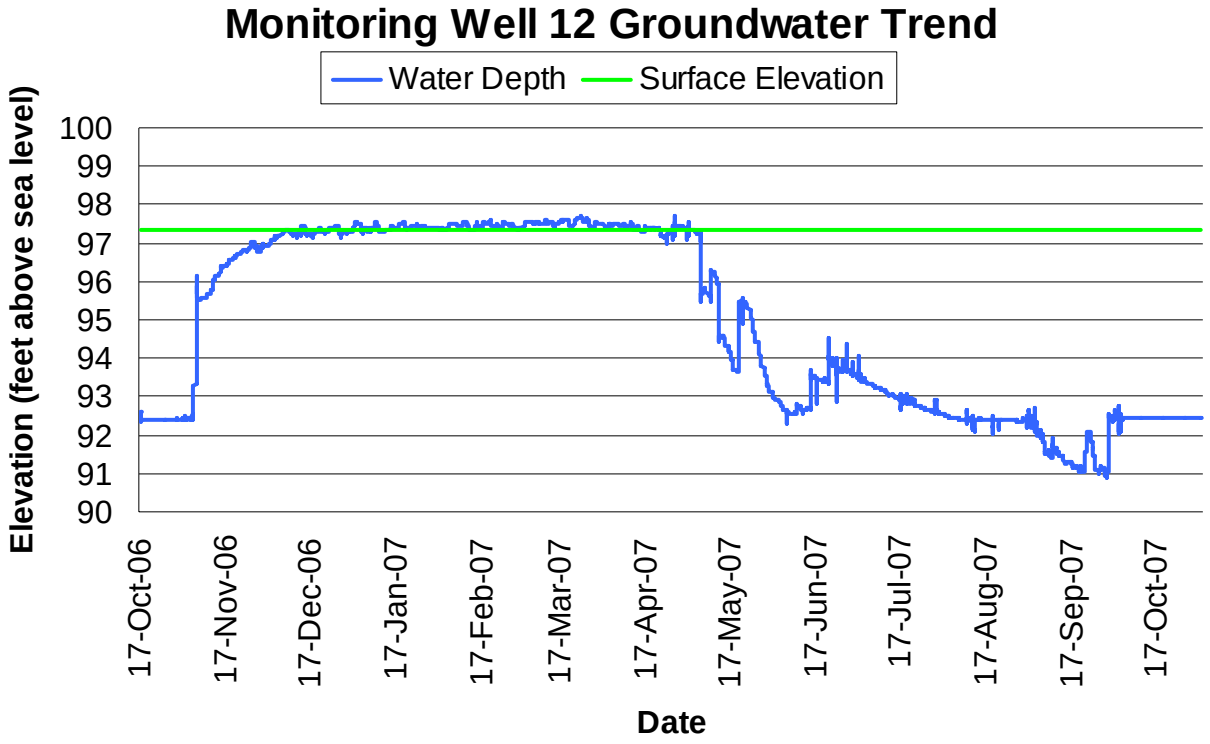
Date


Monitoring Well 12 Groundwater Trend
Water Depth
Surface Elevation
Elevation (feet above sea level)
100
99
98
97
96
95
94
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17-Oct-06
17-Nov-06
17-Dec-06
17-Jan-07
17-Feb-07
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17-Apr-07
17-May-07
17-Jun-07
17-Jul-07
17-Aug-07
17-Sep-07
17-Oct-07
Date

APPENDIX F

WETLAND FUNCTIONS ASSESSMENT DATA SHEETS

Wetland F, AU-1 within West Restoration Area - 25 Years After Rehabilitation is Initiated

Wetland Name: 1
Location: Whatcom County WA
Recorder: SJM

AU ID#:
T/S/R:
Date: 4/4/03

Use this data sheet for:
DEPRESSIONAL OUTFLOW or RIVERINE IMPOUNDING wetlands in the Lowlands of Western Washington
Use in conjunction with the written guidance provided in Parts 1 and 2
Record only numbers, yes/no answers are recorded as a [1] or [0]

Estimate, Score or Rating			
			LANDSCAPE DATA
0	0/1	D0	Do dikes surround the AU, and does it drain through a control structure that can be manipulated?
1286	ha	D1	Area of AU
16	ha	D2	Area of contributing basin (upgradient watershed)
		D3	Land use (as % of total area) within 1 km of AU (include contiguous AUs of different class)
30	%	*D3.1*	Undeveloped forest (if previously clear-cut, cut at least 5 years ago)
5	%	*D3.2*	Agriculture (tilled fields and pastures; includes golf courses)
0	%	*D3.3*	Clear-cut logging (<5 years since clearing)
60	%	*D3.4*	Urban/commercial (any developed areas not identified as residential)
0	%	*D3.5*	High density residential (>1 residence/acre)
0	%	*D3.6*	Low density residential (<= 1 residence/acre)
5	%	*D3.7*	Undeveloped areas, shrubland, other wetlands, and open water
			WATER REGIME
1	0/1	D4	Channels, ditches, or streams in AU
0	0/1	*D4.1*	Channels, ditches, or streams in AU have permanently flowing water *(you see water flowing)*
		D4.2	
1	0/1	*D4.3*	The only surface outflow from the AU is through a culvert (<60 cm) or vertical siphon
		D5	
		D6	
		D7	
		D8	Inundation
20	%	*D8.1*	Percent of AU that is ponded or inundated for >1 month
0	%	*D8.2*	Percent of AU with permanent standing or moving water
0	%	*D8.3*	Percent of AU with permanent open water *(without aquatic bed vegetation)*
0	%	*D8.4*	Percent of AU with unvegetated bars or mudflats
0	0/1	*D8.5*	Unvegetated bars or mudflats at least 100 square meters in size
		D9	Inundation regimes
0	0/1	*D9.1*	Permanently flooded (include vegetated areas)
1	0/1	*D9.2*	Seasonally flooded (>1 month)
1	0/1	*D9.3*	Occasionally flooded (<= 1 month)
1	0/1	*D9.4*	Saturated but seldom inundated
0	0/1	*D9.5*	Permanently flowing stream
0	0/1	*D9.6*	Intermittently flowing stream
0.3	m	D10	Average height of annual flooding above lowest point of outlet or surface of permanent stream at outlet (round to 0.3 m)

By definition: D8.1 >= D8.2 >= D8.3

Chose all that apply that meet size criteria: area >0.1 ha (1/4 acre) or > 10% of AU if AU smaller than 1 ha (2.5 acres)

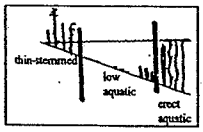
0	0/1	D22	Mature trees in AU

Average DBH of 3 out of 5 largest trees of a species has to exceed size threshold

Tsuga heterophylla (western hemlock) >45 cm (18")
Thuja plicata (western red cedar) >45 cm (18")
Pseudotsuga menziesii (Douglas fir) >45 cm (18")
Picea sitchensis (Sitka spruce) >45 cm (18")
Populus balsamifera (black cottonwood) >45 cm (18")
Acer macrophyllum (big-leaf maple) >45 cm (18")
Alnus rubra (red alder) >30 cm (12")
Fraxinus latifolia (Oregon ash) >30 cm (12")
Pinus contorta (lodgepole pine) >30 cm (12")
Salix lucida (Pacific willow) >30 cm (12")

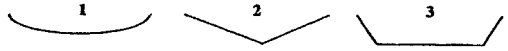
		D23	Sphagnum bogs
0	0/1	*D23.1*	% area of Sphagnum bogs >75%
0	0/1	*D23.2*	% area of Sphagnum bogs = 50-75%
0	0/1	*D23.3*	% area of Sphagnum bogs = 25-49%
0	0/1	*D23.4*	% area of Sphagnum bogs = 1-24%
1	0/1	*D23.5*	% area of Sphagnum bogs = 0%
		D24	Dominance by non-native plant species
0	0/1	*D24.1*	% area of non-native species >75%
0	0/1	*D24.2*	% area of non-native species = 50-75%
0	0/1	*D24.3*	%area of non-native species = 25-49%
1	0/1	*D24.4*	% area of non-native species = 1-24%
0	0/1	*D24.5*	% area of non-natives = 0%
			HABITAT CHARACTERISTICS
0	[0-3]	D25	Number of structure categories in aquatic bed vegetation

Applies only to aquatic bed species
DO NOT count persistent emergents



		D26	pH
7	[4-9]	*D26.1*	pH of interstitial water *(measure immediately after digging hole in non-inundated areas)*
7	[4-9]	*D26.2*	pH of open or standing water *(record the lowest pH, if you cannot measure record a [7])*
0	0/1	D27	Estuary: AU is within 8 km (5 mi) of a brackish or salt water estuary
1	0/1	D28	Large lake: AU is within 1.6km (1 mi) of a lake >8 ha (20 acres)
1	0/1	D29	Open field: AU is within 5 km (3 mi) of an open field (agriculture or pasture) >16 ha (40 acres)
0	0/1	D30	Preferred woody vegetation: AU has >1 ha (2.5 acres) of preferred woody vegetation for beaver in and within 100 m of AU

		D11	Cross section of AU in areas of seasonal inundation (record a 1 next to cross section that best fits)
1	0/1	*D11.1*	Cross section 1
0	0/1	*D11.2*	Cross section 2
0	0/1	*D11.3*	Cross section 3



		D12	Categories of water depths in AU, areas permanently or seasonally inundated/flooded
1	0/1	*D12.1*	1-20 cm (<8 in)
0	0/1	*D12.2*	20-100 cm (8-40 in)
0	0/1	*D12.3*	>100 cm (>40 in)
		D13	Constriction of outlet
0	0/1	*D13.1*	Unconstricted or only slightly constricted
1	0/1	*D13.2*	Moderately constricted
0	0/1	*D13.3*	Severely constricted
0	0/1	*D13.4*	*Riverine Impounding only* – Completely constricted (no surface outlet)
			VEGETATION
		D14	Cowardin Classes (as % area of AU)
3	%	*D14.1*	Forest - evergreen
40	%	*D14.2*	Forest -deciduous
0	%	*D14.3*	Scrub-shrub - evergreen
47	%	*D14.4*	Scrub-shrub - deciduous
10	%	*D14.5*	Emergent
0	%	*D14.6*	Aquatic bed
1	0/1	D15	Does D8.3 + D8.4 + sum (D14.1 to D14.6) = 100? If not, give reason.
50	%	D16	% area of herbaceous understory in forest and shrub areas (not % area in entire AU)
20	%	D17	% area of AU with >75% closure of canopy *(SS, FO classes > 1 m high)*
		D18	
		D19	Plant Richness
35	#	*D19.1*	Record number of native plant species found in AU
6	#	*D19.2*	Record number of non- native plant species found in AU
5	#	D20	The # of plant assemblages in the AU with area >0.1 ha (1/4 acre) or >10% if AU <1 ha *(if more than 12 record a 12)*
3	[1-6]	D21	Strata: The maximum # of strata present in any plant assemblage
0	0/1	*D21.1*	Is vine stratum dominated by non-native blackberries?

- *Include forest only if trees are rooted in AU.*
- *If forest is a mix of deciduous and evergreen estimate the relative % cover of each and divide percentage between the two categories.*
- *If vegetation classes are patchy, add the patches together for each class to get a total.*
- *To count, a class must cover at least 0.1 ha or be more than 10% of the total area of the AU*

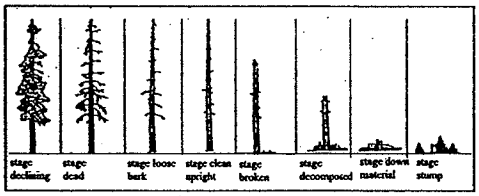
Record a 1 for each category present if >0.1 ha (1/4 acre) or 10% of area

If the AU has multiple outlets, judge the constriction as if all the outlets were combined into one large one.

