NORTHEAST REDMOND NEIGHBORHOOD PARK

Critical Areas Study

Prepared for:

City of Redmond Parks and Recreation
Nakano Associates LLC

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SUMMARY

At the request of Nakano Associates, ESA Adolfson characterized wetlands, streams, and fish and wildlife habitat areas and prepared this technical report for the Northeast Redmond Neighborhood Park site, located in the City of Redmond, Washington. The City of Redmond Parks and Recreation department requested this critical areas report to assist with preparation of a Master Plan for the NE Redmond Neighborhood Park property. The Scope of Work for this project included wetlands determinations, delineations, an assessment of wetland functions, and a discussion of wildlife habitat, all of which are summarized in this technical report. A brief discussion of regulatory implications and permitting considerations is also included in this report.

The subject property is located on parcel 2526059109 between NE 122nd Street and NE 124th Street in Redmond (Figure 1). Critical areas are regulated by the City of Redmond Community Development Guide (RCDG) Title 20 (RCDG 20D.140).

Two wetlands (Wetland A and Wetland B) were delineated on the NE Redmond Neighborhood Park property. Wetland A is a mapped permanently flooded palustrine, unconsolidated bottom, diked/impounded wetland (PUBHh) and a seasonally flooded/saturated palustrine forested wetland (PFOE). This wetland is located on the east side of the property and encompasses a stream (Stream 1) and an excavated pond. Wetland B is a forested wetland located on the west side of the property.

The RCDG 140.30-010 requires that wetlands be rated using the Ecology wetland rating system (Hruby, 2004). Wetland A is rated as Category III with a standard buffer width of 75 feet. Wetland B is rated as Category III with a standard buffer of 40 feet (RCDG 20D.140.30-020).

Compensatory mitigation requirements for wetland habitat on the subject property are found in RCDG 20D.140.30-030. Restoration of Category III wetlands must occur at a 4:1 ratio and enhancement of a Category III wetland requires an 8:1 ratio.

One stream (Stream 1) was identified on the subject property during the field investigation. Stream 1 is a permanently flowing stream that flows through an open field north of the property as a channelized ditch, and continues south along the east side of the property. This stream is characterized by two segments. The north segment of Stream 1 flows into an excavated pond and the south segment drains from the pond to the south end of the property and continues off-site through a box culvert. Stream flow continues off-site and enters Bear Creek, which eventually drains into the Sammamish River. According to RCDG 20D.140.20, Stream 1 is classified as a Class II stream and requires a 100-foot inner buffer and a 50-foot outer buffer.

This site meets the criteria for Fish and Wildlife Habitat Conservation Area (RCDG 20D.140.20). Any alteration to a FWHCA requires protection of sensitive species, including species of concern as identified by WDFW. This includes the pileated woodpecker, which was observed on the property during the field investigation. Fish and Wildlife Habitat Conservation Area Performance Standards (RCDG 20D.140.20-070) require protection of retained habitat for sensitive species and preservation of significant trees. Management recommendations for the

pileated woodpecker include preservation of significant trees and preservation of contiguous habitat both on the property and off-site. General management recommendations for significant trees and retained habitat on the site are provided in RCDG (20D.140.20-070) and include the following:

1. Integrate retained habitat into open space;
2. Consolidate habitat and open space in contiguous blocks;
3. Locate habitat contiguous to other habitat; and
4. Preserve significant trees in groups.

Additional tree replacement requirements, guidelines, protection measures, mitigation, and enforcement measures are outlined in RCDG20D.80.20.

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1.0 PROJECT AUTHORIZATION AND SCOPE OF WORK

At the request of Nakano Associates, ESA Adolfson characterized wetlands, streams, and fish and wildlife habitat areas and prepared this technical report for the Northeast Redmond Neighborhood Park site, located in the City of Redmond (City), Washington. The City of Redmond Parks and Recreation department requested this critical areas report to assist with preparation of a Master Plan for the NE Redmond Neighborhood Park property. The boundaries of the study area were established based on maps provided by the City of Redmond.

The Scope of Work for this project included wetlands determinations, delineations, an assessment of wetland functions, and a discussion of wildlife habitat, all of which are summarized in this technical report. A brief discussion of regulatory implications and permitting considerations is also included in this report. An analysis of potential wetlands impacts and the development of a mitigation plan were not included in this Scope of Work.

2.0 SITE DESCRIPTION

The Northeast Redmond Neighborhood Park property, hereafter referred to as the subject property, is located in the City of Redmond and in King County, Washington (NW1/4 of NE1/4 of SE ¼ Section 25, Township 26N, Range 5E) (Figure 1). The Northeast Redmond Neighborhood Park (Parcel 2526059109) is located northeast of the intersection of 176th Avenue NE and NE 122nd Avenue. One existing residence is located on the adjoining parcel east of the subject property. An existing residential development is located south of the subject property, and the property west of the park is currently undeveloped. An open field is located north of the park property that appears to contain wetland characteristics. One stream flows south along the east side of the subject property; this flows through an excavated pond that straddles the subject property and the private residential property to the east. The stream eventually flows east and drains into Bear Creek. Topography at the site is relatively flat and is characterized by a mixed coniferous-deciduous forest. The project site is located in the Sammamish River Watershed subbasin, located in Water Resource Inventory Area (WRIA) 8 (Cedar-Sammamish Watershed).

3.0 WETLAND DEFINITION AND REGULATIONS

The characteristics of an area that result in its classification as “wetland” have been formally defined by federal and state agencies, as described in Appendix A. Numerous federal, state, and local regulations govern development and other activities in or near wetlands; at each level, there are typically several agencies charged with such powers (Ecology, 1994). Specific regulatory implications concerning the subject property are summarized later in this report.

4.0 METHODS

Two levels of investigation were conducted for the analysis of wetlands on the subject property: a review of existing information and an on-site investigation.

4.1 Review of Existing Information

A review of existing literature, maps, and other materials was conducted to identify wetlands or site characteristics indicative of wetlands on the subject property. These sources can only indicate the likelihood of the presence of wetlands; actual wetland determinations must be based upon data obtained from field investigations.

Several documents were reviewed:

- U.S. Geological Survey (USGS), 2008 King County iMAP – Sensitive Area Information, King County, WA;
- *Soil Survey of King County Area, Washington* (Snyder et al., 1973)
- National Wetland Inventory, Redmond quadrangle (U.S. Fish and Wildlife Service [USFWS], 1989);
- *Wetlands Online Mapper* (USFWS, January 2008);
- *King County Wetlands Inventory, Volume I: North* (King County Environmental Division, 1991);
- *Hydric Soils of the State of Washington* (Natural Resources Conservation Service, 1995);
- *National Hydric Soil List by State: Washington* (National Resources Conservation Service [NRCS], 2008);
- *Water Quality Assessment for Washington 303(d) List* (Washington State Department of Ecology [Ecology], 2004);
- *City of Redmond Critical Areas Maps* (City of Redmond, 2005); and
- *City of Redmond Wildlife Habitat Plan* (Adolfson Associates, Inc. [Adolfson], 2002).

4.2 On-site Investigation

4.2.1 Determining the Presence of Wetlands and Delineating Wetland Boundaries

Methods defined in the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997) were used to determine the presence and extent of wetlands on the subject property. Washington state and all local governments must use the state delineation manual to implement the Shoreline Management Act and/or the local regulations adopted pursuant to the Growth Management Act.

The Washington state manual is consistent with the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). The Corps has been working with states, federal agencies, and others to develop supplemental regional criteria to refine the 1987 delineation manual. Two regions fall within the state of Washington: The Arid West (dry lands west of the Continental Divide, from Idaho and eastern Washington south to the U.S. - Mexico border) and the Western Mountains, Valleys, and Coast. Interim Regional Supplements to the Corps of Engineers 1987 Wetlands Delineation Manual have been completed by the Corps for both regions in Washington, and the appropriate supplement is now used, along with the Washington State Delineation Manual, when conducting delineations in those regions.

The methodology outlined in the manuals is based upon three essential characteristics of wetlands: (1) hydrophytic vegetation; (2) hydric soils; and (3) wetland hydrology. Field indicators of these three characteristics must all be present in order to determine that an area is a wetland (unless problem areas or atypical situations are encountered).

The "routine on-site determination method" was used to determine the wetland boundaries. The routine method is used for areas equal to or less than five acres in size, or for larger areas with relatively homogeneous vegetative, soil, and hydrologic properties.

Formal data plots were established where information regarding each of the three wetland parameters (vegetation, soils, and hydrology) was recorded. This information was used to distinguish wetlands from non-wetlands. If wetlands were determined to be present on the subject property, the wetland boundaries were delineated. Wetland boundaries were identified with sequentially numbered colored flagging imprinted with the words WETLAND BOUNDARY. Data plot locations were also marked with colored flagging. In addition, the ordinary high water mark (OHWM) of the stream located on the east side of the property was marked with striped, colored flagging.

The methods used to assess wetland characteristics are described in greater detail in Appendix A. Please note that common plant names are used throughout this text; the scientific names are presented in Appendix B.

4.2.2 Classifying Wetlands

Two classification systems are commonly used to describe wetlands. The hydrogeomorphic (HGM) system describes wetlands in terms of their position in the landscape and the movement of water in the wetland (Brinson, 1993). The U.S. Fish and Wildlife Service classification system (Cowardin et al., 1979) describes wetlands in terms of their vegetation communities; these include, for example, emergent, scrub-shrub, and forested community types.

4.2.3 Assessing Wetland Functions

Wetlands and buffers play important roles that provide valuable benefits to the environment and society. Because detailed scientific knowledge of wetland functions is limited, evaluations of the functions of individual wetlands are somewhat qualitative and dependent upon professional judgment.

For this project, wetland functions were assessed using the Washington State Department of Ecology's *Wetland Rating System for Western Washington* (Hruby, 2004). Although this system is designed to rate wetlands, it is based on whether a particular wetland performs a particular function and the relative level to which the function is performed. An assessment of wetland functions is inherent in the rating system. This system was developed by Ecology to differentiate wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the beneficial functions they provide to society. Appendix C provides additional information about the rating system wetland categories and completed rating forms for the project.

4.2.4 Stream Delineation, Classification and Rating

Paired flags were placed on the river right and river left banks at the ordinary high water mark (OHWM) of an unnamed stream (#1220902477037) identified as Stream 1 in the field investigation. The OHWM was determined by using multiple indicators, including (1) the upper elevation of alluvial features (e.g., point bars); (2) significant changes in slope; and (3) significant changes in vegetation.

Streams in the City of Redmond are classified and rated using a four-tiered system referenced in RCDG 20D.140.20-010(4). Per the requirements of this system, streams in the City are evaluated based on the water typing criteria founded on fish presence and stream flow.

5.0 FINDINGS

The following sections describe the results of the field investigation conducted by Cathie Conolly, Rachel Hulscher, and Rosemary Baker on the NE Redmond Neighborhood Park site on January 12 and 13, 2009. These sections describe the two wetlands found on the site, streams, upland habitats, and wildlife observations. Five data plots were established within relatively uniform areas of vegetation on the site. Data sheets for each of the formal data plots evaluated for this project are provided in Appendix D.

5.1 Existing Information

National Wetlands Inventory (NWI) data from 1989 and current data from the USFWS Wetlands Online Mapper indicate one wetland on the subject property. The inventoried wetland is a palustrine unconsolidated bottom, permanently flooded, diked/impounded wetland. The NWI wetland is located on the east portion of the site (Figure 3).

City of Redmond Critical Areas Maps do not indicate presence of any wetlands on the property. The Streams Classification map indicates the presence of one stream located on the east side of the subject property. This stream is identified as a Class III stream at the north end of the property and a Class II stream at the south end of the property and continuing off-site to the south (Figure 3).

The Soil Survey of King County Area (Snyder et al., 1973) indicates the Alderwood series occurs on the project site. Specifically, the Alderwood gravelly sandy loam, 6 to 15 percent slopes, soil type is mapped on the project site. Alderwood soils are made up of moderately well drained soils that have a weakly to strongly consolidated substratum at a depth of 24 to 40 inches. These are upland soils that formed under conifers in glacial deposits, at elevations of 100 feet to 800 feet. Annual precipitation is 35 to 60 inches, most of which is rainfall occurring between October and May. During winter months, water moves along the top of the substratum of these soils. Soil series inclusions that may occur are poorly drained Norma, Bellingham, Seattle, Tukwila, and Shalcar soils. Each of these soil inclusions is listed as a hydric soil in Washington due to their high water table and/or frequent, extended periods of ponding (NRCS, 2008) (Figure 2).

5.2 Wetlands Determinations

Two wetlands and one stream were identified on the property. The following describes each of the wetlands and the upland habitats found on the site. Figure 4 shows the approximate location of the wetlands on the NE Redmond Neighborhood Park property. Wetland boundaries were professionally surveyed by PACE Engineering, Inc.

5.2.1 Wetland A

Overview. Wetland A is located on the east side of the property, and includes a stream and an excavated pond (Photo 1 and Photo 2). The wetland and pond extend onto the adjoining property to the east; only the portion of the wetland and pond located on the subject property was delineated for purposes of this report. Wetland A extends from an open area dominated by creeping buttercup on the east side of the stream to an open canopy forest on the west side of the stream. The wetland extends from the south side of the dirt road (NE 124th Street) to the south end of the pond. Hummocks are interspersed throughout the wetland. Wetland A contains components of both a depressional and riverine wetland and is approximately 0.90 acre (39,314 square feet) in size on the site. Wetland A is categorized as a permanently flooded palustrine, unconsolidated bottom, diked/impounded wetland (PUBHh) and a seasonally flooded/saturated palustrine forested wetland (PFOE). Palustrine emergent (PEM) vegetation is located on the east side of the stream and extends off-site. The PEM area comprises less than 20 percent of Wetland A and therefore is not used for Wetland A categorization. This wetland is characterized by Data Plots DP-1 and DP-2.

Wetland A also includes a seep that drains into a channelized ditch at the south end of the property. The ditch is aligned from east to west along NE 122nd Street and also receives stormwater runoff from the road and eventually drains into the west side of Stream 1, which is described below under Streams and Other Drainage Features.

