

Critical Areas Assessment Report: Wetland Delineation

**Grandis Pond
Blaine, WA**

**For:
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Introduction

From February, 2005, to September, 2006, our firm conducted a wetland delineation on the approximately 450-acre property in Blaine (T41N, R1E, eastern portions of Section 33, all of Section 34, & western portions of Section 35). Parcel numbers are listed in **Appendix A**. The purpose of the study was to determine the existence, extent, and regulatory status of any wetlands and streams within the study area.

Study Area Description

The study area consists of 450 acres of undeveloped land located approximately 3.5 miles east of Blaine city center (See **Figure 1. Vicinity Map**). It is bounded on the south side by H Street Road and on the north side by 0 Avenue in British Columbia at the U.S./Canadian border. The northeastern portion of the study area is the site of historic gravel extraction. A network of old logging roads is present throughout the study area. Two maintained gravel roads access the study area from H Street Road: one enters the property across an off-site parcel at the eastern end just west of Valley View Road. The other (known as the Old Mill Logging Road) enters the property near the western end. There are no existing structures within the study area.

The majority of the study area lies within the Little Campbell River watershed, and a smaller portion located at the western end of the study area lies within the Dakota Creek sub-basin of the Drayton Harbor Watershed (see **Figure 2. Watershed and Topography Map**).

The Little Campbell River watershed drains approximately 15,539 acres of land and extends from the upper reaches of Little Campbell River, west approximately 16 miles downstream to White Rock, B.C. and Semiahmoo Bay. Water from the study area flows approximately 3.6 miles down Jacobson Creek to join Little Campbell River, then proceeds another 2.4 miles before emptying into Semiahmoo Bay just south of White Rock. Downstream of the study area, land use within the sub-basin is primarily agricultural and rural residential with urban area and some forest at the western end.

Topography in the eastern and central portion of the study area is sloped towards the center on all sides comprising a bowl shaped headwaters to Jacobson Creek to the northwest. Water draining the slopes through an extensive network of wetlands and ephemeral streams is detained in an approximately 16 acre shallow pond located on flat topography prior to discharging to Jacobson Creek situated in a distinct ravine to the northwest of the pond.

The Drayton Harbor Watershed drains approximately 35,102-acres of land and extends from Drayton Harbor approximately 8 1/2 miles to the east, and from the U.S. Canadian border to approximately 7 miles to the south. It includes both the California and Dakota Creek basins and their tributaries. Land use within the watershed is dominated by rural residential and agricultural land, with cores of commercial use at the western end.

The western portion of the property is separated from the Little Campbell River drainage to the east by a minor ridge. Topography slopes generally to the west and south with some relatively flat areas and minor depressions. This portion of the study area is a headwater contributing basin to the Dakota Creek portion of the Drayton Harbor watershed.

The eastern and southwestern portions of the study area were logged within the last ten years, and vegetation in these areas is representative of a regenerating clear-cut left with sparse standing evergreen and deciduous trees. The central and northwestern portions of the study area are forested, with evidence of less-recent logging activity throughout, in the form of remnant roadbeds, machinery ruts, and stands dominated by red alder, paper birch, black cottonwood, quacking aspen with a salmonberry dominated understory. More diverse and mature mixed evergreen/deciduous forest plant communities remain within and around wetlands that were protected during past logging. Additional information about plant communities and species present is contained in the *Results* section, in the attached data forms (**Appendix B**), and in the plant list (**Appendix C**).

Methods

Wetland determinations were made using the routine on-site technique outlined in both the Army Corps of Engineers (COE) Wetland Delineation Manual (Environmental Laboratory, 1987) and the Washington State Wetlands Identification and Delineation Manual (DOE, 1997). The process of identifying and delineating a jurisdictional wetland involves gathering data on indicators of wetland vegetation, hydric soils, and wetland hydrology; and testing these indicators according to specific criteria for each of these parameters.

Between February 7 and September, 2006 we sampled the vegetation, hydrology, and soils for wetland and upland conditions. Data was taken in wetlands, suspected wetlands, and marginal non-wetlands as well as representative uplands. A total of 183 sample plots were established and recorded on data forms (**Appendix B**). When a wetland was located, we marked the boundaries with sequentially numbered pink or red flagging. Wetland flags were subsequently surveyed by David Evans and Associates, Inc., of Bellingham, Washington.

Vegetation

Vegetation was sampled within a 6-foot radius of each point for the herbaceous strata, and within a 30-foot radius for the tree and shrub strata. Within these areas, species were identified according to the taxonomy of Hitchcock and Cronquist (1973) and percent relative areal cover determined for each species. The wetland indicator status of each plant species was assigned according to the List of Plant Species that Occur in Wetlands, published by the U.S. Fish and Wildlife Service (Reed, 1988 and 1993). This list utilizes a wetland indicator rating system for plants. Each plant species is assigned a probability of occurrence within wetlands, which is referred to as its wetland indicator status, as follows:

- obligate (OBL) (Probability >99% occur in wetlands)
- facultative wetland (FACW) (Probability 67% to 99% occur in wetlands)
- facultative (FAC) (Probability 34% to 66% occur in wetlands)
- facultative upland (FACU), and (Probability 1% to 33% occur in wetlands)
- upland (UPL) (Probability <1% occur in wetlands)

The 1987 COE manual and the 1997 DOE manual provide general guidance on the process of quantitatively assessing wetland plant (hydrophyte) dominance. To meet the criteria for the occurrence of hydrophytic vegetation, more than 50 percent of the dominant plant species within a test plot must be rated FAC or wetter (i.e., FAC+, FACW, FACW-, FACW+, or OBL).

Wetland vegetation cover classes were designated in accordance with the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin, et al., 1979). This system utilizes vegetation structure and moisture class to identify a wetland type.

Soils

A 16 to 18 inch deep soil observation pit was excavated at each sample point to facilitate soils description and classification. Wet soil color per the *Munsell Color Charts* (Kollmorgen Corp., 1988), soil texture and moisture content were determined and recorded. Soil color included both the matrix color of each horizon as well as any redoximorphic mottles or gley layers (depletions) or other hydric soil indicators that were observed. Soil texture describes the particle size distribution classes (e.g., silty clay loam, fine sandy clay loam, etc.) that comprise the soil. Current soil moisture was characterized by feel according to the following relative moisture classes from driest to wettest: dry, damp, moist, wet and saturated.

The COE and DOE manuals describe hydric soil indicators of hydric soils. A hydric soil formed over many years under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. The criteria for hydric soils is very complex and is dependent on clear and direct evidence of a combination of the build-up of organic matter, specific hydrologic regime, drainage class, and permeability class. The hydric soil criteria are as follows:

1. All Histels except Folistels and Histosols except Folistels, or
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that are:
 - a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or
 - b. Poorly drained or very poorly drained and have either:
 - i. water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in), or for other soils

- ii. water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or
 - iii. water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or
3. Soils that are frequently ponded for long duration or very long duration during the growing season, or
 4. Soils that are frequently flooded for long duration or very long duration during the growing season.

Anaerobic conditions that occur in the long-term under aquic and peraquic moisture regimes cause redoximorphic features to develop, which can be evidenced through the observation of mottling, organic staining, gleying (depletions), and the accumulation of organic matter in the upper portions of the soil (i.e., hydric soil indicators). Soils on the site were considered hydric if one or more of the following characteristics or indicators were observed at the required depth: organic soils or soils with an organic surface layer (histosol or histic epipedon),

- matrix chroma just below the A-horizon (or 10 inches, whichever is less) of 1 in unmottled soils, or 2 or less if mottles were present,
- organic staining and streaking,
- gleying immediately below the A-horizon,
- hydrogen sulfide odor (rotten egg smell),
- iron and/or manganese concretions, and/or
- aquic or peraquic moisture regimes.

Wetland Hydrology

Wetland hydrology is generally defined as the source of hydrology that provides saturation at the soil surface and/or inundation long enough during the growing season to provide anaerobic conditions in the upper part of the soil at a minimum frequency of 50 percent (in other words, a probability of occurrence of 50 percent in any given year, or occurs at a frequency of at least once in 2 years, 5 years in 10 years, or 50 years in 100 years). To meet the criteria for wetland hydrology, the area must be inundated or saturated to the surface for at least 5 percent of the growing season in most years (i.e., at least every other year, 5 years in 10 years, or 50 years in 100 years). Sometimes a duration of 12.5 percent of the growing season is used to determine if wetland hydrology is present. The inundation and/or saturation event must occur over consecutive days.

Indicators of wetland hydrology may include, but are not necessarily limited to:

- recorded hydrologic data
- visual observation of inundation or soil saturation

- water marks
- drift lines
- sediment deposits
- drainage patterns in wetlands
- water-stained leaves
- rhizospheres
- geomorphic position

Observations on hydrologic conditions at a sample point and in the area represented by the sample point were made with particular attention given to wetland hydrology indicators. Of particular importance were observations made on the current soil moisture at the time of the investigation, the depth to the water table and/or saturated zone in the soil pit, and the micro topographic position of the sample point.

