



CITY OF
BAINBRIDGE ISLAND

ENVIRONMENTAL TECHNICAL
ADVISORY COMMITTEE
REGULAR MEETING
THURSDAY, NOVEMBER 19, 2020
3:00 PM
VIA ZOOM WEBINAR

THE ENVIRONMENTAL TECHNICAL ADVISORY COMMITTEE WILL HOLD THIS MEETING
USING A VIRTUAL, ZOOM WEBINAR, PER GOVERNOR INSLEE'S
"STAY HOME, STAY HEALTHY" ORDERS

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AGENDA

- 3:00 PM CALL TO ORDER / ROLL CALL / ACCEPT OR MODIFY AGENDA / CONFLICT OF INTEREST DISCLOSURE
- 3:05 PM APPROVAL OF MINUTES – SEPTEMBER 24, 2020 (5 MIN)
- 3:10 PM COUNCIL LIAISON REPORT – CHRISTY CARR (10 MIN)
- 3:20 PM COBI STUDY ON TERTIARY WASTEWATER TREATMENT OPTIONS – JASON FLOWERS (MURRAYSMITH) (20 MIN)
- 3:40 PM CHAIR REPORT ON ACTIVITIES SINCE SEPTEMBER 24TH MEETING – CHARLIE KRATZER (10 MIN)
- 3:50 PM GW FACT SHEET APPROVAL – ETAC GWMP SUB-COMMITTEE (CHARLIE, MELANIE, JUAN, AND CASEY), ALL (25 MIN)
- 4:15 PM TRUE-BROWN HABITAT MANAGEMENT PLAN – ANNIE HILLIER, ETAC HMP SUB-COMMITTEE (JUAN AND STEVE), ALL (40 MIN)
- 4:55 PM PUBLIC COMMENT (5 MIN)
- 5:00 PM ADJOURNMENT

Minutes
Environmental Technical Advisory Committee
Special Meeting, September 24, 2020
Via Zoom Webinar

Call to Order at 3:14 PM

Member Attendees: Charlie Kratzer, Juan Rovalo, Steve Saepoff, Melanie Keenan, Dylan Frazer, Jane Hannuksela, Benjamin Harrison

Members Absent: Michelle McClure

Council Liaison: Christy Carr

Minutes from February 27, 2020 meeting approved by 5-0 vote.

Council Liaison Report

- Christy Carr is the new Council Liaison to ETAC. A few years ago Christy was the COBI Staff Liaison to ETAC.
- Christy reported on the following items that relate to ETAC: (1) the LT Hydrogeologist position will be re-advertised in the 4th Quarter 2020, (2) the final report on the tertiary wastewater treatment study for COBI is due in the 1st Quarter 2021, and (3) the stormwater study is to be initiated in the 2nd Quarter 2021.
- When ETAC completes a GW Fact Sheet for COBI (and votes to approve) it should be sent to COBI Public Works for them to send to KPUD and USGS for review.
- ETAC might be requested to weigh in on the Shoreline Master Plan review process during the next year.

Chair Report on Activities since February 27, 2020 meeting

- Charlie reported that Casey Schmidt has been asked by his employer (Suquamish Tribe) to step down from his ETAC position due to possible conflicts of interest.
- Charlie introduced the newest member of ETAC, Benjamin Harrison, to the committee. Benjamin is replacing Karl Shearer on ETAC, as Karl decided to retire after two full terms on ETAC.
- With Casey stepping down and Michelle McClure being unable to fulfill ETAC duties, there are now 7 members of ETAC and 2 openings.
- With only 7 members, ETAC sub-committees can only have 3 members instead of 4 to avoid a Quorum.
- The GWMP sub-committee is now 3 members (Charlie, Melanie, and Juan). The HMP sub-committee is now only 2 members (Steve and Juan) and has one opening.
- Charlie will soon be presenting the same PowerPoint slides to the BI Senior Center that he presented to the BI Women's Club in January 2020.

GWMP update

- COBI is about to re-advertise the LT Hydrogeologist position.

GW Fact Sheet update

- Charlie will revise the GW Fact Sheet based on comments from Casey and Dylan and send it to the GWMP sub-committee (Charlie, Melanie, Juan, and formerly Casey). After the sub-committee is OK with the Fact Sheet, it will hopefully be presented to ETAC at the October meeting for approval to send to COBI Public Works. Charlie will alert COBI Public Works, KPUD, and USGS in advance.

Adjournment

Meeting adjourned at 4:29 PM.

Charlie Kratzer, Chair

Date

Habitat Management Plan

16.20.060 Habitat management plan.

A. General. A habitat management plan shall comply with the requirements of this section, and shall clearly demonstrate that greater protection of the functions and values of critical areas can be achieved through the HMP than could be achieved through providing the prescribed habitat buffers. The director shall prepare performance standards and monitoring guidelines for habitat management plans, including a program for city oversight of such plans. Once the standards and guidelines are in place, an applicant may propose to implement an HMP as a means to protect habitat buffers associated with wetlands and/or fish and wildlife conservation areas.

B. Intent. HMPs are primarily intended as a means to restore or improve buffers that have been degraded by past activity, and should preserve, and not reduce, existing high quality habitat buffers. While not primarily intended as a means to reduce buffers, the HMP may propose a reduction of the habitat buffer width where it is shown that the HMP will comply with the other requirements of this section. An HMP shall not reduce the prescribed water quality buffer width as listed in BIMC [16.20.130](#) and [16.20.160](#) under any circumstance.