Hydrology. The primary water source for Wetland A is groundwater, with additional inputs from precipitation, and overflow from the stream. The surrounding landscape is generally flat and the subject property contains hummocks, but otherwise is generally flat (0 to 1 percent slope). Ponding and saturation were observed in Wetland A during site investigation. This was

likely due to overbank flooding along the stream, precipitation, and a high groundwater table. Free water and surface saturation were observed in the soil test pits at wetland data plots DP-1 and DP-2. The soil was saturated to the surface in the majority of the wetland except for hummocks of slightly higher elevation (approximately 1 to 2 feet).

Soils. Wetland soils were a very dark brown (10YR 2/2) loam from the surface to 13 inches in depth, above a dark grayish brown (10YR 4/2) gravelly sandy loam between 13 and 19 inches depth at DP-1. Soils at DP-2 were: very dark brown (10YR 2/2) sandy loam from the surface to 6 inches depth with dark yellowish brown (10YR 4/6) common, fine, distinct redoximorphic features; very dark grayish brown (10YR 3/2) loamy sand from 6 to 13 inches in depth with dark gray (10YR 4/1) common, fine, distinct redoximorphic features; and brown (10YR 4/3) loamy sand with some large gravel 13 inches and below with light yellowish brown (2.5Y 6/4) common, fine, distinct redoximorphic features. These soils were not consistent with the mapped Alderwood soil unit but contained characteristics similar to hydric Norma, Bellingham, and Shalcar soils.

Vegetation. Canopy cover in Wetland A is dominated by big-leaf maple and declining red alder trees. Conifer species are interspersed throughout the wetland, including western red cedar, western hemlock, and grand fir. Vine maple and salmonberry dominate the shrub stratum. Creeping buttercup, piggyback plant, and sword fern were dominant in the understory. A dense layer of humic material was present on the ground surface. Other species occurring in the wetland include black cottonwood, Himalayan blackberry, and some reed canarygrass.

Wetland Functions. The results of the functions assessment for the wetland areas are presented in Appendix C. Wetland A received moderate scores for water quality and habitat functions and a low score for hydrologic functions. The wetland has the potential to improve water quality because of its constricted outlet at the south end of the pond, where it drains through an outfall and connects to the southern portion of the stream on the subject property. This constricted outlet provides some potential for reducing flooding and erosion via water storage. Hydrologic functions are limited by the flat topography of the area. Opportunities exist to provide water quality improvement to runoff received from surrounding roads and development. In addition, the stream associated with Wetland A eventually drains into Bear Creek, approximately 0.9 mile southeast of the property. A diverse plant community, including standing snags, large woody debris (LWD), and a dominance of native vegetation, provide a moderate score for habitat functions. Wetland A is part of a relatively undisturbed corridor that extends from the Sammamish River east to Bear Creek, providing corridor connectivity and habitat for wildlife. Live trees and standing snags were observed to indicate presence of pileated woodpeckers and sapsuckers, and one pileated woodpecker was observed during the field investigation. Additional wildlife habitat and observations are discussed below in the Wildlife Habitat section.

5.2.2 Wetland B

Overview. Wetland B is located on the west side of the property and is characterized by flat topography and presence of hummocks within a closed depression (Photo 3). Ponded areas observed during the site investigation were dominated by shrub species, with humic material dominating the ground surface. Hummocks were dominated by tree species and herbaceous

species generally associated with upland habitat. Wetland B is a depressional wetland and is approximately 0.43 acre (18,917 square feet) in size on the subject property, extending off-site to the west. This is categorized as a PFOE wetland and is characterized by Data Plot DP-4.

Hydrology. The primary water source for Wetland B is groundwater, with some contributing precipitation. Topography on the site and in surrounding areas is generally flat. Hummocks interspersed throughout the wetland provide some elevation changes (0 to 1 percent slope). Ponding and saturation were observed in Wetland B during the site investigation, likely because of recent precipitation and a high groundwater table. Surface saturation and free water (2 inches below ground surface) were observed at wetland data plot DP-4. Soils were saturated to the surface in most areas of Wetland B except for hummocks.

Soils. Wetland soils were a very dark grayish brown (10YR 3/2) gravelly sandy loam with dark yellowish brown (10YR 4/6) few, medium, distinct redoximorphic features from the ground surface to 12 inches depth; and a dark grayish brown (10YR 4/2) gravelly sandy loam between 12 inches and 20 inches depth. Charcoal fragments were observed throughout the soil sample. These soils were not consistent with the mapped Alderwood soil unit.

Vegetation. Dominant vegetation in the canopy stratum includes big-leaf maple, red alder, and western red cedar. The shrub stratum is dominated by salmonberry. Dominant herbaceous vegetation includes piggyback plant, with some stinging nettle and sword fern. Other species observed in Wetland B include Douglas-fir, big-leaf maple saplings, red elderberry, and sedge species. A dense layer of humic material dominated open areas of the ground surface.

Wetland Functions. Wetland B received moderate scores for water quality and habitat functions, and a low score for hydrologic functions. Lack of a visible outlet, presence of persistent, woody vegetation, and tendency for untreated stormwater to discharge into the wetland provide some potential and opportunity for Wetland B to improve water quality and to reduce flooding and erosion. Limited water storage and flat topography limit hydrologic functions. Presence of LWD and standing snags, along with low presence of invasive species, provides habitat functions. In addition, Wetland A and Wetland B are part of a relatively undisturbed habitat corridor extending from the Sammamish River to Bear Creek. This combination of wetland and upland habitat provides corridor connections and habitat for wildlife. One pileated woodpecker was observed in Wetland B during the field investigation. Additional wildlife habitat and observations are discussed below in the Wildlife Habitat section.

5.3 Off-site Wetlands

Several mapped wetlands occur in the vicinity of the park property. Data sources for these inventories include NWI, King County iMAP, City of Redmond Critical Areas Maps, and the *King County Wetlands Inventory, Volume 1: North* (King County Environmental Division, 1991). One temporarily flooded PSS wetland is located west of the park property. Stream 1 flows off-site to the south and east, draining into Bear Creek. This stream flows past one small PHBHh wetland near NE 116th Street and 178th Avenue NE and through a large wetland complex located north and south of NE 116th Street west of Avondale Road. The wetland complex is listed as a Category II, 64-acre persistent PEM (PEM1), deciduous (willow) PSS

(PSS5), and a deciduous PFO (PFO6). Stream 1 is identified as a small channel with low flow passing through this wetland mosaic, and the wetland site crosses beneath NE 116th Street via a channelized ditch and culvert. Additional mapped wetlands are located east and west of the property, including a large PEM wetland along the Sammamish River. These wetlands are associated with contiguous forested habitat, which provide opportunities for wildlife.

5.4 Streams and Other Drainage Features

One stream (Stream 1) was identified on the subject property during the field investigation (Figure 4) (Photos 4 through 6). Stream 1 is a permanently flowing stream that flows through an open field north of the property as a channelized ditch and passes through a culvert beneath a dirt road that separates the two properties. Stream 1 flows south along the east side of the property and is described in two segments. The north segment of Stream 1 flows into an excavated pond and the south segment drains from the pond to the south end of the property and continues off-site through a box culvert. Stream flow continues off-site and connects to Bear Creek 0.9 mile downstream, which eventually drains into the Sammamish River.

Stream 1 is associated with Wetland A, as described in Section 5.2.1. Stream 1 varies from two to six feet in width and between two and twelve inches in depth on the subject property. Substrate in the north segment of the stream is dominated by silt and cobble along with some sand. Dominant substrate in the south segment of the stream includes cobble, sand, and some silt. Stream banks reach approximately four feet in height along the south stream segment. The riparian area is vegetated with mature cottonwood, red alder, and salmonberry. Additional species include reed canarygrass, creeping buttercup, and piggyback plant. The east side of the stream is more open and adjoins a maintained lawn on the neighboring property.

Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) data are available for the downstream portion of Stream 1 at its confluence with Bear Creek (approximately 0.9 mile southeast of the park property) and for Bear Creek. The downstream section of Stream 1 (1220902477037) contains documented presence and migration of coast resident cutthroat trout.

Ecology identifies Stream 1 as an unclassified stream. This stream is on the 2004 303(d) list for fecal coliform between river mile (RM) 0 and 0.7, located southeast of the subject property. Stream 1 drains into Bear Creek, which is currently on the 303(d) list for fecal coliform and temperature between RM 3.9 and 6.9. This section of Bear Creek includes the confluence with Stream (Ecology, 2004).

The City of Redmond identifies the north segment of Stream 1 as a Class III stream and the south segment as a Class II stream. According to the Redmond Community Development Guide (RCMD) 20D.140.20-010(4), when more than one stream classification is present on a property, the stream will be classified using the more restrictive class. Therefore, Stream 1 on the subject property is classified as a Class II stream. The RCDG defines Class II streams as “those natural streams that are not Class I and are either perennial or intermittent and have salmonid fish use or the potential for salmonid fish use” (RCDG 20D.140.20-010(4b). Stream I is a permanently flowing stream with no documented fish passage barriers (WDFW, 2009). According to WDFW

PHS data, salmonid presence is documented downstream in Bear Creek. Therefore, salmonid presence is likely along the south segment of Stream 1. The north segment of Stream 1 is not likely accessible to salmonids because of the drainage pipe located at the south end of the pond. The north segment of Stream 1 meets the qualifications for a Class III stream because it is a permanently flowing stream with the potential for non-salmonid fish use. Regulations are discussed below in Regulatory Implications.

5.5 Upland Description

Upland areas at the NE Redmond Neighborhood Park site are characterized primarily by mixed forest. Hummocks are present throughout the site west of the stream and provide minor elevation changes across the site. Dominant vegetation in the tree canopy includes big-leaf maple, red alder, and black cottonwood. Dominant shrubs include vine maple and tree saplings. Herbaceous vegetation is dominated by sword fern, bleeding heart, and stinging nettle. Upland areas located off-site east of the pond are comprised of maintained lawn and creeping buttercup, with a sparse tree canopy containing mostly western hemlock and western red cedar.

Upland portions of the property are characterized by Data Plots DP-3 and DP-5. Dominant plant species are listed above. Additional species observed in the upland plots included Douglas fir, salmonberry, licorice fern, and piggyback plant. Upland soils adjacent to Wetland A were very dark grayish brown (10YR 3/2) sandy loam from the surface to 5 inches depth, above a brown (7.5YR 4/3) loamy sand with iron deposits, charcoal, and pieces of gravel extending from 5 to 18 inches depth. Upland soils adjacent to Wetland B were: very dark grayish brown (10YR 3/2) sandy loam from the ground surface to 2 inches in depth; dark brown (10YR 3/3) loam from 2 to 8 inches in depth; very dark brown (10YR 2/2) between 8 and 12 inches in depth; and dark brown (10YR 3/3) gravelly sandy loam between 12 and 16 inches in depth. Free water was observed at DP-5 and was likely due to recent heavy rainfall. Approximately 2.3 inches of precipitation fell on January 7, 2009. As a result, a high water table was present in both wetland and upland areas of the property during the field investigation.

The majority of trees occurring on the property consist of deciduous trees, including red alder, bigleaf maple, and black cottonwood (Photo 4, Photo 7, and Photo 8). These are concentrated in the center of the property and vary in diameter, ranging from approximately 5 inches diameter at breast height (dbh) to 40 inches dbh. Bigleaf maple trees were observed to be generally healthier than red alders at the time of the field survey. Many red alder trees appeared stressed, which was likely a result of the high water table present throughout the site (Photo 4 and Photo 6). Coniferous trees on the property are dominated by western red cedar and Douglas-fir, and range from approximately 6 inches dbh to 36 inches dbh (Photo 4). Conifers are generally located along the perimeter of the park, with approximately 12 conifers (approximately one-third of the total conifers on the site) occurring in the center of the property, surrounded by mature red alder and some bigleaf maple. The coniferous trees appeared in good health across the site. Snags and LWD are scattered throughout the park property. Many snags indicated presence of woodpecker activity (Photo 3).

5.6 Wildlife Habitats

Fish and Wildlife Habitat Conservation Areas (FWHCA) are discussed in RCDG 20D.140.20. These areas are identified by the Growth Management Act and include state designated endangered, threatened, sensitive, and candidate species listed by WDFW. Wildlife observations during the field study included pileated woodpecker, a state candidate species. Waters of the state, including streams, are also considered FWHCAs. Stream 1 meets the conditions for a Class II stream as discussed in 5.4. Therefore, the subject property satisfies two criteria for a FWHCA in the City of Redmond.

5.6.1 Site Observations

Palustrine forested wetland habitat is present on the subject property. Invasive species observed at the site include small amounts of Himalayan blackberry, reed canarygrass, tansy ragwort, and Scot's broom. Patches of Himalayan blackberry were located primarily in the central portion of the site west of Stream 1 and on the south edge of Wetland A along NE 122nd Street. Small patches of reed canarygrass were observed on the west bank of Stream 1. Overall, invasive vegetation presence on the property is low. Standing snags and LWD were observed across the site. Habitat quality is generally high on the site, although this may be limited by existing residential developments surrounding the park. Existing residential developments are located south of the park and a future residential development is proposed adjacent to the west side of the property. Open forest canopy habitat extends off-site to the west and southwest, providing a habitat corridor for wildlife species.

Stream 1 provides riparian habitat on the east side of the site, extending onto the adjoining residential property to the east. The open forest canopy contains a combination of coniferous and deciduous trees, located primarily on the west side of the stream. Salmonberry provides some overhanging vegetation along the stream, and both shrub and tree species provide shade. The east side of the stream is generally open along the north segment, containing mostly maintained lawn and creeping buttercup. However, the south segment of the stream contains a diverse native plant community including salal, salmonberry and vine maple, and various tree species, including big leaf maple, red alder, black cottonwood, western hemlock, and grand fir.

The forested habitat that characterizes the majority of the property is dominated by red alder, bigleaf maple, western red cedar, and Douglas-fir trees (Photos 4 through 8). Coniferous trees occur throughout the site, with fewer along the east side and south-central portion of the park. Red alder and bigleaf maple trees are concentrated in the center of the property. Bigleaf maples appeared healthier than red alders during the site visit. Many of the red alders were failing, likely due to wet conditions and were converting to standing snags. Woodpecker workings were observed on many snags across the site (Photo 3).

