TALASAEA
CONSULTANTS, INC.

14 January 2019 TAL-1129B

Ms. Nicole Gaudette
Senior Planner
City of Mercer Island Development Services Group
9611 SE 36th Street
Mercer Island, Washington 98040

REFERENCE: Review Comments for File No. CAO17-010 – Hou Critical Areas Determination 4825 E Mercer Way, Mercer Island, WA 98040; King County Tax Parcel #216200-0070
SUBJECT: Response to City of Mercer Island Comments dated 15 October 2018

Dear Nicole:

In response to your comments regarding the *Critical Areas Report* for the Hou Property dated 15 October 2018, we are providing the following comments. As is typical with our procedure for response letter, we will be providing your comments verbatim in **bold** text. Our responses will follow each comment in *italic* text.

1. **Please submit a revised Critical Area Report and Mitigation Plan that incorporates a 5-year monitoring period and associated standards for Years 1 through 5 to comply with MICC 19.07.**

   Response: The Critical Areas Report has been revised to reflect a 5-year monitoring period with performance standards, as requested.

2. **Pursuant to MICC 19.07.080(C)(2), buffer widths can only be reduced if the reduced area is adequate to protect wetland functions and the reduction will result in no net loss. Amy [*sic*] harm to the trees may result in net loss due to the habitat benefits currently provided by the trees. Please ask your arborist to review the proposed encroachments to the drip lines of Exceptional Trees 916 and 917 as reflected Table 1 Sumary [*sic*] of Drip Line Encroachments and provide a report stating that the proposed encroachments will not harm the trees.**

Response: Please see the attached Arborist Report, dated 11 January 2019, that should address the concerns outlined above.

We trust that you will find this information helpful for your current needs. If you have any questions or require additional information, please contact me at (425) 861-7550.

Sincerely,

TALASAEA CONSULTANTS, INC.

Jennifer Marriott, PWS
Senior Wetland Ecologist/Project Manager

Attachments: Revised Critical Areas Report, dated 14 January 2019
Revised Arborist Report, dated 11 January 2019

CRITICAL AREAS REPORT

HOU PROPERTY
MERCER ISLAND, WASHINGTON

Prepared For:

SANG HOU
Mercer Island, Washington

Prepared By:

TALASAEA CONSULTANTS, INC.
Woodinville, Washington

30 July 2007
(Revised 19 July 2017)
(Revised 15 January 2019)

Critical Areas Report

Hou Property
Mercer Island, Washington

Prepared for:

Sang Hou
7022 East Mercer Way
Mercer Island, WA 98040

Prepared by:

Talasaea Consultants, Inc.
15020 Bear Creek Road NE
Woodinville, WA 98077

30 July 2007
(Revised 19 July 2017)
(Revised 15 January 2019)

EXECUTIVE SUMMARY

SITE NAME: Hou Property

SITE LOCATION: The 0.53-acre property includes one parcel located within the City of Mercer Island, Washington. The King County tax parcel number is 2162000070. The Public Land Survey System location of the property is the NE ¼ of Section 19, Township 24N, Range 5E, Willamette Meridian.

CLIENT: Sang Hou

PROJECT STAFF: Bill Shiels, Principal; David Teesdale, Senior Wetland Ecologist; Kristen Numata, Ecologist

FIELD SURVEY: 19 October 2006, 27 March 2007, and 14 July 2017

DETERMINATION: One palustrine, scrub shrub, seasonally saturated wetland was delineated on the property. Wetland A (9,195 sf on-site), is located at the northern portion of the site. The wetland extends off-site to the north, onto an adjacent residential property. According to Mercer Island City Code (MICC), Wetland A would be classified as a Category III wetland. Category III wetlands require a standard 50-foot buffer and a minimum 25-foot buffer with enhancement. A perennial stream, Stream 1, begins off-site to the north of the property and flows onto the property near the northwest corner. According to MICC, this stream is a Type 2 Watercourse. Type 2 Watercourses require a standard 50-foot buffer and a minimum 25-foot buffer with enhancement.

HYDROLOGY: Soil within Wetland A was saturated at or near the surface during our site visits. Indications of shallow ponding (typically less than six inches) were also observed in the wetland. This wetland appears to be supported by direct precipitation and a high groundwater table, as well as by a perennial stream located to the north of the property.

SOILS: The Natural Resources Conservation Service (NRCS) has mapped the property as Kitsap silt loam, 15 to 30% slopes. Kitsap silt loam is not listed as hydric on either of the State or County hydric soil lists. Soils in the upland portions of the property generally appeared to correspond with the Kitsap series.

VEGETATION: Vegetation within Wetland A includes scrub-shrub and emergent vegetation classes. Dominant vegetation includes Devil's club, salmonberry, and slough sedge. Although the wetland is dominated by native species, English ivy is present in the wetland buffer and stream buffer areas. The on-site buffers of Wetland A and Stream 1 are vegetated with large conifers and a native shrub understory.

PROPOSED PROJECT and IMPACTS: The property owner proposes to develop the site with a single-family residence on the property. The project proposes the minimum-buffer-width-with-enhancement standard (MICC 19.07.080(C)(1)) for the on-site Category III Wetland (Wetland A), The reduction of the standard buffer width for Wetland A will be mitigated for, in accordance with MICC 19.07.070(B)(2)(b), by invasive plant removal, and the installation of native vegetation and habitat features. The project proposes no encroachment into the standard 50-foot buffer of Stream 1. A minimum of five years of performance monitoring will be provided for the mitigation areas consistent with MICC.

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CHAPTER 1. INTRODUCTION

1.1 Report Purpose

This report is the result of a critical areas study conducted on a 0.53-acre property in Mercer Island, Washington. The purpose of this report is to identify and describe critical areas on and within 75 feet of the subject property, including wetlands and streams. Information presented in this report will be utilized by the City of Mercer Island to assist in their evaluation of critical areas on the property. This plan is designed to meet the requirements for projects impacting critical areas and buffers, as stated in the Mercer Island Unified Land Development Code (Mercer Island, 2006), Title 19.

The objective of this report is to:

1) describe the critical areas identified and delineated on the site,
2) provide a summary of applicable City regulations that apply to those critical areas, and
3) describe project impacts and mitigation.

1.2 Statement of Accuracy

The critical area studies and regulatory reviews were conducted by trained professionals at Talasaea Consultants, Inc., and adhered to the protocols, guidelines, and generally accepted industry standards available at the time work was performed. The conclusions in this report are based on the results of analyses performed by Talasaea Consultants and represent our best professional judgment. To that extent, and within the limitations of project scope and budget, we believe the information provided herein is accurate and true to the best of our knowledge. Talasaea Consultants does not warrant any assumptions or conclusions not expressly made in this report, or based on information or analyses other than what is included herein.

CHAPTER 2. GENERAL PROPERTY DESCRIPTION AND LAND USE

2.1 Site Location

The property proposed for development is located within the City limits of Mercer Island (**Figure 1**) and includes one parcel: #2162000070. This parcel, hereinafter referred to as the "property", is located in the 4800 block of East Mercer Way off the private drive known as East Mercer Highlands. The Public Land Survey System location of the property is the NE ¼ of Section 19, Township 24N, Range 5E, Willamette Meridian.

2.2 Site Description

The property is currently undeveloped and contains many large deciduous and coniferous trees. The property slopes down from the southwest to the northeast with the westernmost portions of the property defined as steep according to Mercer Island City Code (MICC) 19.16.

CHAPTER 3. METHODOLOGY

The critical areas analysis of the Site involved a two-part effort. The first part consisted of a preliminary assessment of the Site and the immediate surrounding area using existing published environmental information. This information includes:

1) Wetland and soils information from resource agencies;
2) Critical Areas information from the City of Mercer Island and King County;
3) Orthophotography imagery;
4) LIDAR terrain data; and

5) Relevant studies completed or ongoing in the vicinity of the Site.

The second part consisted of site investigations where direct observations and measurements of existing environmental conditions were made. Observations included plant communities, soils, hydrology, and riparian conditions. This information was used to help characterize the existing conditions at the site and to define the limits of critical areas for regulatory purposes (see **Section 3.2 - Field Investigation** below).

3.1 Background Data Reviewed

Background information was reviewed prior to field investigations and included the following:

- U.S. Fish and Wildlife Service (USFWS), National Wetland Inventory (NWI), Wetlands Online Mapper (http://wetlandsfws.er.usgs.gov/wtlnds/launch.html);
- Natural Resources Conservation Service (NRCS), Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/);
- NRCS, National Hydric Soils List by State (http://soils.usda.gov/use/hydric/lists/state.html);
- King County GIS Database (King County, 2017);
- Pacific States Marine Fisheries Commission (PSMFC) StreamNet (www.streamnet.org);
- SalmonScape database, 2017 (www.wdfw.wa.gov/mapping/salmonscape/databases);
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) Database on the Web (2017) (http://wdfw.wa.gov/mapping/phs/);
- USGS EarthExplorer; and Google Earth.

3.2 Field Investigation

An evaluation of the property was initially completed in 2006 and 2007, and was re-evaluated on 14 July 2017.

The original wetland delineation utilized the 1997 *Washington State Wetland Identification and Delineation Manual.* Subsequent site evaluations used the routine methodology described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* (U.S. Army Corps of Engineers, 2010). The wetland boundaries were marked in the field with wire flags or by surveyor's tape on vegetation. Wetlands were classified according to MICC 19.07.080, and wetlands were rated according to the Washington State Department of Ecology Wetland Rating System for Western Washington (Hruby 2004).

Plant species were identified according to the taxonomy of Hitchcock and Cronquist (Hitchcock, *et al.* 1969). Taxonomic names were updated and plant wetland status was assigned according to North American Digital Flora: National Wetland Plant List, Version 2.4.0 (Lichvar, *et al.* 2012). Wetland classes were determined with the U.S. Fish and Wildlife Service's system of wetland classification (Cowardin, *et al.* 1979). Vegetation was considered hydrophytic if greater than 50% of the dominant plant species had a wetland indicator status of facultative or wetter (i.e., facultative, facultative wetland, or obligate wetland).

Wetland hydrology was determined based on the presence of hydrologic indicators listed in the Corps regional supplement. These indicators are separated into Primary Indicators and Secondary Indicators. To confirm the presence of wetland hydrology, one Primary Indicator or two Secondary Indicators must be demonstrated. Indicators of wetland hydrology may include, but are not necessarily limited to: drainage patterns, drift lines, sediment deposition,

watermarks, stream gauge data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation.

Soils on the site were considered hydric if one or more of the hydric soil indicators listed in the Corps Regional Supplement are present. Indicators include presence of organic soils, reduced, depleted, or gleyed soils, or redoximorphic features in association with reduced soils.

Wetland data forms were prepared for selected test plots at representative locations in both the uplands and wetlands along the wetland boundary (**Appendix A**). These data forms document the vegetation, soils, and hydrology information that aided in the wetland boundary determination of Wetland A. A wetland rating form documenting Wetland A's overall functions and subsequent categorical determination was completed in accordance with MICC 19.07.080 and is attached in **Appendix B**.

CHAPTER 4. RESULTS

This section describes the results of background research and field investigation.

4.1 Analysis of Existing Information

The following sources were reviewed for background information based on data compiled from resource agencies and local government.

4.1.1 National Wetland Inventory

The National Wetlands Inventory (NWI) maps does not show any critical areas on the property (**Figure 2**). One riverine intermittent streambed, seasonally flooded (R4SBC) is mapped just south of the Site.

4.1.2 Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) has mapped the property as Kitsap silt loam, 15 to 30% slopes (**Figure 3**). Soils in the upland portions of the property generally appeared to correspond with the Kitsap series. Kitsap silt loam is not listed as hydric on either of the State or County hydric soil lists.

4.1.3 WDFW Priority Habitats and Species Databases

The WDFW Priority Habitats and Species database identifies Bald Eagle (*Haliaeetus leucocephalus*) breeding areas as both points and areas.

4.1.4 SalmonScape and StreamNet

No streams were mapped on SalmonScape or StreamNet databases.

4.2 Analysis of Existing Conditions

One wetland and one watercourse were delineated on the subject property (**Appendix D, Sheet W1.0**). A wildlife habitat conservation area, consisting of one Douglas fir tree known to have an active bald eagle nest at one time, was identified on the property prior to our site visit.

4.2.1 Wetland A

Wetland A (9,195 sf on-site) is a palustrine scrub shrub seasonally saturated wetland (Cowardin, *et al, 1979*). This wetland is located on the northern portion of the site, and continues off-site to the northwest. Vegetation within Wetland A includes scrub-shrub and emergent vegetation classes. Dominant vegetation includes Devil's club *(Oplopanax horridum)*, salmonberry (*Rubus spectabilis*), and slough sedge (*Carex obnupta*). Though the wetland is

dominated by native species, English ivy (*Hedera helix*) is growing on the trees in the wetland and surrounding buffer. The on-site buffers of Wetland A are vegetated with large conifers and a native shrub understory. Large woody debris is prevalent throughout the wetland buffer.

Soil within Wetland A was predominantly a black (10YR 2/1) muck. Soil within the wetland was saturated at or near the surface during our site visit, which occurred in late fall. Indications of shallow ponding (typically less than 6 inches) were also observed in parts of Wetland A. This wetland appears to primarily be supported by direct precipitation and a high groundwater table.

According to MICC 19.07.080, and the wetland rating per the DOE methodology for wetland rating, Wetland A would be classified as a Category III wetland. Category III wetlands require a standard 50-foot buffer. A 25-foot minimum buffer is allowed with enhancement when determined that impacts will be mitigated consistent with MICC 19.07.070(B)(3), and the proposal will result in no net loss of wetland and buffer functions.

4.2.2 Stream 1

Stream 1 is located on the northeastern portion of the property. According to MICC 19.07.070, Stream 1 would be classified as a Type 2 stream, a watercourse with year-round flow, not used by fish. Type 2 watercourses require a standard 50-foot buffer.

4.2.3 Wildlife Habitat Conservation Area

One large diameter Douglas fir wildlife tree is located near the eastern property boundary. This tree is identified as “Nest #3” by WDFW and requires a 20 foot protection zone. The last verified activity in this tree was in 2005. During site visits in 2006 and 2017, eagle activity was not observed. WDFW Certified Wildlife Biologist Bill Vogel conducted a site visit to the Property on 30 June 2017 and confirmed there was no nest in the largest tree or any surrounding trees. His correspondence with the applicant, as well as a Bald Eagle Management Plan previously prepared by WDFW (2007), is provided in **Appendix C.** This tree has since been confirmed again to lack any evidence of usage by bald eagles. It is understood that lack of current use or evidence of recent usage does not preclude the future use of this tree by eagles. This tree will be protected through the standard tree ordinance for Mercer Island.

CHAPTER 5. PROPOSED PROJECT AND MITIGATION

5.1 Project Description

The Client proposes to develop this property as a single-family residence with an associated driveway (**Appendix D, Sheet W1.1**).

5.2 Impacts to Critical Areas

Any proposed impacts to on-site critical areas result from imposing the standard critical area sequencing procedure: Avoidance, minimization, and compensation. Avoiding impacts to Wetland A and Stream 1 significantly influenced the design of the site plan. The proposed development is located in the southeastern portion of the property, thereby avoiding permanent impacts to Wetland A, Stream 1, and the wildlife tree. The project proposes minimizing potential development-related impacts to the wetland and stream buffers by incorporating site-specific best-management practices into the site plan, stormwater management plan, and mitigation plan. Compensation for impacts proposed to the wetland and stream buffers will integrate best available science, Mercer Island City Code, and an approved mitigation plan.