Mapped Soils Description

The *Soil Survey of Whatcom County Area, Washington* published by the U.S.D.A. Soil Conservation Service (now the N.R.C.S.) presents maps that depict soil map units in the project area, and indicates that there are eight different soil units, of which three are on the NRCS hydric soil list. The following soils were listed as occurring within the study area (see the **Figure 3. NRCS Soils Map** for the location of each soil unit):

(31) Clipper silt loam, drained, 0 to 2 percent slopes (listed non-hydric). This very deep, somewhat poorly drained soil is in depressions on outwash terraces and outwash plains. It has been artificially drained. It formed in an admixture of loess and volcanic ash over glacial outwash. Typically, the surface layer is very dark grayish brown silt loam 9" thick. The upper 9" of the subsoil is grayish brown and gray, mottled silt loam. The lower 12" is grayish brown, gray, and yellowish brown, mottled gravelly sandy loam. The substratum to a depth of 60" is dark grayish brown and grayish brown, mottled very gravelly loamy sand. The depth to very gravelly loamy sand or sand ranges from 14" - 30". In some areas the surface layer is loam or gravelly silt loam. In other areas the soil has a substratum of very gravelly sandy loam, gravelly sand, or gravelly sandy loam. Included in this unit are small areas of Birchbay, Kickerville, and Whitehorn soils, undrained Clipper soils, and soils that are similar to the Clipper soil but have 18 to 25 percent clay in the subsoil or have a hardpan of glaciomarine drift at a depth of 40" - 60". Included areas make up about 15 percent of the total acreage. Permeability is moderate in the upper part of the Clipper soil and rapid in the substratum. Available water capacity is moderate. The effective rooting depth is limited by a seasonal high water table, which is at a depth of 2 to 4 feet from November through April. Runoff usually is very slow, but the soil may be ponded during the winter. There is no hazard of erosion.

(48) Everett gravelly sandy loam, hard substratum, 2 to 8 percent slopes (listed non-hydric). This deep, somewhat excessively drained soil is on outwash terraces and moraines. Typically, the surface is covered with a mat of undecomposed needles and twigs 2" thick. When mixed to a depth of 6", the surface layer is dark yellowish brown gravelly sandy loam. The upper 7" of the subsoil is dark brown gravelly sandy loam. The lower 12" is strong brown very gravelly sandy loam. The substratum is dark brown very gravelly loamy sand 16" thick. Dense glacial till that crushes to very gravelly loamy sand is at a depth of 41". The depth to very gravelly loamy sand ranges from 14" to 30". The depth to dense glacial till or dense glaciomarine deposits ranges from 40 to 60". The dense glacial till is similar to a cemented pan. In some areas the surface layer is very gravelly sandy loam or very gravelly loam. In other areas the soil has 15-35% rock fragments in the subsoil, is very gravelly sandy loam in the upper part of the substratum, or has dense glacial till or dense glaciomarine deposits below a depth of 60". Included in this unit are small areas of Birchbay, Clipper, Labounty, Sehome, and Squalicum soils and small areas of Everett soils that have a stony surface or have slopes of more than 8% or less than 2%. Included areas make up about 15% of the total acreage. Permeability is moderate in the upper part of the Everett soil, rapid and very rapid in the substratum, and very slow in the dense glacial till. Water capacity is low. The effective rooting depth is limited by a seasonal high water table which is at a depth of 3.5 to 5 feet from December through April.

(49) Everett very gravelly sandy loam, 8 to 15 percent slopes (listed non-hydric). This very deep, somewhat excessively drained soil formed in a mixture of volcanic ash and alluvium over glacial outwash and glacial till. Typically, the surface is covered with a mat of undecomposed needles, twigs, and rotting wood 4" thick. When mixed to a depth of 6", the surface layer is dark brown very gravelly sandy loam. The subsoil is dark brown very gravelly sandy loam 12" thick. The substratum to a depth of 60" is variegated very gravelly sand. The depth to very gravelly sand ranges from 14 to 24". In some areas the surface layer is very gravelly loam, gravelly sandy loam, or gravelly loam. In other areas the soil has a substratum of very gravelly sand at a depth of 24 to 36", has a weakly cemented hardpan at a depth of 40 to 60", has 15 to 35% rock fragments in the subsoil, or has a substratum of very gravelly sandy loam. Included in this unit are small areas of Birchbay, Clipper, and Squalicum soils and small areas of Everett soils that have a stony surface or have slopes of more than 15% or less than 8%. Included areas make up about 10% of the total acreage. Permeability is rapid in the upper part of the Everett soil and very rapid in the lower part. Available water capacity is low. The effective rooting depth is 60". Runoff is slow, and the hazard of water erosion is slight.

(50) Everett very gravelly sandy loam, 15 to 35 percent slopes (listed non-hydric). This very deep, somewhat excessively drained soil is on outwash terraces and moraines. It formed in a mixture of volcanic ash and alluvium over glacial outwash and glacial till. When mixed to a depth of 6", the surface layer is dark brown very gravelly sandy loam. The subsoil is dark brown very gravelly loam 12 inches thick. The substratum to a depth of 60 inches is variegated very gravelly sand. The depth to very gravelly sand ranges from 14 to 24". In some areas the surface layer is very gravelly loam, gravelly sandy loam, or gravelly

loam. In other areas the soil has a substratum of very gravelly sand at a depth of 24 to 36", has a weakly cemented hardpan at a depth of 40 to 60", has 15 to 35% rock fragments in the subsoil, or has a substratum of very gravelly sandy loam. Included in this unit are small areas of Birchbay, Clipper, and Squalicum soils and small areas of Everett soils that have a stony surface and slopes of less than 15% or more than 35%. Permeability is rapid in the upper part of the Everett soil and very rapid in the lower part. Available water capacity is low. The effective rooting depth is 60". Runoff is slow, and the hazard of water erosion is slight.

(51) Everett complex, 2 to 8 percent slopes (listed non-hydric). This map unit is on outwash terraces and moraines. It formed in a mixture of volcanic ash and alluvium over glacial outwash and glacial till. This unit is 50% Everett very gravelly sandy loam and 35% Everett gravelly sandy loam. The components of this unit occur as areas so intricately intermingled that mapping them separately was not practical at the selected scale of mapping. Included in this unit are small areas of Birchbay, Clipper, Labounty, and Squalicum soils and small areas of Everett soils that have a stony surface, have a surface layer of very gravelly sand, or have slopes of more than 8% or less than 2%. Also included are soils that are similar to the Everett soil but have 15 – 35% rock fragments in the subsoil or have a substratum of very gravelly sandy loam. Included areas make up about 15% of the total acreage. For the Everett very gravelly sandy loam portions, permeability is rapid in the upper part and very rapid in the lower part. Available water capacity is low. The effective rooting depth is 60", runoff is slow, and the hazard of water erosion is slight. For the Everett gravelly sandy loam portions, permeability is moderate in the upper part, rapid in the next part, and very slow in the dense glacial till. Available water capacity is low. The effective rooting depth is limited by a seasonal high water table, which is at a depth of 3.5' to 5.0' from December through April. Runoff is slow, and the hazard of water erosion is slight.

(72) Histosols, ponded, 0 to 1 percent slopes (listed hydric). This is a very deep, very poorly drained soil in backswamps on flood plains and on the edge of bodies of water. This soil is formed in mixed organic material consisting of mosses, forbs, and shrubs over mineral material. No single profile is representative of this unit. In one of the more common profiles, the surface layer is dark brown and dark grayish brown muck about 28" deep. The underlying material is gray silt loam to a depth of 70". Included in this unit are areas of Bellingham or Pangborn soils and areas where histosols have been partially drained. Inclusions make up 10% of the unit. Permeability in the Histosol soil is moderate or moderately slow. Available water capacity is high. The effective rooting depth is limited by a seasonal high water table, which is at or above the surface from November through August. This soil is listed as a hydric soil.

(93) Labounty silt loam, 0 to 2 percent slopes (listed hydric). Labounty is characterized by very deep, poorly drained soil in depressions on glaciomarine drift plains. The upper layer is dark brown silt loam 12" thick, with moderately slow permeability. The upper surface of the subsoil is dark grayish brown, mottled silt loam. The lower 14 inches is grayish brown, mottled silt loam. Permeability is moderately slow in the Labounty soil. The

water capacity is high, and the rooting depth limited by a seasonal high water table at or near the surface from November through May.

(156) Squalicum gravelly loam, 5 to 15 percent slopes (listed non-hydric). This soil is a deep, moderately well-drained soil on foothills and valleys. The surface layer, when mixed to a depth of 7 inches, is very dark grayish brown gravelly loam. The subsoil is dark yellowish brown gravelly loam 23" thick. The substratum is light olive brown gravelly loam 14" thick. Permeability is moderate in the upper part of the Squalicum soil and very slow in the dense glacial till. Available water capacity is high. Rooting depth is limited by a seasonal high water table, which is at a depth of 3.5 to 5.0 feet from December through April.

(165) Tromp loam, 0 to 2 percent slopes (listed non-hydric). This soil is very deep, moderately well drained soil on outwash terraces. The surface layer is dark brown loam 11" thick. The upper 9" of the subsoil is dark brown and strong brown loam. The lower 6" is weakly cemented, dark yellowish brown, mottled sandy loam. Permeability is moderate in the upper part of the soil and very rapid in the substratum. Available water capacity is high. The effective rooting depth is limited by a seasonal high water table at a depth of 1.5' to 2.5' from November through April.