C. Effect of Buffers. An HMP shall provide habitat functions and values that are greater than would be provided by the prescribed habitat buffers. When habitat buffers are a component of an HMP, they shall be at least the minimum size necessary to accomplish the objectives of the HMP. The HMP may propose, but the city shall not require, a habitat buffer containing a greater area than is required by the prescribed habitat buffer.

D. Impact Mitigation – General. The HMP shall encompass an area large enough to provide mitigation for buffer reduction below the standard required buffers, and shall identify how the development impacts resulting from the proposed project will be mitigated. The developer of the plan shall use the best available science in all facets of the analyses. The Washington Department of Fish and Wildlife Priority Habitat and Species Management Recommendations, dated May 1991, and/or bald eagle protection rules outlined in WAC [232-12-292](#), as now or hereafter amended, may serve as guidance for this report. For habitat management plans addressing wetland buffers, Method for Assessing Wetland Functions, Ecology Publication No. 99-116 shall be used for guidance in determining function equivalency.

E. HMP Review. All habitat management plans shall be submitted to the Washington State Department of Fish and Wildlife habitat biologist and to the Suquamish Tribe for review and comment. Within that same time frame, the city's environmental technical advisory committee shall be asked to review the HMP and provide comments.

F. Map. The habitat management plan shall contain a map prepared at an easily readable scale, showing:

1. The location of the proposed development site;

2. Property boundaries;
3. The relationship of the site to surrounding topographic, water features, and cultural features;
4. Proposed building locations and arrangements;
5. A legend which includes a complete legal description, acreage of the parcel, scale, north arrow, and date of map revision.

G. Report. The habitat management plan shall also contain a report which contains:

1. A description of the nature and intensity of the proposed development;
2. An analysis of the effect of the proposed development, activity or land use change upon the wildlife species and habitat identified for protection. If the habitat management plan is addressing wetland habitat, the analysis shall compare an assessment of wildlife habitat suitability of the wetland applying standard buffers with an assessment of habitat suitability as proposed using Method for Assessing Wetland Functions, Washington State Department of Ecology (if available for the specific hydrogeomorphic classification);
3. A plan which identifies how the applicant proposes to mitigate any adverse impacts to wildlife habitats created by the proposed development. For wetland or other habitats protected by this chapter, the application shall show, using the appropriate function assessment methodology, that habitat functions and values are greater after the development than would occur had the prescribed buffers been provided (see mitigation plan requirements, BIMC [16.20.110](#));
4. All review comments received from a habitat biologist from the Washington State Department of Fish and Wildlife (WDFW) and the Suquamish Tribe. If the HMP recommends mitigation involving federally listed threatened or endangered species, migratory waterfowl or wetlands, the U.S. Fish and Wildlife Service shall receive a copy of the draft HMP;
5. For properties subject to the provisions of the city's shoreline master program, Chapter [16.12](#) BIMC, a site-specific analysis of the project's impact on shoreline fish and wildlife habitat, as currently required by the SMMP, utilizing the provisions for environmentally sensitive areas as provided in Exhibit A in BIMC [16.20.260](#);
6. The HMP shall specifically address, as appropriate, the following:
 - a. Enhancement of existing degraded buffer area and replanting of the disturbed buffer area with native or equivalent vegetation;
 - b. The use of alternative on-site wastewater systems in order to minimize site clearing;
 - c. Infiltration of storm water where soils permit;

d. Retention of existing native or equivalent vegetation on other portions of the site in order to offset habitat loss from buffer reduction; and

e. The need for fencing and signage along the buffer edge.

H. Mitigation Measures. Possible mitigation measures to be included in the report, or required by the director, could include, but are not limited to:

1. Establishment of buffer zones;

2. Preservation of critically important plants and trees;

3. Limitation of access to habitat areas;

4. Seasonal restriction of construction activities;

5. Establishing phased development requirements; and

6. Monitoring plan for a period necessary to establish that performance standards have been met. Generally this will be for a period of seven to 10 years.

I. HMP Adequacy. The HMP shall demonstrate to the satisfaction of the director that the habitat functions and values are improved by implementation of the HMP. If there is a disagreement between the director and the applicant as to the adequacy of the HMP, the issue of plan adequacy shall be resolved by consulting with the Washington Department of Fish and Wildlife for HMPs relating to streams or the Washington Department of Ecology for HMPs relating to wetlands. If the state agencies are not available in a timely manner, the applicant may choose to have the city refer the HMPs to a third party consultant at the expense of the applicant. After consultation with such state departments or third party consultant, the director shall make a final decision on the adequacy of the HMP.

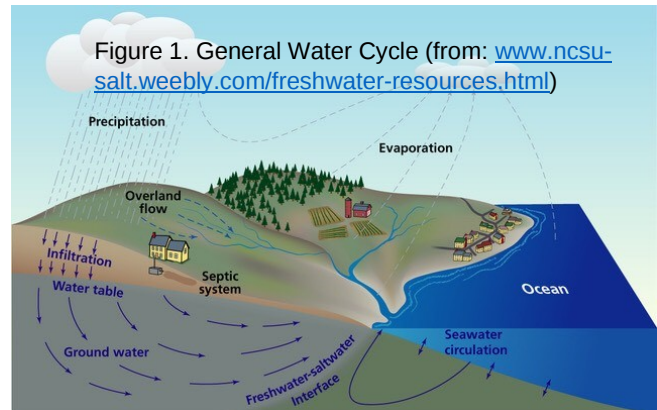
J. Timing. An HMP must be developed and approved either prior to preliminary plat approval or issuance of the building permit, as applicable, and must be implemented before the city grants either final plat approval or an occupancy permit, as applicable.

