Technical Memorandum

To: Randall Perry – U.S. Army Corps of Engineers, Seattle District

From: Kevin Fetherston, Ph.D., PWS – WSP Environment & Energy

Date: April 15, 2009

Re: An Analysis of the Geographic Extent of Waters of the United States, Including Wetlands, at Bakerview Park, Skagit County, Washington

I. Introduction

The City of Mount Vernon, Washington manages a waters/wetlands reserve system as part of their Critical Areas Ordinance (CAO) program. In 2007, the City identified waters/wetlands within Bakerview Park as a priority location for restoration activities in the Trumpeter Creek watershed. The park is located at 3101 East Fir Street, Mount Vernon, Washington (Figure 1). Recently, and in cooperation with the Seattle District of the U.S. Army Corps of Engineers, it has become possible to direct a combination of CAO funds towards restoring 3.67 acres of slope and depressional wetlands at Bakerview Park. This restoration will be accomplished by implementing turf conversion and weed control measures, creating complex microtopography, installing large wood, and planting a mix of native forest and scrub/shrub plant communities. In order to complete the Joint Aquatic Resource Permits Application (JARPA) associated with this project, it is necessary to delineate the location and geographic extent of waters of waters/wetlands at Bakerview Park.

This technical memorandum is a summary of WSP findings of fact and judgments concerning the geographic extent of waters/wetlands at Bakerview Park. The information offered in this report is arranged to: (1) introduce the project and the project area, (2) articulate the delineation objectives, (3) explain the methodology used in the delineation, (4) provide technical results, and (5) discuss the pertinent regulatory issues at the federal, state, and local levels of jurisdiction.

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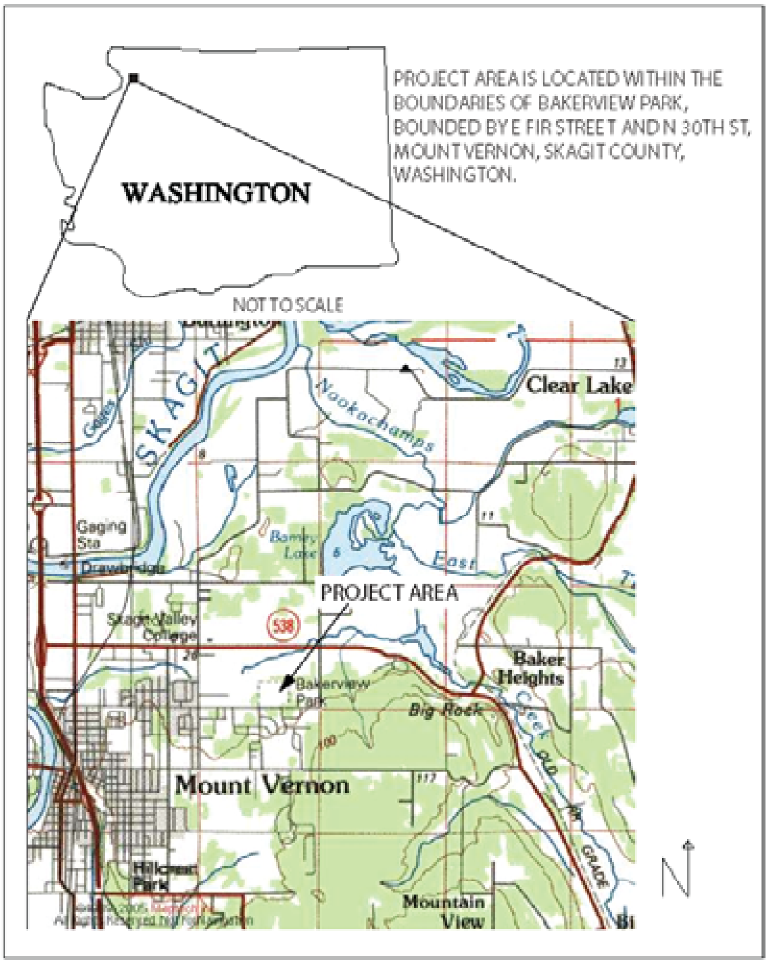
Figure 1. Location map of the Bakerview Park project area (Map source: Maptech Inc.).



II. Objectives

The project objective is to delineate the geographic extent of waters/wetlands within the project area consistent with definitions provided in CFR 33 328.3 (a)(1-8), 328.3 (b, c, and e), and procedures detailed in the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (WMVC Supplement)* (ACOE 2008), supplementing the *1987 Manual* (Environmental Laboratory 1987) as implemented with pertinent regulatory guidance letters, memoranda, and public notices.