Results

We observed 52 wetlands and 11 drainages within the study area. The wetlands are designated alphabetically from A to ZZ, the drainages are number 1 through 11. The wetlands ranged in size from approximately 487 square feet (0.01 acres) to approximately 2,389,035 square feet (54.8 acres). One wetland includes and is associated with Jacobson Creek, a tributary to Little Campbell River. Please see **Figures 4, 5 & 6 Data Plot Locations** and **Figures 7, 8, 9 & 10 Wetland Delineation Maps** for their locations and sizes. Total wetland area within the study area was approximately 94.5 acres. Although many of the wetlands were connected by hydrology or hydric soils to other wetlands or drainages, they were separated according to their differing characteristics and each wetland is individually described in the following paragraphs. Some wetlands were found to lack surficial hydrologic connections to streams or other wetlands. In places, streams and wetlands follow or overflow into remnant roadbeds. Refer to the individual wetland descriptions for more details.

We have categorized the on-site wetlands as category one, two, or three, according to the requirements of Chapter 17.83 Wetland Management of City of Blaine Municipal Code (**See Appendix E**). For full descriptions of each category, refer to the *Regulations* section at the end of this document. A summary of the wetlands and their regulatory status is presented in **Appendix D**.

Wetland A and its contributing wetlands and drainages constitute the headwaters of Jacobson Creek, a tributary to the Little Campbell River Watershed, in southern British Columbia.

Wetland A contains both a palustrine emergent/scrub-shrub permanently ponded wetland portion (PEM/SSH) at the center and a palustrine forested seasonally inundated wetland portion (PFOC) around the perimeter. It is located in the center of the study area, and measures approximately 2,389,035 square feet in area (54.8 acres). It is a depressional wetland with seasonal outflow. The wetland consists of a pond in the center, shrubs around the edge of the pond, and forested sloped wetland with upland inclusions around the perimeter. The ponded area accounts for approximately 16 acres of the total area of **Wetland A**. Vegetation within the pond was dominated by cattail, yellow pond-lily, watershield, and floating-leaved pondweed. At the water's edge, vegetation was dominated by a shrub layer of hardhack and willow. Canopy vegetation throughout the forested perimeter of **Wetland A** was dominated by red alder, with western redcedar and paper birch as sub-dominants. Also present in the canopy were quaking aspen, black cottonwood, and bitter cherry. A shrub layer of salmonberry and vine maple was present throughout, with a partial groundcover of sword fern in places.

Soils within the ponded area were found to be muck with chroma of 10YR 3/1. Soils throughout the forested portions of **Wetland A** typically consist of a 4-6" surface layer of very dark brown loam or silt loam, with chroma of 2. Below this layer we observed black loams, and a range of gray to very dark grayish brown silt loams with chroma of 2 and dark yellowish brown mottles with chroma of 6.

We observed depths of inundation between 3.5'-5' in the ponded area, and saturated soils throughout the outer perimeter of **Wetland A** during our February and March 2005 site visits. **Wetland A** is situated in a basin, with water entering from all directions, from **Wetlands CC, HH, KK, V, XX** and **Drainages 3, 4, 7, and 9**. **Wetland A** does not appear to have any of the characteristics required for category one wetlands. **Wetland A** best qualifies as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream, contains documented habitat for sensitive species (possible priority habitat for cavity-nesting ducks, as documented by the Washington Department of Fish and Wildlife), and provides significant habitat value due to diversity or size.

Wetland B is a palustrine seasonally inundated wetland (PEM/FOC), located in the northeastern portion of the study area, and measures approximately 29,953 square feet in area (0.69 acres). The wetland complex comprised of **Wetlands B, C, and D** lies within the Little Campbell River Watershed but appears to contribute only groundwater to the basin, because the water infiltrates into the historic gravel pit north of **Wetland B**. Water enters the wetland from the linear sloped **Wetland C** to the south. We observed trees within area of standing water, and the presence of a containing berm on the north and east sides suggesting strongly this wetland has been artificially impounded. The soils were a dark

brown gravelly loam with a chroma of 2, lacking mottles. Although the soils at 10" were not of low chroma, and lacked mottles, we observed 10YR 3/1 chroma soils above 4" and it is apparent that hydric soils are in the process of forming under an obvious aquic moisture regime. The wetland is just south of a gravel pit. Groundwater from the wetland appeared to move towards the gravel pit where it infiltrates. **Wetland B** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream as defined by the City of Blaine but does not have any of the characteristics required for category one wetlands.

Wetland C is a sloped palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located in the northeastern portion of the study area, and is approximately 9,970 square feet in area (0.22 acres). The wetland complex comprised of **Wetlands B, C,** and **D** lies within the Little Campbell River Watershed but appears to contribute only groundwater to the basin, because the water infiltrates into the historic gravel pit north of **Wetland B**. **Wetland C** conveys water from **Wetland D** to the south to **Wetland B** to its north. Soils above 10" were a very dark gray organic layer with chroma of 1. Below 10" the soils were a very dark brown loam with chroma of 2. **Wetland C** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream as defined by the City of Blaine but does not have any of the characteristics required for category one wetlands.

Wetland D is a palustrine emergent, forested seasonally inundated wetland (PEM/FOC), located in the eastern portion of the study area, and measures approximately 157,831 square feet in area (3.62 acres). It is depressional with an outlet. The wetland complex comprised of **Wetlands B, C,** and **D** lies within the Little Campbell River Watershed but appears to contribute only groundwater to the basin, because the water infiltrates into the historic gravel pit north of **Wetland B**. It is a mature forested wetland with an abundance of large woody debris throughout. Canopy vegetation was dominated by western redcedar, western hemlock, and bitter cherry (all growing primarily on downed logs). Paper birch and black cottonwood were also present. The shrub layer was dominated by hardhack, salmonberry, and vine maple. Red huckleberry and false azalea were also present on the edges. Himalayan blackberry was present in places on the western edge. The understory was dominated by Pacific water parsley, slough sedge, and salal (on logs). Soils were a very dark gray gravelly loam with chroma of 1. We observed up to 18" of inundation during our February 2005 site visit. **Wetland D** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream as defined by the City of Blaine but does not have any of the characteristics required for category one wetlands.

Wetland E is a closed depressional, palustrine emergent, scrub-shrub seasonally inundated wetland (PEMSSC), located in the eastern portion of the study area, and measures approximately 16,547 square feet in area (0.38 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe surface water or saturated soil connection to the nearby **Wetland D** or **Wetland F**. The canopy vegetation was dominated by red alder and western redcedar, and the shrub layer was dominated by

salmonberry and vine maple. The center of the wetland was dominated by Pacific water parsley. Soils were a very dark brown peaty muck with chroma of 2. We observed ponded conditions with inundation up to 2' deep during our February 2005 site visit. **Wetland E** is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland F is a closed depressional, palustrine forested seasonally inundated wetland (PFOC), is located to the south of **Wetland E** in the eastern portion of the study area, and measures approximately 74,800 square feet in area (1.72 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe surface water or saturated soil connection to any wetlands or streams nearby. **Wetland F** contained a large amount of large woody debris. In the standing water, Pacific water parsley, slough sedge, and skunk cabbage were common. The outer edges of the wetland were dominated by western redcedar, red alder, salmonberry, hardhack, and false azalea. Soils above 6" are a very dark brown peaty muck with rotting bark and chroma of 3. Below 6" soils were a black peaty muck with chroma of 1. We observed standing water up to 18" deep during our February 2005 site visit. **Wetland F** is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland G is a closed depressional, palustrine emergent/scrub-shrub seasonally inundated wetland (PEM/SSC), is located in the eastern portion of the study area, and measures approximately 16,547 square feet in area (0.35 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water or saturated soil connection to any wetlands or streams nearby. The edges of the wetland are dominated by hardhack, with skunk cabbage and water parsley in the center. Soils were a black organic-rich silt loam with chroma of 1. We observed ponded conditions with inundation up to 18" in the northwestern portion, with overflow into a remnant road bed at the eastern portion, during our February 2005 site visit. The wetland appears to have been somewhat disturbed by logging. **Wetland G** is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland H is a closed depressional, palustrine emergent/scrub-shrub seasonally inundated wetland (PEM/SSC), located at the southern property line in the eastern portion of the study area, and measures approximately 1,309 square feet in area (0.03 acres) on-site. It lies within the Little Campbell River Watershed. Although the wetland has a linear configuration, we did not observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. The vegetation was dominated by salmonberry with herbaceous vegetation lacking in inundated areas at the time of our site visit, with some piggyback plant in drier places. Soils were a very dark brown sandy loam with chroma of 2 and dark yellowish brown mottles with chroma of 6. We observed 18" of standing water in a swale-

like depression during our February 2005 site visit. The wetland is bisected by a culverted road crossing and portions appear to have been excavated. The wetland appears to continue off-site. **Wetland H** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland I is a closed depressional, palustrine scrub-shrub seasonally inundated wetland (PSSC), located at the southern property line in the central portion of the study area, and measures approximately 11,974 square feet in area (0.27 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. Vegetation was dominated by hardhack, with a few red alder and willow on the edges. A small amount of slough sedge was also present. Soils were a black silt loam with chroma of 1. We observed up to 18" of inundation during our February 2005 site visits.

