

**Wetland Report
West Bay Drive NW Sidewalks Project
Olympia, Washington**

May 31, 2013

Prepared for

**City of Olympia
Olympia, Washington**



950 Pacific Avenue, Suite 515
Tacoma, WA 98402
(253) 926-2493

EXECUTIVE SUMMARY

The City of Olympia plans to install new sidewalks along the west side of the West Bay Drive NW corridor from 1515 West Bay Drive NW to 1115 West Bay Drive NW in Olympia, Washington. The existing corridor consists of a narrow two-lane road which winds between what appears to be vacant industrial land and West Bay to the east and residential areas and small businesses up on the slope to the west. This critical area investigation included delineating all wetlands and stream channels located within 300 feet of the proposed improvements (study area). Landau Associates identified two Category III wetlands and one Type 5 stream within the study area. A previous site reconnaissance (Skillings Connolly 2012) also identified segments of two Type 3 streams (Schneider Creek and Unnamed Stream B), both streams are piped beneath the study area.

This report provides data and detailed descriptions of the two wetlands and the stream delineated along the West Bay Drive NW corridor to support the project planning and design for the new sidewalk. This report also provides information regarding the piped stream segments that flow beneath the study area. Based on the Olympia Municipal Code (OMC) Category III wetlands that have low habitat scores and are between 1,000 and 4,000 square feet are exempt from OMC 18.32.135A. Potential impacts from this project include minor impacts to a Type 5 stream and one Category III wetland and their associated buffers.

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FACT SHEET

Site Information

Location	Project Information
Site Name(s)	West Bay Drive NW
County	Thurston
City	Olympia
Section (¼, ¼), Township, Range	Section 10 (SE ¼, NW and SW ¼), Township 18 North, Range 02 West
Latitude, Longitude	+47° 03' 32.10" N, -122° 54' 54.46" W to +47° 03' 17.81" N, -122° 54' 49.68" W
Watershed	Deschutes
WRIA Number	13

Summary of Delineated Wetland(s) and Waterways, including type, functions, buffer width, and size:

Designation:	Type within Study Area (Cowardin/HGM):	Category (Rating):	Water Quality Rating	Hydrologic Rating	Habitat Rating	Buffer Width:	Size:
Wetland A	PFO/slope	III (36)	12	12	12	80 ft	3,457 ft ²
Wetland B	PEM/slope	III (35)	12	12	11	80 ft	1,373 ft ²
Unnamed Stream A	Type 5 (Ns)	N/A	N/A	N/A	N/A	150 ft	990 ft ²
Unnamed Stream B	Type 3 (F)	N/A	N/A	N/A	N/A	*Not required	*Piped
Schneider Creek	Type 3 (F)	N/A	N/A	N/A	N/A	*Not required	*Piped
Key: PFO = Palustrine forested PEM = Palustrine emergent HGM = Hydrogeomorphic ft ² = square foot N/A = Not Applicable * The segments of Unnamed Stream B and Schneider Creek within the study area are piped, and stream buffers are not required (City of Olympia 2002). Segments of these streams outside the study area are not piped, and stream buffers may apply.							

Summary of project, including proposed type and location of work , goals and objectives, wetland functions, impacted and mitigated (note assessment method used), and the general design concept (include where it has been done before).

The purpose of the project is to provide public safety by improving pedestrian safety along the West Bay Drive NW corridor from 1515 West Bay Drive NW to 1115 West Bay Drive NW in Olympia, Washington. These improvements will include installing sidewalks along the west side of West Bay Drive NW. Within the study area, two wetlands (Wetlands A and B) and one stream were identified and delineated adjacent to the project area. Two streams, which are piped under the study area, were identified but not delineated. Potential impacts from this project may include minor impacts to a Type 5 stream and Wetland A.

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LIST OF ABBREVIATIONS AND ACRONYMS

BGS	Below Ground Surface
CWA	Clean Water Act
Ecology	Washington State Department of Ecology
FAC	Facultative
FACU	Facultative Upland
FEMA	Federal Emergency Management Agency
ft	Feet/Foot
ft ²	Square foot
GIS	Geographic Information System
HGM	Hydrogeomorphic
HPA	Hydraulic Project approval
NCDC	National Climatic Data Center
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate Wetland
OHWM	Ordinary High Water Mark
OMC	City of Olympia Municipal Code
PEM	Palustrine Emergent
PFO	Palustrine Forested
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WRIA	Water Resource Inventory Area

1.0 INTRODUCTION

Landau Associates is providing consultant services to the City of Olympia (City) to provide a wetland and critical area investigation to support improvements to the West Bay Drive NW corridor from 1515 West Bay Drive NW to 1115 West Bay Drive NW in Olympia, Washington. The project purpose is to improve pedestrian safety by installing sidewalks along the west side of West Bay Drive NW.

The project area includes the footprint of existing and proposed improvements to the West Bay Drive NW corridor. The study area includes the project area and a surrounding 300 foot (ft) radius as required by Chapter 18.32.11 of the City of Olympia Municipal Code (OMC). The project vicinity is shown on Figure 1 and the site plan (including the project area, study area, and features) is shown on Figure 2.

An initial wetland reconnaissance was conducted by Skillings Connolly on July 20, 2012 to identify potential wetland and stream areas in the vicinity of the proposed improvements (Skillings Connolly 2012). This reconnaissance identified two wetland areas and two streams—Schneider Creek and an unnamed stream (Unnamed Stream B), both of which are located outside the project limits and are entirely piped beneath the study area.

1.1 SITE DESCRIPTION

The project is located in Olympia along West Bay Drive NW, within the Deschutes watershed [Water Resource Inventory Area (WRIA) 13] in Section 31, Township 10 North, and Range 8 West. Existing land use in the area consists of commercial/industrial land to the east and residential/professional offices to the west. West Bay Drive NW extends to the north and south beyond the project area. To the east of the adjacent commercial/industrial land is West Bay.

1.2 REGULATORY BACKGROUND

The Clean Water Act (CWA) requires authorization for the discharge of dredged or fill material into “waters of the U.S.” under Section 404. Chapter 18.32 of the OMC provides requirements for establishing wetland buffer widths and building setbacks for any alteration, including fill, of wetlands and their buffers. Ecology requires compliance with the State Water Pollution Control Act [Revised Code of Washington (RCW; 90.48)], and it has administrative oversight of Section 401 of the CWA for water quality certification in the case of impacts to U.S. Army Corps of Engineers (USACE) jurisdictional “waters of the U.S.” Any work that will use, divert, obstruct, or change the bed or flow of state waters, including streams and rivers, must obtain Hydraulic Project Approval (HPA) issued by Washington State Department of Fish and Wildlife (WDFW). The WDFW HPA is administered under RCW 77.55 and

rules in the Washington Administrative Code (WAC) 220-110. Wetlands and certain waterways are regulated by federal, state, and local governmental agencies and compliance with one agency does not necessarily fulfill permitting requirements of any other agencies.

All delineated wetlands and/or waterways described in this report are subject to verification by the USACE. The USACE determines the jurisdiction of a wetland based on the connection, more commonly referred to as adjacency, to other “waters of the U.S.” Those wetlands determined to be “isolated” do not fall under the jurisdiction of the USACE. If delineated wetlands are determined to be adjacent rather than isolated, any filling or dredging of onsite wetlands would require compliance with Section 404 and 401 of the CWA and the Endangered Species Act. Only the USACE can make the determination if a wetland is adjacent or isolated. If the wetlands are determined to be isolated, they may still be subject to regulation by Washington State Department of Ecology (Ecology) under the State Water Pollution Control Act (RCW 90.48) and under the critical area regulations established in the OMC.

2.0 METHODS

Landau Associates conducted this wetland investigation in accordance with the *Wetlands Delineation Manual* (USACE 1987), the *Regional Guidance on the 1987 Manual* (USACE 1994), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010). As of March 1, 2011, Ecology has adopted USACE's *Regional Supplement* for wetland investigations. Therefore, Ecology's *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) was not applied. In general, USACE recommends gathering preliminary data and synthesizing available background information, followed by a field investigation. The West Bay shoreline and species within and adjacent to West Bay were not evaluated as a part of this report.

2.1 BACKGROUND INFORMATION REVIEW

Landau Associates reviewed the following public domain resources to determine existing conditions and potential wetlands and other "waters of the U.S." within the study area:

- U.S. Geological Survey (USGS) Topographic map (Appendix A, Figure A-1)
- Aerial imagery (Appendix A, Figure A-2)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (Appendix A, Figure A-3)
- Federal Emergency Management Agency (FEMA) Geographic Information System (GIS) data Flood Map (Appendix A, Figure A-4)
- Soils Map (Appendix A, Figure A-5)
- Washington State Department of Natural Resources (WDNR) Natural Heritage Program list (WDNR 2011)
- National Hydric Soils List [U.S. Department of Agriculture (USDA), National Resources Conservation Service (NRCS) website 2012]
- Precipitation data [USDA NRCS website 2002, National Climatic Data Center (NCDC) website 2013]
- WDFW Priority Habitats and Species (PHS) database (WDFW website 2013a).

2.2 WETLAND DELINEATION

Both USACE and Ecology outline a three-parameter approach to determine the presence or absence of wetlands that requires evaluating vegetation, soil, and hydrology (Table 1). Landau Associates' biologists completed the field delineation using the routine onsite method, where data are collected at locations representative of typical wetlands and/or uplands of the study area. Following this

method, an area is determined to be wetland if each of the following three criteria are met (also see Table 1):

- The dominant vegetation is hydrophytic
- Soils are hydric
- Wetland hydrology is present.

“Difficult wetland situations” may occur in which one or more of the required criteria have been disturbed by human or natural events (atypical situations) or are absent due to natural variability (problem area). In cases of difficult wetland situations, a wetland determination can be based on the best available information of the site, knowledge of the ecology of wetlands in the region, and/or the other undisturbed/present criteria.

2.3 WETLAND CLASSIFICATION, RATING, AND BUFFER WIDTH

Any wetlands identified as part of this project were classified according to the USFWS Cowardin classification system (Cowardin et al. 1979) and the USACE’s hydrogeomorphic (HGM) classification system (Brinson 1993). Wetlands were rated according to the *Washington State Wetland Rating System for Western Washington* (Hruby 2004), which is accepted practice by the City. This system categorizes wetlands based on their existing functions, including water quality, hydrology, and habitat, as well as the wetland’s rarity, sensitivity to disturbance, or if the wetland can be replaced. The wetland categories range from I to IV, in which Category I wetlands represent unique or rare wetland types and Category IV wetlands represent wetlands that provide low level of functions. Wetland buffers were determined according to Chapter 18.32 of the OMC, which assigns buffer widths based on the overall wetland category and individual scores for habitat and water quality.

2.4 WATERWAY DELINEATION, TYPING, AND BUFFER WIDTH

The ordinary high water mark (OHWM) of surface waters was identified in accordance with Ecology methods (2010). The delineation of OHWM was based on site observation. The method focuses on examining existing hydrologic data and observing field indicators including hydrology, soils and sediments, vegetation, and marks of scouring, etc.

Stream typing and buffer widths are based on Chapters 18.32.410-435 of the OMC and the water typing system presented in Chapter 222-16-020 and -030 of the WAC. Where the OMC did not provide guidance regarding stream buffers for piped stream segments, the 2002 and 2006 hearing examiner decisions (City of Olympia 2002; 2006) were used for guidance.

3.0 RESULTS

3.1 BACKGROUND INFORMATION REVIEW

Wetlands

The USGS topographic map does not identify any wetland areas in the study area (Appendix A, Figure A-1). With the exception of West Bay, no open water is visible in the aerial photograph (Appendix A, Figure A-2). The NWI Map (Appendix A, Figure A-3) identifies one wetland system within the study area. This system, consisting of the West Bay shoreline, is identified as an estuarine, intertidal, unconsolidated shore, regularly flooded (E2USN) wetland/deepwater habitat, and extends from north to south along the shoreline of West Bay and into the northeastern and southeastern corners of the study area.

Waterways

The USGS topographic map for the study area (Appendix A, Figure A-1) identifies West Bay Drive NW as being adjacent to West Bay, which is identified as a perennial waterway underlain by sand in the study area. This area corresponds to the ES2USN wetland/deepwater habitat identified on the NWI map discussed above.

Schneider Creek can be seen to the northwest of the study area in the USGS topographic map, and the upper creek area is also visible as a forested area on the aerial photograph.

Floodplains

The 2011 FEMA GIS data (Appendix A, Figure A-4) indicates that a flood hazard area extends slightly into the northeastern and southeastern corners of the study area.

Soils

The soils map (Appendix A, Figure A-5) identifies three soil series within the study area (complete soil profile report for the Alderwood series and soil descriptions for dystic xerochrepts and xerothents are provided in Appendix B):

- Alderwood gravelly sandy loam, 15 to 30 percent slopes (3) consist of moderately well drained soils formed in glacial drift. These soils are found on glacially modified foothills and valleys (See Appendix B). The National Hydric Soil List (USDA, NRCS website 2012) does not list Alderwood gravelly sandy loam, 15 to 30 percent slopes as a hydric soil.
- Dystic Xerochrepts, 60 to 90 percent slopes (30) consist of well-drained soils found on escarpments with colluvium and glacial till parent materials (See Appendix B). The National Hydric Soil List (USDA, NRCS website 2012) does not list dystic Xerochrepts, 60 to 90 percent slopes (30) as a hydric soil.

- Xerorthents, 0 to 5 percent slopes (125) consist of somewhat excessively drained soils found on tidal flats. The parent material is sandy and loamy cut and fill material. The National Hydric Soil List (USDA, NRCS website 2012) does not list Xerorthents, 0 to 5 percent slopes (125) as a hydric soil in Thurston County.

Land Use

In the aerial photograph (Appendix A, Figure A-2), the West Bay Drive NW corridor is visible as a two-lane road with trees and small buildings adjacent to the west and a large open unvegetated area adjacent to the east which contains several buildings. A small portion of the Budd-3A and Budd-3B marine shoreline reaches (urban shoreline designation) are located within the study area (Thurston County 1990; City of Olympia 2013). The land to the east of West Bay Drive NW is zoned “urban waterfront” and appears to be vacant industrial land. The properties to the west of West Bay Drive NW are zoned “professional office/residential multifamily” and consist of a mix of small office buildings and residential homes.

Precipitation

Precipitation data for the 3-month period prior to the field investigation in the Puget Sound Lowlands division (NCDC website 2013) indicates recorded precipitation levels were normal for the months of December and January and drier than normal for the month of February as listed in NRCS Wetlands Determination tables (USDA, NRCS website 2002). The aggregate sum for the prior 3 months is drier than normal as determined using the USDA *Rainfall Documentation Worksheet* (USDA, NRCS website 1997; Appendix C). Although the prior period was drier than normal, the investigation was completed during the “wet” season in western Washington.

Listed Species

According to the WDFW PHS data, Coho salmon (a candidate for federal listing) are located in Schneider Creek, which passes through the northern portion of the study area. Estuarine intertidal habitat is located in West Bay; a small portion of the West Bay shoreline is located within the study area. The study area also contains shorebird concentrations and a great blue heron breeding area. The township contains little brown *myotis* and *Yuma myotis* (WDFW website 2013a). These species and habitats are PHS listed; Coho salmon are the only candidate species for federal listing that may be present within the study area (WDFW website 2013a). No fish were observed in the wetlands or streams during the field investigation. Additionally, none are listed as being present in the wetlands or streams based on PHS data (WDFW website 2013a) and SalmonScape (WDFW website 2013b). The nearest rare plants are identified as being located over 2 miles from the study area (WDNR 2011).

3.2 FIELD INVESTIGATION

Landau Associates' Project Scientist, Jessica Stone, and Technician, Brittany Hartman, did the field investigation on March 27, 2013. The temperature during the March field investigation was in the mid-50s and the weather was partly cloudy.

Sampling points were taken in areas suspected to meet the mandatory wetland criteria and nearby upland areas to determine corresponding wetland/upland boundaries. The wetland boundary was delineated using numbered flagging. All points were documented and then professionally surveyed by the City. The sampling point locations and numbered flagging for each wetland area are shown on Figures 3A and 3B. Also shown on Figure 3B are additional sampling point locations that were taken in areas suspected to meet wetland criteria. The boundaries of two wetland areas, Wetlands A and B, and one stream were delineated within the study area. Two other areas, labeled Areas C and D, were also investigated for hydrophytic vegetation and hydric soils but these areas did not meet the required wetland criteria.

The data sheets documenting site observations from each sampling point are provided in Appendix D. Site photographs collected during the site reconnaissance are provided in Appendix E. The wetland rating information for Wetlands A and B are provided in Appendix F.

3.2.1 WETLAND A

Wetland A is approximately 3,457 square feet (ft²; 0.08 acre) in size and is located entirely within the study area. Wetland A is not identified on the NWI map (Section 3.1), but was determined during the field investigation to be a palustrine forested (PFO) slope wetland. Wetland A is a linear wetland within a narrow ravine which extends up the hillside to the west of West Bay Drive NW and receives its hydrology from hillside seeps. The USDA Soils Map identifies the soils within Wetland A as consisting of xerorthents, 0 to 5 percent slopes, and dystic xerochrepts, 60 to 90 percent slopes (Appendix A, Figure A-5).

Sampling point SP-01 was recorded to describe the wetland conditions and is located within the wetland area adjacent to West Bay Drive NW. One upland sampling point, sampling point SP-02, was collected adjacent to the north of Wetland A on a hill slope. The site features, numbered flagging, and sampling point locations for Wetland A are shown on Figure 3A.

3.2.1.1 Vegetation

The vegetation at sampling point SP-01 is considered problematic, as 100 percent of the sampling point was covered with English ivy (*Hedera helix*), which is not designated a wetland indicator status.

The English ivy is shallowly rooted in the wetland with a dense concentration of yellow-skunk-cabbage (*Lysichiton americanus*), an obligate (OBL) wetland species. English ivy is an aggressive invasive species (USACE 2010), and due to the narrow width of the wetland, the stems appear to also be rooted in the adjacent upland areas. Vegetation throughout Wetland A contains forested vegetation with some scrub-shrub, emergent, and woody vine understory. The dominant plant species observed within sampling point SP-01 include:

- Red alder [*Alnus rubra*, facultative (FAC)]
- Big leaf maple [*Acer macrophyllum* facultative upland (FACU)]
- Salmonberry [*Rubus spectabilis*, (FAC)]
- Yellow-skunk-cabbage [*Lysichiton americanus*, obligate wetland (OBL)]
- English ivy (*Hedera helix*, no indicator).

One non-dominant species, stinging nettle (*Urtica dioica*, FAC), was also observed within sampling point SP-01.

3.2.1.2 Soils

The hydric soils in sampling point SP-01 are characterized as containing a redox dark surface (hydric soil indicator F6). From 0 to 7 inches below ground surface (BGS), the soils were very dark brown (10 YR 2/2) saturated sandy loam. From 7 to 12 inches BGS, the soils were very dark grey (2.5 Y 3/1) saturated sandy loam with distinct dark brown (7.5 Y 3/4) redox features. Below 12 inches BGS, the percentage of redox features increased to approximately 10 percent.

3.2.1.3 Hydrology

The primary indicators of wetland hydrology observed at sampling point SP-01 are surface water (hydrology indicator A1) and saturation (hydrology indicator A3). Wetland A receives hydrology from seeps which flow intermittently on the hillside. Hydrology varies from surface water to soil saturation throughout the wetland.

3.2.1.4 Wetland Determination

All three mandatory wetland criteria are satisfied for Wetland A. Landau Associates classified Wetland A as a PFO, slope (Cowardin/HGM classification) wetland. Using the Ecology wetland rating form (Hruby 2004), Wetland A is rated as a Category III wetland with a total score of 36. Wetland A scored equally for water quality, hydrologic, and habitat functions, with scores of 12 in each category.