A stratum must have 20% cover in assemblage

2	[0-8]	D31	Snags (record # of stages)

Circle the categories present; minimum DBH of snag =10 cm (4")



1	0/1	*D31.1*	At least one of the snags above has a DBH greater than 30 cm (12").
0	0/1	D32	Overhanging vegetation, extending out for 1 m, for at least 10 m (33 ft) over stream or open water.
0	0/1	D33	Upland islands of at least 10 square meters (100 square ft.) within AU boundary
			Islands need to be surrounded by at least 30 m (100 ft) of open water deeper than 1 m (3 ft)
0	0/1	D34	Undercut banks present for at least 2 m (6.6 ft.)
2	[0-4]	D35	Key for rating egg-laying structures for amphibians

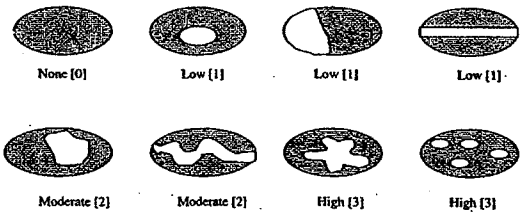
1. Does the AU have thin-stemmed vegetation or thin branches (<8 mm) in at least 1/4 acre (or 10% of AU) of permanent or seasonally inundated areas? *Thin-stemmed vegetation can include herbaceous species such as water parsley.*
   NO – Score = 0 YES go to 2
2. Does the AU have at least 0.2 ha (1/2 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm in diameter?
   NO go to 5 YES go to 3
3. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 (no more than a 40- 60% of the total area is open water)?
   NO go to 4 YES - Score = 4
4. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   NO – Score = 2 YES – Score = 3 STOP
5. Does the AU have >0.1 ha (1/4 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm?
   NO – Score = 1 YES go to 6
6. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 (no more than a 40- 60% of the total area is open water)?
   NO go to 7 YES – Score = 3
7. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   NO – Score = 1 YES – Score = 2

Wetland Name: AU ID#:

0 0/1 D36 Tannins in surface waters >10% of water surface

0 0/1 D37 Steep banks for denning (>30 degree slope, fine material, >10 m long, >0.6 m high) *(may be a dike)*

0 [0-3] D38 Interspersion between erect vegetation and permanent open water (POW + AB) areas of AU

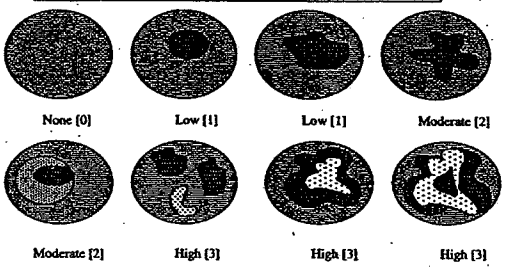


None [0] Low [1] Low [1] Low [1]

Moderate [2] Moderate [2] High [3] High [3]

2 [0-3] D39 Interspersion between Cowardin vegetation classes

*AUs with only 2 classes can only score a moderate[2] or lower
*AUs with 4 vegetation classes score a high [3]
*AUs with 3 classes can score a moderate (2) or a high (3)



None [0] Low [1] Low [1] Moderate [2]

Moderate [2] High [3] High [3] High [3]

Wetland Name: AU ID#:

[0-3] D43 Corridors of AU: Rate corridors using following key *(record rating of 0, 1, 2, or 3)*

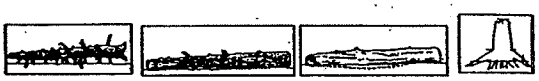
1. Is the AU part of a riparian corridor *(see text for definitions)*
   NO go to 5 YES go to 2
2. Is the wetland part of riparian corridor > 50 m wide connecting 2 or more wetlands within 1 km with at least 30% shrub or forest cover in the corridor?
   NO go to 3 YES = [3]
3. Is the AU part of a riparian corridor 25-50 m wide connecting to other wetlands with at least 30% shrub or forest cover in the corridor?
   NO go to 4 YES = [2]
4. Is the AU part of a riparian corridor >5 m wide with relatively undisturbed veg. (grasslands, abandoned pasture are OK) that extends for more than 1 km?
   NO go to 5 YES = [1]
5. Is there a corridor >50 m wide with good (>30%) cover of forest or shrub (>2 m high) to natural upland area or open water that is >100 ha in size?
   NO go to 6 YES = [3]
6. Is there a 10-50 m wide forest or shrub corridor to a relatively undisturbed upland or open water that is >10 ha?
   NO go to 7 YES = [2]
7. Is there a corridor of relatively undisturbed vegetation (grassland, abandoned pasture) >50 m wide to an undisturbed upland or open water that is >10 ha?
   NO go to 8 YES = [2]
8. Is there any vegetated corridor 5-50 m wide between the AU and any relatively undisturbed area or open water that is >2.5 ha?
   NO = [0] YES = [1]

5 [0-12] D44 # of categories of large woody debris in AU outside of perm. water

Freshly cut stumps are not included

Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")	✓			
21-50cm	(8-20")		✓		✓
>50 cm	(>20")		✓		

0 [0-12] D45 # of categories of large woody debris in permanent water of AU (may include aquatic bed areas)



Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")				
21-50cm	(8-20")				
>50 cm	(>20")				

Wetland Name: AU ID#:

D40

2 [0-3] D41 Edge of AU: The characteristics of the edge between AU and uplands or adjacent wetlands.

Choose the description that best fits the characteristics of the AU edge:

0 There are no differences in level of vegetation height as reflected by vegetation classes on each side of the AU for more than 50% of the circumference: record a [0] regardless of the sinuosity. Examples: emergent (or herbaceous) to emergent (or herbaceous), shrub to shrub, forest to forest.

1 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight for more than 50% of the circumference: record a [1]. Example: emergent (or herbaceous) to shrub, shrub to forest

2 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous for more than 50% of the circumference: record a [2]. Examples: emergent (or herbaceous) to shrub, shrub to forest.

2 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight: record a [2]. Examples: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

3 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous: record a [3]. Example: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

2 If no single category above extends for more than 50% of the circumference, and the edge is straight: record a [2]

3 If no single category above extends for more than 50% of the circumference, and the edge is sinuous: record a [3]

18 [0-5] D42 Buffer of AU: Choose the description that best represents condition of AU buffer

* *Open water or adjacent wetlands are considered part of the buffer*
* *Infrequently used gravel or paved roads or vegetated dikes in a relatively undisturbed buffer can be ignored as a "disturbance"*

5 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >95% of circumference. Clear-cut >5 years old is OK. No developed areas within undisturbed part of buffer.

4 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >50% circumference OR 50 m (170 ft) of forest scrub, grassland or open water >95% circumference. No developed areas within undisturbed part of buffer.

3 100 m (330 ft) of forest, scrub, grassland or open water >25% circumference, OR 50 m (170 ft) of forest, scrub, grassland or open water >50% circumference.

2 No paved areas or buildings within 25m (80 ft) of wetland >95% circumference. Pasture or lawns are OK. OR no paved areas or buildings within 50m of wetland >50% circumference

0 Vegetated buffers are <2 m wide (6.6 ft) for more than 95% of the circumference

1 Does not meet any of the criteria above

Wetland Name: AU ID#:

SOILS and SUBSTRATES

D46 Composition of AU surface

1 0/1 D46.1 Deciduous, broad-leaved, leaf litter
1 0/1 D46.2 Other plant litter
0 0/1 D46.3 Decomposed organic
0 0/1 D46.4 Exposed cobbles
0 0/1 D46.5 Exposed gravel
0 0/1 D46.6 Exposed sand
0 0/1 D46.7 Exposed silt
0 0/1 D46.8 Exposed clay

Record a 1 for each category present if its area is > 10 square meters. Note: bare earth from animal tunnels does NOT count.

D47 Soils present in top (15 cm) of A horizon (record [1] if 1-49% area of AU, [2] if 50-95%, [3] if >95%)

0 [0-3] D47.1 Peat
0 [0-3] D47.2 Organic Muck
3 [0-3] D47.3 Mineral with clay fraction <30%
0 [0-3] D47.4 Clay (clay fraction >30%)

Record the least permeable layer if there are several down to 60 cm.

D48 Infiltration rate of top 60 cm of soil in seasonally inundated areas

0 0/1 D48.1 Fast >50% gravel and cobble and the rest a sand, loamy sand, or sandy loam
0 0/1 D48.2 Moderate >50% sand and rest cobble, gravel, loamy sand, or sandy loam
1 0/1 D48.3 Slow - muck, peat, or loams (except sandy loam), silts, and clays

D49 Substrate of streams

— 0/1 D49.1 Substrate of permanent stream or river in AU has at least 1 square meter of gravel
— 0/1 D49.2 Substrate of permanent stream or river in AU has at least 1 square meter of cobbles
D49.3

Judgements of Opportunity (Ratings of High, Medium, Low)

Rating	Functions
low	Removing Sediments
low	Removing Nutrients
low	Removing Toxic Metals and Organics
Medium	Reducing Peak Flows
medium	Reducing Downstream Erosion
low	Recharging Groundwater
low-medium	General Habitat
low	Anadromous Fish Habitat

Western Washington Wetland Classification Key

Wetland Name: BP Construction + Mitigation Areas
AU ID #: CMA1 **Date:** 4/22/02

1) Water levels in AU usually controlled by tides
   No – go to 2 Yes – **Tidal Fringe**

2) Topography is flat and precipitation is only source (>90%) of water to the AU
   No – go to 3 Yes – **Flat**

3) AU is contiguous with >8 ha open water, and water is deeper than 2 m over 30% of open water area
   No – go to 4 Yes – **Lacustrine Fringe**

4) Open water is <8 ha and >2 m deep, but AU is a fringe narrower than ½ the radius of open water
   No – go to 5 Yes – **Lacustrine Fringe**

5) Water flow in AU is unidirectional on a slope, water is not impounded in the AU
   No – go to 6 Yes – **Slope**

6) AU is located in a topographic valley with stream or river in the middle
   No – go to 9 Yes – go to 7

7) Have data showing area flooded more than once every 2 yrs.; or indicators of flooding are present:
   - ☐ Scour marks common
   - ☐ Recent sediment deposition
   - ☐ Vegetation that is damaged or bent in one direction
   - ☐ Soils have alternating deposits
   - ☐ Vegetation along bank edge has flood marks

   No for all indicators – go to 9 Yes for any indicator – go to 8

8) Flood waters retained
   No – **Riverine Flow-through**
   Yes – **Riverine Impounding**
   - ☐ Depression in floodplain
   - ☐ Constricted outlet
   - ☐ Permanent water

9) Has surface water outflow – **Depressional Outflow**
   Has no surface outflow – **Depressional Closed**

Rationale for Choices:

Wetland Name: SMA1 - current condition AU ID#:
Location: Whatcom County, WA T/S/R:
Rater: EJM Date: 4/4/03

Use this data sheet for:
DEPRESSIONAL OUTFLOW or RIVERINE IMPOUNDING wetlands in the Lowlands of Western Washington
Use in conjunction with the written guidance provided in Parts 1 and 2
Record only numbers, yes/no answers are recorded as a [1] or [0]

