

# **CRITICAL AREAS AND HABITAT MANAGEMENT REPORT**

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**Blakely Elementary School  
City of Bainbridge Island, Washington**

**June 1, 2017**

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**RAEDEKE ASSOCIATES, INC.**

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Report To:

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Title:

Critical Areas & Habitat Management Report,  
Blakely Elementary School,  
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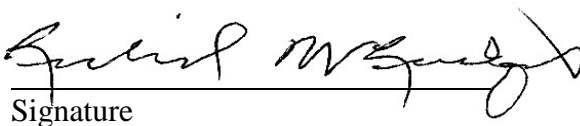
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## **1.0 INTRODUCTION**

### **1.1 PURPOSE**

This report documents the results of our field investigations and assessment of the wetlands and habitats in the vicinity of the building proposed on the Captain Johnston Blakely Elementary property, referred to herein as the Site or Blakely Elementary, and analyzes the proposed project impacts to these resources. The objectives of our study are to: evaluate existing site conditions with respect to wetland and wildlife habitat that currently occurs within the property, assess potential impacts of the proposed development plan, and develop habitat management recommendations which, if implemented, would result in an improvement of wetland habitat currently found on-site. This report includes information required for Habitat Management Plans, as outlined under Section 16.20.060 of the City of Bainbridge Island (2017a) code, and includes wetlands data and a 2014 Washington Department of Ecology Wetland Rating for the wetland area encountered during this study.

### **1.2 PROJECT LOCATION**

The Blakely Elementary property consists of a parcel identified as Kitsap County Parcel Tax Number 03240220042005 located on Blakely Avenue NE in the City of Bainbridge Island, Kitsap County, Washington (Figure 1). Specifically, the Blakely property is located in Section 3, Township 24 North and 25 North, Range 2 East, W.M. with a site address known as 4704 Blakely Avenue NE, Bainbridge Island, Washington 98110.

### **1.3 SITE DESCRIPTION**

The Captain Johnston Blakely Elementary School property, including an approximate 41,300 square-foot school building built in approximately 1963, associated outbuildings, parking, a playground, and associated landscape beds, is situated on a 12.17-acre parcel. The school building is located slightly north of the center of the property. Grass lawn is maintained in the vicinity of the buildings, parking, playground, and landscaped garden areas. The property is bordered on the west by Blakely Avenue and residential properties. It is bordered to the north, east, and south by mixed deciduous and coniferous forested areas associated with the approximately 250-acre Islandwood Environmental Learning Center (Islandwood) identified as Kitsap County Parcel Tax Number 03240210332002. On the Islandwood property and located east northeast of the Site is a large wetland area that was previously investigated by Raedeke Associates, Inc. (1999, 2007) and identified as Wetland 18.

The majority of the site generally drains and gently slopes from east to west toward Blakeley Avenue and in the direction of an off-site stormwater management facility located south of the southwest corner of the Site. Portions of the northern and eastern sides of the property drain off-site toward the north and east, respectively. The northern

portion of the site property, north of the existing school facilities, is a mixed forest of red alder (*Alnus rubra*, FAC), western hemlock (*Tsuga heterophylla*, FACU), and western arborvitae (*Thuja plicata*, FAC). Wetland 18, located on the Islandwood property, is situated at its nearest point approximately 50 feet east of the Site. The forested buffer area along the eastern portions and primarily located off-site consist of primarily western hemlock (*Tsuga heterophylla*) and western arborvitae (aka western red cedar, *Thuja plicata*) with a mixed understory dominated by oso-berry (*Oemleria cerasiformis*, FACU) and Himalayan blackberry (*Rubus armeniacus*, FAC).

#### **1.4 PROPOSED DEVELOPMENT PLAN**

The proposal is to construct a new school building southeast of the existing school building so that the school does not have to shut down services during construction. Once the proposed/new school is constructed, the existing school building will be demolished so that the remaining proposed development plan can be constructed. Land use surrounding the proposed school building will consist of parking areas, educational trails and paths, stormwater management facilities, designated buffer protection areas, and play areas. The proposed school building footprint will total approximately 51,200 square feet and be oriented southeast of the existing school. The proposed building would be constructed in area that is currently mowed lawn with paved and gravel play areas. The existing school building is proposed to be converted into a mowed and maintained open lawn play area, a proposed parking lot, and landscaped areas. Stormwater is currently not being managed on the site. The site generally drains toward Blakely Avenue and continues south along the eastern edge of the roadway. Stormwater generated by new roof area for the proposed additions would be routed to stormwater bioretention facilities and underground vaults located around the proposed building and along the western portions of the Site.

The proposed building will be on city sewer and send wastewater to the nearest treatment facility located off-site. Wastewater will be piped out toward Blakely Avenue from the proposed buildings and is not anticipated to have any effect on the standard critical area buffers identified on the site. An existing waterline easement exists between the existing school building and the off-site Wetland 18 that bisects a portion of the eastern side of the site property. To supply water to the proposed building, a new waterline connection will be made from within the existing waterline easement and will be trenched and connected to the proposed school building.

Due to the location of the existing structures within buffers, site constraints, and the proposed development plan, buffer impacts from the proposed additions are unavoidable and necessitate the preparation of a Habitat Management Plan in compliance with City of Bainbridge Island (2017a) code. An analysis of effect and proposed plan that identifies how the owner intends to mitigate buffer impacts discussed herein, as required in a habitat management plan, are presented later in this report. Mitigation involving federally listed threatened or endangered species, migratory waterfowl, or direct impacts



to wetlands are not anticipated as part of this project. In the event that mitigation or project development work will involve these resources, the analysis of effect and mitigation discussed herein will need to be revised and updated accordingly.

### **1.5 DEMONSTRATED SUCCESS**

Raedeke Associates, Inc. has had demonstrable success in preparation, obtaining agency approval, and implementing the type of Habitat Management Plan proposed. Examples include the following:

- Willow Remodel Habitat Management Plan, City of Bainbridge Island, WA (Raedeke Associates, Inc. 2012) Approved by the City of Bainbridge in 2012.
- Eagle Management Plan for Arborwood Preliminary Plat, Kingston, WA. Approved by WDFW;
- Littlefield Farm Wetland and Wildlife Assessment and Mitigation Plan, Snohomish County, WA (Raedeke Associates, Inc. 2011). Approved by Snohomish County;
- Duvall Urban Village Wetland, Stream, and Wildlife Assessment and Mitigation Plan, City of Duvall, WA (Raedeke Associates, Inc. 2009). Approved by the City of Duvall.

## 2.0 METHODS

### 2.1 DEFINITIONS AND METHODOLOGIES

Wetlands and streams are protected by federal law as well as by state and local regulations. Federal law (Section 404 of the Clean Water Act) prohibits the discharge of dredged or fill material into “Waters of the United States,” including certain wetlands, without a permit from the U.S. Army Corps of Engineers (COE 2012). The U.S. Army Corps of Engineers (COE) makes the final determination as to whether an area meets the definition of a wetland and whether the wetland is under their jurisdiction.

The COE wetland definition was used to determine if any portions of the project area could be classified as wetland. A wetland is defined as an area “inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (Federal Register 1986:41251).

We based our investigation upon the guidelines of the COE Wetlands Delineation Manual (Environmental Laboratory 1987), as further clarified in the Regional Supplement to the Corps of Engineers Delineation Manual: Western Mountains, Valleys, and Coasts Region (COE 2010). The COE wetlands manual is required by state law (WAC 173-22-035, as revised) for all local jurisdictions. As outlined in the 1987 wetland delineation manual, wetlands are distinguished by three diagnostic characteristics: hydrophytic vegetation (wetland plants), hydric soil (wetland soil), and wetland hydrology. Definitions for these terms are provided below.

Hydrophytic vegetation is defined as “macrophytic plant life growing in water, soil or substrate that is at least periodically deficient in oxygen as a result of excessive water content” (Environmental Laboratory 1987). The U.S. Army Corps of Engineers National Wetland Plant list Wetland Indicator Status (WIS) ratings were used to make this determination (Lichvar et al. 2016). The WIS ratings “reflect the range of estimated probabilities (expressed as a frequency of occurrence) of a species occurring in wetland versus non-wetland across the entire distribution of the species” (Reed 1988:8). Plants are rated, from highest to lowest probability of occurrence in wetlands, as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL), respectively. In general, hydrophytic vegetation is present when the majority of the dominant species are rated OBL, FACW, and FAC. Common and scientific names of plants identified within each data plot and encountered during the field investigation were recorded. Pertinent data for purposes of this report are presented in Appendix A.

A hydric soil is defined as “a soil that is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register 1995: 35681). The morphological characteristics of the

soils in the study area were examined to determine whether any could be classified as hydric.

According to the 1987 methodology, wetland hydrology could be present if the soils were saturated (sufficient to produce anaerobic conditions) within the majority of the rooting zone (usually the upper 12 inches) for at least 5% of the growing season, which in this area is usually at least 2 weeks (COE 1991a). It should be noted, however, that areas having saturation to the surface between 5% and 12% of the growing season may or may not be wetland (COE 1991b). Depending on soil type and drainage characteristics, saturation to the surface would occur if water tables were shallower than about 12 inches below the soil surface during this time period.

Positive indicators of wetland hydrology include direct observation of inundation or soil saturation, as well as indirect evidence such as driftlines, watermarks, surface encrustations, and drainage patterns (Environmental Laboratory 1987). Hydrology was further investigated by noting drainage patterns and surface water connections between wetlands and streams within and adjacent to the project area.

## **2.2 BACKGROUND RESEARCH**

Prior to conducting our field investigations, we collected and analyzed background information available for the site from the U.S.D.A. Natural Resources Conservation Service (NRCS 2017) Web Soil Survey, the U.S. Fish and Wildlife Service (USFWS 2016) National Wetland Inventory (NWI), The City of Bainbridge Island (2017b) Critical Areas Public Geographical Information System Maps, Kitsap County (2017) Parcel Map Search Critical Areas Maps, and the Washington Department of Natural Resources (WDNR 2017) Forest Practices Activity Maps. We also reviewed information from the Washington Department of Fish and Wildlife priority habitats and species database and SalmonScape databases (WDFW 2017) for documented information on the potential occurrence of federal- or state-listed endangered, threatened, sensitive, candidate, other priority, or monitor wildlife species within the study area. We also reviewed aerial photographs (Google Earth 2016) and United States Geological Survey (USGS 2017) 7.5-minute topographic maps to assist in the definition of existing plant communities, drainage patterns, and land use.

## **2.3 FIELD SAMPLING PROCEDURES**

Mr. Will Hohman and Mr. Chris Wright of Raedeke Associates, Inc. visited the site on March 16, 2017 to delineate wetlands and streams within the study area. Raedeke Associates, Inc. staff previously visited the Islandwood property to delineate and map wetlands, streams, and habitats in 1999 and 2007 during which we reviewed and assessed the off-site wetland next to the Site as Wetland 18. Information and data collected during those projects were reviewed and utilized to supplement this report (Raedeke 1999,

2007). Wetland flagging was professionally surveyed by a consultant under contract with Bainbridge Island School District and provided by Mithun via email on April 10, 2017.

During our field investigation, we inventoried, classified, and described representative areas of plant communities, soil profiles, and hydrologic conditions in both uplands and wetlands. We searched specifically for areas with positive indicators of hydrophytic vegetation, hydric soil, and wetland hydrology.

Vegetation, soils, and hydrology were examined in representative portions of the investigated area according to the procedures described in the COE Wetlands Delineation Manual (Environmental Laboratory 1987). Areas investigated were examined per the 1987 Manual as updated by the Regional Supplement (COE 2010). Plant communities were inventoried, classified, and described during our field investigation. We estimated the percent coverage of each species. Plant identifications were made according to standard taxonomic procedures described in Hitchcock and Cronquist (1976), with nomenclature as updated by the U.S. Army Corps of Engineers National Wetland Plant List (Lichvar et al. 2016). Wetland classification follows the USFWS wetland classification system (Cowardin et al. 1992). We determined the presence of a hydrophytic vegetation community using the procedure described in the 1987 Manual (Environmental Laboratory 1987), and the Regional Supplement (COE 2010), which requires the use of the dominance test, unless positive indicators of hydric soils and wetland hydrology are also present, in which case the prevalence index or the use of other indicators of a hydrophytic vegetation community as described in the Regional Supplement (COE 2010) may also be required. Wetlands delineated prior to and after the COE 2010 regional supplement were delineated in general accordance with the applicable delineation requirements at the time of the delineation.

We excavated pits to at least 20 inches below the soil surface, where possible, in order to describe the soil and hydrologic conditions throughout the study area. We sampled soil at locations that corresponded with vegetation sampling areas and potential wetland areas. Soil colors were determined using the Munsell Soil Color Chart (Munsell Color 2009). We used the indicators described in the 1987 Manual and Regional Supplement (COE 2010) to determine the presence of hydric soils and wetland hydrology for wetland areas.

Our evaluation of the wetland boundaries was based on the presence of hydric soil, hydrophytic vegetation, and indicators of wetland hydrology. Topographic changes within the context of the landscape were used to aid in our review of the previously delineated the wetland boundaries.

### **3.0 EXISTING CONDITIONS**

#### **3.1 RESULTS OF BACKGROUND INVESTIGATION**

##### **3.1.1 Soil Conservation Service Maps**

According to the USDA NRCS (2017) Web Soil Survey, the soils of the project area were mapped as Kapowsin gravelly ashy loam, 0 to 6% slopes (22) (Figure 2). The soil survey also shows the off-site wetland located east northeast of the site as “water” (Unit 64) along with Mukilteo peat (Unit 33). Soil series boundaries or mapping units are mapped from aerial photographs with limited field verification. Thus, the location and extent of the boundaries between mapping units may be approximate for a given parcel of land within the survey area. In addition, mapping units described by the SCS may encompass smaller inclusions that were not shown as separate units on the survey maps. For example, non-hydric soil units may contain areas of poorly-drained to very poorly-drained hydric soil, which could be classified as wetland. Conversely, there may be areas of well-drained or moderately well-drained soils within mapping units designated as hydric.

According to the USDA NRCS (2017) Web Soil Survey, 22 soils have a 6% inclusion rating of hydric soils within the mapped soil unit. This 6% indicates the percentage of map unit 22 that meets the criteria for hydric soils (i.e., wetland soils).

##### **3.1.2 National Wetland Inventory**

The USFWS NWI (2016) depicts a freshwater pond and freshwater forested and scrub-shrub wetland within 500 feet of the project site (Figure 3). The mapped pond feature is located east northeast of the site, and the wetland area is depicted north and contiguous to the pond feature but is located further from the project site. USFWS NWI does not map any wetlands on the site. Wetlands shown on the NWI are general in terms of location and extent, as they are determined primarily from aerial photographs. Thus, the number and areal extent of existing wetlands located within the project area may differ from those marked on an NWI map.