The OMC designates wetland buffer areas based on wetland ratings obtained using the Ecology wetland rating system. Category III wetlands that do not meet any of the characteristics described in chapter 18.32.535 of the OMC are assigned a wetland buffer width of 80 ft. However, based on the OMC 18.32.135.B: 'Wetlands and "small lakes" between one thousand (1,000) and four thousand (4,000) square feet shall be exempt from the requirements of OMC 18.32.135.A, provided that the wetland or small lake:

1. Is rated as a Category III or IV wetland,
2. Is not associated with a riparian corridor,
3. Is not part of a wetland mosaic,
4. Does not score 20 points or greater for habitat in the Washington State Wetland Rating System for Western Washington (2004),
5. Does not contain habitat identified as essential for local populations of priority species identified by Washington Department of Fish and Wildlife, and
6. A wetland mitigation report is provided as required by OMC [18.32.590](#).

(Ord. 6426 §27, 2006; Ord. 6356 §5, 2005).'

Wetland A is between 1,000 and 4,000 ft² in size and the habitat score was 12, therefore the wetland meets the exemption requirement in 18.32.515. Additionally, the buffer area adjacent to West Bay Drive SW where potential impacts will occur consists of the roadway prism, associated drainage ditches, and is dominated by English ivy.

3.2.1.5 Upland Characterization

The upland area adjacent to Wetland A is characterized by sampling point SP-02, located to the north of SP-01 up on the adjacent hillside. Sampling point SP-02 met none of the mandatory wetland criteria (Appendix D).

No wetland hydrology indicators were observed within the upland sampling point SP-02 or within the upland area surrounding Wetland A.

The upland area surrounding Wetland A is dominated by non-hydrophytic vegetation. The dominant vegetation at sampling point SP-02 consists of red alder, big leaf maple, osoberry (*Oemleria cerasiformis*, FACU), and English ivy.

During the field investigation, the soils within the upland sampling point SP-02 were moist. From 0 to 12 inches BGS, the soils consisted of very dark gray (10 YR 3/1) loam with sand. Below 12 inches BGS, the soils consisted of brown (10 YR 4/3) sandy loam. No hydric soil indicators were observed in the upland sampling point.

3.2.2 WETLAND B

Wetland B is approximately 1,373 ft² (0.03 acre) in size and is located entirely within the study area. Wetland B is not identified on the NWI map (Section 3.1), but was identified during the wetland delineation as a palustrine emergent (PEM) slope wetland. Wetland B is a broad wetland on a small, relatively flat area, located on a hillside to the west of West Bay Drive NW. Hydrology flows primarily through the subsurface and then discharges to a stream (Unnamed Stream A). The USDA Soils Map identifies the soils within Wetland B as consisting of dystric xerochrepts, 60 to 90 percent slopes (Appendix A, Figure A-5).

Sampling point SP-06 was recorded to describe the wetland conditions in Wetland B. Sampling point SP-06 is located west of West Bay Drive NW up on the adjacent hillside and upstream of a stream (Unnamed Stream A described below). One upland sampling point, SP-07, was recorded north of sampling point SP-06 on a sloped area above the wetland. The site features, numbered flagging, and sampling point locations for Wetland B are shown on Figure 3B.

3.2.2.1 Vegetation

Wetland B has a prevalence of hydrophytic vegetation, primarily emergent vegetation. Sampling point SP-06 is dominated by reed canary grass (*Phalaris arundinacea*, facultative wetland), with some Himalayan blackberry (*Rubus armeniacus*, FACU). One non-dominant species, stinging nettle, was also observed within sampling point SP-06.

3.2.2.2 Soils

The soils at sampling point SP-06 also appeared to have been disturbed in the past. During the soil sampling, broken glass and small metal debris were found mixed in the soil. Due to the variations in soil texture and coloration, it appears as though fill material and soil grading previously occurred within the wetland; however, these disturbances did not appear to be recent (last 10 or more years). Although the soil contained variations in soil color, this appeared to also be attributed to soil reduction due to saturation as well as from oxidized and reduced fill material. At sampling point SP-06, the hydric soil indicators consisted of depletions below a dark surface (hydric soil indicator A11), and a depleted matrix (hydric soil indicator F3). The soils were highly variable, and two peds were obtained as described below.

In the first ped from 0 to 6 inches BGS, the soils were very dark grayish brown (10 YR 3/2) saturated sandy gravelly loam. From 6 to 14 inches BGS, the soils were dark grayish brown (2.5 Y 4/2) saturated gravelly compacted silt with prominent dark yellowish brown (10 YR 4/6) redox features.

In the second ped obtained at sampling point SP-06 from 0 to 6 inches BGS, the soils were very dark grayish brown (10 YR 3/2) saturated sandy gravelly loam. From 6 to 8 inches BGS, the soils were

very dark grayish brown (10 YR 3/2) saturated very gravelly silt loam with dark yellowish brown (10 YR 3/4) distinct redox features. From 8 to 14 inches BGS, the soils consisted of greenish gray (10Y 5/1) gleyed saturated gravelly compacted silt with dark yellowish brown (10 YR 4/6) prominent redox features.

3.2.2.3 Hydrology

The primary indicators of wetland hydrology observed at sampling point SP-06 were surface water (hydrology indicator A1) and saturation (hydrology indicator A3). No water table was observed; however, the soil surface was saturated, indicating that wetland hydrology likely seeps from the surrounding hillside.

3.2.2.4 Wetland Determination

All three mandatory wetland criteria are satisfied for Wetland B. Landau Associates classified Wetland B as a PEM/slope wetland (Cowardin et al. 1979). Using the Ecology wetland rating form, Wetland B is rated as a Category III wetland with a total score of 35. Wetland B scored highest for water quality and hydrologic functions with scores of 12 in each category. Habitat functions received a score of 11.

The OMC designates wetland buffer areas based on wetland ratings obtained using the Ecology wetland rating system. Category III wetlands that do not meet any of the characteristics described in chapter 18.32.535 of the OMC are assigned a wetland buffer width of 80 ft. However, based on the OMC 18.32.135.B: 'Wetlands and "small lakes" between one thousand (1,000) and four thousand (4,000) square feet shall be exempt from the requirements of OMC 18.32.135.A, provided that the wetland or small lake:

1. Is rated as a Category III or IV wetland,
2. Is not associated with a riparian corridor,
3. Is not part of a wetland mosaic,
4. Does not score 20 points or greater for habitat in the Washington State Wetland Rating System for Western Washington (2004),
5. Does not contain habitat identified as essential for local populations of priority species identified by Washington Department of Fish and Wildlife, and
6. A wetland mitigation report is provided as required by OMC [18.32.590](#).

(Ord. 6426 §27, 2006; Ord. 6356 §5, 2005).'

Wetland B is between 1,000 and 4,000 ft² in size and the habitat score was 11, therefore the wetland meets the exemption requirement in 18.32.515. The project will not impact Wetland B or its associated buffer.

3.2.2.5 Upland Characterization

The upland area adjacent to Wetland B is characterized by sampling point SP-07, which satisfied none of the three mandatory wetland criteria (see Figure 2 and Appendix D). Sampling point SP-07 is located north of sampling point SP-06 on an upland slope to the north of Wetland B (Figure 2).

No wetland hydrology indicators were observed within the upland sampling point adjacent to Wetland B or within the upland area surrounding Wetland B.

The upland area surrounding Wetland B is dominated by non-hydrophytic vegetation. Dominant vegetation at sampling point SP-07 consisted of red alder, Himalayan blackberry, stinging nettle, and English ivy.

The soils at sampling point SP-07 also appeared to have been disturbed in the past. During the soil sampling, broken glass and small metal debris were found. Due to the variations in soil texture and coloration, it appears as though fill material and soil mixing previously occurred within the wetland; however, these disturbances did not appear to be recent (last 10 or more years). Some color variation associated with metal debris was observed. During the field investigation, the soils within the upland sampling point SP-07 were moist. From 0 to 11 inches BGS the soil consisted of very dark grayish brown (10 YR 3/2) loam with sand. From 11 to 14 inches BGS, the soil consisted of brown (10 YR 4/3) silty loam with strong brown (7.5 YR 4/6) distinct redox features.

3.2.3 UNNAMED STREAM A

A stream with a defined channel was observed near the gravel pad to the west of West Bay Drive NW. This stream is not identified on the *Forest Practice Water Type Map* (WDNR website 2013). The stream OHWM was delineated within the study area. The stream is approximately 990 ft² (0.02 acre) in size and is located entirely within the study area. The stream channel begins at Wetland B, and water from the stream appears to infiltrate into the ground west of West Bay Drive NW.

The stream flows from west to east through the study area, and is classified as a Type 5 stream based on the definitions in the OMC and WAC. Chapter 18.32.410 of the OMC defines Type 5 streams as “those surface waters which meet the criteria of the WDNR, WAC 222-16-030 and 031, as a Type 5 Water. These streams are areas of perennial or intermittent seepage, and ponds and drainage ways have short periods of spring or storm runoff. Type 5 streams do not contain salmonid fish habitat.” The equivalent of a Type 5 stream according to WAC 222-16-030 is a Type “Ns” stream. Type Ns waters are

“seasonal, nonfish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and are not located downstream from any stream reach that is a Type Np water [WAC 222-16-030(4)].” The stream appears to be an area of perennial or intermittent seepage with short periods of spring or storm runoff. The stream channel appears to begin up on the adjacent hillside near Wetland B to the west and most likely derives its hydrology from hillside seeps and sheet flow of stormwater runoff.

The stream flows east from Wetland B and down the hillside through a deeply entrenched channel. It then flows into a flat area of dense reed canary grass where the stream loses its channel definition and appears to infiltrate into the ground. This area of dense reed canary grass was determined to be non-wetland (see Area C below). At the time of the field investigation, a surface water connection between the stream, the drainage ditch, and storm drain adjacent to West Bay Drive NW was not observed; however, it is assumed that water would flow into the drainage ditch adjacent to West Bay Drive NW during very high flow conditions. Although the prior period had been slightly drier than normal, the investigation was still completed during the “wet” season in western Washington. No fish were observed in the stream during the investigation, and it is anticipated the stream is dry during the summer months. Chapter 18.32.435 of the OMC assigns 150-ft protective buffers to Type 5 streams. However, the stream buffer in the project area is already impacted by the existing gravel pad, West Bay Drive NW roadway prism, and existing stormwater drainage infrastructure.

3.2.4 AREA C

Area C is approximately 2,228 ft² (0.05 acre) in size and consists of the area adjacent to the observed unnamed stream (Unnamed Stream A) and the area of dense hydrophytic vegetation (reed canary grass) into which Unnamed Stream A was observed to be infiltrating. This area is located entirely within the study area, adjacent to the west of West Bay Drive NW and adjacent to the south of an existing gravel pad. Two sampling points, sampling points SP-03 and SP-04, were taken within Area C. Both sampling points were located adjacent to the stream channel in areas containing standing water. After the investigation, it was determined that Area C only met two of the three wetland criteria and was therefore not considered a wetland.

Wetland hydrology was present within Area C at the time of the investigation. These indicators included surface water (indicator A1) and saturated soils (indicator A3) at both sampling points SP-03 and SP-04.

Sampling point SP-03 within Area C did not meet the criteria for hydrophytic vegetation, while sampling point SP-04 within Area C met the prevalence index criteria for hydrophytic vegetation. Dominant vegetation at sampling point SP-03 included red alder, big leaf maple, Himalayan blackberry,

and creeping buttercup (*Ranunculus repens*, FAC). Dominant vegetation at sampling point SP-04 included Himalayan blackberry and reed canary grass.

During the field investigation, the soil within Area C sampling point SP-03 was saturated with the area containing standing water. From 0 to 6 inches BGS, the soils consisted of very dark grayish brown (10 YR 3/2) sandy loam. From 6 to 8 inches BGS, the soils consisted of very dark grayish brown (10 YR 3/2) sandy loam with faint dark brown (10 YR 3/3) redox features. Below 8 inches BGS, the soils consisted of dark grayish brown (10 YR 4/2) sandy loam with faint dark brown (10 YR 3/3) redox features. No hydric soil indicators were observed at sampling point SP-04.

During the field investigation, the soil within Area C sampling point SP-04 was saturated with the area containing standing water. From 0 to 12 inches BGS, the soils consisted of very dark grayish brown (10 YR 3/2) silty loam. From 12 to 14 inches BGS, the soils consisted of very dark grayish brown (10 YR 3/2) sandy loam. No hydric soil indicators were observed at sampling point SP-04.

3.2.5 AREA D

Area D is approximately 1,499 ft² (0.03 acre) in size and is located entirely within the study area within a drainage ditch along the western edge of the gravel pad, which was observed to have standing water. Based on soil conditions within the ditch (gravel below a thin layer of loam) and its location along the edge of the gravel pad and adjacent to a cut hillside, it is assumed that the ditch was constructed to provide drainage for the gravel pad. One sampling point, sampling point SP-05, was completed to investigate this area. After the investigation, it was determined that Area D only met one of the three wetland criteria and therefore, was not considered a wetland.

Wetland hydrology was present within Area D at the time of the investigation. These indicators included surface water (hydrology indicator A1) and saturation (hydrology indicator A3).

The area within sampling point SP-05 was not vegetated. However, the root mat from dead grass species was observed from 0 to 3 inches BGS. From 0 to 3 inches BGS, the soils consisted of very dark brown (10 YR 2/2) saturated sandy loam with a dense root mat. From 3 to 12 inches BGS, the soils consisted of dark gray to gray (5 Y 4/1-5/1) saturated sandy gravel, which appeared to be old gravel fill material consistent with the adjacent gravel pad.

3.2.6 UNNAMED STREAM B

During the initial wetland reconnaissance conducted on July 20, 2012 by Skillings Connolly (Skillings Connolly 2012), an unnamed stream was identified in the south end of the study area, beyond the limits of proposed improvements.

Unnamed Stream B is piped through the study area. The piped section of Unnamed Stream B passes beneath the property located at 1107 West Bay Drive NW and West Bay Drive NW (Skillings Connolly 2012, City of Olympia 2006), and then discharges into West Bay. According to the *Forest Practice Water Type Map* (WDNR website 2013), the stream begins to the southwest of the study area near Bowman Avenue NW and flows to the northeast into West Bay. The *Forest Practice Water Type Map* identifies the upper reach of Unnamed Stream B as a type “N” stream and the lower reach of Unnamed Stream B as a type “F” stream. Based on the information reviewed, it appears that the stream type change occurs where Unnamed Stream B enters the pipe. The 2006 Hearing Examiner Decision (City of Olympia 2006) identifies Unnamed Stream B as seasonal. According to WAC 222-16-031, type “Ns” waters are Type 5 waters that are seasonal (surface flow is not present for at least some portion of the year), nonfish habitat streams. Type “F” streams are Type 2 and 3 waters that have a high to moderate degree of fish, wildlife, or human use and may be perennial or seasonal. Type 2 streams have a high degree of fish, wildlife, or human use, and Type 3 streams have a moderate degree of fish, wildlife, or human use. The type “F” portion of the stream is piped, and the portion of the stream west of the pipe is non-fishbearing, indicating that a fish passage barrier may be present at the west end of the culvert. The WDFW SalmonScape database (WDFW website 2013b; Appendix G) identifies this stream but does not indicate any fish usage of this stream in the piped or unpiped stream. Additionally, WDFW PHS data (WDFW website 2013a) do not indicate fish usage in the piped or unpiped stream. The 2006 hearing examiner decision (City of Olympia 2006) identifies the Unnamed Stream B as seasonal with a “limited potential for establishing a fishery.” For these reasons, the piped segment of Unnamed Stream B is considered to have minimal to no fish use (and no wildlife or human use).

Therefore, Unnamed Stream B is considered a Type 5 stream at its western reach (unpiped segment west of the study area), which is outside the limits of the proposed project improvements and will not be impacted by the proposed project.

OMC 18.32.435 assigns a 150-ft buffer to Type 5 streams. The 2002 hearing examiner decision (City of Olympia 2002) determined that stream buffers are not required around piped stream segments. Unnamed Stream B and its associated buffer will not be impacted by the project.

3.2.7 SCHNEIDER CREEK

The initial wetland reconnaissance (Skillings Connolly 2012) identified Schneider Creek to the north of the proposed project limits. Schneider Creek passes through a culvert below the Smyth Landing building at 1801 West Bay Drive NW and is located outside the area of proposed improvements. A very small portion of Schneider Creek (which is entirely piped) passes through the study area.

According to the *Forest Practice Water Type Map* (WDNR website 2013), Schneider Creek begins to the west of the study area and discharges into West Bay. The stream is identified as a Type “F” stream. According to WAC 222-16-031, Type “F” streams are Type 2 and 3 waters that have a high to moderate degree of fish, wildlife, or human use and may be perennial or seasonal. Type 2 streams have a high degree of fish, wildlife, or human use, and Type 3 streams have a moderate degree of fish, wildlife, or human use. The WDFW SalmonScape database (WDFW website 2013b; Appendix G) identifies Schneider Creek as containing Coho salmon, indicating that fish use Schneider Creek. Therefore, Schneider Creek has a moderate degree of fish usage and is a Type 3 stream. Schneider Creek is located outside the proposed improvements and will not be impacted by the proposed project.

OMC 18.32.435 assigns a 200-ft buffer to Type 3 streams. However, the hearing examiner decision (City of Olympia 2002) determined that stream buffers are not required around piped stream segments. Therefore, Schneider Creek does not require a protective buffer within the study area.

4.0 REGULATORY ASSESSMENT

A very small portion of the project area is urban shoreline and is within the jurisdiction of the Olympia Shoreline Master Program. Wetlands A and B, Unnamed Streams A and B, and Schneider Creek are not shorelines of the state and are therefore not subject to shoreline jurisdiction under the current regulations. The West Bay shoreline and species within and adjacent to West Bay were not evaluated as a part of this report.

As indicated in Chapter 18.32.515 of the OMC, Category III and IV wetlands and “small lakes” between 1,000 and 4,000 ft² in size which are not associated with a riparian corridor or part of a wetland mosaic, do not score 20 points or higher for habitat, and do not contain habitat identified as essential for priority species identified by WDFW, are exempt from the requirements of OMC 18.32.135.A. However, even though the wetlands are exempt, a wetland mitigation report must still be provided as required by OMC 18.32.590. Wetlands A and B are both rated as Category III wetlands, are between 1,000 and 4,000 ft² in size and are not associated with a riparian corridor [Unnamed Stream A adjacent to Wetland does not contain true riparian vegetation, and does not constitute a riparian corridor]. Although the study area is listed as containing state priority habitats and species, no priority habitats and species are listed within Wetlands A and B (WDFW website 2013a). The township is listed as containing priority *myotis* species, but *myotis* habitat has not been specifically identified within Wetlands A and B. Therefore, Wetlands A and B should be exempt from the requirements of OMC 18.32.135.A. It is not clear in the OMC whether wetlands exempt from the requirements of OMC 18.32.135 are required to apply protective buffers. To be conservative in this report, we applied the standard 80-ft buffer widths to Wetlands A and B.

Chapter 18.32.435 of the OMC allows for stream buffer width averaging and reduction. For Type 5 streams which have no fish usage, buffer width reduction may be allowed up to 50 percent under certain conditions, including a substantial buffer of native vegetation exists or that the buffer has been replanted to a density of 400 tree units per acre with an understory of native plants. Due to the dominance of Himalayan blackberry within the Unnamed Stream A buffer, Unnamed Stream A most likely will not meet the conditions for buffer width reduction. Additionally, Unnamed Stream A buffer is already interrupted by the existing gravel pad and West Bay Drive NW. As previously mentioned, the 2002 hearing examiner decision (City of Olympia 2002) determined that regulated buffers are not required around piped stream segments.