The existing site plan proposes reducing the standard buffer width for Wetland A. The standard buffer width for Wetland A would be reduced to the allowable minimum buffer width for a short

segment with enhancement, as identified in MICC 19.07.080(C). No impacts to the Stream 1 buffer are proposed.

In the area of development, the wetland buffer reduction from a pre-development, approximate 50-foot buffer, to a reduced 25-foot buffer in select areas, results in the minimum impact feasible with the construction of a site-constrained driveway access (circumnavigating the tree protection zones), and house. The proposed mitigation incorporates a semi-quantitative assessment of pre- and post-construction critical area functions and values, and will provide no-net-loss of wetland and buffer functions by restoring and enhancing the site's degraded habitat. Sub-section 5.3, Proposed Mitigation and Restoration Plan, discusses measures to remove on-site dominant invasive species, install habitat features, and enhance native vegetation. These measures, in combination with an approved stormwater plan, will minimize and compensate for development-related impacts to the wetland buffer. Throughout the project site, the combination of the wetland, stream, and wildlife tree buffers preserve a significant portion of the subject property, and provide for combined increases in critical area buffers.

5.3 Wildlife Habitat Conservation

The subject parcel contains one, 80-inch diameter Douglas fir tree. This tree, located at the east end of the parcel, adjacent to the private access drive, and north of the proposed driveway, is one of four known nest trees of the Mercer Island Central bald eagle territory. The Mercer Island Central bald eagle territory was verified as active during the site assessment by WDFW in 2005, but has not since been observed as active, as documented by USFWS in 2017 and reiterated in the fall of 2018. Even though the eagle nest is gone and has not been active in 12 years, the 20-foot habitat protection zone around Tree #3 will be upheld to preserve the habitat values of the Property.

In addition to the 80" tree, a nearby 42" Douglas fir tree will also be included within the targeted tree protection guidelines, as outlined in the recently revised Arborist Report prepared by Brian Gilles, dated 11 January 2019. The driplines of these two large trees has been measured and included within site planning efforts.

CHAPTER 6. WETLAND A FUNCTIONS AND VALUES

6.1 Methodology

Wetlands and wetland buffers provide many valuable ecological and social functions, including: flood and stormwater control, base flow and groundwater support, fish and wildlife habitat, shade and temperature control, woody debris recruitment, water quality improvement, noise and visual screening, and recreation and education. The subject wetland, stream and buffer areas, located in the City of Mercer Island, Washington, were analyzed with a semi-quantitative methodology to determine impacts and mitigation potential for the proposed encroachment into the on-site wetland buffer area. The Semi-Quantitative Assessment Methodology (SAM) (Cooke, 2000) analyzes these ecological and social functions relative to the development's impact on the wetland buffer area. The semi-quantitative methodology allows analysis of pre- and post-construction wetland and buffer functions and values.

6.2 Evaluation

Wetland A includes scrub-shrub and emergent vegetation classes. The dominant vegetation includes Devil's club *(Oplopanax horridum)*, salmonberry (*Rubus spectabilis*), and slough sedge (*Carex obnupta*). Though the wetland is characterized with a diversity of native species, the invasive English ivy (*Hedera helix*) dominates trees in the wetland and surrounding buffer. The buffer of Wetland A, which includes the area to be impacted by the proposed development, is vegetated with large conifers, a native shrub understory, and invasive English ivy. Wetland A was classified in its landscape context for the purpose of the semi-quantitative analysis; it is less than 5 acres, located in the highly developed Lake Washington/Cedar River Watershed, with a greater than 60% wetland loss, is small in comparison to other wetlands documented by the National Wetlands Inventory (NWI) within the drainage basin, and possesses a significantly disturbed buffer resulting from adjacent roads and residential development. The following table, **Table 1,** summarizes the subject wetland's pre- and post-construction functional value assessment.

Table 1. Wetland A Functions and Values Assessment

Function	Existing Conditions (pre-construction)	Restored/Enhanced Buffer Area (post-construction)
Flood/ Stormwater Control	**Moderate**: The subject wetland and buffer area are sloped and do not provide significant detention capabilities. The wetland is located in the middle 1/3 of the overall drainage basin and drains to the on-site stream, an unconstrained outlet. The wetland buffer area is primarily vegetated with scrub-shrub vegetation and a degraded forested class dominated by invasive *Hedera helix*.	**Moderate:** The sloped wetland buffer area will not be impacted by the proposed development. Stormwater resulting from the development is proposed to be diverted to the City stormwater system, resulting in a net decrease of stormwater to the wetland system. The buffer area will be planted with conifers, increasing potential for flood and stormwater control.
Water Quality Improvement	**Moderate**: The slope of the wetland area and adjacent unconstrained stream outlet provide generally rapid flow through the site. Water is detained and seasonally ponded within the center of the wetland area, as evidenced by organic mucky soils. The upland buffer and wetland areas consist of moderate native vegetation cover, dominated by invasive English ivy. The basin upstream of the wetland area, and upstream of the surrounding steep slopes, is highly developed. The areas directly to the north, south, and east of the wetland area are developed. Any pre-existing wetland areas to the north and east of the on-site stream have been developed.	**Moderate**: The existing wetland area and slope will remain undisturbed. A small area of the wetland buffer will be impacted by the development. The remaining buffer will be planted with native conifers to stabilize soils, specifically in areas of invasive ivy removal. This will provide for increased on-site water detention and reduced water flow through.
Natural Biological Support	**Moderate**: The site wetland and buffer provide moderate natural biological support. The wetland is well connected to vegetated buffers, although significant portions of the buffer to the north and east have been degraded as the result of development. There is moderate plant diversity, impacted by a high amount of invasive species. The wetland and buffer area contain some significant habitat features, moderate organic accumulation, seasonal surface water, and partial connection to upland habitats.	**Moderate/High**: Conifers and shrubs will be planted in the mitigation area to increase plant diversity, provide stream shading, and improve overall water quality. The removal of the highly invasive English ivy throughout site will increase overall native plant health through the reduction of invasive species.

Habitat Functions	**Moderate**: A few small snags are present in the buffer. There is one large wildlife tree located on the site. There is one small, non-fish bearing stream meandering along the northern boundary of the site; the stream flows under the road at the northeast corner of the site.	**Moderate/High**: The wildlife tree will be protected with a buffer consistent with the Department of Fish and Wildlife recommendation. Large woody debris will be placed in the stream buffer to increase habitat function. Invasive English ivy will be removed from existing conifers to increase diversity and conifer health. Newly planted and restored conifers will provide for future large woody debris recruitment.
Cultural/ Socio-economic	**Low:** The site provides this residential neighborhood with an undeveloped stream, wetland, and buffer area. The site is privately owned and lacks available passive and active recreational opportunities. It has aesthetic value to the community.	**Low/Moderate:** The development of this site, with the inclusion of the City of Mercer Island public review process, will be an educational opportunity for the neighborhood, potentially increasing awareness of critical areas, and the development process.

6.3 Summary of Wetland Buffer Functions

An evaluation of the functions and values for Wetland A and its buffer was conducted to provide a semi-quantitative analysis. This assessment confirms that the proposed project and mitigation (buffer enhancement and restoration) will increase the functional values of the wetland and associated stream. Five functions, including Flood and Stormwater Control, Water Quality Improvement, Natural Biological Support, Habitat Functions, and Cultural and Socioeconomic value were given a value of low, moderate, or high. The existing functional values are summarized in **Table 1**.

The existing functions of Wetland A and its buffer are moderate for the majority of functions and low for cultural/socioeconomic value. Buffer enhancement, including the addition of conifer trees and native shrubs within the remaining and restored buffer of Wetland A, removal of highly invasive English ivy throughout the entire site, protection of existing habitat features, and installation of new habitat features would increase values for all functions. With the proposed buffer enhancement, concept functions and values will be improved to protect and benefit the on-site stream, Wetland A, and associated buffers.

CHAPTER 7. PROPOSED MITIGATION PLAN

The proposed monitoring plan for Wetland A buffer reduction will involve buffer enhancement and will follow the guidelines set forth in MICC 19.07. The enhanced buffer will be removed of invasive species and planted with conifers. Large woody debris features will be added throughout the outer buffer to aid in habitat features.

7.1 Proposed Mitigation and Restoration Plan

Mitigation for reducing the standard buffer width for Wetland A will include:

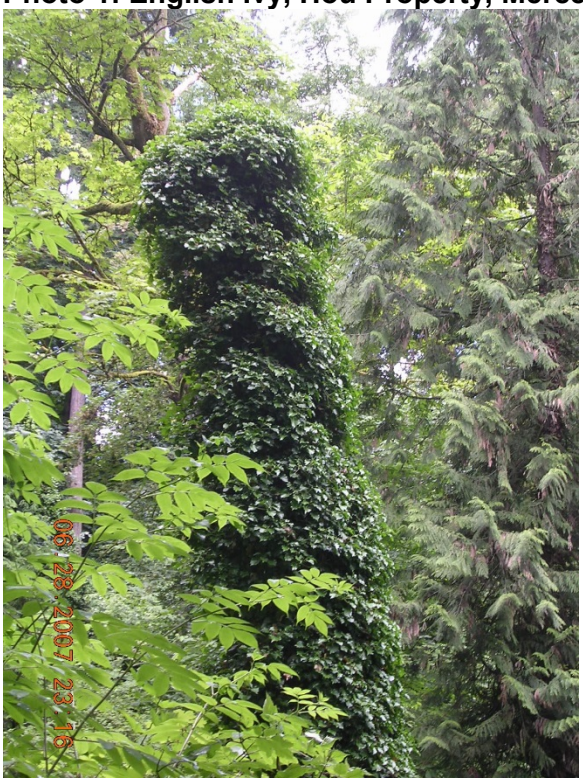
1) English Ivy removal,
2) Placement of large woody debris (taken from one, on-site, decomposing large-diameter snag removed during construction) in the wetland and stream buffer areas,
3) Planting of 21 conifer trees in the enhanced buffer areas (greater than a 1:1 replacement ratio for conifers removed during construction of the house and driveway),

4) Vegetative enhancement of reduced wetland buffer areas; and
5) Addition of 776 SF of non-compensatory critical area buffer.

7.1.1 English Ivy Removal

The invasive English ivy (*Hedera helix*) is classified as a Class C Noxious Weed of Concern in King County. Removal of on-site English ivy will be achieved through manual control. Manual control consists of cutting/prying accessible vines off trees, removing all accessible flowers and seed heads, hand pulling/digging out plants, and mulching areas of ivy removal with an 8" thick mulch layer. Mulching will only occur on areas not located on steep slopes. The following photo (**Photo 1**), dated 28 June 2007, is representative of the on-site invasive species conditions.

Photo 1: English Ivy, Hou Property, Mercer Island, Washington



7.1.2 Large Woody Debris Enhancement

During construction, there will be some removal of large woody debris from the building site, consistent with approved conditions of the bald eagle management plan. There is one, on-site, decomposing snag that will be removed during construction. This snag is ideal large woody debris for mitigation in the wetland and wetland and stream buffer areas. Large woody debris provides many small animals with food and shelter, creates microclimates and microhabitats, and eventually incorporates into the soil, enhancing organic content and productivity. The snag will be cut into appropriate lengths and placed in areas of partial shade, located parallel to site contours.

7.1.3 Vegetation Enhancement

Vegetation enhancement within the Wetland A and the Stream 1 buffers will take place in conjunction with invasive species removal. The remaining critical area buffers will be enhanced with additional native conifers and shrubs to increase stream shading, species diversity, and

result in the required net improvement of critical area functions. The project proposes planting the following species: vine maple, sword fern, Douglas fir, baldhip rose, salmonberry, and western red cedar (**Sheet 1.2**). 21 replacement conifer trees (minimum 6-feet high at time of planting), will be established in the buffer areas at a 1:1 ratio for conifer trees removed during construction of the house and driveway. More smaller trees are being proposed for the enhancement (and tree replacement) plantings because we have found smaller trees establish within mature forest settings better than larger plant materials. Therefore, 21 smaller conifers are currently proposed rather than the previously proposed (7) larger conifers. Post-construction, a set of as-built plans depicting plant types and locations will accompany a compliance report submitted to the City.

7.2 Mitigation Goals, Objectives, and Performance Standards

The mitigation will be evaluated through the following objectives and performance standards. Mitigation monitoring will be performed by a qualified wetland biologist or ecologist.

Goals: The primary goal of the mitigation plan is to replace the functions and values lost through permanently reducing a segment of the Wetland A buffer from 50' to 25'. Mitigation will be achieved by enhancing 11,366 sf of wetland/stream buffer and restoring all disturbed areas.

Objective 1: Plant 21 conifer trees in the wetland and stream buffers.
Performance Standard 1: One year after establishment of conifer tree mitigation plantings, survival shall be 100%. Any trees that do not survive shall be replaced per the contractor's plant guarantee. For the remaining four years of the monitoring period, conifer tree survival shall be 80%.

Objective 2: Remove and control invasive English ivy to less than 10 percent cover within Wetland A and its buffer.
Performance Standard 2: One year after establishment of mitigation plantings, the percent cover of invasive English ivy within Wetland A and its buffer area will be visually estimated, recorded, and included in the performance monitoring report. The percent cover of English ivy shall not exceed 10% of the wetland and buffer areas at any time during the five-year performance monitoring period.

Objective 3: Increase habitat functions provided by Wetland A by incorporating large woody debris into the mitigation areas.
Performance Standard 3: Following construction, the wetland and stream buffer will contain large woody debris habitat features. The specific locations of the large woody debris will be provided on the as-built mitigation plans submitted to the City of Mercer Island post-construction. A description of the establishment of habitat features will be recorded and included in the performance monitoring reports.

CHAPTER 8. CONSTRUCTION SEQUENCING

8.1 Mitigation Construction Sequencing

The following provides the general sequence of activities anticipated to be necessary to complete this mitigation project. Some of these activities may be conducted concurrently as the project progresses.

1. Conduct a site meeting between the Contractor, Talasaea Consultants, and the Owner's Representative to review the mitigation project plans.

2. Flag woody material for future use as habitat features.
3. Install silt fencing and other erosion control BMPs for water quality protection.
4. Clear and grub invasive species.
5. Place habitat features.
6. Place topsoil and mulch in restored buffer areas.
7. Complete site cleanup and install plant materials.

8.2 Post-Construction Approval

Following construction completion Talasaea Consultants shall also notify the City in writing when the planting is completed for a final site inspection and subsequent final construction approval.

8.3 Post-Construction Baseline Assessment

Once construction is approved by the City, a qualified wetland ecologist from Talasaea Consultants shall conduct a post-construction assessment. The purpose of this assessment will be to establish baseline conditions at Year 0 of the required monitoring period. A Baseline Assessment report, including "as-built" drawings, will be submitted to the City. The as-built plan set will identify and describe any changes in planting or other features in relation to the original approved plan.

CHAPTER 9. MONITORING PLAN

9.1 Monitoring Schedule

Performance monitoring will be completed annually during the fall for the required five years as determined by the City of Mercer Island. **Table 2** below presents the schedule of maintenance, monitoring, and report submissions.

Table 2: Proposed Monitoring Schedule

Year	Date	Maintenance Review	Performance Monitoring	Report Due to City
0	Fall	X	BA*	X
1	Fall	X	X	X
2	Fall	X	X	X
3	Fall	X	X	X
4	Fall	X	X	X
5	Fall	X	X	X**

* Baseline Assessment
**Obtain final approval to facilitate bond release from City of Mercer Island (presumes performance criteria are met).