##### **3.1.3 City of Bainbridge Island and Kitsap County Critical Areas Mapping**

The City of Bainbridge Island (2017b) and Kitsap County (2017) provide public on-line geographical information systems data regarding critical areas and parcels (Figure 4). Upon review of these maps, both depict a large wetland area east northeast of the site and two smaller wetland areas south of and apparently within 250 feet of the site. The two wetlands south of the site are depicted approximately 50 feet from the center of the southern property boundary and a smaller wetland is 200 feet further south of this wetland.

##### **3.1.4 WDNR Forest Practice Activity Map**

The WDNR (2017) Forest Practice Activity Map for the study area depicts a Type Ns stream over 500 feet north of the northern property boundary.

### 3.1.5 WDFW Priority Species Database and SalmonScape

The WDFW (2017) PHS database map does not depict any State of Federal listed species (threatened, endangered, or sensitive) within the project site or its vicinity. The PHS database map does map a wetland area similar to the NWI map in the vicinity of the site property. WDFW SalmonScape does not map any fish-related streams or associated fish structures or barriers of concern at or in the vicinity of the site. SalmonScape does map a Swamp Marsh area under its National Hydrography Database Water Bodies layer feature east northeast of the site and in the vicinity of the previously mentioned mapped wetland/pond features. This also corresponds to the location of the wetland identified during our field investigations summarized the following section of this report.

## 3.2 RESULTS OF FIELD INVESTIGATIONS

During our field investigations, Raedeke Associates, Inc. did not find any wetlands located on the Site. Specifically, the forested area in the northern half of the property consisted of dominant plant species adapted to life in uplands and lacked indications of wetland hydrology and wetland soils (hydric soils). In general, the remainder of the site consisted of manicured landscape beds, mowed and maintained lawns, play areas, parking, and the existing school building. Refer to sample plot data on Figure 2 and Appendix A for additional information regarding the on-site conditions. Upon re-investigating portions of the Islandwood property nearest the Site (off-site areas), we re-delineated the nearest portions of Wetland 18 as part of this study. For purposes of this investigation, only the edges of wetland area nearest the Site were field flagged. Results of the investigation of Wetland 18 are presented in the subsequent section.

### 3.2.1 Wetland 18

Wetland 18, discussed in Raedeke's previous investigations as Wetland 18 or the Cattail Marsh (Raedeke 1999, 2007), totals approximately 8.44 acres in area and occurs east northeast of the Blakely Elementary School property site (Figure 5).

#### *Vegetation*

Wetland 18 consists of palustrine, forested, scrub-shrub, emergent, and open water communities dominated by western hemlock (*Tsuga heterophylla*, FACU), western arborvitae (*Thuja plicata*, FAC), Pacific ninebark (*Physocarpus capitatus*, FACW), Douglas spirea (*Spiraea douglasii*, FACW), and common cattail (*Typha latifolia*, OBL). Central portions of Wetland 18 contain an open water component and a floating mat of sphagnum moss, whereas the western arborvitae trees are generally rooted at the edge of the wetland. The forested and scrub-shrub portions of this wetland occur primarily along the north and west sides of the wetland. Cattails dominate the eastern and central portions of the wetland.

### ***Soils and Hydrology***

During our March 17, 2017 site investigation, soils at the southwestern edge of the wetland were identified as being hydric, consisting of arborvitae remnants and organics (woody peat in texture) greater than 8 inches thick overlaying a dark gray (2.5Y 4/1) silty clay loam mineral soil layer. Ponding was observed at depths at depths between 12 inches and more than 3 feet in certain areas. The hydrogeomorphic classification (HGM) of Wetland 18 is depressional and receives hydrologic input from groundwater discharge, interflow from surrounding uplands, and precipitation.

During our previous site investigations soils were identified as being hydric, consisting of greater than 15 inches of black (7.5YR 2.5/1) woody peat textured soil in the area sampled (Raedeke 1999, 2007). Ponding to depths greater than 18 inches was observed in the wetland during these investigations. This field work was conducted in February and March of 1999 and August of 2007. Based on its size, presence of organic soils, and interspersed vegetative cover, Wetland 18 was rated as a dual rated Category I/II wetland, per criteria of the City of Bainbridge Island Municipal Code and the wetland ratings system in effect at the time of our previous site investigations in 1999 and 2007.

### ***Determination and Classification***

Based on our March 2017 site investigation, we observed hydrophytic vegetation, wetland hydrology, and hydric soils in the wetland. Positive indicators for each of the three wetland parameters at the time of our site investigation means that the delineated area meets the necessary criteria for designation as a wetland according to the guidelines of the COE (Environmental Laboratory 1987) and the Regional Supplement (COE 2010). During the field work, we delineated the wetland edge nearest the site with 26 flags labeled alpha-numerically with “A#.” Alpha-numeric numbering was selected so as to not conflict with any remnant flagging from the previous studies performed by Raedeke Associates, Inc., but the wetland is described herein as Wetland 18 for continuity between reports.

Wetland 18 consists of a palustrine, scrub-shrub, broad-leaved deciduous, emergent, persistent, and aquatic bed, rooted vascular (PSS1/PEM1/PAB3) wetland according to the USFWS (Cowardin et al. 1992) wetland classification system.

Per requirements of City of Bainbridge Island (2017a) Municipal code, we rated the wetland using the Washington Department of Ecology’s (WDOE) 2014 Wetland Rating System for Western Washington (Hruby 2014). See Appendix B for the completed wetland rating forms. The delineated wetland was rated using the HGM methodology for depressional wetlands. The results categorize the wetland as Category II wetland that scored a total 8 habitat points. Due to the bog component of the wetland, it receives a dual rating as a Category I/II wetland since bogs are considered to be wetlands with special characteristics and are categorized as Category I wetlands per the WDOE

guidance (Hruby 2014). The bog mat portion appeared to be well inside the wetland boundary at the time of our site visit.

The City of Bainbridge Island (2017a) Municipal code (BIMC) requires standard buffer widths of 100 feet to protect water quality functions and an additional 200 feet to protect habitat functions, for a total buffer width of 300 feet for both Category I and II wetlands with high habitat scores. The City of Bainbridge Island also requires a building setback of 15 feet from the edge of any wetland buffer unless waived by the Director as provided under BIMC 16.20.160(D)(10) following a determination that the proposed structural or impervious surface is minor and that it will not adversely impact wetland functions.

### 3.2.2 Adjacent Uplands

Uplands adjacent to the southwest portion of Wetland 18, between the wetland and the Blakely Elementary property, consist of a second-growth mixed coniferous and deciduous forest. Dominant canopy trees include western arborvitae and bigleaf maple (*Acer macrophyllum*, FACU), with evergreen blueberry (*Vaccinium ovatum*, FACU) and western arborvitae saplings dominant in the understory. Pineland swordfern (*Polystichum munitum*, FACU), Himalayan blackberry, brackenfern (*Pteridium aquilinum*, FACU), salal (*Gaultheria shallon*, FACU), English holly (*Ilex aquifolium*, FACU), and English ivy (*Hedera helix*, FACU) are scattered throughout. Soils consist mainly of 3 to 6 inches of dark gray (7.5YR4/1) silty loam over dark yellowish brown (10YR 4/4) gravelly sandy loam. No primary or secondary indicators of wetland hydrology were observed during our March 2017 site visit. Therefore, we found no wetland areas in the forested areas immediately adjacent to the site property.

Furthermore, we found no wetland areas off-site and south of the site property in the general vicinity nearest the property and shown on the Bainbridge Island inventory (Figure 4). A small drainage pattern running parallel with the southern property boundary was observed to convey water east to west toward the stormwater facility located south of the southwest corner of the site property. Vegetation in this location consisted of big-leaf maple, red alder (*Alnus rubra*, FAC), Oso-berry (*Oemerlia cerasiformis*, FACU), English holly, salal, cut-leaf blackberry (*Rubus laciniatus*, FACU), and Pineland swordfern. Soils consisted of 6 to 8 inches of dark grayish brown and very dark grayish brown silt loam and gravelly silt loam underlain by soils with marginal redoxomorphic features between 6 to 12+ inches of silt loam and gravelly silt loam in the two locations observed along the southern property line (Figure 2, SP-5 and SP-6, respectively). Although surface ponding was observed in these locations, the area lacked hydrophytic vegetation and hydric soils conditions sufficient for an area to be called a wetland. Along with the wetter than normal winter season, 1.85 inches of precipitation was observed in the 3 days leading up to our site visit.



## 4.0 WETLAND FUNCTIONS AND VALUES ASSESSMENT

Per requirements for preparation of habitat management plans outlined in BIMC 16.20.060, functional assessments were prepared for Wetland 18. The Washington State Department of Ecology Wetland Rating System for Western Washington 2014 Update (Hruby 2014) and The Washington State Department of Transportation (WSDOT 2000) Wetland Functions Characterization Tool for Linear Projects were used to evaluate wetland functions and values provided by Wetland 18. The WDOE 2014 and WSDOT 2000 wetland data forms for Wetland 18 are presented in Appendix B and C, respectively.

The WDOE 2014 Wetland Ratings system provides an analysis of the rarity, sensitivity to disturbances, and functions and values of wetlands in order to determine the level of protection, via buffers, that local jurisdictions require when working near wetland areas.

The Washington State Department of Transportation (WSDOT 2000) Wetland Functions Characterization Tool for Linear Projects broadly divides wetland functions and values into hydrologic functions, biological functions, and social values. The functions and values evaluated are typically based on best professional judgement.

Hydrologic functions include flood flow alteration, sediment removal, nutrient and toxicant removal, and erosion control/shoreline stabilization. Biological functions include production of organic matter and its export, general habitat suitability, habitat for aquatic invertebrates, amphibians, wetland-associated mammals, and wetland-associated birds, as well as, general fish habitat and native plant richness. Social values include educational or scientific value, as well as uniqueness and heritage.

### 4.1 HYDROLOGIC FUNCTIONS

With the exception of shoreline stabilization and erosion control, since it is a closed depression nearest the headwaters of the drainage basin and provides very minimal (if any) of these functions, Wetland 18 is likely to provide most hydrologic functions. If the overflow outlet that is already highly constricted is altered, many hydrologic functions and values could be lost. The proposed project, however, does not intend to directly impact this wetland or its overflow area.

Generally, Wetland 18 does have the potential to provide floodwater storage and desynchronization because it is a large wetland located in the upper portion of the watershed, and is located in a relatively deep depression with a single, highly-constricted outlet. Wetland 18 also has moderate potential to remove sediments because it can hold water for a relatively long period of time and has dense vegetation to trap sediments. Wetland 18 also has the potential to remove nutrients and toxicants because of its ability to store water for long periods, the presence of dense emergent and aquatic vegetation,

and organic soils; however, because most of the wetland remains permanently inundated, it unlikely to perform significant denitrification.

#### **4.2 BIOLOGIC FUNCTIONS**

Wetland 18 is likely to provide all of the biological functions. It is situated in a very established and undisturbed wetland that contains a variety of habitat types, a high level of structural diversity, a high diversity of plant species, large areas that are permanently inundated, and a high level of interspersions between habitats. Wetland 18 has high potential to provide general habitat suitability, and habitat for aquatic invertebrates and amphibians. Wetland 18 has moderate potential to provide habitat for wetland-associated mammals and birds, although it is likely to provide suitable habitat for beavers and wetland-associated songbirds. Its buffer and proximity to several other wetlands increases the potential for the wetland to perform many of the functions mentioned above. Although Wetland 18 likely produces a large amount of organic matter, the wetland provides only low to moderate potential to export it due to its lack of surface water connection to other aquatic systems. Furthermore, the wetland does not appear to support fish because it is not connected to a fish-bearing stream.

#### **4.3 SOCIAL FUNCTIONS & VALUES**

Wetland 18 is also likely to provide educational/scientific value because it is in public ownership and has documented scientific or educational use by Islandwood Learning Center and Blakely Elementary School. Wetland 18 may have value for uniqueness and heritage due to the presence of wetland bog habitats designated by WDFW (2008, 2017).

## **5.0 REGULATORY CONSIDERATIONS**

Wetlands and streams are protected by Section 404 of the Federal Clean Water Act and other state and local policies and ordinances including the City of Bainbridge Island (2017a) Municipal code. Regulatory considerations pertinent to wetlands and streams at the site are subject to Federal, State, and City of Bainbridge (2017a) Critical Areas Regulations discussed below; however, this discussion should not be considered comprehensive. Additional information may be obtained from agencies with jurisdictional responsibility for, or interest in, the site. A brief review of federal and state regulations and City of Bainbridge policy, relative to wetlands, is presented below.

### **5.1 FEDERAL CLEAN WATER ACT (U.S. ARMY CORPS OF ENGINEERS)**

Federal law (Section 404 of the Clean Water Act) discourages the discharge of dredged or fill material into the nation's waters, including most wetlands and streams, without a permit from the U.S. Army Corps of Engineers (COE). The COE makes the final determination as to whether an area meets the definition of "Waters of the U.S." as defined by the federal government (Federal Register 1986:41251), and thus, if it is under their jurisdiction.

We should caution that the placement of fill within wetlands or other "Waters of the U.S." without authorization from the COE is not advised, as the COE makes the final determination regarding whether any permits would be required for any proposed alteration (COE 2012). If any modification of wetlands or streams is proposed, we recommend requesting a jurisdictional determination from the COE prior to any construction activities. However, we understand that the proposed school project does not involve any direct impacts to the off-site wetland. A jurisdictional determination can also provide evaluation and confirmation of our delineation by the COE, if desired.

### **5.2 STATE OF WASHINGTON**

Under Section 401 of the Clean Water Act, an activity involving a discharge in waters of the U.S. and authorized by the COE must also receive certification that the federally permitted activity complies with the federal Clean Water Act, state water quality laws, and any other appropriate state laws (such as the Water Resources Act and Hydraulic Code). In Washington State, the certifying agency is usually the Washington Department of Ecology (WDOE). In addition, if the COE-authorized permit is for actions within the 15 coastal counties, including Kitsap County, then the WDOE must confirm or deny that the proposed action complies with the Washington Coastal Zone Management Program. Again, as currently proposed, the project does not involve any direct impacts to the off-site wetland.

The WDOE also regulates activities within isolated wetlands under the state Water Pollution Control Act (90.48 RCW) and the Shoreline Management Act (90.58 RCW)

in instances where a wetland or water is determined to be non-jurisdictional by the COE. The standards of review for issuance of a permit by the WDOE for activities within non-COE-jurisdictional wetlands or waters are the same as those for Section 401 certifications.

### **5.3 CITY OF BAINBRIDGE ISLAND**

City of Bainbridge Island (2017a) Municipal code regulates wetlands and streams as critical areas under Title 16 Environmental Chapter 16.20 Critical Areas. Alterations of wetlands or streams and their buffers are generally prohibited, except as allowed under certain conditions. All direct wetland impacts must be mitigated through wetland creation, restoration, or enhancement. The City of Bainbridge Island has the final authority to determine wetland ratings, buffers, and allowed uses of wetlands, their buffers, and other sensitive areas that are under their jurisdiction.