III. Methods

The WSP team of Dr. Kevin Fetherston, PWS, and Sam Stoner conducted the field delineation on April 3, 2009. Resumes of the delineation team are included in Appendix A. Prior to field delineation, WSP reviewed topographic maps, regional soil data, and available aerial photography (Google Earth), and National Wetlands Inventory maps. In the field, hydrology, soils and vegetation data were collected to assess whether jurisdictional wetland criteria were met. Four soil pits were excavated and four vegetation plots were sampled (Photographs 1-4; Appendix B - Datasheets).

A. Hydrology

Wetland hydrology was determined by evaluating a variety of direct and indirect indicators, consistent with the *1987 Manual* (Environmental Laboratory 1987), current regulatory guidance (COE 3-92 Memorandum), and the *WMVC Supplement* (ACOE 2008). Direct indicators, such as local knowledge of ponding, stream/lake gauge data, flood predictions (*i.e.,* FEMA maps), and historic records pertaining to the study may also be used to satisfy the wetland hydrology parameter (Environmental Laboratory 1987).

Wetland hydrology is considered to be present at a location if field observations indicate the area has a high probability of being periodically inundated or saturated to the soil surface for a sufficient duration of the growing season to develop anaerobic conditions in the surface soil environment (*i.e.*, root zone) (Environmental Laboratory 1987). According to guidance in the *WMVC Supplement* (ACOE 2008), if at least one primary indicator or at least two secondary indicators are present at a sample point, the wetland hydrology criterion is met.

B. Soils

The presence of hydric soils was determined consistent with criteria articulated in the *1987 Manual,* current regulatory guidance, and *Field Indicators of Hydric Soils in the United States, Version 6.0.* (NRCS 2006a). A hydric soil is defined as "…a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (USDA National Technical Committee for Hydric Soils (NTCHS) 1994). The determination of whether or not a soil is hydric is based on the fulfilment of at least one of four technical criteria (Federal Register 2002; Table 1). The technical criteria can be satisfied using a combination of published soils information and field indicators. Field indicators for determining whether a soil satisfies the hydric soil definition and the technical criteria for hydric soils are listed in the *Field Indicators of Hydric Soils in the United States* (NRCS 2006a) and the *WMVC Supplement* (ACOE 2008). Field indicators published in the above-referenced documents are intended to supersede guidance provided in the *1987 Manual*.

Table 1. Criteria for Hydric Soils of the United States (Federal Register 2002).

Hydric soil criteria:

1. All Histels except for Folistels, and Histosols except for Folists, or
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Historthels, and Histoturbels great groups, and Cumulic or Pachic subgroups that:
    a. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
    b. are poorly drained or very poorly drained and have either:
        (1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
        (2) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
        (3) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches, or
3. Soils that are frequently ponded for periods of long or very long duration during the growing season or,
4. Soils that are frequently flooded for periods of long or very long duration during the growing season.

C. Vegetation

The presence of hydrophytic vegetation was determined using the criteria and procedures outlined in the *WMCV Supplement* and *1987 Manual*. Species identifications and taxonomic nomenclature follow *Vascular Plants of the Pacific Northwest* (Hitchcock and Cronquist 1990). Each species' indicator status was assigned using the *National List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (Reed 1988) (hereafter cited as *The National List*). According to the *WMVC Supplement* (ACOE 2008), only the five basic levels of wetland indicator status (i.e. OBL, FACW, FAC, FACU, and UPL) should be used. For species listed with no indicator status (NI) or those that are not known to occur in the region, the indicator status assigned to the species in the nearest adjacent region should be applied. Species that are not listed, (NL) are assumed to be upland.

The *WMVC Supplement* (ACOE 2008) recommends that the presence of dominant species is determined using the 50/20 rule. Dominant species are those species that individually or collectively cover more than 50% of the total vegetative cover within each stratum, in addition to those species that by themselves cover 20% or more of the total cover within each vegetation stratum. The hydrophytic vegetation parameter for wetlands is met when, under normal circumstances, more than 50% of the dominant species from each stratum are obligate wetland (OBL), facultative wetland (FACW), and/or facultative (FAC) species.

IV. Results – Geographic Extent of Water of the U.S., Including Wetlands

The WSP field team identified and delineated three wetlands at Bakerview Park (Wetland A, B, and C, Exhibit 1) encompassing 3.67 acres (159,600 ft^2, Table 2). The following hydrology, soils, and vegetation data are presented to confirm jurisdictional waters/wetland criteria.

Table 2. Wetland areas at Bakerview Park (Exhibit 1).