Wetland I is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland J is a palustrine emergent/scrub-shrub seasonally inundated wetland (PEM/SSC), located at the southern property boundary in the central portion of the study area, and measures approximately 26,443 square feet in area (0.61 acres). It lies within the Little Campbell River Watershed. It is depressional with an outlet, continuing offsite to the south, through an 18" culvert under H Street, and is connected north to **Wetland K** through a short drainage. Canopy vegetation was present along the drier edges and consisted of red alder, western redcedar, and bitter cherry. The shrub layer was dominated by hardhack, salmonberry, and vine maple. Within the center of the wetland, the herbaceous layer was dominated by reed canarygrass and Pacific water parsley. Soils were a black silt loam with chroma of 1. We observed ponded conditions with depths above 2' during our February 2005 site visit. **Wetland J** is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland K is a closed depressional, palustrine scrub-shrub seasonally inundated wetland (PSSC), located in the south-central portion of the study area, and measures approximately 5,548 square feet in area (0.13 acres). It lies within the Little Campbell River Watershed. Water enters the south end from **Wetland J** through a short drainage and appears to drain underground at the north end surface as Drainage 2. Vegetation consisted of a shrub layer dominated by hardhack and salmonberry, and an herbaceous layer of skunk cabbage and Pacific water parsley. Soils were a black silt loam with chroma of 1. We observed up to 1' of inundation during our February 2005 site visit. It is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland L is a sloped depressional palustrine scrub-shrub seasonally inundated wetland (PSSC), located in the south-central portion of the study area, and measures approximately

17,314 square feet in area (0.40 acres). It lies within the Little Campbell River Watershed. Water enters the south end from **Wetland M** through a culvert, and exits the north end in Drainage 10. Vegetation was dominated by a shrub layer of salmonberry, and an herbaceous layer of algae, skunk cabbage, Pacific water parsley, and slough sedge. Red alder was also present around the edges. Also present, growing on raised hummocks within the wetland, were western redcedar, sword fern, salal, lady fern, and moss. Soils were a black silt loam with chroma of 1. We observed flowing water up to 10" deep during our February 2005 site visit. **Wetland L** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland M is a depressional palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located at the southern property boundary in the central portion of the study area, and measures approximately 228,100 square feet in area (5.24 acres). It lies within the Little Campbell River Watershed. Water enters the west end through a small off-site stream and exits to the northwest through a culvert discharging into **Wetland L**. The wetland appears to be artificially impounded. Canopy vegetation was present on fallen logs and drier wetland edges, and included black cottonwood, red alder, Pacific willow, and western redcedar. Portions of the wetland were dominated by thick hardhack and salmonberry, while other portions contained herbaceous slough sedge and Pacific water parsley. An abundance of large woody debris with moss and salal was present throughout the wetland. Soils were very dark gray loam with chroma of 1. We observed pools of inundation up to 2' deep during our February 2005 site visit. **Wetland M** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland N is a depressional palustrine forested seasonally inundated wetland (PFOC), located in the south-central portion of the study area, and measures approximately 10,654 square feet in area (0.24 acres). It lies within the Little Campbell River Watershed. Water enters at the south and west from **Drainage 10** and **Wetland W**, and exits at the north into **Drainage 1**. Vegetation was dominated by red alder in the canopy, salmonberry in the shrub layer, and skunk cabbage in the understory. Paper birch and lady fern were also present. Soils above 12" were black silt with chroma of 1. Below 12" the soils were a very dark brown gravelly loam with chroma of 2. We observed saturation to the surface and shallow standing water during our February 2005 site visit. **Wetland N** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland O is a closed depressional, palustrine forested seasonally inundated wetland (PFOC), located in the south-central portion of the study area, and measures approximately 12,662 square feet in area (0.29 acres). It appears to be hydrologically isolated, and we didn't observe any surface water or saturated soil connection to any other wetlands or streams nearby. The overstory vegetation was dominated by red alder with western redcedar and

paper birch as sub-dominants. The shrub layer was dominated by salmonberry and vine maple. The center of the wetland was inundated and contained skunk cabbage. Abundant large woody debris was present. Soils were a black silt loam with chroma of 1. We observed inundation up to 6" during our March 2005 site visit. **Wetland O** is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands.

Wetland P is a depressional palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located in the south-central portion of the study area, and measures approximately 37,867 square feet in area (0.87 acres). It lies within the Little Campbell River Watershed. Water enters at the south from **Drainage 2** and exits at the north into Drainage 3. Canopy vegetation was dominated by red alder and Pacific willow. The shrub layer was dominated by red-osier dogwood and salmonberry. The herbaceous layer was dominated by Pacific water parsley, and also included skunk cabbage, small-flowered bulrush, and cattail. Soils were very dark gray organic-rich silt with chroma of 1. We observed saturation to the surface and inundation up to 2' deep during our February 2005 site visit. **Wetland P** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland Q is a closed depressional, palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located in the south-central portion of the study area, and measures approximately 8,300 square feet in area (0.19 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. Portions of the wetland had a canopy layer dominated by red alder, with some Pacific willow also present. The shrub layer was dominated by salmonberry. Skunk cabbage and American brooklime were also present in the wettest areas. Soils were a very dark gray clay loam with chroma of 1. We observed saturation to the surface during our February 2005 site visits. **Wetland H** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland R is a closed depressional, palustrine scrub-shrub seasonally inundated wetland (PSSC), located in the south-central portion of the study area, and measures approximately 771 square feet in area (0.02 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. The vegetation was dominated by salmonberry. Herbaceous cover was lacking within inundated areas during our site visit. Soils were a very dark gray silt loam with chroma of 1. We observed up to 8" of standing water during our February 2005 site visits. **Wetland R** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland S is a closed depressional, palustrine scrub-shrub seasonally inundated wetland (PSSC), located in the north-central portion of the study area, and measures approximately

13,147 square feet in area (0.30 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water or saturated soil connection to any other wetlands or streams nearby. Vegetation was an almost pure stand of vine maple. The center of the wetland was inundated and contained skunk cabbage. Abundant large woody debris was present. Soils were a very dark gray silt loam with chroma of 1. We observed surface inundation during our March 2005 site visit. **Wetland S** is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland T is a closed depressional, palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located at the eastern property line in the south-central portion of the study area, and measures approximately 9,136 square feet in area (0.21 acres). It is located within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. An overstory of black cottonwood was present around the edges, with a shrub layer of hardhack and salmonberry throughout. A few sword fern and slough sedge were present in the understory. Soils were a very dark brown loam with chroma of 2 and dark yellowish brown mottles with chroma of 6. We observed 18" of inundation during our February 2005 site visit. The wetland appears to continue off-site to the east for a short distance. **Wetland T** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland U is a closed depressional, palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located to the west of **Wetland P**, in the south-central portion of the study area, and measures approximately 5,909 square feet in area (0.14 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. A canopy of red alder and black cottonwood was present on the edges of the wetland, with a mixture of salmonberry, hardhack, and vine maple forming the shrub layer throughout. A groundcover of Pacific water parsley was present in the wettest areas, with some ladyfern and mannagrass also present. Soils were a black silt loam with chroma of 1. We observed 2" of inundation during our February 2005 site visit. **Wetland U** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland V is a sloped depressional, palustrine forested seasonally inundated wetland (PFOC), located in the south-central portion of the study area, and measures approximately 9,159 square feet in area (0.21 acres). It lies within the Little Campbell River Watershed. Water enters at the south from Drainage 1 through a 12" steel pipe culvert, and exits at the north into **Wetland A**. Vegetation was dominated by a canopy of red alder, a shrub layer of salmonberry, and a groundcover of skunk cabbage, piggyback plant, and small-flowered bulrush. Also present were western redcedar, vine maple, and piggyback plant. Soils were black and dark gray silt loams with chroma of 1. We observed saturation at the surface during our February 2005 site visit. **Wetland V** is regulated as a category two wetland,

therefore carrying a 50' buffer, because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland W is a depressional, palustrine scrub-shrub seasonally inundated wetland (PSSC), located in the south-central portion of the study area, and measures approximately 23,224 square feet in area (0.53 acres). It lies within the Little Campbell River Watershed. Water enters at the south from **Wetland Z** and exits at the north into **Wetlands N** and **CC**. Canopy vegetation was dominated by red alder and paper birch, with some western redcedar along the edges. The shrub layer was dominated by salmonberry and vine maple. Herbaceous vegetation was dominated by Pacific water parsley, and also included mannagrass, ladyfern, and skunk cabbage. Soils were very dark gray silt with chroma of 1. We observed 5" of inundation during our February 2005 site visit. **Wetland W** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland X is a closed depressional, palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located in the south-central portion of the study area, and measures approximately 7,463 square feet in area (0.17 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. A canopy layer dominated by red alder, with quaking aspen, western redcedar, and western hemlock was present over portions of the wetland. The shrub layer was dominated by vine maple and salmonberry throughout. An herbaceous layer of skunk cabbage, Pacific water parsley, and mannagrass was also present. Soils were a very dark gray silt loam with chroma of 1. We observed inundation up to 18" during our February 2005 site visit. **Wetland X** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland Y is a closed depressional, palustrine scrub-shrub seasonally inundated wetland (PSSC), located in the south-central portion of the study area, and measures approximately 1,868 square feet in area (0.04 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. Vegetation was present around the edges of the wetland, dominated by a few western redcedar in the overstory, and vine maple in the shrub layer. Some salmonberry and devil's club were also present. No vegetation was growing within the inundated center of the wetland at the time of our site visit. The soils above 10" are a dark gray silt loam with chroma of 1. Below 10" the soils were a dark grayish brown silt loam with chroma of 2. We observed 1' of inundation during our February 2005 site visits. **Wetland Y** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland Z is a sloped depressional, palustrine forested seasonally inundated wetland (PFOC), located in the south-central portion of the study area, and measures approximately 17,793 square feet in area (0.41 acres). It lies within the Little Campbell River Watershed.