We rated the wetland within the project areas using the 2014 WDOE Wetland Rating System for Western Washington (Hruby 2014), as required and clarified by City of Bainbridge Island (2017a) Municipal code for determination of wetland buffer widths and mitigation ratios (see Appendix B) and per communication with Ms. Christy Carr of the City of Bainbridge Island Department of Planning & Community Development via voicemail on March 22, 2017. The wetland scored 8 points for habitat function for which the City of Bainbridge Island (2017a) requires a 300-foot buffer. This buffer consists of an inner 100-foot water quality buffer and outer 200-foot habitat buffer. Table 1 summarizes the off-site wetland within the project study area and its probable rating and corresponding buffer.

## 6.0 IMPACTS

The standard prescriptive buffer (standard buffer) width for Wetland 18 includes a 100-foot water quality buffer and an additional 200-foot habitat buffer for a total of a 300-foot wetland buffer measured on a horizontal plane from the wetland edge. The wetland edge was provided by Bainbridge Island School District's professional surveyor as previously mentioned. However, based on the site's existing developed and maintained school areas, certain portions of the standard habitat buffer do not drain surficial stormwater toward Wetland 18. The area of standard buffer that drains away from the wetland is therefore considered as non-functional buffer. Furthermore, existing land uses within the buffer provide limited functionality and value as a buffer to the wetland. This section presents our analysis of functional buffer impacts within the extent of the buffer that drains to the wetland in both the existing and proposed development scenarios. Because it is not feasible to provide the standard 300-foot buffer or apply buffer averaging, the site plan proposes a reduced buffer that fully encompasses the water quality buffer and provides compensation for unavoidable impacts.

Approximately 160,521 square feet of standard buffer exists on the project site. Figure 5 presents a depiction of the sites existing land uses within the standard buffer. Based on the drainage divide depicted on this plan, provided by Mithun, Inc. via email on April 11, 2017, only portions of the habitat buffer drain toward the wetland. Therefore, for purposes of providing appropriate buffer compensation for unavoidable impacts to the existing buffer, the impacts described herein detail impacts to the overall standard buffer and those areas that actually drain toward the wetland. Buffer impacts are calculated based on the information provided by Bainbridge Island School District's consultant, Mithun, Inc., on May 15, 2017.

### 6.1 DIRECT IMPACTS

Direct impacts to wetland and the wetland's water quality buffer would be avoided under the proposed development plan (Figure 6) and per direct communication with Mithun, Inc. on April 17, 2017 and confirmed via email on the same day.

Based on existing site land uses and the proposed land development plan provided by Mithun, Inc., the existing and proposed drainage divides within the standard habitat buffer will generally remain the same during pre- and post-development build-out conditions. Conservatively, our analysis of impacts assumes all forested areas on the site that are contiguous to the water quality buffer, within the habitat buffer and no matter which direction topography drains provide habitat for wildlife that utilizes the wetland. The portions of these forested areas that do drain toward the wetland that are located within the habitat buffer serve both value and function for the wetland. Furthermore, the existing cleared areas within the contributing basin of the wetland currently provide only very low buffer functions. The following presents a summary of anticipated wetland buffer impacts associated with the proposed land development compared with the site's

existing land uses. The proposed habitat mitigation plan considers existing land uses within the buffer as a means to providing sufficient mitigation buffer compensation for unavoidable impacts.

Direct impacts to the habitat buffer are presented on Figure 6. Detailed descriptions of the proposed wetland buffer impacts are presented in section 6.3.

## **6.2 HYDROLOGIC IMPACTS**

As discussed in Section 3.2 above, the primary source of hydrology to Wetlands 18 is shallow groundwater seepage and surface water runoff within the drainage basin during storm events. This source of wetland hydrology in volume and duration is likely to be unchanged under the development proposal. However, a small area of the proposed building would divert runoff away from the wetland basin. Run-off from all new impervious surface created by the new building will be routed to the stormwater infiltration facilities or to dry-wells/rain gardens adjacent to the proposed structures. This will effectively pre-treat stormwater per the Department of Ecology's 2012 Stormwater Management Manual for Western Washington and the 2012 Low Impact Development Technical Guidance Manual for Puget Sound (2012) as adopted by the Bainbridge Island (2017) Municipal Code. This pre-treatment will occur before entering groundwater or the City's existing stormwater drainage facilities.

## **6.3 WETLAND BUFFER IMPACTS**

The proposed project school building and fire lane would eliminate approximately 8,815 square feet of forested habitat buffer, and approximately 56,130 square feet of the forested buffer would remain unchanged based on the proposed development design.

The water quality buffers for this critical area would not be impacted.

Habitat buffer impacts to Wetland 18 are unavoidable for the following reasons:

- 1) the existing school must remain open for business requiring the proposed school building be built adjacent to the existing school;
- 2) Portions of the existing school, playground, and mowed maintained lawn are already located within the buffer;
- 3) structural elements, existing forested areas, and existing landscape necessitate construction of the school in the proposed location;
- 4) the applicant desires to retain as much of the existing forested areas as possible to protect several large native trees located in the habitat buffer;
- 5) per fire code requirements, the fire lane is required to wrap around the rear of the building to provide the fire department emergency access in the event of a fire.

The existing functions provided by the wetland buffer on the east northeast side of the drainage divide are significantly degraded under current conditions due to the presence of mowed lawn and gravel/paved pathways and play areas that extend to the wetland's water quality buffer boundary. As a result, this portion of the buffer does not provide more than a minimal level of buffer functions such as sediment and nutrient removal, fish or wildlife habitat, and screening of the wetlands from noise and light intrusions. The existing land uses within the standard buffer and those areas serving minimal, if any, value and function to the habitat buffer are shown on Figure 5.

The proposed plan involves the removal and regrading of approximately 8,815 square-feet of forest within the habitat buffer area on the eastern side of the site. This disturbance is primarily to provide a fire lane for emergency access. This would involve the removal of approximately 9 deciduous and 5 conifer trees ranging in size from 8 inches to 30 inches diameter breast height (dbh) (Figure 6). Elimination of this portion of the wetland habitat buffer would likely reduce the wildlife functions provided by the buffer to a relatively small degree. These include a reduction in area for foraging and nesting, as well as reducing that portion of the buffer's ability to screen Wetland 18 from noise and light intrusions. However, the majority of this area would not affect hydrological and water quality functions of the buffer, as most of the proposed clearing is outside of the contributing basin of the wetland.

## 7.0 HABITAT MANAGEMENT PLAN

Under BMIC 16.50, the City recognizes that in some cases it may not be possible to provide a critical area buffer that meets the prescribed standard buffer widths required under City code. Under BMIC 16.50(C), impacts to the habitat buffer for critical areas are allowed provided that the applicant provides a Habitat Management Plan (HMP) that demonstrates that greater protection of functions and values of the critical area would be achieved through the HMP than would be achieved through providing the prescribed standard buffers. Impacts to the water quality buffer for critical areas are not allowed.

HMP's are primarily intended as a means to restore or improve buffers that have been degraded by past activity (City of Bainbridge Island 2017a). The City of Bainbridge Island (2017a) requires that the HMP incorporate elements that specifically address, as appropriate, the following:

- Enhancement of existing degraded buffer area and replanting of the disturbed buffer area with native or equivalent vegetation;
- The use of alternative on-site wastewater systems in order to minimize site clearing;
- Infiltration of stormwater where soils permit;
- Retention of existing native or equivalent vegetation on other portions of the site in order to offset habitat loss from buffer reduction; and
- The need for fencing and signage along the buffer edge.

The proposed construction of a new school building and associated school facilities, water interconnections and trail facilities meets the necessary criteria for a reduction of the habitat buffer for Wetland 18 through implementation of a HMP. The HMP would incorporate the following mitigation measures:

- 1) Enhancement of degraded on-site portions of the Wetland 18 buffer through installation of native trees, shrubs, and low cover;
- 2) Removal of Himalayan blackberry from the on-site wetland buffer located on the site property;
- 3) Implementation of stormwater management on a site that does not currently have any stormwater management;
- 4) Construction of the fire lane with a combination of grass and concrete to promote infiltration of runoff within the wetland basin;
- 5) Installation of trails limited to 5-feet wide within the buffer will be oriented to avoid tree removal and be constructed of pervious materials;
- 6) Native understory vegetation would be retained to the greatest extent feasible during construction;



- 7) Invasive species would be removed in locations of buffer disturbances;
- 8) The new proposed trails and learning areas would be for educational purposes within the buffer and restricted to those allowed under the City of Bainbridge (2017a) code.

The HMP will include installation of fencing and/or signage along the buffer edge at the request of the City of Bainbridge Island Planning and Community Development. Demarcation of the proposed wetland buffer, if accepted, will adhere to the minimum requirements per Bainbridge Island (2017a) Municipal Code.

Implementation of these measures would result in increased habitat function for the wetland buffers by (1) improving screening of the wetland from noise and light intrusions from the school and associated outdoor activities, (2) increasing area within the buffer that provides forage and nesting for wildlife, (3) increasing large woody debris recruitment to wetland to improve water quality, (4) protecting large coniferous trees that are suitable for cavity nesting birds and mammals, (5) maintaining groundwater discharge to Wetland 18.

## 8.0 MITIGATION

This wetland mitigation plan has been prepared in compliance with all applicable sections of the City of Bainbridge Island (2017a) Municipal Critical Areas code.

### 8.1 MITIGATION SEQUENCE

Mitigation has been defined by the State Environmental Policy Act (SEPA) (WAC 197-11-768; cf. Cooper 1987), and more recently in a Memorandum of Agreement between the Environmental Protection Agency and the U.S. Army Corps of Engineers (Anonymous 1989). In order of desirability, mitigation may include:

1. **Avoidance** - avoiding impacts by not taking action or parts of an action;
2. **Minimization** - minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3. **Compensation** - which may involve:
  - a) repairing, rehabilitating, or restoring the affected environment;
  - b) replacing or creating substitute resources or environments;
  - c) mitigation banking.

#### 8.1.1 Avoidance and Minimization of Impacts

The proposed development plan was designed to avoid direct impacts to wetlands and to limit disturbance of native vegetation areas both in and outside of standard buffer areas as much as possible. The proposed development plan incorporates a number of design features that would avoid or minimize impacts to the wetlands and their buffers, including:

- Direct impacts to wetland areas or streams would be avoided;
- The proposed stormwater plan would infiltrate run-off from all existing and new impervious surface to minimize wetland and stream impacts;
- Removal of native vegetation within the wetland would be avoided;
- All other construction areas would be within existing lawn or roadways and would not require the removal of native vegetation;
- Temporary erosion and sediment control (TESC) measures would be installed during construction and would utilize appropriate best management practices (BMPs) designed to prevent sediment from entering surface waters or wetlands during and

after construction, including placement of straw bales and silt fencing between work activities and adjacent wetlands;

- All potentially hazardous material (e.g., fuel, lubricating fluids) would be stored within the designated staging area, and no fueling or servicing of construction vehicles would be permitted within the wetland or stream buffers;
- Upon completion of the project, the areas disturbed during construction that are not converted to permanent development features shall be re-graded to be compatible with the natural terrain and replanted with grass to prevent erosion.

### **8.1.2 Compensatory Mitigation**

Direct wetland impacts would be avoided under the proposed development plan; therefore, wetland creation, re-establishment, rehabilitation, or enhancement is not proposed.

Approximately 8,815 square feet of the habitat buffer for Wetland 18 would be eliminated in order to construct the proposed project (Figure 6). When comparing existing impervious site conditions with the amount of impervious designed in the proposed buildout, approximately 730 square feet of mowed and maintained lawn area that drains toward the wetland would also be eliminated (calculated as impervious cover). Conservatively, this existing lawn calculation assumes the proposed fire lane is impervious in its proposed design. However, the proposed design intends to use a combination of grass and concrete pervious materials for the fire lane to promote infiltration of runoff.

To off-set the loss of wetland buffer totaling 9,545 square-feet, consisting of approximately 8,815 square feet of truly functioning habitat buffer and 730 square feet of low-functioning mowed lawn play areas, approximately 9,820 square feet of wetland buffer would be enhanced by planting native trees, shrubs, and low cover (Figure 6). The portions of the habitat and water quality buffer areas occupied by an existing waterline easement that will need to be disturbed to construct the proposed design and to provide enhanced buffer function will be restored with a native 'low' cover shrubs and groundcover land cover (totaling approximately 3,725 square-feet). Of the 9,820 square feet of proposed full native forest plantings and 3,725 square-feet of native 'low' cover shrubs and groundcover, approximately 3,515 square feet of this area is currently mowed maintained lawn area within the water quality buffer that will be enhanced with a combination of these two proposed land covers. To further improve the function and value of the existing buffer, Himalayan blackberry and other nuisance and invasive species would be removed from an additional 1,985 square feet of area within the habitat buffer as shown on Figure 6. The proposed buffer compensation, enhancement, and restoration areas are presented on Figure 6 of this report. Detailed information regarding the proposed vegetation may be viewed on Mithun, Inc.'s landscape plans.

The proposed location of the buffer compensation areas will re-connect areas previously forested before the existing school was constructed as well as provide additional functional and valuable habitat areas within the wetland buffer once established.

## **8.2 MITIGATION GOALS AND OBJECTIVES**

The overall goal of the compensatory mitigation is to increase the existing level of protection provided by the buffer for wetland functions. The enhanced wetland buffer is designed to be a low maintenance, self-sustaining community resembling native forest habitat typical of the Puget Sound lowlands. Evaluation and performance standards for these goals are found in Section 8.5.

The specific objectives of the buffer enhancement plan are:

- 1) Remove Himalayan blackberry, protect existing native trees and understory, and install native coniferous trees and shrubs (See Mithun, Inc. Landscaping Plans dated April 20, 2017) within an approximately 1,985 square foot area of the buffer for Wetland 18 (Figure 6);
- 2) Remove Himalayan blackberry and install full native forest plantings of trees and shrubs within an approximately 9,820 square feet area of the Wetland 18 buffer (Figure 6);
- 3) Remove Himalayan blackberry and other nuisance and invasive species within all areas proposed for enhancement and restoration located within the buffer and on site (Figure 6);

## **8.3 BUFFER AND WETLAND ENHANCEMENT PLAN IMPLEMENTATION**

The buffer and wetland enhancement plan would be implemented concurrently with construction of the proposed building and site improvements to the extent feasible. Part of the proposed buffer area, depending on site conditions during construction may be needed temporarily as play areas until the new building and old building construction phases are completed.

### **8.3.1 Site preparation**

Prior to site preparation, the limits of the buffer planting area would be clearly marked (staked) in the field by appropriate means with the assistance of the project biologist. Generally speaking, soil amendments, soil decompaction greater than or equal to 1 foot depth, grass removal, and mulching the entire planted area will be the minimum extent of site preparation.

### **8.3.2 Plant Species Composition**

Tree and shrub species selected for the buffer enhancement plan are those that commonly occur in riparian vegetation communities in the vicinity of the project site. Tree and

shrub plantings would consist of western red cedar, douglas fir, western hemlock, shore pine, vine maple, serviceberry, salal, oceanspray, low Oregon grape, Pacific ninebark, and snowberry, (Figure 6, and refer to Mithun, Inc.'s Landscaping Plans dated April 20, 2017).

### **8.3.3 Plant Specifications, and Installation**

All plant materials would be locally grown and be of local provenance. Tree stock would be five-gallon container-grown, 3- to 4-feet tall, and well-rooted and branched. Trees would be planted on 10-foot centers within the in-fill areas and the full native forest planting areas (Figure 9). Shrub stock would be one gallon container-grown, 18- to 24-inches tall, well-rooted and branched. Shrub plantings would be spaced on 5-foot centers. Shrubs would be planted within all areas of the proposed buffer compensation.

All plantings would be installed in pits that are approximately twice the diameter of the root ball. Plantings would be installed so that the top of the root ball is approximately flush with grade in order to avoid smothering the trees and shrubs during mulch installation. Mulch consisting of organic material would be installed for all planted trees and shrubs. Mulch would be installed for the entire planted area at two to three inches in depth.

The project biologist would review and approve plant materials, soil amendment, and mulch for quality and quantity, as well as review and approve plant locations and supervise installation procedures.

### **8.3.4 Planting Schedule**

Planting would occur between October 1 and March 1 to take advantage of seasonal rains and greater availability of plant material. Planting at any other time or during periods of abnormally hot, dry, or freezing weather conditions would not occur without prior approval by the project biologist and may require plant substitutions and supplemental irrigation.

### **8.3.5 Site Maintenance**

The enhanced wetland buffer is designed to be self-sustaining. To ensure the success of the plantings, additional replanting and control of undesirable plant species may be necessary after initial installation. Invasive species would be controlled by methods that do not compromise the rest of the buffer plantings. Manual removal of invasive species is preferred, but does require early detection and action to be effective.

Temporary irrigation of plantings would be provided during the first two years after installation to ensure plant survival. All trees and shrubs that die over time would be removed and replaced after Year 1 or per the City's requirements and/or Mithun's specifications whichever is the most comprehensive to meet the performance standards described herein. During subsequent years, additional dead or dying plants may be replaced at the project biologist's direction if it is determined to be necessary in order to

meet specific mitigation performance standards. Irrigation would need to be installed as appropriate to ensure the installed plantings are adequately watered during the site maintenance period.

### **8.3.6 Critical Area Location Recording**

Wetland 18 and its buffers will be recorded with the City of Bainbridge Island.

## **8.4 MONITORING PROGRAM**

Because of the variable success of wetland mitigation projects in the Pacific Northwest, the City of Bainbridge Island code requires that mitigation areas be monitored in order to evaluate their success in replacing lost wetland values and functions. Therefore, this plan includes a systematic monitoring program of the enhanced upland buffers to evaluate the success of the mitigation efforts. The results of the monitoring will be used to develop modifications, if needed, to the mitigation plan in subsequent years.

The purposes of the monitoring program are as follows: (1) to document physical and biological characteristics of the enhanced wetland buffers, and (2) to ensure that the goals and objectives comply with permit specifications (Josselyn et al. 1990).

The monitoring process would consist of three distinct phases: (1) construction monitoring; (2) compliance monitoring; and (3) long-term monitoring. Construction monitoring serves to ensure proper site preparation and plant placement relative to actual site conditions. The “time-zero” or baseline composition, and cover abundance would be documented during the compliance monitoring phase. The long-term monitoring program would document the survival of planted vegetation and rates of colonization by other plants over a minimum seven-year period after implementation of the mitigation plan is complete per City of Bainbridge Island (2017a) code.

### **8.4.1 Construction Monitoring**

The project biologist would be present on-site during the various stages of construction in order to: (1) demark the limits of the areas to be planted; (2) review and approve the plant materials and recommend their final placement before planting; (3) make adjustments in planting plans, as needed, in response to field conditions; (4) ensure that construction activities are conducted per the approved plan; and (5) resolve problems that arise during construction, thus lessening problems that might occur later during the long-term monitoring phase.

### **8.4.2 Compliance Monitoring**

Compliance monitoring consists of evaluating the buffer enhancement area immediately after grading and planting activities are completed. The objectives would be to verify that all design features, as agreed to in the buffer enhancement planting plan, have been correctly and fully implemented, and that any changes made in the field are consistent with the intent and the design of the approved plan. Evaluation of the planting areas after

implementation would be done by the project biologist using evaluation standards and criteria detailed in Section 8.5.

After planting of the buffer is completed, fixed sample plots would be established within areas representative of the plant communities being sampled. The same sample plots would be utilized during each subsequent monitoring of the site during the seven-year long-term monitoring. These sample plots may be located randomly or along specific transects, depending upon-site conditions. During compliance monitoring, a quantitative assessment of the plants established in the wetland and buffer would be recorded in representative sample plots for baseline data. Photos would be taken from each sample plot. This information would be used to document “time-zero” conditions from which the long-term monitoring period would begin.

The compliance monitoring phase would conclude with the preparation of a brief compliance report by the project biologist. The report would document whether all design features have been correctly, fully, and successfully implemented. Substantive changes made in the planting plans would be noted in the compliance report and on the drawings for use during the long-term monitoring phase. Locations of monitoring sample plots established for the compliance monitoring would be identified on the as-built plans.

The planting plans along with the compliance report, would document “as-built” conditions at the time of construction compliance. The compliance report and as-built plan would be submitted to City of Bainbridge Island for review and approval.

### **8.4.3 Long-Term Monitoring**

The long-term monitoring program will begin following approval of the mitigation compliance monitoring report and would be conducted over a seven-year period during years 1, 2, 3, 5, 7, along with off-year spring checks and inspections. Long-term monitoring would evaluate the establishment and maintenance of the plant communities in the enhanced wetland buffer to determine if the goals and objectives of the mitigation plan have been met.

At each sample plot, plant species would be identified, and the combined areal cover for all native planted and volunteer woody species would be estimated. In addition, plant counts would be made following completion of the first and second growing seasons and all subsequent monitoring years in order to document the overall percent survival of the tree and shrub plantings. Plant identifications would be made according to standard taxonomic procedures described in Hitchcock and Cronquist (1976), with nomenclature as updated by the U.S. Army Corps of Engineers National Wetland Plant list (Lichvar et al. 2016).

Photos would be taken within the mitigation planting areas during each monitoring year (years 1, 2, 3, 5, and 7 and along with off-year spring checks). Photographs would be taken from locations established during the compliance monitoring site visit.

#### **8.4.4 Monitoring and Reporting Schedule**

Formal monitoring of the enhanced wetland buffer would occur at the end of the growing season (late-August or September). In addition, during the first two growing seasons, the project biologist would also evaluate the mitigation site during spring and mid-summer to assess site progress and to determine whether maintenance is needed to ensure success of the buffer enhancement areas in attaining the goals and objectives of the mitigation plan.

Monitoring reports would be prepared following the completion of the growing season and submitted to the City of Bainbridge Island for review and approval. The long-term monitoring period will commence following acceptance of the compliance report and “as-built” drawings by the City.

Monitoring reports would be submitted to the City of Bainbridge Island as soon as possible after the monitoring has been completed, with a target date of December 31 of each monitoring year. The report would document conditions within the enhanced areas and make recommendations for correcting any problems encountered.

### **8.5 EVALUATION AND PERFORMANCE STANDARDS**

Specific performance standards to be used in the seven-year long-term monitoring are the following:

#### **Area 1 – Wetland Buffer Enhancement & Restoration with Full Native Forest Plantings**

- 100% survival of all planted trees, shrubs, and low cover following completion of the first year after planting;
- 90% survival of all planted trees, shrubs, and low cover following completion of the second year after planting;
- 80% survival at the end of Long-term monitoring;
- Coverage by shrub species (volunteer and planted individuals) will be the following:
  - at least 5% after one year;
  - at least 10% after two years;
  - at least 20% after three years;
  - at least 40% after five years;
  - at least 50% after seven years;
- Cover of Himalayan blackberry, English Ivy and all other nuisance and invasive species recognized by the City of Bainbridge Island will not exceed 10% within the buffer restoration areas at any time during the long-term monitoring.



**Wetland Buffer In-fill Plantings (“Buffer Around Trail Area”)**

- 100% survival of all planted trees (if feasible), shrubs, and low cover following completion of the first year after planting;
- 80% survival of all planted trees, shrubs, and low cover following completion of the second year after planting. If replacement plantings are necessary to meet the performance standard following completion of the second year, this standard shall be met following their installation;

**Invasive Species Removal**

- Cover of Himalayan blackberry, English Ivy, and all other nuisance and invasive species recognized by the City of Bainbridge Island will not exceed 10% at any time during the long-term monitoring.

## 9.0 LIMITATIONS

We have prepared this report for the exclusive use of the Bainbridge Island School District and their consultants. No other person or agency may rely upon the information, analysis, or conclusions contained herein without permission from the Bainbridge Island School District.

The determination of ecological system classifications, functions, values, and boundaries is an inexact science, and different individuals and agencies may reach different conclusions. With regard to wetlands, the final determination of their boundaries and buffers for regulatory purposes is the responsibility of the various agencies that regulate development activities in and around wetlands. We cannot guarantee the outcome of such determinations. Therefore, the conclusions of this report should be reviewed by the appropriate regulatory agencies.

We warrant that the work performed conforms to standards generally accepted in our field, and prepared substantially in accordance with then-current technical guidelines and criteria. The conclusions of this report represent the results of our analysis of the information provided by the project proponent and their consultants, together with information gathered in the course of the study. No other warranty, expressed or implied, is made.

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## **FIGURES AND TABLES**

PROJECT LOCATION

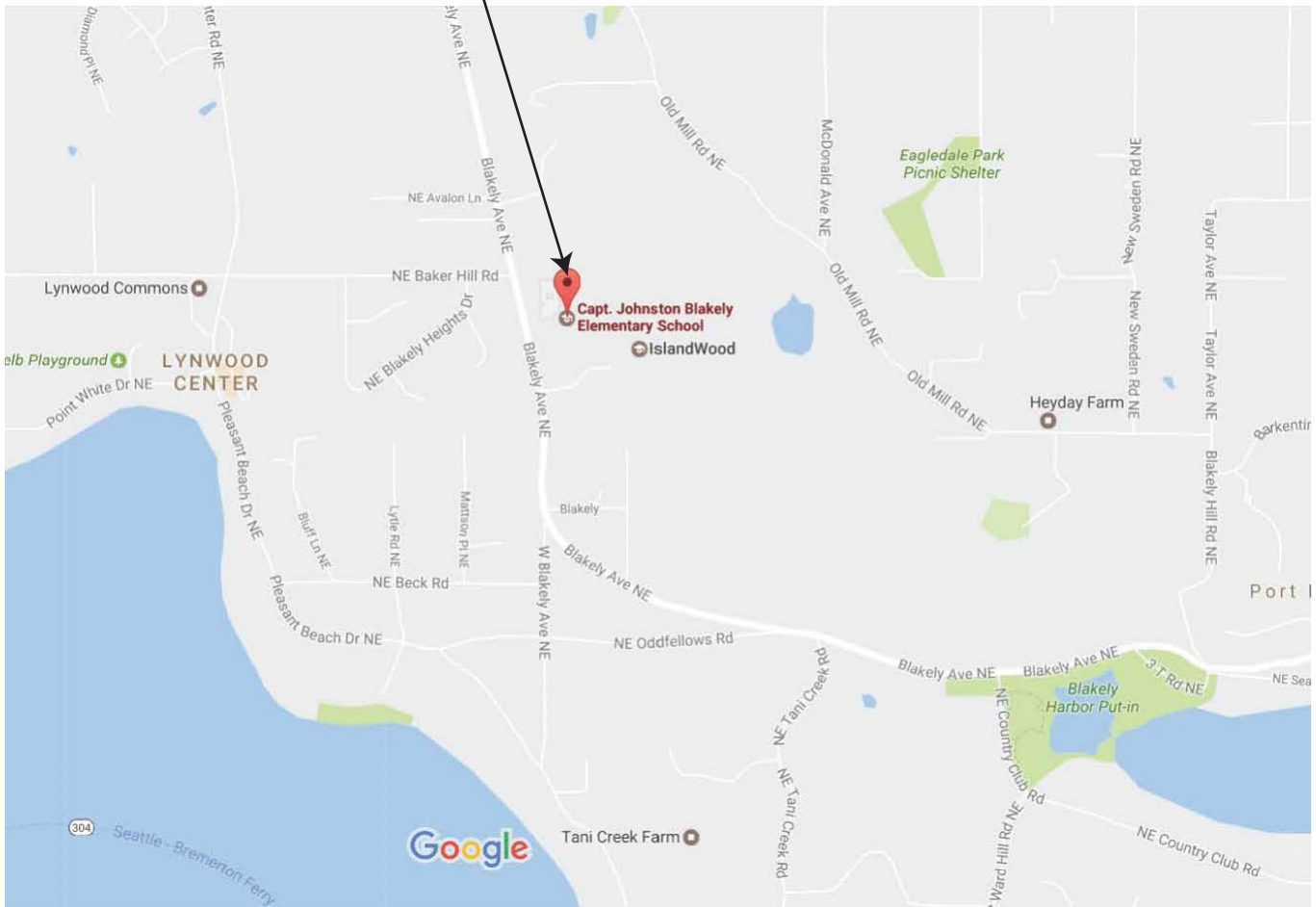
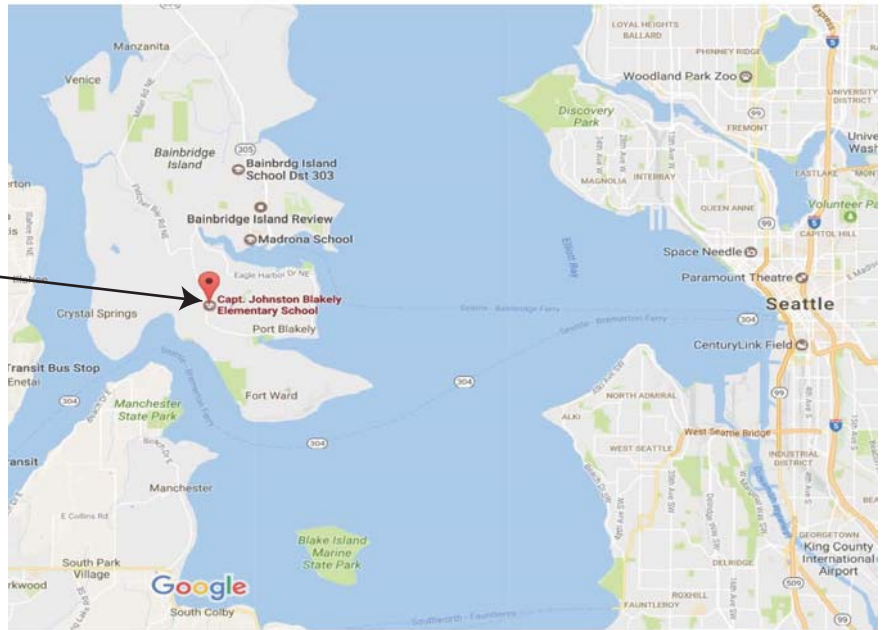


FIGURE 1

# REGIONAL & VICINITY MAP

## BLAKELY ELEMENTARY

## BAINBRIDGE ISLAND, WA



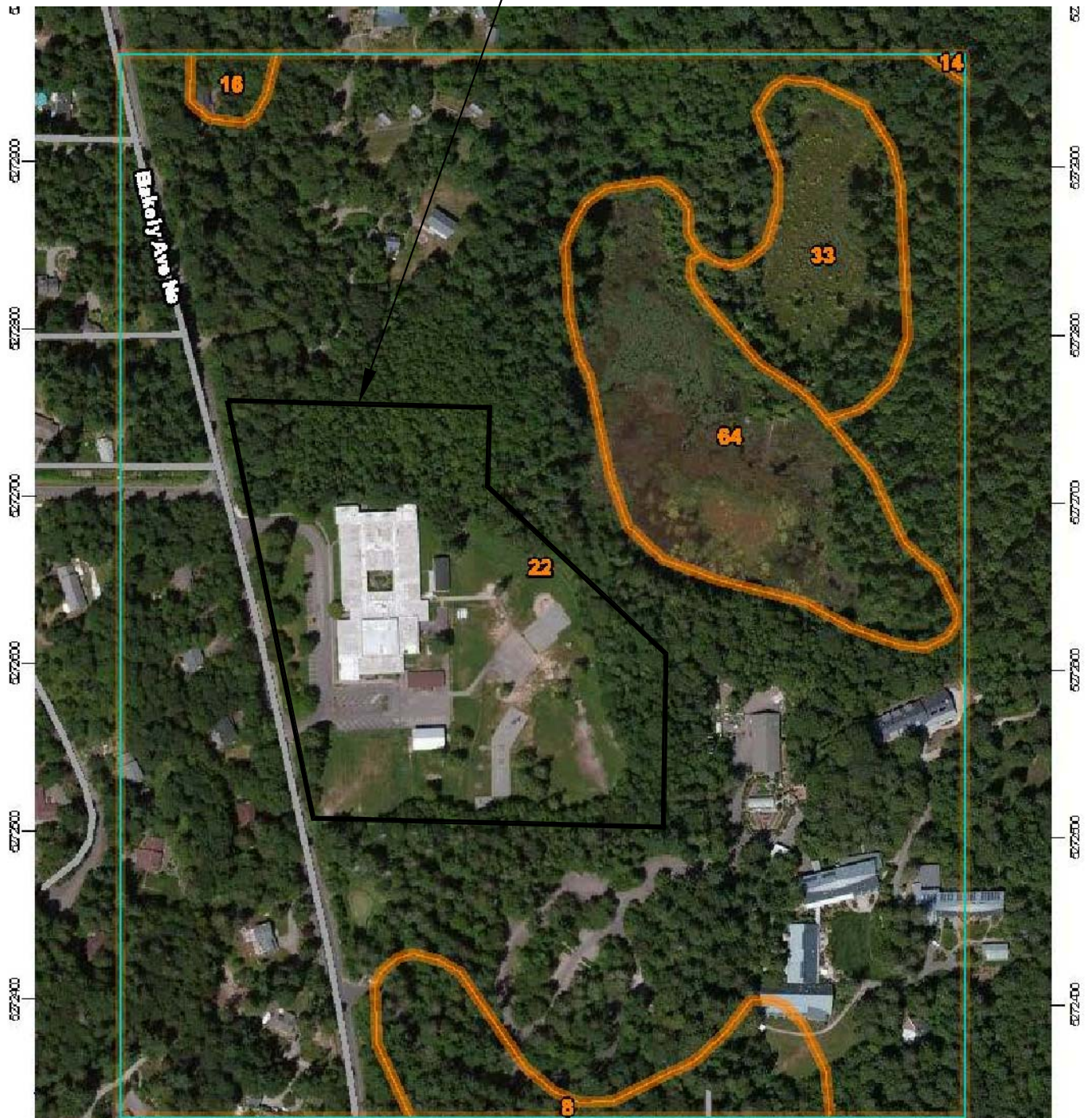
**Raedeke**  
Associates, Inc.

2111 N. Northgate Way, Ste. 219  
Seattle, WA 98133

RAI # 2017-014



# PROJECT AREA



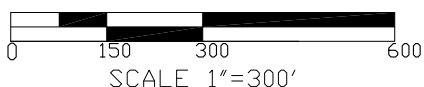
Source: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed [2017/03/09].

## SOILS KEY:

- 22: Kapowsin gravelly ashy loam, 0 - 6% slopes
- 64: Water
- 33: Mukilteo peat
- 16: Harstine gravelly ashy sandy loam, 15-30% slopes
- 14: Harstine gravelly ashy sandy loam, 0-6% slopes
- 8: Cathcart silt loam, 8-15% slopes

## FIGURE 2 SOILS MAP

BLAKELY ELEMENTARY SCHOOL  
BAINBRIDGE ISLAND, WA



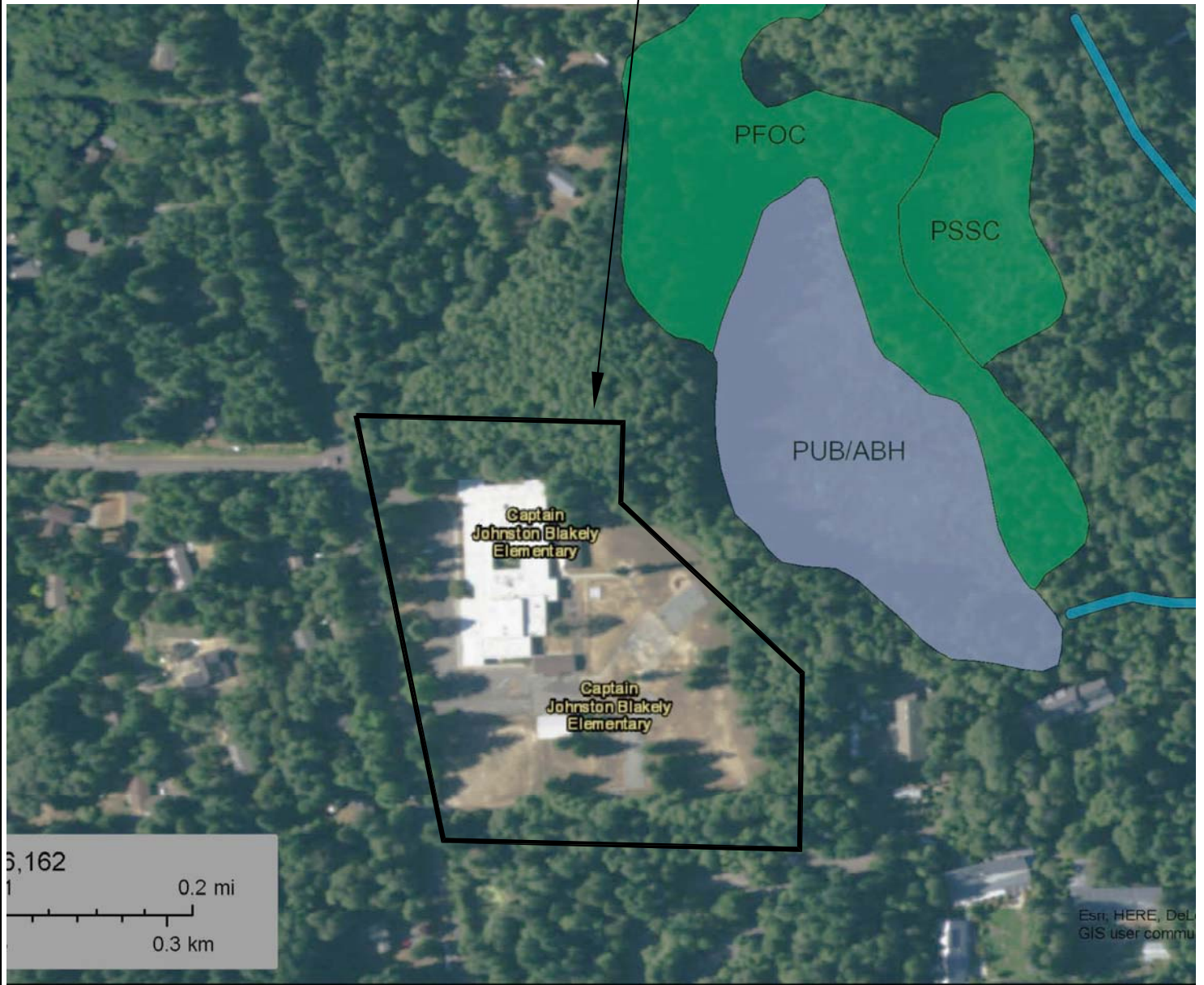
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Seattle, WA 98133

RAI # 2017-014



# PROJECT AREA



Source: US Fish and Wildlife Service National Wetlands Inventory, Wetlands Mapper. Available at <http://www.fws.gov/wetlands/data/mapper.HTML>. Accessed on 2017/03/09.

## NWI WETLAND KEY:

PFOC: Palustrine, Forested, Seasonally Flooded  
 PUB/ABH: Palustrine, Unconsolidated bottom / Aquatic bed, Permanently Flooded  
 PSSC: Palustrine, Scrub Shrub, Seasonally Flooded

 Estuarine and Marine Deepwater	 Freshwater Forested/Shrub Wetland	 Other
 Estuarine and Marine Wetland	 Freshwater Pond	 Riverine
 Freshwater Emergent Wetland	 Lake	



FIGURE 3  
 NWI MAP  
 BLAKELY ELEMENTARY SCHOOL  
 BAINBRIDGE ISLAND, WA

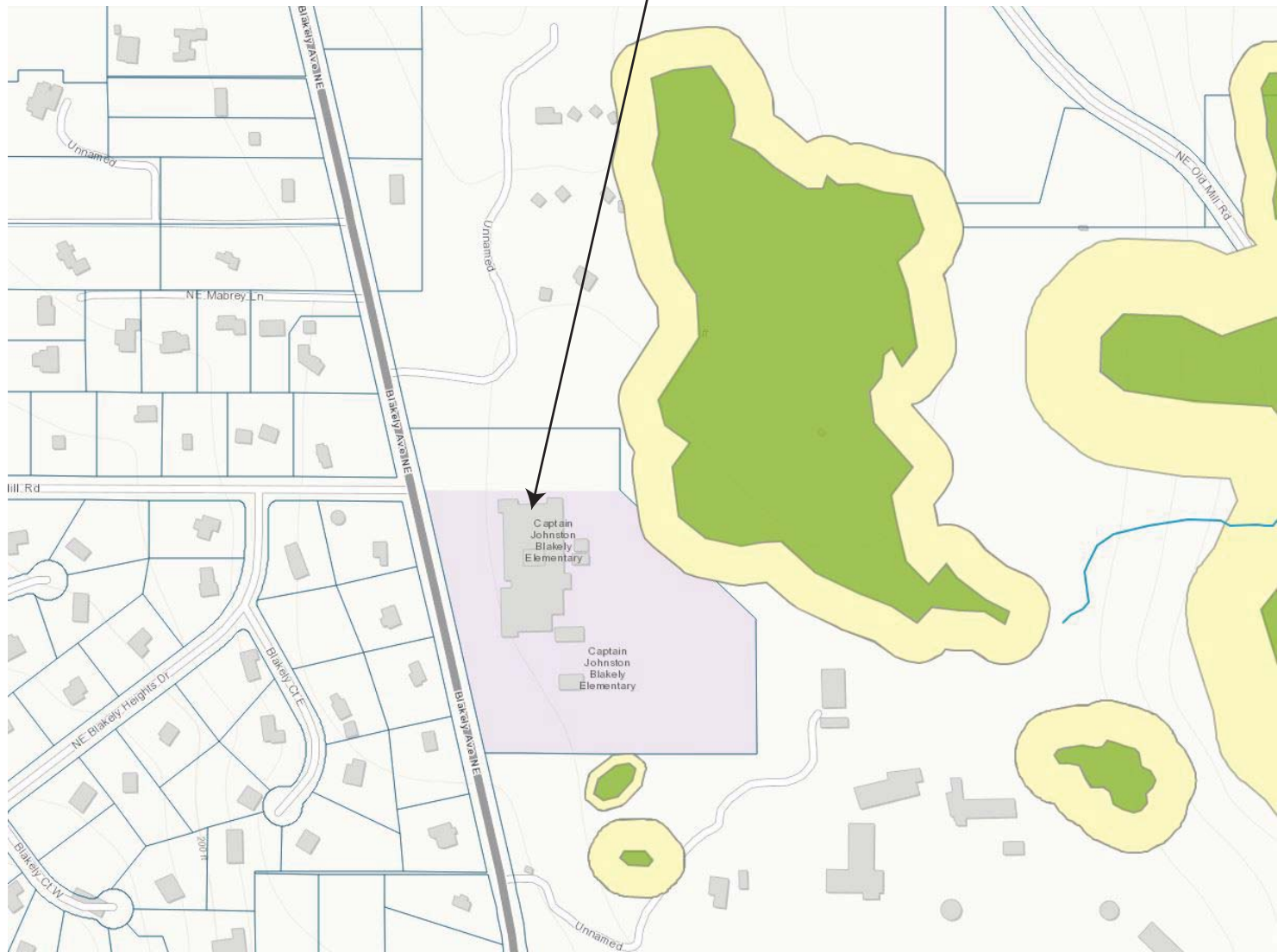
**Raedeke**  
 Associates, Inc.

2111 N. Northgate Way, Ste. 219  
 Seattle, WA 98133

RAI # 2017-014

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## BLAKELY ELEMENTARY



Source: City of Bainbridge Island, WA Mapping Gallery. Available at <https://cityofbi.maps.arcgis.com>. (Accessed 2017-5-16).

### Wetlands Habitat Buffer



### Wetlands Water Quality Buffer



### Kitsap County Parcel Data



### Streams

— Fish

— Non-Fish Perennial

— Non-Fish Seasonal

— Shoreline Stream

### Wetlands



Delineation Available



No Delineation Available



Not a Wetlands



FIGURE 4  
BAINBRIDGE ISLAND CRITICAL AREAS MAPPING  
BLAKELY ELEMENTARY  
BAINBRIDGE ISLAND, WA

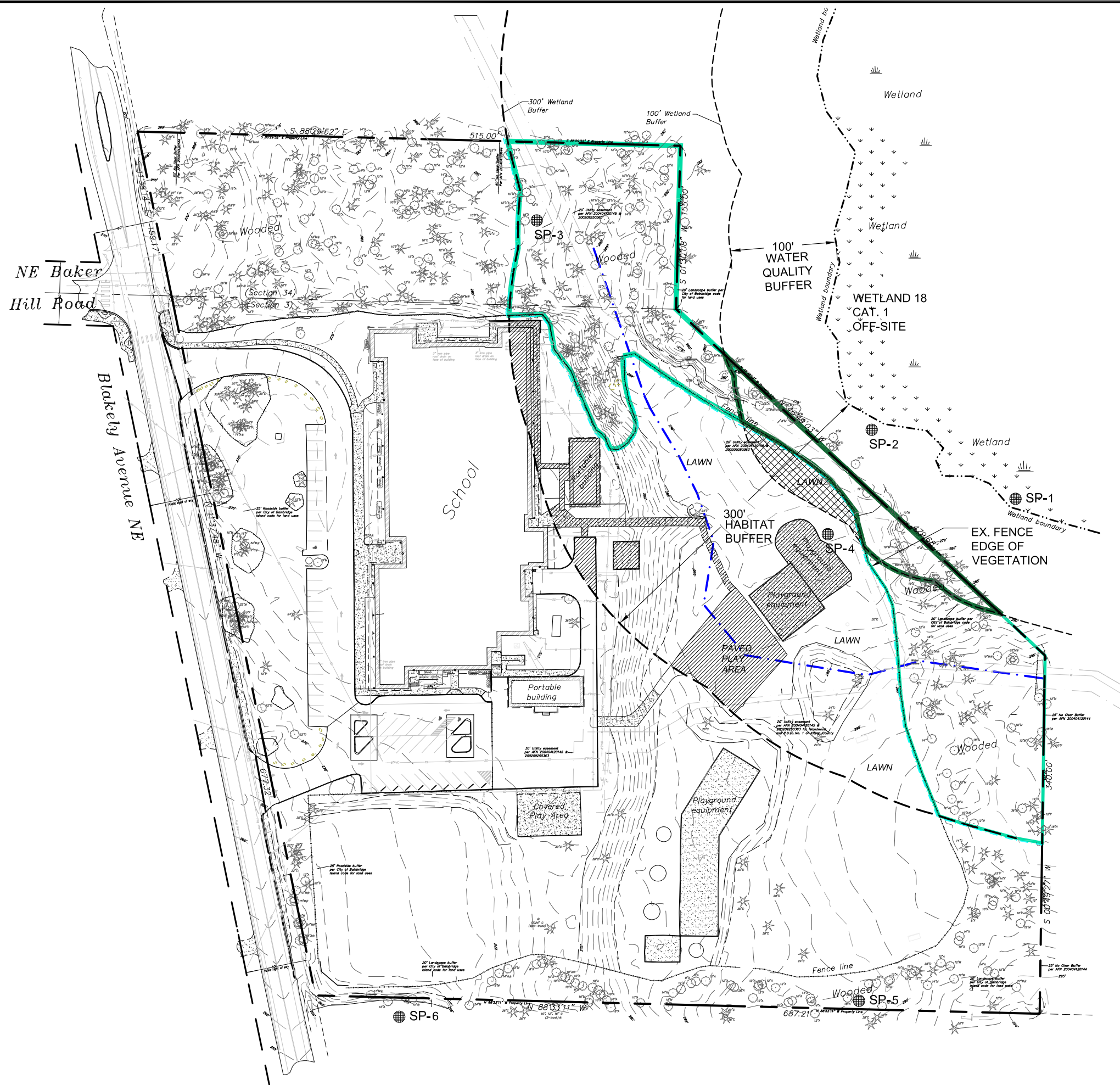
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RAI # 2017-014



FIGURE 5  
BAINBRIDGE ISLAND SCHOOL DISTRICT  
BLAKELY ELEMENTARY SCHOOL  
BAINBRIDGE ISLAND, WA  
CRITICAL AREAS REPORT  
EXISTING CONDITIONS



**LEGEND**

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING WETLAND
- 100' WATER QUALITY BUFFER
- 300' HABITAT BUFFER
- DRAINAGE DIVIDE
- FUNCTIONAL EXISTING HABITAT BUFFER LINE
- SP-# SAMPLE PLOT LOCATIONS (APPROX.)
- EXISTING TREES

EXISTING USES WITHIN THE WATER QUALITY BUFFER ON PROPERTY

FORESTED  
8,500 SF

LAWN  
3,515 SF

THE ENTIRETY OF THE WATER QUALITY BUFF. WITHIN THE WETLAND DRAINAGE AREA.

EXISTING USES WITHIN THE HABITAT BUFFER ON PROPERTY

FORESTED  
64,945 SF  
27,975 SF WETLAND DRAINAGE AREA

BUILDINGS & HARDSCAPE  
20,145 SF  
8,370 SF WETLAND DRAINAGE AREA

LAWN  
63,416 SF  
23,850 SF WETLAND DRAINAGE AREA

NORTH

0 50' 100' 200'

SCALE: 1" = 100'

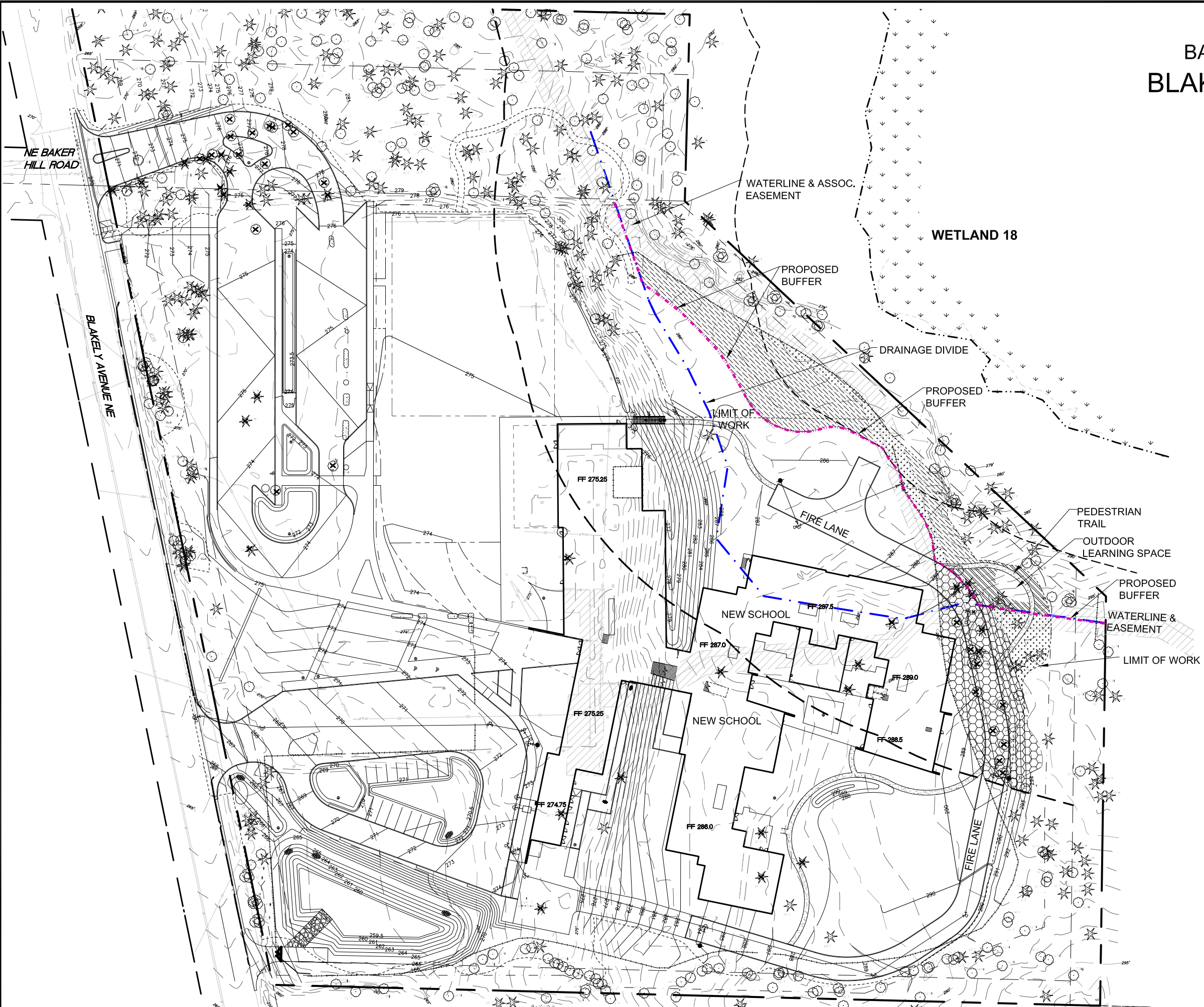
**Raedeke**  
Associates, Inc.

2111 N. Northgate Way, Ste 219  
Seattle, WA 98133

RAI PROJECT: 2017-014	
DATE: 5/23/2017	
DRAWN BY:AC	PM:WH
BASE INFORMATION:	
Mithun/Pier 56 1201 Alaskan Way #200 Seattle, WA 98101	LPD Engineering 1932 First Avenue, Suite 201 Seattle, WA 98101



FIGURE 6  
BAINBRIDGE ISLAND SCHOOL DISTRICT  
BLAKELY ELEMENTARY SCHOOL  
BAINBRIDGE ISLAND, WA  
CRITICAL AREAS REPORT  
SITE PLAN



**LEGEND**

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING WETLAND
- 100' WATER QUALITY BUFFER
- 300' HABITAT BUFFER
- LIMIT OF EX. VEGETATION
- DRAINAGE DIVIDE
- PROPOSED BUFFER
- PROPOSED CONTOURS
- TREES TO BE REMOVED
- HABITAT BUFFER LOSS 8,815 SF

**BUFFER COMPENSATION & RESTORATION**

- FULL NATIVE FOREST PLANTINGS\* 9,820 SF
- NATIVE 'LOW' COVER SHRUBS & GROUNDCOVER\* 3,725 SF
- BUFFER AROUND TRAIL\* 1,985 SF

- \*NOTE FOR ALL PLANTED AREAS:
- REMOVE INVASIVES
  - LIMIT NEW FACILITIES TO TRAIL
  - KEEP TREES & NATIVE UNDESTORY
  - SUPPLEMENTAL NEW PLANTING
  - LEAVE EX. SOIL
  - DECOMPACT COMPACTED SOILS TO ≥ 1 FOOT DEPTH



**Raedeke Associates, Inc.**  
2111 N. Northgate Way, Ste 219  
Seattle, WA 98133

RAI PROJECT: 2017-014	
DATE: 5/23/2017	
DRAWN BY: AC	PM: WH
BASE INFORMATION:	
Mithun/Pier 56 1201 Alaskan Way #200 Seattle, WA 98101	LPD Engineering 1932 First Avenue, Suite 201 Seattle, WA 98101

Table 1. Probable Wetland Ratings per revised WDOE (Hruby 2014) ratings form and corresponding City of Bainbridge Island (2017) buffer standards.

<b>Wetland or Stream</b>	<b>Cowardin Classification</b>	<b>HGM Classification</b>	<b>WDOE Rating (Total Score)</b>	<b>Habitat Function Score</b>	<b>Water Quality Buffer<sup>1</sup></b>	<b>Habitat Buffer</b>	<b>Total Buffer</b>
Wetland 18	PSS1/PEM1/PAB 3	Depressional	21	8	100 ft.	200 ft.	300 ft.

## **APPENDIX A**

### **Field Survey Data**

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

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017  
 Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 1  
 Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.  
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 5  
 Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.606363 Long: -122.533507 Datum: Unknown  
 Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: Palustrine

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 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"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Sample Plot 1 is located within Wetland A, in the southwest corner.	

## VEGETATION – Use scientific names of plants.

Stratum	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>5 m</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>3 m</u> )				
1. <u>Oemleria cerasiformis (Oso-Berry)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	<u>25</u>	= Total Cover		
<b>Herb Stratum</b> (Plot size: <u>1 m</u> )				
1. <u>Typha latifolia (Broad-Leaf Cat-Tail)</u>	<u>50</u>	<u>Y</u>	<u>OBL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>50</u>	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: <u>3 m</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>25</u>				
Remarks:				

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

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

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>50</u>	x 1 = <u>50</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>25</u>	x 4 = <u>100</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>75</u> (A)	<u>150</u> (B)

Prevalence Index = B/A = 2

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ 5 - Wetland Non-Vascular Plants<sup>1</sup>

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

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

**Hydrophytic Vegetation Present?** Yes ☒ No ☐



# SOIL

Sampling Point: SP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0 - 6+	7.5YR 2.5/2	100						cedar remnants
	2.5Y 4/1	100					Silt Clay Loam	

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input checked="" 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)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <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)
---	---

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

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

Remarks:

# HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <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 checked="" 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) ( <b>except MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Frost-Heave Hummocks (D7)					

<b>Field Observations:</b> Surface Water Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 12 Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0 Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0 (includes capillary fringe)	<b>Wetland Hydrology Present?</b> 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: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017  
 Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 2  
 Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.  
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 5  
 Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.606442 Long: -122.534216 Datum: Unknown  
 Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

Are Vegetation       , Soil       , or Hydrology        significantly disturbed? 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"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample Plot 2 was located in an upland trail near the southwest corner of Wetland A.	

## VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>5 m</u> )				
1. _____	_____	_____	_____	<b>Dominance Test worksheet:</b> 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)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
		<u>0</u> = Total Cover		<b>Prevalence Index worksheet:</b> 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 = _____
<b>Sapling/Shrub Stratum</b> (Plot size: <u>3 m</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
		<u>0</u> = Total Cover		<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <small><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small>
<b>Herb Stratum</b> (Plot size: <u>1 m</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
		<u>0</u> = Total Cover		<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>Woody Vine Stratum</b> (Plot size: <u>3 m</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
		<u>0</u> = Total Cover		
<b>% Bare Ground in Herb Stratum</b> <u>100</u>				

Remarks: There was no vegetation growing in the trail.

## SOIL

Sampling Point: SP 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0 - 16	7.5YR 3/2	100						Hog Fuel/Bark
16+	10YR 4/1	100					Loam	

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <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)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <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)  <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)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

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

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one required; check all that apply)</u>				<u>Secondary Indicators (2 or more required)</u>			
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input 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) ( <b>except MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Frost-Heave Hummocks (D7)					
<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>18</u> Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)				<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: _____							
Remarks: _____							

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017  
Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 3  
Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.  
Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 5  
Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.607089 Long: -122.535608 Datum: Unknown  
Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

Hydrophytic Vegetation Present?      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"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

Tree Stratum (Plot size: 5 m)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Alnus rubra (Red Alder)</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>
2.	<u>Thuja plicata (Western Arborvitae)</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
		<u>70</u>	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Vaccinium parvifolium (Red Blueberry)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>
2.	<u>Gaultheria shallon (Salal)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
		<u>45</u>	= Total Cover	
Herb Stratum (Plot size: 1 m)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Polystichum munitum (Pineland Sword Fern)</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
		<u>30</u>	= Total Cover	
Woody Vine Stratum (Plot size: 3 m)		Absolute % Cover	Dominant Species?	Indicator Status
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
		<u>0</u>	= Total Cover	
% Bare Ground in Herb Stratum <u>70</u>				
Remarks:				

**Dominance Index worksheet:**

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

**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>70</u>	x 3 = <u>210</u>
FACU species <u>75</u>	x 4 = <u>300</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>145</u> (A)	<u>510</u> (B)

Prevalence Index = B/A = 3.5

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ 5 - Wetland Non-Vascular Plants<sup>1</sup>

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

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

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

## SOIL

Sampling Point: SP 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0 - 1	10YR 4/2	100					Silt Clay	
1 - 12+	10YR 5/3	75	10YR 4/6	25	C	M	Gr. Si. Clay	

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <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)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <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)  <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)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

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

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one required; check all that apply)</u>				<u>Secondary Indicators (2 or more required)</u>	
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input 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) ( <b>except MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Frost-Heave Hummocks (D7)			
<b>Field Observations:</b> 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)				<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" 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: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017  
 Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 4  
 Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.  
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 5  
 Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.606282 Long: -122.534442 Datum: Unknown  
 Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

Are Vegetation       , Soil       , or Hydrology        significantly disturbed? 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"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample Plot 4 is located in a mowed lawn, in the school yard near the building site.	

## VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>5 m</u> )				
1. _____	_____	_____	_____	<b>Dominance Test worksheet:</b> 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)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____	_____	_____	_____	
		<u>0</u> = Total Cover		<b>Prevalence Index worksheet:</b> 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 = _____
<b>Sapling/Shrub Stratum</b> (Plot size: <u>3 m</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
		<u>0</u> = Total Cover		<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
<b>Herb Stratum</b> (Plot size: <u>1 m</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
		<u>100</u> = Total Cover		<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>Woody Vine Stratum</b> (Plot size: <u>3 m</u> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
		<u>0</u> = Total Cover		
<b>% Bare Ground in Herb Stratum</b> <u>0</u>				
Remarks: Mowed lawn providing 100% cover, only Schedonorus arundinaceus (FAC) identified.				

## SOIL

Sampling Point: SP 4

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

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <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) ( <b>except MLRA 1</b> ) <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)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <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)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b>			
<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (2 or more required)</u>	
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input 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) ( <b>except MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Frost-Heave Hummocks (D7)	
<b>Field Observations:</b> 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)		<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" 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: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017  
 Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 5  
 Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.  
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 5  
 Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.605017 Long: -122.534363 Datum: Unknown  
 Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

Are Vegetation       , Soil       , or Hydrology        significantly disturbed? 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"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample Plot 5 is located south of the school, in an area of ponding in the woods.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus rubra</u> (Red Alder)	<u>25</u>	<u>Y</u>	<u>FAC</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
		<u>25</u> = Total Cover		<b>Prevalence Index worksheet:</b> 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>25</u> x 3 = <u>75</u> FACU species <u>80</u> x 4 = <u>320</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>105</u> (A) <u>395</u> (B)  Prevalence Index = B/A = <u>3.8</u>
<b>Sapling/Shrub Stratum (Plot size: 3 m)</b>				
1. <u>Oemeria cerasiformis</u> (Oso-Berry)	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Ilex aquifolium</u> (English Holly)	<u>10</u>	<u>N</u>	<u>FACU</u>	
3. <u>Gaultheria shallon</u> (Salal)	<u>10</u>	<u>N</u>	<u>FACU</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. <u>Rubus laciniatus</u> (Cut-Leaf Blackberry)	<u>10</u>	<u>N</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
		<u>55</u> = Total Cover		
<b>Herb Stratum (Plot size: 1 m)</b>				<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. <u>Polystichum munitum</u> (Pineland Sword Fern)	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
		<u>25</u> = Total Cover		
<b>Woody Vine Stratum (Plot size: 3 m)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
		<u>0</u> = Total Cover		
<b>% Bare Ground in Herb Stratum <u>75</u></b>				
Remarks:				



## SOIL

Sampling Point: SP 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0 - 8	10YR 4/3	100					Silt Loam	
8+	10YR 4/2	95	10YR 4/4	5	C	M	Silt Loam	

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <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)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <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) <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)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

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

Remarks: marginal redox features lacking masses and/or pore linings sufficient to be hydric.

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <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 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) ( <b>except MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Frost-Heave Hummocks (D7)			
<b>Field Observations:</b> Surface Water Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>NA</u> Water Table Present?    Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ (includes capillary fringe)				<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks: Observations of ponding follow 3 days of abundant rainfall in a wetter than average winter.					

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

Project/Site: Blakely Elementary School City/County: Bainbridge Island Sampling Date: 3/16/2017  
Applicant/Owner: Bainbridge Island School District State: WA Sampling Point: SP 6  
Investigator(s): C. Wright and W. Hohman Section, Township, Range: S3, T24N, R2E, W.M.  
Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 5  
Subregion (LRR): Northwest Forests & Coasts (LRR A) Lat: 47.604776 Long: -122.536003 Datum: Unknown  
Soil Map Unit Name: Kapowsin gravelly ashy loam NWI classification: None

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

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? 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"/>	<b>Is the Sampled Area within a Wetland?</b>	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: Sample Plot 6 is located between the Islandwood pond and the southern school boundary.			

**VEGETATION** – Use scientific names of plants.

Tree Stratum (Plot size: 5 m)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Acer macrophyllum (Big-Leaf Maple)</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
		<u>40</u>	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Rubus spectabilis (Salmon Raspberry)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
2.	<u>Oemerlia cerasiformis (Oso-Berry)</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
3.	<u>Gaultheria shallon (Salal)</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
		<u>40</u>	= Total Cover	
Herb Stratum (Plot size: 1 m)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Polystichum munitum (Pineland Sword Fern)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>
2.	<u>Urtica dioica (Stinging Nettle)</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
		<u>30</u>	= Total Cover	
Woody Vine Stratum (Plot size: 3 m)		Absolute % Cover	Dominant Species?	Indicator Status
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
		<u>0</u>	= Total Cover	
% Bare Ground in Herb Stratum <u>70</u>				
Remarks: _____				

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

**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>5</u>	x 3 = <u>15</u>
FACU species <u>105</u>	x 4 = <u>420</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>110</u> (A)	<u>435</u> (B)

Prevalence Index = B/A = 3.9

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ 5 - Wetland Non-Vascular Plants<sup>1</sup>

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

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

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

# SOIL

Sampling Point: SP 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0 - 6	10YR 3/2	100					Gr. Si. Loam	
6 - 8	10YR 4/4	97	10YR 4/6	3	C	M	Gr. Si. Loam	

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <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) ( <b>except MLRA 1</b> ) <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)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <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)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: marginal redox features lacking masses and/or pore linings sufficient to be hydric

# HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <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) ( <b>except MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> ) <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) ( <b>LRR A</b> ) <input type="checkbox"/> Frost-Heave Hummocks (D7)					

<b>Field Observations:</b> Surface Water Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>4</u> Water Table Present?    Yes <input type="checkbox"/> No <input type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Observations of ponding follow 3 days of abundant rainfall in a wetter than average winter

## **APPENDIX B**

**Washington Department of Ecology 2014 Wetland Rating Forms for Western  
Washington**

Wetland name or number 18

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 18 Date of site visit: 03/16/17Rated by Will Hohman Trained by Ecology? ☒ Yes ☐ No Date of training March 2017HGM Class used for rating Depressional/Bog Wetland has multiple HGM classes? ☐ Y ☐ N**NOTE: Form is not complete without the figures requested** (*figures can be combined*).Source of base aerial photo/map Google Earth, WDOE**OVERALL WETLAND CATEGORY** I/II (based on functions ☒ or special characteristics ☒)

### 1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	H <b>M</b> L	H <b>M</b> L	<b>H</b> M L	
Landscape Potential	H <b>M</b> L	H <b>M</b> L	H <b>M</b> L	
Value	<b>H</b> M L	H M <b>L</b>	<b>H</b> M L	<b>TOTAL</b>
Score Based on Ratings	<b>7</b>	<b>5</b>	<b>8</b>	<b>20</b>

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

9 = H,H,H

8 = H,H,M

7 = H,H,L

7 = H,M,M

6 = H,M,L

6 = M,M,M

5 = H,L,L

5 = M,M,L

4 = M,L,L

3 = L,L,L

### 2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number 18

## Maps and figures required to answer questions correctly for Western Washington

### Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	not incl.
Hydroperiods	D 1.4, H 1.2	" "
Location of outlet ( <i>can be added to map of hydroperiods</i> )	D 1.1, D 4.1	" "
Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )	D 2.2, D 5.2	" "
Map of the contributing basin	D 4.3, D 5.3	" "
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	" "
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	" "
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	" "

### Riverine Wetlands

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

### Lake Fringe Wetlands

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

### Slope Wetlands

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

Wetland name or number 18

## HGM Classification of Wetlands in Western Washington

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

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

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

☒ NO – go to 2

☐ YES – the wetland class is **Tidal Fringe** – go to 1.1

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

☒ NO – **Saltwater Tidal Fringe (Estuarine)**

☐ YES – **Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

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

☒ NO – go to 3

☐ YES – The wetland class is **Flats**

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

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

\_\_\_ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;

\_\_\_ At least 30% of the open water area is deeper than 6.6 ft (2 m).

☒ NO – go to 4

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

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

\_\_\_ The wetland is on a slope (*slope can be very gradual*),

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

\_\_\_ The water leaves the wetland **without being impounded**.

☒ NO – go to 5

☐ YES – The wetland class is **Slope**

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

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

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

\_\_\_ The overbank flooding occurs at least once every 2 years.

Wetland name or number 18

NO – go to 6

YES – The wetland class is **Riverine**

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

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

NO – go to 7

YES – The wetland class is **Depressional**

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

NO – go to 8

YES – The wetland class is **Depressional**

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

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

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

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



Wetland name or number 18

<b>DEPRESSIONAL AND FLATS WETLANDS</b>	
<b>Water Quality Functions - Indicators that the site functions to improve water quality</b>	
<b>D 1.0. Does the site have the potential to improve water quality?</b>	
<b>D 1.1. Characteristics of surface water outflows from the wetland:</b> Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	<b>2</b>
<b>D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No = 0</b>	<b>4</b>
<b>D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</b> Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > 1/10 of area points = 1 Wetland has persistent, ungrazed plants < 1/10 of area points = 0	<b>3</b>
<b>D 1.4. Characteristics of seasonal ponding or inundation:</b> <i>This is the area that is ponded for at least 2 months. See description in manual.</i> Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	<b>2</b>
<b>Total for D 1</b>	<b>11</b>

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

<b>D 2.0. Does the landscape have the potential to support the water quality function of the site?</b>	
<b>D 2.1. Does the wetland unit receive stormwater discharges?</b>	Yes = 1 No = 0
<b>D 2.2. Is &gt; 10% of the area within 150 ft of the wetland in land uses that generate pollutants?</b>	Yes = 1 No = 0
<b>D 2.3. Are there septic systems within 250 ft of the wetland?</b>	Yes = 1 No = 0
<b>D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3?</b>	Yes = 1 No = 0
Source _____	Yes = 1 No = 0
<b>Total for D 2</b>	<b>2</b>

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

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

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

Wetland name or number 18**DEPRESSIONAL AND FLATS WETLANDS****Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream degradation

<b>D 4.0. Does the site have the potential to reduce flooding and erosion?</b>		
<b>D 4.1. Characteristics of surface water outflows from the wetland:</b> Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0		<b>2</b>
<b>D 4.2. Depth of storage during wet periods:</b> <i>Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.</i> Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0		<b>3</b>
<b>D 4.3. Contribution of the wetland to storage in the watershed:</b> <i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i> The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5		<b>5</b>
Total for D 4		<b>10</b>

**Rating of Site Potential** If score is: 12-16 = H ☒ 6-11 = M 0-5 = L

Record the rating on the first page

<b>D 5.0. Does the landscape have the potential to support hydrologic functions of the site?</b>		
<b>D 5.1. Does the wetland receive stormwater discharges?</b> Yes = 1 No = 0		<b>1</b>
<b>D 5.2. Is &gt;10% of the area within 150 ft of the wetland in land uses that generate excess runoff?</b> Yes = 1 No = 0		<b>0</b>
<b>D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at &gt;1 residence/ac, urban, commercial, agriculture, etc.)?</b> Yes = 1 No = 0		<b>0</b>
Total for D 5		<b>1</b>

**Rating of Landscape Potential** If score is: 3 = H ☒ 1 or 2 = M 0 = L

Record the rating on the first page

<b>D 6.0. Are the hydrologic functions provided by the site valuable to society?</b>		
<b>D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.</b> The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. <i>Explain why</i> _____ points = 0 There are no problems with flooding downstream of the wetland. points = 0		<b>0</b>
<b>D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</b> Yes = 2 No = 0		<b>0</b>
Total for D 6		<b>0</b>

**Rating of Value** If score is: 2-4 = H 1 = M ☒ 0 = L

Record the rating on the first page

Wetland name or number 18**These questions apply to wetlands of all HGM classes.****HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat**H 1.0. Does the site have the potential to provide habitat?**

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of 1/4 ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- |   |                                  |   |
|---|----------------------------------|---|
| <input checked="" type="checkbox"/> Aquatic bed                                       | 4 structures or more: points = 4 | 4 |
| <input checked="" type="checkbox"/> Emergent  | 3 structures: points = 2         |   |
| <input checked="" type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover) | 2 structures: points = 1         |   |
| <input checked="" type="checkbox"/> Forested (areas where trees have > 30% cover)     | 1 structure: points = 0          |   |

*If the unit has a Forested class, check if:*

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

**H 1.2. Hydroperiods**

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 ac to count (*see text for descriptions of hydroperiods*).

- |  |                                     |   |
|--|-------------------------------------|---|
| <input checked="" type="checkbox"/> Permanently flooded or inundated                         | 4 or more types present: points = 3 | 2 |
| <input checked="" type="checkbox"/> Seasonally flooded or inundated                          | 3 types present: points = 2         |   |
| <input type="checkbox"/> Occasionally flooded or inundated                                   | 2 types present: points = 1         |   |
| <input checked="" type="checkbox"/> Saturated only   | 1 type present: points = 0          |   |
| <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"/> <b>Lake Fringe wetland</b>  | <b>2 points</b>                     |   |
| <input type="checkbox"/> <b>Freshwater tidal wetland</b>                                     | <b>2 points</b>                     |   |

**H 1.3. Richness of plant species**

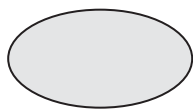
Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup>.

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

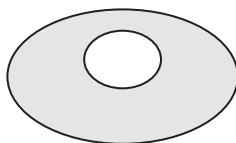
- |                              |            |   |
|------------------------------|------------|---|
| If you counted: > 19 species | points = 2 | 2 |
| 5 - 19 species               | points = 1 |   |
| < 5 species                  | points = 0 |   |

**H 1.4. Interspersion of habitats**

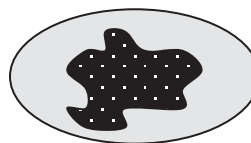
Decide from the diagrams below whether interspersions among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



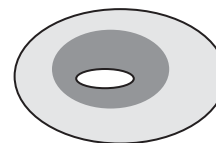
**None** = 0 points



**Low** = 1 point

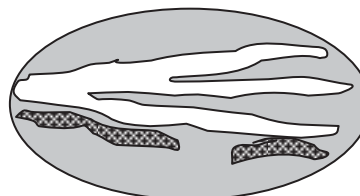
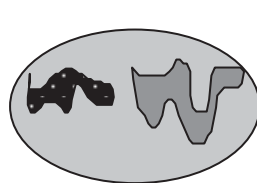


**Moderate** = 2 points



3

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



Wetland name or number 18

<p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).</p> <p><input checked="" type="checkbox"/> Standing snags (dbh &gt; 4 in) within the wetland</p> <p><input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)</p> <p><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input checked="" type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input checked="" type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p>	4
<p>Total for H 1</p> <p style="text-align: right;">Add the points in the boxes above</p>	15

**Rating of Site Potential** If score is: ☒ 15-18 = H ☐ 7-14 = M ☐ 0-6 = L

Record the rating on the first page

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

<p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p>Calculate: % undisturbed habitat <u>6</u> + [(% moderate and low intensity land uses)/2] <u>9</u> = <u>15</u> %</p> <p>If total accessible habitat is:</p> <p>&gt; 1/3 (33.3%) of 1 km Polygon points = 3</p> <p>20-33% of 1 km Polygon points = 2</p> <p>10-19% of 1 km Polygon points = 1</p> <p>&lt; 10% of 1 km Polygon points = 0</p>	1
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p>Calculate: % undisturbed habitat <u>19</u> + [(% moderate and low intensity land uses)/2] <u>11</u> = <u>30</u> %</p> <p>Undisturbed habitat &gt; 50% of Polygon points = 3</p> <p>Undisturbed habitat 10-50% and in 1-3 patches points = 2</p> <p>Undisturbed habitat 10-50% and &gt; 3 patches points = 1</p> <p>Undisturbed habitat &lt; 10% of 1 km Polygon points = 0</p>	1
<p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>&gt; 50% of 1 km Polygon is high intensity land use points = (- 2)</p> <p>≤ 50% of 1 km Polygon is high intensity points = 0</p>	0
<p>Total for H 2</p> <p style="text-align: right;">Add the points in the boxes above</p>	2

**Rating of Landscape Potential** If score is: ☐ 4-6 = H ☒ 1-3 = M ☐ < 1 = L

Record the rating on the first page

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

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

Record the rating on the first page

Wetland name or number 18

## WDFW Priority Habitats

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

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

- **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- **Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
- ✓ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ✓ **Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ✓ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

Wetland name or number 18**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

Wetland Type	Category
<p><i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i></p> <p><b>SC 1.0. Estuarine wetlands</b>            Does the wetland meet the following criteria for Estuarine wetlands?            — The dominant water regime is tidal,            — Vegetated, and            — With a salinity greater than 0.5 ppt            Yes – Go to <b>SC 1.1</b>      No = <b>Not an estuarine wetland</b></p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?            Yes = <b>Category I</b>      No - Go to <b>SC 1.2</b></p>	<b>Cat. I</b>
<p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?            — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25)            — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.            — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.            Yes = <b>Category I</b>      No = <b>Category II</b></p>	<b>Cat. I</b>  <b>Cat. II</b>
<p><b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b>            SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?            Yes – Go to <b>SC 2.2</b>      No – Go to <b>SC 2.3</b>            SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?            Yes = <b>Category I</b>      No = <b>Not a WHCV</b>            SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?  <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a>            Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b>      No = <b>Not a WHCV</b>            SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?            Yes = <b>Category I</b>      No = <b>Not a WHCV</b></p>	<b>Cat. I</b>
<p><b>SC 3.0. Bogs</b>            Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i>            SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?            Yes – Go to <b>SC 3.3</b>      No – Go to <b>SC 3.2</b>            SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?            Yes – Go to <b>SC 3.3</b>      No = <b>Is not a bog</b>            SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4?            Yes = <b>Is a Category I bog</b>      No – Go to <b>SC 3.4</b>  <b>NOTE:</b> If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.            SC 3.4. Is an area with peats or mucks forested (&gt; 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?            Yes = <b>Is a Category I bog</b>      No = <b>Is not a bog</b></p>	<b>Cat. I</b>

SC 3.0 - A field identified bog community is in the middle of the wetland. Aerial photo interpretation indicates that there is a bog community fringing the central open water area.



Wetland name or number 18

<p><b>SC 4.0. Forested Wetlands</b></p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <b><i>If you answer YES you will still need to rate the wetland based on its functions.</i></b></p> <ul style="list-style-type: none"> <li>— <b>Old-growth forests</b> (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</li> <li>— <b>Mature forests</b> (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</li> </ul> <p style="text-align: right;">Yes = <b>Category I</b>      No = <b>Not a forested wetland for this section</b></p>	<b>Cat. I</b>
<p><b>SC 5.0. Wetlands in Coastal Lagoons</b></p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> <li>— 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</li> <li>— The lagoon in which the wetland is located contains ponded water that is saline or brackish (&gt; 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>)</li> </ul> <p style="text-align: right;">Yes – Go to <b>SC 5.1</b>      No = <b>Not a wetland in a coastal lagoon</b></p> <p><b>SC 5.1. Does the wetland meet all of the following three conditions?</b></p> <ul style="list-style-type: none"> <li>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</li> <li>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</li> <li>— The wetland is larger than <math>\frac{1}{10}</math> ac (4350 ft<sup>2</sup>)</li> </ul> <p style="text-align: right;">Yes = <b>Category I</b>      No = <b>Category II</b></p>	<b>Cat. I</b>       <b>Cat. II</b>
<p><b>SC 6.0. Interdunal Wetlands</b></p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <b><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></b></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <li>— Long Beach Peninsula: Lands west of SR 103</li> <li>— Grayland-Westport: Lands west of SR 105</li> <li>— Ocean Shores-Copalis: Lands west of SR 115 and SR 109</li> </ul> <p style="text-align: right;">Yes – Go to <b>SC 6.1</b>      No = <b>not an interdunal wetland for rating</b></p> <p><b>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</b>  <span style="float: right;">Yes = <b>Category I</b>      No – Go to <b>SC 6.2</b></span></p> <p><b>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</b>  <span style="float: right;">Yes = <b>Category II</b>      No – Go to <b>SC 6.3</b></span></p> <p><b>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?</b>  <span style="float: right;">Yes = <b>Category III</b>      No = <b>Category IV</b></span></p>	<b>Cat I</b>       <b>Cat. II</b>    <b>Cat. III</b>    <b>Cat. IV</b>
<p><b>Category of wetland based on Special Characteristics</b></p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

Wetland name or number 18

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## **APPENDIX C:**

**Washington Department of Transportation (2000)  
Functional Assessment Data Form**

# Wetland Functions Field Data Form – WSDOT's BPJ Characterization \*

Project: Blakely Elementary School Date: 01/17/17  
 Wetland Name: wetland 18 Biologist: WKH  
 (ref. proj. no. 2017-014)

## A. Flood Flow Alteration

(Storage and Desynchronization)

1. Wetland occurs in the upper portion of its watershed.
2. Wetland is in a relatively flat area and is capable of retaining higher volumes of water during storm events, than under normal rainfall conditions.
3. Wetland is a closed (depressional) system.
4. If flowthrough, wetland has constricted outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.
5. Wetland has dense woody vegetation.
6. Wetland receives floodwater from an adjacent water course.
7. Floodwaters come as sheet flow rather than channel flow.

Likely or not likely to provide.  
(State your rationale.)

Likely

## B. Sediment Removal

1. Sources of excess sediment (from tillage or construction) are present upgradient of the wetland.
2. Slow-moving water and/or a deepwater habitat are present in the wetland.
3. Dense herbaceous vegetation is present.
4. Interspersion of vegetation and water is high in wetland.
5. Ponding of water occurs in the wetland.
6. Sediment deposits are present in wetland.

Likely or not likely to provide.  
(State your rationale.)

Likely

\* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

### C. Nutrient and Toxicant Removal

1. Sources of excess nutrients (fertilizers) and toxicants (pesticides and heavy metals) are present upgradient of the wetland.
2. Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.
3. Wetland provides long duration for water detention.
4. Wetland has at least 30% areal cover of live dense herbaceous vegetation.
5. Fine-grained mineral or organic soils are present in the wetland.

Likely or not likely to provide.  
(State your rationale.)

Likely

### D. Erosion Control and Shoreline Stabilization

*If associated with water course or shoreline.*

1. Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.
2. A herbaceous layer is part of this dense vegetation.
3. Trees and shrubs able to withstand erosive flood events are also part of this dense vegetation.

Likely or not likely to provide.  
(State your rationale.)

N/A

### E. Production of Organic Matter and its Export

1. Wetland has at least 30% areal cover of dense herbaceous vegetation.
2. Woody plants in wetland are mostly deciduous.
3. High degree of plant community structure, vegetation density, and species richness present.
4. Interspersion of vegetation and water is high in wetland.
5. Wetland is inundated or has indicators that flooding is a seasonal event during the growing season.
6. Wetland has outlet from which organic matter is flushed.

Likely or not likely to provide.  
(State your rationale.)

Likely

\* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

**F. General Habitat Suitability**

1. Wetland is not fragmented by development.
2. Upland surrounding wetland is undeveloped.
3. Wetland has connectivity with other habitat types.
4. Diversity of plant species is high.
5. Wetland has more than one Cowardin Class, i.e., (PFO, PSS, PEM, PAB, POW, etc.)
6. Has high degree of Cowardin Class interspersed.
7. Evidence of wildlife use, e.g., tracks, scat, gnawed stumps, etc., is present

Likely or not likely to provide.  
(State your rationale.)

Likely

**G. Habitat for Aquatic Invertebrates**

1. Wetland must have permanent or evidence of seasonal inundation for this function to be provided.
2. Various water depths present in wetland
3. Aquatic bed vegetation present.
4. Emergent vegetation present within ponded area.
5. Cover (i.e., woody debris, rocks, and leaf litter) present within in the standing water area.
6. A stream or another wetland within 2 km (1.2 mi) of wetland.

Likely or not likely to provide.  
(State your rationale.)

Likely

**H. Habitat for Amphibians**

1. Wetland contains areas of seasonal and/or permanent standing water in most years. (Must be present for this function to be provided)
2. Thin-stemmed emergent and/or floating aquatic vegetation present within areas of seasonal and/or perennial standing water.
3. Wetland buffer < 40% developed, i.e., by pavement and/or buildings.

Likely or not likely to provide.  
(State your rationale.)

Likely

\* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

4. Woody debris present within wetland.
5. Lands within 1 km (0.6 mi) of wetland are greater than or equal to 40% undeveloped (e.g., green belts, forest, grassland, agricultural).
6. Other wetlands and/or an intermittent or perennial stream within 1 km (0.6 mi) of wetland.

**I. Habitat for Wetland-Associated Mammals**

1. Permanent water present within the wetland. (Must be present for this function to be provided.)
2. Presence of emergent vegetation in areas of permanent water.
3. Areas containing dense shrubs and/or trees are present within wetland or its buffer.
4. Interspersion between different strata of vegetation.
5. Interspersion between permanent open water (without vegetation) and permanent water with vegetation.
6. Presence of banks suitable for denning.
7. Evidence of wildlife use, e.g., dens, tracks, scat, gnawed stumps, etc., is present.

**J. Habitat for Wetland-Associated Birds**

1. Wetland has 30 to 50% shallow open water and/or aquatic bed classes present within the wetland.
2. Emergent vegetation class present within the wetland.
3. Forested and scrub-shrub classes present within the wetland or its buffer.
4. Snags present in wetland or its buffer.
5. Sand bars and/or mud flats present within the wetland.

Likely or not likely to provide.  
(State your rationale.)

Likely or not likely to provide.  
(State your rationale.)

Likely or not likely to provide.  
(State your rationale.)

\* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

6. Wetland contains invertebrates, amphibians, and/or fish.
7. Buffer contains relatively undisturbed grassland shrub and/or forest habitats.
8. Lands within 1 km (0.6 mi) of the wetland are greater than or equal to 40% undeveloped (e.g., green belts, forest, grassland, agricultural).

**K. General Fish Habitat**

*(Must be associated with a fish-bearing water.)*

1. Wetland has a perennial or intermittent surface-water connection to a fish-bearing water body
2. Wetland has sufficient size and depth of open water so as not to freeze completely during winter.
3. Observation of fish.
4. Herbaceous and/or woody vegetation is present in wetland and/or buffer to provide cover, shade, and/or detrital matter.
5. Spawning areas are present (aquatic vegetation and/or gravel beds).

**L. Native Plant Richness**

1. Dominant and codominant plants are native.
2. Wetland contains two or more Cowardin Classes.
3. Wetland has three or more strata of vegetation.
4. Wetland has mature trees.

**M. Educational or Scientific Value**

1. Site has documented scientific or educational use.
2. Wetland is in public ownership.
3. Parking at site is suitable for a school bus.

Likely or not likely to provide.  
(State your rationale.)

Likely or not likely to provide.  
(State your rationale.)

N/A

Likely or not likely to provide.  
(State your rationale.)

Likely or not likely to provide.  
(State your rationale.)

\* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

**N. Uniqueness and Heritage**

1. Wetland contains documented occurrence of a state- or federally listed threatened or endangered species.
2. Wetland contains documented critical habitat, high quality ecosystems, or priority species respectively designated by the U.S. Fish and Wildlife Service, the WDNR's Natural Heritage Program, or WDFW's Priority Habitats and Species Program.
3. Wetland is part of a National Natural Landmark designated by the National Park Service or a Natural Heritage Site designated by WDNR.
4. Wetland has biological, geological, or other features that are determined rare by the local jurisdiction.
5. Wetland has been determined significant by the local jurisdiction because it provides functions scarce for the area.
6. Wetland is part of ...
  - an estuary,
  - a bog.
  - a mature forest.

Likely or not likely to provide.  
(State your rationale.)

may likely

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\* Adapted from the Highway Methodology Workbook Supplement for Wetland Functions and Values (COE, 1995).

## **APPENDIX 4**

### **Wetland Functions and Values Form**

(Can be copied for use in the appendices of a report)



## Wetland Functions &amp; Values Form

Wetland I.D. BProject: Blakely Elem. SchoolAssessed by: WPHCowardin Class: PSS/DEMIEcology Category: 1/11Local Rating: " "Wetland size:     Date: 4/17/17

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	/		see characterization ?		
Sediment Removal	/		"		
Nutrient & Toxicant Removal	/		"		
Erosion Control & Shoreline Stabilization		/	"		
Production of Organic Matter and its Export	/		"		
General Habitat Suitability	/		"		
Habitat for Aquatic Invertebrates	/		"		
Habitat for Amphibians	/		"		
Habitat for Wetland-Associated Mammals	/		"		
Habitat for Wetland-Associated Birds	/		"		
General Fish Habitat		/	"		
Native Plant Richness	/		"		
Educational or Scientific Value	/		"		
Uniqueness and Heritage	/		"		