Even though Wetlands A and B may be exempt from some sections of the OMC, wetlands of any size/category may also be regulated by Ecology pursuant to the State Water Pollution Control Act (RCW 90.48) and potentially, USACE. The information provided in this report is presented to assist the

agencies that are ultimately responsible for determining jurisdiction. The jurisdictional determinations made by the City/USACE can be amended to this report or documented in another agreed-upon format.

5.0 ASSESSMENT OF IMPACTS

Potential impacts from the proposed project include approximately 16 ft² of impacts to Wetland A and approximately 6 ft² of impacts to Unnamed Stream A. It is not clear in the OMC whether wetlands exempt from the requirements of OMC 18.32.135 are required to apply regulated buffers.. A large portion of the Wetland A buffer is already impacted by the West Bay Drive NW roadway prism, a driveway to the south of Wetland A, and the industrial development to the east of West Bay Drive NW. A portion of the Wetland B buffer is already impacted by a driveway. A large portion of the Unnamed Stream A buffer is already impacted by the West Bay Drive NW roadway prism, the gravel pad, a building and its driveway, a parking lot, and the industrial development to the east of West Bay Drive NW. If the City determines that regulated buffer widths apply to Wetland A, approximately 3,000 ft² of additional impacts will occur to the already-impacted wetland buffer. Approximately 2,500 ft² of additional impacts will also occur to the already-impacted buffer of Unnamed Stream A. No impacts are anticipated to occur to Wetland B or its associated buffer. As determined in the 2002 hearing examiner decision (City of Olympia 2002), buffers are not required for piped stream segments. As such, no impacts will occur to the streams and associated buffers of the Unnamed Stream B and Schneider Creek. All impacts to waterbodies and buffers will be mitigated for in accordance with Chapter 18.32 of the OMC. One option is provided in OMC 18.32.545 E, “a development project by a public entity...with a wetland less than four thousand (4,000) square feet, may pay a fee to the Department to have the City construct a compensation project. Such a proposal shall be on a case by case basis”. Since the impacts are minor, OMC 18.32.545 E may be an option for public works to consider.

6.0 CONCLUSIONS

Landau Associates has provided this wetland and critical area investigation on behalf of the City to support improvements to the West Bay Drive NW corridor from 1515 West Bay Drive NW to 1115 West Bay Drive NW in Olympia, Washington. The improvements will improve pedestrian safety by installing a sidewalk along the west side of West Bay Drive NW.

Within the study area, two wetlands (Wetlands A and B) and one stream were identified and delineated within the project area. Wetlands A and B were rated as Category III wetlands under the Ecology rating system. Chapter 18.32.535 of the OMC assigns Category III wetlands without special characteristics a buffer width of 80 ft. Unnamed Stream A was classified as a Class 5 stream, which requires a 150-ft buffer under Chapter 18.32.435 of the OMC. Most of the study area has been developed or disturbed as part of development in the past.

Potential impacts from the proposed project include approximately 16 ft² of impacts to Wetland A and approximately 6 ft² of impacts to Unnamed Stream A. The buffers of Wetlands A and B and Unnamed Streams A and B are already impacted by existing development. If the City determines that regulated buffer widths apply to Wetland A, approximately 3,000 ft² additional impacts will occur to the already-impacted wetland buffer. Approximately 2,500 ft² of additional impacts will also occur to the already-impacted buffer of Unnamed Stream A. No impacts are anticipated to occur to Wetland B, Unnamed Stream B, Schneider Creek, or associated buffers. All impacts to waterbodies and buffers will be mitigated for in accordance with Chapter 18.32 of the OMC and since the impacts are minimal, one option is to use OMC 18.32.545.

7.0 USE OF THIS REPORT

These findings are based on our understanding of the OMC, USACE, and Ecology wetland delineation methodology, and on our interpretation of the vegetative, soil, and hydrology conditions observed during the site reconnaissance on March 27, 2013. Within the limitations of scope, schedule, and budget, the findings presented in this report were prepared following generally accepted sensitive area investigation principles and practices in this locality at the time the report was prepared. We make no other warranty, either express or implied.

This report was prepared for the use of the City of Olympia and applicable regulatory agencies. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations presented for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk.

Wetland areas delineated by Landau Associates are considered preliminary until USACE and/or local jurisdictional agencies validate the wetland boundaries. Because wetlands are dynamic communities, wetland boundaries may change over time. The agencies typically recognize wetland delineations for a period of 5 years following an approved jurisdictional determination. In addition, changes in government code, regulations, and/or laws may occur.

This document has been prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.



Brittany N. Hartman
Technician



Theresa M. Turpin, AICP
Associate Planner

BNH/JCS/TMT/jrc

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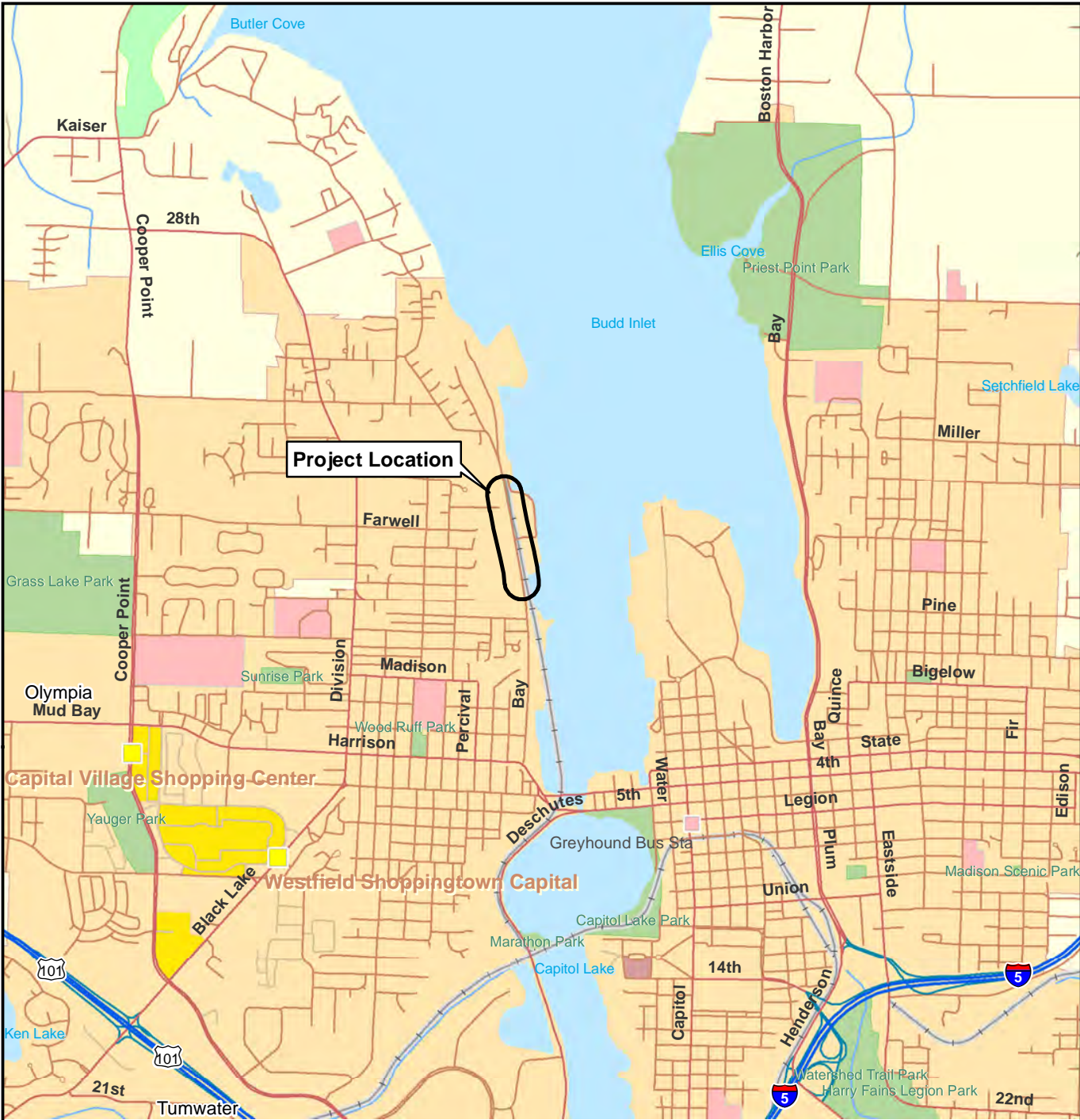
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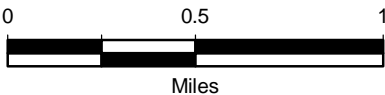
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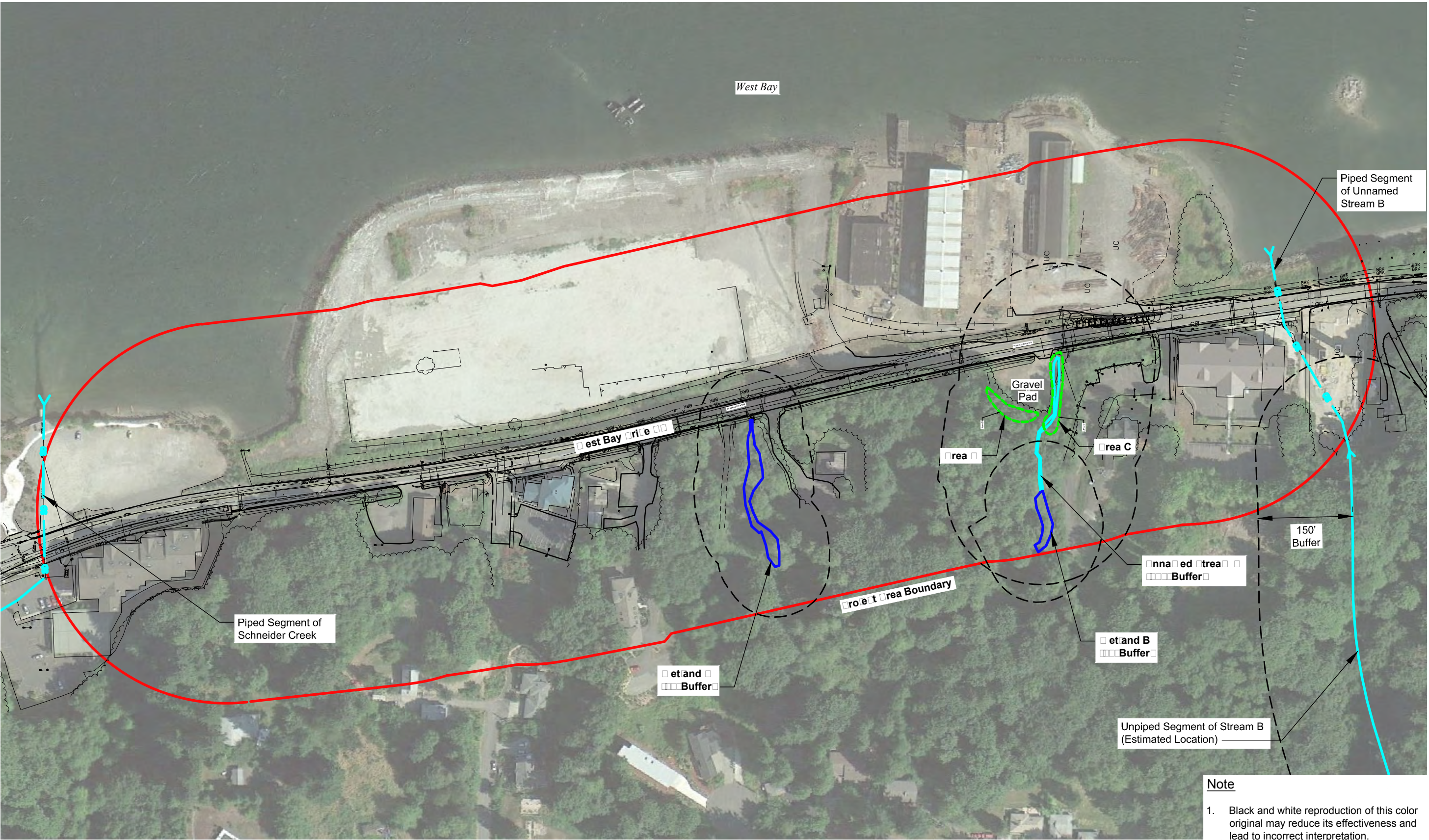


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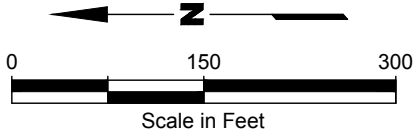
West Bay Drive Improvements City of Olympia Olympia, Washington	Vicinity Map	Figure 1
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LANDAU ASSOCIATES, INC. | V:\2580310\0101\F_Wetland.dwg (A) "Figure 2" 5/21/2013



Note

- 1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



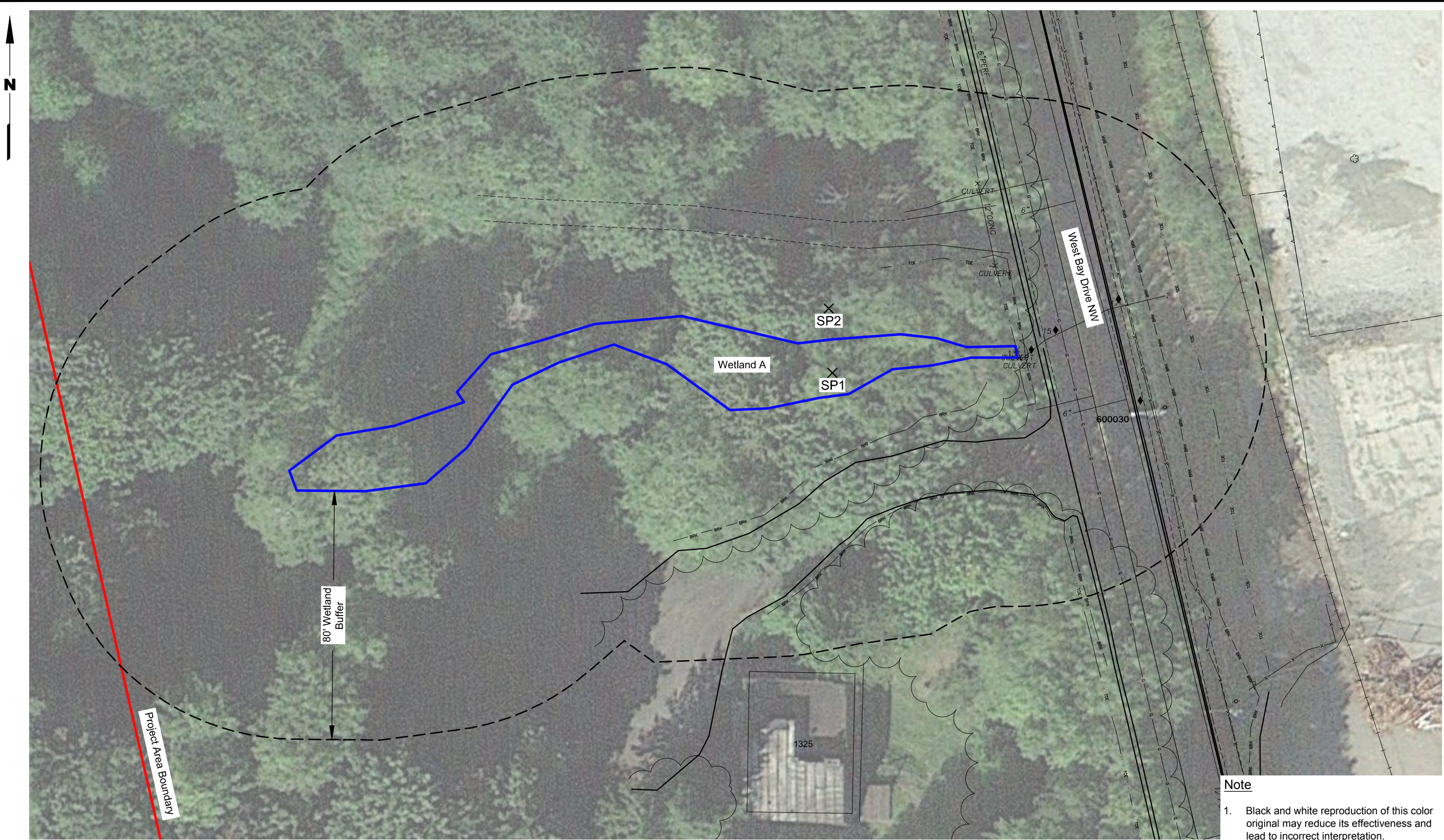
Google Earth Pro 2010; Survey 2013

City of Olympia
West Bay Drive
Improvements
Olympia, Washington

Site Plan

Figure 2

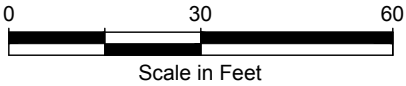
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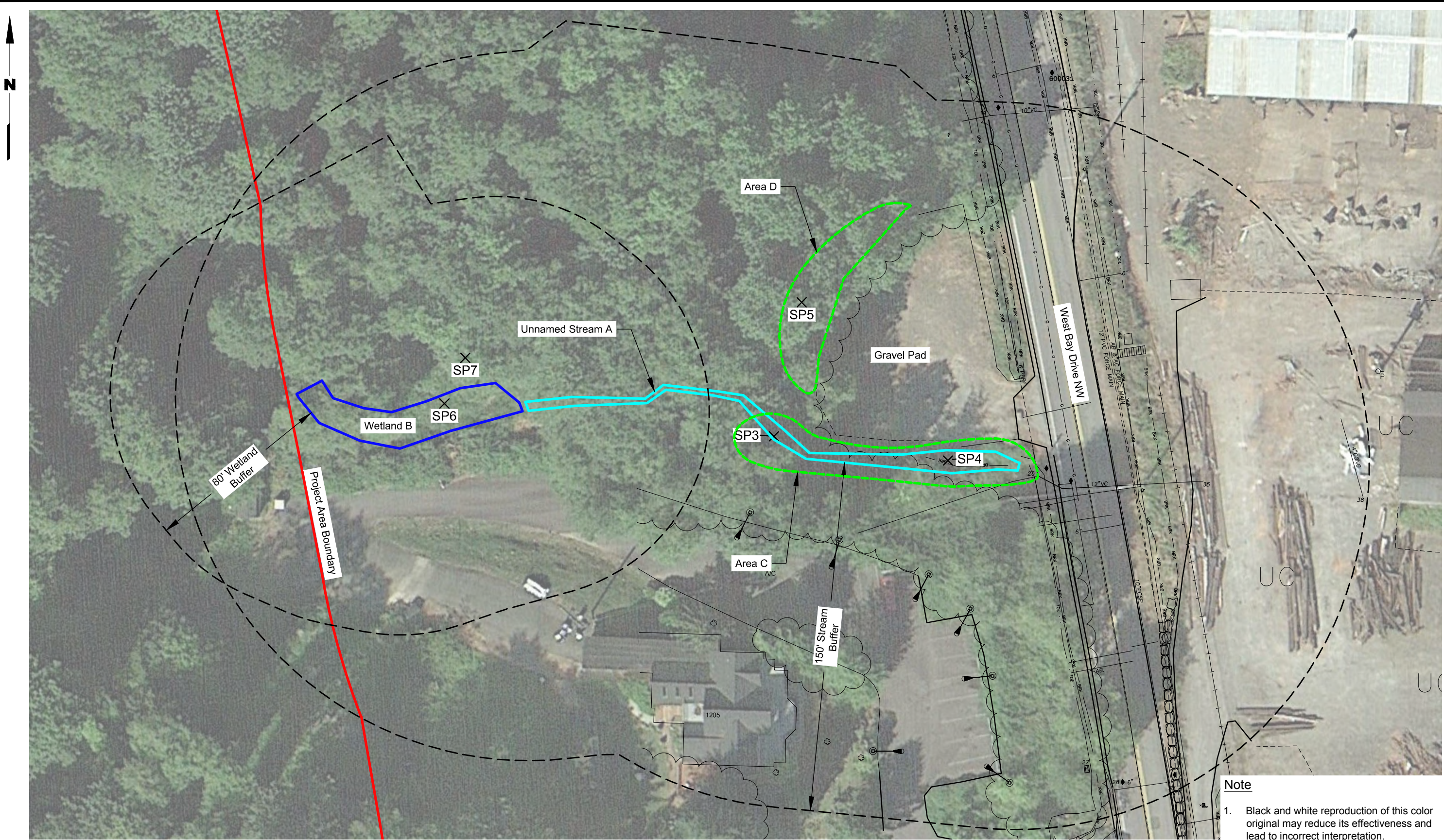
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Google Earth Pro 2010; Survey 2013