Water enters at the south from **Drainage 6** and **Wetland AA**, and exits at the north into Wetland W. Canopy vegetation was dominated by red alder, with some black cottonwood, paper birch, western redcedar, and western hemlock also present. The shrub layer consisted primarily of vine maple and salmonberry. Groundcover species present included piggyback plant, sword fern, and ladyfern. An abundance of small woody debris was present. Soils were a very dark gray silt loam with chroma of 1. We observed saturation to the surface during our February 2005 site visit. **Wetland Z** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland AA is a depressional, palustrine forested seasonally inundated wetland (PFOC), located in the south-central portion of the study area, and measures approximately 2,939 square feet in area (0.07 acres). It lies within the Little Campbell River Watershed. It is connected at its north end to **Wetland Z**. Vegetation was dominated by a canopy layer of red alder, and a shrub layer of vine maple and salmonberry. Also present were a few western redcedar and swamp gooseberry. Soils were a very dark brown and black silt loam with chroma of 1. We observed 1" of inundation during our February 2005 site visit. **Wetland AA** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland BB is a closed depressional, palustrine forested seasonally inundated wetland (PFOC), located in the south-central portion of the study area (between **Wetland W** and **Wetland X**), and measures approximately 1,474 square feet in area (0.03 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. Canopy vegetation was dominated by red alder, western redcedar, and paper birch. The shrub layer was primarily salmonberry, with a small amount of Himalayan blackberry in places. Soils were a very dark brown silt loam with chroma of 2 and dark yellowish brown mottles with chroma of 5. We observed inundation to the surface during our February 2005 site visit. **Wetland BB** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland CC is a sloped depressional, palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located in the south-central portion of the study area, and measures approximately 36,622 square feet in area (0.84 acres). It lies within the Little Campbell River Watershed. It is a linear drainage, with water entering at the south from **Wetland W**, and fanning out at the north to join **Wetland A**. Canopy vegetation was dominated by red alder, paper birch, quaking aspen, and bitter cherry. The shrub layer was dominated by salmonberry and vine maple. Areas of ponding were lacking the canopy vegetation and therefore classified as scrub-shrub. Soils were a very dark gray loam with chroma of 1. We observed saturated soils throughout the southern portion and increasing areas of inundation to the north, up to 10" deep during our February 2005 site visit. **Wetland CC** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with a

stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland DD is a closed depressional, palustrine emergent/scrub-shrub/forested seasonally inundated wetland (PEM/SS/FOC), located in the south-central portion of the study area (north of Wetland R), and measures approximately 9,819 square feet in area (0.23 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. Vegetation in the southern portion of the wetland was dominated by a canopy of red alder, while other areas were dominated by a shrub layer of salmonberry. There were also areas containing primarily skunk cabbage, moss, and algae. Soils in the upper 6" are a very dark gray organic-rich silt loam with chroma of 1. Below 6" the soils were a very dark grayish brown with chroma of 2 and dark yellowish brown mottles with chroma of 6. We observed 6" of inundation during our February 2005 site visit.

Wetland DD is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland EE is a depressional palustrine forested seasonally inundated wetland (PFOC), located in the western portion of the study area, and measures approximately 5,224 square feet in area (0.12 acres). It lies within the Dakota Creek Watershed. **Wetland EE** borders an unimproved roadway along the western property line and connects with **Wetland OO** at its northern end. Vegetation was dominated by salmonberry and Himalayan blackberry on the edges of the roadbed. Within the roadbed, reed canarygrass, soft rush, and creeping buttercup are the dominant grass and weedy herbaceous plant species present. Soils above 10" are a dark brown gravelly silt loam with chroma of 2. Below 10" soils were dark grayish brown sand with chroma of 2 and olive mottles with chroma of 6. We observed shallow inundation during our March 2005 site visit. **Wetland EE** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland FF is a sloped depressional, palustrine scrub-shrub seasonally inundated wetland (PSSC), located in the east-central portion of the study area (just east of **Wetland A**), and measures approximately 29,981 square feet in area (0.69 acres). It lies within the Little Campbell River Watershed. **Wetland FF** is located in an area of fairly recent logging and consists of what appear to be areas of exposed groundwater due to mechanical cuts into the soil, rutting and compaction. It appears to be hydrologically isolated, and we did not observe any hydric soil connections to nearby wetlands. However, in times of high flow it may have a surface water connection to b. The vegetation has been clear-cut, and was dominated by red alder seedlings, creeping bentgrass, and common rush at the time of our site visits. A few remnant western redcedar and black cottonwood were present, as well as re-sprouting bigleaf maple stumps. The wetland is highly disturbed, and a large amount of logging slash is present. Soils in low places are a black silt loam with chroma of 1, while on humps they are non-hydric. We observed surface inundation and flowing water in places during our February 2005 site visit. **Wetland FF** is regulated as a category three wetland,

therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland GG is a closed depressional, palustrine emergent/scrub-shrub/forested seasonally inundated wetland (PSS/SS/FOC), located in the east-central portion of the study area (East of **Wetland A** and West of **Wetland FF**), and measures approximately 487 square feet in area (0.01 acres). It lies within the Little Campbell River Watershed. Water exits into Drainage 7, an artificial feature, which joins **Wetland A**. In times of high flow, **Wetland GG** likely has a surface water connection via a road cut to **Wetland FF**. An overstory of red alder was present around the wetland edges, with the shrub layer dominated by salmonberry in places. The understory contained some sword fern, northern mannagrass, and dagger-leaved rush. Soils above 10" are black mucky silt with chroma of 1. Below 10", soils were a dark grayish brown loam with chroma of 2 and dark yellowish brown mottles with chroma of 6. We observed surface inundation during our February 2005 site visit. **Wetland GG** is exempt from regulation by the City of Blaine, as it does not have hydric soil connections to any nearby wetlands and is less than 10,000 square feet in area.

Wetland HH is a sloped depressional, palustrine scrub-shrub/forested seasonally inundated wetland (PSS/FOC), located in the north central portion of the study area, and measures approximately 74,526 square feet in area (1.71 acres). It lies within the Little Campbell River Watershed. It is a linear wetland, with water originating as runoff from slopes at its eastern end and into **Wetland A** at its west end. Vegetation was dominated by a canopy of red alder in places, with salmonberry, vine maple, willow, and hardhack as dominants in the shrub layer. An herbaceous layer is present in areas, with skunk cabbage, slough sedge, mannagrass, and algae. Soils were a black organic-rich silt loam and gravelly silt loam with chroma of 1. We observed varying levels of standing water, from surface inundation to 18" inundation, during our February, 2005 site visit. **Wetland HH** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with **Wetland A**, and therefore with Jacobson Creek, but does not have any of the characteristics required for category one wetlands.

Wetland II is a closed depressional, palustrine emergent/scrub-shrub seasonally inundated wetland (PEM/SSC), located in the eastern portion of the study area (south of **Wetland HH** and east of **Wetland A**), and measures approximately 4,121 square feet in area (0.09 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. The center of **Wetland II** was ponded and lacked vegetation during our site visit; however during the drier seasons herbaceous vegetation is likely present. Around the perimeter of the wetland, a sparse canopy of red alder was present. The shrub-layer was dominated by salmonberry and vine maple, with a few devil's clubs. Some skunk cabbage was present at the water's edge. Soils were a dark grayish brown sandy silt loam with chroma of 2 and dark yellowish brown mottles with chroma of 6. We observed up to 1' of inundation during our February 2005 site visit. **Wetland II** is exempt from regulation by the City of Blaine, as it is isolated and less than 10,000 square feet in area.

Wetland JJ is a sloped/depressional palustrine forested seasonally inundated wetland (PFOC) located in the south central portion of the study area and measures approximately 7,286 square feet in area (0.17 acres). The wetland lies within the Little Campbell River Watershed. Vegetation was dominated by a canopy of red alder, a shrub layer of salmonberry, and an herbaceous layer of sword fern. Soils were a very dark gray silt loam with chroma of 1 to 6" below the surface with a 2.5Y 5/2 silt loam with 10YR 4/6 mottles from 6" to 18". We observed saturation to the surface during our February 2005 site visit. Saturation in the upper soil appears to occur from lateral flow of ground water from the surrounding uplands. **Wetland JJ** is exempt from regulation by the City of Blaine, as it is not connected by hydric soils to any other wetlands, and is less than 10,000 square feet in area.

Wetland KK is a depressional palustrine forested seasonally inundated wetland (PFOC), located in the north-central portion of the study area, and measures approximately 3,102 square feet in area (0.07 acres). It lies within the Little Campbell River Watershed. It is connected to **Wetland A** at its south end. Vegetation was dominated by a canopy of red alder, a shrub layer of salmonberry, and an herbaceous layer of northern mannagrass. Also present were a few Indian plum and sword fern. Soils were a very dark gray silt loam with chroma of 1. We observed saturation to the surface during our February 2005 site visit. Saturation in the upper soil appears to occur from lateral flow of ground water from the surrounding uplands and possibly from road run-off from 0 Avenue to the north. **Wetland KK** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with **Wetland A**, and therefore with Jacobson Creek, but does not have any of the characteristics required for category one wetlands.

Wetland LL is a depressional palustrine emergent/scrub-shrub seasonally inundated wetland (PEM/SSC), located in the north-central portion of the study area, and measures approximately 30,105 square feet in area (0.69 acres). It lies within the Little Campbell River Watershed. Water enters from the north and exits into **Drainage 9**, and **Wetland XX**, which both continue south to join **Wetland A**. Vegetation was dominated by a shrub layer of salmonberry, hardhack, and twinberry, around the outer portions of the wetland. In the center of the wetland, where water is deepest, an herbaceous layer of Pacific water parsley was dominant. Also present were Indian plum and northern mannagrass. Soils above 10" are a black silt loam with chroma of 1. Below 10" soils were a greenish gray gleyed clay loam and contain dark yellowish mottles with chroma of 6. We observed up to 1' of inundation during our March 2005 site visit. **Wetland LL** is regulated as a category two wetland, therefore carrying a 50' buffer, because it is contiguous with **Wetland A**, and therefore with Jacobson Creek, but does not have any of the characteristics required for category one wetlands.

Wetland MM is a closed depressional palustrine forested seasonally inundated wetland (PFOC), located at the western boundary of the study area, and measures approximately 5,529 square feet in area (0.13 acres). It lies within the Dakota Creek Watershed. Water

drains into a man-made ditch, at the edge of an off-site gravel driveway which parallels the western property boundary. Water then flows under the road through two 6" culverts. Soils were a black silt loam with chroma of 1. We observed inundation to 3" during our March 2005 site visit. **Wetland MM** is exempt from regulation by the City of Blaine, as it is not connected by hydric soils to any other wetlands, and is less than 10,000 square feet in area.

Wetland NN is a closed depressional, palustrine forested seasonally inundated wetland (PFOC), located in the western portion of the study area, and measures approximately 18,974 square feet in area (0.44 acres). It lies within the Dakota Creek Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. Vegetation in the overstory was dominated by western redcedar over one half and by red alder over the other, with paper birch present throughout as a sub-dominant. The shrub layer was dominated by salmonberry and vine maple. Some spiny wood fern was present as groundcover, with large woody debris, moss, and leaf litter throughout. Soils were a black silt loam with chroma of 1. We observed inundation up to 2" deep during our March 2005 site visit. **Wetland NN** is regulated as a category three wetland, therefore carrying a 25' buffer, because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland OO is a depressional palustrine forested seasonally inundated wetland (PFOC), located in the western portion of the study area, and measures approximately 2,081 square feet in area (0.05 acres). It lies within the Dakota Creek Watershed. It is a highly disturbed wetland situated within a remnant roadway, and has a seasonal surface water connection north to **Wetland QQ**. An off-site scoured drainage channel, approximately 1' wide, is present to the south of the **Wetland OO** roadway and directs surface flows to the southwest into an off-site excavated pond on the adjacent parcel to the west. A canopy of red alder was present along the edges of the wetland and remnant roadway. Herbaceous American brooklime, creeping buttercup, and soft rush were also present within the inundated portions of the wetland. Soils above 10" are a dark brown gravelly silt loam with chroma of 2. Below 10" soils were dark grayish brown sand with chroma of 2 and olive mottles with chroma of 6. We observed shallow inundation during our March 2005 site visit. **Wetland OO** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland PP is a depressional palustrine forested seasonally inundated wetland (PFOC), located in the western portion of the study area, and measures approximately 42,588 square feet in area (0.98 acres). It lies within the Dakota Creek Watershed. We observed surface water overflowing from **Wetland VV** across the gravel Mill Road Right-of-Way into **Wetland PP**. It drains to **Wetland QQ** to the southwest, through a surface water connection in a narrow scoured channel crossing a remnant road. Canopy vegetation was dominated by red alder and black cottonwood. The shrub layer was dominated by salmonberry and vine maple. Areas of standing water were largely bare, with some moss and

algae. Drier areas contained a groundcover of sword fern, Dewey's sedge, spiny wood fern, and Siberian miner's lettuce. Abundant small woody debris and a thick layer of downed leaves and humus cover the ground surface. Soils above 10" are a black silt loam with chroma of 1. Below 10" a dark olive brown sandy layer is present. We observed inundation to 1" during our March 2005 site visit. **Wetland PP** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland QQ is a depressional palustrine forested seasonally inundated wetland (PFOC), located in the western portion of the study area, and measures approximately 58,072 square feet in area (1.33 acres). It lies within the Dakota Creek Watershed. Water enters from the east as a surface water connection from **Wetland PP**, and drains off-site to the southwest across an unimproved roadway at **Wetland OO**. Vegetation was dominated by a canopy layer of red alder and black cottonwood. The shrub layer was dominated by salmonberry and vine maple. Herbaceous plants were generally lacking within inundated depressional areas; however skunk cabbage was present in some areas. Soils were a black silt loam with chroma of 1. We observed saturation to the surface, and shallow inundation during our March 2005 site visit. **Wetland QQ** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland RR is a closed depressional, palustrine forested seasonally inundated wetland (PFOC), located in the western portion of the study area, and measures approximately 166,970 square feet in area (3.83 acres). It lies within the Dakota Creek Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other wetlands or streams nearby. Through the majority of the wetland, the overstory vegetation was dominated by black cottonwood, red alder, and western redcedar, and the shrub layer by salmonberry. Herbaceous vegetation was typically absent in the seasonally inundated areas at the time of the site visits; however skunk cabbage was present in some places. The westernmost portion of the wetland was ponded, and contained scrub-shrub (PSSC) and emergent (PEMC) classes. The vegetation in that area was primarily hardhack, salmonberry, Pacific water parsley, and slough sedge. Soils were a very dark gray and dark gray silt loam ranging from sandy to clayey, with chroma of 1. We observed inundation varying from 4-12" of during our March 2005 site visits. **Wetland RR** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland SS is a closed depressional, palustrine forested seasonally inundated wetland (PFOC), located in the south-central portion of the study area, and measures approximately 19,378 square feet in area (0.45 acres). It lies within the Little Campbell River Watershed. It appears to be hydrologically isolated, and we didn't observe any surface water or saturated soil connection to any other wetlands or streams nearby. The overstory vegetation was dominated by red alder with western redcedar and paper birch as sub-dominants. The shrub

layer was dominated by salmonberry and vine maple, with some red elderberry on the edges. The center of the wetland was inundated and contained skunk cabbage. Sword fern and bleeding heart were also present in the understory. Abundant large woody debris was present. Soils were a black silt loam with chroma of 1. We observed inundation up to 6" during our March 2005 site visit. **Wetland SS** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland TT is a sloped depressional, palustrine forested seasonally inundated wetland (PFOC), located in the west-central portion of the study area, and measures approximately 71,002 square feet in area (1.63 acres). It lies within the Little Campbell River Watershed. Water flows northeast through the wetland and enters **Drainage 5**. Vegetation was dominated by a canopy of red alder and a shrub layer of salmonberry. Also present were black cottonwood, red elderberry, vine maple, and Himalayan blackberry. Herbaceous plants present included American brooklime, skunk cabbage, spiny wood fern, Siberian miner's lettuce, stinging nettle, and licorice fern. Soils were a black organic-rich silt loam with chroma of 1. We observed inundation at the surface during our March 2005 site visit. **Wetland TT** is regulated as a category three wetland because it is contiguous with a stream, as defined by the City of Blaine, but does not have any of the characteristics required for category one wetlands.