K. Performance Surety. The director may require that the applicant provide a performance surety to ensure conformance with mitigation requirements of the habitat management plan pursuant to BMC [16.20.180](#). (Ord. 2005-03 § 2, 2005)

Groundwater on Bainbridge Island: A Fact Sheet

What is Groundwater?

- Groundwater is water that exists underground in saturated zones beneath the land surface (Fig. 1). The upper surface of the saturated zone is called the water table. Contrary to popular belief, groundwater generally does not form underground rivers. It fills the pores and fractures in underground materials (soil, sand, gravel, and rocks), much the same way that water fills a sponge. If groundwater flows naturally out of rock materials or if it can be removed by pumping (in useful amounts), the saturated zones are called aquifers. Groundwater moves slowly from higher to lower water levels, typically at rates of 3 to 25 inches per day. As a result, water could remain in an aquifer for hundreds or thousands of years.
- Aquifers are separated by layers of soil or rock called confining layers. Despite these confining layers, there is usually some water exchange between aquifers.
- Groundwater quantity is estimated by measuring water levels in wells. Water levels vary seasonally due to rainfall and pumping, so measurements at the same time each year will give the best information on changes in the amount of groundwater on an annual basis (from: USGS FAQs; www.usgs.gov/faq/water).
- Some surface waters (i.e., ponds, wetlands, streams) receive significant contributions from groundwater depending on groundwater levels.



Groundwater on Bainbridge Island

- There are six aquifers on Bainbridge Island (shown in Fig. 2 cross-section of BI from Port Orchard Bay on the left to Puget Sound on the right). However, the permeable interbeds (QC1pi) and bedrock (BR) aquifers produce little water. The four main aquifers are:
 - Vashon (Perched)(Qva)** (water table at elevation 0 to 300 ft),
 - Sea Level (QA1)** (-200 to +200 ft),
 - Glaciomarine (QA2)** (-500 to -300 ft), and
 - Deep (Fletcher Bay)(QA3)** (-900 to -600 ft)

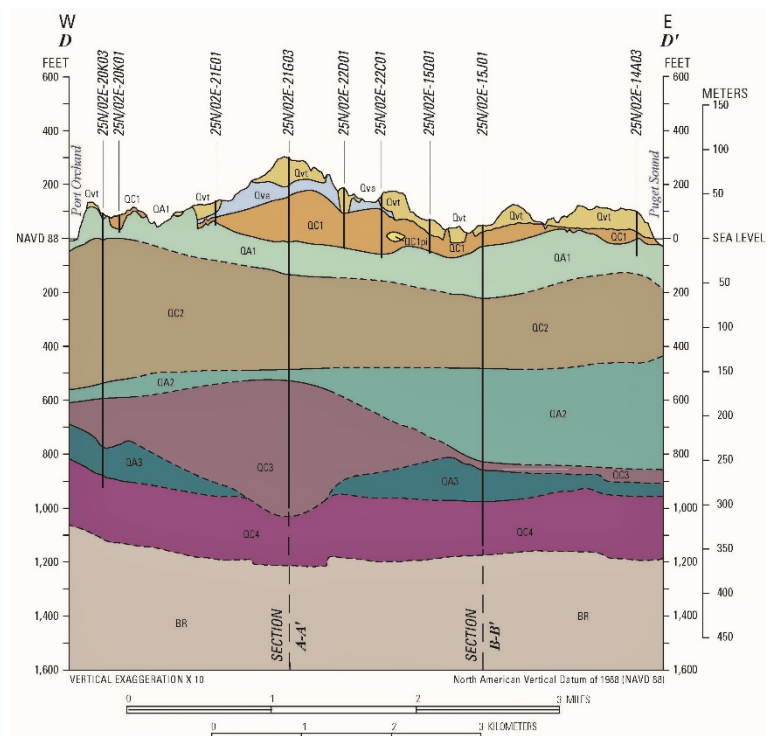
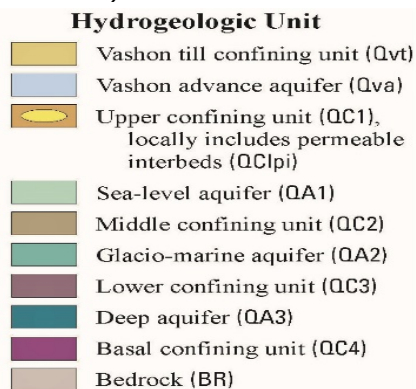


Figure 2. Aquifers on Bainbridge Island (from: Frans and others, 2011)

- These four aquifers are separated by five confining layers: Qvt (Vashon till near ground surface), QC1, QC2, QC3, and QC4.
- 97% of usage (pumped well water) comes from the Vashon, sea level, and deep aquifers
- All the recharge water for the aquifers originates as precipitation on the island, except for about 5% that flows under Port Orchard Bay from the Kitsap Peninsula to the sea level, glaciomarine, and deep aquifers (from: Frans and others, 2011)

Sole Source Aquifer Designation

- In 2013, USEPA designated BI as a sole source aquifer, meaning that it “supplies at least 50% of the drinking water consumed in the area overlying the aquifer, and for which there is no alternative source or combination of alternative drinking water sources which could physically, legally, and economically supply those dependent upon the aquifer”
- Sole source designation can affect Federal funding for any project with the potential to contaminate the groundwater on BI
- Based on this designation, ETAC believes that BI should have the goal of remaining self-sufficient with respect to water resources and that alternative sources are not advisable (i.e., a pipeline across Agate Pass Bridge or desalination of seawater).
- This cross-section of the Kitsap Peninsula (Fig. 3) from Clear Creek (Silverdale) on the left to BI/Puget Sound on the right shows the connection of the glaciomarine and deep aquifers (from: Welch and others, 2014). However, as stated above the contribution of off-island water from these aquifers is only about 5% of total water usage on BI, as the actual movement towards BI depends on several factors – pumping rates, recharge rates, and head/pressure differences between BI and Kitsap Peninsula.