City of Olympia West Bay Drive Improvements Olympia, Washington	et and	Figure 3A
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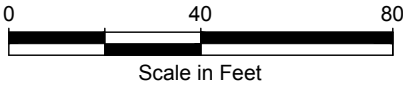
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Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Google Earth Pro 2010; Survey 2013



City of Olympia
West Bay Drive
Improvements
Olympia, Washington

Wetland B, Unnamed Stream A, and Areas C and D

Figure 3B

TABLE 1
METHODS FOR WETLAND DETERMINATION
WEST BAY DRIVE NW IMPROVEMENTS
OLYMPIA, WASHINGTON

Parameter	Definition	Field Indicators	Field Assessment
Wetland Vegetation (a)	<p>Wetland vegetation is adapted to saturated soil conditions. The U.S. Fish and Wildlife Service has assigned a wetland indicator to each plant species that denotes its frequency of occurrence within wetlands (Reed 1988 and 1993). These are:</p> <ul style="list-style-type: none">• Obligate (OBL) wetland plants occur almost always in wetlands under natural conditions (more than 99 percent of the time).• Facultative wetland (FACW) plants usually occur in wetlands (67 to 99 percent of the time) but are occasionally found in nonwetlands.• Facultative (FAC) plants are equally likely to occur in wetlands or nonwetlands (34 to 66 percent of the time).• Facultative upland (FACU) plants usually occur in nonwetlands, but are occasionally found in wetlands (1 to 33 percent of the time).• Obligate upland (UPL) plans almost always occur in uplands (more than 99 percent of the time). <p>* Tentative assignment based on limited information from which to determine the indicator status.</p>	<p>More than 50 percent of the dominant plants totaled from all vegetation strata are hydrophytic, i.e., those species with indicators of OBL, FACW, or FAC (regardless of modifier), or</p> <p>A plant community has a visually estimated cover percentage of OBL and FACW species that exceeds the coverage of FACU and UPL species. If dominance is not met, the Prevalence Index is calculated, or consideration is given to morphological adaptations and/or non-vascular plants observed.</p>	<p>1. Dominance: The dominant plants and their wetland indicator status are evaluated quantitatively within data plots and visually throughout the study area. If the test for dominance fails, and indicators of wetland soils and hydrology are present, the Prevalence Index is calculated.</p> <p>2. Prevalence Index: A weighted average of the percent cover of each indicator status is calculated (see data sheets in Appendix D). An index of 3 or less is considered meeting the hydrophytic vegetation criterion. If the Prevalence Index is not met, the consideration is given to morphological adaptations and/or non-vascular plants.</p> <p>3. Morphological Adaptations/Non-Vascular Plants: Some plants develop recognizable morphological adaptations when occurring in wetland areas. These features must be observed on >50 percent of the individuals of an FACU species living in an area where indicators of hydric soils and wetland hydrology are present. Wetland non-vascular plants can include bryophytes (mosses, liverworts, hornworts). The cover of wetland bryophytes must be >50 percent of the total bryophyte cover in a plot in coastal Washington forested wetlands.</p>
Wetland Soils (b)	<p>Soils are classified as hydric, or they possess characteristics that are associated with reducing soil conditions. A hydric soil is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil.</p>	<p>Hydric soils have an identifiable color pattern, which occurs if the soil is saturated, flooded, or ponded for a long period of time. Faint or washed-out colors typically form in the soil, and mottles of bright color, such as rust (known as redoxymorphic features), form. Accumulations of organic matter at the surface, a sulfur odor, and organic matter stains may also be present.</p>	<p>A shovel is used to dig holes at least 20 inches BGS at multiple locations in the study area. Direct observation of the soil is made at multiple locations in both wetlands and uplands, as applicable. Soil organic content is determined visually and texturally, and soil color is determined using the Munsell soil color chart (Greytag Macbeth 1994). Depth to water saturation and/or inundation is also observed (see Wetland Hydrology). The characteristics observed are compared to the hydric soil indicators for “all soils,” “sandy soils,” and “loamy clayey soils,” as described in the USACE Regional Supplement (USACE 2010); and for hydric soils indicators as described in the Ecology wetland delineation manual (Ecology 1997).</p>
Wetland Hydrology (c)	<p>The area is inundated either permanently or periodically at mean water depths less than or equal to 6.6 ft, or</p> <p>The soil is inundated or saturated to the surface for at least 14 consecutive days during the growing season (d).</p>	<p>Primary indicators of wetland hydrology include surface inundation (standing water), saturated soils, water marks, drift lines, sediment deposits, and drainage patterns. Secondary indicators of hydrology include water-stained leaves, oxidized root channels, or local soil survey data for identified soils. In the absence of any primary indicators, at least two secondary indicators are required to meet the wetland hydrology criterion.</p>	<p>During investigation of soils, soil pits are allowed to stand for up to 20 minutes in order to allow percolation of any groundwater into the pit to determine groundwater level in the soil profile. Additional digging may occur to 24 inches BGS during the dry season to investigate groundwater levels. In addition, the extent of soil saturation and presence/absence of oxidation are determined in the soils removed as part of the soils investigation (see Wetland Soils). Other indicators of wetland hydrology are observed at ground surface.</p>

Notes:

(a) Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel.

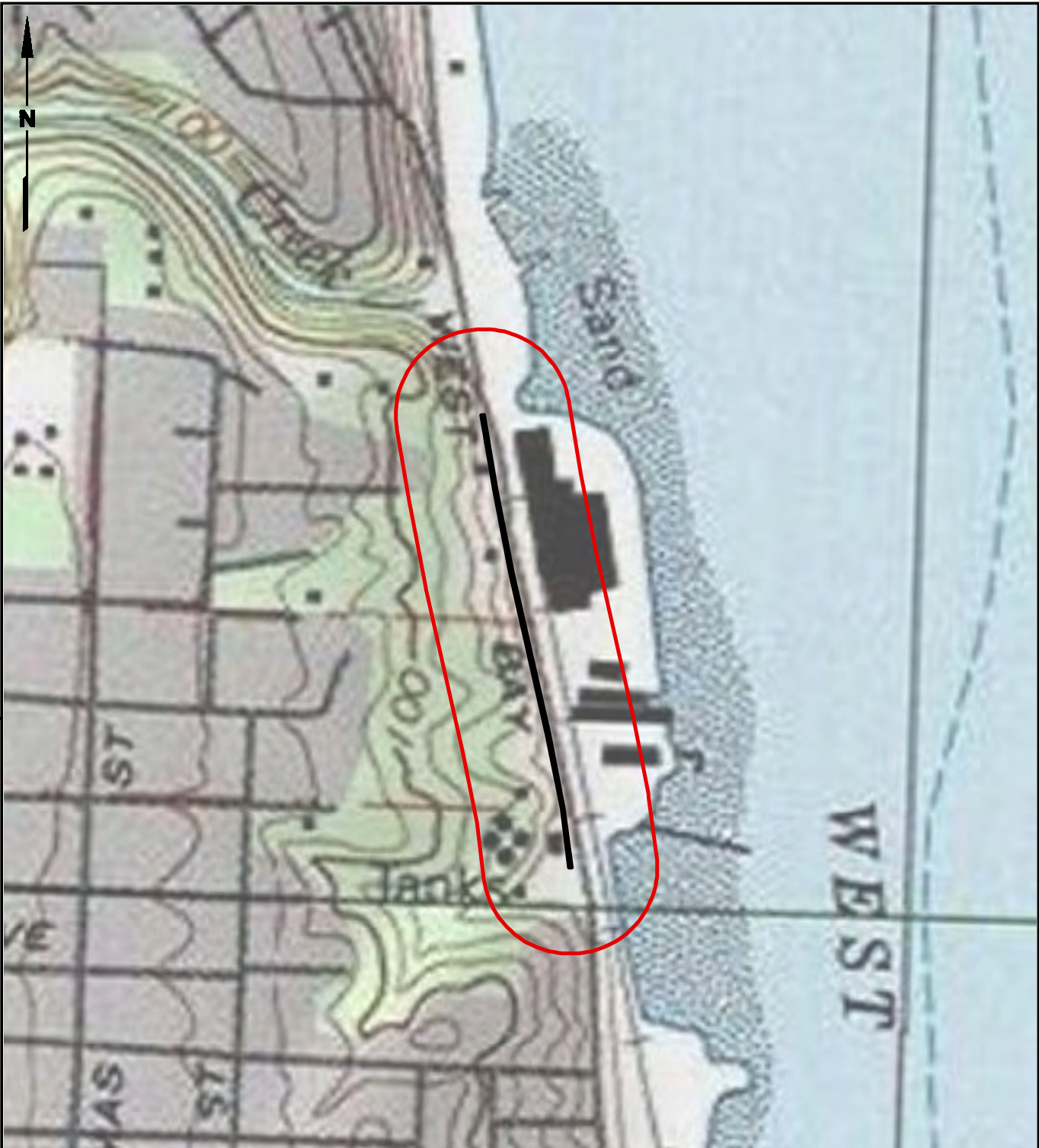
(b) USACE 1987 2010; USDA, NRCS 2006.

(c) USACE 1987, 2010.



(d) The growing season is the time during which two or more non-evergreen vascular plant species growing in a wetland or surrounding area exhibit biological activity, such as new growth. Growing season can also be determined by soil temperature.

Background Information Review Figures

Y:\Projects\258031\010\WetlandReport\FigureA-1Topo.mxd 5/24/2013 NAD 1983 StatePlane Washington South FIPS 4602 Feet

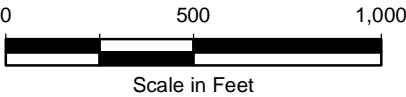


Legend

-  Project Area
-  Study Area

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Data Source: USDA NRCS.





West Bay Drive Improvements City of Olympia Olympia, Washington	USGS Topographic Map	Figure A-1
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Y:\Projects\258031\010\WetlandReport\FigureA-2Aerial.mxd 5/24/2013 NAD 1983 StatePlane Washington South FIPS 4602 Feet



Legend

-  Project Area
-  Study Area

Note

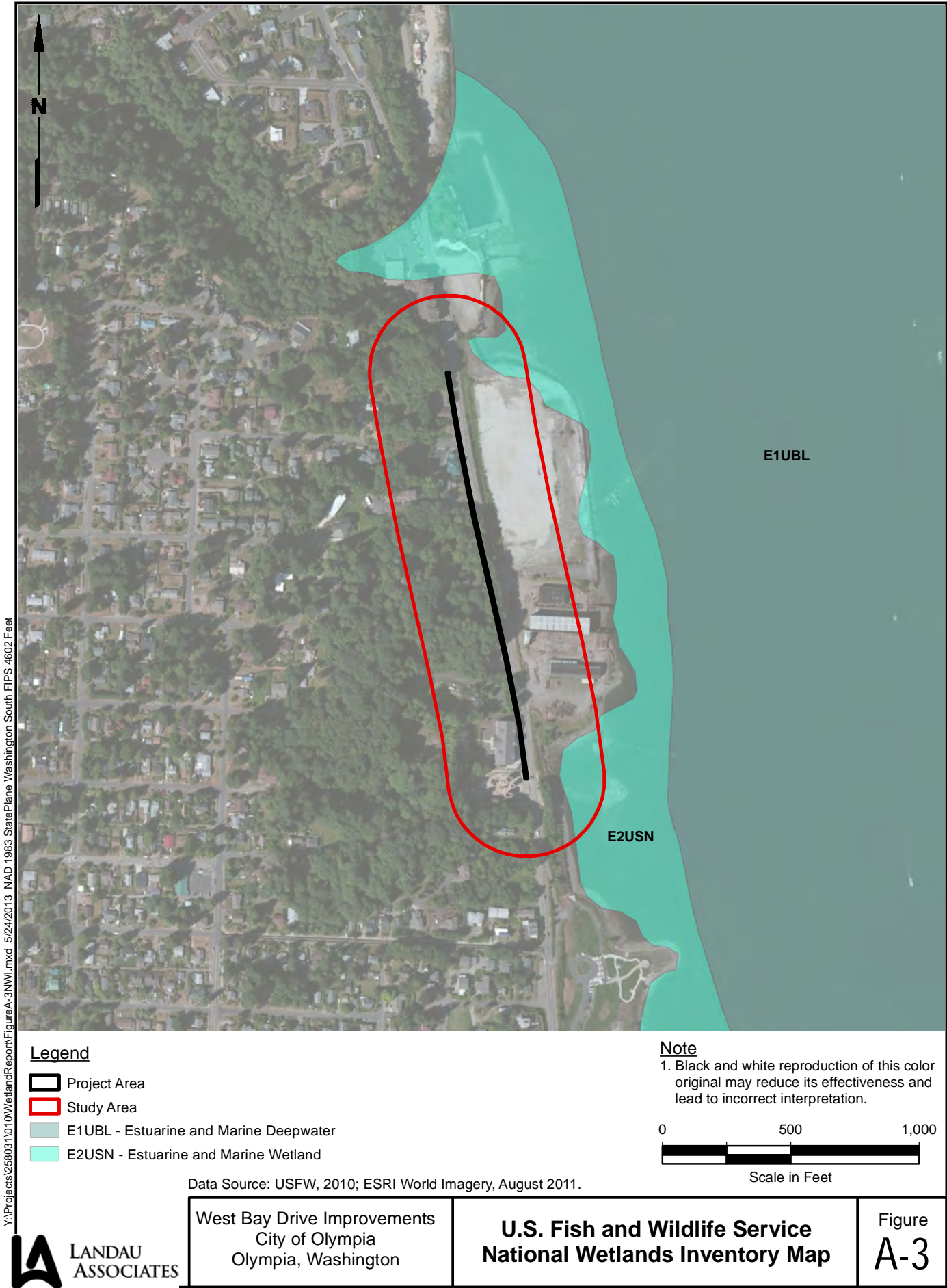
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



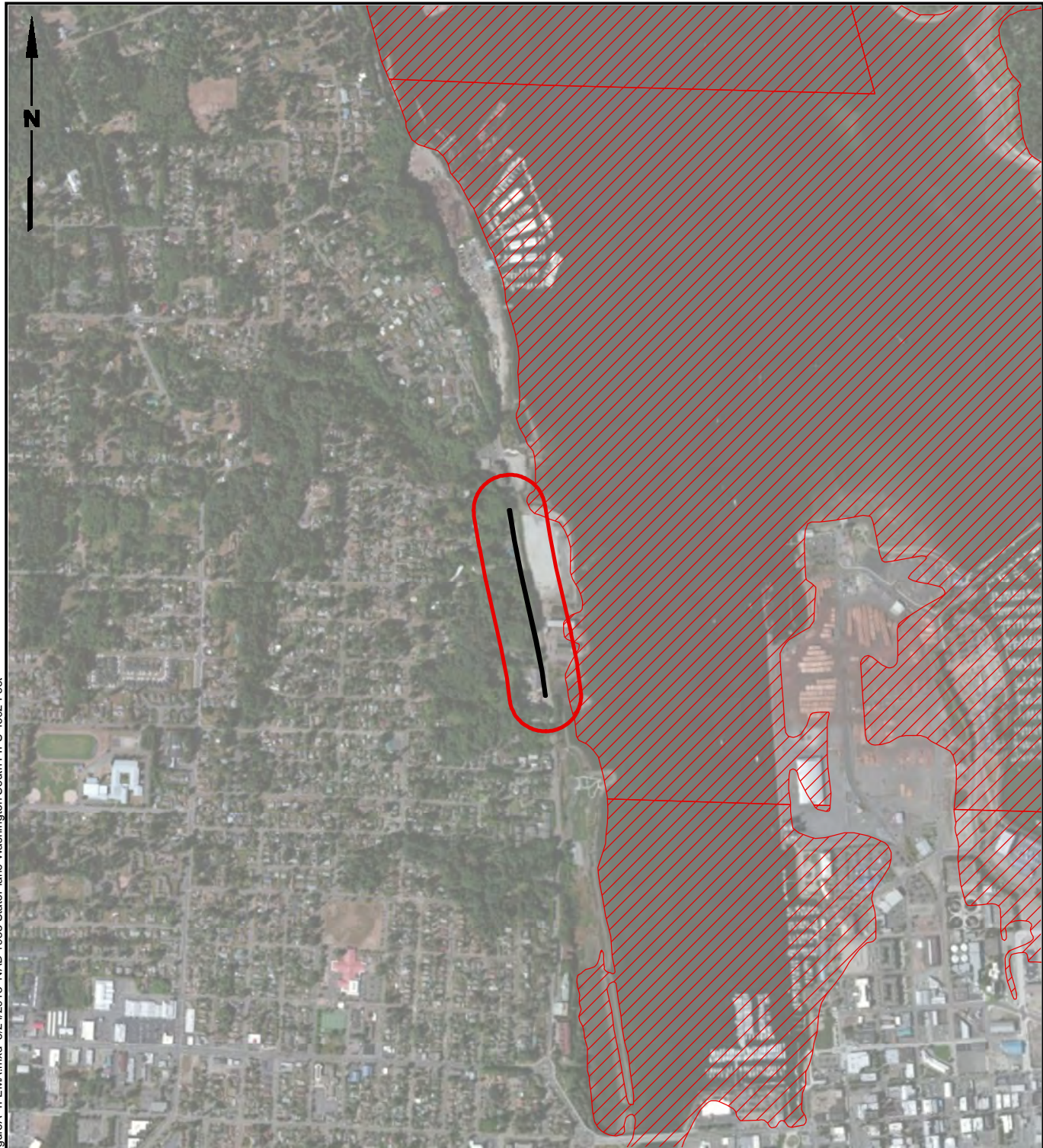
Data Source: ESRI World Imagery, August 2011.