Wetland UU is a depressional, palustrine forested seasonally inundated wetland (PFOC), located in the western portion of the study area, on the east side of Mill Road Right-of-Way (north of **Wetland VV**), and measures approximately 10,272 square feet in area (0.24 acres). It lies within the Dakota Creek Watershed. **Wetland UU** drains through a culvert under a gravel logging road south to join **Wetland VV**. Canopy vegetation was dominated by western redcedar, with western hemlock, red alder as sub-dominants. The shrub layer was dominated by salmonberry and vine maple. The understory was dominated by skunk cabbage and lady fern. Large woody debris with moss was prevalent throughout the wetland. Soils were a black muck with chroma of 1. We observed inundation to 4" during our March 2005 site visit. **Wetland UU** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland VV is a depressional, palustrine forested seasonally inundated wetland (PFOC), located in the western portion of the study area, just east of Mill Road Right-of-Way (south of **Wetland UU**), and measures approximately 53,128 square feet in area (1.22 acres). It lies within the Dakota Creek Watershed. We did not observe any hydric soil connection to any other wetlands or streams nearby; however, water enters from **Wetland UU** through a culvert at the north end, and surface water flow crosses the road to the west and empties into **Wetland PP**. Canopy vegetation was dominated by western redcedar and western hemlock (growing on downed logs), with some Sitka spruce, paper birch, and red alder in places. The shrub layer was dominated by salmonberry and vine maple, with false azalea and red huckleberry on the edges. The understory was dominated by Pacific water parsley, with

some skunk cabbage, American brooklime, spiny wood fern, and deer fern in places. Large downed logs were present throughout the wetland, covered in moss, salal, and western hemlock. Soils were a black silt loam with chroma of 1. We observed 6" of inundation during our March 2005 site visit. **Wetland VV** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland WW is a sloped depressional, palustrine scrub-shrub seasonally inundated wetland (PSSC), located in the north-central portion of the study area, and measures approximately 42,589 square feet in area (0.98 acres). It lies within the Little Campbell River Watershed. The wetlands present in **Wetland WW** are fringe wetlands associated with Jacobson Creek, a tributary to the Campbell River, which is contained within a ravine. Jacobson Creek drains the pond associated with Wetland A at its south end; water flows northwest through a 24" culvert under 0 Avenue. The wetland has impounded at the north end by the culvert. Vegetation was dominated by a shrub layer of salmonberry, with a few Indian plum on drier humps. In the wettest areas, the soil was largely bare, with an herbaceous layer of American brooklime, Pacific water parsley, and skunk cabbage present in places. On drier humps were sword fern, spiny wood fern, piggyback plant, and moss. An abundance of both large and small woody debris was present. Soils were very dark grayish brown gravelly silt with chroma of 2. We observed flowing water during our March 2005 site visit. **Wetland WW** is regulated as a category two wetland because it contiguous with a stream, and does not have any of the characteristics required for category one wetlands.

Wetland XX is a depressional palustrine emergent/scrub-shrub seasonally inundated wetland (PEM/SSC), located in the north-central portion of the study area, and measures approximately 37,926 square feet in area (0.87 acres). It lies within the Little Campbell River Watershed. Water enters from the north and joins **Wetland A** at the south. **Wetland XX** is partially ponded at the north end. Vegetation within the ponded north end was partially bare during our March 2005 site visit, with an herbaceous layer of slough sedge, Pacific water parsley, skunk cabbage, and American wintercress. A shrub layer of salmonberry and vine maple was present on the edges. At the eastern end, twinberry, and creeping buttercup were also present. Soils were a very dark gray silt loam with chroma of 1. We observed saturation to the surface and 2" of inundation during our March 2005 site visit. **Wetland XX** is regulated as a category two wetland because it contiguous with Wetland A, and therefore with a stream, but does not have any of the characteristics required for category one wetlands.

Wetland YY is a closed depressional, palustrine forested seasonally inundated wetland (PFOC), located at the northern boundary of the study area, approximately 370' to the east of Mill Road Right-of-Way, and measures approximately 19,199 square feet in area on-site (0.44 acres). It continues offsite to the northeast (totaling approximately 40,000 square feet in area), and parts of it appear to be located within a remnant road bed. It lies within the Little Campbell River Watershed. **Wetland YY** appears to be hydrologically isolated, and we didn't observe any surface water, saturated soil, or hydric soil connection to any other

wetlands or streams nearby. The overstory vegetation was dominated by western redcedar and red alder. The shrub layer was dominated by salmonberry and hardhack, with some Himalayan blackberry present along the previously cleared eastern and northern edges of the wetland, adjacent to 0 Avenue. The herbaceous layer was dominated by water parsley and skunk cabbage within inundated depressions. Woody debris, including large logs, was present within the wetland. Soils were a highly compacted, very dark gray gravelly clayey silt loam with chroma of 1. We observed a drainage pattern and inundation varying from 4-12” during our March 2005 site visits. We observed flowing water during our March 2005 site visit. **Wetland YY** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Wetland ZZ is a closed depressional, palustrine forested seasonally inundated wetland (PFOC), located in the northwestern corner of the study area, and measures approximately 242,132 square feet in area on-site (5.56 acres). It lies within the Little Campbell River Watershed. It is a linear east-west wetland that continues offsite to the southwest. It appears to be hydrologically isolated, and we didn’t observe any surface water or saturated soil connection to any other wetlands or streams nearby. The overstory vegetation was dominated by red alder, black cottonwood and western redcedar. The shrub layer was dominated by salmonberry, while inundated depressions included areas of skunk cabbage, Pacific water parsley, and American brooklime. Abundant woody debris was present. Soils were a black and very dark gray rocky silt loam with chroma of 1. We observed saturated soils and shallow standing water during our March 2005 site visits. **Wetland ZZ** is regulated as a category three wetland because it does not have any of the characteristics required for category one or category two wetlands, but is greater than 10,000 square feet in area.

Uplands

In the eastern and southwestern portions of the study area, upland vegetation is characterized by a regenerating plant community and remnant herbaceous plants from recent logging. These areas are dominated by red alder saplings, and regenerating vine maple, red elderberry and salmonberry. Sword fern and trailing blackberry are present in the understory, as well as various other herbaceous plants typical of disturbed areas. Himalayan blackberry is present and generally sparse, but is thick in some places of greater past disturbance. A very sparse canopy of uncut western redcedar, western hemlock, Douglas fir, bigleaf maple, red alder, and black cottonwood were left standing throughout.

Uplands throughout the central and northwestern portions of the study area are typically characterized by a canopy layer dominated by red alder. Also present in the canopy to a lesser degree are western redcedar, western hemlock, Douglas fir, paper birch, bigleaf maple and bitter cherry. A shrub layer of salmonberry is present in most areas, with vine maple, red elderberry, and Indian plum also common.

Additional information on the plant communities and species present is contained in **Appendix B** (data forms) and **Appendix C** (plant list).

Drainages

We observed eleven ephemeral drainages within the study area, which were not included within the boundaries of a wetland. Their descriptions and wetland connections are described in the following paragraphs. Please refer to **Figures 7-10** for more information on the locations of the drainages.

Drainage 1 (DR-1) is located in the south-central portion of the study area, and is approximately 131 feet in length. It lies within the Little Campbell River Watershed. It is a meandering channel with scour marks and had fresh sediment at the time of our site visits. Water enters from **Wetland N** and is conveyed to **Wetland V**. Vegetation present along the sides is dominated by red alder and salmonberry, with a smaller amount of western redcedar. It varied from approximately 1'-2' wide and was approximately 2" deep during our February 2005 site visit. **Drainage 1** carries a 25' standard buffer.

Drainage 2 (DR-2) is located in the south-central portion of the study area, and is approximately 102 feet in length. It lies within the Little Campbell River Watershed. It is a flowing stream in a defined channel with a gravel substrate. It appears to originate from underground, approximately 10' north of **Wetland K**. Water flows north, entering into the south end of **Wetland P**. **Drainage 2** carries a 25' standard buffer.

Drainage 3 (DR-3) is located in the south-central portion of the study area, and is approximately 278 feet in length. It lies within the Little Campbell River Watershed. The stream flows in a defined channel with a gravel substrate at its south end and fans out into a braided flow towards the north. It varied from approximately 10-50' wide and was approximately 6" deep during our February 2005 site visit. **Drainage 3** carries a 25' standard buffer.

Drainage 4 (DR-4) is located in the south-central portion of the study area, and is approximately 481 feet in length. It lies within the Little Campbell River Watershed. Water overflows from **Drainage 3** onto a remnant road bed towards the east, curving around to flow south and eventually joins Wetland A. The northernmost portion of **Drainage 4** did not contain water during our February 2005 site visit, but had an obvious scour-path. **Drainage 4** is an artificial feature and therefore does not carry a buffer.

Drainage 5 (DR-5) is a stream located in the north-central portion of the study area, and is approximately 187 feet in length. It lies within the Little Campbell River Watershed. Water flows into the stream from **Wetland TT** at the south, and follows a defined channel with scour marks and a gravel substrate north to **Wetland WW**. Vegetation present along the sides was dominated by red alder, vine maple, and sword fern. Abundant large woody debris

is present within the stream channel. It was approximately 2' wide and was approximately 2" deep during our March 2005 site visit. **Drainage 5** carries a 25' standard buffer.

Drainage 6 (DR-6) is located in the south-central portion of the study area, and is approximately 231 feet in length. It lies within the Little Campbell River Watershed. It begins where water tops over from the middle of Wetland M onto a gravel road and travels north to where it enters **Wetland Z**. We observed shallow flowing water during our February 2005 site visit. **Drainage 6** is an artificial feature and therefore does not carry a buffer.

Drainage 7 (DR-7) is located in the east-central portion of the study area, and is approximately 153 feet in length. It lies within the Little Campbell River Watershed. It is best characterized as water running down a remnant road bed, and connects **Wetland GG** west to **Wetland A**. We observed flowing water during our February 2005 site visit. **Drainage 7** is an artificial feature and therefore does not carry a buffer.

Drainage 8 (DR-8) is located in the north-central portion of the study area, and is approximately 594 feet in length. It lies within the Little Campbell River Watershed. It flows west and enters **Wetland HH**. We observed during our February 2005 site visit. **Drainage 8** is an artificial feature and therefore does not carry a buffer.

Drainage 9 (DR-9) is located in the north-central portion of the study area, and is approximately 68 feet in length. It lies within the Little Campbell River Watershed. It drains water from **Wetland LL** south to **Wetland A**, and contains a scour path approximately 2' wide. We observed flowing water during our February 2005 site visit. **Drainage 9** carries a standard 25' buffer.

Drainage 10 (DR-10) is located in the south-central portion of the study area, and is approximately 380 feet in length. It lies within the Little Campbell River Watershed. It drains water from **Wetland MM** north to **Wetland N**. The drainage lacked hydric soils and hydrophytic vegetation and appears to follow an historic logging road. **Drainage 10** is an artificial feature and therefore does not carry a buffer.

Drainage 11 (DR-11) is located in the western portion of the study area, and is approximately 44 feet in length on-site. It lies within the Dakota Creek Watershed. It appears to drain water from **Wetlands QQ** and **OO** into an off-site pond. We observed shallow, flowing water during our spring 2005 site visits. It consists of a narrow band of surface water crossing through a remnant roadbed and appears to be artificially created. The off-site pond is also artificially dug. We observed shallow flowing water during our March 2005 site visit. **Drainage 11** is an artificial feature and therefore does not carry a buffer.

Regulatory Issues

The following section summarizes the most commonly applicable laws to wetlands, streams, associated buffers, and mitigation. Other laws and regulations that are not discussed here may also apply.

The City of Blaine regulates Wetlands through the Blaine Municipal Code, Chapter 17.83 Wetland Management. Three categories of wetlands are recognized by the City of Blaine, as follows:

Category one wetlands include wetlands which have exceptional resource value based on unique qualities, presence of rare wetland communities and sensitivity to disturbance. These wetlands have one or more of the following features: a) documented habitat of threatened, endangered or rare species, b) high-quality native wetland sites which qualify as quality natural heritage wetlands, c) irreplaceable or rare wetland types (sphagnum bogs, fens or significant peat deposits, marine-influenced wetlands and mature forested wetlands), d) exceptional local significance, such as rarity, ground water recharge areas, significant habitats, unique educational sites or other specific functional values within a watershed.

Category two wetlands are wetlands not included in category one which are a significant resource based on functional values and diversity. These wetlands have one or more of the following features: a) documented habitats for sensitive plant, fish or animal species, b) contiguousness with any stream, or c) significant habitat value based on diversity and size, as follows:

- i. Ten acres or greater in size, and two or more Cowardin classes together with 20 percent or greater permanent open water during a normal year; or
- ii. Ten acres or greater in size with three or more Cowardin classes; and five or more subclasses of vegetation in a dispersed pattern; or
- iii. Five acres or greater in size, and 40 to 60 percent permanent open water during a normal year; and two or more subclasses of vegetation in a dispersed pattern;

Category three wetlands include all wetlands not included in category one or two. These wetlands may be valuable for their functions in storm water retention, aquifer recharge and as water quality purifiers. Category three wetlands include wetlands that are not contiguous with a stream, with no threatened, endangered or sensitive plant or animal species or rare wetland types, and contain less than 20 percent permanent open water. Generally they provide only minimal habitat functions. Normally their functions and values may be mitigated or recreated artificially.

The City of Blaine considers the following wetlands exempt from regulation:

1. Wetlands less than 10,000 square feet in size.
2. Artificially created wetlands that were not required to be constructed as mitigation for wetland impacts. These may include but are not limited to irrigation and drainage

ditches, grass-lined swales, canals, detention facilities, reservoirs, wastewater treatment ponds, farm ponds, and landscape amenities.

3. Wetlands for which the United States Army Corps of Engineers requires an Individual 404 Permit consistent with the United States Clean Water Act and it is determined by the director that the requirements of Chapter 17.83 are met.

The City of Blaine regulates standard buffers for wetland categories as follows: category one wetlands carry a minimum 75' buffer, category two wetlands carry a minimum 50' buffer, and category three wetlands carry a minimum 25' buffer from impervious surfaces. Streams carry a minimum 25' buffer. Buffers are to remain undisturbed by development. The buffer requirement may be increased and/or averaged where it is demonstrated by a city-approved wetlands specialist that certain portions of the wetland or stream are more sensitive to disturbance than others.

The full text of Chapter 17.83, including requirements for wetland permits and mitigation is included as **Appendix E**.

The Washington State Department of Ecology (DOE) regulates wetlands by authority of the State Water Pollution Control Act (RCW 90.48), and by the State Shoreline Management Act (RCW 90.58). Section 401 of the federal Clean Water Act also requires that proposed dredge and fill activities be reviewed and certified to comply with state water quality standards. For proposed wetland fills of greater than 1/10 acre DOE reviews the permit application on an "individual" basis. In these cases the applicant is required by the DOE to submit a completed Nationwide Permit State Application Form to the Nationwide Permit Coordinator for review. The permit is not authorized in documented habitat for state listed endangered, threatened, or sensitive animal and plant species. Mitigation is often required.

The Washington State Department of Fish & Wildlife (WDFW) regulates in-water work by authority of WAC Chapter 220-110 and RCW Chapter 77.55. A Hydraulic Project Approval (HPA) is required for any form of work that uses, diverts, obstructs, or changes the natural flow or bed of any fresh water or saltwater of the state. Permit processing can take up to 45 days following receipt of a complete application package. A complete application package for an HPA must include a completed Joint Aquatic Resource Permit Application (JARPA) form, general plans for the overall project, and complete plans and specifications of the proposed work within the mean higher high water line in salt waters or within the ordinary high water line (or "mark") (OHWM) in fresh waters of the state, complete plans and specifications for the protection of fish life, and notice of compliance with any applicable requirements of the State Environmental Policy Act (SEPA). SEPA compliance must be complete prior to review of the application and issuance of the HPA by WDFW. SEPA compliance is not required for an expedited or an emergency HPA.

The U.S. Army Corps of Engineers (Corps) regulates all navigable waters by authority of Section 404 of the Federal Clean Water Act. "Navigable waters" includes all Waters of the United States, the territorial seas, tributary waters, and adjacent wetlands [Section 502(7)].

Wetlands separated from other Waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes, and the like are considered “adjacent” and are under Corps jurisdiction [33 CFR Part 328.3(c)]. Only the Corps can determine adjacency, and the Corps reserves the authority to determine the existence and limits of any areas presumed to be wetland.

Depending on the project, a wetland fill will require either an Individual Permit or a Nationwide Permit from the Corps of Engineers. Nationwide Permits are a form of general permits which authorize a category of activities throughout the nation. These permits are valid only if the conditions applicable to the permits are met. If the conditions cannot be met, an Individual Permit will be required. Under certain conditions, Nationwide Permits may allow for fill of up to 0.5 acres of wetland as required for a given project. Multiple (different) Nationwide Permits may not be used to authorize greater than 0.5 acres of fill for any project site. For wetland fills over 0.5 acres (or which meet certain other criteria), an Individual Permit is required. Individual permits are issued following a full public interest review of an individual application for a Department of the Army permit. A public notice is distributed to all known interested persons. After evaluating all comments and information received, final decision on the application is made. The permit decision is generally based on the outcome of a public interest balancing process where the benefits of the project are balanced against the detriments. A permit will be granted unless the proposal is found to be contrary to the public interest. Processing time ideally takes 60 to 120 days unless a public hearing is required or an environmental statement must be prepared.

Upon submittal of an application, the Corps will determine whether an Individual or Nationwide Permit applies to a particular project. No activity is authorized under any Nationwide Permit which is likely to jeopardize the continued existence of a threatened, endangered, or proposed species. General Condition 11 requires notification of all wetland fills so that the Corps can determine if the proposed fill will affect any threatened or endangered species, or species proposed for listing. In addition to General Condition 11, each Nationwide Permit has a procedure for notification. The Joint Aquatics Resource Permit Application (JARPA) form may be used to notify for all wetland fills.

Disclaimer

This critical area study is based upon physical circumstances that are described in manuals and publications utilized by Federal, State, and Local agencies. The wetland delineation methodology used in this report is consistent with the routine on-site determination method prescribed by the 1987 Corps of Engineers Wetland Delineation Manual. No guarantees are given that the delineation will concur exactly with those performed by agencies with jurisdiction or by other qualified professionals. The Corps of Engineers is available to make wetland delineation verifications upon request. This report is provided for the use of the named recipient only and is not intended for use by other parties for any other purpose.