9.2 Monitoring Reports

Each monitoring report will adhere to the requirements of MICC and will also utilize the Corps document titled *Annual Monitoring Report Format Requirements* (USACE Regulatory Guidance Letter No. 08-03, OCT 2008). The reports will include: 1) Project Overview, 2) Requirements, 3) Summary Data, 4) Maps and Plans, and 5) Conclusions. If the performance criteria are met, monitoring for the City will cease at the end of year three, unless objectives are met at an earlier date and the City accepts the mitigation project as successfully completed.

9.3 Monitoring Methods

The following monitoring methods will be used to evaluate the approved performance standards.

9.3.1 Methods for Monitoring Vegetation Establishment

Vegetation monitoring methods may include counts; photo-points; random sampling; sampling plots, quadrats, or transects; stem density; visual inspection; and/or other methods deemed appropriate by the City of Bellevue. Vegetation monitoring components shall include general appearance, health, mortality, colonization rates, percent cover, percent survival, volunteer plant species, and invasive weed cover.

Permanent vegetation sampling plots, quadrats, and/or transects will be established at selected locations to adequately sample and represent all of the plant communities within the mitigation project areas. The number, exact size, and location of transects, sampling plots, and quadrats will be determined at the time of the baseline assessment.

The established vegetation sampling locations will be monitored and compared to the baseline data during each performance monitoring event to aid in determining the success of plant establishment. Percent survival of shrubs and trees will be evaluated in a 10-foot-wide strip along each established transect. The species and location of all shrubs and trees within this area will be recorded at the time of the baseline assessment, and will be evaluated during each monitoring event to determine percent survival.

9.4 Photo Documentation

Locations will be established within the mitigation area from which panoramic photographs will be taken throughout the monitoring period. These photographs will document general appearance and relative changes within the plant community. Review of the photos over time will provide a semi-quantitative representation of success of the planting plan. Vegetation sampling transect/plot/quadrat and photo-point locations will be shown on a map and submitted with the baseline assessment report and yearly performance monitoring reports.

9.5 Wildlife

Birds, mammals, reptiles, amphibians, and invertebrates observed in the wetland and buffer areas (either by direct or indirect means) will be identified and recorded during scheduled monitoring events, and at any other times observations are made. Direct observations include actual sightings, while indirect observations include tracks, scat, nests, song, or other indicative signs. The kinds and locations of the habitat with greatest use by each species will be noted, as will any breeding or nesting activities.

9.6 Water Quality

Water quality will be assessed qualitatively, unless it is evident there is a serious problem. In such an event, water quality samples will be taken and analyzed in a laboratory for suspected parameters. Qualitative assessments of water quality include:

- oil sheen or other surface films,
- abnormal color or odor of water,
- stressed or dead vegetation or aquatic fauna,
- turbidity, and
- absence of aquatic fauna.

9.7 Site Stability

Observations will be made of the general stability of slopes and soils in the mitigation areas during each monitoring event. Any erosion of soils or slumping of slopes will be recorded and corrective measures will be taken.

CHAPTER 10. MAINTENANCE AND CONTINGENCY

Regular maintenance reviews will be performed according to schedule presented in **Table 2** to address any conditions that could jeopardize the success of the mitigation project. Following maintenance reviews by the biologist or ecologist, required maintenance on the site will be implemented within ten (10) business days of submission of a maintenance memo to the maintenance contractor and permittee.

Established performance standards for the project will be compared to the yearly monitoring results to judge the success of the mitigation. If, during the course of the monitoring period, there appears to be a significant problem with achieving the performance standards, the permittee shall work with the City to develop a Contingency Plan in order to get the project back into compliance with the performance standards. Contingency plans can include, but are not limited to, the following actions*:* additional plant installation, erosion control, modifications to hydrology, and plant substitutions of type, size, quantity, and/or location. If required, a Contingency Plan shall be submitted to City by December 31st of any year when deficiencies are discovered.

The following list includes examples of maintenance (M) and contingency (C) actions that may be implemented during the course of the monitoring period. This list is not intended to be exhaustive, and other actions may be implemented as deemed necessary.

- During year one, replace all dead woody plant material (M).
- Water all plantings at a rate of 1" of water every week between June 15 – October 15 during the first two years after installation, and for the first two years after any replacement plantings (C & M).
- Replace dead plants with the same species or a substitute species that meets the goals and objectives of the mitigation plan, subject to Talasaea and City approval (C).
- Re-plant area after reason for failure has been identified (e.g., moisture regime, poor plant stock, disease, shade/sun conditions, wildlife damage, etc.) (C).
- After consulting with City staff, minor excavations, if deemed to be more beneficial to the existing conditions than currently exists, will be made to correct surface drainage patterns (C).
- Remove/control weedy or exotic invasive plants (e.g., Scot's broom, reed canarygrass, Himalayan blackberry, purple loosestrife, Japanese knotweed, etc.) by manual or chemical means approved by the City. Use of herbicides or pesticides within the mitigation area would only be implemented if other measures failed or were considered unlikely to be successful, and would require prior City approval. All non-native vegetation must be removed and disposed of off-site. (C & M).
- Weed all trees and shrubs to the dripline and provide 3-inch deep mulch rings 24 inches in diameter for shrubs and 36 inches in diameter for trees (M).
- Remove trash and other debris from the mitigation areas twice a year (M).
- Selectively prune woody plants at the direction of Talasaea Consultants to meet the mitigation plan's goal and objectives (e.g., thinning and removal of dead or diseased portions of trees/shrubs) (M).
- Repair or replace damaged structures including weirs, signs, fences, or bird boxes (M).

10.1 Performance Monitoring/Maintenance Bond

A performance bond or other surety device will be posted with the City of Mercer Island by the property owner to cover 100% of the cost of labor, materials, maintenance, and monitoring (**Appendix E**). The bond or assignment may be released in partial amounts at the sole discretion of the City of Mercer Island in proportion to work successfully completed over the three year monitoring period, as the applicant demonstrates performance and corrective measures.

CHAPTER 11. SUMMARY

A critical areas study was conducted on a 0.53-acre property in Mercer Island, Washington. One wetland, one watercourse, and one wildlife habitat conservation area (wildlife tree) have been identified and delineated on the property. Wetland A is a Category III wetland, requiring a standard 50-foot buffer, or a minimum 25-foot buffer with enhancement. Stream 1 is a Type 2 watercourse, requiring a standard 50-foot buffer. The property owner proposes to develop one single-family residential structure with an associated driveway.

The development has been designed to avoid permanent impacts to Wetland A, Stream 1, and critical area buffers. The proposed impact to Wetland A, a reduction of a short segment of the standard buffer width to the “minimum-buffer-width-with-enhancement” standard, is consistent with MICC 19.07.080(C), and will be mitigated for through invasive plant removal, installation of habitat features, and vegetation enhancement.

The proposed mitigation will compensate for unavoidable, development impacts through invasive plant removal, placement of large woody debris in the wetland and buffer areas, replacement plantings of conifers in the enhanced buffer area, and enhancement plantings in the stream buffer replacement area. This mitigation, as shown in the assessments of critical area functions and values, will enhance and protect the ecological health of the stream, wetland, and significant wildlife ecosystems.

The proposed mitigation will be monitored for a period of not less than five years to ensure successful establishment of the mitigation plantings. Monitoring methods will follow the approved monitoring plan, and will measure the established performance standards. Regular maintenance of the mitigation areas will be provided to help ensure performance standards are met. If the performance standards are not being met at any point during the monitoring period, corrective contingency measures will be implemented.

CHAPTER 12. REFERENCES

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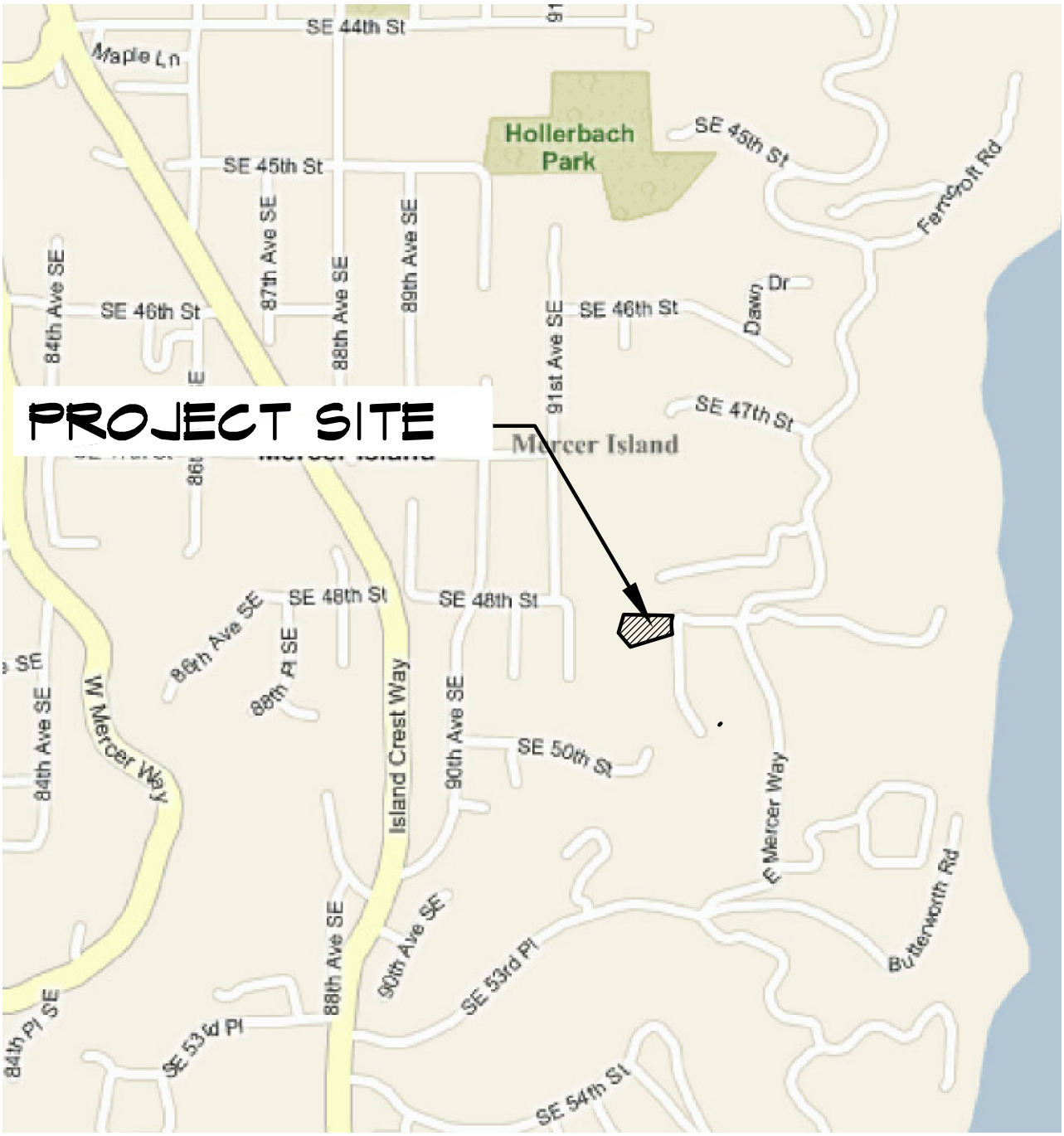
FIGURES



NORTH

SOURCE: MSN MAPS ON LINE: http://maps.live.com

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast
Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE #1

VICINITY MAP
SKALL PROPERTY
MERCER ISLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
CC	CC	1129

SCALE: NTS

DATE: 03-23-07

REVISED

1

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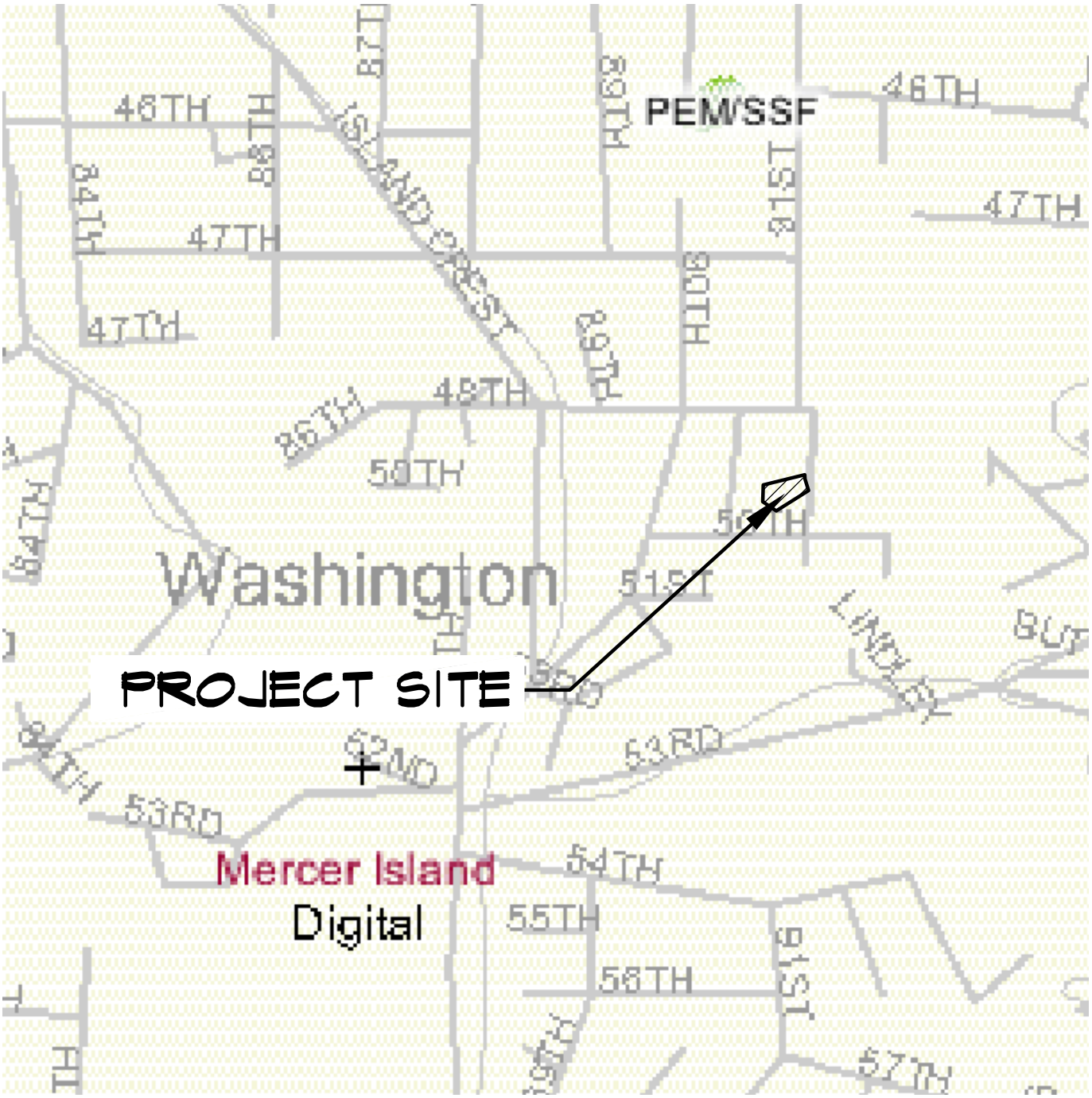

NORTH

SOURCE: U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE, NATIONAL WETLANDS INVENTORY MAP, http://wetlandsfws.er.usgs.gov/NWI

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
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Woodinville, Washington 98077
Bus (425)861-7550 - Fax (425)861-7549

FIGURE #2

NATIONAL WETLANDS INVENTORY MAP
SKALL PROPERTY
MERCER ISLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
CC	CC	1129

SCALE: NTS

DATE: 03-23-07

REVISED

2

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NORTH

LEGEND

KpD KITSAP SILT LOAM, 15 TO 30 PERCENT SLOPES

SOURCE: U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE, KING COUNTY AREA SOIL SURVEY, 1973.