Wildlife observed during the site investigation included: cottontail (scat), black-tailed deer (tracks, scat), pileated woodpecker, Canada goose, black-capped chickadee, red-tail hawk, red-breasted nuthatch, downy woodpecker, hairy woodpecker, kinglet species, spotted towhee, song sparrow, Steller's jay, American robin, American crow, and Bewick's wren. Live and decaying snags with evidence of pileated woodpecker, downy woodpecker, and red-breasted sapsucker

workings were observed across the site. The pileated woodpecker is currently listed by WDFW as a species of concern.

Other species of birds, mammals, reptiles, and amphibians in addition to those observed are expected to use habitat on the project site. For example, nocturnal species may be present that were not active during the site visit, or other species may only be highly visible or present in this area during certain seasons.

5.6.2 Previously Identified Species and Habitats in Project Area

ESA Adolfson developed a wildlife habitat plan for the City in 2002 (Adolfson, 2002). The report identified existing wildlife habitat in the City and proposed measures for protecting these habitat areas and connecting them with surrounding jurisdictions as well as areas within the City. Habitat cover types were mapped using wildlife habitat surveys and analysis of aerial photographs. The NE Redmond Neighborhood Park property was included in the study and was designated as forested, primary habitat (Figure 5). The subject property and adjacent areas of contiguous habitat in North Redmond were given a high rating based on community interspersion, priority species presence and habitat use, proximity to protected habitat (e.g., wetlands and streams), habitat connectivity, forest age, and low presence of invasive species. Wildlife observations during the study included pileated woodpecker. The report proposed future management considerations, including the protection of habitat on the subject property for wildlife corridors.

The City of Redmond has provided Critical Areas Maps for Wetlands, Streams, and FWHCAs (RCDG Title 20), within the Redmond Municipal Code (RMC). Mapped wetlands and streams are discussed in 5.1 and previously identified off-site wetlands are discussed in 5.3 above.

There are no priority species mapped by WDFW within one mile of the subject property. Priority habitats in the vicinity of the property include identified wetland habitat (PUBHh, PFO, palustrine emergent [PEM], and palustrine scrub-shrub [PSS]).

The USFWS has identified Endangered Species Act listed species for the King County area. This list applies to the entire county and includes species that are likely to occur only in remote wilderness areas. None of the listed species identified by the USFWS were observed during the field investigation. A pileated woodpecker was observed on the property during the study. This species is not currently listed by USFWS but is listed as a species of concern by WDFW.

6.0 REGULATORY IMPLICATIONS

Wetlands are regulated at the federal, state, and local levels. Agencies with jurisdiction include the U.S. Army Corps of Engineers (Corps), Washington State Department of Ecology (Ecology), and the City of Redmond. The Washington Department of Fish and Wildlife regulates work within streams. Regulatory implications associated with development in wetlands include, but may not be limited to, those discussed in this section. All applicable permits should be obtained prior to developing or otherwise altering streams or wetlands.

6.1 Federal Regulations

The Corps regulates discharges of dredged or fill materials into waters of the United States, including wetlands, under Section 404 of the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." A Section 404 permit may be required if a proposed project involves filling wetlands or altering streambeds or other waters of the U.S. The Corps will determine if wetlands are jurisdictional under Section 404 based upon the presence of a "significant nexus" to navigable waters (EPA and Corps, June 5, 2007).

The Corps has established two types of permit programs under Section 404: nationwide and individual. Nationwide permits are issued when a proposed activity will have minimal adverse impacts to wetlands. All other projects are evaluated under the individual permitting process. The Corps determines which permitting process is used for a proposed project. The Corps will require that wetland impacts be avoided or minimized to the extent practicable, and mitigation will likely be required for unavoidable wetland impacts.

6.2 State Regulations

The state certification process under Section 401 of the federal Clean Water Act is usually triggered through a Section 404 permit application. Section 401 directs each state to certify that proposed in-water activities will not adversely affect water quality or violate state aquatic protection laws. In Washington State, Ecology is responsible for administering the state certification program. Ecology may issue approval, approval with conditions, denial, or a request for delay due to lack of information. Any conditions attached to the 401 certification become part of the Section 404 permit.

King County is one of the 15 coastal counties in Washington regulated under the Washington State Coastal Zone Management (CZM) Program. Activities that would affect coastal resources and involve approvals from the federal government (such as a Section 404 permit) must be evaluated for CZM compliance through a process called "federal consistency." The Washington State Department of Ecology administers the CZM program in this state.

If relocation or alteration of stream culverts or other in-stream work is proposed as part of the project, a Hydraulic Project Approval (HPA) would be required from the Washington Department of Fish and Wildlife under the state Hydraulic Code (RCW 77.55, WAC 220-110).

6.3 Local Regulations

The NE Redmond Neighborhood Park property is located within regulatory jurisdiction of the City of Redmond. Critical Areas are discussed in the RCDG under Title 20 of the RMC. Critical Areas include FWHCAs, wetlands, and streams (RCDG 20A.20.030). Fish and Wildlife Conservation Areas include priority habitats and species as well as streams (RCDG 20A.20.060). The FWHCA Performance Standards requires the preservation of significant trees (RCDG 20D.140.20-070). Tree protection standards are provided in RCDG 20D.80.20. Regulations regarding wetlands are provided in RCDG 20D.140.30.

Wetland and stream classifications and buffer requirements for critical areas on the subject property are summarized in Table 1. Wetland and stream buffers are depicted in Figure 6.

Table 1. Wetland and Stream Classifications and Ratings

Critical Area	On-site size in square feet (acres)	HGM Class / Cowardin Class[A]	Ecology Rating Score / Habitat Function Score	City of Redmond Rating and Buffer (feet)
Wetland A	39,314 (0.90)	Depressional Palustrine Unconsolidated Bottom, Palustrine Forested	42 (Total) 24 (Habitat)	Category III 75' buffer
Wetland B	18,917 (0.43)	Depressional Palustrine Forested	39 (Total) 15 (Habitat)	Category III 40' buffer
Stream 1	N/A	N/A	N/A	Class II 100' inner buffer 50' outer buffer

[A]Wetland Classifications (Cowardin et al., 1979 and Brinson 1993).

The RCDG 20D.140.30-010 requires that wetlands be rated using the Ecology wetland rating system (Hruby, 2004). Using this system, Wetland A and Wetland B meet the criteria for a Category III (RCDG.140.30-010[1c]). The standard buffer width for a Category III wetland receiving a habitat score between 20 and 28 points, and receiving a low level of impacts is 75 feet. Low impact land uses include low-intensity open space (e.g., passive recreation) and unpaved trails (RCDG 20D.140.30-020). Wetland A requires a 75-foot buffer using this requirement. A Category III wetland with a habitat score below 20 points associated with low impact land use requires a 40-foot buffer; this applies to Wetland B. Buffer widths may be reduced by buffer width reduction or buffer width averaging, as long as the resulting buffer width is no less than 75 percent of the standard (75-foot or 40-foot, respectively) buffer for that wetland (RCDG 20D.140.30-020).

Compensatory mitigation requirements for impacts to wetland habitat on the subject property are found in RCDG 20D.140.30-030. These mitigation measures apply to adverse impacts to temporary and permanent loss of wetland habitat. Impacts to Category III wetlands require the replacement ratios provided in Table 2.

Table 2. City of Redmond Wetland Replacement Ratios for a Category III Wetland[A]

Creation or Re-establishment	Rehabilitation (Restoration)	Re-establishment or Creation (R/C) and Enhancement (E)	Enhancement Only
2:1	4:1	1:1 R/C and 2:1 E	8:1

[A]RCDG 20D.140.30-030[7].

According to the City of Redmond *Critical Areas Map: Streams Classification* (RMC Title 20, Community Development Guide: List of Maps), Stream 1 is classified as a Class III stream along the north segment and a Class II stream along the south segment that continues off-site toward Bear Creek. The RCDG 20D.140.20-010(4) states that streams receiving more than one classification on the same property shall be classified according to the more restrictive classification. Stream 1 is therefore classified as a Class II stream. The RCDG designates two buffers to Class I and Class II streams: a more restrictive inner buffer and an outer buffer. These buffers combine to provide protection of instream fish habitat; preservation of fish and wildlife habitat; and riparian corridor connections. According to RCDG 20D.140.20-020, Stream 1 requires a 100-foot inner buffer and a 50-foot outer buffer. Stream buffer width reduction and buffer width averaging are permitted under certain restrictions. Stream buffer averaging requires that the buffer width not be reduced to less than 25 percent of the standard stream buffer width or 25 feet, whichever is greater. For Class II streams, maximum clearing and grading located in the outer 50-foot buffer must be no less than 35 percent of the outer buffer area. Permitted structures and improvements within a stream buffer include permeable trails, footbridges, and educational signage (RCDG 20D.140.20-020).

As discussed in 5.6 above, the subject property meets the definition of a FWHCA based on the presence of a state candidate species (pileated woodpecker) and a water of the state (Stream 1). Any alteration to a FWHCA requires protection of sensitive species, including species of concern as identified by WDFW. This includes the pileated woodpecker, which was observed on the property during the field investigation. The RCDG 20D.140.20-050 requires that management recommendations be implemented in the event a FWHCA is altered. Performance Standards for FWHCAs (RCDG 20D.140.20-070) require preservation of retained habitat and significant trees. Management recommendations for the pileated woodpecker and tree protection are provided below.

7.0 MANAGEMENT RECOMMENDATIONS

Alteration of Fish and Wildlife Habitat Conservation Areas (RCDG 20D.140.20-050) requires protection for species of concern. The subject property contains presence of pileated woodpeckers based on observations of this species and its habitat during field investigations. Standing live and decaying snags showed evidence of pileated woodpecker activity and presence of pileated woodpeckers was observed visually and audibly during the site investigation. Management recommendations for this species include preservation of significant trees (discussed below) and preservation of contiguous habitat both on the property and off-site. A contiguous, vegetated corridor extends generally west, east, and south of the park property and provides an existing habitat corridor for wildlife. We recommend that mature trees and snags on the property be retained in contiguous blocks and that a corridor connection be retained between the park and surrounding properties. A residential development is proposed west of the park; this will result in the elimination of some contiguous forested habitat on the east side of the development.

The FWHCA Performance Standards (RCDG 20D.140.20-070) require protection of sensitive species and preservation of significant trees. A significant tree is defined as “any healthy tree six

inches or greater in dbh; or any tree four inches dbh that, after considering its age, height, value, or function, the tree or tree stand is determined to be significant". A tree stand is defined as "a group of three or more trees of any size or species, whose driplines touch" (RCDG 20A.20). PACE Engineering, Inc. is conducting a tree survey on the subject property, which will provide an estimate of the number and dbh of significant trees on the property. General management recommendations for significant trees and retained habitat on the site include the following:

1. Integrate retained habitat into open space;
2. Consolidate habitat and open space in contiguous blocks;
3. Locate habitat contiguous to other habitat; and
4. Preserve significant trees in groups.

These recommendations are provided in RCDG 20D.140.20-070(2), FWHCA Performance Standards. Removal of any significant trees, or stands of trees, requires a Tree Removal Permit. Removal of more than 10 significant trees requires approval for clearing and grading (RCDG 20D.80.20.020). One replacement tree must be planted for each significant tree removed on a site. Options for tree replacement include on-site replacement, off-site replacement, a fee in lieu of tree replacement, and landscape restoration. Additional tree replacement requirements, guidelines, protection measures, mitigation, and enforcement measures are outlined in RCDG20D.80.20.

8.0 LIMITATIONS

Within the limitations of schedule, budget, scope-of-work, and seasonal constraints, we warrant that this study was conducted in accordance with generally accepted environmental science practices, including the technical guidelines and criteria in effect at the time this study was performed, as outlined in the Methods section. The results and conclusions of this report represent the authors' best professional judgment, based upon information provided by the project proponent in addition to that obtained during the course of this study. No other warranty, expressed or implied, is made.

9.0 GLOSSARY

agricultural wetland - Areas where wetland soils and hydrology remain, but hydrophytic vegetation has been removed to allow a crop to be grown.

anaerobic - A situation in which molecular oxygen is absent (or effectively so) from the environment.

atypical situation - Areas in which one or more wetland parameters (vegetation, soil, and/or hydrology) have been sufficiently altered by recent human activities or natural events to preclude the presence of wetland indicators of the parameter. "Recent" is intended to mean that period of time since legal jurisdiction of an applicable law began.

best management practices (BMPs) – The physical, structural, and/or managerial practices that, when used singly or in combination, prevent or reduce pollutant discharges.

buffer - A designated area along the edge of a stream or wetland that is regulated to control the negative effects of adjacent development from intruding into the aquatic resource.

concretion - A local concentration of chemical compounds such as calcium carbonate or iron oxide in the soil that forms a grain or nodule of varying size, shape, hardness, and color. Concretions of significance in hydric soil are usually iron and/or manganese oxides occurring at or near the soil surface that develop under conditions of prolonged soil saturation.

dominant species – Plant species that define the character of a vegetation community. In wetland delineation, this is typically measured using percent areal cover. For each stratum in the plant community (trees, shrubs, and herbs), dominant species are the most abundant plant species that when ranked in descending order of abundance and cumulatively totaled immediately exceed 50 percent cover for the stratum, plus any additional species that individually compose 20 percent or more of the total cover in the stratum. The list of dominant plant species is then combined across strata. (Corps of Engineers Wetland Delineation Manual, 1987)

emergent - A plant that grows rooted in shallow water, the bulk of which emerges from the water and stands vertically. Usually applied to non-woody vegetation.

emergent wetland - In the USFWS classification system (Cowardin et al., 1979), a wetland characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens.

enhancement - An improvement in the functions and values of an existing wetland, typically through native plantings.

fill material - Any material placed in an area to increase the surface elevation.

forested wetland - In the USFWS classification system (Cowardin et al., 1979), a wetland characterized by woody vegetation that is six meters (20 feet) tall or taller.

gleyed - A soil condition resulting from prolonged soil saturation, manifested by the presence of bluish or greenish colors throughout the soil or in mottles (spots or streaks) among other colors.

herbaceous - Having the characteristics of an herb; a plant with no persistent woody stem above the ground.

hydric soil – A soil that formed under conditions of saturation, flooding, or ponding long enough to develop anaerobic conditions in the upper part.

hydrogeomorphic (HGM) classification – A system of classifying wetlands based on their position in the landscape and the movement of water within the wetland.

hydrology – The science dealing with the properties, distribution, and circulation of water.

hydrophyte - Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. The sum total of hydrophytes in an area is known as "hydrophytic vegetation."

in-kind compensation - Compensation for lost wetland habitat with a replacement wetland of the same habitat type.

inundation – A condition in which water from any source temporarily or permanently covers a land surface.

invasive plant species - Plant species that become established easily in disturbed conditions, reproduce readily, and often establish monocultures. Most invasive plants are non-native species; they were introduced to the Northwest intentionally or unintentionally by humans. Examples of common invasive species in the Pacific Northwest are Scot's broom, Canada thistle, hedge bindweed, English ivy, reed canarygrass, and purple loosestrife.

lacustrine - In the USFWS classification system (Cowardin et al., 1979), lacustrine refers to a freshwater area that has all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) has less than 30% coverage of trees, shrubs, persistent emergent plants, mosses, or lichens; and (3) total area exceeds 20 acres. For areas less than 20 acres, an area is considered lacustrine if it has an active wave-formed or bedrock shoreline or is deeper than 6.6 feet in the deepest part. "Freshwater" means less than 0.5 parts per thousand ocean-derived salts.

mitigation – Defined in WAC 197-11-766 as:

(1) Avoiding the impact altogether by not taking a certain action or parts of an action;

(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;

(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

(5) Compensating for the impact by replacing, enhancing or providing substitute resources or environments: and/or

(6) Monitoring the impact and taking appropriate corrective measures.

mottles - Spots or blotches of different color or shades of color interspersed within the dominant color in a soil layer. This usually results from periodic anaerobic conditions in the soil.