West Bay Drive Improvements City of Olympia Olympia, Washington	Aerial Photograph	Figure A-2
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Y:\Projects\25803\1010\WetlandReport\FigureA-4\FEMA.mxd 5/24/2013 NAD 1983 StatePlane Washington South FIPS 4602 Feet



Legend

- Project Area
- Study Area
- 100-Year Flood Plain

Note

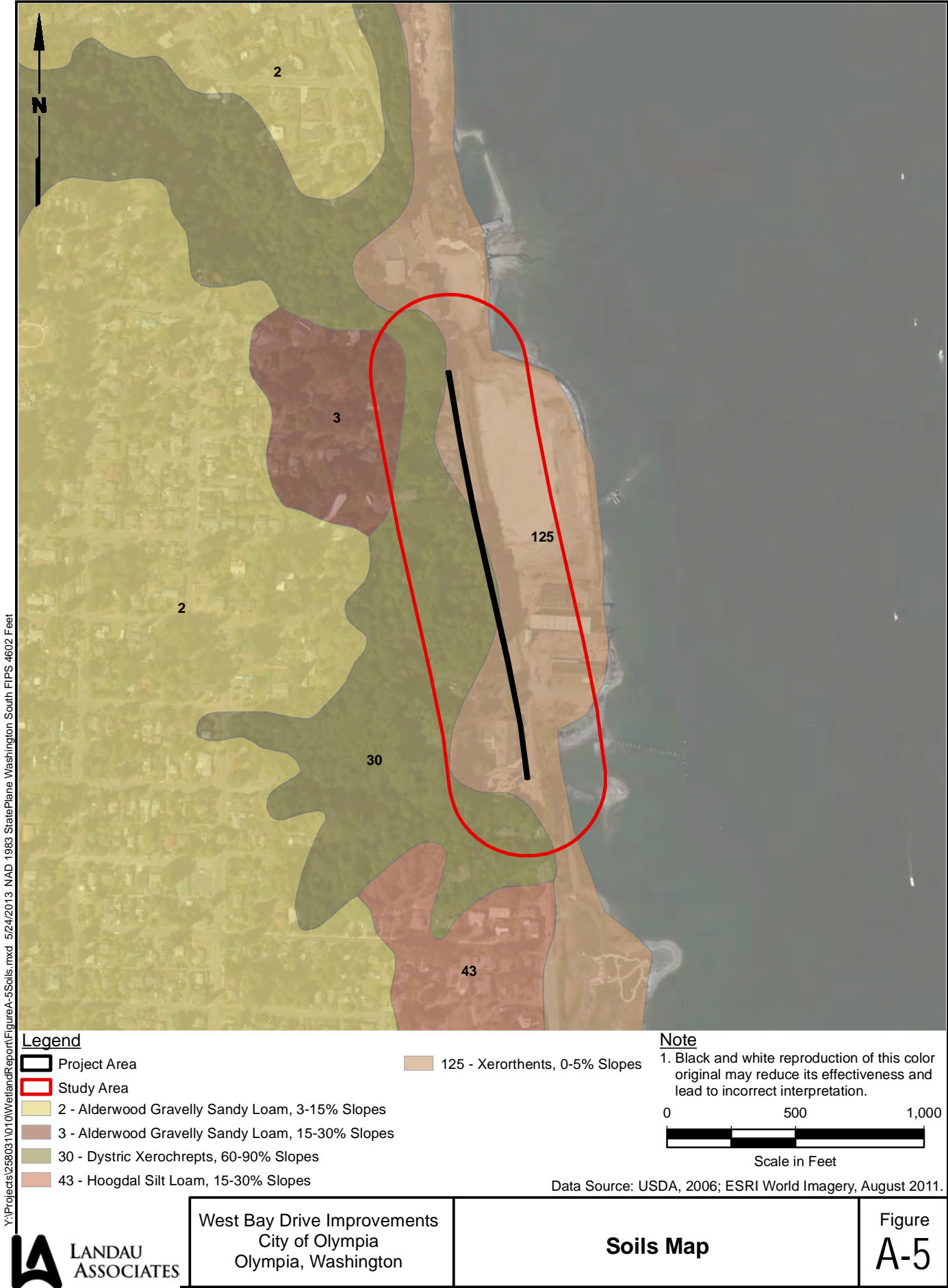
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Data Source: FEMA; ESRI World Imagery, August 2011.



West Bay Drive Improvements City of Olympia Olympia, Washington	FEMA GIS Flood Map	Figure A-4
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Y:\Projects\258031010\WetlandReport\FigureA-5Soils.mxd 5/24/2013 NAD 1983 StatePlane Washington South FIPS 4802 Feet

APPENDIX B

Soil Profile Reports

LOCATION ALDERWOOD WA

Established Series
Rev. AD/CAB/MPR
11/2011

ALDERWOOD SERIES

The Alderwood series consists of moderately deep to a densic contact, moderately well drained soils formed in glacial drift. Alderwood soils are on glacially modified foothills and valleys and have slopes of 0 to 65 percent. The mean annual precipitation is about 1,000 mm and the mean annual temperature is about 10 degrees C.

TAXONOMIC CLASS: Loamy-skeletal, isotic, mesic Aquic Dystroxerepts

TYPICAL PEDON: Alderwood gravelly sandy loam - forested. (Colors are for moist soil unless otherwise noted.)

A--0 to 18 cm; very dark grayish brown (10YR 3/2) gravelly sandy loam, brown (10YR 5/3) dry; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; few fine irregular pores; 20 percent gravel; moderately acid (pH 5.8); abrupt smooth boundary. (7 to 18 cm thick)

Bw1--18 to 53 cm; dark yellowish brown (10YR 4/4) very gravelly sandy loam, yellowish brown (10YR 5/4) dry; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; many fine tubular and irregular pores; 35 percent gravel; gradual smooth boundary; moderately acid (pH 5.8).

Bw2--53 to 75 cm; brown (10YR 4/3) very gravelly sandy loam, pale brown (10YR 6/3); dry; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; few very fine tubular pores; 40 percent gravel; moderately acid (pH 5.8); clear wavy boundary. (Combined Bw1 and Bw2 horizons is 35 to 67cm thick)

Bg--75 to 89 cm; 50 percent olive brown (2.5Y 4/4) very gravelly sandy loam, light yellowish brown (2.5Y 6/4) dry and 50 percent dark grayish brown (2.5Y 4/2) iron-manganese nodules with strong brown (7.5YR 5/6) coatings on fragments, light brownish gray (2.5Y 6/2) and reddish yellow (7.5YR 6/6) dry; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; common fine tubular and interstitial pores; 45 percent gravel; moderately acid (pH 6.0); abrupt wavy boundary. (8 to 38 cm thick)

2Cd1--89 to 109 cm; dark grayish brown (2.5Y 4/2) very gravelly sandy loam, light brownish gray (2.5Y 6/2) dry; dark yellowish brown (10YR 4/4), olive (5Y 4/4), yellowish red (5YR 4/6) and strong brown (7.5YR 5/6) coatings in cracks; massive; extremely hard; extremely firm, nonsticky and nonplastic; few fine roots; few fine tubular pores; 40 percent gravel; moderately

acid (pH 6.0); abrupt irregular boundary. (13 to 51 cm thick)

2Cd2--109 to 150 cm; grayish brown (2.5Y 5/2) dense glacial till that breaks to very gravelly sandy loam, light gray (2.5Y 7/2) dry; massive; extremely hard, extremely firm, nonsticky and nonplastic; 40 percent gravel; moderately acid (pH 6.0).

TYPE LOCATION: Snohomish County, Washington; about 8 km east of Lynnwood on Maltby road; 61 meters south and 122 meters east of the center of section 28, T. 27 N., R. 5 E.

RANGE IN CHARACTERISTICS:

Depth to densic contact - 50 to 100 cm

Mean annual soil temperature - 8 to 13 degrees C.

Moisture control section - dry 60 to 75 consecutive days following the summer solstice

Reaction - strongly acid to slightly acid above the 2Cd horizon

Particle-size control section - averages 35 to 50 percent total rock fragments and 5 to 15 percent clay

Depth to redox features with chroma of 2 or less - 45 to 75 cm

A horizon

Hue - 10YR or 7.5YR

Value - 2 or 3 moist, 3 to 5 dry

Chroma - 2 to 4 moist and dry

Rock fragments - 15 to 65 percent total, 15 to 65 percent gravel, 0 to 5 percent cobbles, and 0 to 5 percent stones

An E horizon less than 3 cm thick is sometimes present.

Bw horizons

Fine earth texture - SL, L, or COSL

Hue - 10YR or 7.5YR

Value and chroma - 2 to 6 dry or moist

Rock fragments - 15 to 65 percent total, 15 to 65 percent gravel, 0 to 15 percent cobbles, and 0 to 5 percent stones

Bg horizon (2BC or 2CB horizon)

Fine-earth texture - SL, L, or COSL

Hue - 10YR or 2.5Y

Value - 5 to 7 dry

Chroma - 2 to 4 moist and dry

Redox concentrations - beginning within 75 cm of the surface

Rock fragments - 35 to 85 percent total, 35 to 60 percent gravel, 0 to 25 percent cobbles, and 0 to 5 percent stones

2Cd horizons

Fine-earth texture - SL, LS, COSL, or FSL

Hues - 10YR or 2.5Y

Value - 4 to 8 dry

Chroma - 1 to 3 moist and dry

Rock Fragments - 15 to 45 percent total, 0 to 45 percent gravel, 0 to 10 percent cobbles, and 0 to 5 percent stones.

Reaction - slightly to moderately acid

COMPETING SERIES: This is the [Whidbey](#) series. Whidbey soils are dry 75 to 90 consecutive days following the summer solstices.

GEOGRAPHIC SETTING: These soils are on till plains and moraines at elevations of 0 to about 245 meters. Slope is 0 to 65 percent. The soils formed in glacial till. Alderwood soils are in a cool marine climate. The summers are cool and dry, and the winters are mild and wet. Mean annual precipitation is 200 to 1500 cm, most of which falls as rain from November through March. Mean January temperature is 3 degrees C, mean July temperature is 16 degrees C, and mean annual temperature is 10 degrees C. The growing season (-2 degrees C) is about 200 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Beausite](#), [Dick](#), [Everett](#), [Hoogdal](#), [Indianola](#), [Kitsap](#), [Norma](#), [Quilcene](#), [Skipopa](#) and [Whidbey](#) series. All of these soils except Whidbey soils lack a densic layer within 100 cm. In addition, the Beausite soils have a lithic contact at 50 to 100 cm. Dick, Hoogdal, Indianola, Kitsap, and Skipopa soils have less than 35 percent coarse fragments. Everett soils are sandy-skeletal. McKenna soils have an aquic moisture regime. Norma soils have an aquic moisture regime of less than 35 percent coarse fragments in the upper part of the control section. Quilcene soils are in a fine family.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well drained; high saturated hydraulic conductivity above the densic layer and low saturated hydraulic conductivity in the densic material. A perched water table is at its highest from January through March.

USE AND VEGETATION: Used mostly for woodland, field crops, hay and pasture, orchards, vineyards, wildlife habitat, watershed, and non-farm uses. The natural vegetation is Douglas-fir, western hemlock, western redcedar, and red alder with an understory of salal, Oregon-grape, western brackenfern, western swordfern, Pacific rhododendron, red huckleberry, evergreen huckleberry, and Orange honeysuckle.

DISTRIBUTION AND EXTENT: Northwestern Washington; MLRA 2. The series is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Snohomish County, Washington 1936.

REMARKS: Diagnostic horizons and features recognized in this soil:

Ochric epipedon

Cambic horizon - from 18 to 89 cm

Densic contact - from 89 to 150 cm

Aquic feature - redox depletions with chroma of 2 or less at 75cm.

Humic subgroup - meet color requirement from 0 to 18 cm

Particle-size control section - 25 to 89 cm.

The current typical pedon is borderline in meeting the Aquic subgroup criteria and is also borderline in meeting Humic subgroup criteria. Based on the range of characteristics, the present classification is marginal to being Aquic subgroup and marginal to not meeting Humic subgroup criteria. It is recommended a new typical pedon be selected to represent the series concept and classification.

The series has had a long history in classification, much of it involves the cementation or not of the upper part of the glacial till. The series in 1978 started as a loamy-skeletal, mixed, mesic Dystric Entic Durochrepts, then in 1988 to a loamy-skeletal, mixed, mesic, ortstein Aquic Haplorthods, then in 1994 to a loamy-skeletal, mixed, mesic Vitrandic Durochrepts, then in 2000 to a loamy-skeletal, isotic, mesic Vitrandic Dystroxerepts and in 2011 to a loamy-skeletal, isotic, mesic Aquic Dystroxerepts. The 89 to 109 cm horizon is the horizon in question as to cementation or not, and if cemented, what is the cementing agent. The material was studied in the late 1960's and early 1970's and it was thought at that time to be cemented, but the cementing agent was not easily identifiable. The strength of Vitrandic properties in the upper part of the solum is very weak. Given all this change in classification the typical pedon has remained the same and the concept of a moderately deep and moderately well drained soil has remained the same.

An in depth study of the glacial till is needed throughout the Puget Sound foothills on several similar soil series.

ADDITIONAL DATA: Partial data available for this series. Sample # S71WA033002, 71WA033003, S04WA-061-002, and S09WA053098.

National	Cooperative	Soil	Survey
U.S.A.			

Thurston County Area, Washington

30—Dystric Xerochrepts, 60 to 90 percent slopes

Map Unit Setting

Mean annual precipitation: 50 inches
Mean annual air temperature: 50 degrees F
Frost-free period: 180 days

Map Unit Composition

Dystric xerochrepts and similar soils: 85 percent
Minor components: 5 percent

Description of Dystric Xerochrepts

Setting

Landform: Escarpments
Parent material: Colluvium and glacial till

Properties and qualities

Slope: 60 to 90 percent
Depth to restrictive feature: 20 to 72 inches to densic material
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low
to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.1 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 7e
Hydrologic Soil Group: C

Typical profile

0 to 4 inches: Very gravelly sandy loam
4 to 30 inches: Very gravelly sandy loam
30 to 34 inches: Very gravelly sandy loam

Minor Components

Skipopa

Percent of map unit: 5 percent

Data Source Information

Soil Survey Area: Thurston County Area, Washington
Survey Area Data: Version 2, Jul 27, 2012

Thurston County Area, Washington

125—Xerorthents, 0 to 5 percent slopes

Map Unit Setting

Landscape: Uplands

Mean annual precipitation: 30 to 60 inches

Mean annual air temperature: 39 to 50 degrees F

Frost-free period: 150 to 200 days

Map Unit Composition

Xerorthents and similar soils: 100 percent

Description of Xerorthents

Setting

Landform: Tidal flats

Parent material: Sandy and loamy cut and fill material

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Depth to water table: About 24 inches

Frequency of flooding: None

Frequency of ponding: None

Interpretive groups

Farmland classification: Not prime farmland

Land capability (nonirrigated): 7s

Typical profile

0 to 60 inches: Variable

Data Source Information

Soil Survey Area: Thurston County Area, Washington

Survey Area Data: Version 2, Jul 27, 2012

APPENDIX C

Hydrology Data

NOAA Divisional Data

Puget Sound Lowlands

[illegible]

USDA NRCS Wetlands Retrieval (WETS) Data

WETS Station : OLYMPIA WSO AP, WA6114

Creation Date: 09/10/2002

Latitude: 4658 Longitude: 12254

Elevation: 00190

State FIPS/County(FIPS): 53067

County Name: Thurston

Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)				
	avg daily max	avg daily min	avg	avg	30% chance will have		avg # of days w/.1 or more	avg total snow fall
					less than	more than		
January	45.3	31.8	38.5	7.54	4.76	9.10	13	4.3
February	49.4	32.7	41.0	6.17	3.92	7.44	12	3.9
March	54.2	34.2	44.2	5.29	3.91	6.20	12	1.0
April	59.4	36.6	48.0	3.58	2.53	4.24	9	0.1
May	65.6	42.0	53.8	2.27	1.41	2.74	6	0.0
June	70.8	46.6	58.7	1.78	1.23	2.12	5	0.0
July	76.7	49.9	63.3	0.82	0.36	1.01	2	0.0
August	77.6	49.8	63.7	1.10	0.39	1.35	2	0.0
September	72.2	45.2	58.7	2.03	0.73	2.56	4	0.0
October	60.9	39.1	50.0	4.19	2.42	5.09	8	0.0
November	50.1	35.3	42.7	8.13	5.58	9.69	14	1.5
December	44.5	32.0	38.3	7.89	5.76	9.28	13	3.5
Annual	-----	-----	-----	-----	45.75	55.07	--	----
Average	60.6	39.6	50.1	-----	-----	-----	--	----
Total	-----	-----	-----	50.79	-----	-----	100	14.3

Figure 19-7 Rainfall documentation worksheet

Rainfall Documentation
(use with photographs)

Date: 3/28/13

Weather station: Olympia WSO AP, WA6114 Landowner: City of Olympia Tract no.: _____

County: Thurston State: WA

Soil name: _____ Growing season: _____

Photo date: _____

Long-term rainfall records								
Month	3 yrs. in 10 less than	Normal	3 yrs. in 10 more than	Rain fall	Condition dry, wet, normal	Condition value	Month weight value	Product of previous two columns
1st prior month*	Feb. 3.92	6.17	7.44	2.47	dry	1	3	3
2nd prior month*	Jan. 4.76	7.54	9.10	5.59	normal	2	2	4
3rd prior month*	Dec. 5.76	7.89	9.28	8.04	normal	2	1	2
							Sum	9

* Compared to photo date

Note: If sum is

6 - 9	then prior period has been drier than normal
10 - 14	then prior period has been normal
15 - 18	then prior period has been wetter than normal

Condition value:

Dry	=1
Normal	=2
Wet	=3

Conclusions:

Source:
USDA, NRCS website. 1997. Figure 19-7 Rainfall Documentation Worksheet. Engineering Field Handbook-Hydrology Tools for Wetland Determination. <http://policy.nrcs.usda.gov/OpenNonWebContent.aspx?content=17556.wba>.

Data Sheets

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

Project/Site: City of Olympia West Bay Drive City/County: Olympia/Thurston Sampling Date: 3/27/2013
 Applicant/Owner: City of Olympia State: WA Sampling Point: SP-01
 Investigator(s): Jessica Stone; Brittany Hartman Section, Township, Range: S 10, T 18 North, R 2 West
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): A Lat: 47° 03' 21.09" N Long: 122° 54' 51.41" W Datum: _____
 Soil Map Unit Name: Xerorthents, 0 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation X, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: SP-01 located within Wetland A in an inundated area. The prior period has been slightly drier than normal.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60%</u> (A/B)
1. <u>Alnus rubra</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Acer macrophyllum</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	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 = _____
<u>30</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: 5 ft)				
1. <u>Rubus spectabilis</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input checked="" type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>20</u> = Total Cover				
Herb Stratum (Plot size: 3 ft)				
1. <u>Lysichiton americanus</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Urtica dioica</u>	<u>1</u>	<u>N</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>16</u> = Total Cover				
Woody Vine Stratum (Plot size: 3 ft)				
1. <u>Hedera helix</u>	<u>100</u>	<u>Y</u>	<u>NI</u>	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
<u>100</u> = Total Cover				
% Bare Ground in Herb Stratum <u>100</u>				

Remarks: Hedera helix is typically an upland plant but was observed rooted in the wetland, however, as a woody vine the stems extend from the surrounding upland area. Presence of Hedera helix indicates problematic hydrophytic vegetation due to its status as an aggressive invasive plant (USACE 2010).

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-7	10 YR 2/2	100					-->	Sandy loam (saturated)
7-12	2.5 Y 3/1	97	7.5 YR 3/4	3			-->	Sandy loam (saturated)
12-14	2.5 Y 3/1	90	7.5 YR 3/4	10			-->	Sandy loam (saturated)

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 1" _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): Surface _____ (includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: Hydrology is from seeps along the hilside.		