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FIGURE #3

NRCS SOILS MAP
SKALL PROPERTY
MERCER ISLAND, WASHINGTON

DESIGN	DRAWN	PROJECT
CC	CC	1129

SCALE: NTS

DATE: 03-23-07

REVISED

3

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APPENDIX A

Wetland Delineation Data Sheets

(Talasaea, 2017)

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	4821 East Mercer Way, Mercer Island, WA	Date:	10/19/06
Applicant/Owner:	Jeff Skall	County:	King
Investigators:	C. Christy (Transcribed to data form by E. Schau)	State:	WA
Do normal circumstances exist on the site?		Community ID:	
Is the site significantly disturbed (Atypical Situation?)		Transect ID:	
Is the area a potential Problem Area (If needed, explain on reverse)?		Plot ID:	Test Plot 1

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
Athyrium filix-femina (Lady Fern)	H		FAC				
Oplopanax horridum (Devil's Club)	S		FAC+				
Equisetum (horsetail)	H		FAC				

* Dominant Percent of dominant species that are OBL, FACW, or FAC

Criterion Met? Yes | Rationale/Remarks:

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☒ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☐ Technical literature
- ☐ Physiological/reproductive adaptations
- ☒ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water 0 inches
Depth to free water
Depth to saturated soil 0 inches

Is it the growing season? ☒ Yes ☐ No
Based on: ☐ Soil temp (record temp)
☒ Other (explain): October

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☒ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☐ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met? | Rationale/Remarks:

SOILS

Map unit name Kitsap silt loam
(Series and phase)
Taxonomy (subgroup)

Drainage class
Field Observations confirm mapped type? Soils in upland portions of site generally conform to mapped soils.

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
	10 YR 2/1			Muck

Hydric Soil Indicators:

- ☒ Histosol
- ☐ Histic epipedon
- ☒ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low chroma (=1) matrix
- ☐ Matrix chroma [2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? | Rationale/Remarks:

WETLAND DETERMINATION

Wetland vegetation present? **Yes** Wetland hydrology present? **Yes** Hydric soils present? **Yes**	Remarks:	Is this sampling point within a wetland? **Yes**

ROUTINE WETLAND DETERMINATION DATA FORM 1 *(Revised)*

Project/Site:	4821 East Mercer Way, Mercer Island, WA	Date:	10/19/06
Applicant/Owner:	Jeff Skall	County:	King
Investigators:	C. Christy (Transcribed to data form by E. Schau)	State:	WA
Do normal circumstances exist on the site? Yes		Community ID:	
Is the site significantly disturbed (Atypical Situation?) No		Transect ID:	
Is the area a potential Problem Area (If needed, explain on reverse)? No		Plot ID:	Test Plot 2

VEGETATION

Plant species	Stratum	% Cover	Indicator Status	Plant species	Stratum	% Cover	Indicator Status
Tsuga heterophylla (Western hemlock)	Tree		FACU				
Thuja plicata (Western red cedar)	Tree		FAC				
Hedera helix (Climbing ivy)	Vine		invasive				

* Dominant Percent of dominant species that are OBL, FACW, or FAC

Criterion Met? No	Rationale/Remarks:

Check all Hydrophytic Vegetation Indicators that apply and explain:

- ☐ Plant growing in areas of prolonged inundation/saturation
- ☐ Morphological adaptations
- ☐ Technical literature
- ☐ Physiological/reproductive adaptations
- ☐ Wetland plant database
- ☐ Personal knowledge of regional plant communities
- ☐ Other (explain)

HYDROLOGY

Field Observations:

Depth of surface water	N/A
Depth to free water	N/A
Depth to saturated soil	N/A

Is it the growing season? ☒Yes ☐ No

Based on: ☐ Soil temp (record temp)

☒ Other (explain): October

Primary Wetland Hydrology Indicators:

- ☐ Inundated
- ☐ Saturated in upper 12in/30cm
- ☐ Water marks
- ☐ Drift lines
- ☐ Sediment deposits
- ☐ Drainage patterns in wetland

Secondary Wetland Hydrology Indicators (minimum 2 required):

- ☐ Oxidized root channels in upper 12in/30cm
- ☐ Water-stained leaves
- ☐ Local soil survey data
- ☐ FAC-neutral test
- ☐ Other

Criterion Met?	Rationale/Remarks:

SOILS

Map unit name Kitsap silt loam (Series and phase) Taxonomy (subgroup)	Drainage class Field Observations confirm mapped type? Soils in upland portions of site generally conform to mapped soils.

Profile Description: Depth	Matrix colors (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance/contrast	Texture, concretions, structure, etc
	10 YR 2/2	none		

Hydric Soil Indicators:

- ☐ Histosol
- ☐ Histic epipedon
- ☐ Sulfidic odor
- ☐ Aquic moisture regime
- ☐ Reducing conditions
- ☐ Gleyed or low chroma (=1) matrix
- ☐ Matrix chroma [2 with mottles
- ☐ Mg or FE concretions
- ☐ High organic content in surface layer in sandy soils
- ☐ Listed on National Hydric Soils List
- ☐ Other ( )

Criterion Met? **No**	Rationale/Remarks:

WETLAND DETERMINATION

Wetland vegetation present? **No** Wetland hydrology present? **No** Hydric soils present? **No**	Remarks:	Is this sampling point within a wetland? **No**

APPENDIX B

Wetland Rating Form

Talasaea, 2006

Jett Small property Creek Buffer width = 50 feet TAL 1129

Wetland name or number A Bainbridge Island Minimum = 25 feet

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Wetland A Date of site visit: 10/19/06 / 7/14/17

Rated by Caroline Christy / JMM Trained by Ecology? Yes X No ___ Date of training 10/06

SEC: 19 TWNSHP: 24 RNGE: 5 Is S/T/R in Appendix D? Yes ___ No X

Map of wetland unit: Figure ___ **Estimated size** 5,000 ft² (includes off-site portion)

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III X IV ___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for Water Quality Functions	11
Score for Hydrologic Functions	8
Score for Habitat Functions	15 18
TOTAL score for Functions	33 36

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ **Does not Apply** X

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

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

Wetland name or number A

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

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

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

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

Wetland name or number A

Classification of Wetland Units in Western Washington

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

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

NO – go to 2 **YES** – the wetland class is **Tidal Fringe**

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p.).

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

NO – go to 3 **YES** – The wetland class is **Flats**

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

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

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

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

NO – go to 4 **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

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

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

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

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

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

NO - go to 5 **YES** – The wetland class is **Slope**

Wetland name or number A

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

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

___ The overbank flooding occurs at least once every two years. NO

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

NO - go to 6 **YES** – The wetland class is **Riverine**

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

NO – go to 7 **YES** – The wetland class is **Depressional**

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

NO – go to 8 **YES** – The wetland class is **Depressional**

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

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

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

Wetland name or number A

	D Depressional and Flats Wetlands WATER QUALITY FUNCTIONS – Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
D	**D 1. Does the wetland unit have the potential to improve water quality?**	*(see p.38)*
D	D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) points = 3 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 1 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 (*If ditch is not permanently flowing treat unit as "intermittently flowing"*) Provide photo or drawing	Figure ___
D	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES points = 4 NO points = 0	
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	Figure ___
D	D1.4 Characteristics of seasonal ponding or inundation. *This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0 Map of Hydroperiods	Figure ___
D	**Total for D 1** *Add the points in the boxes above*	
D	**D 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ **YES** multiplier is **2** **NO** multiplier is **1**	*(see p. 44)* multiplier ____
D	**TOTAL - Water Quality Functions** Multiply the score from D1 by D2 ***Add score to table on p. 1***	

Wetland name or number A

	Depressional and Flats Wetlands HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	*(see p.46)*
D	D 3.1 Characteristics of surface water flows out of the wetland unit Unit is a depression with no surface water leaving it (no outlet) points = 4 Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2 Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch points = 1 *(If ditch is not permanently flowing treat unit as "intermittently flowing")* Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) points = 0	
D	D 3.2 Depth of storage during wet periods *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland" points = 5 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0	
D	D 3.3 Contribution of wetland unit to storage in the watershed *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire unit is in the FLATS class points = 5	
D	**Total for D 3** *Add the points in the boxes above*	
D	**D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?** *(see p. 49)* Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other_____ **YES** multiplier is 2 **NO** multiplier is 1	multiplier _____
D	**TOTAL - Hydrologic Functions** Multiply the score from D 3 by D 4 ***Add score to table on p. 1***	

Wetland name or number A

	Slope Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality	Points (only 1 score per box)
S	**S 1. Does the wetland unit have the potential to improve water quality?**	*(see p.64)*
S	S 1.1 Characteristics of average slope of unit: Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 (Slope is greater than 5%) steep slope points = 0	0
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* Thick muck - smells like sulfur (YES = 3 points) NO = 0 points	3
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 (Dense, woody, vegetation > ½ of area) (points = 2) Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ___ 2
S	**Total for S 1** *Add the points in the boxes above*	5
S	**S 2. Does the wetland unit have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields, logging, or orchards within 150 feet of wetland X Residential, urban areas, or golf courses are within 150 ft upslope of wetland — Other ___ (YES multiplier is 2) NO multiplier is 1	*(see p.67)* multiplier 2
S	**TOTAL - Water Quality Functions** Multiply the score from S1 by S2 ***Add score to table on p. 1***	10

Comments

The houses to the West and South of the wetland are both upslope of it

Wetland name or number A

	Slope Wetlands HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion.	Points (only 1 score per box)
	S 3. Does the wetland unit have the potential to reduce flooding and stream erosion?	*(see p.68)*
S	S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. (points = 6) Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3 Dense, uncut, **rigid** vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0	6
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. (YES points = 2) NO points = 0	2
S	*Add the points in the boxes above*	8
S	**S 4. Does the wetland have the opportunity to reduce flooding and erosion?** Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* — Wetland has surface runoff that drains to a river or stream that has flooding problems — Other _____ *(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)* **YES** multiplier is **2** (**NO** multiplier is **1**)	*(see p. 70)* multiplier 1
S	**TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4 ***Add score to table on p. 1***	8

Comments

A stream flows adjacent to the wetland, but is a very small, seasonal drainage. The lack of residential development upslope makes me believe that the stream does not have flooding problems.

100' to stream

Wetland name or number A

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat	Points (only 1 score per box)
H 1. Does the wetland unit have the potential to provide habitat for many species?	
H 1.1 Vegetation structure *(see p. 72)* *Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.* ___ Aquatic bed _X_ Emergent plants _X_ Scrub/shrub (areas where shrubs have >30% cover) ___ Forested (areas where trees have >30% cover) *If the unit has a forested class check if:* ___ The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon *Add the number of vegetation structures that qualify. If you have:* 4 structures or more points = 4 3 structures points = 2 (2 structures points = 1) 1 structure points = 0 Map of Cowardin vegetation classes	Figure ___ 1
H 1.2. Hydroperiods *(see p. 73)* *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)* ___ Permanently flooded or inundated _X_ Seasonally flooded or inundated _X_ Occasionally flooded or inundated _X_ Saturated only ___ Permanently flowing stream or river in, or adjacent to, the wetland ___ Seasonally flowing stream in, or adjacent to, the wetland – stream does not cover 10% of wetland ___ ***Lake-fringe wetland* = 2 points** ___ ***Freshwater tidal wetland* = 2 points** 4 or more types present points = 3 (3 types present points = 2) 2 types present point = 1 1 type present points = 0 Map of hydroperiods	Figure ___ 2
H 1.3. Richness of Plant Species *(see p. 75)* Count the number of plant species in the wetland that cover at least 10 ft^2. *(different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle* *List species below if you want to:* If you counted: > 19 species points = 2 (5 - 19 species points = 1) < 5 species points = 0	1

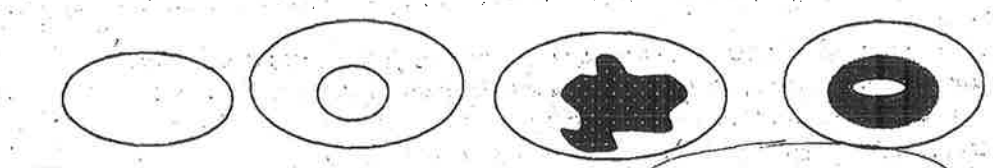
Total for page 4

Wetland name or number A

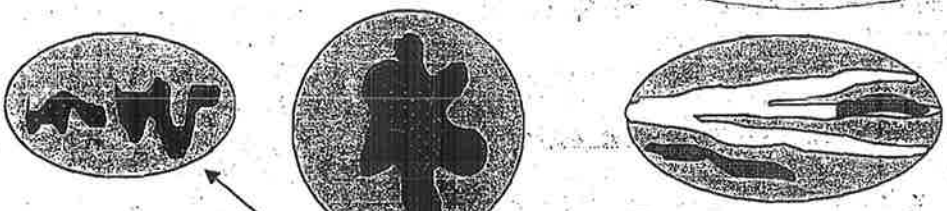
H 1.4. Interspersion of habitats *(see p. 76)*

Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.

Figure ___



None = 0 points Low = 1 point Moderate = 2 points



[riparian braided channels]

High = 3 points

NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use map of Cowardin vegetation classes

2

H 1.5. Special Habitat Features: *(see p. 77)*

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

X Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

X Standing snags (diameter at the bottom > 4 inches) in the wetland

X Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*

___ At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)*

___ Invasive plants cover less than 25% of the wetland area in each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

3

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

9

Comments

Wetland name or number A

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
H 2.1 Buffers *(see p. 80)* *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."* — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively NO undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5** — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% NO circumference. **Points = 4** — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** X No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	Figure ___ 2
H 2.2 Corridors and Connections *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*). YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2 H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = H 2.2.3 H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = **1 point** NO = **0 points**	1

Total for page 3

Wetland name or number A

H 2.3 Near or adjacent to other priority habitats listed by WDFW *(see p. 82)*

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.*

These are DFW definitions. Check with your local DFW biologist if there are any questions.