100-year floodplain - The flood with a 100-year recurrence interval; those areas identified as Zones A, A1-30, AE, AH, AO, A99, V, V1-30, and VE on most current Federal Emergency Management Agency (FEMA) Flood Rate Insurance Maps, or areas identified as 100-year floodplain on applicable local Flood Management Program maps.

ordinary high-water mark - The line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; changes in the character of soil or vegetation; topographic shelves; or the presence of a line of litter or debris.

out-of-kind compensation - Compensation for lost wetland habitat with a replacement wetland of a different habitat type.

palustrine - In the USFWS classification system (Cowardin et al., 1979), palustrine refers to freshwater areas dominated by trees, shrubs, persistent emergent plants, mosses, or lichens. They can be non-tidal or tidal. Palustrine also includes wetlands lacking this vegetation but with the following characteristics: (1) area less than 20 acres; (2) no active wave-formed or bedrock shoreline; (3) water depth in the deepest part is less than 6.6 feet at low water. "Freshwater" means having less than 0.5 parts per thousand ocean-derived salts.

persistent emergents – Emergent plants that remain standing at least until the beginning of the next growing season.

reach - A length of stream channel with uniform characteristics.

redoximorphic soil characteristics – Features of the soil such as masses, nodules, or mottles formed through reduction and oxidation of iron and manganese in seasonally saturated soils.

restoration - To improve a disturbed or altered wetland by returning wetland parameters that may be missing.

rhizosphere - The zone of soil surrounding a plant root in which interactions between the living root and microorganisms occur.

riverine - In the USFWS classification system (Cowardin et al., 1979), riverine refers to freshwater areas that are contained within a channel and are not dominated by trees, shrubs, and

persistent emergent plants. Examples include rivers and streams. "Freshwater" means having less than 0.5 parts per thousand ocean-derived salts.

saturated soil conditions - A condition in which all easily drained spaces between soil particles in the root zone are temporarily or permanently filled with water.

scrub-shrub - In the USFWS classification system (Cowardin et al., 1979), areas dominated by woody vegetation less than 6 meters (20 feet) tall. The species include tree shrubs, young trees, and trees or shrubs that are stunted because of environmental conditions.

Section 404 permit - A permit issued by the U.S. Army Corps of Engineers under Section 404 of the federal Clean Water Act that allows an activity (filling) within a wetland. A 404 permit usually requires compensation or mitigation for the wetland impacts.

soil matrix - The portion of a given soil that has the dominant color. In most cases, the matrix is the portion of the soil having more than 50% of the same color.

synonymy - Different scientific names for the same species.

waters of the United States - As defined in 33 CFR Part 328, the term "waters of the United States" means:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    iii. Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under the definition;
5. Tributaries of waters identified in paragraphs 1-4;
6. The territorial seas;

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1-6.

   Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.

8. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.

wetlands - Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Federal Register, 1982, 1986).

wetland boundary – The point on the ground at which a shift from wetlands to non-wetlands or aquatic habitat occurs.

wetland hydrology - Wetland hydrology is considered to be present when there is permanent or periodic inundation or soil saturation at or near the soil surface for more than 12.5% of the growing season (typically two weeks in lowland Pacific Northwest areas). Areas that are inundated or saturated for between 5% and 12.5% of the growing season in most years may or may not be wetlands. Areas inundated or saturated for less than 5% of the growing season are non-wetlands (Ecology, 1997).

wetland indicator status (WIS) - Categories assigned to plant species based upon the estimated probabilities (expressed as a frequency of occurrence) of the species occurring in a wetland or a non-wetland. Wetland indicator status categories include the following:

- Obligate (OBL): species that almost always occur in wetlands under natural conditions (estimated probability >99%).
- Facultative wetland (FACW): species that usually occur in wetlands (estimated probability 67 to 99%), but are occasionally found in non-wetland areas.
- Facultative (FAC): species that are equally likely to occur in wetlands (estimated probability 34 to 66%) or non-wetland areas.
- Facultative upland (FACU): species that usually occur in non-wetland areas (estimated probability 67 to 99%), but are occasionally found in wetlands.
- Upland (UPL): species that almost always occur in non-wetland areas under normal conditions (estimated probability >99%).

A (+) or (-) following the WIS signifies a greater or lesser likelihood, respectively, of the species being found in wetland conditions. Plant species can also be designated "No indicator" or NI,

which includes species for which insufficient information is available to determine status, or which were not evaluated by USFWS in compiling the WIS listings. Plant species that are not listed on the USFWS list of WIS ratings are designated "NL" and are presumed to be upland species.

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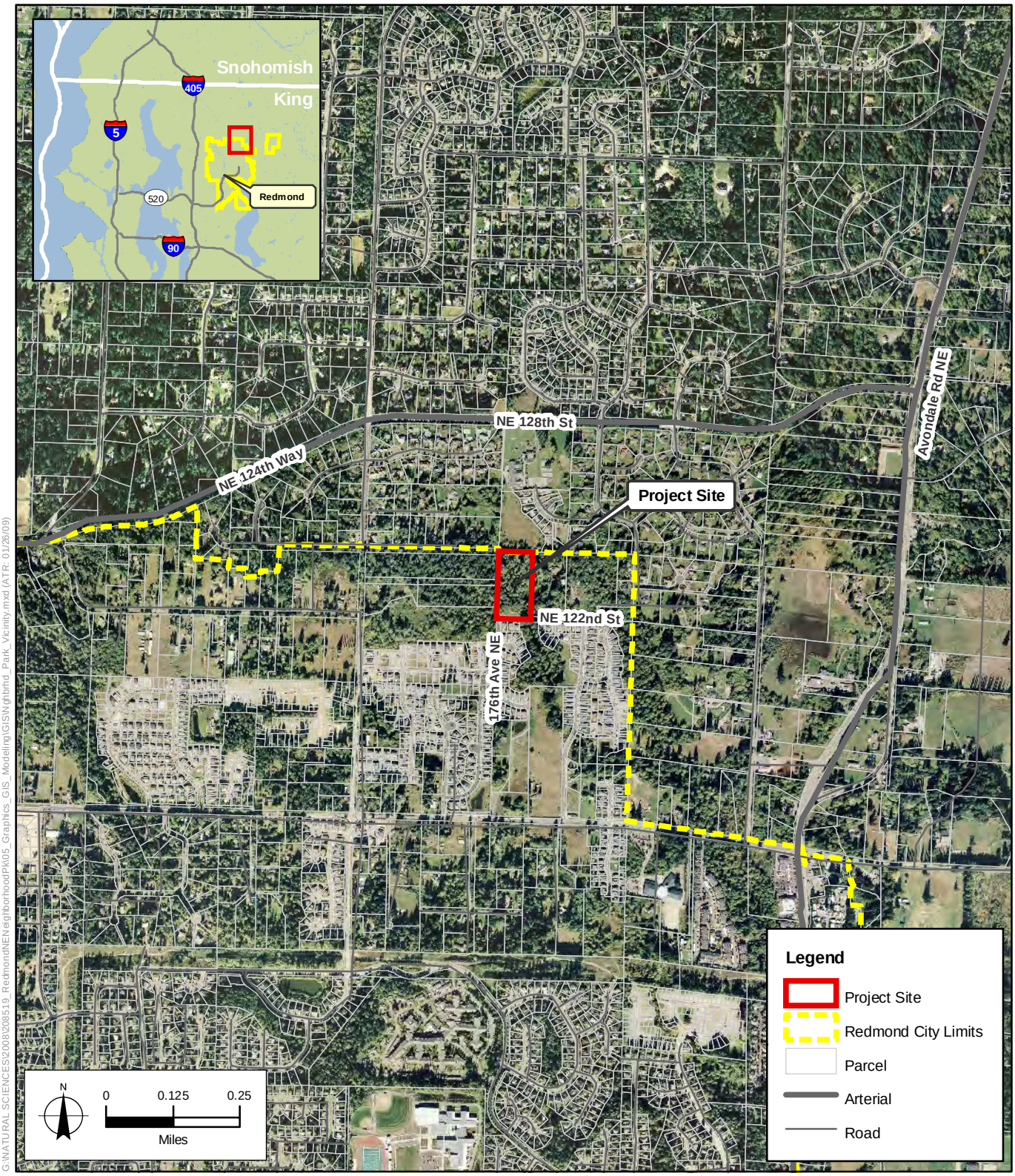
FIGURES AND PHOTOGRAPHS



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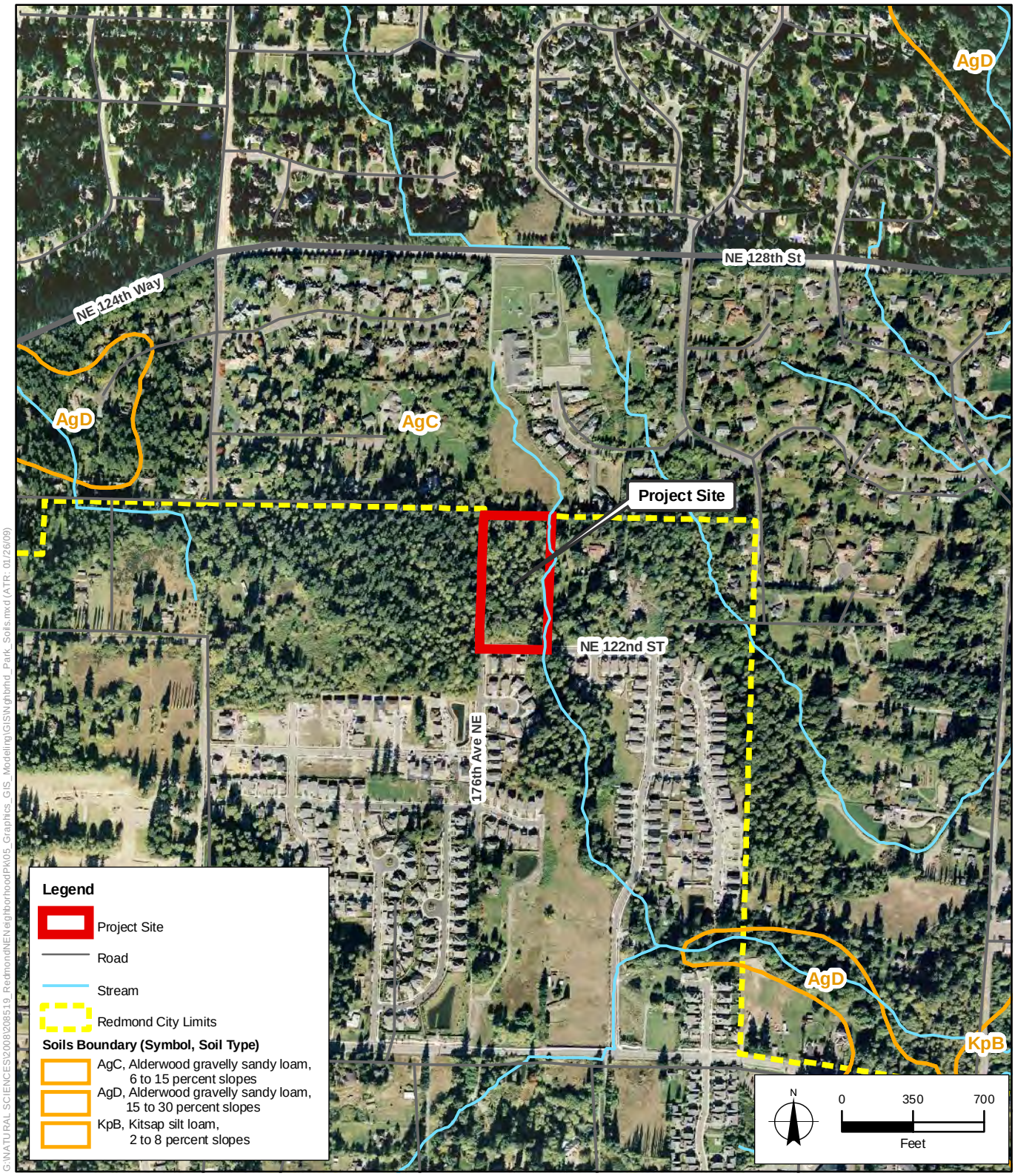
NE Redmond Neighborhood Park. 208519

SOURCE: Digital Globe, 2006 (Aerial); King County, 2005, 2007.