Wetland	Acres	Ft^2
"A"	0.77	33,330
"B"	2.64	114,870
"C"	0.26	11,400
Total	3.67	159,600

A. Hydrology

1. Watershed Context – Connection to Navigable Waters

The project area receives water from precipitation, surface flow, and shallow subsurface flow from the hillslope to the south. Wetlands within the project area are "adjacent" (i.e. bordering, neighboring, or contiguous) to Trumpeter Creek. Trumpeter Creek is a perennial tributary to Nookachamps Creek, which flows into the Skagit River (a navigable water in fact). Therefore, a direct hydrologic connection exists between the Bakerview Park wetlands and the Skagit River.

2. Wetland Hydrology Parameter

Observations of wetland hydrology were made at the beginning of the growing season during a period of normal precipitation. At sample plots within the project area we observed primary indicators of wetland hydrology including high water table (Plots 2 and 3, Appendix B; Photographs 1-3), saturation (Plots 1-3, Appendix B), and oxidized rhizospheres along living roots (Plot 1, Appendix B). In addition, we observed ponding throughout the project area (Photograph 5). At least one primary indicator was observed at each of the three wetland plots (Plots 1-3, Appendix B), thus meeting the wetland hydrology parameter.

B. Soils

The soils within the project area are mapped by the Natural Resource Conservation Service (NRCS 2006b) as Skipopa silt loam (map unit symbol 124, Figure 2). According to the NRCS (2006b) Skipopa silt loam is a hydric soil found on terraces with 0 to 3 percent slopes. Its parent material is volcanic ash and loess over glaciolacustrine deposits. Skipopa silt loam is somewhat poorly drained with a depth to water table of about 12 to 24 inches. A typical profile of Skipopa silt loam is silt loam from 0 to 16 inches and silty clay from 16 to 60 inches (NRCS 2006b).

Figure 2. NRCS soil map, which depicts Skipopa silt loam (map unit symbol 124) as the soil type within the project area (NRCS 2006b).

Skipopa silt loam has minor components of Bellingham silt loam. The NRCS (2006b) describes Bellingham silt loam as a hydric soil found in depressions with 0 to 3 percent slopes. Its parent material is alluvium and glaciolacustrine deposits. Bellingham silt loam is poorly drained with a depth to water table of about 0 to 12 inches. A typical profile of Bellingham silt loam is silt loam from 0 to 9 inches and silty clay from 9 to 60 inches.

Field investigation revealed the soil to have consistent texture of silty clay loam to clay loam. The soil profile was highly disturbed, having been historically excavated and graded. Wetland soils had a depleted matrix (Plots 1-3; Appendix B; Hydric soil indicator F3, ACOE 2008).

C. Vegetation

The existing vegetation community includes portions of actively maintained lawn (Photographs 5-7), wet meadows dominated by reed canarygrass (*Phalaris arundinaceae*) (Photographs 6 and 8), and forests dominated by red alder (*Alnus rubra*) with minor components of willows (*Salix sp.*) and young conifers (Photograph 5).

The vegetation within Plot 1 (Photograph 6; Appendix B) was problematic because it is actively maintained as a lawn. For this reason, the grasses were unidentifiable. Without regular maintenance, the area would likely be dominated by reed canary grass as found in the adjacent non-maintained wet meadow (Photograph 6). Besides the unidentifiable grasses, creeping buttercup (*Ranunculus repens*) was present over 15% of the area. Due to hydric soils, wetland hydrology, and characteristics of the adjacent vegetation, we determined Plot 1 to be within a wetland.

The vegetation community within Plot 2 (Appendix B) was hydrophytic based on the 50/20 rule. This area was covered entirely (100%) by reed canarygrass (Photograph 8), a facultative wetland (FACW) species.

The vegetation at Plot 3 was mowed grass, actively maintained by the City of Mount Vernon Parks Department (Photograph 7). The grass species were unidentifiable. However, Plot 3 was determined to be within a wetland following similar logic as Plot 1. That is, the adjacent unmowed area was dominated by reed canarygrass over greater than 90% of its area and there were hydric soils and wetland hydrology present.

The vegetation at Plot 4 was also problematic, with 40% coverage by unidentifiable mowed grass, and reed canarygrass and thistle (*Cirsium arvense*) (FACU) playing dominant roles (Photograph 4). However, wetland hydrology was not present. Therefore, Plot 4 was not within a wetland.

V. Regulatory Context

Three levels of government have jurisdiction over the waters/wetlands at the project area in Bakerview Park. These jurisdictions include the U.S. Federal Government, the State of Washington, and the City of Mount Vernon. A summary of each level of jurisdiction is presented below.