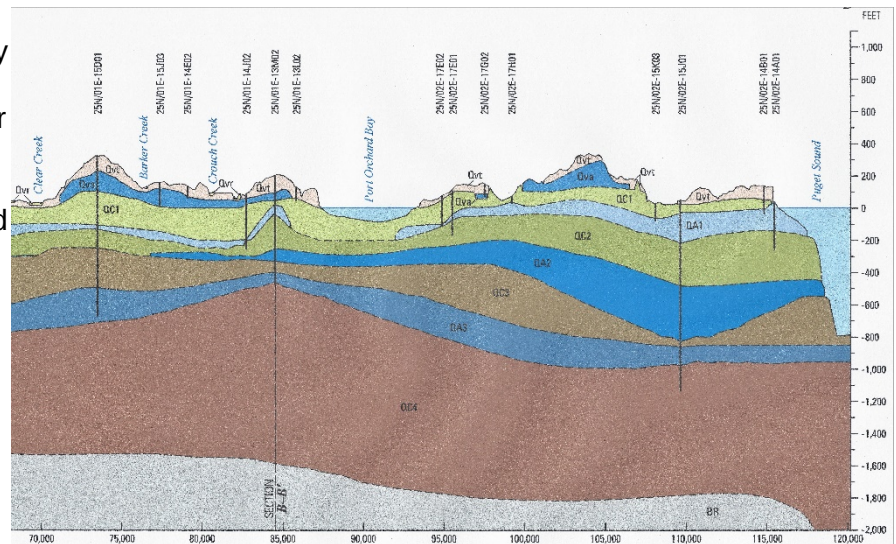


Figure 3. Aquifers on Kitsap Peninsula (from Welch and others, 2014)

Seawater Intrusion

- Seawater can potentially be drawn into near-shoreline wells if groundwater is over-pumped
- COBI checks for potential seawater intrusion (Fig. 4) by monitoring chloride as a surrogate for seawater in near-shoreline wells (Cl⁻ > 100 mg/L is used as an early warning level for potential seawater intrusion)
- Historically, seawater intrusion has not been a significant problem, but as an island this issue is always of concern
- Freshwater sits on top of seawater due to density differences; hence, for every 1' of GW above sea level, GW extends roughly 40' below sea level

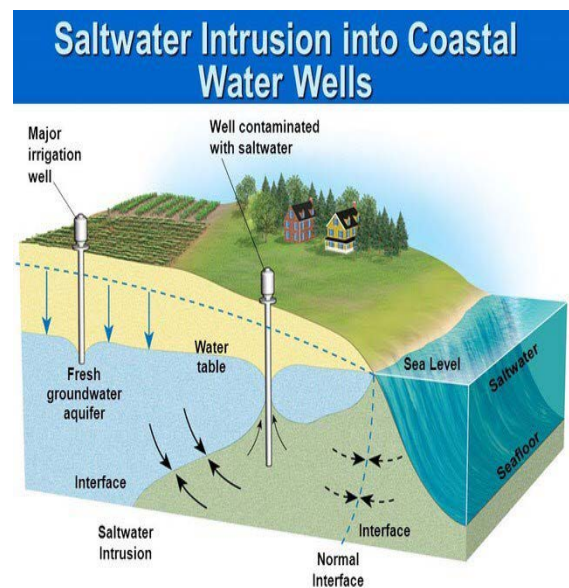


Figure 4. Saltwater Intrusion (from: www.whoi.edu/oceanus/feature/charette)

Water Budget for Bainbridge Island

In its' simplest terms, the water budget for Bainbridge Island can be expressed as (Fig. 5):

$$\text{Inflows} - \text{Outflows} = \text{Change in Storage}$$

- Inflows: recharge from precipitation (85-90%); recharge from septic systems (5-10%); off-island aquifer flow to BI from Kitsap Peninsula (5%)
- Outflows: pumping (5-10%); discharge to BI surface waters (50-60%); discharge to Puget Sound (30-40%)
- Change in Storage: reflected in (calculated from) change in water levels

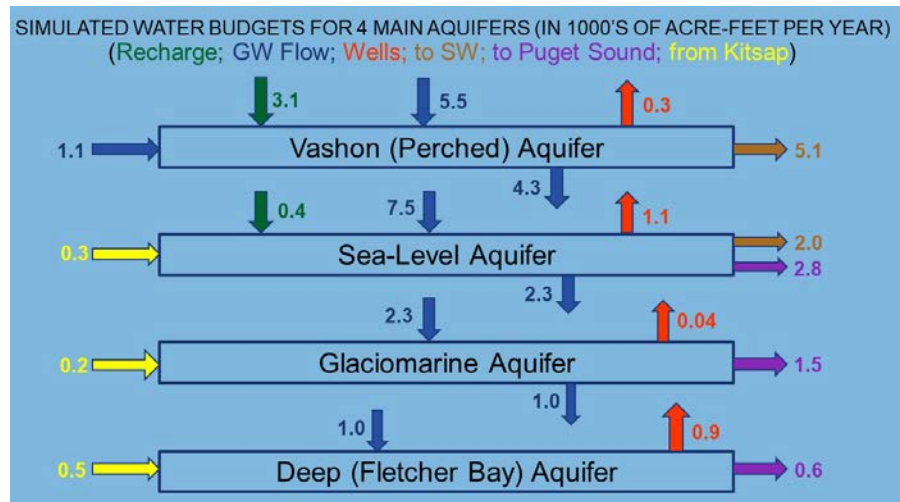


Figure 5. Water Budget for BI (modified from: Frans and others, 2011)

USGS Bainbridge Island Groundwater Model

The general groundwater model used by USGS to model both Bainbridge Island and the entire Kitsap Peninsula is the free, publicly-available, industry standard MODFLOW model (https://www.usgs.gov/mission-areas/water-resources/science/modflow-and-related-programs?qt-science_center_objects=0#qt-science_center_objects). The model specifics for its' Bainbridge Island application are (Fig. 6):

- Horizontal discretization (grid size) – 800 feet by 800 feet; total of 139 columns by 197 rows for all of Bainbridge Island; cells bordering surface waters (streams, coastline) are specified “drains” (flows from GW to SW); presence or absence of the Vashon till confining layer in the surface layer; Gazzam Lake represented by “general head” recharge source (flows from SW to GW)
- Vertical discretization – 33 layers from land surface to bedrock
- Model inputs – monthly precipitation, soils, surface water features, streamflow, wells and monthly pumping, measured monthly water levels
- Model outputs – simulated monthly water levels
- Model calibration – calibrate simulated water levels to measured water levels; adjust model inputs until there is an optimized match of water levels (use weighting of model inputs in adjustment process based on input data certainty and importance)

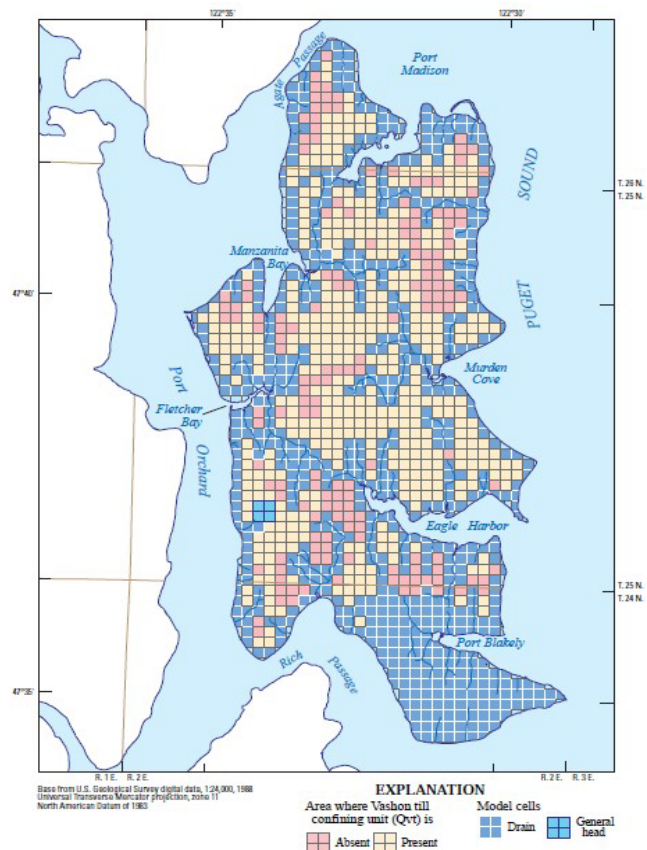


Figure 6. MODFLOW Grid for BI (from: Frans and others, 2011)

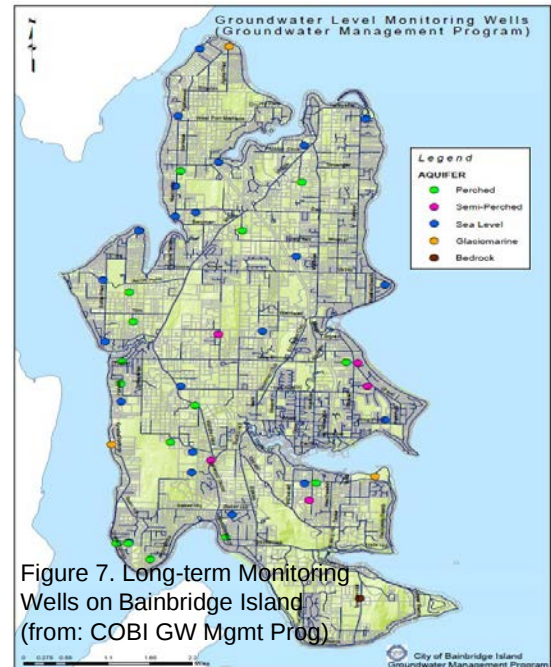
USGS Kitsap Groundwater Model

- This application of the MODFLOW model indicates that groundwater recharge is more important than groundwater pumping in determining impacts on the resource.
- Example in Frans and Olsen, 2016: Decrease of 15% in long-term annual recharge resulted in 16-18% decrease in streamflow over seven years, while 80% decrease in summer watering (about a 40% decrease in summer pumping and 20% decrease in annual pumping) only reduced streamflow by 0.2-0.5% over seven years.

Importance of Monitoring

Although the number and frequency of water-level monitoring wells is in flux, long-term monitoring wells are shown in Fig. 7 by aquifer.

- Changes in water levels over the long-term provide an indication of potential issues (water availability, seawater intrusion)
- Thus, COBI and KPUD should continue monitoring water levels and water quality, and expand the monitoring to include more near-shoreline wells
- Monitoring of water levels in Fall (lowest) and Spring (highest) is most important
- Use non-parametric trend analysis (Seasonal Kendall test) to analyze trends in Fall and Spring water levels (<https://pubs.usgs.gov/sir/2005/5275/pdf/sir2005-5275.pdf>)



Possible Recommendations in GWMP

- COBI and KPUD should expand their groundwater and surface water monitoring program
- COBI should create aquifer conservation zones to enhance recharge
- COBI should develop a water conservation program to reduce water usage
- COBI should incentivize and facilitate the reuse of stormwater and grey water
- COBI should improve wastewater treatment to tertiary and recharge GW with effluent instead of discharging the effluent to Puget Sound
- COBI should improve stormwater management to keep more stormwater on BI for recharging the aquifers instead of running off to Puget Sound
- COBI should develop a community-wide education program on the aquifers of BI

References:

- USGS Frequently Asked Questions; www.usgs.gov/faq/water
- Frans, L.M., Bachmann, M.P., Sumioka, S.S., and Olsen, T.D., 2011, Conceptual model and numerical simulation of the groundwater-flow system of Bainbridge Island, Washington: USGS Scientific Investigations Report 2011-5021, 96 p., www.doi.org/10.3133/sir20115021
- Welch, W.B., Frans, L.M., and Olsen, T.D., 2014, Hydrogeologic framework, groundwater movement, and water budget of the Kitsap Peninsula, west-central Washington: USGS Scientific Investigations Report 2014-5106, 44 p., www.doi.org/10.3133/sir20145106
- Frans, L.M. and Olsen, T.D., 2016, Numerical simulation of the groundwater-flow system of the Kitsap Peninsula, west-central Washington: USGS Scientific Investigations Report 2016-5052, 63 p., www.doi.org/10.3133/sir20165052

Abbreviations: BI – Bainbridge Island; SW – surface water; GW – groundwater; COBI – City of Bainbridge Island; KPUD – Kitsap Public Utility District; USGS – U.S. Geological Survey; Cl – chloride; ETAC – Environmental Technical Advisory Committee; USEPA – U.S. Environmental Protection Agency; GWMP – Groundwater Management Plan



Department of Planning and Community Development

Memorandum

Date: October 27, 2020
To: Environmental Technical Advisory Committee
From: Annie Hillier, Associate Planner
Subject: True-Brown Habitat Management Plan (HMP)

Background

Two alternative methods may be used to meet the goals and policies of the Vegetation Management Section of the [Shoreline Master Program \(SMP\)](#): 1. The standard Shoreline Buffer, comprised of a Zone 1 and a Zone 2 protective buffer with predetermined dimensions (see SMP Table 4-3); or 2. A Site-Specific Vegetation Management Area, with unique dimensional standards intended to protect shoreline vegetation and ecological functions (SMP Section 4.1.3.5.3).

The standard Shoreline Buffer, if applied to this site, would extend 50' landward from the top of the slope and encumber the entire site. In lieu of the standard Shoreline Buffer, the applicant has proposed a Site-Specific Vegetation Management Area. As provided in SMP 4.1.3.5.3, the Site-Specific Vegetation Management Area must include specific dimensional standards that meet the Vegetation Management goals and policies (see SMP Section 4.1.3) as determined through a Habitat Management Plan prescribed in Appendix B, Section B-4, provided the plan demonstrates the following:

- There is no net loss of the property's specific shoreline ecological functions and associated ecosystem-wide processes pursuant to Section 4.1.2, Impact Analysis and No Net Loss.
- Uses the scientific and technical information¹ compiled to support the Shoreline Buffer standards of Section 4.1.3.5(3)(b), and/or other appropriate technical information which, as determined by a qualified professional, demonstrates how the proposal protects ecological functions and processes and how it meets the goals and policies of Section 4.1.3, Vegetation Management.

Project Summary

The project site is located at 5967 Rose Loop NE, along the south shoreline of Eagle Harbor. Critical areas onsite include a geologically hazardous area (i.e. landslide hazard) and associated buffer. A single-family residence (SFR) is currently under construction on the site, which was approved under previous land use

¹ Scientific and technical information supporting the Shoreline Buffer standards is provided in the following documents available at the City of Bainbridge Island's Department of Planning and Community Development: Documentation of Marine Shoreline Buffer Recommendation Discussions, Memorandum, 2011, Herrera Environmental; Addendum to Summary of Science, 2011, Herrera Environmental; Bainbridge Island Current and Historic Coastal Geomorphic/Feeder Bluff Mapping, 2010, Coastal Geologic Services, Inc.; Best Available Science, 2003, Battelle; Bainbridge Island Nearshore Habitat Characterization and Assessment, 2004 Battelle.



and building permits. The new proposal includes redeveloping the access to the shoreline and creating access pathways and terraces surrounding the SFR. The proposed Site-Specific Vegetation Management Area is shown on sheet L11 and described within the HMP; it is located between the SFR and the shoreline and wraps around the sides and front of the SFR. Landscape plans provide specific details about the types of plantings proposed.

Next Steps

In accordance with SMP 4.1.3.5.3(a) (ii), the HMP must be reviewed by an independent third party. The Environmental Technical Advisory Committee (ETAC) should review the HMP for compliance with the standards in Appendix B, Section B-4, and should determine whether the proposal meets two requirements identified above. Staff intends to take into account all recommendations provided by ETAC prior to making a decision on the proposed Site-Specific Vegetation Management Area, and will add conditions to the proposal as necessary. The Administrator (e.g. Director) may approve, approve with conditions, or deny the request for a Site-Specific Vegetation Management Area.

Attachments

Habitat Management Plan and No Net Loss Assessment (Peninsula Environmental Group, Inc. 2020)
Site Plan (sheet L11, Bart Berg Landscape LLC)
Landscape Plans (sheets L1, L2, Bart Berg Landscape LLC)



PENINSULA ENVIRONMENTAL GROUP, INC.