Figure 1
Vicinity Map
Redmond, Washington



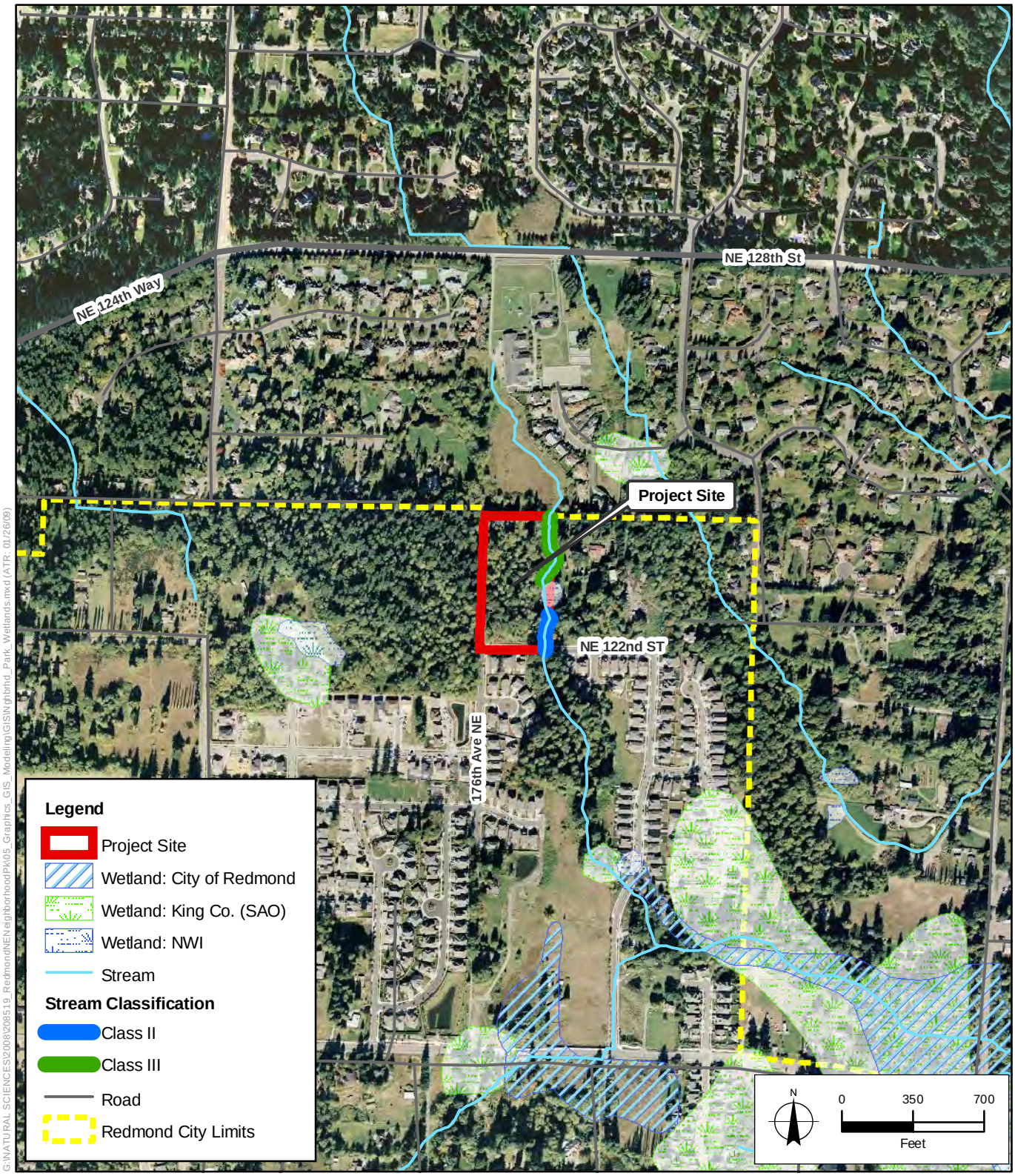
G:\NATURAL SCIENCES\2008\208519_RedmondNENeighborhoodPA\05_Graphics_GIS_Modeling\GIS\Nghbrhd_Park_Soils.mxd (ATR: 01/26/09)

NE Redmond Neighborhood Park. 208519

SOURCE: Digital Globe, 2006 (Aerial); King County, 2005, 2007; NRCS, 2006.

Figure 2

Previously Mapped Soils
Redmond, Washington



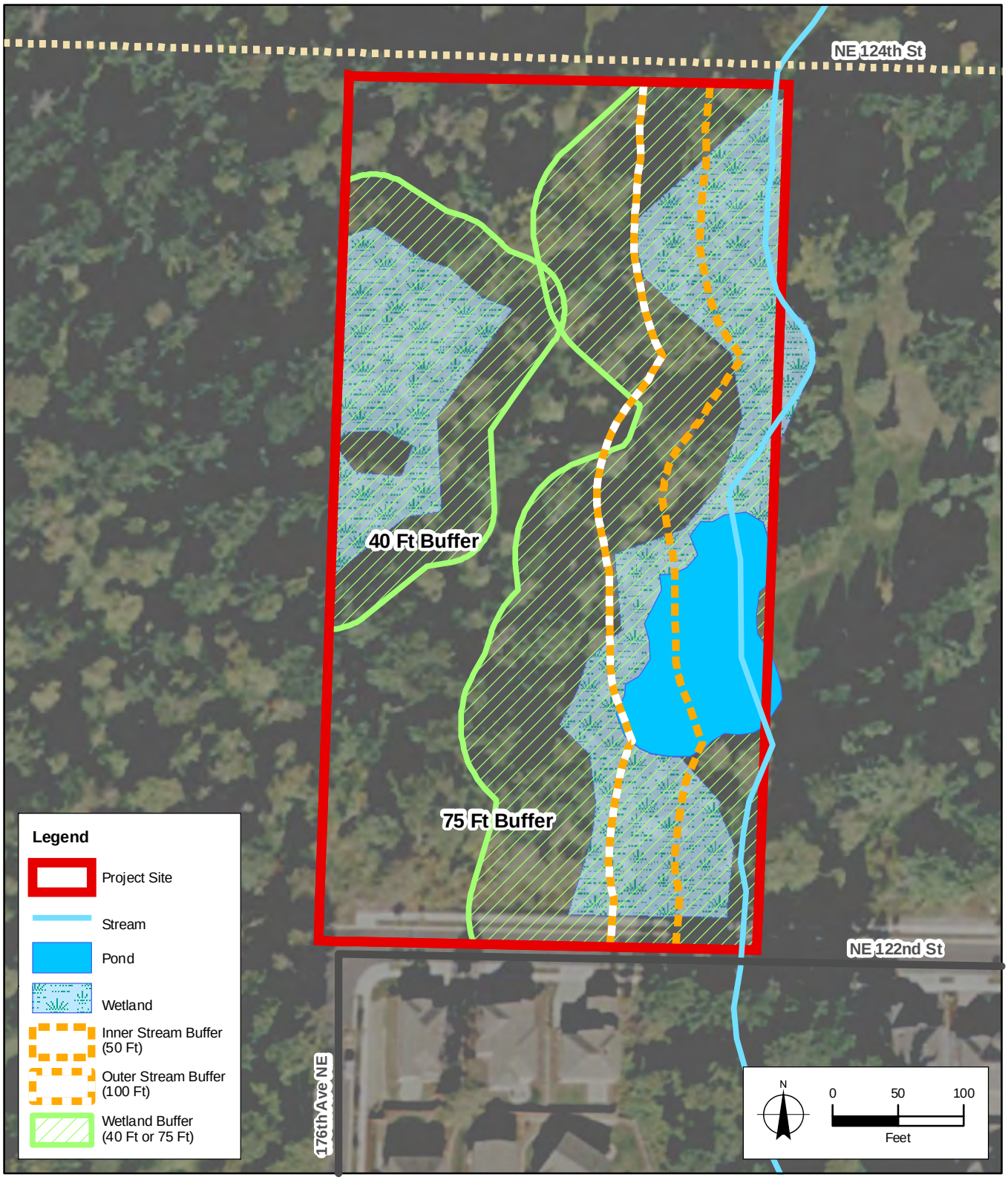
G:\NATURAL SCIENCES\2008\208519_Redmond\NEN eighborhood\PK\05_Graphics_GIS_Modeling\GIS\Nghbrhd_Park_Wetlands.mxd (ATR: 01/26/09)

SOURCE: City of Redmond, 2007; Digital Globe, 2006 (Aerial);
King County, 2003, 2005, 2007; WDFW, 2008.

NE Redmond Neighborhood Park. 208519

Figure 3

Previously Mapped Wetlands and Streams
Redmond, Washington

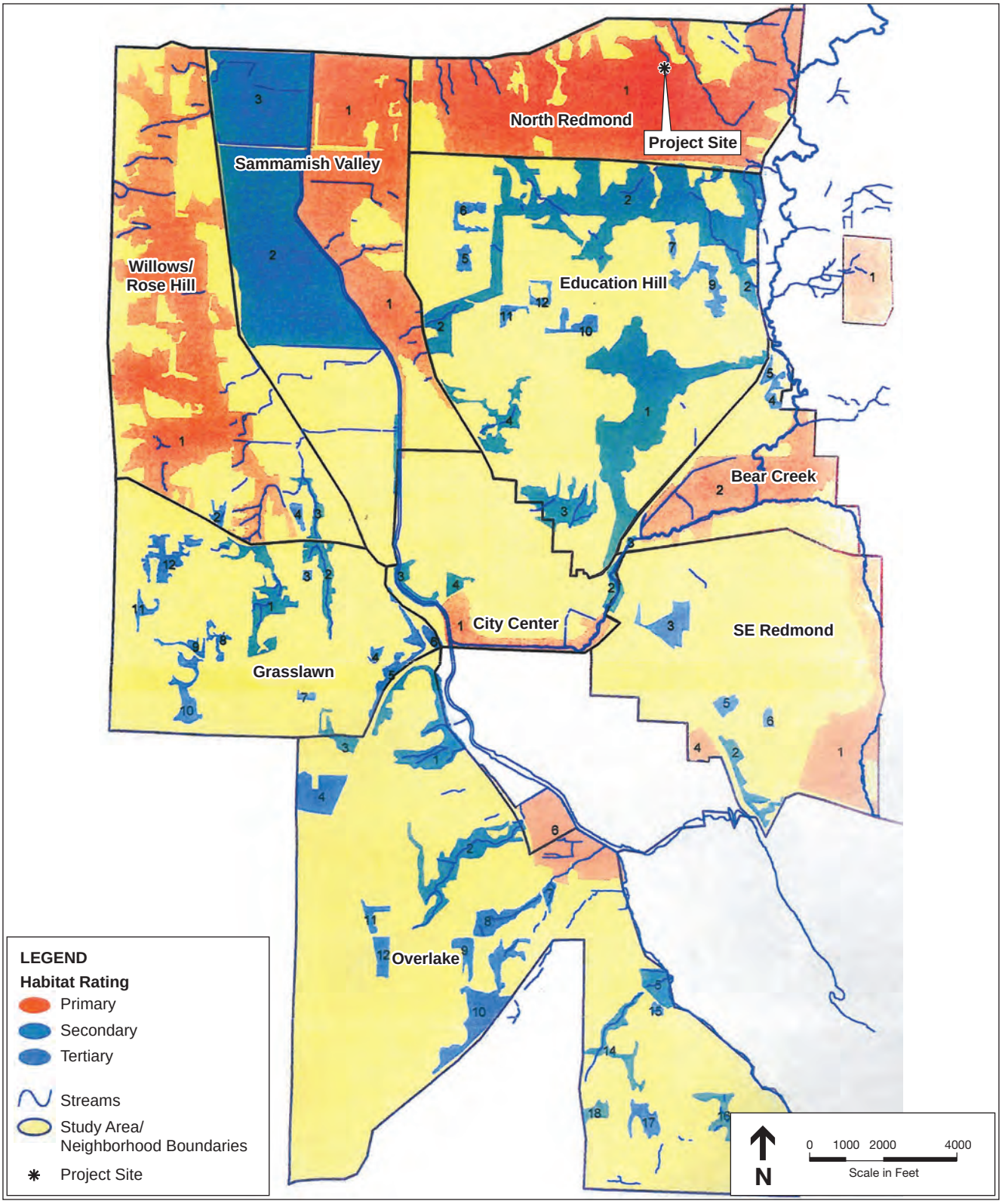


NE Redmond Neighborhood Park. 208519

SOURCE: Digital Globe, 2006 (Aerial); King County, 2007; PACE, 2009.

Figure 4

Wetland Delineation and Stream Assessment
Redmond, Washington

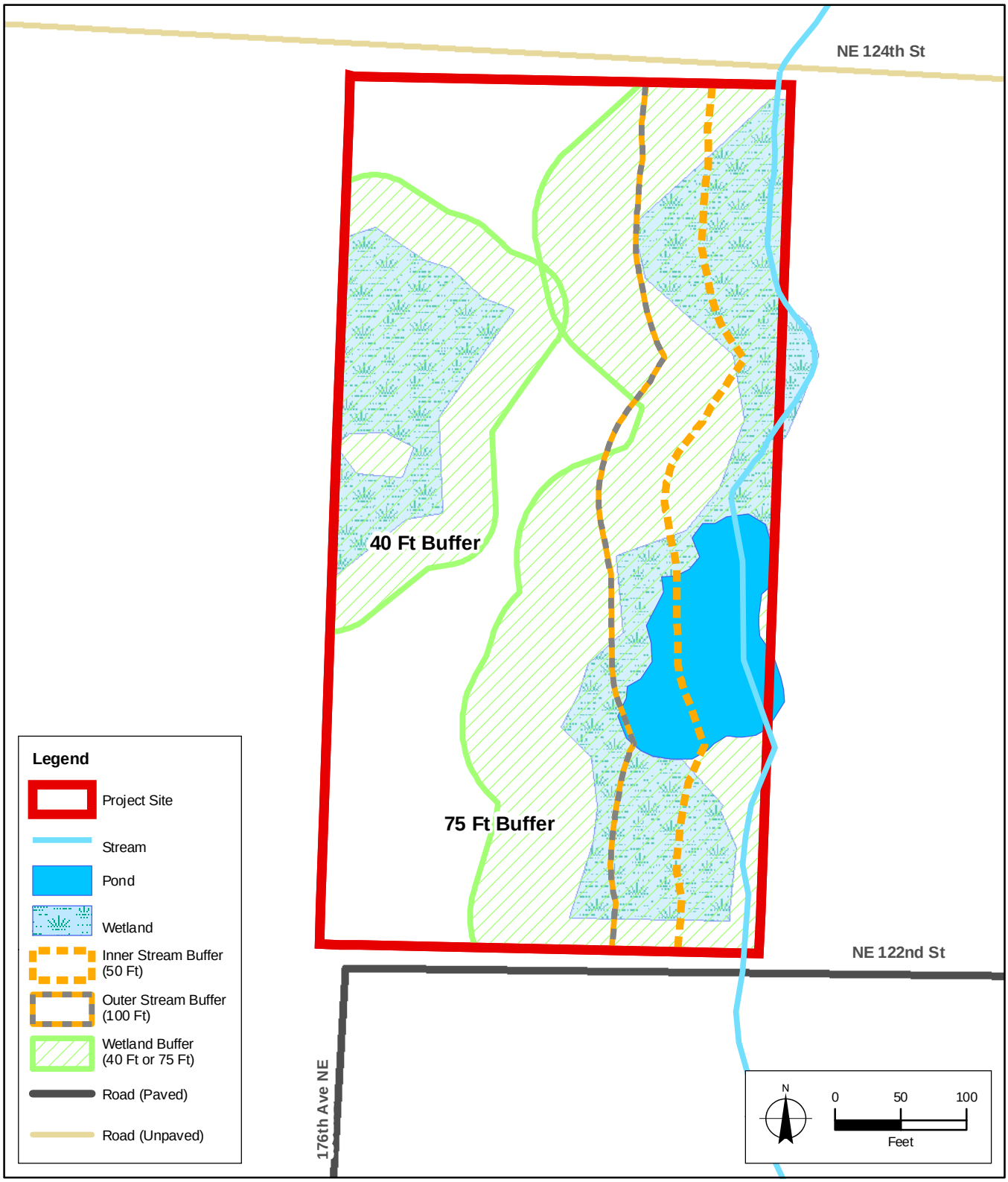


FILE NAME: Fig05_WildlifeHabitatRatings.ai
CREATED/EDITED BY: JAB / DATE LAST UPDATED: 01/27/09

SOURCE: Redmond GIS; ESA Adolfson.