A. Federal Jurisdiction

1. Clean Water Act (CWA), Section 404

Waters/wetlands at the Bakerview Park project area are hydrologically connected and adjacent to Trumpeter Creek, a perennial tributary of the Nookachamps Creek. Nookachamps Creek is a tributary of the Skagit River (a navigable water in fact). Therefore, consistent with current guidance (USEPA and ACOE 2008), project area waters/wetlands are regulated at the federal level by the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency through the CWA. Written acceptance of this WSP delineation is required from the Corps to confirm the current geographic extent of federal waters/wetlands presented in this report.

2. CWA Section 401

Section 401 of the CWA addresses water quality in the nation's waters, including wetlands. The State of Washington administers Section 401. See section V.B.1. below.

3. Endangered Species Act, Section 7 (U.S. Fish and Wildlife Services)

There are no known federal listed threatened or endangered species in the project area.

4. Section 106 of Historic Preservation Act

As part of the CWA Section 404 permit review process, the project proponent is obligated to review records to determine if the project will (or is likely to) impact cultural resources. In addition, the National Historic Preservation Act requires that, if cultural resources are encountered during construction, the appropriate state agencies be notified. As of this writing, there are no known cultural resources at the project area.

B. Washington State

1. Clean Water Act (Water Quality Certification) Section 401

Any work involving discharges of pollutants to waters/wetlands needs to be reviewed by the State of Washington Department of Ecology in the context of the Clean Water Act 401 Water Quality Certification Program.

2. Hydraulic Project Approval (HPA)

Any form of work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water of the state requires a Hydraulic Project Approval (HPA) from the Washington State Department of Fish and Wildlife (WDFW). In this context, the bridge installation and culvert replacement associated with the Trumpeter Creek (a fish-bearing stream) floodplain in the project area would likely fall under the jurisdiction of the Washington State HPA program.

C. Local Jurisdiction

1. City of Mount Vernon

The proposed project is part of the City of Mount Vernon's "wetland reserve" program. The project purpose is to restore the waters/wetland ecosystem for Trumpeter Creek basin. Within the City of Mount Vernon, any work that alters waters/wetlands and their buffers must follow the provisions of the *Mount Vernon Municipal Code* (CMV 1994) and the *City of Mount Vernon Critical Area Ordinance Update* (CAO) (CMV 2007). The CAO update regulates the use of land on and around environmentally sensitive areas, including waters/wetlands.

VI. Photographs

Photograph 1. Plot 1 soil pit. Note the water table at table at 13 inches.

Photograph 2. Plot 2 soil pit. Note the water table at 10 inches.

Photograph 3. Plot 3 soil pit. Note the water table at 10 inches.

Photograph 4. The vegetation at Plot 4 was dominated by reed canarygrass, thistle, and unidentifiable grasses. Due to the higher topography in comparison to the wetlands, indicators of wetland hydrology were not present at Plot 4.

Photograph 5. Ponding was present throughout the project area. Note in the background the red alder dominated forest with minor components of willows (*Salix sp.*) and young conifers.

Photograph 6. The lawn is actively mowed and maintained at Plot 1. Note the adjacent reed canarygrass.

Photograph 7. The lawn is actively mowed and maintained at Plot 3. Note the adjacent reed canarygrass in the background.

Photograph 8. Plot 2 is located within a reed canarygrass dominated meadow

VI. References

City of Mount Vernon (CMV). 1994. Mount Vernon Municipal Code.

City of Mount Vernon (CMV). 2007. City of Mount Vernon Critical Areas Ordinance Update.

Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

Federal Register. September 18, 2002. Hydric Soils of the United States. Washington, D.C. (Hydric Soil Criteria).

Hitchcock, C. L., A. Cronquist, M. Ownbey, J. W. Thompson. 1990. Vascular Plants of the Pacific Northwest. University of Washington Press.

Natural Resources Conservation Service (NRCS). 2006a. Field Indicators of Hydric Soils in the United States, Version 6.0. G.W. Hurt, L.M. Vasilas, editors. United States Department of Agriculture (USDA), NRCS, in cooperation with the National Technical Committee for Hydric Soils, Fort Worth, TX.

Natural Resource Conservation Service (NRCS). 2006b. Custom soil resource report for Skagit County Area, Washington. United States Department of Agriculture, NRCS. Survey Area Data: Version 4, Dec 4, 2006. Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov. Accessed March 2009.

Reed, P. 1988. *National List of Plant Species that Occur in Wetlands: Northwest Region 9*. U.S. Fish and Wildlife Service, Biological Report 88 (26.9).