Community Specific — Resource Specific Planning

Report Title	True/Brown Shoreline Development
Description	Shoreline Impact Analysis and Statement of Net Loss Habitat management Plan FEMA Floodplain Habitat Assessment Shoreline Functions Evaluation
Report Date	June 20, 2020
Agent	Bart Berg
Property Owner	TRUE LAWRENCE D & BROWN LINDA 1108 WILLARD ST, SEATTLE
Project Address	5961 Rose Loop NE Bainbridge Island, WA, 98110 Kitsap County Parcel: 3425021025004
Prepared By	Peninsula Environmental Group, Inc. Office: (360) 504-3825 Online: www.peninsulaenvironmental.com <u>Consultants:</u> John Bornsworth Urban Forester & Senior Ecologist Liz Donadio Biologist
Project Number:	20242

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Thank you for the opportunity to contribute to your project. We are pleased to present the results of our services in this letter. If you have questions do not hesitate to contact us. Peninsula Environmental Group, Inc. is a Port Angeles-based company specializing in advanced evaluation and interpretation of urban and natural resources. We provide evidence-based, scientific natural resource consulting, stewardship, and design services.

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1 Executive Summary

Our Client, Bart Berg, is managing the permitting and development of a 0.21-acre single-family development on the southern shore of Eagle Harbor on Bainbridge Island. No structures exist upland on the parcel prior to development, except for an 850 square foot gravel parking pad. Within the shoreline environment there exists a dock and a small boat cabin. This shoreline dock and cabin are not being rebuilt, or enlarged, though they are receiving some general maintenance and upkeep.

The parcel is entirely in the Shoreline Residential Conservancy jurisdiction, with approximately 64 feet of linear high-bluff coast and approximately 90 feet of maximum vertical feet from the Puget Sound at 150 feet from the ordinary highwater mark (OHWM). The northern edge of the parcel abuts the Puget Sound, on the south side of Eagle Harbor. The southern side of the parcel abuts Rose Loop NE. The very northern edge of the property, approximately 10-15 mapped feet from the OHWM, rests within a FEMA Flood Hazard Area AE, though the proposed project is entirely outside the mapped flood zone. The FEMA Flood Hazard Area is upland of an armored shoreline. The majority of the parcel is mapped with a steep slope greater than 40%. See Figures 1 – 2.

The development project adds 1,635 square feet impervious service to what was previously existing. The planned single-family dwelling totals 1,200 ft², while additional impervious and semi-pervious landscape features add an additional 1,285 square feet.

Proposed impact triggers the necessity for a specific site impact analysis to determine what shoreline functions may be lost by the development and how those impacts can be mitigated. All work is being performed outside of the OHWM and the mapped FEMA flood zone. Invasive and noxious weed control will be removed and restored with native plant material within the FEMA flood zone. Other than normal excavation involved with planting and installing small trees and shrubs, no soil movement will occur.

We have collaborated with, and reviewed final renditions, of Bart Berg Landscape LLC (landscape architect) landscape plans for the project and approve their plans, which include sheet L1, L2, and L11. An additional tree risk and management plan was developed by Peninsula Environmental Group in 2019 to discuss tree risk on site and recommend pruning and removal of certain significant trees.

To reduce and compensate for impacts where the footprint is extended, areas where the existing footprint is removed will be restored with native and equivalent plantings. Additional rehabilitation of the coastal bluff and native soils/vegetation upland will further demonstrate reduced impacts. No grading or material is being brought into the SSVMA or the FEMA flood zone.

Due to limited parcel dimensions, the prescriptive shoreline buffering offered by the COBI Shoreline Master Plan does not apply to this parcel. The parcel is nearly entirely inside the prescriptive shoreline buffer. Instead we seek to delineate a Site-Specific Vegetation Management Area (SSVMA) rather than applying the normal Zone 1 and Zone 2 shoreline buffer, per SMP Section 4.1.3.5. The proposed updated dimensional standards for the SSVMA is outlined in Chapter 6.4 Non-conforming Shoreline Buffer. Zone 1 is proposed as 30 feet and Zone 2 is proposed as 70 feet, per Herrera 2011 findings.

If the guidelines and mitigating measures in this report are followed, we find the proposed project will result in a **no-net-loss of shoreline function**. The proposed project **may affect, but is not likely to adversely affect**, ESA listed species. Proposed construction actions, related to the demolition and construction of the home, are completely outside of the FEMA Flood Hazard Area. Natural shoreline enhancement activities, to include invasive plant control and native or equivalent plant installation, are partially within the FEMA Flood Hazard Zone.



1.1 Proposed Activity

Current structure and zoning and proposed structure and zoning are R2.9 and single-family homes. As mentioned above, the entirety of the parcel rests within the Shoreline Residential environmental designation. A table of existing and proposed footprints are below.

Area	Existing (Ft ²)	Proposed (Ft ²)	Difference (Ft ²)	Percentage of Total Lot Size
Home – Primary Structure/Footprint	0	1,200	+1,200	13%
Additional Impervious or Semi-pervious Surfaces ¹	850	1,285	+435	N/A
Total impervious or semi-pervious surfaces	850	2,485	+1,635	30%
Site-Specific Vegetation Management Area	N/A	6,322	+6,322	69%
Total Lot Size	9,148	9,148	N/A	100%
SFD Setback from OHWM	N/A	70-79	N/A	N/A

Construction:

A 1,200 square foot single-family unit will be constructed, in the general vicinity of the old gravel parking lot. Appurtenance impervious and semi-pervious facilities totaling 1,285 square feet will be installed around the main structure and down the steep slope. The SFD will be setback from the OHWM approximately 66-79 feet, from west to east respectively.