NE Redmond Neighborhood Park . 208519

Figure 5
Redmond Wildlife Habitat Map
Redmond, Washington



SOURCE: King County, 2007; PACE, 2009.

NE Redmond Neighborhood Park. 208519

Figure 6

Wetland and Stream Buffers

Redmond, Washington

Photo 1. Wetland A looking south (01/12/09).

Photo 2. Wetland A looking east onto adjacent property (01/12/09).

Photo 3. Snag in Wetland B with signs of pileated woodpecker activity (01/13/09).

Photo 4. Stream 1 looking northwest (north stream segment) (01/12/09).

Photo 5. View of Stream 1 substrate (south stream segment) (01/12/09).

Photo 6. Stream 1, south segment (looking north) (01/12/09).

Photo 7. Looking north from the pond (Wetland A is on the left) (01/12/09).

Photo 8. Mixed forest habitat at NE Redmond Neighborhood Park (01/12/09).

APPENDIX A:
METHODS USED TO EVALUATE WETLAND CHARACTERISTICS

Wetland Definition

Wetlands are formally defined by the U.S. Army Corps of Engineers (Corps) (Federal Register 1982), the Environmental Protection Agency (EPA) (Federal Register 1988), the Washington Shoreline Management Act (SMA) of 1971 (Ecology, 1991) and the Washington State Growth Management Act (GMA) (Ecology, 1992) as

> … *those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas* (Federal Register, 1982, 1986).

In addition, the SMA and the GMA definitions add:

> *Wetlands do not include those artificial wetlands intentionally created from non-wetland site, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990 that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificially created wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.*

Methods defined in the *Washington State Wetlands Identification and Delineation Manual* (Ecology, 1997) were used to determine the presence and extent of wetlands on the subject property. Washington state and all local governments must use the state delineation manual to implement the Shoreline Management Act and/or the local regulations adopted pursuant to the Growth Management Act.

The Washington state manual is consistent with the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). The Corps has been working with states, federal agencies, and others to develop supplemental regional criteria to refine the 1987 delineation manual. Two regions fall within the state of Washington: The Arid West (dry lands west of the Continental Divide, from Idaho and eastern Washington south to the U.S. - Mexico border) and the Western Mountains, Valleys, and Coast. Interim Regional Supplements to the Corps of Engineers 1987 Wetlands Delineation Manual have been completed by the Corps for both regions in Washington, and the appropriate supplement is now used, along with the Washington State Delineation Manual, when conducting delineations in those regions.

The methodology outlined in the manuals is based upon three essential characteristics of wetlands: (1) hydrophytic vegetation; (2) hydric soils; and (3) wetland hydrology. Field indicators of these three characteristics must all be present in order to determine that an area is a wetland (unless problem areas or atypical situations are encountered). These characteristics are discussed below.

Vegetation

Plants must be specially adapted for life under saturated or anaerobic conditions to grow in wetlands. The U.S. Fish and Wildlife Service (USFWS) has determined the estimated probability of each plant species' occurrence in wetlands and has accordingly assigned a "wetland indicator status" (WIS) to each species (USFWS, 1988, 1993). Plants are categorized as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), upland (UPL), not listed (NL), or no indicator status (NI). Definitions for each indicator status are listed in the Glossary. Species with an indicator status of OBL, FACW, or FAC are considered adapted for life in saturated or anaerobic soil conditions. Such species are referred to as "hydrophytic" vegetation. A (+) or (-) sign following the WIS signifies greater or lesser likelihood, respectively, of the species being found in wetland conditions.

Areas of relatively homogeneous vegetative composition can be characterized by "dominant" species. The indicator status of the dominant species within each vegetative stratum is used to determine if the plant community may be characterized as hydrophytic. The vegetation of an area is considered to be hydrophytic if more than 50% of the dominant species have an indicator status of OBL, FACW, or FAC. The Regional Supplements provide additional tests for evaluating the presence of hydrophytic vegetation communities including the prevalence index, morphological adaptations, and wetland non-vascular plants. The Supplements also address difficult situations where hydrophytic vegetation indicators are not present but hydric soils and wetland hydrology are observed.

Soils

Hydric soils are indicative of wetlands. Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (Federal Register, 1994). The Natural Resources Conservation Service (NRCS), in cooperation with the National Technical Committee for Hydric Soils, has compiled lists of hydric soils (NRCS, 1995). These lists identify soil series mapped by the NRCS that meet hydric soil criteria. It is common, however, for a map unit of non-wetland (non-hydric) soil to have inclusions of hydric soil, and vice versa. Therefore, field examination of soil conditions is important to determine if hydric soil conditions exist.

The NRCS has developed a guide for identifying field indicators of hydric soils (NRCS, 1998). This list of hydric soil indicators is considered to be dynamic; revisions are anticipated to occur on a regular basis as a result of ongoing studies of hydric soils. In general, anaerobic conditions create certain characteristics in hydric soils, collectively known as "redoximorphic features," that can be observed in the field (Vepraskas, 1999). Redoximorphic features include high organic content, accumulation of sulfidic material (rotten egg odor), greenish- or bluish-gray color (gley formation), spots or blotches of different color interspersed with the dominant or matrix color (mottling), and dark soil colors (low soil chroma) (NRCS, 1998; Vepraskas, 1999). Soil colors are described both by common color name (for example, "dark brown") and by a numerical description of their hue, value, and chroma (for example, 10YR 2/2) as identified on a Munsell soil color chart (Munsell Color, 2000). Soil color is determined from a moist soil sample.

The Regional Supplements provide methods for difficult situations where hydric soil indicators are not observed, but indicators of hydrophytic vegetation and wetland hydrology are present.

Hydrology

Water must be present in order for wetlands to exist; however, it need not be present throughout the entire year. Wetland hydrology is considered to be present when there is permanent or periodic inundation or soil saturation at or near the soil surface for more than 12.5% of the growing season (typically two weeks in lowland Pacific Northwest areas). Areas that are inundated or saturated for between 5% and 12.5% of the growing season in most years may or may not be wetlands. Areas inundated or saturated for less than 5% of the growing season are non-wetlands (Ecology, 1997).

Indicators of wetland hydrology include observation of ponding or soil saturation, water marks, drift lines, drainage patterns, sediment deposits, oxidized rhizospheres, water-stained leaves, and local soil survey data. Where positive indicators of wetland hydrology are observed, it is assumed that wetland hydrology occurs for a sufficient period of the growing season to meet the wetland criteria, as described by Ecology (1997). The Regional Supplements provide methods for evaluating situations in wetlands that periodically lack indicators of wetland hydrology but where hydric soils and hydrophytic vegetation are present.

APPENDIX B:
COMMON AND SCIENTIFIC NAMES OF PLANTS AND THEIR WETLAND INDICATOR STATUS

PLANT SPECIES LIST FOR THE NORTHEAST REDMOND NEIGHBORHOOD PARK PROJECT, IDENTIFIED ON JANUARY 12, 2009

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR STATUS*
Trees		
big-leaf maple	*Acer macrophyllum*	FACU
grand fir	*Abies grandis*	FACU
bittercherry	*Prunus emarginata*	FACU*
black cottonwood	*Populus trichocarpa (Populus balsamifera ssp. trichocarpa)*	FAC
Douglas fir	*Pseudotsuga menziesii*	FACU*
red alder	*Alnus rubra*	FAC
western hemlock	*Tsuga heterophylla*	FACU-
western red cedar	*Thuja plicata*	FAC
Shrubs		
black raspberry (blackcap)	*Rubus leucodermis*	NL
dull Oregongrape	*Berberis nervosa*	NL
English holly	*Ilex aquifolium*	NL
evergreen blackberry	*Rubus laciniatus*	FACU+
Himalayan blackberry	*Rubus discolor (Rubus armenicus)*	FACU
Indian plum (osoberry)	*Oemleria cerasiformis*	FACU
red elderberry	*Sambucus racemosa*	FACU
red huckleberry (red bilberry)	*Vaccinium parvifolium*	NL
salal	*Gaultheria shallon*	FACU*
salmonberry	*Rubus spectabilis*	FAC+
Scot's broom	*Cytisus scoparius*	NL
swamp gooseberry	*Ribes lacustre*	FAC+
vine maple	*Acer circinatum*	FAC-
Herbs		
bracken fern	*Pteridium aquilinum*	FACU
creeping buttercup	*Ranunculus repens*	FACW
Dewey's sedge	*Carex deweyana*	FACU*
foxglove	*Digitalis purpurea*	FACU*
giant horsetail	*Equisetum telmateia*	FACW
large-leaf avens	*Geum macrophyllum*	FACW-*
licorice fern	*Polypodium glycyrrhiza*	NL
Pacific blackberry (dewberry)	*Rubus ursinus*	FACU
Pacific bleedingheart	*Dicentra formosa*	FACU*
pig-a-back-plant (piggyback plant)	*Tolmiea menziesii*	FAC*

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR STATUS*
red clover	*Trifolium pratense*	FACU
reed canarygrass	*Phalaris arundinacea*	FACW
Siberian spring beauty	*Montia sibirica* *(Claytonia sibirica)*	FAC
small-fruited bulrush	*Scirpus microcarpus*	OBL
sphagnum moss	*Sphagnum spp.*	NL
spreading wood fern	*Dryopteris expansa*	FACU
stinging nettle	*Urtica dioica*	FAC+
sword fern	*Polystichum munitum*	FACU
yellow archangel	*Lamiastrum galeobdolon*	NL

*Key to Wetland Indicator Status codes – Northwest Region (Source: USFWS, 1988, 1993):

OBL Obligate: species that almost always occur wetlands under natural conditions (est. probability >99%).

FACW Facultative wetland : species that usually occur in wetlands (est. probability 67 to 99%), but are occasionally found in non-wetlands.

FAC Facultative: Species that are equally likely to occur in wetlands or non-wetlands (est. probability 34 to 66%).

FACU Facultative upland: species that usually occur in non-wetlands (est. probability 67 to 99%), but are occasionally found in wetlands.

UPL Upland: species that almost always occur in non-wetlands under normal conditions (est. probability >99%).

NL Not listed: species that are not listed by USFWS (1988, 1993) and are presumed to be upland species.

NI No indicator: species for which insufficient information is available to determine status, or which were not evaluated by USFWS.

\+ indicates a species that is more frequently found in wetlands

\- indicates a species that is less frequently found in wetlands

* identifies a tentative assignment based upon either limited information or conflicting reviews

APPENDIX C: WASHINGTON STATE WETLAND RATING SYSTEM AND RATING FORMS

Washington State Wetland Rating System

The observed wetlands were rated using the Washington State Department of Ecology's *Wetland Rating System for Western Washington* (Hruby, 2004). This system was developed by Ecology to differentiate wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the beneficial functions they provide to society. Wetlands are categorized using the Ecology rating system according to the following criteria:

Category I wetlands represent a unique or rare wetland type; or are more sensitive to disturbance; or are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime.

Category II wetlands are difficult, though not impossible, to replace, and provide high levels of some functions.

Category III wetlands have a moderate level of function. They have been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.

Category IV wetlands have the lowest levels of functions and are often heavily disturbed.

Wetland name or number A

WETLAND RATING FORM – WESTERN WASHINGTON

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

Name of wetland (if known): Wetland A Date of site visit: 01·12·09

Rated by Rachel Hulscher Trained by Ecology? Yes X No___ Date of training 10/2007

SEC: 25 TWNSHP: 26N RNGE: 05E Is S/T/R in Appendix D? Yes___ No X

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	14
Score for Hydrologic Functions	4
Score for Habitat Functions	24
TOTAL score for Functions	42

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	X

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		Pileate Woodpe
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

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 A

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

X 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	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 See page 14 Map of Cowardin vegetation classes	Figure ___ 3
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*	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 X Untreated stormwater discharges to wetland – dirt road at north end — Tilled fields or orchards within 150 ft of wetland X A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging X Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — 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***	14

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 = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	2
D	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	0
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	0
D	**Total for D 3** *Add the points in the boxes above*	2
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 X Wetland drains to a river or stream that has flooding problems Bear Creek — 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 2
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	4

Surrounding topography of basin is flat

Wetland name or number A

R	**Riverine and Freshwater Tidal Fringe Wetlands** WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality	**Points** (only 1 score per box)
R	**R 1. Does the wetland unit have the potential to improve water quality?**	*(see p.52)*
R	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland — points = 8 Depressions cover > 1/2 area of wetland — points = 4 If depressions > ½ of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/2 area of wetland — points = 2 No depressions present — points = 0	Figure ___
R	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): Trees or shrubs > 2/3 the area of the unit — points = 8 Trees or shrubs > 1/3 area of the unit — points = 6 Ungrazed, herbaceous plants > 2/3 area of unit — points = 6 Ungrazed herbaceous plants > 1/3 area of unit — points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit — points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___
R	*Add the points in the boxes above*	
R	**R 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 — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 feet 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 — The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.53)* multiplier ____
R	**TOTAL - Water Quality Functions** Multiply the score from R 1 by R 2 ***Add score to table on p. 1***	

Comments

Wetland name or number A

R	**Riverine and Freshwater Tidal Fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
	R 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	***(see p.54)***
R	R 3.1 Characteristics of the overbank storage the unit provides: *Estimate the average width of the wetland unit perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit)/(average width of stream between banks).* If the ratio is more than 20 points = 9 If the ratio is between 10 – 20 points = 6 If the ratio is 5 - <10 points = 4 If the ratio is 1 - <5 points = 2 If the ratio is < 1 points = 1 Aerial photo or map showing average widths	**Figure ___**
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description.* (polygons need to have >90% cover at person height NOT Cowardin classes): Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area points = 7 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area points = 4 Vegetation does not meet above criteria points = 0 Aerial photo or map showing polygons of different vegetation types	**Figure ___**
R	*Add the points in the boxes above*	
R	**R 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. *Note which of the following conditions apply.* — There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. — There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding — Other_____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is **2** **NO** multiplier is **1**	***(see p.57)*** multiplier _____
R	**TOTAL - Hydrologic Functions** Multiply the score from R 3 by R 4 ***Add score to table on p. 1***	

Comments

Wetland name or number A

L	**Lake-fringe Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	**Points** (only 1 score per box)
L	**L 1. Does the wetland unit have the <u>potential</u> to improve water quality?**	*(see p.59)*
L	L 1.1 Average width of vegetation along the lakeshore *(use polygons of Cowardin classes)*: Vegetation is more than 33ft (10m) wide — points = 6 Vegetation is more than 16 (5m) wide and <33ft — points = 3 Vegetation is more than 6ft (2m) wide and <16 ft — points = 1 Vegetation is less than 6 ft wide — points = 0 Map of Cowardin classes with widths marked	Figure ___
L	L 1.2 Characteristics of the vegetation in the wetland: *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Cover of herbaceous plants is >90% of the vegetated area — points = 6 Cover of herbaceous plants is >2/3 of the vegetated area — points = 4 Cover of herbaceous plants is >1/3 of the vegetated area — points = 3 Other vegetation that is not aquatic bed or herbaceous covers > 2/3 unit — points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area — points = 1 Aquatic bed vegetation and open water cover > 2/3 of the unit — points = 0 Map with polygons of different vegetation types	Figure ___
L	*Add the points in the boxes above*	
L	**L 2. Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Polluted water discharges to wetland along upland edge — Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) — Power boats with gasoline or diesel engines use the lake — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.61)* multiplier _____
L	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from L1 by L2 ***Add score to table on p. 1***	

Comments

Wetland name or number A

L	**Lake-fringe Wetlands** HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce shoreline erosion	**Points** (only 1 score per box)
L	**L 3. Does the wetland unit have the potential to reduce shoreline erosion?**	*(see p.62)*
L	L 3 Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* > ¾ of distance is shrubs or forest at least 33 ft (10m) wide — points = 6 > ¾ of distance is shrubs or forest at least 6 ft. (2 m) wide — points = 4 > ¼ distance is shrubs or forest at least 33 ft (10m) wide — points = 4 Vegetation is at least 6 ft (2m) wide (any type except aquatic bed) — points = 2 Vegetation is less than 6 ft (2m) wide (any type except aquatic bed) — points = 0 Aerial photo or map with Cowardin vegetation classes	**Figure ___**
L	*Record the points from the box above*	
L	**L 4. Does the wetland unit have the opportunity to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* — There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests other wetlands) than can be damaged by shoreline erosion — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.63)* multiplier
L	**TOTAL - Hydrologic Functions** Multiply the score from L 3 by L 4 ***Add score to table on p. 1***	

Comments

Wetland name or number A

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	
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	
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 ___**
S	**Total for S 1** *Add the points in the boxes above*	
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 — 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 _____
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	

Comments

Wetland name or number A

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 potential 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	
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	
S	*Add the points in the boxes above*	
S	**S 4. Does the wetland have the opportunity 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 ____
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	

Comments

Wetland name or number A

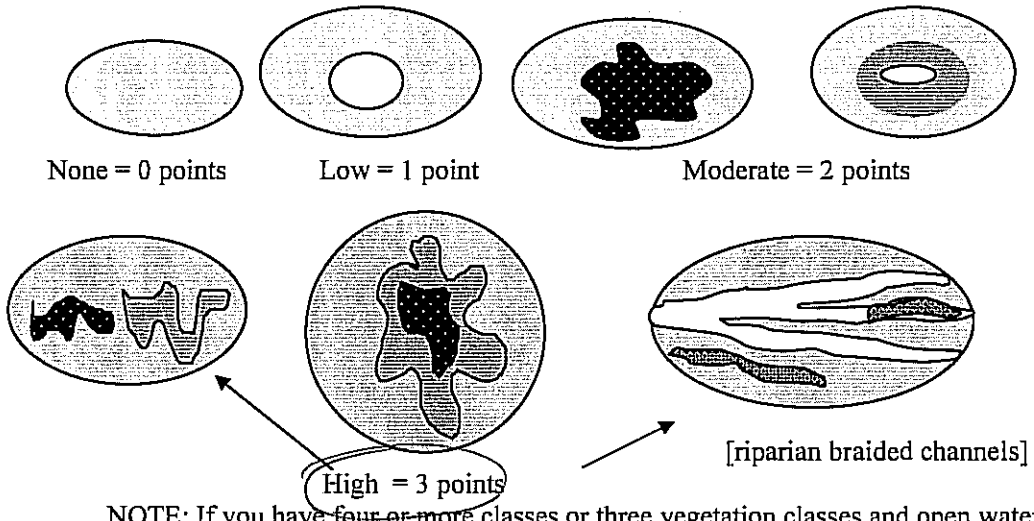
These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Vegetation structure ***(see p. 72)*** *Check 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 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:* 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 See Sketch p.14	**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 ____Seasonally flooded or inundated X Occasionally flooded or inundated X Saturated only X Permanently flowing stream or river in, or adjacent to, the wetland ____ Seasonally flowing stream in, or adjacent to, the wetland ____***Lake-fringe wetland* = 2 points** ____***Freshwater tidal wetland* = 2 points** 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:* see Appendix B	2

Total for page 6

Wetland name or number A

H 1.4. Interspersion of habitats *(see p. 76)* — Figure ___

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 see sketch below

3

H 1.5. Special Habitat Features: *(see p. 77)*

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

X Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

X Standing snags (diameter at the bottom > 4 inches) in the wetland

X 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)*

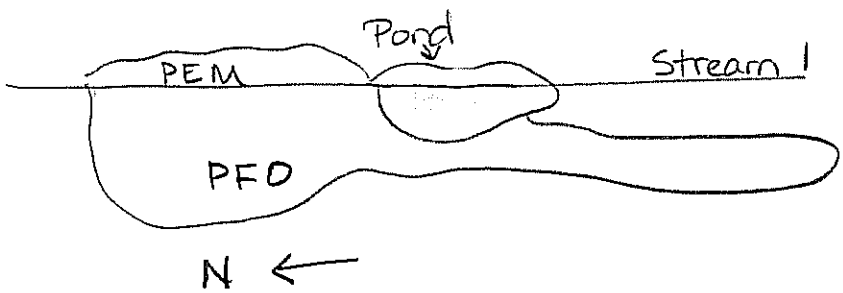
X Invasive plants cover less than 25% of the wetland area in each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

4

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5 — 13

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** — 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** X 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 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**	2

Total for page 5

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.* 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 tban 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)*	3

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	3
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	13
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	24

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 X	
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 he 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 2.2 NO X 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 ____not a Heritage Wetland	**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 X not a forested wetland with special characteristics	**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 X 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 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	N/A

Wetland name or number B

WETLAND RATING FORM – WESTERN WASHINGTON

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

Name of wetland (if known): Wetland B Date of site visit: 01·12·09

Rated by Rachel Hulscher Trained by Ecology? Yes X No___ Date of training 10/2007

SEC: 25 TWNSHP: 26N RNGE: 05E Is S/T/R in Appendix D? Yes___ No X

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	20
Score for Hydrologic Functions	4
Score for Habitat Functions	14
TOTAL score for Functions	38

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 B

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		Pileated Woodpecke
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 B

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 B

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 B

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 1. Does the wetland unit have the potential to improve water quality?	*(see p.38)*
D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	Figure 4 3
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 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 See page 14 Map of Cowardin vegetation classes	Figure ___ 5
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
Total for D 1 *Add the points in the boxes above*	10
D 2. Does the wetland unit have the opportunity to improve water qnality? 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 X Untreated stormwater discharges to wetland – dirt road to north — 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
TOTAL - Water Quality Functions Multiply the score from D1 by D2 ***Add score to table on p. 1***	20

Wetland name or number B

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 rednce 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 = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* points = 0	4
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	0
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	0
D	**Total for D 3** *Add the points in the boxes above*	4
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***	4

surrounding topography in basin is flat

Wetland name or number B

R	Riverine and Freshwater Tidal Fringe Wetlands WATER QUALITY FUNCTIONS -- Indicators that wetland functions to improve water quality	Points (only 1 score per box)
R	**R 1. Does the wetland unit have the potential to improve water quality?**	*(see p.52)*
R	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland — points = 8 Depressions cover > 1/2 area of wetland — points = 4 If depressions > ½ of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/2 area of wetland — points = 2 No depressions present — points = 0	Figure ___
R	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): Trees or shrubs > 2/3 the area of the unit — points = 8 Trees or shrubs > 1/3 area of the unit — points = 6 Ungrazed, herbaceous plants > 2/3 area of unit — points = 6 Ungrazed herbaceous plants > 1/3 area of unit — points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit — points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___
R	*Add the points in the boxes above*	
R	**R 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 — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 feet 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 — The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality — Other _____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.53)* multiplier ___
R	**TOTAL - Water Quality Functions** Multiply the score from R 1 by R 2 ***Add score to table on p. 1***	

Comments

Wetland name or number B

R	Riverine and Freshwater Tidal Fringe Wetlands HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion	Points (only 1 score per box)
	R 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.54)*
R	R 3.1 Characteristics of the overbank storage the unit provides: *Estimate the average width of the wetland unit perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit)/(average width of stream between banks).* If the ratio is more than 20 points = 9 If the ratio is between 10 – 20 points = 6 If the ratio is 5 - <10 points = 4 If the ratio is 1 - <5 points = 2 If the ratio is < 1 points = 1 Aerial photo or map showing average widths	Figure ___
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description.* (polygons need to have >90% cover at person height NOT Cowardin classes): Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area points = 7 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area points = 4 Vegetation does not meet above criteria points = 0 Aerial photo or map showing polygons of different vegetation types	Figure ___
R	*Add the points in the boxes above*	
R	**R 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. *Note which of the following conditions apply.* — There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. — There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding — Other_____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.57)* multiplier _____
R	**TOTAL - Hydrologic Functions** Multiply the score from R 3 by R 4 ***Add score to table on p. 1***	

Comments

Wetland name or number B

	Lake-fringe Wetlands WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
L	**L 1. Does the wetland unit have the potential to improve water quality?**	*(see p.59)*
L	L 1.1 Average width of vegetation along the lakeshore *(use polygons of Cowardin classes)*: Vegetation is more than 33ft (10m) wide — points = 6 Vegetation is more than 16 (5m) wide and <33ft — points = 3 Vegetation is more than 6ft (2m) wide and <16 ft — points = 1 Vegetation is less than 6 ft wide — points = 0 Map of Cowardin classes with widths marked	Figure ___
L	L 1.2 Characteristics of the vegetation in the wetland: *choose the appropriate description that results in the highest points, and do not include any open water in your estimate of coverage. The herbaceous plants can be either the dominant form or as an understory in a shrub or forest community. These are not Cowardin classes. Area of Cover is total cover in the unit, but it can be in patches. NOTE: Herbaceous does not include aquatic bed.* Cover of herbaceous plants is >90% of the vegetated area — points = 6 Cover of herbaceous plants is >2/3 of the vegetated area — points = 4 Cover of herbaceous plants is >1/3 of the vegetated area — points = 3 Other vegetation that is not aquatic bed or herbaceous covers > 2/3 unit — points = 3 Other vegetation that is not aquatic bed in > 1/3 vegetated area — points = 1 Aquatic bed vegetation and open water cover > 2/3 of the unit — points = 0 Map with polygons of different vegetation types	Figure ___
L	*Add the points in the boxes above*	
L	**L 2. Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in the lake water, or polluted surface water flowing through the unit to the lake. *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.* — Wetland is along the shores of a lake or reservoir that does not meet water quality standards — Grazing in the wetland or within 150ft — Polluted water discharges to wetland along upland edge — Tilled fields or orchards within 150 feet of wetland — Residential or urban areas are within 150 ft of wetland — Parks with grassy areas that are maintained, ballfields, golf courses (all within 150 ft. of lake shore) — Power boats with gasoline or diesel engines use the lake — Other _____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.61)* multiplier _____
L	**TOTAL - Water Quality Functions** Multiply the score from L1 by L2 ***Add score to table on p. 1***	

Comments

Wetland name or number B

	Lake-fringe Wetlands HYDROLOGIC FUNCTIONS – Indicators that the wetland unit functions to reduce shoreline erosion	Points (only 1 score per box)
L	**L 3. Does the wetland unit have the <u>potential</u> to reduce shoreline erosion?**	*(see p.62)*
L	L 3 Distance along shore and average width of Cowardin classes along the lakeshore (**do not** include aquatic bed): *(choose the highest scoring description that matches conditions in the wetland)* > ¾ of distance is shrubs or forest at least 33 ft (10m) wide — points = 6 > ¾ of distance is shrubs or forest at least 6 ft. (2 m) wide — points = 4 > ¼ distance is shrubs or forest at least 33 ft (10m) wide — points = 4 Vegetation is at least 6 ft (2m) wide (any type except aquatic bed) — points = 2 Vegetation is less than 6 ft (2m) wide (any type except aquatic bed) — points = 0 Aerial photo or map with Cowardin vegetation classes	Figure ___
L	*Record the points from the box above*	
L	**L 4. Does the wetland unit have the <u>opportunity</u> to reduce erosion?** Are there features along the shore that will be impacted if the shoreline erodes? *Note which of the following conditions apply.* — There are human structures and activities along the upland edge of the wetland (buildings, fields) that can be damaged by erosion. — There are undisturbed natural resources along the upland edge of the wetland (e.g. mature forests other wetlands) than can be damaged by shoreline erosion — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p.63)* multiplier
L	**TOTAL - Hydrologic Functions** Multiply the score from L 3 by L 4 ***Add score to table on p. 1***	

Comments

Wetland name or number B

	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 is 1% 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	
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	
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 ___
S	**Total for S 1** *Add the points in the boxes above*	
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 — 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 _____
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	

Comments

Wetland name or number B

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	
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	
S	*Add the points in the boxes above*	
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 ____
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	

Comments

Wetland name or number B

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 ____Seasonally flooded or inundated ____Occasionally flooded or inundated X Saturated only 4 or more types present — points = 3 3 types present — points = 2 2 types present — point = 1 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 ___ 0
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:* see Appendix B	1

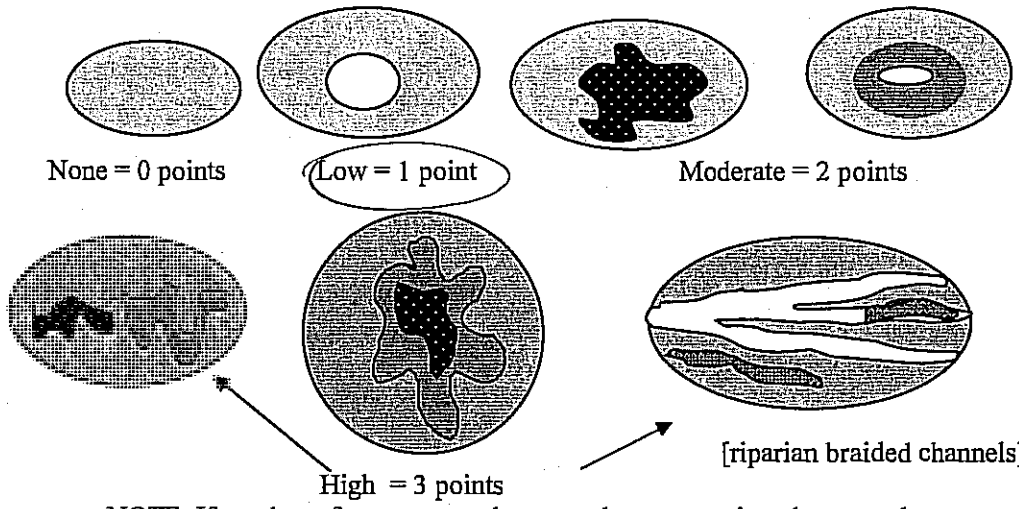
Total for page 3

Wetland name or number B

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.

Figure ___



0

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 See Sketch below

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).

X Standing snags (diameter at the bottom > 4 inches) in the wetland

___ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>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

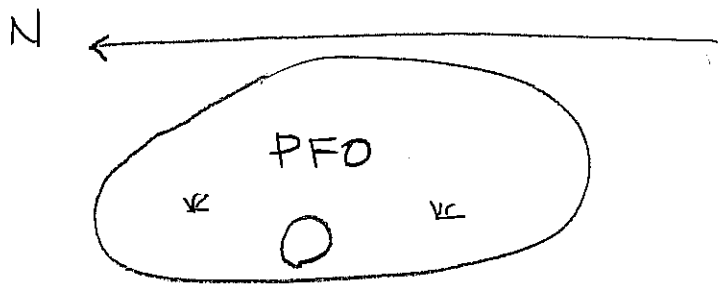
NOTE: The 20% stated in early printings of the manual on page 78 is an error.

3

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

6

Comments



Wetland name or number B

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 B

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.

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)

Wetland name or number B

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*	8
TOTAL for H 1 from page 14	6
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 B

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 X	
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

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 2.2 NO X 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 ____not a Heritage Wetland	**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 B

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 X not a forested wetland with special characteristics	**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 X 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 B

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	

APPENDIX D: WETLAND DETERMINATION DATA SHEETS

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

Project/Site: NE Neighborhood Park City/County: Redm Sampling Date: 11-13-09
Applicant/Owner: Redmond Park Dept State: WA Sampling Point: DP-1
Investigator(s): CC Section, Township, Range: NW¼ of NE¼ of SE¼ S 25 T 26N, R
Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): none
Subregion (LRR): LRR A Lat: 47.71009 Long: -122.10455 Datum:
Soil Map Unit Name: Alderwood GSL, 6-15% slope NWI classification: PUBHh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓ No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks: 2.29" rain Jan 7th, 2009

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	10		FAC
2.			
3.			
4.			
Total Cover:	10		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Ranunculus repens	98		FACW
2. Festuca rubra	Tr		FAC
3. Phalaris arundinacea	Tr		FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	98		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 1%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: DP-1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR 2/2						L	
13-19	10YR 4/2		7.5YR 4/6	10			GSL	common

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: none

Depth (inches): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9) **(except NW coast)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(NW coast)**
- ___ Sparsely Vegeteted Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 1"

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): surf

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks: Stream flowing 8' to west

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

Project/Site: NE Redmond Neighborhood Park City/County: Redmond / King Sampling Date: 01.12.09
Applicant/Owner: City of Redmond Parks Dept. State: WA Sampling Point: DP-2 (wetland)
Investigator(s): Rachel Hulscher, Cathie Corolly, Rosemary Baker Section, Township, Range: NW¼ of NE¼ of SE¼ S25, T26N, R05
Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): convex Slope (%): 0-1
Subregion (LRR): LRR A Lat: 47.71009 Long: -122.10455 Datum:
Soil Map Unit Name: Aldenwood gravelly sandy loam, 6 to 15% slope NWI classification: PUBHh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes X	No ____
Wetland Hydrology Present?	Yes X	No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks: City of Redmond received approx. 5.23 inches of rainfall Jan 1 to Jan 13, 2009 with 2.29 inches precip. on Jan. 7, 2009 (normal precip 5.13 inches)

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	20	Y	FACU
2.			
3.			
4.			
Total Cover:	20		
Sapling/Shrub Stratum			
1. Rubus spectabilis	50	Y	FAC
2. Acer circinatum	5	N	FAC
3.			
4.			
5.			
Total Cover:	55		
Herb Stratum			
1. Tolmiea menziesii	15	Y	FAC
2. Polystichum munitum	10	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	25		
Woody Vine Stratum			
1. Rubus armeniacus	2	N	FACU
2.			
Total Cover:	2		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: No bare ground. all open areas covered by a dense layer of humic material / leaf litter at time of site visit.

SOIL

Sampling Point: DP-2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	95	10YR 4/6	5	C	M	sandy loam	
6-13	10YR 3/2	95	10YR 4/1	5	D	M	loamy sand	
13+	10YR 4/3	95	2.5Y 6/4	5	D	M	loamy sand	some large gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks: Horizon depths approximate due to high water table

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9) **(except NW coast)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) **(NW coast)**
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 1.5

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

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

Remarks: Data plot is located along a drainage leading east to stream feature; east side of Wetland A (approx. 30 feet west of stream)

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

Project/Site: NE Redmond Neighborhood Park City/County: Redmond/King Sampling Date: 01-12-09
Applicant/Owner: Redmond Parks & Recreation State: WA Sampling Point: DP-3 upland
Investigator(s): Rachel Hulscher Cathie Conolly Section, Township, Range: NW¼ of NE¼ of SE¼ S25, T26N, R05E
Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): convex Slope (%): 0-1%
Subregion (LRR): LRRA Lat: 47.71009 Long: -122.10455 Datum:
Soil Map Unit Name: Alderwood GSL 6 to 15% slope NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Approx. 5.23 in of precip received since Jan 1, 2009 with 2.29 inches occurring on Jan 7, 2009. (normal precip 5.13 inches)

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	30	Y	FACU
2. Pseudotsuga menziesii	5	N	FACU
3. Alnus rubra	5	N	FAC
4. Populus trichocarpa	20	Y	FAC
Total Cover:	60		
Sapling/Shrub Stratum			
1. Acer circinatum	60	Y	FAC
2.			
3.			
4.			
5.			
Total Cover:	60		
Herb Stratum			
1. Polystichum munitum	5	Y	FACU
2. Polypodium glycyrrhiza	1	N	FACU
3. Dicentra formosa	1	N	FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	7		
Woody Vine Stratum			
1. Rubus ursinus	1	N	FACU
2.			
Total Cover:	1		

% Bare Ground in Herb Stratum —

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	85	x 3 =	255
FACU species	43	x 4 =	172
UPL species		x 5 =	
Column Totals:	128 (A)		427 (B)

Prevalence Index = B/A = 3.34

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Open areas covered by dense layer of leaf litter; no bare ground

SOIL

Sampling Point: DP-3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100	—				sandy loam	
5-18	7.5YR 4/3	100	—				loamy sand	iron deposits & wood, charcoal & gravel pieces

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: roots

Depth (inches): 18 in.

Hydric Soil Present? Yes ___ No X

Remarks: Test pit stops at 18" due to dense root layer

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(NW coast)**
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): >15

Water Table Present? Yes ___ No X Depth (inches): >15

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >15

Wetland Hydrology Present? Yes ___ No X

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

Remarks: No wetland hydrology indicators present; note upland areas start at groups of hummocks; dense patches of vine maple

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

Project/Site: NE Neighborhood Park City/County: Redmond / King Sampling Date: 1/12/09
Applicant/Owner: City of Redmond State: WA Sampling Point: DP4 - wetland B
Investigator(s): Cathie Conolly, Rachel Hulscher, Rosemary Baker Section, Township, Range: NE¼ of NW¼ of SE¼ S25, T26N, R5E
Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): concave Slope (%): 0-1%
Subregion (LRR): LRR A Lat: 47.71009 Long: -122.10455 Datum:
Soil Map Unit Name: Alderwood GSL 6 to 15% slope NWI classification: PUBHh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No ____	Is the Sampled Area within a Wetland? Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:
Site affected by December 2008 and January 2009 flood events; ponding observed throughout the site. Approx. 5.23 inches of precip since Jan 1, 2009; with 2.29 in precip on Jan 7, 2009.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	15	Y	FAC
2. Alnus rubra	25	Y	FAC
3.			
4.			
Total Cover:	40		
Sapling/Shrub Stratum			
1. Rubus spectabilis	60	Y	FAC+
2. Sambucus racemosa	2	N	FACU
3.			
4.			
5.			
Total Cover:	62		
Herb Stratum			
1. Polystichum munitum	1	N	FACU
2. Tolmeia menziesii	5	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	6		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: ~~3~~ 4 (A)
Total Number of Dominant Species Across All Strata: ~~3~~ 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species	~~105~~ 120	x 3 = ~~315~~ 360
FACU species	3	x 4 = 12
UPL species		x 5 =
Column Totals:	~~123~~ 123 (A)	~~327~~ 372 (B)

Prevalence Index = B/A = 3.02

Hydrophytic Vegetation Indicators:
✓ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Wetland Non-Vascular Plants[1]
✓ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:
Open ground covered by dense layer of leaf litter; no bare ground. All dominant vegetation is FAC. Sword fern generally occurs on hummocks. Wetland soils and hydrology are present. Additional hydrophitic vegetation may not be visible due to time of year and dense layer of leaf litter.

SOIL

Sampling Point: DP 4 - Wetland B

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	98	10YR 4/6	2	C	M	gravelly sandy loam	charcoal pieces, oxydized root channels
12-20	10YR 4/2	100					gravelly sandy loam	charcoal, wood fragments

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Rock

Depth (inches): 20"

Hydric Soil Present? Yes ✓ No ___

Remarks:

- Horizon depths are approximate due to high water table (hole filled with water; horizons could not be measured)
- Hydrologic source is episaturation (surface-fed) & we believe this meets exception for no depleted/gleyed matrix below the dark surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9) **(except NW coast)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(NW coast)**
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): 2 in.

Water Table Present? Yes ✓ No ___ Depth (inches): 2 in.

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): surface

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks:

High water table.
Hole filled with water up to 2" below surface
Data plot located on west side of site

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

Project/Site: NE Neighborhood City/County: Redmond, KC Sampling Date: 1-13-09
Applicant/Owner: Redmond Parks State: WA Sampling Point: D-5
Investigator(s): CC + RH Section, Township, Range: NW¼ of NE¼ of SE¼ S25, T26N, R05E
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): convex Slope (%): 0
Subregion (LRR): LRR A Lat: 47.71009 Long: -122.10455 Datum: _____
Soil Map Unit Name: Alderwood GSL 6 to 15% slope NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks: Approx. 5.23 inches of precip. occurred since Jan 1, 2009; with approx. 2.29 inches of precip on Jan 7, 2009.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	60	Y	FACU
2. Pseudotsuga menziesii	25	Y	FACU
3. Alnus rubra	25	N	FAC
4.			
Total Cover: ~~80~~ 110			
Sapling/Shrub Stratum			
1. Rubus spectabilis	60	Y	FAC
2. Acer macrophyllum	10	N	FACU
3. Tolmiea menziesii			
4.			
5.			
Total Cover: ~~60~~ 70			
Herb Stratum			
1. Tolmiea menziesii	25	Y	FAC
2. Carex sp	Tr	N	FAC
3. Urtica dioica	Tr	N	FAC
4.			
5.			
6.			
7.			
8.			
Total Cover: 25			
Woody Vine Stratum			
1.			
2.			
Total Cover: _____			

% Bare Ground in Herb Stratum —

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ~~25~~ 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 =
FACW species		x 2 =
FAC species	110	x 3 = 330
FACU species	95	x 4 = 380
UPL species		x 5 =
Column Totals:	205 (A)	710 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: No bare ground – open areas covered by dense layer of humic material / leaf litter

SOIL

Sampling Point: DP-5 upland near WLB. SE ba

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100	—				SL	
2-8	10YR 3/3	100	—				L	
8-12	10YR 3/2	100					L	
12-16	10YR 3/3	100					GSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(NW coast)**
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Frost-Heave Hummocks (D4)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): 7"

Water Table Present? Yes X No ___ Depth (inches): 10"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 7"

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks: Very wet weather in last week (2.29 inches precip on Jan 7, 2009)