U.S. Army Corps of Engineers (ACOE). 1992. "Clarification and Interpretation of the *1987 Manual*." 3-92 Memorandum.

U.S. Army Corps of Engineers (ACOE). 2008. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*, ed. J.S. Wakely, R. W. Lichvar, and C.V. Noble. ERDC/EL TR-08-13. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers (USEPA and ACOE). December 02, 2008. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States. Joint memorandum issued December 02, 2008. Washington, D.C.

USDA National Technical Committee for Hydric Soils (NTCHS). 1994. Changes in hydric soils of the United States. Federal Register 59(133): 35680-35681, July 13, 1994.

Appendix A

Delineation Team Resumes

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Kevin L. Fetherston, Ph.D., PWS

Senior Ecologist
Ecosystem Science & Restoration Services

Kevin L. Fetherston is Senior Ecologist in the Ecosystem Science & Restoration Services (ESR) group of WSP Environment & Energy (WSP). ESR focuses on the assessment, management, and restoration of natural ecosystems, specializing in wetlands, rivers, and watersheds. ESR includes several internationally recognized scientists with direct and applied national and international experience with restoration of many types of terrestrial and aquatic ecosystems including forests, grasslands, waters/wetlands, rivers and streams, riparian ecosystems, urban landscapes, and brownfields.

Dr. Kevin L. Fetherston came to WSP after working in wetland, river, and forested ecosystems for 24 years. Currently, his interests are focused on identifying and assessing ecological processes that generate whole ecosystems and communities and applying these findings to the restoration of degraded landscapes; design and construction of waters/wetlands ecosystem restorations; and wildland conservation.

Education

- Ph.D. Ecosystem Analysis & Conservation, 2005, University of Washington
- M.F.S. Forest Ecology, 1987, Harvard University
- B.A. Biology, 1984, Boston University

Certifications & Registrations

- Professional Wetland Scientist (certification #1800), Society of Wetland Scientists
- HAZWOPER (certification # 06-1759)
- Sediment and Erosion Control Lead (certification # UW076-755429)

Prior to joining WSP in February of 2007, Kevin worked as Senior Ecologist for Entrix, Inc. (2006), Senior Ecologist for Herrera Environmental Consultants (2005-2006), Principal of Wetland and River Ecology, Inc. (2000-2005), Senior Wetland Ecologist for L.C. Lee & Associates, Inc. (1990-2000) and Senior Wetland Ecologist for Environmental Concern, Inc. (1987-1990). Currently his research interests are focused on (a) identification and assessment of ecological processes that generate and maintain whole ecosystems and communities, (b) assembly of wetland, river, and forested ecosystems, (c) design and construction of waters/wetlands ecosystem restorations, and (d) development of landscape scale ecosystem restoration strategies.

While a graduate student in forest ecology at Harvard University, Kevin assisted in developing the first geographic information system (GIS) for the Harvard Forest, an experimental forest in western Massachusetts. His master's degree research focused on the effects of hurricanes on the composition and structure of forests in Central New England. Following his masters program, Kevin apprenticed to Dr. Edgar Garbisch at Environmental Concern, Inc. (EC), St. Michaels, Maryland. Dr. Garbisch pioneered tidal marsh restoration techniques along the Atlantic seaboard during the 1970's, 80's, and 90's. In his position at EC, Kevin studied and practiced all aspects of waters/wetlands restoration including ecosystem analysis, restoration design, and supervision of restoration construction and planting operations, operation of earth-moving equipment, native plant propagation, restoration site monitoring, jurisdictional waters/wetlands delineation, and restoration environmental permitting. Kevin's projects involved the analysis, design, construction, and monitoring of tidal marsh, estuarine and bottomland forest restoration projects along the Atlantic coast from Maine to Virginia. Two notable projects were a 63-acre intertidal marsh restoration in the Hackensack Meadowlands, New Jersey and restoration of 34-acres of intertidal freshwater marsh at the Kenilworth Marsh US National Park on the Anacostia River, Washington D.C.

As Senior Wetland Ecologist at L.C. Lee & Associates, Inc. (LCLA), Seattle, Washington, Kevin continued his ecological restoration practice, participating in a number of complex large-scale projects. These included the 57-acre, 7.2 million dollar North Creek riverine ecosystem restoration at the University of Washington Bothell/Cascadia Community College campus, and the restoration of 10-acres of tidally influenced freshwater emergent, scrub-shrub and forested wetland and secondary channel along lower Newskah Creek, a tributary to Grays Harbor, Aberdeen, Washington. While at LCLA, Kevin participated in the development of a number of the first hydrogeomorphic (HGM) wetland functional analyses. The HGM approach to waters/wetlands functional assessment has since become the national standard for the analysis of waters/wetlands functions for environmental regulatory purposes. At LCLA, Kevin also taught in number of professional wetland science courses for the National Wetland Science Training Cooperative, a division of LCLA. These included wetland functional analysis, jurisdictional wetland delineation, and constructed wetlands for stormwater management.