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

Project/Site: City of Olympia West Bay Drive City/County: Olympia/Thurston Sampling Date: 3/27/2013
 Applicant/Owner: City of Olympia State: WA Sampling Point: SP-02
 Investigator(s): Jessica Stone; Brittany Hartman Section, Township, Range: S 10, T 18 North, R 2 West
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): ~10
 Subregion (LRR): A Lat: 47° 03' 21.09" N Long: 122° 54' 51.41" W Datum: _____
 Soil Map Unit Name: Xerorthents, 0 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: SP-02 located to north of SP-01 up on hillside. The prior period has been slightly drier than normal.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25%</u> (A/B)
1. <u>Alnus rubra</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Acer macrophyllum</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>10</u> x 3 = <u>30</u> FACU species <u>15</u> x 4 = <u>60</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>25</u> (A) <u>90</u> (B) Prevalence Index = B/A = <u>3.60</u>
= Total Cover				

Sapling/Shrub Stratum (Plot size: 5 ft)				
1. <u>Oemleria cerasiformis</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				

Herb Stratum (Plot size: 3 ft)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
= Total Cover				

Woody Vine Stratum (Plot size: 3 ft)				
1. <u>Hedera helix</u>	<u>100</u>	<u>Y</u>	<u>NI</u>	
2. _____	_____	_____	_____	
= Total Cover				

% Bare Ground in Herb Stratum <u>100</u>				

SOIL

Sampling Point: SP-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-12	10 YR 3/1	100					-->	Loam with sand (moist)
12-16+	10 YR 4/3	100					-->	Sandy loam (moist)

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators:	
<u>Primary Indicators (minimum of one required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (2 or more required)</u> <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Soils were moist, but not saturated.	

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

Project/Site: City of Olympia West Bay Drive City/County: Olympia/Thurston Sampling Date: 3/27/2013
 Applicant/Owner: City of Olympia State: WA Sampling Point: SP-03
 Investigator(s): Jessica Stone; Brittany Hartman Section, Township, Range: S 10, T 18 North, R 2 West
 Landform (hillslope, terrace, etc.): Bottom of hillslope Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): A Lat: 47° 03' 21.09" N Long: 122° 54' 51.41" W Datum: _____
 Soil Map Unit Name: Xerorthents, 0 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: SP-03 located in Area C within stream channel. The prior period has been slightly drier than normal.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. <u>Alnus rubra</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Acer macrophyllum</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>55</u> x 3 = <u>165</u> FACU species <u>22</u> x 4 = <u>88</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>77</u> (A) <u>253</u> (B) Prevalence Index = B/A = <u>3.29</u>
= Total Cover				

Sapling/Shrub Stratum (Plot size: 5 ft)				
1. <u>Rubus armeniacus</u>	<u>2</u>	<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
= Total Cover				

Herb Stratum (Plot size: 3 ft)				
1. <u>Ranunculus repens</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____	_____	_____	_____	
= Total Cover				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

Woody Vine Stratum (Plot size: 3 ft)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	
= Total Cover				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

% Bare Ground in Herb Stratum <u>100</u>				

SOIL

Sampling Point: SP-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-6	10 YR 3/2	100					-->	Sandy loam (saturated)
6-8	10 YR 3/2	100	10 YR 3/3	5			-->	Sandy loam (saturated)
8-12+	10 YR 4/2		10 YR 3/3	7			-->	Sandy loam (saturated)

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
--	---

Remarks: These soils have likely been disturbed in the past.

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>1 "</u> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u> (includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

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

Project/Site: City of Olympia West Bay Drive City/County: Olympia/Thurston Sampling Date: 3/27/2013
 Applicant/Owner: City of Olympia State: WA Sampling Point: SP-04
 Investigator(s): Jessica Stone; Brittany Hartman Section, Township, Range: S 10, T 18 North, R 2 West
 Landform (hillslope, terrace, etc.): Bottom of hillslope Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): A Lat: 47° 03' 21.09" N Long: 122° 54' 51.41" W Datum: _____
 Soil Map Unit Name: Xerorthents, 0 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: SP-04 located within Area C adjacent to stream feature. The prior period has been slightly drier than normal.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>100</u> x 2 = <u>200</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>5</u> x 4 = <u>20</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>105</u> (A) <u>220</u> (B) Prevalence Index = B/A = <u>2.095</u>
Sapling/Shrub Stratum (Plot size: 5 ft) 1. <u>Rubus armeniacus</u> <u>5</u> _____ <u>FACU</u>				
2. _____				
3. _____				
4. _____				
_____ = Total Cover				
Herb Stratum (Plot size: 3 ft) 1. <u>Phalaris arundinacea</u> <u>100</u> _____ <u>FACW</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
_____ = Total Cover				
Woody Vine Stratum (Plot size: 3 ft) 1. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				

SOIL

Sampling Point: SP-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-12	10 YR 3/2	100					-->	Silty loam (saturated)
12-14	10 YR 3/2	100					-->	Sandy loam (saturated)

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)			Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)		
Restrictive Layer (if present): Type: _____ Depth (inches): _____			Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>					

Remarks: These soils have likely been disturbed in the past.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one required; check all that apply)</u>				<u>Secondary Indicators (2 or more required)</u>			
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)		<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)			
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>1/2 "</u> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u> (includes capillary fringe)				Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:							
Remarks:							

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

Project/Site: City of Olympia West Bay Drive City/County: Olympia/Thurston Sampling Date: 3/27/2013
 Applicant/Owner: City of Olympia State: WA Sampling Point: SP-05
 Investigator(s): Jessica Stone; Brittany Hartman Section, Township, Range: S 10, T 18 North, R 2 West
 Landform (hillslope, terrace, etc.): Bottom of hillslope Local relief (concave, convex, none): concave Slope (%): ≤1
 Subregion (LRR): A Lat: 47° 03' 20.43" N Long: 122° 54' 50.84" W Datum: _____
 Soil Map Unit Name: Xerorthents, 0 to 5 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: SP-05 located within Area D in what appears to be a drainage ditch which extends around the western edge of the gravel pad. Standing water observed, but no vegetation. Soils contain compacted gravel below a thin layer of loam. The prior period has been slightly drier than normal.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>10 ft</u>)	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Prevalence Index worksheet: <u>Total % Cover of:</u> _____ <u>Multiply by:</u> _____ 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 = _____
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5 ft</u>)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
Herb Stratum (Plot size: <u>3 ft</u>)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>3 ft</u>)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>100</u>				

Remarks: No vegetation present, but root mat of dead grass observed.

Remarks: Standing water observed--most likely came from hillside sheet flow and runoff from old gravel pad.

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

Project/Site: City of Olympia West Bay Drive City/County: Olympia/Thurston Sampling Date: 3/27/2013
 Applicant/Owner: City of Olympia State: WA Sampling Point: SP-06
 Investigator(s): Jessica Stone; Brittany Hartman Section, Township, Range: S 10, T 18 North, R 2 West
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): ~5
 Subregion (LRR): A Lat: 47° 03' 20.70" N Long: 122° 54' 54.05" W Datum: _____
 Soil Map Unit Name: Dystric Xerochrepts, 60 to 90 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: SP-06 located within Wetland B up on hillslope, upslope of small creek. The prior period has been slightly drier than normal.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>95</u> x 2 = <u>190</u> FAC species <u>5</u> x 3 = <u>15</u> FACU species <u>5</u> x 4 = <u>20</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>105</u> (A) <u>225</u> (B) Prevalence Index = B/A = <u>2.14</u>
Sapling/Shrub Stratum (Plot size: 5 ft) 1. <u>Rubus armeniacus</u> 5 Y FACU 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover				
Herb Stratum (Plot size: 3 ft) 1. <u>Phalaris arundinacea</u> 95 Y FACW 2. <u>Urtica dioica</u> 5 N FAC 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ _____ = Total Cover				
Woody Vine Stratum (Plot size: 3 ft) 1. _____ 2. _____ _____ = Total Cover				
% Bare Ground in Herb Stratum _____				

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is >50%

☒ Prevalence Index is ≤3.0¹

☐ Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants¹

☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present?

Yes ☒ No ☐

SOIL

Sampling Point: SP-06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-6	10 YR 3/2	100					-->	Sandy gravelly loam (saturated)
6-14	2.5 Y 4/2	80	10 YR 4/6	20			-->	Gravelly compacted silt (saturated)
								Fill material encountered
0-6	10 YR 3/2	100					-->	Sandy gravelly loam (saturated)
6-8	10 YR 3/2	95	10 YR 3/4	5			-->	Very gravelly silt loam (saturated)
8-14	Gley 10Y 5/1	70	10 YR 4/6	30			-->	Gravelly compacted silt (saturated)
								Fill material encountered

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present):	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____	
Depth (inches): _____	

Remarks: Soils were highly variable. Two peds were obtained, yielding different results. Both sets of results are included above. These soils have been disturbed in the past. Broken glass and metal were found in peds. Due to the inconsistencies in soil texture, soil is assumed to include fill material.

HYDROLOGY

Wetland Hydrology Indicators:	
<u>Primary Indicators (minimum of one required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (2 or more required)</u> <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)

Field Observations:	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0.5"</u>	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surface</u> (includes capillary fringe)	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	

Remarks: Surface saturated, but no water table present in hole. Appears that hydrology comes from sheet flow of surface seeps from hillside.

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

Project/Site: City of Olympia West Bay Drive City/County: Olympia/Thurston Sampling Date: 3/27/2013
 Applicant/Owner: City of Olympia State: WA Sampling Point: SP-07
 Investigator(s): Jessica Stone; Brittany Hartman Section, Township, Range: S 10, T 18 North, R 2 West
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): ~5
 Subregion (LRR): A Lat: 47° 03' 20.75" N Long: 122° 54' 53.92" W Datum: _____
 Soil Map Unit Name: Dystic Xerochrepts, 60 to 90 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation _____, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: SP-07 located up on hillslope to north of SP-06 (wetland B). The prior period has been slightly drier than normal.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 ft)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. <u>Alnus rubra</u>	<u>100</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>130</u> x 3 = <u>390</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>140</u> (A) <u>430</u> (B) Prevalence Index = B/A = <u>3.07</u>
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: 5 ft)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Rubus armeniacus</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: 3 ft)				
1. <u>Urtica dioica</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: 3 ft)				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. <u>Hedera helix</u>	<u>70</u>	<u>Y</u>	<u>NI</u>	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				

SOIL

Sampling Point: SP-07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-11	10 YR 3/2	100					-->	Loam with sand (moist)
11-14	10 YR 4/3	95	7.5 YR 4/6	5			-->	Silty loam (moist)

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: These soils have been disturbed in the past. Fill material, glass, and metal were found in ped.

HYDROLOGY

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
---	---

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

Remarks: Soils were moist, but not saturated.

Selected Site Photographs



1. Looking west from West Bay Drive NW at Wetland A.



2. View of wetland hydrology from hillside seep within Wetland A.

5/31/13 Y:\258\031.010\RE_Photos\E-1.docx



3. Looking west at skunk cabbage along seep within Wetland A.



4. Looking east (downslope) toward West Bay from western portion of Wetland A.

5/31/13 Y:\258\031.010\RIE_Photos\E-2.docx



5. View of Wetland A hydric soils at sampling point SP-01.



6. Looking west at the unnamed stream from downstream area near West Bay Drive NW.

5/31/13 Y:\258\031.010\RIE_Photos\E-3.docx



7. Looking east from top of slope at Unnamed Stream A.



8. Looking west at Area C and Unnamed Stream A from West Bay Drive NW.

5/31/13 Y:\258\031.010\RE_Photos\E-4.docx



9. Looking east toward West Bay Drive NW along Unnamed Stream A and Area C.



10. View of sampling point SP-03 within Area C and Unnamed Stream A.

5/31/13 Y:\258\031.010\RE_Photos\E-5.docx



11. View of sampling point SP-04 within Area C adjacent to Unnamed Stream A.



12. View of runoff from gravel pad adjacent to Unnamed Stream A and Area C.

5/31/13 Y:\258\031.010\RIE_Photos\E-6.docx



13. Looking east at Wetland B.



14. Looking west at Wetland B.

5/31/13 Y:\258\031.010\RE_Photos\E-7.docx



15. Looking east at where Wetland B meets Unnamed Stream A.



16. View of sub-surface flow from Wetland B discharging into Unnamed Stream A.

5/31/13 Y:\258\031.010\RIE_Photos\E-8.docx



17. Looking northwest from West Bay Drive NW at gravel pad.



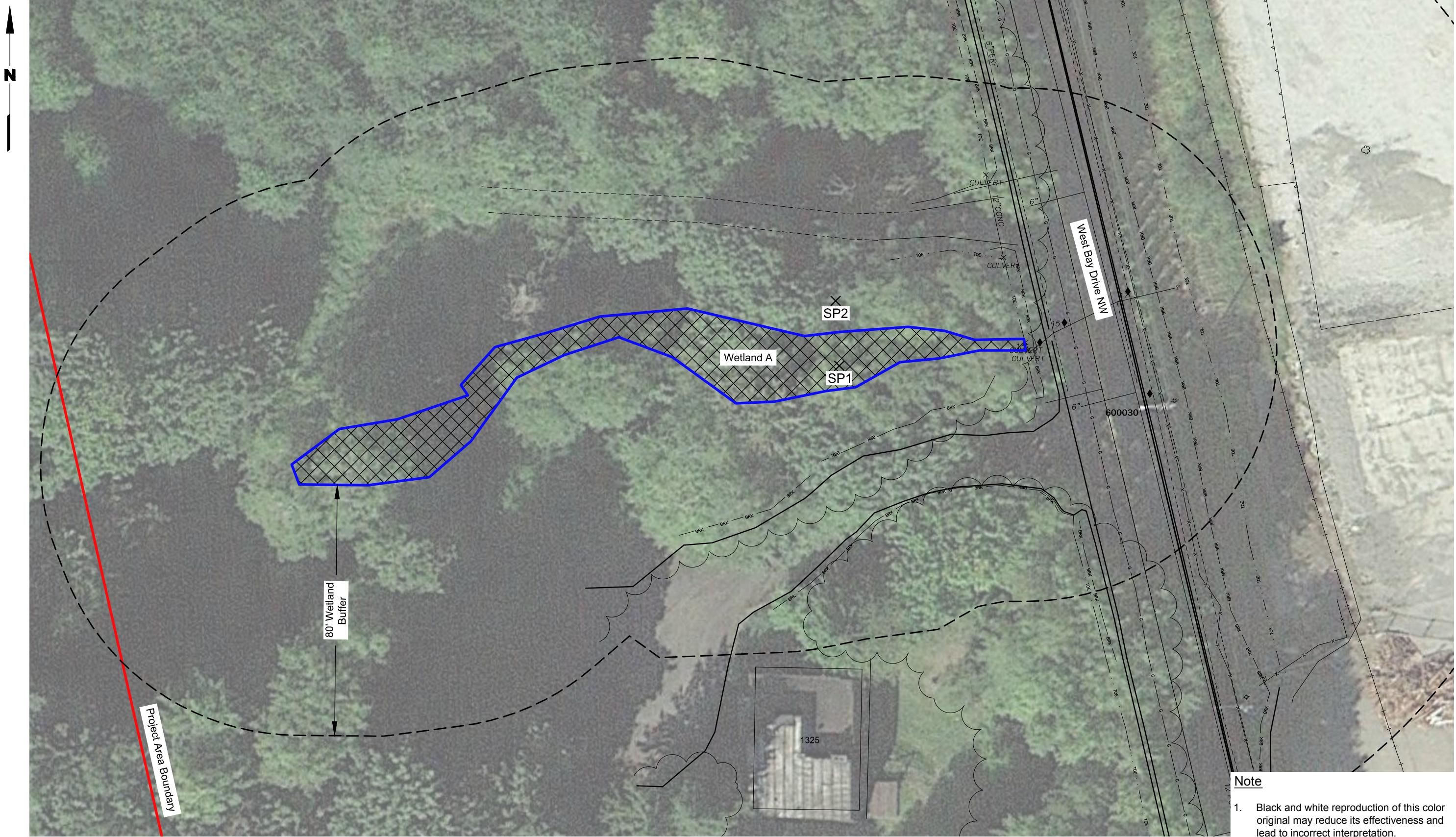
18. Looking down from slope at gravel pad and Area D.

5/31/13 Y:\258\031.010\RIE_Photos\E-9.docx

APPENDIX F

Wetland Rating Forms

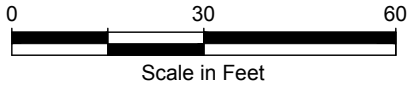
LANDAU ASSOCIATES, INC. | V:\2580310\0101\F_Wetland_Appendix-F.dwg (A) "F1" 5/31/2013



Legend

Wetland Boundary

Forested



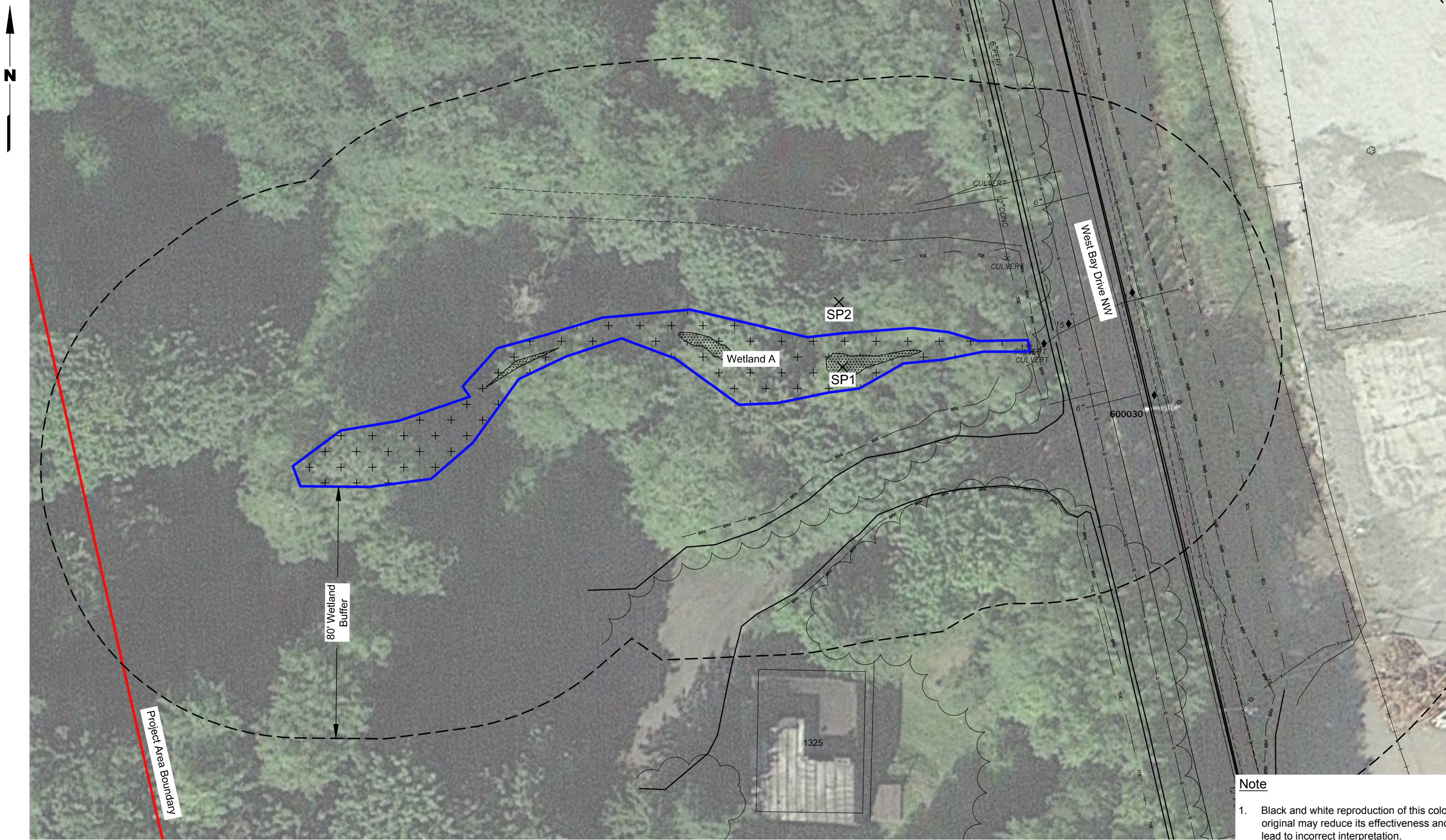
Google Earth Pro 2010; Survey 2013

City of Olympia West Bay Drive Improvements Olympia, Washington	Cowardin Vegetation	Figure F1
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Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES, INC. | V:\2580310\0101\F_Wetland_Appendix-F.dwg (A) "F2" 5/31/2013