Estimate, Score/or Rating			
			LANDSCAPE DATA
0	0/0	D0	Do dikes surround the AU, and does it drain through a control structure that can be manipulated?
164	ha	D1	Area of AU
24	ha	D2	Area of contributing basin (upgradient watershed)
		D3	Land use (as % of total area) within 1 km of AU (include contiguous AUs of different class)
25	%	*D3.1*	Undeveloped forest (if previously clear-cut, cut at least 5 years ago)
30	%	*D3.2*	Agriculture (tilled fields and pastures; includes golf courses)
0	%	*D3.3*	Clear-cut logging (<5 years since clearing)
9	%	*D3.4*	Urban/commercial (any developed areas not identified as residential)
0	%	*D3.5*	High density residential (>1 residence/acre)
4	%	*D3.6*	Low density residential (<= 1 residence/acre)
32	%	*D3.7*	Undeveloped areas, shrubland, other wetlands, and open water
			WATER REGIME
1	0/1	D4	Channels, ditches, or streams in AU
0	0/1	*D4.1*	Channels, ditches, or streams in AU have permanently flowing water *(you see water flowing)*
		D4.2	
0	0/1	*D4.3*	The only surface outflow from the AU is through a culvert (<60 cm) or vertical siphon
		D5	
		D6	
		D7	
		D8	Inundation
31	%	*D8.1*	Percent of AU that is ponded or inundated for >1 month
0	%	*D8.2*	Percent of AU with permanent standing or moving water
0	%	*D8.3*	Percent of AU with permanent open water *(without aquatic bed vegetation)*
0	%	*D8.4*	Percent of AU with unvegetated bars or mudflats
0	0/1	*D8.5*	Unvegetated bars or mudflats at least 100 square meters in size
		D9	Inundation regimes
0	0/1	*D9.1*	Permanently flooded (include vegetated areas)
1	0/1	*D9.2*	Seasonally flooded (>1 month)
1	0/1	*D9.3*	Occasionally flooded (<= 1 month)
1	0/1	*D9.4*	Saturated but seldom inundated
0	0/1	*D9.5*	Permanently flowing stream
1	0/1	*D9.6*	Intermittently flowing stream
0.3	m	D10	Average height of annual flooding above lowest point of outlet or surface of permanent stream at outlet (round to 0.3 m)

By definition: D8.1 >= D8.2 >= D8.3

Chose all that apply that meet size criteria: area >0.1 ha (1/4 acre) or > 10% of AU if AU smaller than 1 ha (2.5 acres)

DEPRESSIONAL OUTFLOW or RIVERINE IMPOUNDING

Wetland Name: AU ID#:

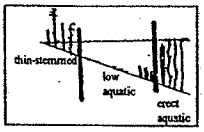
0	0/1	D22	Mature trees in AU

Average DBH of 3 out of 5 largest trees of a species has to exceed size threshold

Tsuga heterophylla (western hemlock) >45 cm (18")
Thuja plicata (western red cedar) >45 cm (18")
Pseudotsuga menziesii (Douglas fir) >45 cm (18")
Picea sitchensis (Sitka spruce) >45 cm (18")
Populus balsamifera (black cottonwood) >45 cm (18")
Acer macrophyllum (big-leaf maple) >45 cm (18")
Alnus rubra (red alder) >30 cm (12")
Fraxinus latifolia (Oregon ash) >30 cm (12")
Pinus contorta (lodgepole pine) >30 cm (12")
Salix lucida (Pacific willow) >30 cm (12")

		D23	Sphagnum bogs
0	0/1	*D23.1*	% area of Sphagnum bogs >75%
0	0/1	*D23.2*	% area of Sphagnum bogs = 50-75%
0	0/1	*D23.3*	% area of Sphagnum bogs = 25-49%
0	0/1	*D23.4*	% area of Sphagnum bogs = 1-24%
1	0/1	*D23.5*	% area of Sphagnum bogs = 0%
		D24	Dominance by non-native plant species
1	0/1	*D24.1*	% area of non-native species >75%
0	0/1	*D24.2*	% area of non-native species = 50-75%
0	0/1	*D24.3*	%area of non-native species = 25-49%
0	0/1	*D24.4*	% area of non-native species = 1-24%
0	0/1	*D24.5*	% area of non-natives = 0%
			HABITAT CHARACTERISTICS
0	[0-3]	D25	Number of structure categories in aquatic bed vegetation

Applies only to aquatic bed species
DO NOT count persistent emergents

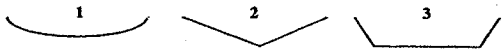


		D26	pH
6.5	[4-9]	*D26.1*	pH of interstitial water *(measure immediately after digging hole in non-inundated areas)*
6.9	[4-9]	*D26.2*	pH of open or standing water *(record the lowest pH, if you cannot measure record a [7])*
1	0/1	D27	Estuary: AU is within 8 km (5 mi) of a brackish or salt water estuary
0	0/1	D28	Large lake: AU is within 1.6km (1 mi) of a lake >8 ha (20 acres)
1	0/1	D29	Open field: AU is within 5 km (3 mi) of an open field (agriculture or pasture) >16 ha (40 acres)
0	0/1	D30	Preferred woody vegetation: AU has >1 ha (2.5 acres) of preferred woody vegetation for beaver in and within 100 m of AU

DEPRESSIONAL OUTFLOW or RIVERINE IMPOUNDING

Wetland Name: AU ID#:

		D11	Cross section of AU in areas of seasonal inundation (record a 1 next to cross section that best fits)
1	0/1	*D11.1*	Cross section 1
0	0/1	*D11.2*	Cross section 2
0	0/1	*D11.3*	Cross section 3



		D12	Categories of water depths in AU, areas permanently or seasonally inundated/flooded
1	0/1	*D12.1*	1-20 cm (<8 in)
0	0/1	*D12.2*	20-100 cm (8-40 in)
0	0/1	*D12.3*	>100 cm (>40 in)
		D13	Constriction of outlet
1	0/1	*D13.1*	Unconstricted or only slightly constricted
0	0/1	*D13.2*	Moderately constricted
0	0/1	*D13.3*	Severely constricted
–	0/1	*D13.4*	*Riverine Impounding only* – Completely constricted (no surface outlet)
			VEGETATION
		D14	Cowardin Classes (as % area of AU)
0	%	*D14.1*	Forest - evergreen
1	%	*D14.2*	Forest -deciduous
0	%	*D14.3*	Scrub-shrub - evergreen
2	%	*D14.4*	Scrub-shrub - deciduous
97	%	*D14.5*	Emergent
0	%	*D14.6*	Aquatic bed
1	0/1	D15	Does D8.3 + D8.4 + sum (D14.1 to D14.6) = 100? If not, give reason.
30	%	D16	% area of herbaceous understory in forest and shrub areas (not % area in entire AU)
7	%	D17	% area of AU with >75% closure of canopy *(SS, FO classes > 1 m high)*
		D18	
		D19	Plant Richness
11	#	*D19.1*	Record number of native plant species found in AU
16	#	*D19.2*	Record number of non- native plant species found in AU
5	#	D20	The # of plant assemblages in the AU with area >0.1 ha (1/4 acre) or >10% if AU <1 ha *(if more than 12 record a 12)*
3	[1-6]	D21	Strata: The maximum # of strata present in any plant assemblage
0	0/1	*D21.1*	Is vine stratum dominated by non-native blackberries?

- *Include forest only if trees are rooted in AU.*
- *If forest is a mix of deciduous and evergreen estimate the relative % cover of each and divide percentage between the two categories.*
- *If vegetation classes are patchy, add the patches together for each class to get a total.*
- *To count, a class must cover at least 0.1 ha or be more than 10% of the total area of the AU*

Record a 1 for each category present if >0.1 ha (1/4 acre) or 10% of area

If the AU has multiple outlets, judge the constriction as if all the outlets were combined into one large one.

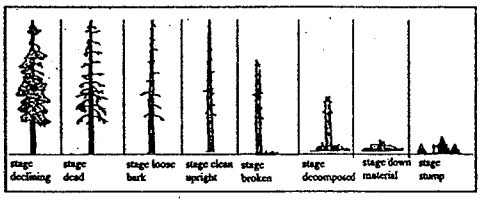
A stratum must have 20% cover in assemblage

DEPRESSIONAL OUTFLOW or RIVERINE IMPOUNDING

Wetland Name: AU ID#:

0	[0-8]	D31	Snags (record # of stages)

Circle the categories present; minimum DBH of snag =10 cm (4")



0	0/1	*D31.1*	At least one of the snags above has a DBH greater than 30 cm (12").
0	0/1	D32	Overhanging vegetation, extending out for 1 m, for at least 10 m (33 ft) over stream or open water.
0	0/1	D33	Upland islands of at least 10 square meters (100 square ft.) within AU boundary

Islands need to be surrounded by at least 30 m (100 ft) of open water deeper than 1 m (3 ft)

0	0/1	D34	Undercut banks present for at least 2 m (6.6 ft.)
2	[0-4]	D35	Key for rating egg-laying structures for amphibians

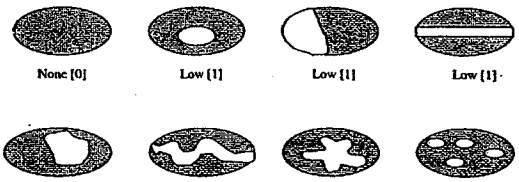
1. Does the AU have thin-stemmed vegetation or thin branches (<8 mm) in at least 1/4 acre (or 10% of AU) of permanent or seasonally inundated areas? *Thin-stemmed vegetation can include herbaceous species such as water parsley.*
   NO – Score = 0 YES go to 2
2. Does the AU have at least 0.2 ha (1/2 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm in diameter?
   NO go to 5 YES go to 3
3. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 [no more than a 40- 60% of the total area is open water)?
   NO go to 4 YES - Score = 4
4. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   → NO – Score = 2 YES – Score = 3 STOP
5. Does the AU have >0.1 ha (1/4 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm?
   NO – Score = 1 YES go to 6
6. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 [no more than a 40- 60% of the total area is open water)?
   NO go to 7 YES – Score = 3
7. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   NO – Score = 1 YES – Score = 2

Wetland Name:	AU ID#:

0 0/1 D36 Tannins in surface waters >10% of water surface

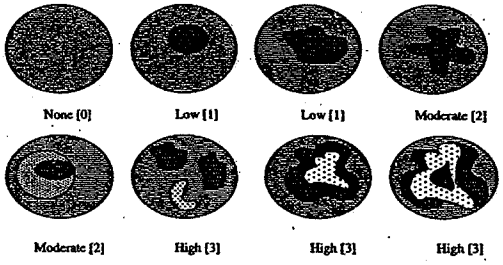
0 0/1 D37 Steep banks for denning (>30 degree slope, fine material, >10 m long, >0.6 m high) *(may be a dike)*

0 [0-3] D38 Interspersion between erect vegetation and permanent open water (POW + AB) areas of AU



1 [0-3] D39 Interspersion between Cowardin vegetation classes

**AUs with only 2 classes can only score a moderate[2] or lower*
**AUs with 4 vegetation classes score a high [3]*
**AUs with 3 classes can score a moderate (2) or a high (3)*



Wetland Name:	AU ID#:

3 [0-3] D43 Corridors of AU: Rate corridors using following key *(record rating of 0, 1, 2, or 3)*

1. Is the AU part of a riparian corridor *(see text for definitions)*
   NO go to 5 YES go to 2
2. Is the wetland part of riparian corridor > 50 m wide connecting 2 or more wetlands within 1 km with at least 30% shrub or forest cover in the corridor?
   NO go to 3 YES = [3]
3. Is the AU part of a riparian corridor 25-50 m wide connecting to other wetlands with at least 30% shrub or forest cover in the corridor?
   NO go to 4 YES = [2]
4. Is the AU part of a riparian corridor >5 m wide with relatively undisturbed veg. (grasslands, abandoned pasture are OK) that extends for more than 1 km?
   NO go to 5 YES = [1]
5. Is there a corridor >50 m wide with good (>30%) cover of forest or shrub (>2 m high) to natural upland area or open water that is >100 ha in size?
   NO go to 6 YES = [3]
6. Is there a 10-50 m wide forest or shrub corridor to a relatively undisturbed upland or open water that is >10 ha?
   NO go to 7 YES = [2]
7. Is there a corridor of relatively undisturbed vegetation (grassland, abandoned pasture) >50 m wide to an undisturbed upland or open water that is >10 ha?
   NO go to 8 YES = [2]
8. Is there any vegetated corridor 5-50 m wide between the AU and any relatively undisturbed area or open water that is >2.5 ha?
   NO = [0] YES = [1]

1 [0-12] D44 # of categories of large woody debris in AU outside of perm. water

Freshly cut stumps are not included

Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")	✓			
21-50cm	(8-20")				
>50 cm	(>20")				

0 [0-12] D45 # of categories of large woody debris in permanent water of AU (may include aquatic bed areas)

Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")				
21-50cm	(8-20")				
>50 cm	(>20")				

Wetland Name:	AU ID#:

D40

1 [0-3] D41 Edge of AU: The characteristics of the edge between AU and uplands or adjacent wetlands.