Following his tenure at LCLA, Kevin earned a doctorate in ecosystem analysis and conservation in the College of Forest Resources, University of Washington. His doctoral research concerned the development of forested mountain valley ecosystems of the coastal Pacific Northwest. Specifically, the work focused on the role of channel processes, large wood, and floodplain forests in generating and maintaining the structure and biodiversity of forested riverine ecosystems. Based upon his research findings, Kevin has developed new silvicultural approaches to the restoration of floodplain forests. These techniques are currently being applied to the silvicultural restoration of forested wetlands and river valleys throughout the Pacific Northwest, most notably the Quinault River Salmon Habitat Restoration for the Quinault Indian Nation; the University of Washington/Cascadia Community College North Creek riverine ecosystem restoration, Seattle, Washington; the Earth Sanctuary wetland and stream restoration on South Whidbey Island, Washington; and Benewah Creek riverine and riparian restoration for the Coeur d'Alene Tribe in northern Idaho. Kevin has coauthored a number of peer-reviewed papers and book chapters pertaining to riparian forest ecology, conservation of riverine/riparian ecosytems, and restoration of river valley ecosystems. While a graduate student at University of Washington, Kevin taught as a guest lecturer in graduate and undergraduate courses in introductory forestry, forest ecosystem science, old growth forest ecology, and river ecology.

Kevin is an active member of the scientific community presenting his research findings at national and regional meetings. He also serves as an on-going thesis advisor to graduate students at the University of Washington, and as an advisor for long-term restoration projects for the Quinault Indian Nation, Coeur d'Alene Tribe and the Earth Sanctuary, a private nature reserve.

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Sam Stoner is Staff Scientist in the Ecosystem Science & Natural Resources Management Services (ESNRM) group of WSP Environment & Energy (WSP). ESNRM focuses on the assessment, management, and restoration of natural ecosystems, specializing in wetlands, rivers, and watersheds. ESNRM includes several internationally recognized scientists with direct and applied national and international experience with restoration of many types of terrestrial and aquatic ecosystems including forests, grasslands, waters/wetlands, rivers and streams, riparian ecosystems, urban landscapes, and brownfields.

Prior to joining WSP in June of 2007, Mr. Stoner completed his undergraduate degree in Environmental Science from Huxley College at Western Washington University. His studies focused on freshwater ecology of the Pacific Northwest, with particular emphasis on the effect of land use practices on salmonids and other native fishes. In 2003, Mr. Stoner graduated with an Associates Degree in Occupations Studies (AOS) from the Northwest School of Wooden Boatbuilding. This experience developed practical mechanical and construction skills suited to field instrumentation, sampling design and implementation, and equipment repair. Currently, his interests are focused on ecological restoration of riverine and wetland landscapes.

At WSP, Mr. Stoner has been involved in numerous waters/wetland projects including jurisdictional waters/wetland delineations, development of waters/wetland functional assessments using the hydrogeomorphic (HGM) approach, development of waters/wetland restoration projects, and conducting stream surveys. Mr. Stoner's wetland delineation experience includes small-scale, reconnaissance-level projects to complex, large scale, highly degraded sites. He has worked as support staff for the National Wetland Science Training Cooperative, a division of ESNRM, in running a 40-hour training course in the jurisdictional delineation of waters of the U.S., including wetlands on the California coast. His restoration experience includes restoration design, permitting, and construction supervision.

Sam Stoner came to WSP after earning a Bachelors degree in environmental science, with an emphasis on freshwater ecology. Currently, his interests are focused on ecological restoration of riverine and wetland landscapes. Mr. Stoner has developed skills in functional assessment of waters/wetlands using the HGM approach; jurisdictional delineation of waters/wetlands; and restoration design, permitting, and restoration construction.

Education

- B.S. Environmental Science, 2007, Western Washington University, Huxley College of the Environment, University Honors Program.
- AOS, 2003, Northwest School of Wooden Boatbuilding.