X **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

____ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

____ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.

____ **Old-growth forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age.

X **Mature forests:** Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

____ **Prairies:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

____ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

____ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages

____ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

X **Urban Natural Open Space:** A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

____ **Estuary/Estuary-like:** Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

____ **Marine/Estuarine Shorelines**: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

If wetland has **3 or more** priority habitats = **4 points**

If wetland has **2** priority habitats = **3 points**

If wetland has **1** priority habitat = **1 point**

No habitats = 0 points

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)

X

4

* Bald Eagle tree on property - near Lake WA

Wetland name or number A

H 2.4 Wetland Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 84)*** There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5 The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5 There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3 The wetland is Lake-fringe on a lake **with** disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3 There is at least 1 wetland within ½ mile. points = 2 There are no wetlands within ½ mile. points = 0	2
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1,H2.2, H2.3, H2.4*	6 9
TOTAL for H 1 from page 14	9
Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1	15 18

APPENDIX C

Bald Eagle Management Plan and Correspondence

WDFW, 2007, 2009 and 2017

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
16018 Mill Creek Blvd Mill Creek, Washington 98012 (425) 775-1311 FAX (425) 379-2323

RCW 77.12.655
WAC 232-12-292

EAGLE SITE: Mercer Island Central #1214

Applicant	Site Location	Pending
Jeffrey Skall 11218 SE 64th Street Bellevue, Washington 98006	King County Parcel 2162000070 4821 E. Mercer Highlands Drive, Mercer Island T24N R05E S19 NE of NW	Single-family residence construction

BACKGROUND/JUSTIFICATION

This parcel contains one of four known nest trees of the Mercer Island Central bald eagle territory. Nest #3 is located in a large residual 80-inch diameter Douglas fir. The nest tree is growing on a slope at the west end of the parcel adjacent to the street. The territory is relatively new, this nest only having been discovered by the Washington Department of Fish and Wildlife (WDFW) in 2001, although the nest may have been present several years before that. The territory was verified as active during the most recent survey (2005); however, nest #3 was not in use at that time. Eagle territories are generally occupied year after year, although it is not unusual for a territory to be unoccupied for one or several years at a time. Since this territory has multiple nests, the birds may switch the nest they use from year to year. The purpose of the bald eagle management plan is to maintain eagle habitat throughout known eagle territories, while allowing reasonable development of property. This is accomplished by maintaining the majority of the large conifer trees (for current perching and alternate nest sites) and a portion of smaller conifers (to replace larger trees over time) on the property.

The current proposal involves construction of a single-family residence and driveway accessing the property (Figure 1). The driveway must be constructed in such a way that there is no damage to the nest tree. A creek along the northern property boundary further complicates access to the parcel. This type III stream has a minimum 25-foot buffer setback required by the City of Mercer Island. A certified arborist from Northwest Arboriculture, LLC assessed the nest tree and supporting roots to determine a proposed driveway location with the least impact to the tree (see Appendix A). He found that most of the roots, including all major supporting roots, were on the downhill (north) side of the tree toward the creek. Therefore, he determined that the least impacting location for the driveway is on the uphill (south) side of the tree, even though this will require an excavation of up to 4 feet. In order to minimize damage to the tree, the 12-foot wide driveway shall be adjacent to the south property line, and the roadcut shall be nearly vertical, supported by retaining walls on either side. Drainage shall be directed to the south side of the driveway. The eagle tree protection zone shall be marked with construction fencing (to be retained throughout all phases of construction). No activities of any kind, including materials storage, shall occur within the eagle tree protection zone. After construction the fencing may be removed, and minimal intrusion is allowed for invasive plant removal.

The current site development plan as conditioned, may remove one significant conifer tree in the vicinity of the nest tree, although the intention is to retain the tree if an arborist evaluation deems it safe to remain. Nest tree protection conditions are included to avoid construction impacts to the nest tree itself. Mitigation for the tree removal is a required condition of this plan. Trees within the riparian protection zone and upslope on the western portion of the property will be retained. In order to encourage renesting, WDFW recommends sensitivity in timing of construction activities to limit disturbance during the most sensitive periods during the breeding season (see Appendix B). Hazard trees and dead trees may be removed (see Danger Trees, below).

FACTORS CONSIDERED

1) Landowner goals were considered through information and revisions transmitted by the landowner via telephone calls, fax, and email correspondence, through review of proposed development plans, and during a site visit on March 27, 2007. An additional site visit was made on 26 September 2005 with the arborist and developer representing the former landowner to assess the nest tree and driveway location.

2) Bald eagle habitat use was considered by analysis of territory integrity through time, current surrounding habitat conditions, current status of the bald eagle population and scientific literature concerning bald eagle habitat protection.

CONDITIONS

The following condition(s) apply to the entire parcel or lot and are intended to protect bald eagles and their habitat. This Agreement is project and owner specific; any further development or change in ownership will require an additional Bald Eagle Management Plan.

1. **Retain all conifer trees ≥20 inches diameter at breast height (d.b.h.) on the property, EXCEPT that one >32 inch Douglas fir may be removed from the building site. No other conifer trees ≥ 20 inches d.b.h. located on the parcel may be cut or sustain damage resulting in a mortality.**

2. **No more than 10% of the conifer trees < 20 inches d.b.h., located outside of the building envelope and driveway footprint as shown in Figure 1, may be cut or killed on the property. This provision is intended to allow for flexibility in the construction, although the current landowner goal is to retain native trees outside of the building envelope.**

3. **Driveway construction shall not cause damage to tree roots in the eagle tree protection zone, and should be constructed as far from the wildlife tree as possible. To avoid soil compaction near the eagle nest tree a protection zone is to be established per Condition 4. Any excavation adjacent to this area must be done under the supervision of a certified arborist to ensure that there is no damage that will weaken or result in the decline of the wildlife tree. Drainage from site construction on the property, including the driveway, shall be directed away from the eagle tree protection zone.**

4. **An eagle tree protection zone shall be established to protect the critical root zone of the wildlife tree within a radius of 20 feet from the bole (trunk) of the nest tree, as shown in Figure 1. This zone shall be enclosed by durable, high-visibility construction fencing before the start of any construction, and shall remain in place until all construction is completed. No entry of any kind may take place within the eagle tree protection zone during construction, including materials storage. The placement of the construction fencing must be verified by City of Mercer Island or WDFW prior to commencing any work.**

5. **The eagle tree protection zone shall remain in native vegetation, with no landscaping, no irrigation, and no maintenance other than the removal of non-native plants (ivy) and the planting of native plants (e.g. salal and sword fern), if desired. Outside the eagle tree protection zone, landscaping may occur as desired, although native plants are encouraged.**

6. **Mitigation is required for removal of the >32 inch Douglas fir adjacent to the building envelope. No fewer than two Douglas fir or grand fir trees shall be planted and maintained on the property. The conifers shall be at least 2 feet tall at time of planting. They must be planted at least 10 feet from the house or other structures, and at least 10 feet from any other conifer tree. The trees must be maintained with summer watering for at least 2 summers. The landowner shall replace mitigation tree mortalities that occur within ten years of planting.**

7. **Windowing and low limbing of trees is acceptable provided no more than 30% of the live crown is removed, EXCEPT that no trimming of the nest tree is permitted. Limiting other live branch removal to < 25% is recommended. Topping of trees is not allowed.**

8. **There are no mandatory timing restrictions on construction activities. However, in light of the close proximity of the nest tree to the proposed activity, sensitivity in timing of construction is encouraged to minimize disturbance of nesting eagles. Eagles are more subject to disturbance during the early phase of nesting (February - April) and are less likely to abandon once they have begun incubating by mid April. Refer to Appendix B for disturbance avoidance recommendations.**

DURATION OF PROTECTION

This Plan applies to the landowner who signs the Plan. Since eagles return to the same traditional use areas each year, the conditions of this Plan shall apply indefinitely, unless a breeding territory has been unoccupied for 5 consecutive years. Please contact the Washington Department of Fish and Wildlife (WDFW) if the eagles change the location of their nest. Do not assume that the conditions of this Plan no longer apply.

REVIEW AND AMENDMENT

This Plan will be subject to the following review and amendment procedures. The Plan may be reviewed periodically by WDFW and the landowner to determine whether: 1) the Plan requires amendment in response to changing eagle and landowner circumstances; or, 2) the terms of the Plan comply with applicable laws and regulations; or, 3) the parties to the Plan are complying with its terms.

DANGER TREES

Except for a tree that presents imminent danger to the safety or property of individuals, a report from a certified arborist, indicating the health of the tree and the need to remove the tree, shall be submitted to WDFW prior to cutting the danger tree.

APPEAL PROCEDURE

In addition to the provisions of WAC 232-12-292 (7.1)-(7.3), the landowner may request a formal appeal of WDFW actions according to the Administrative Procedures Act, Chapter 34.05 RCW, and the Model Rules of Procedure, Chapter 10.08 WAC. Such a request shall be filed with the Department within 20 days of receipt of the contested WDFW decision. The appeal request shall clearly state the relief sought and the grounds for the appeal.

COMPLIANCE

Failure to comply with this Plan constitutes a misdemeanor as set forth in RCW 77.15.130. However, compliance with this plan does not ensure compliance with the Endangered Species Act or other federal, state or local laws. This Plan applies only to the proposed land use listed above. Any other proposals may be subject to a different set of conditions. It is the landowner's responsibility to notify the WDFW of any newly proposed land use activities.

If the Plan is acceptable, sign and return for WDFW signature.

WDFW Approval	**Landowner Approval**
_____	_____
William Ritchie (date) Threatened and Endangered Species Biologist	Landowner or Agent (circle one) (date)
_____	_____
Bob Everitt (date) Regional Manager	Landowner or Agent, print name _____ _____ _____ Landowner or Agent, Address

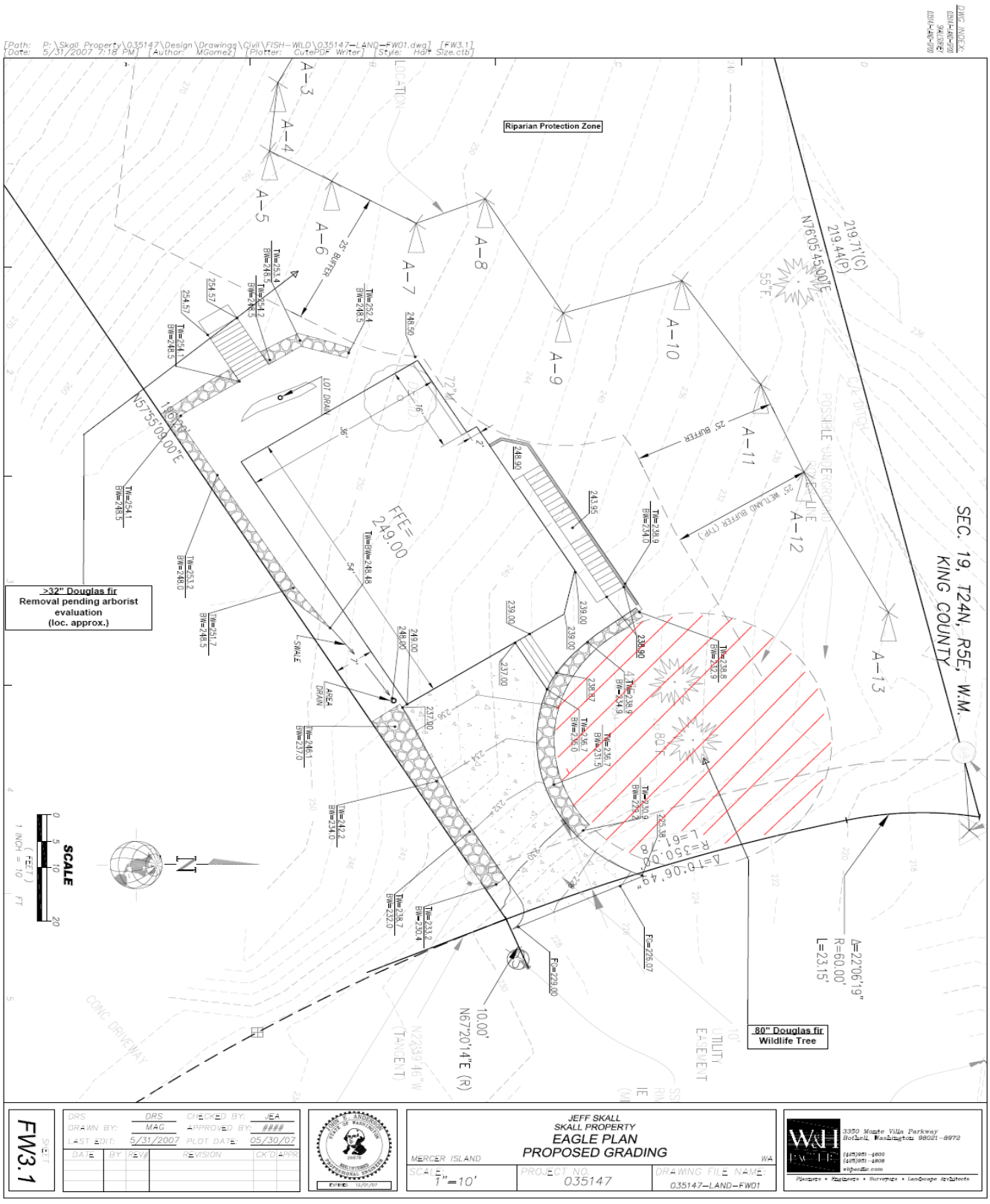


Figure 1. Topographic survey and site development plan for Skall residence construction at 4821East Mercer Highlands Drive, Mercer Island, WA (TPN 2162000070) indicating wildlife tree (80" fir w/ eagle nest). One conifer tree (>32" fir) west of house may be removed pending arborist evaluation. The eagle tree protection zone includes an area within a 20-foot radius measured from the bole of the wildlife tree (hatched area).

APPENDIX A.

Northwest Arboriculture LLC
Contractor No. CCBMEX NORTHAL972CR
19818 34th Dr SE. Bothell, WA 98012
(425) 806-6945

July 27, 2005

Jim Forman
15625 Ne 99th Way
Redmond, WA 98052

SUBJECT: ARBORICULTURAL ANALYSIS AND RECOMMENDATIONS OF TREES AND SHRUBS ON THE CUSTOMER PROPERTY

Dear Mr. Forman,

On July 20 2005, we walked your property on Mercer Island. We discussed the condition of the trees and shrubs, what care they need, and what options you have available to best manage those plants and trees located around the wildlife tree. Given the location of the tree it is my recommendation that a drive be installed on the uphill side along the property line. It would be clear of the critical root zone. The other large fir that is in the critical root zone should be left in tacked as well as the large leaf maple and other native vegetation. Site address is 4821 East Mercer Way.

To evaluate your trees and shrubs and to prepare this report, I drew upon my education and 16 years of experience in the fields of horticulture and arboriculture. Also, I followed the protocol of the International Society of Arboriculture for Hazard Tree Assessment while looking at the overall health of the trees and the site conditions. This is a scientifically based process to look at the entire site, the surrounding land and the soil, as well as a complete look at the trees themselves. In examining each tree, I looked at such factors as: size, vigor, crown ratio and class, density of needles, injury, insect activity, root damage and root collar health, crown health, evidence of disease causing bacteria, fungi or virus, dead wood and hanging limbs. While no one can predict with absolute certainty which trees will or will not fail, we can, buy using this scientific process, assess which trees are most likely to fail and take appropriate actions to minimize injury and damage.

The good news for you is that the majority of the trees and plants around the wildlife tree on your property are in good condition. There are a few plants that need proper pruning to bring them back into health. Such as the ivy removed from the trunk of the second Doug fir and installing a protective fence around the critical root zone.

Northwest Arboriculture LLC
Contractor No. CCBMEX NORTHAL972CR
19818 34th Dr SE. Bothell, WA 98012
(425) 806-6945

PHOTO JOURNALING:
I also recommend that you take an active part in managing the trees in the area in question by creating a photo history of the trees. Take pictures of all the trees; especially take pictures of the tops of each tree (the crown). A photo history of the trees will aid in future decision-making. Date and indicate the spots from which you took the photos. Create a process in which you take photos from the same spots every year. Decline in vigor will show up as you compare the annual photos with such indicators as: dying, thinning, or broken out crowns, excessive numbers of dead or broken branches, excessive needle/leaf loss.

Call me every two years to take a brief look at the trees. Combined with your photo history of the trees, we will be able to monitor the health of the trees and react to any serious changes in health and vigor.

SUMMARY:
These recommendations can be summarized as:

- The following trees will require a perimeter fence around the drip line of the trees. This fence should consist of 3-foot orange protection fencing common in construction work. This will preserve 85-to-95% of the root crown.
- The drive on the up hill side will need to have a drainage system, so the surface water from the new drive will not impact the wild life tree.
- An arborist needs to monitor the trees during construction and after, for two growing seasons.

WAIVER OF LIABILITY:
There are many conditions affecting a tree's health and stability which may be present and cannot be ascertained, such as, root rot, previous or unexposed construction damage, internal cracks, stem rot and more which may be hidden. Changes in circumstances and conditions can also cause a rapid deterioration of a tree's health and stability. While I have used every reasonable means to examine these trees, this evaluation represents my opinion of the tree health at this point in time. These findings do not guarantee future safety nor are they predictions of future events.

Thank you for considering us for you're arboricultural needs. I hope this report answers your questions. Please call me if I can provide more information or be of further service.

Sincerely,

Patrick See
ISA Certified Arborist
#PN-1463

APPENDIX B.

Thank you for your inquiry about bald eagle nesting and your interest in planning construction activities to minimize disturbance of a nearby eagle nest. The Washington Department of Fish and Wildlife (WDFW) no longer applies mandatory timing limitations on activities adjacent to eagle nests, but does encourage sensitivity in the timing of activities that have the potential to disturb or disrupt breeding and nesting.

A bald eagle management plan is required under the Bald Eagle Protection Act, WAC 232-12-292, whenever an activity has the potential to negatively impact a bald eagle nest site or communal roost site. Bald eagle management plans are site-specific and are made between the landowner and WDFW. We emphasize that these are site-specific plans, but in many cases a standard plan can be prepared for construction of single-family homes. The basic provisions include retaining all conifer trees that are $\geq$ 24 inch diameter at breast height (dbh: measured at 4'6" height), keeping all cottonwoods $\geq$ 20 dbh, and keeping at least 50% of the smaller trees. There are no mandatory timing restrictions. However, where a nest tree is very close (within 400 feet) to the proposed building site, we encourage sensitivity in timing of activities, if at all possible. Eagles are more subject to disturbance during the early phase of nesting (February - April) and are less likely to abandon once they have begun incubating.

WDFW biologists met on Dec 4, 2001 to discuss bald eagle management plan provisions in light of the continuing success of bald eagle recovery, and the pending status and rule changes. At that meeting it was determined that timing restrictions will no longer be required for building activities in the vicinity of bald eagle nests. This is in recognition of the overall success of the bald eagle population in Washington State, and of the goal of managing for the population as a whole, rather than the year-to-year success of individual pairs. We have had opportunities to observe the effect of disturbance on some nests, generally where nests have not been known to WDFW before the disturbance, and in a few cases where disturbance has occurred in violation of a management plan. We have found that in certain cases nest failure occurred, but in other cases eagles have successfully fledged young in spite of disturbance. Eagles are long-lived birds that have strong fidelity to their nesting site, and will return to renest even after failure in a given year. Therefore, we now feel that it is justified to permit the potential disturbance created by building activities, although we still protect nest and perch trees and other aspects of bald eagle habitat.

However, in light of the close proximity of the nest tree to the proposed activity, we would encourage sensitivity in timing if at all possible. While timing restrictions are no longer required, landowners are advised to consider delaying construction until after the most sensitive time periods during their breeding season. Eagles are most sensitive to disturbance 01 February - 15 April. Eagles are establishing territories and beginning incubation at this time. The chicks typically hatch in mid to late April. Once the chicks have hatched, the adults are less likely to abandon as a result of disturbance. The chicks are able to thermoregulate and feed themselves by late April to early May, so they are more readily able to survive periods when the adults are off the nest due to temporary disturbance. The young typically fledge (leave the nest) in mid July. At that time, just before fledging, they are vulnerable to premature fledging, in which they can be frightened off the nest before they are able to fly. Therefore, we hope that you can take the following approximate schedule into account as much as possible when planning your project: 01 February - 01 May, more sensitive; 01 May - 01 July, less sensitive; 01 July - 15 July, more sensitive; 15 July - 31 January, least sensitive.

Please also see the WDFW website at http://wdfw.wa.gov/wlm/diversty/soc/baldeagle/ for information about bald eagles and eagle management plans.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
16018 Mill Creek Blvd Mill Creek, Washington 98012 (425) 775-1311 FAX (425) 379-2323

Mr. Jeffrey Skall
11218 SE 64th Street
Bellevue, Washington 98006

April 12 2007

Dear Mr. Skall:

Please find enclosed the site-specific bald eagle plan for your property on Mercer Island, Washington (King County TPN 2162000070). Your development plans call for construction of a single-family residence and driveway, requiring removal of one large diameter Douglas fir located in the building envelope. Based on these plans there should not be a conflict with maintaining eagle habitat in this area. Review of our data, as verified on a site visit in March 2007, indicates the eagle nest is located on the parcel.

I have prepared a plan that protects the eagle habitat and is not in conflict with your plans to construct a single-family residence. The intent of the plan is to: 1) protect current habitat, including the nest tree, by protecting all large ($\geq$ 20 inch d.b.h.) conifers, 2) ensure future habitat by protecting existing smaller conifers, and 3) provide as much screening as possible between the eagle nest and the house to minimize disturbance of the nest. The current development plans, as described, meet all of these criteria. I have imposed a condition for retention of 90% of the smaller conifers because of the proximity of the nest tree, and to retain as much potential screening of the nest as possible. This condition does not conflict with your current goals.

Please review the conditions of this plan, then sign and return it to me for final WDFW signature. You may mail the signed plan to the letterhead address, or fax it to me at: 425-338-1066. Upon receipt and approval, I will return the plan to you. Keep a copy for your files, and provide a copy to the City of Mercer Island with your permitting.

If you have any questions, please call me at (425) 379-2301, or email me at eagle4@dfw.wa.gov.

Sincerely,

William Ritchie
Threatened and Endangered Species Biologist

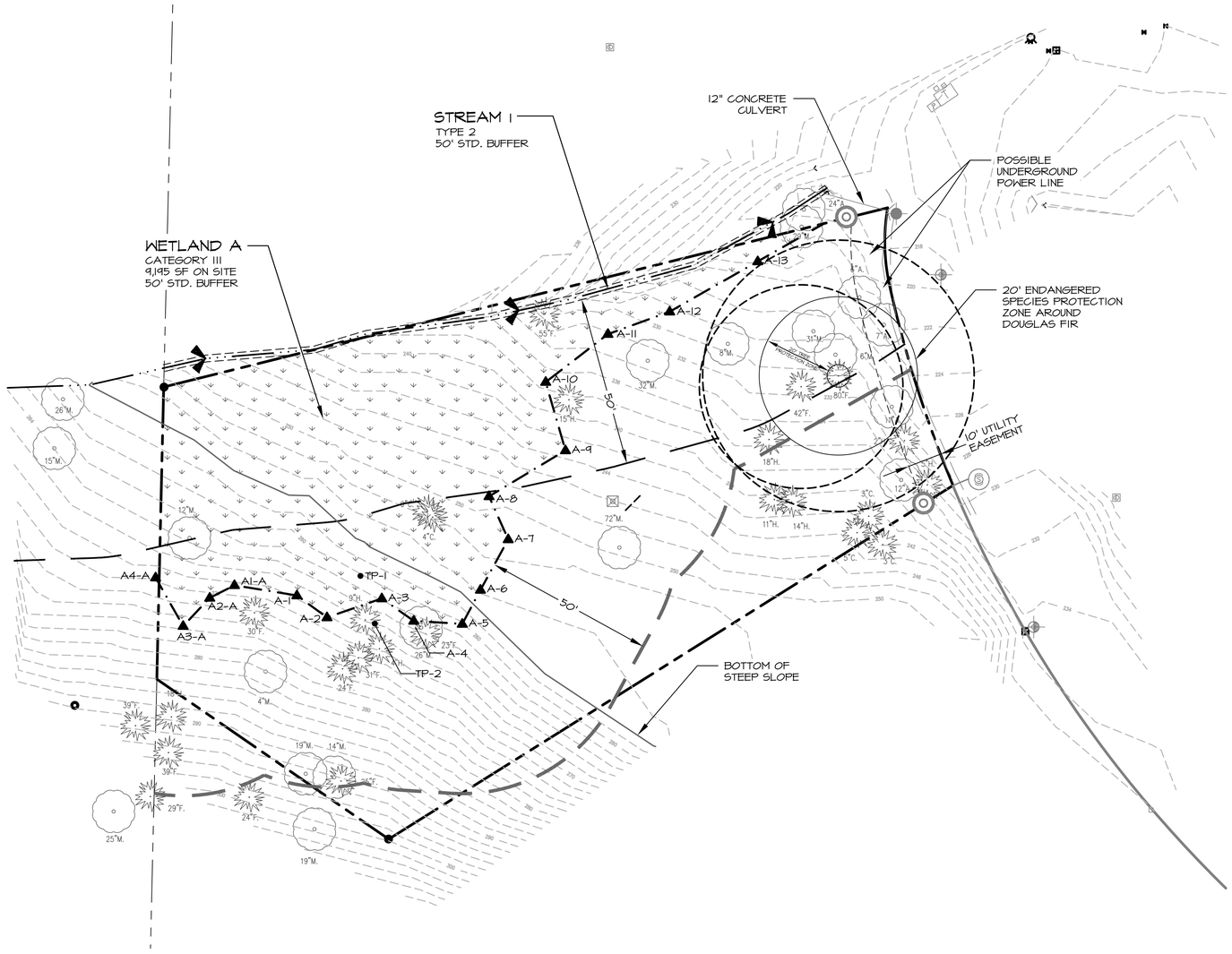
APPENDIX D

Critical Area Mitigation Plans

Talasaea Consultants, 2018

Sheet W1.0 Existing Conditions Plan
Sheet W1.1 Proposed Site Development Plan
Sheet W1.2 Planting Plan, Schedule, Notes & Details

SECTION 19, TOWNSHIP 24N, RANGE 5E, W.M.



EXISTING CONDITIONS PLAN

GRAPHIC SCALE (IN FEET)
0 10 20 40
SCALE: 1"=20'

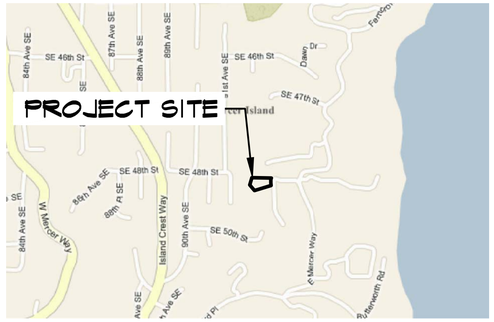
NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- WETLAND BUFFER - STANDARD
- CENTERLINE OF STREAM & FLOW DIRECTION
- APPROXIMATE OHWM
- STREAM BUFFER - STANDARD
- ▲A-# WETLAND FLAG LOCATION
- ●TP-# SOIL TEST PLOT LOCATION
- EXISTING TREES

VICINITY MAP

NTS



SOURCE: WWW.MAPQUEST.COM

NORTH

CONTACTS

APPLICANT

NAME:	SANG HOU
ADDRESS:	7022 EAST MERCER WAY MERCER ISLAND, WA 98040
PHONE:	(206) 948-7698

SURVEYOR

NAME:	ESM CONSULTING ENGINEERS
ADDRESS:	33400 8TH AVE S #205 FEDERAL WAY, WA 98003
PHONE:	(253) 838-6113
CONTACT:	

ENVIRONMENTAL CONSULTANT

NAME:	TALASAEA CONSULTANTS, INC.
ADDRESS:	15020 BEAR CREEK RD. NE WOODINVILLE, WA 98077
PHONE:	(425) 861-7550
CONTACT:	ANN M. OLSEN, RLA SENIOR PROJECT MANAGER JENNIFER MARRIOTT, PWS SENIOR WETLAND ECOLOGIST

SHEET INDEX

NOT FOR CONSTRUCTION

THESE PLANS HAVE BEEN SUBMITTED TO THE APPROPRIATE AGENCIES FOR REVIEW AND APPROVAL. UNTIL APPROVED, THESE PLANS ARE:

SUBJECT TO REVISION

811 Know what's **below.** **Call** before you dig.

NOTES

1. SURVEY PROVIDED BY ESM CONSULTING ENGINEERS, 33400 8TH AVE S #205, FEDERAL WAY, WA 98003.
2. SOURCE DRAWING WAS MODIFIED BY TALASAEA CONSULTANTS FOR VISUAL ENHANCEMENT.
3. THIS PLAN IS AN ATTACHMENT TO THE CRITICAL AREAS REPORT PREPARED BY TALASAEA CONSULTANTS IN SEPTEMBER 2018.

TALASAEA CONSULTANTS, INC.
Resource & Environmental Planning
15020 Bear Creek Road Northeast - Woodinville, Washington 98077
Bus (425) 861-7550 - Fax (425) 861-7549

CRITICAL AREAS MITIGATION PLAN
EXISTING CONDITIONS PLAN
HOU PROPERTY
MERCER ISLAND, WA

Revisions	Date	By
CITY COMMENTS	9-4-2018	KM

Date	7-27-2017
Scale	AS SHOWN
Designed	AO
Drawn	MM
Checked	OA
Approved	BS
Project #	11298
Sheet #	W1.0

SECTION 19, TOWNSHIP 24N, RANGE 5E, W.M.

PROPOSED SITE DEVELOPMENT PLAN

GRAPHIC SCALE (IN FEET)
0 10 20 40
SCALE: 1"=20'

NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- WETLAND BUFFER - STANDARD
- CENTERLINE OF STREAM & FLOW DIRECTION
- APPROXIMATE OHWM
- STREAM BUFFER - STANDARD
- PROPOSED CRITICAL AREAS BUFFER
- EXISTING TREES TO REMAIN
- EXISTING TREES TO BE REMOVED

BUFFER MITIGATION LEGEND

PROPOSED BUFFER REDUCTION (PER MICC 19.07.080.C.2.)	2,197 SF
NON-COMPENSATORY BUFFER ADDITION	776 SF
PROPOSED BUFFER ENHANCEMENT*	11,366 SF
PROPOSED BUILDABLE AREA	4,960 SF

*DURING CONSTRUCTION HEDERA HELIX WILL BE FIELD LOCATED AND REMOVED IN ENHANCEMENT AREAS. ALL INVASIVE WEEDS WILL BE DISPOSED OF OFF SITE.

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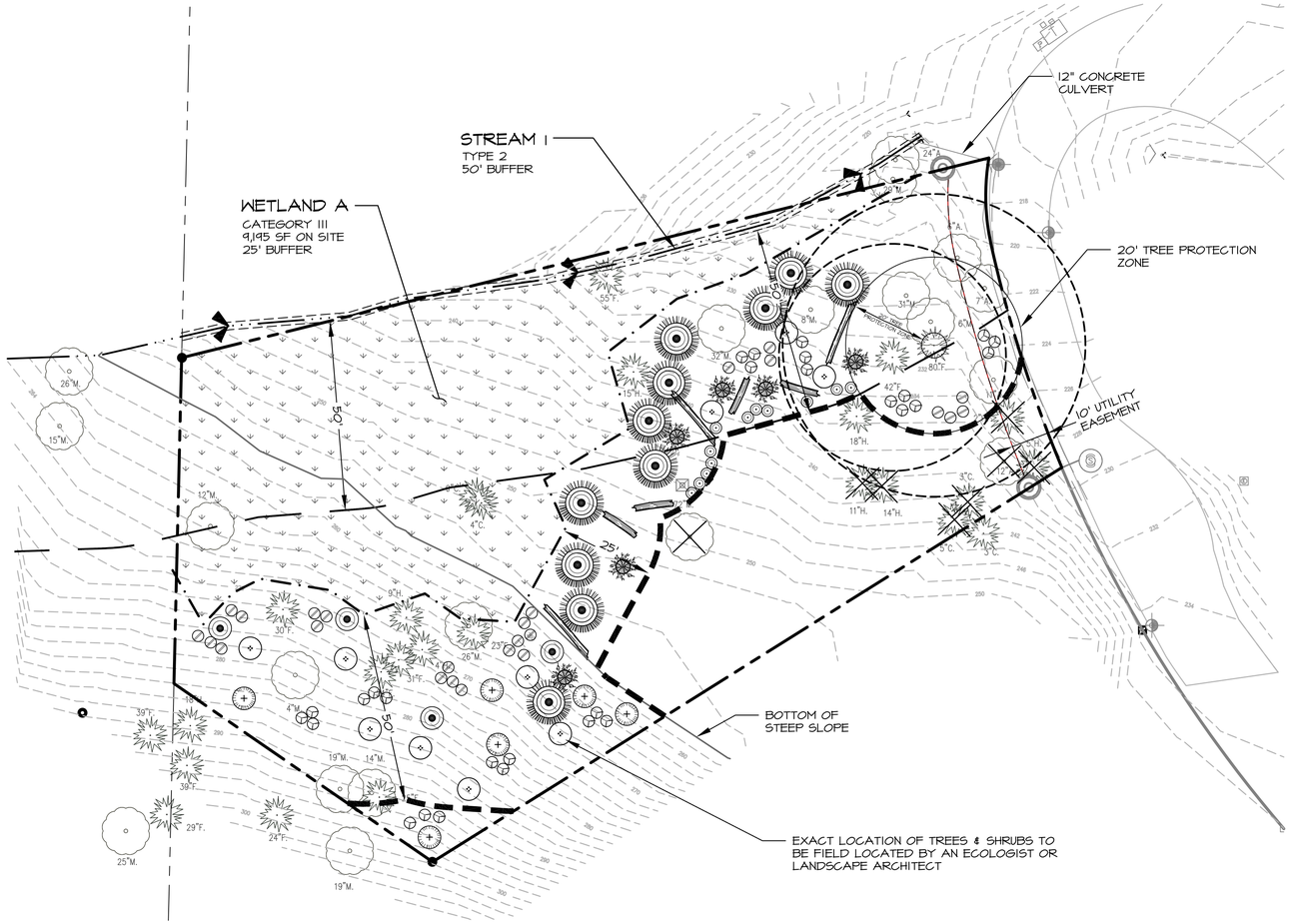
CRITICAL AREAS MITIGATION PLAN
PROPOSED SITE DEVELOPMENT PLAN
HOU PROPERTY
MERCER ISLAND, WA

Revisions	Date	By
CITY COMMENTS	9-4-2018	KM

Date	7-27-2017
Scale	1"=20'
Designed	AO
Drawn	MN
Checked	OA
Approved	BS
Project #	11298
Sheet #	W1.1

SECTION 19, TOWNSHIP 24N, RANGE 5E, W.M.



PLANTING PLAN

GRAPHIC SCALE (IN FEET)
0 10 20 40
SCALE: 1"=20'

NORTH

PLAN LEGEND

- PROPERTY LINE
- EXISTING WETLAND
- CENTERLINE OF STREAM & FLOW DIRECTION
- APPROXIMATE OHWM
- PROPOSED CRITICAL AREAS BUFFER
- EXISTING TREES TO REMAIN
- EXISTING TREES TO BE REMOVED
- LARGE WOODY DEBRIS

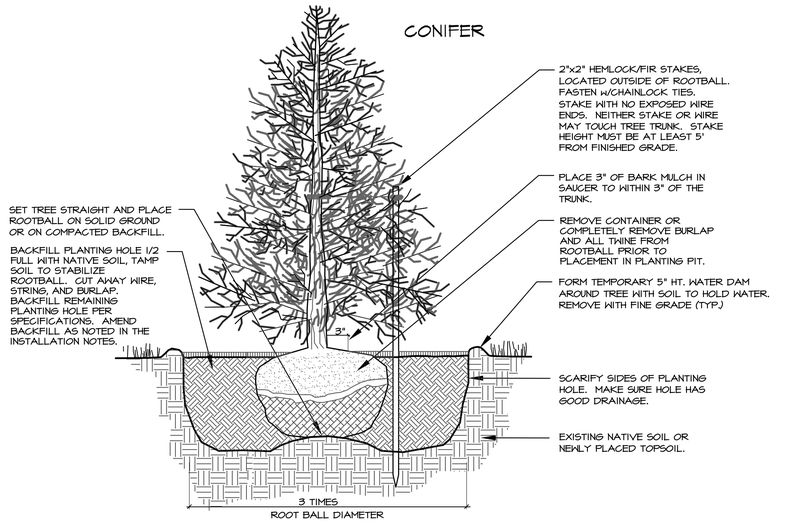
PLANT SCHEDULE

TREES

SYMBOL	SCIENTIFIC NAME	COMMON NAME	WL STATUS	QTY.	SPACING	SIZE (MIN.)	NOTES
	ACER CIRCINATUM	VINE MAPLE	FAC	10	AS SHOWN	2 GAL.	FULL & BUSHY
	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	FACU	6	AS SHOWN	2-3' HT.	FULL & BUSHY
	THUJA PLICATA	WESTERN RED CEDAR	FAC	11	AS SHOWN	4-5' HT.	B&B, FULL & BUSHY
	THUJA PLICATA	WESTERN RED CEDAR	FAC	4	AS SHOWN	2-3' HT.	FULL & BUSHY

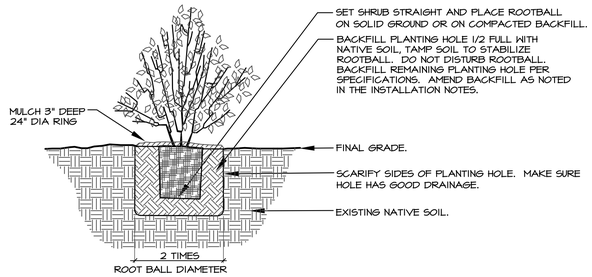
SHRUBS

SYMBOL	SCIENTIFIC NAME	COMMON NAME	WL STATUS	QTY.	SPACING	SIZE (MIN.)	NOTES
	OEMLERIA CERASIFORMIS	INDIAN PLUM	FACU	28	5' O.C.	18" HT.	MULTI-CANE (3 MIN.)
	ROSA GYMNOCARPA	BALDHIP ROSE	FACU	12	3' O.C.	1 GAL.	MULTI-CANE (3 MIN.)
	RUBUS SPECTABILIS	SALMONBERRY	FAC	25	3' O.C.	1 GAL.	FULL & BUSHY



1 LARGE CONIFER TREE PLANTING (TYP.)

SCALE: NTS



2 CONTAINER TREE/SHRUB PLANTING (TYP.)

SCALE: NTS

GENERAL PLANTING INSTALLATION NOTES

1. PLANT TREE &/OR SHRUB 1/2" HIGHER THAN DEPTH GROWN AT NURSERY.
2. FOR CONTAINER TREES &/OR SHRUBS, SCORE FOUR SIDES OF ROOTBALL PRIOR TO PLANTING. BUTTERFLY ROOTBALL IF ROOT CIRCLING IS EVIDENT.
3. AFTER PLANTING, STAKE TREES ONLY IF NECESSARY (LEANING OR DROOPING) OR IN EXPOSED AREAS.
4. TREE STAKES TO BE VERTICAL, PARALLEL, EVEN-TOPPED, UNSCARRED AND DRIVEN INTO UNDISTURBED SUBGRADE. REMOVE AFTER ONE YEAR.
5. WATER IMMEDIATELY AND THOROUGHLY, HEAVIER AT FIRST, 2 OR 3 TIMES PER WEEK THROUGH THE DRY SEASON, THEN LESS UNTIL ESTABLISHED.

NOT FOR CONSTRUCTION

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CRITICAL AREAS MITIGATION PLAN
PLANTING PLAN, SCHEDULE, NOTES & DETAILS
HOU PROPERTY
MERCER ISLAND, WA

Revisions	Date	By
CITY COMMENTS	9-14-2018	KM

Date 7-27-2017
Scale AS NOTED
Designed AO
Drawn MW
Checked OA
Approved BS

Project #1129B

Sheet # WL2

APPENDIX E

Bond Quantity Worksheet

Talasaea Consultants, 2019

King County
Department of Permitting
Environmental Review
35030 SE Douglas Str, Suite 210
Snoqualmie, WA 98065-9266
206-296-6600 TTY Relay: 711

Critical Areas Mitigation
Bond Quantity Worksheet

C24 09/09/2015
ls-wks-sensareaBQ.xls
ls-wks-sensareaBQ.pdf

Project Name: Hou Property **Date:** 14-Jan-19 **Prepared by:** Fern Huynh

Project Number: 1129B **Project Description:** Buffer Reduction/Averaging

Location: Mercer Island **Applicant:** Sang Hou **Phone:** 206-948-7698

PLANT MATERIALS (includes labor cost for plant installation)

Type	Unit Price	Unit	Quantity	Description	Cost
PLANTS: Container, 1 gallon, medium soil	$11.50	Each	65.00		$ 747.50
PLANTS: Container, 2 gallon, medi	$20.00	Each	20.00		$ 400.00
PLANTS: Container, 5 gallon, medium soil	$36.00	Each	11.00		$ 396.00
				TOTAL	**$ 1,543.50**

INSTALLATION COSTS (LABOR, EQUIPMENT, & OVERHEAD)

Type	Unit Price	Unit			Cost
Labor, general (construction)	$40.00	HR	10.00	Ivy removal	$ 400.00
Labor: Consultant, supervising	$55.00	HR	15.00		$ 825.00
Labor: Consultant, on-site re-design	$95.00	HR	5.00		$ 475.00
Staking material (set per tree)	$7.00	Each	11.00		$ 77.00
Surveying, line & grade	$250.00	HR	3.00		$ 750.00
				TOTAL	**$ 2,527.00**

HABITAT STRUCTURES*

ITEMS	Unit Cost	Unit			Cost
Logs (cedar) w/o root wads, 16"-24" diam., 30'	$400.00	Each	7.00		$ 2,800.00
Root wads	$163.00	Each	6.00		$ 978.00
* All costs include delivery and installation				*TOTAL*	**$ 3,778.00**

EROSION CONTROL

ITEMS	Unit Cost	Unit			Cost
Fence, silt	$1.60	LF	200.00		$ 320.00
Mulch, by hand, wood chips, 2" deep	$3.25	SY	40.00		$ 130.00
Hauling and disposal	$20.00	CY	3.00		$ 60.00
Topsoil, delivered and spread	$35.73	CY	14.00		$ 500.22
				TOTAL	**$ 1,010.22**

OTHER

				(Construction Cost Subtotal)	**$ 8,858.72**
ITEMS	Percentage of Construction	Unit			Cost
Mobilization	10%	1			$ 885.87
Contingency	30%	1			$ 2,657.62
				TOTAL	**$ 3,543.49**

MAINTENANCE AND MONITORING

NOTE: Projects with multiple permit requirements may be required to have longer monitoring and maintenance terms. This will be evaluated on a case-by-case basis for development applications. Monitoring and maintance ranges may be assessed anywhere from 5 to 10 years.

Maintenance, annual (by owner or consultant)					
Larger than 5,000 sq.ft. but < 1 acre -buffer mitigation only	$ 360.00	EACH	4.00	(8 hrs @ 45/hr)	$ 1,440.00
Monitoring, annual (by owner or consultant)					
Larger than 5,000 sq.ft. but < 1 acre with wetland or aquatic area impacts	$ 900.00	EACH	4.00	(10 hrs @ $90/hr)	$ 3,600.00
				TOTAL	**$ 5,040.00**

Total **$17,442.21**

Gilles Consulting
Brian K. Gilles
425-822-4994

FIELD REPORT:

Project Address:	**4825 E. Mercer Way, Mercer Island, WA 98040**
Prepared For:	**Mr. Sang Hao** **7022 E. Mercer Way, Mercer Island, WA 98040**
Date of Site Visit:	**November 7, 2018**
Date of Report:	**January 11, 2019**

REASON FOR THE SITE VISIT:
The City of Mercer Island has requested information on ensuring that trees 916 & 917 are adequately protected for the long-term.

Specifically, in a letter dated October 15, 2018 from Nicole Gaudette, Senior Planner for the Development Services Group the request is as follows:

> 2. Pursuant to MICC 19.07.080(C)(2), buffer widths can only be reduced if the reduced area is adequate to protect wetland functions and the reduction will result in no net loss. Amy harm to the trees may result in net loss due to the habitat benefits currently provided by the trees. Please ask your arborist to review the proposed encroachments to the drip lines of Exceptional Trees 916 and 917 as reflected Table 1 Sumary of Drip Line Encroachments and provide a report stating that the proposed encroachments will not harm the trees.

The wetland consultant has responded to the wetland issues. I was asked to respond to the tree issues.

The current proposal is to place the driveway within the dripline of both trees just feet from the base of the two *Exceptional Trees.*

fax: 425-822-6314
email: bkgilles@comcast.net
P.O. Box 2366 Kirkland, WA 98083

METHODLOLOGY

The two trees were given an extensive root analysis several years ago. In 2017 a Level III Tree Risk Assessment was performed on the two trees including tomograph tests to determine if there was in rot in the lower trunks. The trees proved to be solid and healthy.

In my previous report I stated that it is my professional opinion that a driveway can be placed over the critical root zone of the two trees if it is suspended on pin piles or similar construction technique driving to the appropriate depth required for long-term stability and strategically placed in between the major roots.

I requested that the engineer "over design" the driveway to account for moving a few of the pins to avoid the major roots of both trees as needed. The concept is that the driveway is designed strong enough and during construction if the proposed location of a pin pile is right where a major buttress root is located, then the driveway design will allow for moving the pin pile a foot one way or another to avoid the root. This solution I believe to be doable. The home and driveway constructed will be enhanced by having one big Douglas Fir, # 917 43.5" DBH, and the largest Douglas Fir I have ever measured in lowland Puget Sound, # 916, 80+" DBH.

CONCLUISON AND RECOMMENDATIONS

There are two main issues as far as the two trees are considered: Damage to the trees during construction that can lead to long-term decline or death, and the covering of a portion of the root zone with a hard surface.

<u>ISSUE # 1: The Construction of the Driveway</u>:

As noted above, I believe that the driveway and home can be built and the trees retained without damage if extraordinary tree protection measures are carefully followed. They are outlined below.

<u>ISSUE # 2: The Construction of the Driveway Over the Roots</u>:

The placement of an impervious surface over several square yards of the critical root zone must be considered. And it is my professional judgment that the two trees will be just fine. The majority of the absorbing roots are located further away from the trunks and there will be adequate soil volume and moisture available for the trees to adapt and adjust to the new circumstances. Temporary irrigation of the two trees is to be installed prior to any construction to help alleviate any drought stress as a result of construction.

EXTRAORDINARY TREE PROTECTION MEAUSURES

In order for trees to survive the stresses placed upon them in the construction process, tree protection must be planned in advance of equipment arrival on site. If tree protection is not planned integral with the design and layout of the project, the trees will suffer needlessly and will possibly die. With proper preparation, often costing little, or nothing extra to the project budget, trees can survive and thrive after construction. This is critical for tree survival because damage prevention is the single most effective treatment for trees on construction sites. Once trees are damaged, the treatment options available are limited.

The following minimum Tree Protection Measures are included on three separate sheets so that they can be copied and introduced into all relevant documents such as site plans, permit applications and conditions of approval, and bid documents so that everyone involved is aware of the requirements. These Tree Protection Measures are intended to be generic in nature. They will need to be adjusted to the specific circumstances of your site that takes into account the location of improvements and the locations of the trees.

The key is that the driveway must be complete prior to any other work on the site. All supplies and debris must be brought in and removed via the driveway.

TREE PROTECTION MEASURES

1. Tree Protection Fencing:
    a. Tree Protection Fences will need to be placed around each tree or group of trees to be retained.
        i. Tree Protection Fences are to be placed just outside the *Limits of Development*.
        ii. The area inside the fences is the *Tree Protection Zone.*
        iii. The area outside the fences is the work zone or the construction zone.
        iv. Tree Protection Fences must be inspected prior to the beginning of any clearing or construction work activities.
        v. Nothing must be parked or stored within the Tree Protection Fences—no equipment, vehicles, soil, debris, or construction supplies of any sorts.

    b. Signs:
        i. The Tree Protection Fences need to be clearly marked with the following or similar text in four inch or larger letters:

"TREE PROTECTION FENCE
DO NOT ENTER THIS AREA
DO NOT PARK OR STORE MATERIALS
WITHIN THE PROTECTION AREA

Any questions, contact Mercer Island Code Compliance at:
@ 206 275-7605. Or,
codeenforcement@mercergov.org

2. Cement Trucks:
    a. Cement trucks must not be allowed to deposit waste or wash out materials from their trucks within the Tree Protection Fences.

3. Canopy Pruning:
    a. If the canopies of any of the trees to be retained need to be pruned for clearance or safety, the work must be done properly.
    b. "Properly: means that the pruning *must* be done by an International Society of Arboriculture, (ISA) Certified Arborist using current industry standard pruning techniques. (ANSI A300 Pruning Standards and ANSI Z131.1 Safety Standards as well as all OSHA, WISHA, and local standards must be followed.)

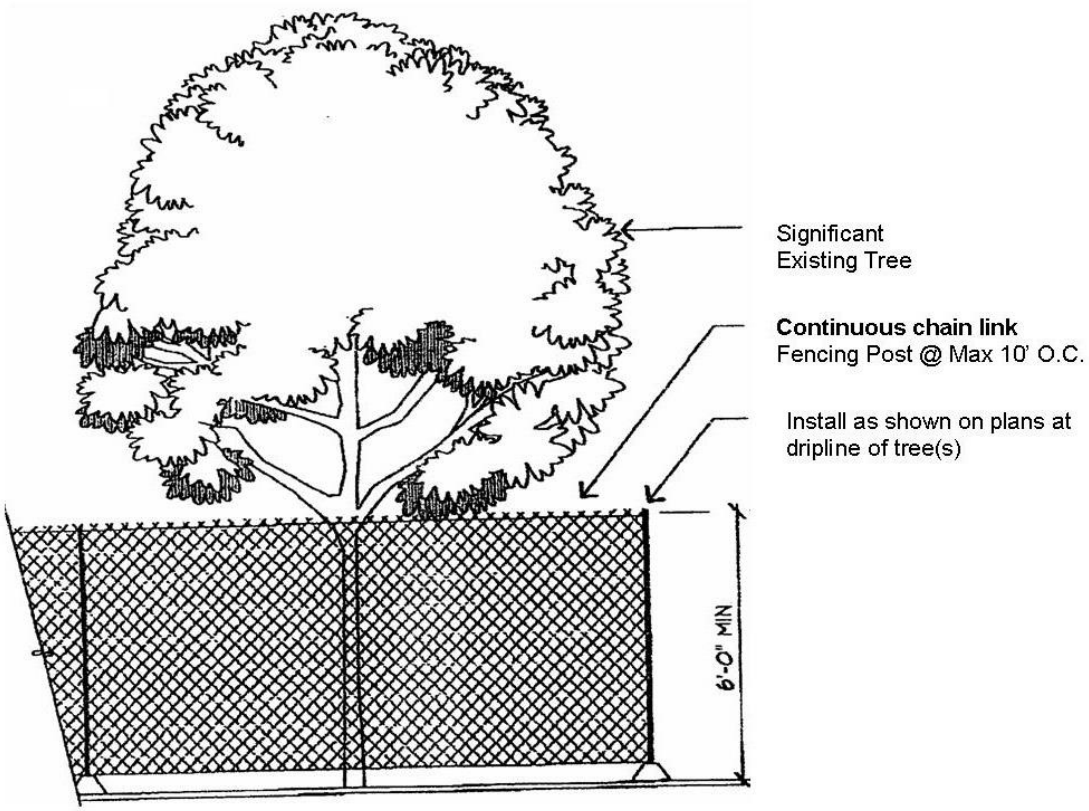
c. The pruning *must* be done using clean climbing techniques to allow tip pruning and he smallest cuts possible.
d. Plant debris can be chipped and utilized on site for the mulch under the trees.

5. Excavation:
    a. When excavation occurs near trees that are scheduled for retention, the following procedure must be followed to protect the long term survivability of the tree:
    b. An International Society of Arboriculture, (ISA) Certified Arborist must be working with all equipment operators.
        i. The Certified Arborist should be outfitted with a shovel, hand pruners, a pair of loppers, a handsaw, and a power saw (a "sawsall" is recommended).
        ii. The arborist must also have an *air spade* and compressor to blow the soil away and expose the roots.
    c. Grubbing:
        i. The area under the driveway and for one foot beyond each side, the ground cover plants will be removed by hand grubbing.
        ii. No mechanical equipment is allowed within the dripline until the driveway is complete.
        iii. Powered hand tools are acceptable.
    d. Placement of Pin Piles or sonotubes:
        i. Once roots are exposed, the position of each sonotube or pin pile within the driplines can be determined.
        ii. Once determined, the Certified Arborist can cleanly cut any small roots to allow for the sonotubes or pin piles to be correctly installed.
    e. Once the sonotubes are placed or the pin piles drilled, the rest of the root zone must be immediately filled back in and the disturbed ground watered.
        i. The water needs to be applied slow and long to allow deep penetration and to help eliminate air pockets in the disturbed area.

6. Putting Utilities Under the Root Zone:
    a. If it is necessary to place utilities within the dripline, it must be accomplished with trenchless technology such as boring under the root systems of trees (and other vegetation). This work *shall* be done under the supervision of an ISA Certified Arborist or ASCA Registered Consulting Arborist.
    b. This is to be accomplished by excavating a limited trench or pit outside each side of the critical root zone of the two trees.
    c. The pits must be deep enough to allow the utility pipes to be placed at least 4.5 feet below the existing grade.

d. Tunneling under the roots of trees shall be done under the supervision of an ISA Certified Arborist in an open trench by carefully excavating and hand digging around areas where large roots are exposed. No roots 1 inch in diameter or larger shall be cut.
e. The contractor shall verify the vertical and horizontal location of existing utilities to avoid conflicts and maintain minimum clearances; adjustment shall be made to the grade of the new utility as required.

7. Watering:
    a. The trees will require significant watering throughout the summer and early fall in order to survive long-term.
    b. A temporary drip irrigation system will need to be installed.
    c. Installation and operation must be approved by the Project Arborist and the City of Mercer Island prior to the construction of the driveway.
    d. Irrigation needs to be slow to allow water penetration to a depth of 18 to 20 inches.
        i. *Do not overwater*. Too much water can be disastrous on a steep slope.
    e. Once the water reaches the proper depth, turn off the irrigation for four weeks and then water again.
    f. Water more often when temperatures increase—every three weeks when temperatures exceed 80 degrees and every two weeks when temperatures exceed 90 degrees.
    g. This drying out of the soil in between watering is important to prevent soil pathogens from attacking the trees.



Six-foot high temporary chain link fence shall be placed as shown on plans. Fence shall completely encircle tree(s). Install fence posts using pier blocks only. Avoid driving posts or stakes into major roots.

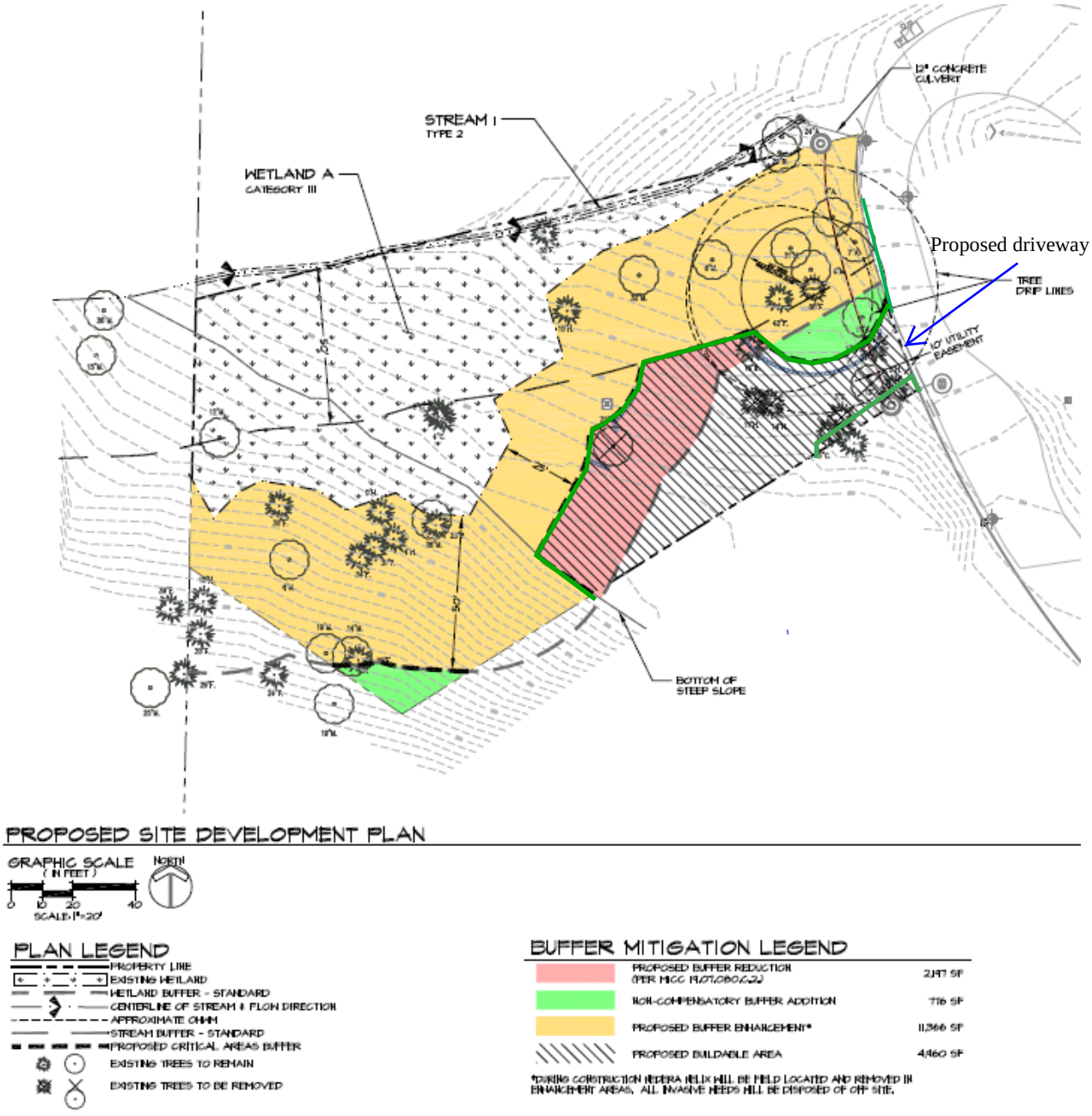
Make a clean straight cut to remove damaged portion of root for all roots over 1" in diameter damaged during construction. ***All*** exposed roots shall be temporarily covered with damp burlap and covered with soils the same day, if possible, to prevent drying. If not possible, burlap must be kept moist at all times.

Work with the protection fencing shall be done manually. No stockpiling of materials, soil, debris, vehicle traffic, or storage of equipment or machinery shall be allowed within the limit of the fencing.

Cement trucks must not be allowed to deposit waste or wash out materials from their trucks within the Tree Protection Fences.

The area within the Tree Protection Fencing must be covered with wood chips, hog fuel, or similar materials to a depth of 8 to 10 inches. The materials should be placed prior to beginning construction and remain until the Tree Protection Fencing is taken down.

Proposed Site Plan, Impacts, & Mitigation Plan, provided by Talasaea Consultants,
Approximate locations of *Tree Protection Fences* ——



WAIVER OF LIABILITY

There are many conditions affecting the stability of a slope. The recommendations in this report are to help the Palladian Pointe Homeowners Association manage the property only. It is not a guarantee against severe erosion or landslide. Tree, shrub, and groundcover roots cannot prevent deep-seated landslides from occurring. If a severe landslide occurs, all trees and vegetation will be swept away as part of the landslide.

There are also many conditions affecting a tree's health and stability which may be present and cannot be ascertained, such as, root rot, previous or unexposed construction damage, internal cracks, stem rot and more which may be hidden. Changes in circumstances and conditions can also cause a rapid deterioration of slope stability. While I have used every reasonable means to examine the slope and all relevant factors, this tree management plan represents my opinion of the situation at this point in time. These findings do not guarantee future safety nor are they predictions of future events. It is the property owner/project manager's responsible to engage the services of a qualified geotechnical engineer to ascertain the conditions of the slope and actions that will enhance or destabilize the slope.

As conditions change, it is the responsibility of the property owners to schedule additional site visits by the necessary professionals to ensure that the long-term success of the project is ensured. It is the responsibility of the property owner to obtain all required permits from city, county, state, or federal agencies. It is the responsibility of the property owner to comply with all applicable laws, regulations, and permit conditions. It is the responsibility of each property owner to comply with all Codes, Covenants, and Restrictions (CC&R's) that apply to tree pruning and tree removal.

This tree evaluation is to be used to inform and guide the client in the management of their trees. This in no way implies that the evaluator is responsible for performing recommended actions or using other methods or tools to further determine the extent of internal tree problems without written authorization from the client. Furthermore, the evaluator in no way holds that the opinions and recommendations are the only actions required to insure that the tree will not fail. A second opinion is recommended. The client shall hold the evaluator harmless for any and all injuries or damages incurred if the evaluator's recommendations are not followed or for acts of nature beyond the evaluator's reasonable expectations, such as severe winds, excessive rains, heavy snow loads, etc.

This report and all attachments, enclosures, and references, are confidential and are for the use of the client concerned. They may not be reproduced, used in any way, or disseminated in any form without the prior consent of the client concerned and Gilles Consulting.

Thank you for calling Gilles Consulting for your arboricultural needs.

Sincerely,

Brian K. Gilles, Consulting Arborist
ASCA Registered Consulting Arborist # RCA-418
ASCA Tree & Plant Appraisal Qualified.
ASCA Tree & Plant Appraisal Certified Instructor
ISA TRAQ Qualified
ISA TRAQ Certified Instructor