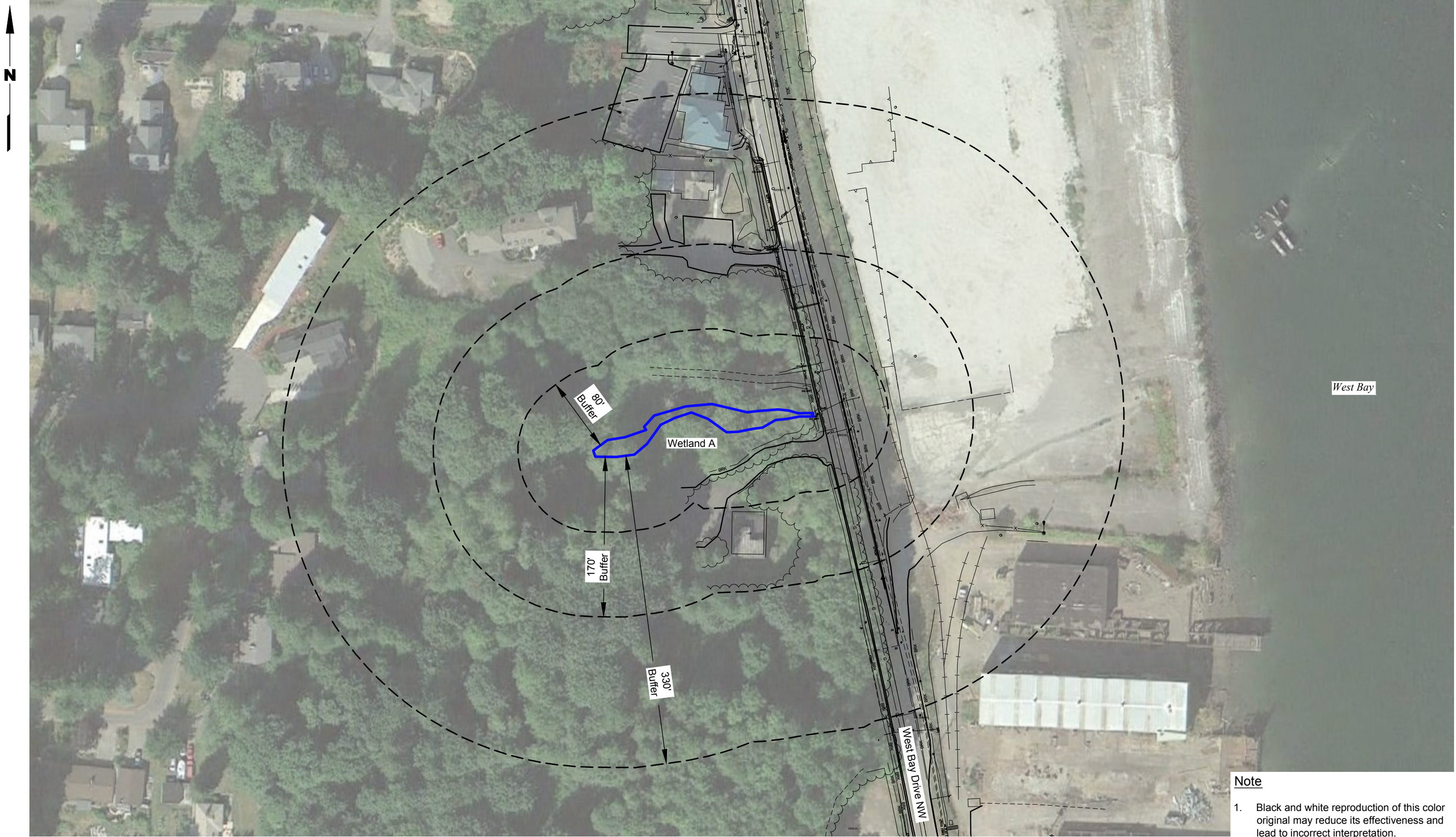
Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Google Earth Pro 2010; Survey 2013

City of Olympia West Bay Drive Improvements Olympia, Washington	Hydroperiods	Figure F2
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LANDAU ASSOCIATES, INC. | V:\258031\010\011F_Wetland_Appendix-F.dwg (A) "F3" 5/31/2013



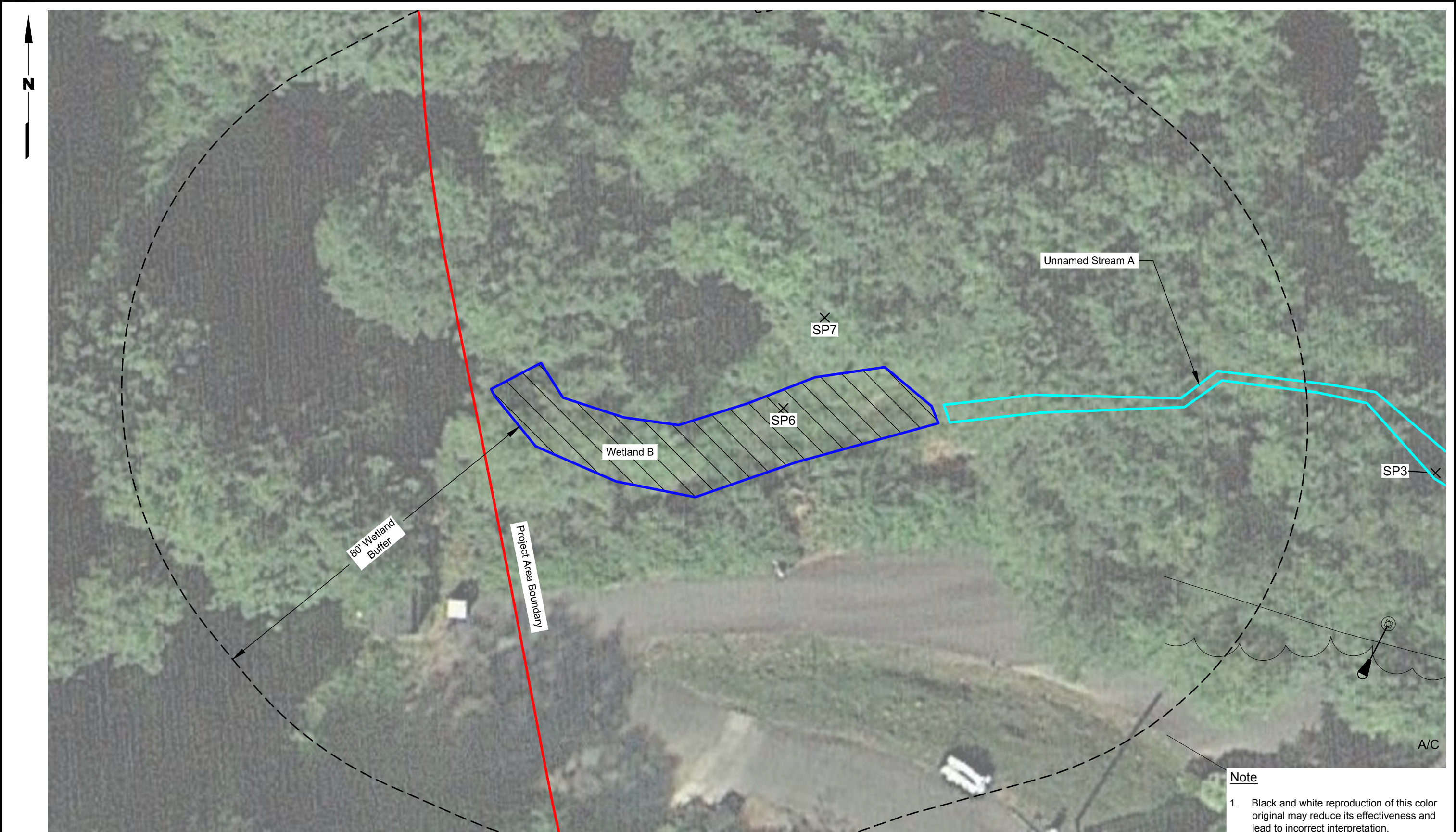
Note

- 1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Google Earth Pro 2010; Survey 2013

City of Olympia West Bay Drive Improvements Olympia, Washington	Buffers	Figure F3
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LANDAU ASSOCIATES, INC. | V:\25803110\0101\F_Wetland_Appendix-F.dwg (A) "F4" 4/30/2013



Legend

- Wetland Boundary
- Emergent

Google Earth Pro 2010; Survey 2013

City of Olympia
West Bay Drive
Improvements
Olympia, Washington

Cowardin Vegetation

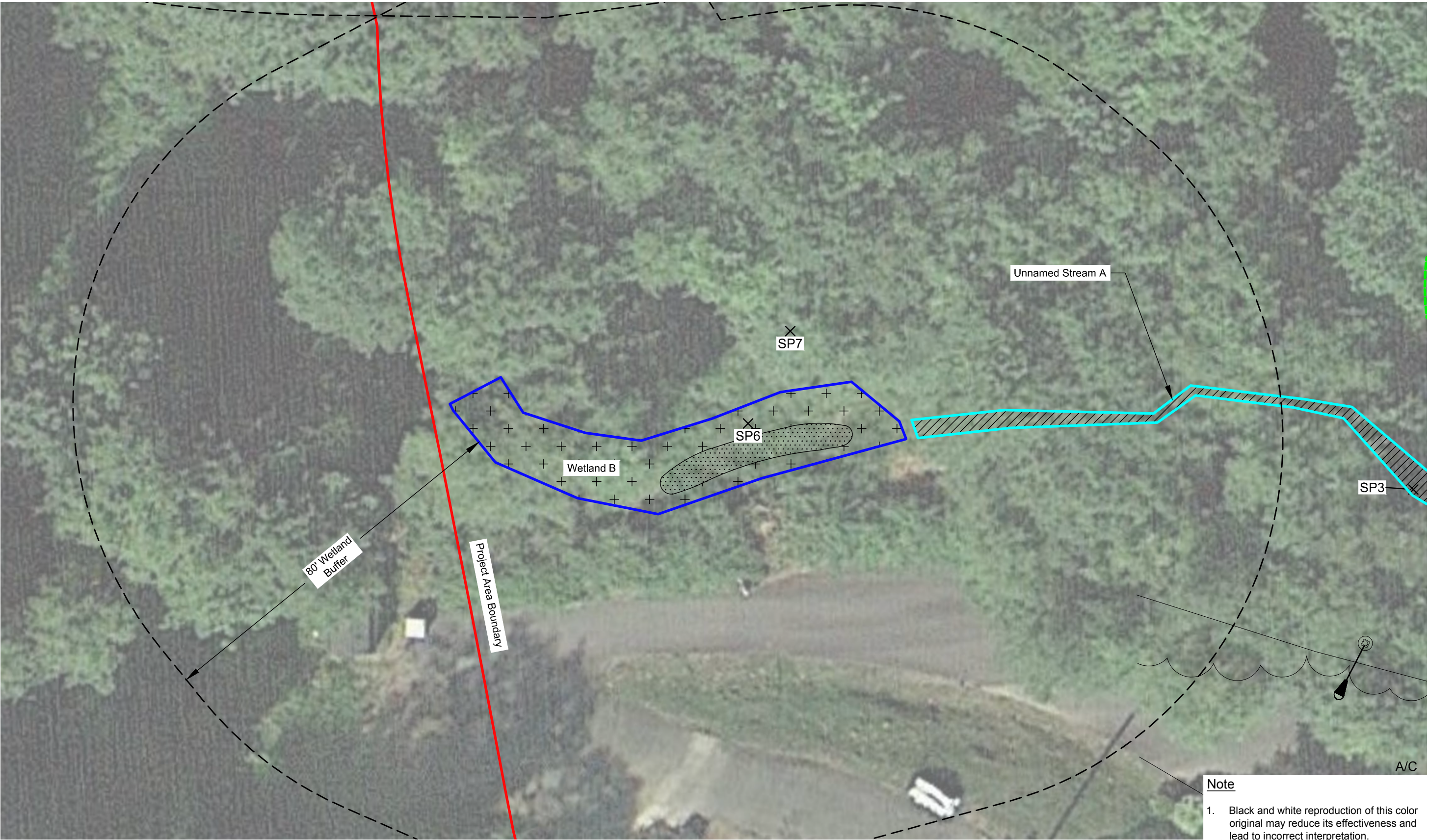
Figure
F4

Note

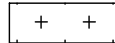

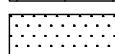
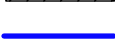
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

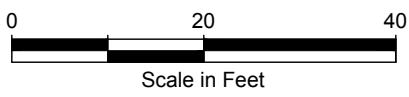


LANDAU ASSOCIATES, INC. | V:\258031\010\01 1\F_Wetland_Appendix-F.dwg (A) *F5* 5/31/2013



Legend

- | | | | |
|---|----------------------|---|---------------------------|
|  | Saturated |  | Seasonally Flowing Stream |
|  | Seasonally Inundated |  | Wetland Boundary |



Google Earth Pro 2010; Survey 2013

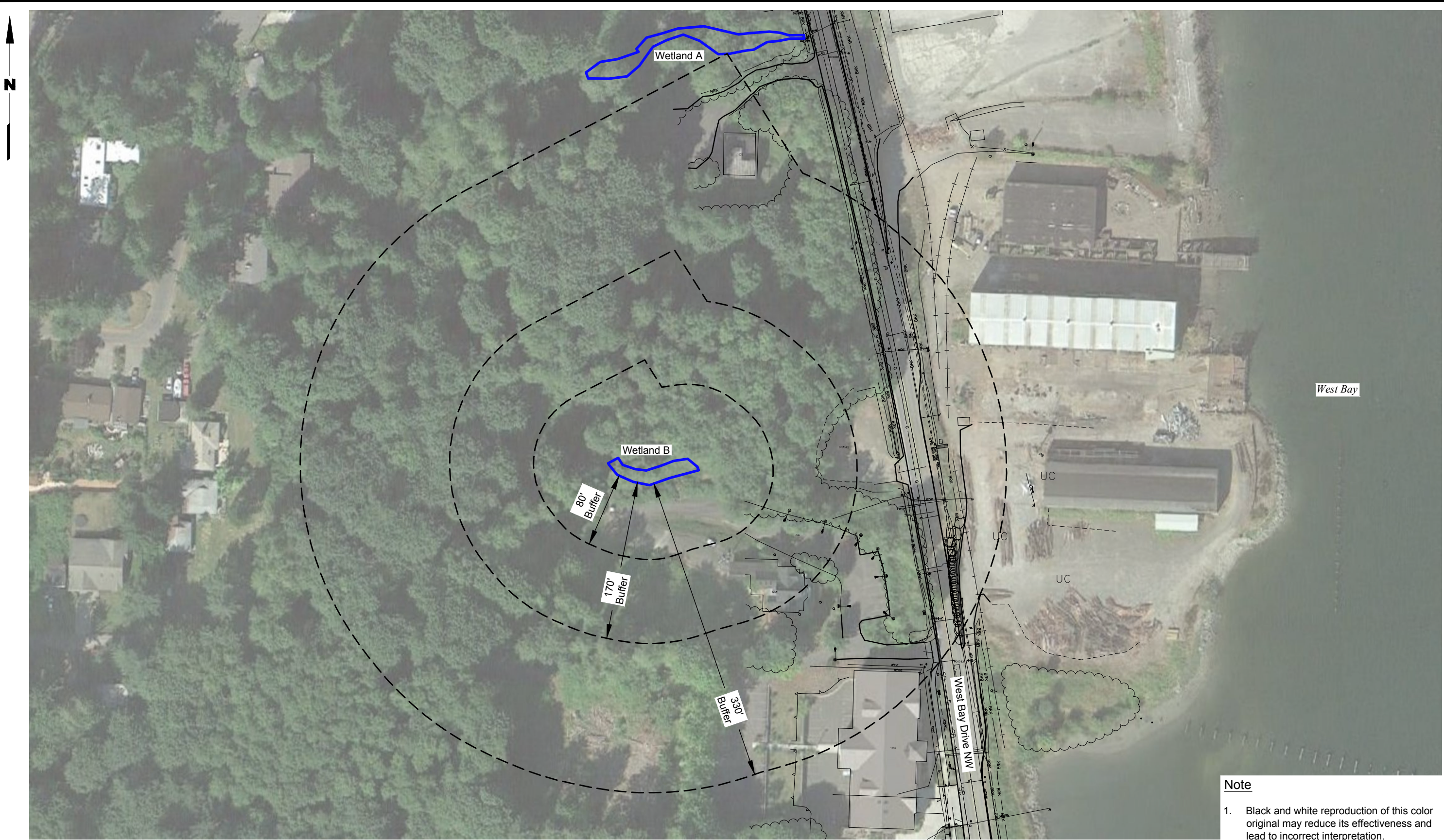
City of Olympia West Bay Drive Improvements Olympia, Washington	Hydroperiods	Figure F5
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Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

A/C

LANDAU ASSOCIATES, INC. | V:\25803110\0101\F_Wetland_Appendix-F.dwg (A) *F6* 5/31/2013



Note

- 1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Google Earth Pro 2010; Survey 2013

City of Olympia West Bay Drive Improvements Olympia, Washington	Buffers	Figure F6
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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: 3/27/2013Rated by: Jessica Stone Trained by Ecology? Yes X No Date of training: 6/18/2008SEC: 10 TWNSHP: 18 North RNGE: 02 West Is S/T/R in Appendix D? Yes No XMap of wetland unit: Figure Estimated size Approx. **SUMMARY OF RATING**Category based on FUNCTIONS provided by wetland: I II III X IV

Category I = Score > 70	Score for Water Quality Functions	12
Category II = Score 51 - 69	Score for Hydrologic Functions	12
Category III = Score 30 - 50	Score for Habitat Functions	12
Category IV = Score < 30	TOTAL Score for Functions	36

Category based on SPECIAL CHARACTERISTICS of Wetland I II Does not apply X**Final Category** (choose the “highest” category from above”) III**Summary of basic information about the wetland unit.**

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

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

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, “documented” means the wetland is on the appropriate state or federal database.		X
SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> For the purposes of this rating system, “documented” means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i>		X
SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

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

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

Wetland name or number A **Classification of Vegetated Wetlands for Western Washington**

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

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

NO – go to 2

YES – the wetland class is **Tidal Fringe**

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

YES – **Freshwater Tidal Fringe**NO – **Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland. Wetlands that were 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 only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3

YES – The wetland class is **Flats**

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

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

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

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

NO – go to 4

YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

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

☒ 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 types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*

NO – go to 5

YES – The wetland class is **Slope**

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

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

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

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

NO – go to 6

YES – The wetland class is **Riverine**

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

NO – go to 7

YES – The wetland class is **Depressional**

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

No – go to 8

YES – The wetland class is **Depressional**

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

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





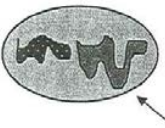

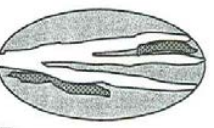
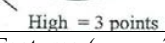
If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number A

S Slope Wetlands		Points
WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.		(only 1 score per box) (see p.64)
S 1	Does the wetland have the <u>potential</u> to improve water quality?	
S 1.1	Characteristics of average slope of unit: <ul style="list-style-type: none"> Slope is 1% or less (<i>a 1% slope has a 1 ft. vertical drop in elevation for every 100 ft. horizontal distance</i>)..... points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0 	0
S 1.2	The soil 2 inches below the surface (or duff layer) is clay, organic (<i>Use NRCS definitions</i>). YES = 3 points NO = 0 points	0
S 1.3	Characteristics of the vegetation in the wetland that trap sediments and pollutants: <i>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.</i> <ul style="list-style-type: none"> Dense, uncut, herbaceous vegetation > 90% of the wetland area..... points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > 1/2 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 F1 6
Total for S 1 <i>Add the points in the boxes above</i>		6
S 2	Does the wetland have the <u>opportunity</u> to improve water quality?	(see p. 67)
<p>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? <i>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.</i></p> <p> <input type="checkbox"/> Grazing in the wetland or within 150 ft <input type="checkbox"/> Untreated stormwater discharges to wetland <input type="checkbox"/> Tilled fields, logging, or orchards within 150 ft. of wetland <input checked="" type="checkbox"/> Residential, urban areas, or golf courses are within 150 ft. upslope of wetland <input type="checkbox"/> Other _____ </p> <p>YES multiplier is 2 NO multiplier is 1</p>		Multiplier 2
◆ TOTAL – Water Quality Functions Multiply the score from S1 by S2; then <i>add score to table on p. 1</i>		12
HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.		
S 3	Does the wetland have the <u>potential</u> to reduce flooding and stream erosion?	(see p.68)
S 3.1	Characteristics of vegetation that reduce the velocity of surface flows during storms: <i>Choose the points appropriate for the description that best fits conditions in the wetland (stems of plants should be thick enough (usually > 1/8in), or dense enough to remain erect during surface flows).</i> <ul style="list-style-type: none"> 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 	6
S 3.2	Characteristics of slope wetland that holds back small amounts of flood flows. The slope has small surface depressions that can retain water over at least 10% of its area. YES = 2 points NO = 0 points	0
Add the points in the boxes above		6
S 4	Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?	(see p. 70)
<p>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? <i>Note which of the following conditions apply.</i></p> <p> <input type="checkbox"/> Wetland has surface runoff that drains to a river or stream that has flooding problems <input checked="" type="checkbox"/> Other <input type="checkbox"/> The stream could potentially flood W. Bay Dr. Stream drains to Puget Sound. <i>(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))</i> </p> <p>YES multiplier is 2 NO multiplier is 1</p>		Multiplier 2
◆ TOTAL – Hydrologic Functions Multiply the score from S3 by S4; then <i>add score to table on p. 1</i>		12

Comments: Average wetland slope ranges from approximately 9% to approximately 20%.