Choose the description that best fits the characteristics of the AU edge:

0 There are no differences in level of vegetation height as reflected by vegetation classes on each side of the AU for more than 50% of the circumference: record a [0] regardless of the sinuosity. Examples: emergent (or herbaceous) to emergent (or herbaceous), shrub to shrub, forest to forest.

1 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight for more than 50% of the circumference: record a [1]. Example: emergent (or herbaceous) to shrub, shrub to forest

2 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous for more than 50% of the circumference: record a [2]. Examples: emergent (or herbaceous) to shrub, shrub to forest.

2 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight: record a [2]. Examples: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

3 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous: record a [3]. Example: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

2 If no single category above extends for more than 50% of the circumference, and the edge is straight: record a [2]

3 If no single category above extends for more than 50% of the circumference, and the edge is sinuous: record a [3]

3 [0-5] D42 Buffer of AU: Choose the description that best represents condition of AU buffer

** Open water or adjacent wetlands are considered part of the buffer*
** Infrequently used gravel or paved roads or vegetated dikes in a relatively undisturbed buffer can be ignored as a "disturbance"*

5 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >95% of circumference. Clear-cut >5 years old is OK. No developed areas within undisturbed part of buffer.

4 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >50% circumference OR 50 m (170 ft) of forest scrub, grassland or open water >95% circumference. No developed areas within undisturbed part of buffer.

3 100 m (330 ft) of forest, scrub, grassland or open water >25% circumference, OR 50 m (170 ft) of forest, scrub, grassland or open water >50% circumference.

2 No paved areas or buildings within 25m (80 ft) of wetland >95% circumference. Pasture or lawns are OK, OR no paved areas or buildings within 50m of wetland >50% circumference

0 Vegetated buffers are <2 m wide (6.6 ft) for more than 95% of the circumference

1 Does not meet any of the criteria above

Wetland Name:	AU ID#:

SOILS and SUBSTRATES

D46 Composition of AU surface

0 0/1 *D46.1* Deciduous, broad-leaved, leaf litter
1 0/1 *D46.2* Other plant litter
0 0/1 *D46.3* Decomposed organic
0 0/1 *D46.4* Exposed cobbles
0 0/1 *D46.5* Exposed gravel
0 0/1 *D46.6* Exposed sand
0 0/1 *D46.7* Exposed silt
0 0/1 *D46.8* Exposed clay

Record a 1 for each category present if its area is > 10 square meters. Note: bare earth from animal tunnels does NOT count.

D47 Soils present in top (15 cm) of A horizon (record [1] if 1-49% area of AU, [2] if 50-95%, [3] if >95%)

0 [0-3] *D47.1* Peat
0 [0-3] *D47.2* Organic Muck
3 [0-3] *D47.3* Mineral with clay fraction <30%
0 [0-3] *D47.4* Clay (clay fraction >30%)

Record the least permeable layer if there are several down to 60 cm.

D48 Infiltration rate of top 60 cm of soil in seasonally inundated areas

0 0/1 *D48.1* Fast >50% gravel and cobble and the rest a sand, loamy sand, or sandy loam
0 0/1 *D48.2* Moderate >50% sand and rest cobble, gravel, loamy sand, or sandy loam
1 0/1 *D48.3* Slow - muck, peat, or loams (except sandy loam), silts, and clays

D49 Substrate of streams

0/1 *D49.1* Substrate of permanent stream or river in AU has at least 1 square meter of gravel
0/1 *D49.2* Substrate of permanent stream or river in AU has at least 1 square meter of cobbles
D49.3

Judgements of Opportunity (Ratings of High, Medium, Low)

Rating	*Functions*
low	Removing Sediments
low	Removing Nutrients
low	Removing Toxic Metals and Organics
low-medium	Reducing Peak Flows
low-medium	Reducing Downstream Erosion
low	Recharging Groundwater
medium-high	General Habitat
low	Anadromous Fish Habitat

25 Years After Rehabilitation is Intended

Wetland Name: CMA 1 — AU ID#:
Location: Whatcom County, WA — T/S/R:
Tester: GSM — Date: 4/4/03

Use this data sheet for:
DEPRESSIONAL OUTFLOW or RIVERINE IMPOUNDING wetlands in the Lowlands of Western Washington
Use in conjunction with the written guidance provided in Parts 1 and 2
Record only numbers, yes/no answers are recorded as a [1] or [0]

Estimate, Score/Rating			
			LANDSCAPE DATA
0	1/0	D0	Do dikes surround the AU, and does it drain through a control structure that can be manipulated?
164	ha	D1	Area of AU
24	ha	D2	Area of contributing basin (upgradient watershed)
		D3	Land use (as % of total area) within 1 km of AU (include contiguous AUs of different class)
32	%	*D3.1*	Undeveloped forest (if previously clear-cut, cut at least 5 years ago)
25	%	*D3.2*	Agriculture (tilled fields and pastures; includes golf courses)
0	%	*D3.3*	Clear-cut logging (<5 years since clearing)
14	%	*D3.4*	Urban/commercial (any developed areas not identified as residential)
0	%	*D3.5*	High density residential (>1 residence/acre)
4	%	*D3.6*	Low density residential (<= 1 residence/acre)
25	%	*D3.7*	Undeveloped areas, shrubland, other wetlands, and open water
			WATER REGIME
1	0/1	D4	Channels, ditches, or streams in AU
0	0/1	*D4.1*	Channels, ditches, or streams in AU have permanently flowing water *(you see water flowing)*
		D4.2	
0	0/1	*D4.3*	The only surface outflow from the AU is through a culvert (<60 cm) or vertical siphon
		D5	
		D6	
		D7	
		D8	Inundation
31	%	*D8.1*	Percent of AU that is ponded or inundated for >1 month
0	%	*D8.2*	Percent of AU with permanent standing or moving water
0	%	*D8.3*	Percent of AU with permanent open water *(without aquatic bed vegetation)*
0	%	*D8.4*	Percent of AU with unvegetated bars or mudflats
0	0/1	*D8.5*	Unvegetated bars or mudflats at least 100 square meters in size
		D9	Inundation regimes
0	0/1	*D9.1*	Permanently flooded (include vegetated areas)
1	0/1	*D9.2*	Seasonally flooded (>1 month)
1	0/1	*D9.3*	Occasionally flooded (<= 1 month)
1	0/1	*D9.4*	Saturated but seldom inundated
0	0/1	*D9.5*	Permanently flowing stream
1	0/1	*D9.6*	Intermittently flowing stream
0.3	m	D10	Average height of annual flooding above lowest point of outlet or surface of permanent stream at outlet (round to 0.3 m)

By definition: D8.1 >= D8.2 >= D8.3

Chose all that apply that meet size criteria: area >0.1 ha (1/4 acre) or > 10% of AU if AU smaller than 1 ha (2.5 acres)

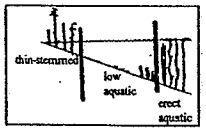
0	0/1	D22	Mature trees in AU

Average DBH of 3 out of 5 largest trees of a species has to exceed size threshold

Tsuga heterophylla (western hemlock) >45 cm (18")
Thuja plicata (western red cedar) >45 cm (18")
Pseudotsuga menziesii (Douglas fir) >45 cm (18")
Picea sitchensis (Sitka spruce) >45 cm (18")
Populus balsamifera (black cottonwood) >45 cm (18")
Acer macrophyllum (big-leaf maple) >45 cm (18")
Alnus rubra (red alder) >30 cm (12")
Fraxinus latifolia (Oregon ash) >30 cm (12")
Pinus contorta (lodgepole pine) >30 cm (12")
Salix lucida (Pacific willow) >30 cm (12")

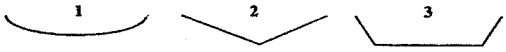
		D23	Sphagnum bogs
0	0/1	*D23.1*	% area of Sphagnum bogs >75%
0	0/1	*D23.2*	% area of Sphagnum bogs = 50-75%
0	0/1	*D23.3*	% area of Sphagnum bogs = 25-49%
0	0/1	*D23.4*	% area of Sphagnum bogs = 1-24%
1	0/1	*D23.5*	% area of Sphagnum bogs = 0%
		D24	Dominance by non-native plant species
0	0/1	*D24.1*	% area of non-native species >75%
1	0/1	*D24.2*	% area of non-native species = 50-75%
0	0/1	*D24.3*	%area of non-native species = 25-49%
0	0/1	*D24.4*	% area of non-native species = 1-24%
0	0/1	*D24.5*	% area of non-natives = 0%
			HABITAT CHARACTERISTICS
0	[0-3]	D25	Number of structure categories in aquatic bed vegetation

Applies only to aquatic bed species
DO NOT count persistent emergents



		D26	pH
6.9	[4-9]	*D26.1*	pH of interstitial water *(measure immediately after digging hole in non-inundated areas)*
6.9	[4-9]	*D26.2*	pH of open or standing water *(record the lowest pH, if you cannot measure record a [7])*
1	0/1	D27	Estuary: AU is within 8 km (5 mi) of a brackish or salt water estuary
0	0/1	D28	Large lake: AU is within 1.6km (1 mi) of a lake >8 ha (20 acres)
1	0/1	D29	Open field: AU is within 5 km (3 mi) of an open field (agriculture or pasture) >16 ha (40 acres)
1	0/1	D30	Preferred woody vegetation: AU has >1 ha (2.5 acres) of preferred woody vegetation for beaver in and within 100 m of AU

		D11	Cross section of AU in areas of seasonal inundation (record a 1 next to cross section that best fits)
1	0/1	*D11.1*	Cross section 1
0	0/1	*D11.2*	Cross section 2
0	0/1	*D11.3*	Cross section 3



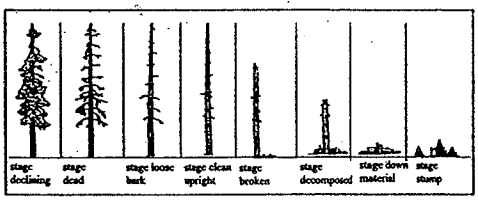
		D12	Categories of water depths in AU, areas permanently or seasonally inundated/flooded
1	0/1	*D12.1*	1-20 cm (<8 in)
0	0/1	*D12.2*	20-100 cm (8-40 in)
0	0/1	*D12.3*	>100 cm (>40 in)
		D13	Constriction of outlet
1	0/1	*D13.1*	Unconstricted or only slightly constricted
0	0/1	*D13.2*	Moderately constricted
0	0/1	*D13.3*	Severely constricted
–	0/1	*D13.4*	*Riverine Impounding only* – Completely constricted (no surface outlet)
			VEGETATION
		D14	Cowardin Classes (as % area of AU)
5	%	*D14.1*	Forest - evergreen
65	%	*D14.2*	Forest -deciduous
0	%	*D14.3*	Scrub-shrub - evergreen
10	%	*D14.4*	Scrub-shrub - deciduous
20	%	*D14.5*	Emergent
0	%	*D14.6*	Aquatic bed
1	0/1	D15	Does D8.3 + D8.4 + sum (D14.1 to D14.6) = 100? If not, give reason.
40	%	D16	% area of herbaceous understory in forest and shrub areas (not % area in entire AU)
80	%	D17	% area of AU with >75% closure of canopy (SS, FO classes > 1 m high)
		D18	
		D19	Plant Richness
35	#	*D19.1*	Record number of native plant species found in AU
2	#	*D19.2*	Record number of non- native plant species found in AU
7	#	D20	The # of plant assemblages in the AU with area >0.1 ha (1/4 acre) or >10% if AU <1 ha *(if more than 12 record a 12)*
3	[1-6]	D21	Strata: The maximum # of strata present in any plant assemblage
0	0/1	*D21.1*	Is vine stratum dominated by non-native blackberries?

- *Include forest only if trees are rooted in AU.*
- *If forest is a mix of deciduous and evergreen estimate the relative % cover of each and divide percentage between the two categories.*
- *If vegetation classes are patchy, add the patches together for each class to get a total.*
- *To count, a class must cover at least 0.1 ha or be more than 10% of the total area of the AU*

A stratum must have 20% cover in assemblage

2	[0-8]	D31	Snags (record # of stages)

Circle the categories present; minimum DBH of snag =10 cm (4")



1	0/1	*D31.1*	At least one of the snags above has a DBH greater than 30 cm (12").
0	0/1	D32	Overhanging vegetation, extending out for 1 m, for at least 10 m (33 ft) over stream or open water.
0	0/1	D33	Upland islands of at least 10 square meters (100 square ft.) within AU boundary

Islands need to be surrounded by at least 30 m (100 ft) of open water deeper than 1 m (3 ft)

0	0/1	D34	Undercut banks present for at least 2 m (6.6 ft.)
2	[0-4]	D35	Key for rating egg-laying structures for amphibians

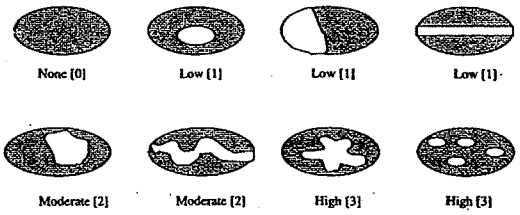
1. Does the AU have thin-stemmed vegetation or thin branches (<8 mm) in at least 1/4 acre (or 10% of AU) of permanent or seasonally inundated areas? *Thin-stemmed vegetation can include herbaceous species such as water parsley.*
   NO – Score = 0 — YES go to 2
2. Does the AU have at least 0.2 ha (1/2 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm in diameter?
   NO go to 5 — YES go to 3
3. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 [no more than a 40- 60% of the total area is open water)?
   NO go to 4 — YES - Score = 4
4. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   → NO – Score = 2 — YES – Score = 3 STOP
5. Does the AU have >0.1 ha (1/4 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm?
   NO – Score = 1 — YES go to 6
6. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 [no more than a 40- 60% of the total area is open water)?
   NO go to 7 — YES – Score = 3
7. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   NO – Score = 1 — YES – Score = 2

Wetland Name:	AU ID#:

0 0/1 D36 Tannins in surface waters >10% of water surface

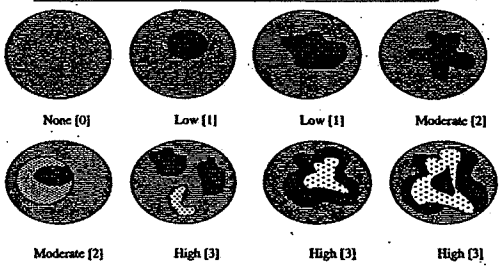
0 0/1 D37 Steep banks for denning (>30 degree slope, fine material, >10 m long, >0.6 m high) *(may be a dike)*

0 [0-3] D38 Interspersion between erect vegetation and permanent open water (POW + AB) areas of AU



2 [0-3] D39 Interspersion between Cowardin vegetation classes

**AUs with only 2 classes can only score a moderate[2] or lower*
**AUs with 4 vegetation classes score a high [3]*
**AUs with 3 classes can score a moderate (2) or a high (3)*



Wetland Name:	AU ID#:

2 [0-3] D43 Corridors of AU: Rate corridors using following key *(record rating of 0, 1, 2, or 3)*

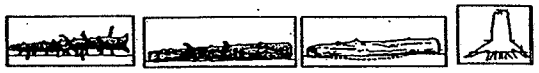
1. Is the AU part of a riparian corridor *(see text for definitions)*
   NO go to 5 YES go to 2
2. Is the wetland part of riparian corridor > 50 m wide connecting 2 or more wetlands within 1 km with at least 30% shrub or forest cover in the corridor?
   NO go to 3 YES = [3]
3. Is the AU part of a riparian corridor 25-50 m wide connecting to other wetlands with at least 30% shrub or forest cover in the corridor?
   NO go to 4 YES = [2]
4. Is the AU part of a riparian corridor >5 m wide with relatively undisturbed veg. (grasslands, abandoned pasture are OK) that extends for more than 1 km?
   NO go to 5 YES = [1]
5. Is there a corridor >50 m wide with good (>30%) cover of forest or shrub (>2 m high) to natural upland area or open water that is >100 ha in size?
   NO go to 6 YES = [3]
6. Is there a 10-50 m wide forest or shrub corridor to a relatively undisturbed upland or open water that is >10 ha?
   NO go to 7 YES = [2]
7. Is there a corridor of relatively undisturbed vegetation (grassland, abandoned pasture) >50 m wide to an undisturbed upland or open water that is >10 ha?
   NO go to 8 YES = [2]
8. Is there any vegetated corridor 5-50 m wide between the AU and any relatively undisturbed area or open water that is >2.5 ha?
   NO = [0] YES = [1]

5 [0-12] D44 # of categories of large woody debris in AU outside of perm. water

Freshly cut stumps are not included

Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")	✓	✓		✓
21-50cm	(8-20")		✓		✓
>50 cm	(>20")				

0 [0-12] D45 # of categories of large woody debris in permanent water of AU (may include aquatic bed areas)



Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")				
21-50cm	(8-20")				
>50 cm	(>20")				

Wetland Name:	AU ID#:

D40

3 [0-3] D41 Edge of AU: The characteristics of the edge between AU and uplands or adjacent wetlands.

Choose the description that best fits the characteristics of the AU edge:

0 There are no differences in level of vegetation height as reflected by vegetation classes on each side of the AU for more than 50% of the circumference: record a [0] regardless of the sinuosity. Examples: emergent (or herbaceous) to emergent (or herbaceous), shrub to shrub, forest to forest.

1 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight for more than 50% of the circumference: record a [1]. Example: emergent (or herbaceous) to shrub, shrub to forest

2 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous for more than 50% of the circumference: record a [2]. Examples: emergent (or herbaceous) to shrub, shrub to forest.

2 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight: record a [2]. Examples: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

3 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous: record a [3]. Example: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

→ 2 If no single category above extends for more than 50% of the circumference, and the edge is straight: record a [2]

3 If no single category above extends for more than 50% of the circumference, and the edge is sinuous: record a [3]

3 [0-5] D42 Buffer of AU: Choose the description that best represents condition of AU buffer

** Open water or adjacent wetlands are considered part of the buffer*
** Infrequently used gravel or paved roads or vegetated dikes in a relatively undisturbed buffer can be ignored as a "disturbance"*

5 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >95% of circumference. Clear-cut >5 years old is OK. No developed areas within undisturbed part of buffer.

4 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >50% circumference OR 50 m (170 ft) of forest scrub, grassland or open water >95% circumference. No developed areas within undisturbed part of buffer.

3 100 m (330 ft) of forest, scrub, grassland or open water >25% circumference, OR 50 m (170 ft) of forest, scrub, grassland or open water >50% circumference.

2 No paved areas or buildings within 25m (80 ft) of wetland >95% circumference. Pasture or lawns are OK. OR no paved areas or buildings within 50m of wetland >50% circumference

0 Vegetated buffers are <2 m wide (6.6 ft) for more than 95% of the circumference

1 Does not meet any of the criteria above

Wetland Name:	AU ID#:

SOILS and SUBSTRATES

D46 Composition of AU surface

1 0/1 *D46.1* Deciduous, broad-leaved, leaf litter
1 0/1 *D46.2* Other plant litter
0 0/1 *D46.3* Decomposed organic
0 0/1 *D46.4* Exposed cobbles
0 0/1 *D46.5* Exposed gravel
0 0/1 *D46.6* Exposed sand
0 0/1 *D46.7* Exposed silt
0 0/1 *D46.8* Exposed clay

Record a 1 for each category present if its area is > 10 square meters. Note: bare earth from animal tunnels does NOT count.

D47 Soils present in top (15 cm) of A horizon (record [1] if 1-49% area of AU, [2] if 50-95%, [3] if >95%)

0 [0-3] *D47.1* Peat
0 [0-3] *D47.2* Organic Muck
3 [0-3] *D47.3* Mineral with clay fraction <30%
0 [0-3] *D47.4* Clay (clay fraction >30%)

Record the least permeable layer if there are several down to 60 cm.

D48 Infiltration rate of top 60 cm of soil in seasonally inundated areas

0 0/1 *D48.1* Fast >50% gravel and cobble and the rest a sand, loamy sand, or sandy loam
0 0/1 *D48.2* Moderate >50% sand and rest cobble, gravel, loamy sand, or sandy loam
1 0/1 *D48.3* Slow - muck, peat, or loams (except sandy loam), silts, and clays

D49 Substrate of streams

— 0/1 *D49.1* Substrate of permanent stream or river in AU has at least 1 square meter of gravel
— 0/1 *D49.2* Substrate of permanent stream or river in AU has at least 1 square meter of cobbles
D49.3

Judgements of Opportunity (Ratings of High, Medium, Low)

Rating	*Functions*
low	Removing Sediments
low	Removing Nutrients
low	Removing Toxic Metals and Organics
low-medium	Reducing Peak Flows
low-medium	Reducing Downstream Erosion
low	Recharging Groundwater
medium-high	General Habitat
low	Anadromous Fish Habitat

Western Washington Wetland Classification Key

Wetland Name: BP Construction + Mitigation Areas
AU ID #: CMA2 **Date:** 4/22/02

1) Water levels in AU usually controlled by tides
   No – go to 2 Yes – **Tidal Fringe**

2) Topography is flat and precipitation is only source (>90%) of water to the AU
   No – go to 3 Yes – **Flat**

3) AU is contiguous with >8 ha open water, and water is deeper than 2 m over 30% of open water area
   No – go to 4 Yes – **Lacustrine Fringe**

4) Open water is <8 ha and >2 m deep, but AU is a fringe narrower than ½ the radius of open water
   No – go to 5 Yes – **Lacustrine Fringe**

5) Water flow in AU is unidirectional on a slope, water is not impounded in the AU
   No – go to 6 Yes – **Slope**

6) AU is located in a topographic valley with stream or river in the middle
   No – go to 9 Yes – go to 7

7) Have data showing area flooded more than once every 2 yrs.; or indicators of flooding are present:
   - ☐ Scour marks common
   - ☐ Recent sediment deposition
   - ☐ Vegetation that is damaged or bent in one direction
   - ☐ Soils have alternating deposits
   - ☐ Vegetation along bank edge has flood marks

   No for all indicators – go to 9 Yes for any indicator – go to 8

8) Flood waters retained
   No – **Riverine Flow-through**
   Yes – **Riverine Impounding**
   - ☐ Depression in floodplain
   - ☐ Constricted outlet
   - ☐ Permanent water

9) Has surface water outflow – **Depressional Outflow**
   Has no surface outflow – **Depressional Closed**

Rationale for Choices:

Wetland Name: CMA2 - current conditions AU ID#:
Location: Whatcom County, WA T/S/R:
Recorder: EJM Date: 4/4/03

Use this data sheet for:
DEPRESSIONAL OUTFLOW or RIVERINE IMPOUNDING wetlands in the Lowlands of Western Washington
Use in conjunction with the written guidance provided in Parts 1 and 2
Record only numbers, yes/no answers are recorded as a [1] or [0]

Estimate, Score or Rating			
			LANDSCAPE DATA
0	,0	D0	Do dikes surround the AU, and does it drain through a control structure that can be manipulated?
25.6	ha	D1	Area of AU
38.4	ha	D2	Area of contributing basin (upgradient watershed)
		D3	Land use (as % of total area) within 1 km of AU (include contiguous AUs of different class)
15	%	*D3.1*	Undeveloped forest (if previously clear-cut, cut at least 5 years ago)
23	%	*D3.2*	Agriculture (tilled fields and pastures; includes golf courses)
0	%	*D3.3*	Clear-cut logging (<5 years since clearing)
12	%	*D3.4*	Urban/commercial (any developed areas not identified as residential)
0	%	*D3.5*	High density residential (>1 residence/acre)
1	%	*D3.6*	Low density residential (<= 1 residence/acre)
49	%	*D3.7*	Undeveloped areas, shrubland, other wetlands, and open water
			WATER REGIME
1	0/1	D4	Channels, ditches, or streams in AU
0	0/1	*D4.1*	Channels, ditches, or streams in AU have permanently flowing water *(you see water flowing)*
		D4.2	
0	0/1	*D4.3*	The only surface outflow from the AU is through a culvert (<60 cm) or vertical siphon
		D5	
		D6	
		D7	
		D8	Inundation
24	%	*D8.1*	Percent of AU that is ponded or inundated for >1 month
0	%	*D8.2*	Percent of AU with permanent standing or moving water
0	%	*D8.3*	Percent of AU with permanent open water *(without aquatic bed vegetation)*
0	%	*D8.4*	Percent of AU with unvegetated bars or mudflats
0	0/1	*D8.5*	Unvegetated bars or mudflats at least 100 square meters in size
		D9	Inundation regimes
0	0/1	*D9.1*	Permanently flooded (include vegetated areas)
1	0/1	*D9.2*	Seasonally flooded (>1 month)
1a	0/1	*D9.3*	Occasionally flooded (<= 1 month)
1	0/1	*D9.4*	Saturated but seldom inundated
0	0/1	*D9.5*	Permanently flowing stream
1	0/1	*D9.6*	Intermittently flowing stream
0.3	m	D10	Average height of annual flooding above lowest point of outlet or surface of permanent stream at outlet (round to 0.3 m)

By definition: D8.1 >= D8.2 >= D8.3

Chose all that apply that meet size criteria: area >0.1 ha (1/4 acre) or > 10% of AU if AU smaller than 1 ha (2.5 acres)

Wetland Name: AU ID#:

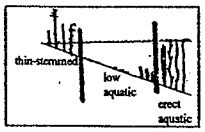
0	0/1	D22	Mature trees in AU

Average DBH of 3 out of 5 largest trees of a species has to exceed size threshold

Tsuga heterophylla (western hemlock) >45 cm (18")
Thuja plicata (western red cedar) >45 cm (18")
Pseudotsuga menziesii (Douglas fir) >45 cm (18")
Picea sitchensis (Sitka spruce) >45 cm (18")
Populus balsamifera (black cottonwood) >45 cm (18")
Acer macrophyllum (big-leaf maple) >45 cm (18")
Alnus rubra (red alder) >30 cm (12")
Fraxinus latifolia (Oregon ash) >30 cm (12")
Pinus contorta (lodgepole pine) >30 cm (12")
Salix lucida (Pacific willow) >30 cm (12")

		D23	Sphagnum bogs
0	0/1	*D23.1*	% area of Sphagnum bogs >75%
0	0/1	*D23.2*	% area of Sphagnum bogs = 50-75%
0	0/1	*D23.3*	% area of Sphagnum bogs = 25-49%
0	0/1	*D23.4*	% area of Sphagnum bogs = 1-24%
1	0/1	*D23.5*	% area of Sphagnum bogs = 0%
		D24	Dominance by non-native plant species
1	0/1	*D24.1*	% area of non-native species >75%
0	0/1	*D24.2*	% area of non-native species = 50-75%
0	0/1	*D24.3*	%area of non-native species = 25-49%
0	0/1	*D24.4*	% area of non-native species = 1-24%
0	0/1	*D24.5*	% area of non-natives = 0%
			HABITAT CHARACTERISTICS
0	[0-3]	D25	Number of structure categories in aquatic bed vegetation

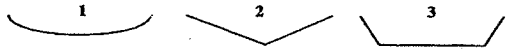
Applies only to aquatic bed species
DO NOT count persistent emergents



		D26	pH
6.9	[4-9]	*D26.1*	pH of interstitial water *(measure immediately after digging hole in non-inundated areas)*
6.9	[4-9]	*D26.2*	pH of open or standing water *(record the lowest pH, if you cannot measure record a [7])*
1	0/1	D27	Estuary: AU is within 8 km (5 mi) of a brackish or salt water estuary
0	0/1	D28	Large lake: AU is within 1.6km (1 mi) of a lake >8 ha (20 acres)
1	0/1	D29	Open field: AU is within 5 km (3 mi) of an open field (agriculture or pasture) >16 ha (40 acres)
0	0/1	D30	Preferred woody vegetation: AU has >1 ha (2.5 acres) of preferred woody vegetation for beaver in and within 100 m of AU

Wetland Name: AU ID#:

		D11	Cross section of AU in areas of seasonal inundation (record a 1 next to cross section that best fits)
1	0/1	*D11.1*	Cross section 1
0	0/1	*D11.2*	Cross section 2
0	0/1	*D11.3*	Cross section 3



		D12	Categories of water depths in AU, areas permanently or seasonally inundated/flooded
1	0/1	*D12.1*	1-20 cm (<8 in)
0	0/1	*D12.2*	20-100 cm (8-40 in)
0	0/1	*D12.3*	>100 cm (>40 in)
		D13	Constriction of outlet
1	0/1	*D13.1*	Unconstricted or only slightly constricted
0	0/1	*D13.2*	Moderately constricted
0	0/1	*D13.3*	Severely constricted
—	0/1	*D13.4*	*Riverine Impounding only* – Completely constricted (no surface outlet)
			VEGETATION
		D14	Cowardin Classes (as % area of AU)
0	%	*D14.1*	Forest - evergreen
2	%	*D14.2*	Forest -deciduous
0	%	*D14.3*	Scrub-shrub - evergreen
1	%	*D14.4*	Scrub-shrub - deciduous
97	%	*D14.5*	Emergent
0	%	*D14.6*	Aquatic bed
1	0/1	D15	Does D8.3 + D8.4 + sum (D14.1 to D14.6) = 100? If not, give reason.
20	%	D16	% area of herbaceous understory in forest and shrub areas (not % area in entire AU)
1	%	D17	% area of AU with >75% closure of canopy *(SS, FO classes > 1 m high)*
		D18	
		D19	Plant Richness
11	#	*D19.1*	Record number of native plant species found in AU
16	#	*D19.2*	Record number of non- native plant species found in AU
5	#	D20	The # of plant assemblages in the AU with area >0.1 ha (1/4 acre) or >10% if AU <1 ha *(if more than 12 record a 12)*
3	[1-6]	D21	Strata: The maximum # of strata present in any plant assemblage
1	0/1	*D21.1*	Is vine stratum dominated by non-native blackberries?

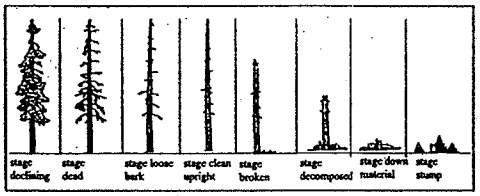
- *Include forest only if trees are rooted in AU.*
- *If forest is a mix of deciduous and evergreen estimate the relative % cover of each and divide percentage between the two categories.*
- *If vegetation classes are patchy, add the patches together for each class to get a total.*
- *To count, a class must cover at least 0.1 ha or be more than 10% of the total area of the AU*

A stratum must have 20% cover in assemblage

Wetland Name: AU ID#:

0	[0-8]	D31	Snags (record # of stages)

Circle the categories present; minimum DBH of snag =10 cm (4")



0	0/1	*D31.1*	At least one of the snags above has a DBH greater than 30 cm (12").
0	0/1	D32	Overhanging vegetation, extending out for 1 m, for at least 10 m (33 ft) over stream or open water.
0	0/1	D33	Upland islands of at least 10 square meters (100 square ft.) within AU boundary
			Islands need to be surrounded by at least 30 m (100 ft) of open water deeper than 1 m (3 ft)
0	0/1	D34	Undercut banks present for at least 2 m (6.6 ft.)
2	[0-4]	D35	Key for rating egg-laying structures for amphibians

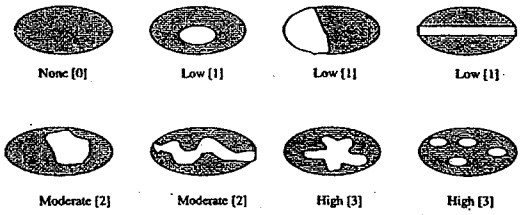
1. Does the AU have thin-stemmed vegetation or thin branches (<8 mm) in at least 1/4 acre (or 10% of AU) of permanent or seasonally inundated areas? *Thin-stemmed vegetation can include herbaceous species such as water parsley.*
   NO – Score = 0 YES go to 2
2. Does the AU have at least 0.2 ha (1/2 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm in diameter?
   NO go to 5 YES go to 3
3. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 [no more than a 40- 60% of the total area is open water)?
   NO go to 4 YES - Score = 4
4. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   → NO – Score = 2 YES – Score = 3 STOP
5. Does the AU have >0.1 ha (1/4 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm?
   NO – Score = 1 YES go to 6
6. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 [no more than a 40- 60% of the total area is open water)?
   NO go to 7 YES – Score = 3
7. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   NO – Score = 1 YES – Score = 2

Wetland Name: AU ID#:

0 0/1 D36 Tannins in surface waters >10% of water surface

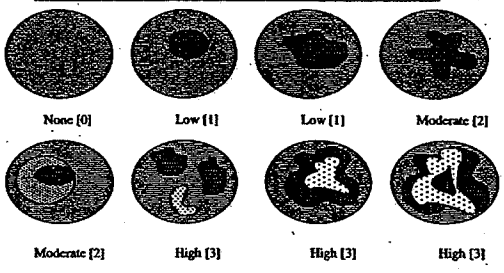
0 0/1 D37 Steep banks for denning (>30 degree slope, fine material, >10 m long, >0.6 m high) *(may be a dike)*

0 [0-3] D38 Interspersion between erect vegetation and permanent open water (POW + AB) areas of AU



1 [0-3] D39 Interspersion between Cowardin vegetation classes

*AUs with only 2 classes can only score a moderate[2] or lower
*AUs with 4 vegetation classes score a high [3]
*AUs with 3 classes can score a moderate (2) or a high (3)



Wetland Name: AU ID#:

3 [0-3] D43 Corridors of AU: Rate corridors using following key *(record rating of 0, 1, 2, or 3)*

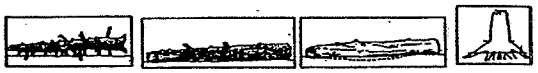
1. Is the AU part of a riparian corridor *(see text for definitions)*
   NO go to 5 YES go to 2
2. Is the wetland part of riparian corridor > 50 m wide connecting 2 or more wetlands within 1 km with at least 30% shrub or forest cover in the corridor?
   NO go to 3 YES = [3]
3. Is the AU part of a riparian corridor 25-50 m wide connecting to other wetlands with at least 30% shrub or forest cover in the corridor?
   NO go to 4 YES = [2]
4. Is the AU part of a riparian corridor >5 m wide with relatively undisturbed veg. (grasslands, abandoned pasture are OK) that extends for more than 1 km?
   NO go to 5 YES = [1]
5. Is there a corridor >50 m wide with good (>30%) cover of forest or shrub (>2 m high) to natural upland area or open water that is >100 ha in size?
   NO go to 6 YES = [3]
6. Is there a 10-50 m wide forest or shrub corridor to a relatively undisturbed upland or open water that is >10 ha?
   NO go to 7 YES = [2]
7. Is there a corridor of relatively undisturbed vegetation (grassland, abandoned pasture) >50 m wide to an undisturbed upland or open water that is >10 ha?
   NO go to 8 YES = [2]
8. Is there any vegetated corridor 5-50 m wide between the AU and any relatively undisturbed area or open water that is >2.5 ha?
   NO = [0] YES = [1]

1 [0-12] D44 # of categories of large woody debris in AU outside of perm. water

Freshly cut stumps are not included

Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")		✓		
21-50cm	(8-20")				
>50 cm	(>20")				

0 [0-12] D45 # of categories of large woody debris in permanent water of AU (may include aquatic bed areas)



Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")				
21-50cm	(8-20")				
>50 cm	(>20")				

Wetland Name: AU ID#:

D40

1 [0-3] D41 Edge of AU: The characteristics of the edge between AU and uplands or adjacent wetlands.

Choose the description that best fits the characteristics of the AU edge:

0 There are no differences in level of vegetation height as reflected by vegetation classes on each side of the AU for more than 50% of the circumference: record a [0] regardless of the sinuosity. Examples: emergent (or herbaceous) to emergent (or herbaceous), shrub to shrub, forest to forest.

1 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight for more than 50% of the circumference: record a [1]. Example: emergent (or herbaceous) to shrub, shrub to forest

2 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous for more than 50% of the circumference: record a [2]. Examples: emergent (or herbaceous) to shrub, shrub to forest.

2 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight: record a [2]. Examples: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

3 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous: record a [3]. Example: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

2 If no single category above extends for more than 50% of the circumference, and the edge is straight: record a [2]

3 If no single category above extends for more than 50% of the circumference, and the edge is sinuous: record a [3]

3 [0-5] D42 Buffer of AU: Choose the description that best represents condition of AU buffer

* *Open water or adjacent wetlands are considered part of the buffer*
* *Infrequently used gravel or paved roads or vegetated dikes in a relatively undisturbed buffer can be ignored as a "disturbance"*

5 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >95% of circumference. Clear-cut >5 years old is OK. No developed areas within undisturbed part of buffer.

4 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >50% circumference OR 50 m (170 ft) of forest scrub, grassland or open water >95% circumference. No developed areas within undisturbed part of buffer.

3 100 m (330 ft) of forest, scrub, grassland or open water >25% circumference, OR 50 m (170 ft) of forest, scrub, grassland or open water >50% circumference.

2 No paved areas or buildings within 25m (80 ft) of wetland >95% circumference. Pasture or lawns are OK. OR no paved areas or buildings within 50m of wetland >50% circumference

0 Vegetated buffers are <2 m wide (6.6 ft) for more than 95% of the circumference

1 Does not meet any of the criteria above

Wetland Name: AU ID#:

SOILS and SUBSTRATES

D46 Composition of AU surface

0 0/1 D46.1 Deciduous, broad-leaved, leaf litter
1 0/1 D46.2 Other plant litter
0 0/1 D46.3 Decomposed organic
0 0/1 D46.4 Exposed cobbles
0 0/1 D46.5 Exposed gravel
0 0/1 D46.6 Exposed sand
0 0/1 D46.7 Exposed silt
0 0/1 D46.8 Exposed clay

Record a 1 for each category present if its area is > 10 square meters. Note: bare earth from animal tunnels does NOT count.

D47 Soils present in top (15 cm) of A horizon (record [1] if 1-49% area of AU, [2] if 50-95%, [3] if >95%)

0 [0-3] D47.1 Peat
0 [0-3] D47.2 Organic Muck
3 [0-3] D47.3 Mineral with clay fraction <30%
0 [0-3] D47.4 Clay (clay fraction >30%)

Record the least permeable layer if there are several down to 60 cm.

D48 Infiltration rate of top 60 cm of soil in seasonally inundated areas

0 0/1 D48.1 Fast >50% gravel and cobble and the rest a sand, loamy sand, or sandy loam
0 0/1 D48.2 Moderate >50% sand and rest cobble, gravel, loamy sand, or sandy loam
1 0/1 D48.3 Slow - muck, peat, or loams (except sandy loam), silts, and clays

D49 Substrate of streams

0 0/1 D49.1 Substrate of permanent stream or river in AU has at least 1 square meter of gravel
— 0/1 D49.2 Substrate of permanent stream or river in AU has at least 1 square meter of cobbles
— D49.3

Judgements of Opportunity (Ratings of High, Medium, Low)

Rating	Functions
low	Removing Sediments
low	Removing Nutrients
low	Removing Toxic Metals and Organics
low-medium	Reducing Peak Flows
low medium	Reducing Downstream Erosion
low	Recharging Groundwater
medium-high	General Habitat
low	Anadromous Fish Habitat

15 Years After Rehabilitation is Initiated

Wetland Name: CMA2
Location: Whatcom County, WA
Rater: EJM

AU ID#:
T/S/R:
Date: 4/4/03

Use this data sheet for:
DEPRESSIONAL OUTFLOW or RIVERINE IMPOUNDING wetlands in the Lowlands of Western Washington
Use in conjunction with the written guidance provided in Parts 1 and 2
Record only numbers, yes/no answers are recorded as a [1] or [0]

Estimate, Score or Rating			
			LANDSCAPE DATA
0	0/1	D0	Do dikes surround the AU, and does it drain through a control structure that can be manipulated?
27.3	ha	D1	Area of AU
51.6	ha	D2	Area of contributing basin (upgradient watershed)
		D3	Land use (as % of total area) within 1 km of AU (include contiguous AUs of different class)
35	%	*D3.1*	Undeveloped forest (if previously clear-cut, cut at least 5 years ago)
18	%	*D3.2*	Agriculture (tilled fields and pastures; includes golf courses)
0	%	*D3.3*	Clear-cut logging (<5 years since clearing)
15	%	*D3.4*	Urban/commercial (any developed areas not identified as residential)
0	%	*D3.5*	High density residential (>1 residence/acre)
1	%	*D3.6*	Low density residential (<= 1 residence/acre)
41	%	*D3.7*	Undeveloped areas, shrubland, other wetlands, and open water
			WATER REGIME
1	0/1	D4	Channels, ditches, or streams in AU
0	0/1	*D4.1*	Channels, ditches, or streams in AU have permanently flowing water *(you see water flowing)*
		D4.2	
0	0/1	*D4.3*	The only surface outflow from the AU is through a culvert (<60 cm) or vertical siphon
		D5	
		D6	
		D7	
		D8	Inundation
42	%	*D8.1*	Percent of AU that is ponded or inundated for >1 month
0	%	*D8.2*	Percent of AU with permanent standing or moving water
0	%	*D8.3*	Percent of AU with permanent open water *(without aquatic bed vegetation)*
0	%	*D8.4*	Percent of AU with unvegetated bars or mudflats
0	0/1	*D8.5*	Unvegetated bars or mudflats at least 100 square meters in size
		D9	Inundation regimes
0	0/1	*D9.1*	Permanently flooded (include vegetated areas)
1	0/1	*D9.2*	Seasonally flooded (>1 month)
1	0/1	*D9.3*	Occasionally flooded (<= 1 month)
1	0/1	*D9.4*	Saturated but seldom inundated
0	0/1	*D9.5*	Permanently flowing stream
1	0/1	*D9.6*	Intermittently flowing stream
0.3	m	D10	Average height of annual flooding above lowest point of outlet or surface of permanent stream at outlet (round to 0.3 m)

By definition: D8.1 >= D8.2 >= D8.3

Chose all that apply that meet size criteria: area >0.1 ha (1/4 acre) or > 10% of AU if AU smaller than 1 ha (2.5 acres)

0	0/1	D22	Mature trees in AU

Average DBH of 3 out of 5 largest trees of a species has to exceed size threshold

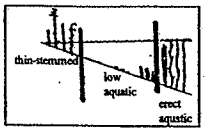
Tsuga heterophylla (western hemlock) >45 cm (18")
Thuja plicata (western red cedar) >45 cm (18")
Pseudotsuga menziesii (Douglas fir) >45 cm (18")
Picea sitchensis (Sitka spruce) >45 cm (18")
Populus balsamifera (black cottonwood) >45 cm (18")
Acer macrophyllum (big-leaf maple) >45 cm (18")
Alnus rubra (red alder) >30 cm (12")
Fraxinus latifolia (Oregon ash) >30 cm (12")
Pinus contorta (lodgepole pine) >30 cm (12")
Salix lucida (Pacific willow) >30 cm (12")

		D23	Sphagnum bogs
0	0/1	*D23.1*	% area of Sphagnum bogs >75%
0	0/1	*D23.2*	% area of Sphagnum bogs = 50-75%
0	0/1	*D23.3*	% area of Sphagnum bogs = 25-49%
0	0/1	*D23.4*	% area of Sphagnum bogs = 1-24%
1	0/1	*D23.5*	% area of Sphagnum bogs = 0%
		D24	Dominance by non-native plant species
0	0/1	*D24.1*	% area of non-native species >75%
0	0/1	*D24.2*	% area of non-native species = 50-75%
1	0/1	*D24.3*	%area of non-native species = 25-49%
0	0/1	*D24.4*	% area of non-native species = 1-24%
0	0/1	*D24.5*	% area of non-natives = 0%

HABITAT CHARACTERISTICS

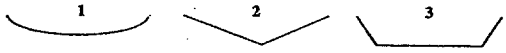
1	[0-3]	D25	Number of structure categories in aquatic bed vegetation

Applies only to aquatic bed species
DO NOT count persistent emergents



		D26	pH
6.9	[4-9]	*D26.1*	pH of interstitial water *(measure immediately after digging hole in non-inundated areas)*
6.9	[4-9]	*D26.2*	pH of open or standing water *(record the lowest pH, if you cannot measure record a [7])*
1	0/1	D27	Estuary: AU is within 8 km (5 mi) of a brackish or salt water estuary
0	0/1	D28	Large lake: AU is within 1.6km (1 mi) of a lake >8 ha (20 acres)
1	0/1	D29	Open field: AU is within 5 km (3 mi) of an open field (agriculture or pasture) >16 ha (40 acres)
1	0/1	D30	Preferred woody vegetation: AU has >1 ha (2.5 acres) of preferred woody vegetation for beaver in and within 100 m of AU

		D11	Cross section of AU in areas of seasonal inundation (record a 1 next to cross section that best fits)
1	0/1	*D11.1*	Cross section 1
0	0/1	*D11.2*	Cross section 2
0	0/1	*D11.3*	Cross section 3



		D12	Categories of water depths in AU, areas permanently or seasonally inundated/flooded
1	0/1	*D12.1*	1-20 cm (<8 in)
1	0/1	*D12.2*	20-100 cm (8-40 in)
0	0/1	*D12.3*	>100 cm (>40 in)
		D13	Constriction of outlet
1	0/1	*D13.1*	Unconstricted or only slightly constricted
0	0/1	*D13.2*	Moderately constricted
0	0/1	*D13.3*	Severely constricted
1	0/1	*D13.4*	*Riverine Impounding only* – Completely constricted (no surface outlet)

Record a 1 for each category present if >0.1 ha (1/4 acre) or 10% of area

If the AU has multiple outlets, judge the constriction as if all the outlets were combined into one large one.

VEGETATION

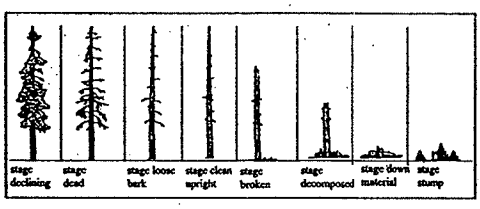
		D14	Cowardin Classes (as % area of AU)
5	%	*D14.1*	Forest - evergreen
55	%	*D14.2*	Forest -deciduous
0	%	*D14.3*	Scrub-shrub - evergreen
15	%	*D14.4*	Scrub-shrub - deciduous
25	%	*D14.5*	Emergent
0	%	*D14.6*	Aquatic bed
1	0/1	D15	Does D8.3 + D8.4 + sum (D14.1 to D14.6) = 100? If not, give reason.
35	%	D16	% area of herbaceous understory in forest and shrub areas (not % area in entire AU)
55	%	D17	% area of AU with >75% closure of canopy *(SS, FO classes > 1 m high)*
		D18	
		D19	Plant Richness
35	#	*D19.1*	Record number of native plant species found in AU
8	#	*D19.2*	Record number of non- native plant species found in AU
8	#	D20	The # of plant assemblages in the AU with area >0.1 ha (1/4 acre) or >10% if AU <1 ha *(if more than 12 record a 12)*
4	[1-6]	D21	Strata: The maximum # of strata present in any plant assemblage
0	0/1	*D21.1*	Is vine stratum dominated by non-native blackberries?

- *Include forest only if trees are rooted in AU.*
- *If forest is a mix of deciduous and evergreen estimate the relative % cover of each and divide percentage between the two categories.*
- *If vegetation classes are patchy, add the patches together for each class to get a total.*
- *To count, a class must cover at least 0.1 ha or be more than 10% of the total area of the AU*

A stratum must have 20% cover in assemblage

2	[0-8]	D31	Snags (record # of stages)

Circle the categories present: minimum DBH of snag =10 cm (4")



1	0/1	*D31.1*	At least one of the snags above has a DBH greater than 30 cm (12").
0	0/1	D32	Overhanging vegetation, extending out for 1 m, for at least 10 m (33 ft) over stream or open water.
0	0/1	D33	Upland islands of at least 10 square meters (100 square ft.) within AU boundary
			Islands need to be surrounded by at least 30 m (100 ft) of open water deeper than 1 m (3 ft)
0	0/1	D34	Undercut banks present for at least 2 m (6.6 ft.)
2	[0-4]	D35	Key for rating egg-laying structures for amphibians

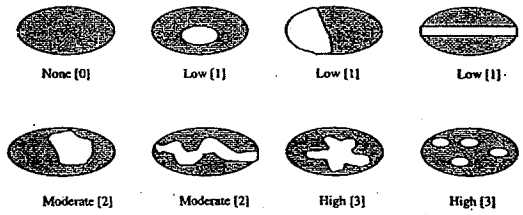
1. Does the AU have thin-stemmed vegetation or thin branches (<8 mm) in at least 1/4 acre (or 10% of AU) of permanent or seasonally inundated areas? *Thin-stemmed vegetation can include herbaceous species such as water parsley.*
   NO – Score = 0 YES go to 2
2. Does the AU have at least 0.2 ha (1/2 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm in diameter?
   NO go to 5 YES go to 3
3. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 (no more than a 40- 60% of the total area is open water)?
   NO go to 4 YES - Score = 4
4. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   → NO – Score = 2 YES – Score = 3 STOP
5. Does the AU have >0.1 ha (1/4 acre) of thin-stemmed emergent vegetation or woody branches, 1-4 mm?
   NO – Score = 1 YES go to 6
6. Does the area with thin stems contain open water interspersed in a patchwork of a ratio that is approximately 1:1 (no more than a 40- 60% of the total area is open water)?
   NO go to 7 YES – Score = 3
7. Is the area of open water between 25% and 75% of the total area in the zone of thin stemmed vegetation?
   NO – Score = 1 YES – Score = 2

Wetland Name:	AU ID#:

0 0/1 D36 Tannins in surface waters >10% of water surface

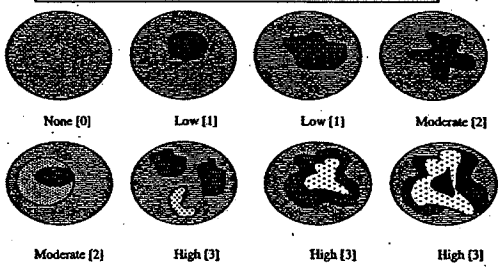
0 0/1 D37 Steep banks for denning (>30 degree slope, fine material, >10 m long, >0.6 m high) *(may be a dike)*

2 [0-3] D38 Interspersion between erect vegetation and permanent open water (POW + AB) areas of AU



2 [0-3] D39 Interspersion between Cowardin vegetation classes

**AUs with only 2 classes can only score a moderate[2] or lower*
**AUs with 4 vegetation classes score a high [3]*
**AUs with 3 classes can score a moderate (2) or a high (3)*



Wetland Name:	AU ID#:

3 [0-3] D43 Corridors of AU: Rate corridors using following key *(record rating of 0, 1, 2, or 3)*

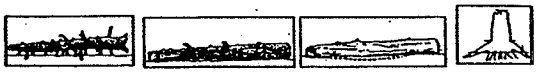
1. Is the AU part of a riparian corridor *(see text for definitions)*
   NO go to 5 YES go to 2
2. Is the wetland part of riparian corridor > 50 m wide connecting 2 or more wetlands within 1 km with at least 30% shrub or forest cover in the corridor?
   NO go to 3 YES = [3]
3. Is the AU part of a riparian corridor 25-50 m wide connecting to other wetlands with at least 30% shrub or forest cover in the corridor?
   NO go to 4 YES = [2]
4. Is the AU part of a riparian corridor >5 m wide with relatively undisturbed veg. (grasslands, abandoned pasture are OK) that extends for more than 1 km?
   NO go to 5 YES = [1]
5. Is there a corridor >50 m wide with good (>30%) cover of forest or shrub (>2 m high) to natural upland area or open water that is >100 ha in size?
   NO go to 6 YES = [3]
6. Is there a 10-50 m wide forest or shrub corridor to a relatively undisturbed upland or open water that is >10 ha?
   NO go to 7 YES = [2]
7. Is there a corridor of relatively undisturbed vegetation (grassland, abandoned pasture) >50 m wide to an undisturbed upland or open water that is >10 ha?
   NO go to 8 YES = [2]
8. Is there any vegetated corridor 5-50 m wide between the AU and any relatively undisturbed area or open water that is >2.5 ha?
   NO = [0] YES = [1]

5 [0-12] D44 # of categories of large woody debris in AU outside of perm. water

Freshly cut stumps are not included

Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")	✓	✓		✓
21-50cm	(8-20")		✓		✓
>50 cm	(>20")				

0 [0-12] D45 # of categories of large woody debris in permanent water of AU (may include aquatic bed areas)



Diameter		Log Class 1	Log Class 2	Log Class 3	Stump
10-20cm	(4-8")				
21-50cm	(8-20")				
>50 cm	(>20")				

Wetland Name:	AU ID#:

D40

2 [0-3] D41 Edge of AU: The characteristics of the edge between AU and uplands or adjacent wetlands.

Choose the description that best fits the characteristics of the AU edge:

0 There are no differences in level of vegetation height as reflected by vegetation classes on each side of the AU for more than 50% of the circumference: record a [0] regardless of the sinuosity. Examples: emergent (or herbaceous) to emergent (or herbaceous), shrub to shrub, forest to forest.

1 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight for more than 50% of the circumference: record a [1]. Example: emergent (or herbaceous) to shrub, shrub to forest

2 There is a difference of one level in vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous for more than 50% of the circumference: record a [2]. Examples: emergent (or herbaceous) to shrub, shrub to forest.

2 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is straight: record a [2]. Examples: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

3 There is a difference of more than one level of vegetation height as reflected by vegetation classes on each side of the AU and the edge is sinuous: record a [3]. Example: emergent (or herbaceous) to forest, bryophytes to scrub/shrub or forest.

2 If no single category above extends for more than 50% of the circumference, and the edge is straight: record a [2]

3 If no single category above extends for more than 50% of the circumference, and the edge is sinuous: record a [3]

3 [0-5] D42 Buffer of AU: Choose the description that best represents condition of AU buffer

** Open water or adjacent wetlands are considered part of the buffer*
** Infrequently used gravel or paved roads or vegetated dikes in a relatively undisturbed buffer can be ignored as a "disturbance"*

5 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >95% of circumference. Clear-cut >5 years old is OK. No developed areas within undisturbed part of buffer.

4 100 m (330 ft) of forest, scrub, relatively undisturbed grassland or open water >50% circumference OR 50 m (170 ft) of forest scrub, grassland or open water >95% circumference. No developed areas within undisturbed part of buffer.

3 100 m (330 ft) of forest, scrub, grassland or open water >25% circumference, OR 50 m (170 ft) of forest, scrub, grassland or open water >50% circumference.

2 No paved areas or buildings within 25m (80 ft) of wetland >95% circumference. Pasture or lawns are OK. OR no paved areas or buildings within 50m of wetland >50% circumference

0 Vegetated buffers are <2 m wide (6.6 ft) for more than 95% of the circumference

1 Does not meet any of the criteria above

Wetland Name:	AU ID#:

SOILS and SUBSTRATES

D46 Composition of AU surface

1 0/1 D46.1 Deciduous, broad-leaved, leaf litter
1 0/1 D46.2 Other plant litter
0 0/1 D46.3 Decomposed organic
0 0/1 D46.4 Exposed cobbles
0 0/1 D46.5 Exposed gravel
0 0/1 D46.6 Exposed sand
1 0/1 D46.7 Exposed silt
0 0/1 D46.8 Exposed clay

Record a 1 for each category present if its area is > 10 square meters. Note: bare earth from animal tunnels does NOT count.

D47 Soils present in top (15 cm) of A horizon (record [1] if 1-49% area of AU, [2] if 50-95%, [3] if >95%)

0 [0-3] D47.1 Peat
0 [0-3] D47.2 Organic Muck
3 [0-3] D47.3 Mineral with clay fraction <30%
0 [0-3] D47.4 Clay (clay fraction >30%)

Record the least permeable layer if there are several down to 60 cm.

D48 Infiltration rate of top 60 cm of soil in seasonally inundated areas

0 0/1 D48.1 Fast >50% gravel and cobble and the rest a sand, loamy sand, or sandy loam
0 0/1 D48.2 Moderate >50% sand and rest cobble, gravel, loamy sand, or sandy loam
1 0/1 D48.3 Slow - muck, peat, or loams (except sandy loam), silts, and clays

D49 Substrate of stream

— 0/1 D49.1 Substrate of permanent stream or river in AU has at least 1 square meter of gravel
— 0/1 D49.2 Substrate of permanent stream or river in AU has at least 1 square meter of cobbles
D49.3

Judgements of Opportunity (Ratings of High, Medium, Low)

Rating	*Functions*
low-medium	Removing Sediments
low-medium	Removing Nutrients
low-medium	Removing Toxic Metals and Organics
medium-high	Reducing Peak Flows
medium-high	Reducing Downstream Erosion
low	Recharging Groundwater
medium-high	General Habitat
low	Anadromous Fish Habitat