Certifications & Registrations

- Member, Society of Wetland Scientists
- HAZWOPER (certification # 7541954)

Appendix B

Datasheets

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

Project/Site: Bakerview Park City/County: MT Vernon/Skagit Sampling Date: 4/3/09

Applicant/Owner: City of Mount Vernon State: WA Sampling Point: 1

Investigator(s): Kevin Fetherston and Sam Stover Section, Township, Range: S 16, T34N, R4E

Landform (hillslope, terrace, etc.): ____ Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): LRR A UTM 10N 552202E 5364462N Lat: ____ Long: ____ Datum: NAD 83

Soil Map Unit Name: Skipopa silt loam 0-3 % NWI classification: PEMC

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

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

Are Vegetation YES, Soil NO, or Hydrology NO 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 ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☐

Remarks: PROBLEMATIC VEGETATION IF NOT MAINTAINED WOULD BE DOMINATED BY PHALARIS.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. RANUNCULUS REPENS	15		FACW
2.			
3. GRASS SPP	85		uncertain
4. UNIDENTIFIABLE			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: PLOT AREA IS AN ACTIVELY MAINTAINED LAWN IN MT. BAKER PARK. VEGETATION IN IMMEDIATELY ADJACENT AREA IS DOMINATED BY REED CANARY GRASS

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR3/2	100	NONE				SILTY CLAY LOAM	MANY FINE ROOTS
4-11	10YR3/2	80	2.5Y 5/2	20	C		SILTY CLAY LOAM	CONGLOMERATE
11-16	2.5YR4/2	100	10YR 5/6	10	C	2	CLAY LOAM	OXIDIZED RHIZOSPERES

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ☒ No ☐

Remarks: SOIL PROFILE IS A HISTORICALLY HIGHLY DISTURBED (URBAN EXCAVATED & GRADED SITE. SOIL IS A CONGLOMERATE, + OXIDIZED RHIZOSPHERES AT 11-16" ARE COMMON, FINE & DISTINCT

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ______

Water Table Present? Yes ☒ No ☐ Depth (inches): 13

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 11

Wetland Hydrology Present? Yes ☒ No ☐

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: Bakerview Park City/County: Mt Vernon/Skagit Sampling Date: 4/3/09

Applicant/Owner: City of Mount Vernon State: WA Sampling Point: 2

Investigator(s): Kevin Fetherston and Sam Stoner Section, Township, Range: S16, T34N, R4E

Landform (hillslope, terrace, etc.): LRR A Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): ______ Lat: UTM 10U 552196E Long: 5364468N Datum: NAD83

Soil Map Unit Name: Skipopa silt loam 0-3% NWI classification: PEMC

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 ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. PHALARIS ARUNDINACEAE	100	YES	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR2/2	100	none	—	—	—	SILTY CLAY LOAM	
5-16	10YR2/1	100	none	—	—	—	SILTY CLAY LOAM	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ☒ No ☐

Remarks: LOW CHROMA MATRIX 10YR2/1

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☒ No ☐ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 5

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

SOIL

Sampling Point: 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR2/2	100	none	—			SILTY CLAY LOAM	
5-14	10YR2/1	100	none	—			SILTY CLAY LOAM	
14-19	2.5Y5/2	90	10YR5/6	10	C			

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks: HISTORICALLY EXCAVATED SOIL TO ~ 14" DEPTH
14-19 DEPLETED MATRIX WITH REDOX FEATURES

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 5

Wetland Hydrology Present? Yes ☒ No ☐

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: Bakerview Park City/County: Mt Vernon/Skagit Sampling Date: 4/3/09

Applicant/Owner: City of Mount Vernon State: WA Sampling Point: 3

Investigator(s): Kevin Fetherston and Sam Stoner Section, Township, Range: S 16, T34N, R4E

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): LRR A Lat: UTM 10U 552128 5364358 N Long: ______ Datum: NAD83

Soil Map Unit Name: Skipopa silt loam 0-3% NWI classification: PEMC

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 YES, 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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1.			
2. MOWED GRASS	100		uncertain
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: ADJACENT UNMOWED AREA DOMINATED >90% PHALARIS ARUNDINACEAE

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

Project/Site: BAKERVIEW PARK City/County: MT. VERNON/SKAGIT Sampling Date: 4/3/09

Applicant/Owner: CITY MT. VERNON State: WA Sampling Point: 4

Investigator(s): Kevin Fetherston, Sam Stover Section, Township, Range: S16, T34N, R4E

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ~~convex~~ concave Slope (%): 2

Subregion (LRR): LRR A Lat: UTM 10U 0552120E 5364341N Long: ______ Datum: NAD83

Soil Map Unit Name: Skipopa silt loam 0-3% NWI classification: PEMC

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 ☐ No ☒ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size: ____)			
1. Cirsium arvense	30	N	FACU
2. LAWN GRASSES	40	uncertain	
3. PHALARIS	20	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	100		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
= Total Cover			