Wetland name or number A

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)
HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.		
H 1	Does the wetland have the <u>potential</u> to provide habitat for many species?	
H 1.1	<p><u>Vegetation structure</u> (see P. 72): Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.</p> <p><input type="checkbox"/> Aquatic Bed <input type="checkbox"/> Emergent plants <input type="checkbox"/> Scrub/shrub (areas where shrubs have > 30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have > 30% cover) If the unit has a forested class check if: <input type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon. Add the number of vegetation types that qualify. If you have:</p> <div style="display: flex; justify-content: space-between;"> <div> <p>4 structures or more points = 4 2 structures points = 1</p> </div> <div> <p>Map of Cowardin vegetation classes 3 structures points = 2 1 structure points = 0</p> </div> </div>	<p>Figure F1</p> <p>0</p>
H 1.2	<p><u>Hydroperiods</u> (see p.73): Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).</p> <p><input type="checkbox"/> Permanently flooded or inundated <input checked="" type="checkbox"/> Seasonally flooded or inundated <input type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> Saturated only <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points</p> <div style="display: flex; justify-content: space-between;"> <div> <p>4 or more types present points = 3 3 or more types present points = 2 2 types present points = 1 1 type present points = 0</p> </div> <div> <p>Map of hydroperiods</p> </div> </div>	<p>Figure F2</p> <p>1</p>
H 1.3	<p><u>Richness of Plant Species</u> (see p. 75): Count the number of plant species in the wetland that cover at least 10 ft² (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</p> <p>List species below if you want to:</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>1</p>
H 1.4	<p><u>Interspersion of Habitats</u> (see p. 76): Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>None = 0 points</p> </div> <div style="text-align: center;">  <p>Low = 1 point</p> </div> <div style="text-align: center;">  <p>Moderate = 2 points</p> </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>[riparian braided channels]</p> </div> <div style="text-align: center;">  <p>High = 3 points</p> </div> </div> <p>Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always “high”.</p> <p>Use map of Cowardin classes.</p>	<p>Figure F1</p> <p>2</p>
H 1.5	<p><u>Special Habitat Features</u> (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.</p> <p><input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) <input type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland <input type="checkbox"/> 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) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown) <input type="checkbox"/> At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) <input type="checkbox"/> 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.</p>	<p>1</p>
H 1 TOTAL Score – potential for providing habitat		<p>Add the points in the column above</p> <p>5</p>

Wetland name or number A

H 2	Does the wetland have the <u>opportunity</u> to provide habitat for many species?	(only 1 score per box)
	<p>H 2.1 <u>Buffers</u> (see P. 80): <i>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".</i></p> <p>_____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... points = 5</p> <p>_____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference..... points = 4</p> <p>_____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... points = 4</p> <p><u>X</u> 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference..... points = 3</p> <p>_____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference..... points = 3</p> <p>If buffer does not meet any of the criteria above:</p> <p>_____ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK..... points = 2</p> <p>_____ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... points = 2</p> <p>_____ Heavy grazing in buffer..... points = 1</p> <p>_____ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... points = 0</p> <p>_____ Buffer does not meet any of the criteria above..... points = 1</p> <p style="text-align: right;">Arial photo showing buffers</p>	<p>Figure F3</p> <p style="text-align: center;">3</p>
	<p>H 2.2 <u>Corridors and Connections</u> (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor.</i>)</p> <p style="text-align: center;">YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?</p> <p style="text-align: center;">YES = 2 points (go to H 2.3) NO = go to H 2.2.3</p> <p>H. 2.2.3 Is the wetland:</p> <ul style="list-style-type: none"> • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR YES = 1 point • Within 1 mile of a lake greater than 20 acres? NO = 0 points 	<p style="text-align: center;">1</p>

Comments: Wetland is within 5 miles of West Bay.

Wetland name or number A

	<p>H 2.3 <u>Near or adjacent to other priority habitats listed by WDFW</u> (see p. 82): Which of the following priority habitats are within 330 ft. (100m) of the wetland? <i>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.</i></p> <p>_____ Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.</p> <p>_____ Aspen Stands: Pure or mixed stands of aspen greater than 0.8 ha (2 acres)</p> <p>_____ Cliffs: Greater than 7.6m (25 ft) high and occurring below 5000 ft.</p> <p>_____ Old-growth forests: (Old growth west of Cascade Crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings, with at least 20 trees/ha (8 trees/acre) > 81cm (32 in) dbh or > 200 years of age.</p> <p><u> X </u> Mature forests: Stands with average diameters exceeding 53cm (21 in) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 – 200 years old west of the Cascade Crest.</p> <p>_____ Prairies: Relatively undisturbed areas (as indicated by dominance of native plants) where greases and/or forbs form the natural climax plant community.</p> <p>_____ Talus: Homogenous areas of rock rubble ranging in average size 0.15 – 2.0m (0.5 – 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.</p> <p>_____ Caves: A naturally occurring cavity, recess, void, or system of interconnected passages.</p> <p>_____ Oregon white Oak: Woodlands stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.</p> <p>_____ 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 <i>priority habitats</i>, 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.</p> <p>_____ Estuary/Estuary-like: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5 ppt. during the period of average annual low flow. Includes both estuaries and lagoons.</p> <p>_____ 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).</p> <p>If wetland has 3 or more priority habitats...= 4 points If wetland has 1 priority habit .. = 1 point If wetland has 2 priority habitats.....= 3 points No habitats..... = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. (Nearby wetlands are addressed in question H 2.4).</p>	1
	<p>H 2.4 <u>Wetland Landscape:</u> <i>Choose the one description of the landscape around the wetland that best fits (see p. 84)</i></p> <ul style="list-style-type: none"> • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.....points = 5 • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 milepoints = 5 • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed.points = 3 • The wetland fringe on a lake with disturbance and there are 3 other lake-fringe wetlands within 1/2 milepoints = 3 • There is at least 1 wetland within 1/2 milepoints = 2 • There are no wetlands within 1/2 mile.....points = 0 	2
	<p>H 2 TOTAL Score – opportunity for providing habitat <i>Add the scores from H2.1, H2.2, H2.3, H2.4</i></p>	7
	<p><i>TOTAL for H 1 from page 8</i></p>	5
◆	<p>Total Score for Habitat Functions <i>Add the points for H 1 and H 2; then record the result on p. 1</i></p>	12

Comments: Although project area is adjacent to West Bay, the marine shoreline is not within 330 ft of Wetland A.

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

Wetland name or number A

SC4	<p>Forested Wetlands (see p. 90)</p> <p>Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? <i>If you answer yes you will still need to rate the wetland based on its function.</i></p> <p>_____ Old-growth forests: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more).</p> <p>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.</p> <p>_____ Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.</p> <p>YES = Category I NO = <u> X </u> not a forested wetland with special characteristics</p>	Cat. I
SC5	<p>Wetlands in Coastal Lagoons (see p. 91)</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p>_____ 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.</p> <p>_____ 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 (<i>needs to be measured near the bottom.</i>)</p> <p>YES = Go to SC 5.1 NO <u> X </u> not a wetland in a coastal lagoon</p> <p>SC 5.1 Does the wetland meet all of the following three conditions?</p> <p>_____ 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).</p> <p>_____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p>_____ The wetland is larger than 1/10 acre (4350 square ft.)</p> <p>YES = Category I NO = Category II</p>	Cat. I Cat. II
SC6	<p>Interdunal Wetlands (see p. 93)</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p>YES = Go to SC 6.1 NO <u> X </u> not an interdunal wetland for rating</p> <p><i>If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> • 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 <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger?</p> <p>YES = Category II NO = go to SC 6.2</p> <p>SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?</p> <p>YES = Category III</p>	Cat. II Cat. III
◆	<p>Category of wetland based on Special Characteristics</p> <p>Choose the "highest" rating if wetland falls into several categories, and record on p. 1.</p> <p>If you answered NO for all types enter "Not Applicable" on p. 1</p>	

Comments:

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: 3/27/2013Rated by: Jessica Stone _____ Trained by Ecology? Yes X No _____ Date of training: 6/18/2008SEC: 10 TWNSHP: 18 North RNGE: 02 West Is S/T/R in Appendix D? Yes _____ No XMap of wetland unit: Figure Estimated size Approx. _____**SUMMARY OF RATING**Category based on FUNCTIONS provided by wetland: I _____ II _____ III X IV _____

Category I = Score > 70	Score for Water Quality Functions	12
Category II = Score 51 - 69	Score for Hydrologic Functions	12
Category III = Score 30 – 50	Score for Habitat Functions	11
Category IV = Score < 30	TOTAL Score for Functions	35

Category based on SPECIAL CHARACTERISTICS of Wetland I _____ II _____ Does not apply X**Final Category** (choose the “highest” category from above”) III**Summary of basic information about the wetland unit.**

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

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

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, “documented” means the wetland is on the appropriate state or federal database.		X
SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> For the purposes of this rating system, “documented” means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).		X
SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i>		X
SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		X

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

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

Wetland name or number B **Classification of Vegetated Wetlands for Western Washington**

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

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

NO – go to 2

YES – the wetland class is **Tidal Fringe**

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

YES – **Freshwater Tidal Fringe**NO – **Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were 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 only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3

YES – The wetland class is **Flats**

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

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

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

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

NO – go to 4

YES – The wetland class is **Lake-fringe (Lacustrine Fringe)**

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

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

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

 X The water leaves the wetland **without being impounded**?

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

NO – go to 5

YES – The wetland class is **Slope**

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

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

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

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

NO – go to 6

YES – The wetland class is **Riverine**

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

NO – go to 7

YES – The wetland class is **Depressional**

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

No – go to 8

YES – The wetland class is **Depressional**

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

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

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

Wetland name or number B

S Slope Wetlands		Points
WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.		(only 1 score per box) (see p.64)
S 1	Does the wetland have the <u>potential</u> to improve water quality?	
S 1.1	Characteristics of average slope of unit: <ul style="list-style-type: none"> Slope is 1% or less (a 1% slope has a 1 ft. 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 	0
S 1.2	The soil 2 inches below the surface (or duff layer) is clay, organic (Use NRCS definitions). YES = 3 points NO = 0 points	0
S 1.3	Characteristics of the vegetation in the wetland that trap sediments and pollutants: <i>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.</i> <ul style="list-style-type: none"> Dense, uncut, herbaceous vegetation > 90% of the wetland area..... points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > 1/2 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 F4 6
Total for S 1 <i>Add the points in the boxes above</i>		6
S 2	Does the wetland 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? <i>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.</i> _____ Grazing in the wetland or within 150 ft _____ Untreated stormwater discharges to wetland _____ Tilled fields, logging, or orchards within 150 ft. of wetland <u> X </u> 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 <u> 2 </u>
◆	TOTAL – Water Quality Functions Multiply the score from S1 by S2; then <i>add score to table on p. 1</i>	12
HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.		
S 3	Does the wetland have the <u>potential</u> to reduce flooding and stream erosion?	(see p.68)
S 3.1	Characteristics of vegetation that reduce the velocity of surface flows during storms: <i>Choose the points appropriate for the description that best fits conditions in the wetland (stems of plants should be thick enough (usually > 1/8in), or dense enough to remain erect during surface flows).</i> <ul style="list-style-type: none"> 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 	6
S 3.2	Characteristics of slope wetland that holds back small amounts of flood flows. The slope has small surface depressions that can retain water over at least 10% of its area. YES = 2 points NO = 0 points	0
Add the points in the boxes above		6
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? <i>Note which of the following conditions apply.</i> _____ 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 <u> 2 </u>
◆	TOTAL – Hydrologic Functions Multiply the score from S3 by S4; then <i>add score to table on p. 1</i>	12

Comments: Average slope of the wetland ranges from approximately 8% to approximately 10%

Page 4 of 8

Wetland name or number B

H 2	Does the wetland have the <u>opportunity</u> to provide habitat for many species?	(only 1 score per box)
	<p>H 2.1 <u>Buffers</u> (see P. 80): <i>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".</i></p> <p>_____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... points = 5</p> <p><u>X</u> 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference..... points = 4</p> <p>_____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... points = 4</p> <p>_____ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference..... points = 3</p> <p>_____ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference..... points = 3</p> <p>If buffer does not meet any of the criteria above:</p> <p>_____ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK..... points = 2</p> <p>_____ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... points = 2</p> <p>_____ Heavy grazing in buffer..... points = 1</p> <p>_____ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... points = 0</p> <p>_____ Buffer does not meet any of the criteria above..... points = 1</p> <p style="text-align: right;">Arial photo showing buffers</p>	<p>Figure F6</p> <p style="text-align: center;">4</p>
	<p>H 2.2 <u>Corridors and Connections</u> (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor.</i>)</p> <p style="padding-left: 100px;">YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?</p> <p style="padding-left: 100px;">YES = 2 points (go to H 2.3) NO = go to H 2.2.3</p> <p>H. 2.2.3 Is the wetland:</p> <ul style="list-style-type: none"> • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR YES = 1 point • Within 1 mile of a lake greater than 20 acres? NO = 0 points 	<p style="text-align: center;">1</p>

Comments:

Wetland name or number B

	<p>H 2.3 <u>Near or adjacent to other priority habitats listed by WDFW</u> (see p. 82): Which of the following priority habitats are within 330 ft. (100m) of the wetland? <i>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.</i></p> <p><input type="checkbox"/> Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.</p> <p><input type="checkbox"/> Aspen Stands: Pure or mixed stands of aspen greater than 0.8 ha (2 acres)</p> <p><input type="checkbox"/> Cliffs: Greater than 7.6m (25 ft) high and occurring below 5000 ft.</p> <p><input type="checkbox"/> Old-growth forests: (Old growth west of Cascade Crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings, with at least 20 trees/ha (8 trees/acre) > 81cm (32 in) dbh or > 200 years of age.</p> <p><input checked="" type="checkbox"/> Mature forests: Stands with average diameters exceeding 53cm (21 in) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 – 200 years old west of the Cascade Crest.</p> <p><input type="checkbox"/> Prairies: Relatively undisturbed areas (as indicated by dominance of native plants) where greases and/or forbs form the natural climax plant community.</p> <p><input type="checkbox"/> Talus: Homogenous areas of rock rubble ranging in average size 0.15 – 2.0m (0.5 – 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.</p> <p><input type="checkbox"/> Caves: A naturally occurring cavity, recess, void, or system of interconnected passages.</p> <p><input type="checkbox"/> Oregon white Oak: Woodlands stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.</p> <p><input type="checkbox"/> 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 <i>priority habitats</i>, 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.</p> <p><input type="checkbox"/> Estuary/Estuary-like: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5 ppt. during the period of average annual low flow. Includes both estuaries and lagoons.</p> <p><input type="checkbox"/> 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).</p> <p>If wetland has 3 or more priority habitats...= 4 points If wetland has 1 priority habit .. = 1 point If wetland has 2 priority habitats.....= 3 points No habitats..... = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. (Nearby wetlands are addressed in question H 2.4).</p>	1
	<p>H 2.4 <u>Wetland Landscape:</u> <i>Choose the one description of the landscape around the wetland that best fits (see p. 84)</i></p> <ul style="list-style-type: none"> • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.....points = 5 • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 milepoints = 5 • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed.points = 3 • The wetland fringe on a lake with disturbance and there are 3 other lake-fringe wetlands within 1/2 milepoints = 3 • There is at least 1 wetland within 1/2 milepoints = 2 • There are no wetlands within 1/2 mile.....points = 0 	2
	<p>H 2 TOTAL Score – opportunity for providing habitat <i>Add the scores from H2.1, H2.2, H2.3, H2.4</i></p>	8
	<p><i>TOTAL for H 1 from page 8</i></p>	3
◆	<p>Total Score for Habitat Functions <i>Add the points for H 1 and H 2; then record the result on p. 1</i></p>	11

Comments: Marine shoreline is not within 300 ft. Nearby forests do not qualify as “mature.”

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

Wetland name or number B

SC4	<p>Forested Wetlands (see p. 90)</p> <p>Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? <i>If you answer yes you will still need to rate the wetland based on its function.</i></p> <p>— Old-growth forests: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more).</p> <p>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.</p> <p>— Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.</p> <p>YES = Category I NO = <u> X </u> not a forested wetland with special characteristics</p>	Cat. I
SC5	<p>Wetlands in Coastal Lagoons (see p. 91)</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p>— 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.</p> <p>— 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 (<i>needs to be measured near the bottom.</i>)</p> <p>YES = Go to SC 5.1 NO <u> X </u> not a wetland in a coastal lagoon</p> <p>SC 5.1 Does the wetland meet all of the following three conditions?</p> <p>— 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).</p> <p>— At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p>— The wetland is larger than 1/10 acre (4350 square ft.)</p> <p>YES = Category I NO = Category II</p>	Cat. I Cat. II
SC6	<p>Interdunal Wetlands (see p. 93)</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p>YES = Go to SC 6.1 NO <u> X </u> not an interdunal wetland for rating</p> <p><i>If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> • 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 <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger?</p> <p>YES = Category II NO = go to SC 6.2</p> <p>SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?</p> <p>YES = Category III</p>	Cat. II Cat. III
◆	<p>Category of wetland based on Special Characteristics</p> <p>Choose the "highest" rating if wetland falls into several categories, and record on p. 1.</p> <p>If you answered NO for all types enter "Not Applicable" on p. 1</p>	

Comments: