

January XX, 200X

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**SUBJECT: SR XX: Happy St. Vicinity to Golucky Way (XL 1111)
Phase II Mitigation Site Wetland Delineation**

The Washington State Department of Transportation (WSDOT) proposes to widen State Route (SR) XX between Golucky Way and SE Sappy Place in Issaquah, Washington, between milepost (MP) XX.XX and MP XX.00. Permanent wetland and buffer impacts will be mitigated for by wetland creation and riparian and wetland buffer enhancement in Lake Sammamish State Park. This memorandum documents the location and characteristics of two wetlands identified and delineated for the Phase II Mitigation Site within Lake Sammamish State Park (Figure 1). The mitigation site is within Sections 20 and 21 of Township 13 North, Range 3 East, in Purple County, Washington just north of the City of Issaquah. A description of the methodology used to delineate and classify the wetlands is provided below.

Methodology

The mitigation site was assessed for wetland resources using guidelines and methods described in the *Washington State Wetland Identification and Delineation Manual* (Ecology 1997) and the *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987). In places that appeared to have wetland characteristics, the dominant plant species, soil conditions in test pits, and evidence of hydrologic conditions were recorded on routine data forms. Upland areas adjacent to each potential wetland area were also evaluated. Based on the field data, a wetland/non-wetland determination was made for each area examined. Following confirmation of all three wetland parameters in a given area, the wetland boundary was marked by placing sequentially numbered, pink fluorescent flagging along the wetland perimeter.

The wetlands delineated within the study area were classified according to federal, state, and local systems. The United State Fish and Wildlife Service system (Cowardin et al. 1979) is a descriptive classification, based on physical attributes (i.e., vegetation, soils, and water regime). The Washington State Department of Ecology (Ecology) system (Hruby 2004) divides wetlands into four hierarchical categories based on specific attributes such as rarity, sensitivity to disturbance, functions, and our ability to replace them. It incorporates consideration of the wetland's hydrologic and geomorphic conditions into the system by assigning wetlands a hydrogeomorphic classification. This allows for a more accurate rating of how well the wetland functions based on its position in the landscape (geomorphic setting), water source (hydrology), and the flow and fluctuation of the water once in the wetland (hydrodynamics). Ecology's classification hierarchy ranges from Category I wetlands, which exhibit outstanding features (rare wetland type, relatively undisturbed or a high sensitivity to disturbance, high level of functions), to Category IV wetlands, which have the lowest levels of function and are often heavily disturbed.

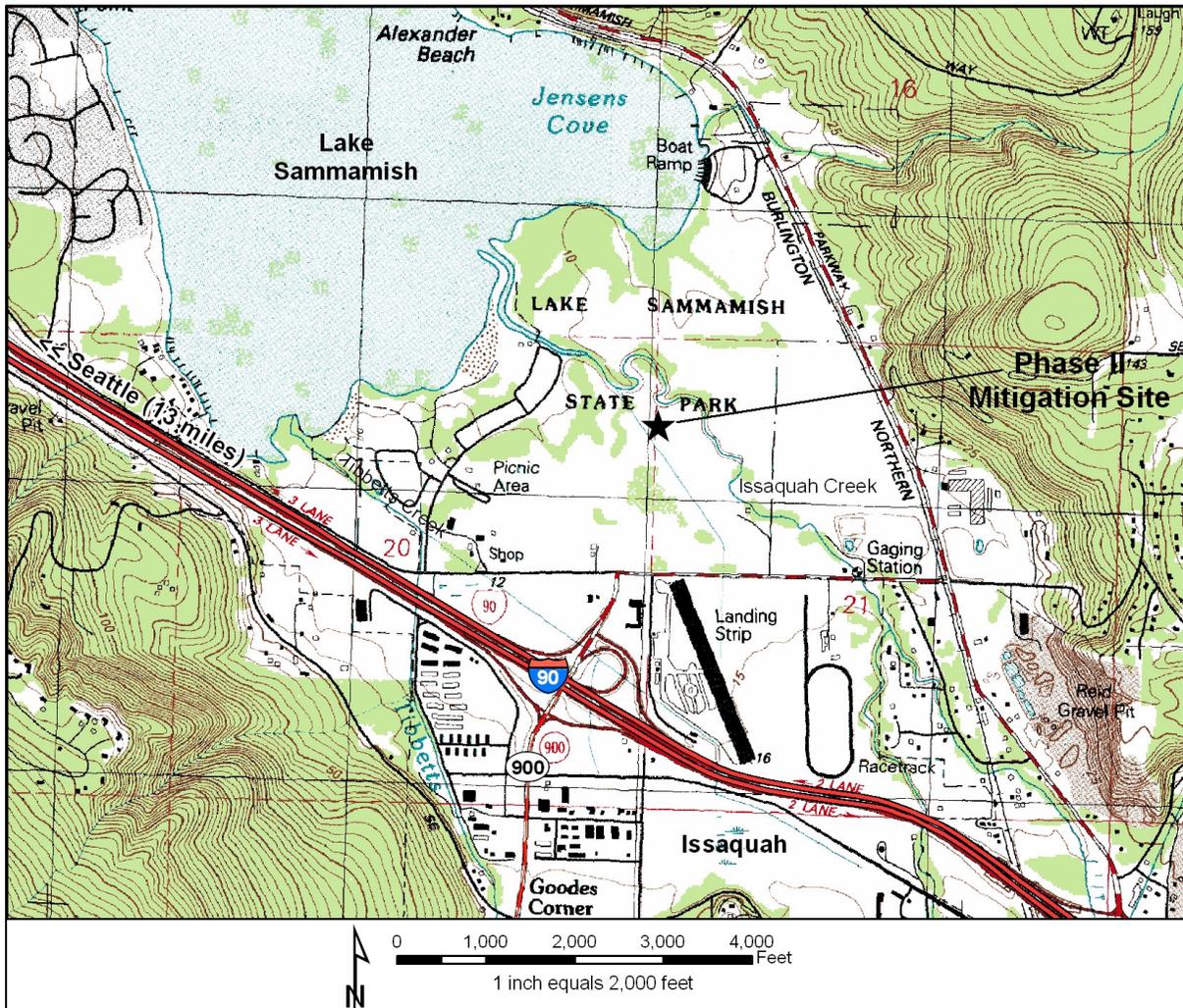


Figure 1. Project vicinity map.

The area we investigated at Lake Sammamish State Park is under the jurisdiction of Purple County. Purple County has adopted Ecology's wetland rating system. The mitigation site in Lake Sammamish State Park is in the Urban Growth Area of Purple County, and the required wetland buffers depend on the habitat score determined by the Ecology rating system.

Wetland functions for the wetlands within the mitigation area were evaluated using the WSDOT *Wetland Functions Characterization Tool for Linear Projects* manual (WSDOT 2000). The manual is a qualitative tool designed for linear projects to enable the rapid documentation and characterization of the functions provided by a given wetland. The methodology does not assign quantitative values to a particular function, but identifies functional strengths and weaknesses to help guide management decisions and aid in mitigation choices. Wetland functions are divided into 14 categories:

- Flood flow alteration
- Sediment removal
- Nutrient and toxicant removal
- Erosion control and shoreline stabilization
- Production of organic matter and its export
- General habitat suitability
- Habitat for aquatic invertebrates
- Habitat for amphibians
- Habitat for wetland-associated mammals
- Habitat for wetland-associated birds
- General fish habitat
- Native plant richness
- Educational or scientific value
- Uniqueness and heritage

Existing Conditions

The National Wetland Inventory (NWI) does not map any wetlands in the immediate project area that we investigated (USFWS 1999). The closest NWI-mapped wetland is a large wetland complex that practically surrounds the mitigation area on all sides and extends north and east of Issaquah Creek to Lake Sammamish. The Purple County sensitive area maps also shows a large wetland complex, but this data includes the proposed mitigation area and had a wetland rating of 1 when Purple County rated the site in 1990 (Purple County 2005a).

The Purple County soil survey identifies two soil types within the project area: Sammamish silt loam and Puget silty clay loam (USDA, SCS 1973). Sammamish silt loam is a somewhat poorly drained soil that formed in alluvium in stream valleys. It occurs in higher undulations or swells and natural levees along streams, in this case, Issaquah Creek. The soil profile has a very dark grayish-brown surface layer underlain by a dark grayish-brown subsoil frequently with redoximorphic features present. Inclusions of up to 5 percent Puget and up to 10 percent Bellingham soil types can be found in Sammamish silt loam. Sammamish silt loam is listed as a hydric soil (USDA, NRCS 2005).

Puget silty clay loam is a poorly drained soil that formed in alluvium in small depressions of the river valleys in the region. It is widely distributed throughout the larger stream valleys and is usually found in nearly round or elongated tracks that range in size from three to 110 acres. The soil profile is predominantly a dark grayish-brown and grayish-brown silty clay loam to a depth of about 45 inches with redoximorphic features present. This soil can include areas of up to 10 percent Woodinville and Snohomish soils. Puget silty clay loam is classified as a hydric soil (USDA, NRCS 2005).

The wetland mitigation site is located in the Issaquah Creek subbasin of the Cedar-Sammamish watershed (Water Resource Inventory Area [WRIA] 8; Purple County 2005b). The mitigation site is bordered on the north and east by Issaquah Creek; an unnamed tributary to Issaquah Creek (WRIA 08-0178a) bisects the proposed mitigation site (Figure 2). Issaquah Creek flows from steep headwaters in the southern part of the basin into Lake Sammamish at the northern edge of the basin. Lake Sammamish is located approximately 0.3 miles north of the mitigation site. The proposed mitigation for this site consists of approximately 2.7 acres of wetland creation and upland and riparian buffer enhancement. The proposed wetland creation will tie into existing wetlands on the site.

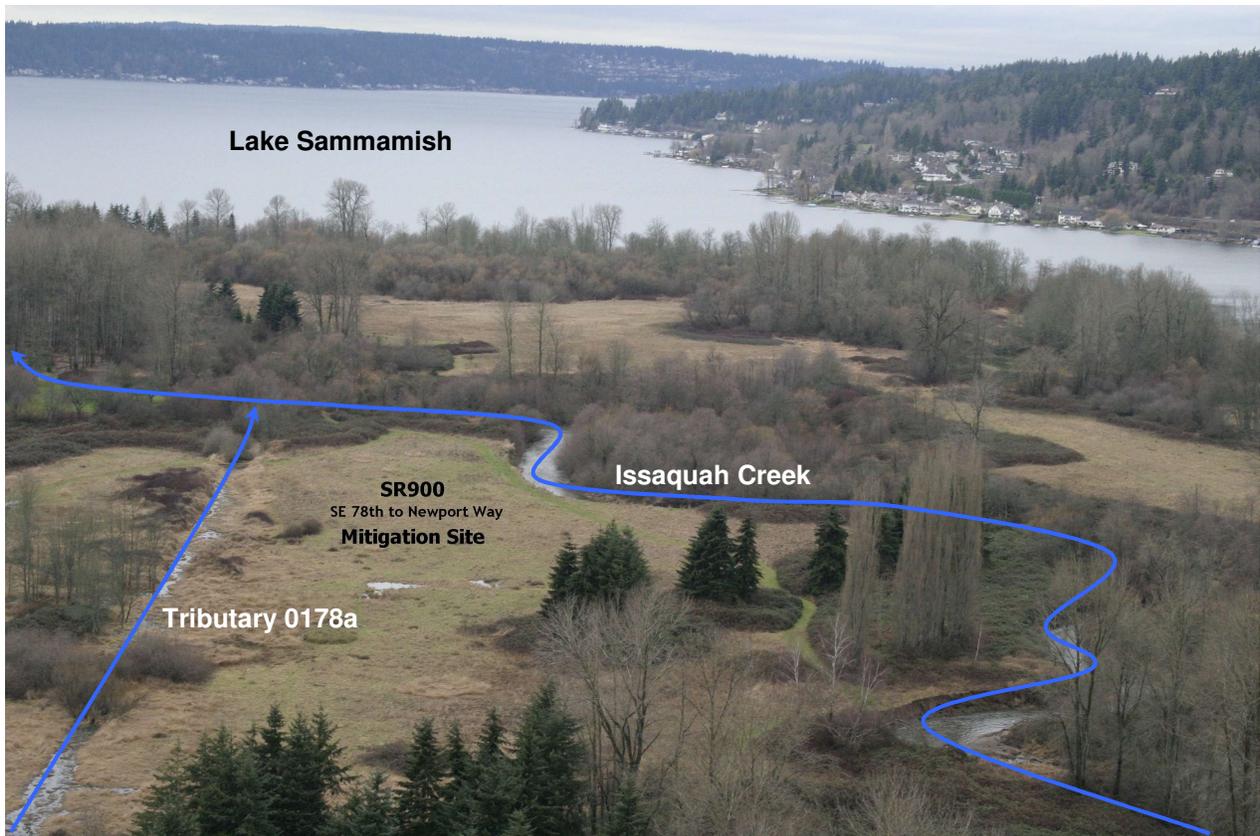


Figure 2. Proposed wetland mitigation site. Photo taken February 3, 2004 facing northeast.

Mitigation Site Setting

The wetland mitigation site is located in the 100-year floodplain of Issaquah Creek in Lake Sammamish State Park. Lake Sammamish State Park encompasses approximately 512 acres at the south end of Lake Sammamish. The Park is primarily developed as a day-use facility that includes swimming beaches, picnic shelters, and soccer and baseball fields. A large portion of the Park is undeveloped and includes meadows, extensive wetlands, lakeshore areas, and Issaquah, Tibbetts, and Laughing Jacobs Creek. Human activities have altered the natural resources in the Park and the watershed. Before the Park was created, humans cleared and farmed the area, draining wetlands and channelizing creeks (see Tributary 08-0178a in Figure 2). Wetland mitigation efforts at this location will serve multiple functions in the increasingly urbanizing area near the City of Issaquah.

Stream Conditions

Issaquah Creek Tributary 0178a

Tributary 0111a is an excavated, trapezoidal ditch that drains into Issaquah Creek near river mile (RM) 0.5. It bisects the proposed wetland mitigation site in Lake Sammamish State Park (Figures 2 and 3). Flows appear to originate at or near the stormwater ponds associated with the Pickering Place development just south of Lake Sammamish State Park. From there, the stream flows northwest through a deep, excavated channel under SE XXth Street. The stream

frequently floods during storm events and appears to receive most of its flow from stormwater. Channel substrate is dominated by fines and sands. Under the Purple County Critical Area Ordinance (CAO; KCC Chapter 21A.24), biologists recommend a Type F rating for Tributary 0178a with a corresponding 165 foot buffer.

Issaquah Creek

The proposed wetland mitigation site is immediately adjacent to Issaquah Creek (WRIA 08-0178). The mainstem of Issaquah Creek is approximately 17 miles long and originates on the steep slopes of Tiger Mountain. From its origins, Issaquah Creek flows southwest to RM 12.5, where it turns north and flows through Cedar Grove, south of Squak Mountain. It enters the narrow valley formed by Squak Mountain and Tiger Mountain at RM 7.0 and continues flowing north to RM 2.0 where it enters the broad alluvial floodplain at the south end of Lake Sammamish and crosses under I-90, eventually flowing into Lake Sammamish. Under the Purple County CAO, Issaquah Creek is rated as a Type S stream with a corresponding 165 foot buffer.

Wetland Conditions

We delineated two wetlands within the study area on October X and X, 200X. Routine wetland data, Ecology rating, and functional assessment forms that document our observations are attached to this memorandum. The Plan Sheet with the wetland boundaries and associated buffers is also attached.

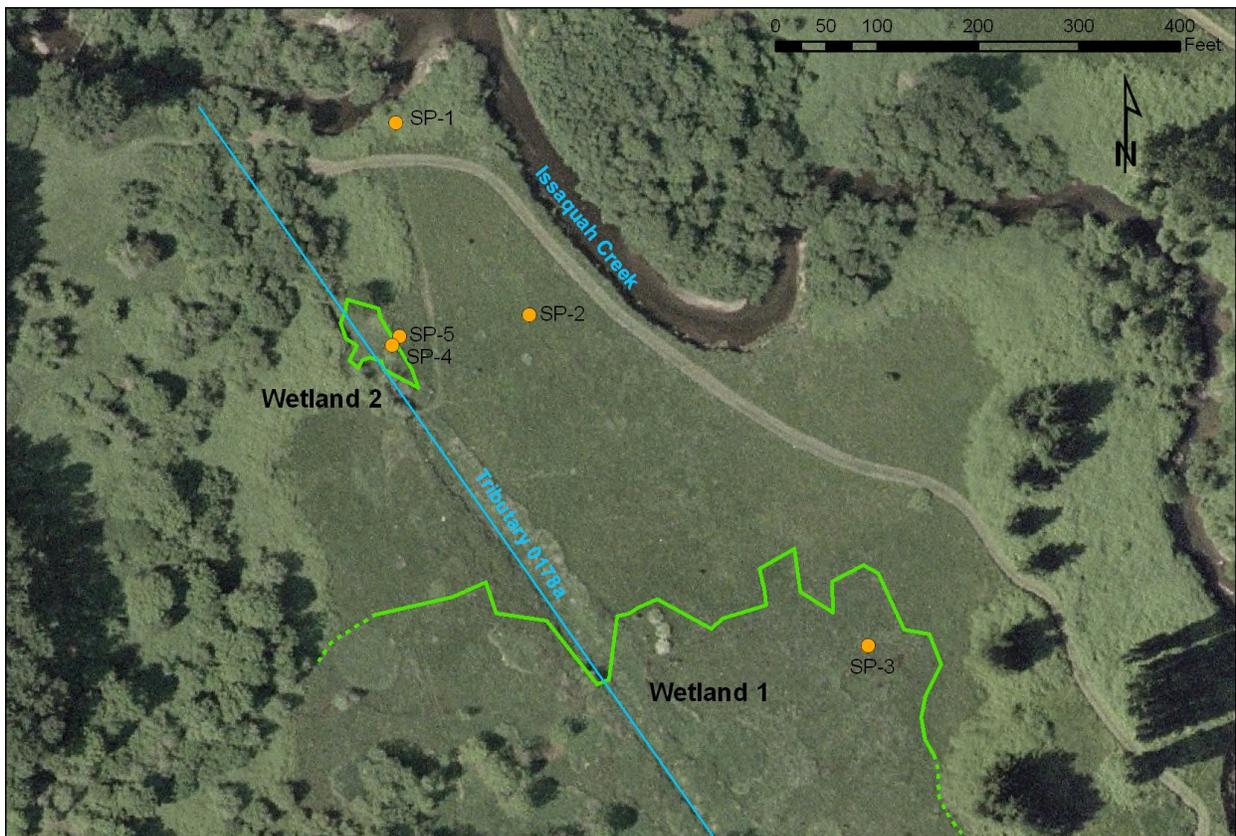


Figure 3. Approximate boundaries of wetlands in project area.

Wetland 1

PEM

Purple County Category III (Habitat score = 22; 125 foot buffer)

Ecology Category III

Wetland 1 is approximately 5 acres in size and is located in the large open field south of Issaquah Creek. It extends west across a mowed walking trail and the ditch (Tributary 0178a; Figure 3 and Plan Sheet). Wetland 1 continues south and west, but this area was not delineated as it is outside the proposed project limits. Wetland 1 is a low-lying area covered by dense herbaceous vegetation. A shrub dominated area surrounds each side of the ditch.

Wetland 1 is dominated by common velvetgrass (*Holcus lanatus*), soft rush (*Juncus effusus*), and field horsetail (*Equisetum arvense*), and has trace amounts of common timothy (*Phleum pratense*) (Figure 4a). The upland area north and west of Wetland 1 and closer to Issaquah Creek is dominated by cleavers (*Galium aparine*), Canada thistle (*Cirsium arvense*), reed canarygrass (*Phalaris arundinacea*), field horsetail, and redtop (*Agrostis gigantea*) (Figure 4b).

The wetland soil pit, examined to a 16-inch depth, exhibited hydric conditions. The surface layer was a very dark grayish brown (10YR 3/2) silt loam in the top four inches. This silt loam with the same matrix color continues to 12 inches, but with a mix of dark yellowish brown (10YR 4/6) and strong brown (7.5YR 4/6) redoximorphic features. A dark grayish brown (2.5Y 4/2) silty clay loam matrix with the strong brown redoximorphic features continues from 12 to 16 inches. A matrix chroma of 2 with redoximorphic features is a positive indicator of wetland soil. The soil pit was dry, but was examined at the height of the growing season. We assume the hydrology criteria to be met earlier in the growing season. Figure 2 taken in February 200X shows standing water in the wetland. Wetland hydrology is primarily supported by a high groundwater table.



Figure 4a (left) and 4b (right). Facing east on walking trail. Figure 4a shows typical vegetation in Wetland 1 and 4b shows typical upland vegetation.

Wetland 2

PEM

Purple County Category III (Habitat score < 20; 75 foot buffer)

Ecology Category III

Wetland 2 is a small wetland approximately 3000 square feet in size. It is located on either side of Tributary 0178a in the northwest corner of the proposed mitigation area (Figure 3 and Plan Sheet). It is a low-lying densely vegetated wetland associated with the ditch.

Wetland 2 is dominated by reed canarygrass (Figure 5). This reed canarygrass continues in the upland areas around Wetland 2, but is co-dominated by a dense community of Himalayan blackberry (*Rubus armeniacus*).

The soil pit in Wetland 2 was examined to a 16-inch depth and exhibited hydric conditions. A very dark grayish brown (10YR 3/2) mucky silt loam matrix with strong brown (7.5YR 5/8) redoximorphic features predominated below the fibric duff to 10 inches. Below 10 inches, the matrix was a gleyed very dark bluish gray (10B 3/1) silt loam with organics. Soils were damp but not saturated, however they were examined in August at the height of the growing season. Hydrology is presumed to be present earlier in the growing season. Groundwater is the principle water source for Wetland 2, although Tributary 0178a also contributes water to this wetland.



Figure 5. Wetland 2. Photo taken facing northwest. Ditch is approximately 10 feet to the left of this photo.

Wetland Functions

Both Wetland 1 and 2 are classified as depressional wetlands. Depressional wetlands can be closed on all sides, forming a depressional wetland with no outlet, or open on at least one side, forming a depression with an outlet, like the wetlands in the project area. In general, depressional wetland attributes include groundwater seepage, precipitation, or surface water inflow from a river or stream as the principal water source, the movement of surface and shallow subsurface water from at least three directions toward the lowest elevation in the depression, and closed topographic contours on at least three sides. The principal water source for Wetlands 1 and 2 appear to be groundwater. Tributary 0178a drains both wetlands.

These wetlands provide many of the functions listed on the Functions and Values Form. Although they do have the potential to provide flood flow alteration and some erosion control to the ditch, and to remove sediment, nutrients, and toxicants, these functions have low opportunity because of the location of these wetlands at the base of the watershed. The most important functions of Wetlands 1 and 2 include habitat suitability, as well as habitat for aquatic invertebrates and amphibians. They do not provide suitable habitat for wetland-associated mammals or birds, as there is no permanent open water component. Tributary 0178a has an intermittent surface water connection to Issaquah Creek and has the potential to provide off-channel refuge for fish during high flows. Wetland 1 also has native plant richness as it has two Cowardin classes and is not dominated by invasive species. Wetland 2 is a much smaller wetland that is dominated by the invasive species reed canarygrass. The location of these wetlands in a State Park also lends itself to having educational and/or scientific value.

Please call me if you have questions regarding these findings.

csc

encls: References
Plan Sheet
Routine Wetland Data Forms
Wetland Functions and Values Forms
Ecology Rating Forms

REFERENCES

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