% Bare Ground in Herb Stratum ____

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		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants[1]

☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL

Sampling Point: 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					SILTY CLAY LOAM	
5-17	10YR 3/2	80	10YR 5/6	10			SILTY CLAY LOAM	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ☒ No ☐

Remarks: SOIL HAS BEEN HISTORICALLY EXCAVATED TO DEPTH

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

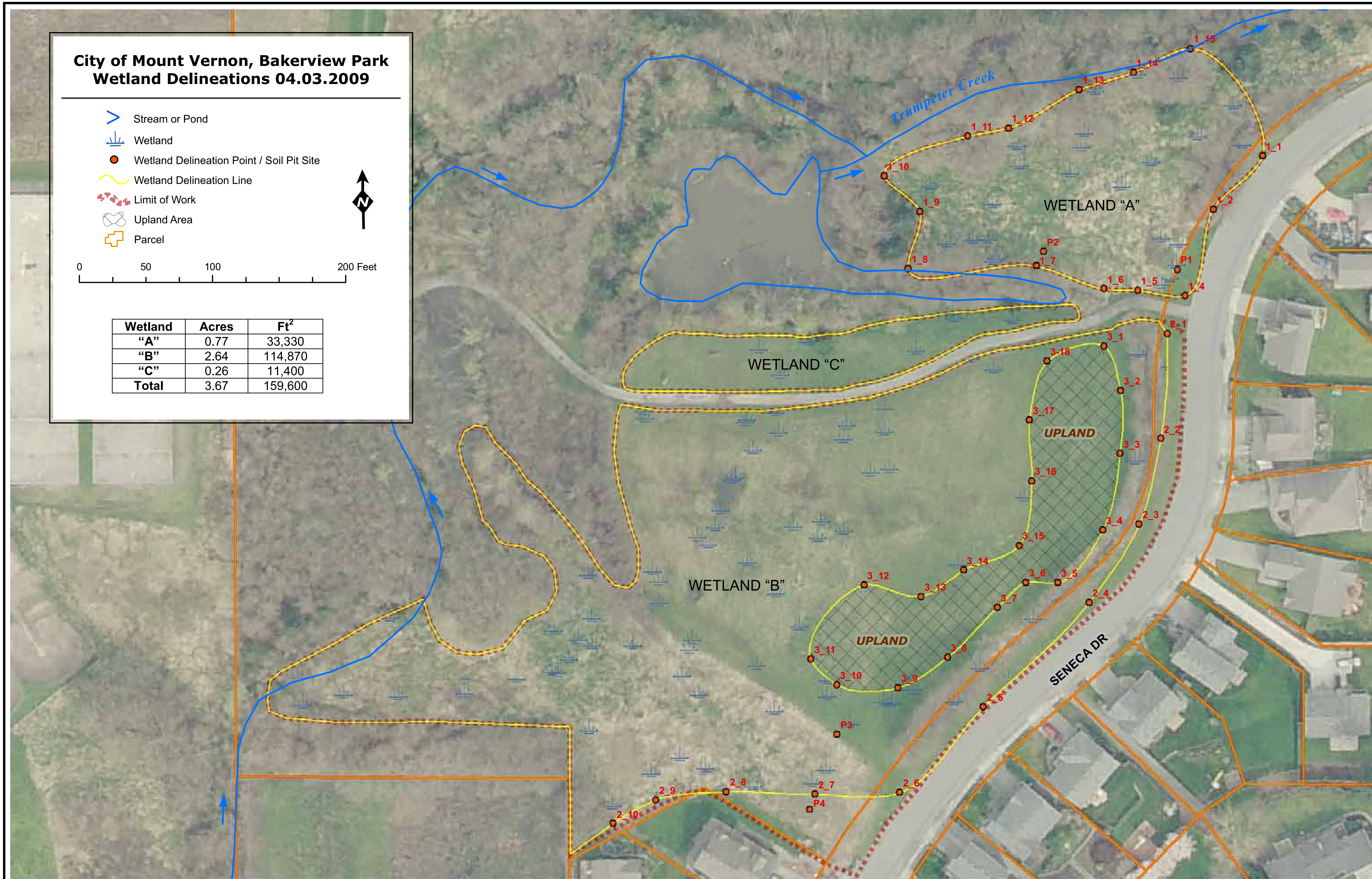
Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

Exhibit 1

Bakerview Park Wetland Delineation



Wetland	Acres	Ft^2
"A"	0.77	33,330
"B"	2.64	114,870
"C"	0.26	11,400
Total	3.67	159,600