Landscape Mitigation:

When the Consultant visited the site in 2019, the entire steep slope was inundated with Himalayan blackberry (*Rubus armeniacus*) and English laurel (*Prunus laurocerasus*), which have been removed and will be replaced with native plant specimens. A row of significant Douglas-fir trees (*Pseudotsuga menziesii*) near the south western edge of the property suffered root excavation damage and have been discussed in a tree risk report by the Consultant dated September 18, 2019. We have collaborated with, and reviewed final renditions, of Bart Berg Landscape LLC (landscape architect) plans, including sheet L1, L2, and L11, for the landscape mitigation and SSVMA delineation.

1.2 Description of Work

Existing gravel parking lot will be used to stage material and build the single-family home. Retaining walls discussed in geotechnical reports are being installed adjacent to the structure. A wooden staircase will extend the steep slope to the rock bulkhead. Other appurtenance structures, like a garbage enclosure, generator pad, sidewalk, and driveway, are being installed with both impervious and semi-pervious structures. Where available, impervious hardscapes are being retrofitted with semi-pervious LIDs and structures.

¹ Includes table 2 on L11 from Bart Berg Landscapes LLC.



Standard TESC measures will be installed in a manner consistent with City of Bainbridge Island Municipal Code and development standards, described in the construction plans.

Stormwater management implementation will meet City of Bainbridge Island stormwater requirements (Stormwater Management Manual for Western Washington 2014 edition). A stormwater management system is currently installed, as through a tightline and dissipator below the bulkhead. This system was present prior to the development application. New stormwater discharge from impervious installation will be rerouted to this existing tightline and released below the bulkhead. Any uncaptured stormwater is expected to infiltrate locally and evaporate.

No beach access is required. All debris will be removed from site, including noxious weed debris. No grading, outside of the construction zone, is required.

Mitigation will consist of rehabilitating the steep slope with native plantings, and removal of noxious weeds. Invasive weeds within the lower slope and beachface area growing entirely above the OHWM and within the FEMA Flood Hazard Zone.

No new impervious surfaces, grading, or mechanized equipment will occur within the FEMA Flood Hazard Zone or below the OHWM.



2 Background

Bart Berg of Bart Berg Landscapes LLC (the “Client”) requested a site-specific impact analysis and biological opinion at 5961 Rose Loop NE, Bainbridge Island, WA 98110 as required by the city of Bainbridge Island. Bart Berg is the landscape architect for the True/Brown party, the property owners. Peninsula Environmental (the “Consultant”) consultants, John Bornsworth and Liz Donadio, visited the above address to evaluate potential impacts that may result from development on the site. Our assessment, opinions and recommendations are included in this letter. Please contact us with questions you may have regarding this report.

Assignment & Purpose:

- Evaluate baseline environmental conditions at property.
- Apply proper mitigation sequence consideration to potential impacts of development.
- Determine specific impacts of site development.
- Provide a site-specific impact analysis report, including mitigation plan for proposed impacts.

This report summarizes the information collected during our site reconnaissance and assessment, our conversations regarding the project, and our professional opinions and recommendations. The results and recommendations of this report represent our professional opinion compiled from biological forensics, information provided to us, referenced material and our experience. Our recommendations are compiled with industry standards, best-available-science and currently accepted best management practices.

Additional project specific limitations:

- Consultant’s employees visited the property on April 10, 2019 and September 10, 2019. This report summarizes site characteristics as they were observed these days only.
- This report is intended for the exclusive use of the Client and their agents and only for specific application to the referenced property. This report should not be applied to any other landscape or other property for any purpose.
- Our evaluation assesses only the areas identified within the scope of this project.
- Contours, shoreline, and shoreline designation layers were sourced from Bainbridge Island’s ArcOnline data.
- Climate data was gathered from the NRCS National Water Climate Center (2019).
- Parcels data was sourced from Kitsap County GIS Data, but lines may not be survey accurate.



3 Site Assessment

3.1 Site History

Kitsap County records shows the parcel undeveloped, with a gravel pad dating back to the early 2000's. Prior site history is unknown.

3.2 Site Properties

Table 1. Site properties as of assessment date.

County	Kitsap
Parcels	34250210252004
Acreage	0.21
Zoning	Residential-R-2
WRIA	Water Resource Inventory Area 15 – Kitsap
Critical Area Inventory	AE FEMA Flood Zone Shoreline Master Program: Shoreline Residential Conservancy Geologically Hazardous Area: 15-40% and 40%+ slopes.
Elevation Range	Approximately 60 feet, rising toward the south up the bluff to Rose Loop NE.
Aspect	North
Existing Structures	None (gravel pad exists, 850 sqft)
Site Visit Conditions	The weather was clear during the site assessment. There was little to no wind, and temperatures around 48°F.

3.3 Landscape Characterization and Existing Conditions

- Site is almost entirely unimproved and historically impacted with noxious weeds. If unimpacted, Washington's Natural Heritage Program would likely classify the historical forest type a component of the "North Pacific Maritime Dry-Mesic Douglas-fir Western Hemlock Forest" ecosystem (Rocchio & Crawford 2015).
- **Pre-development:** A grouping of significant remnant trees (Douglas-fir) are present on the southwestern corner of the property, acting as a visual barrier. A single large red alder (*Alnus rubra*), which has been previously logged and topped, exists on the northwest corner of the property. Two western redcedars (*Thuja plicata*) exist in the center of the property. Lastly a significant, but decaying, western redcedar is on the northeastern side of the property. Both wood decay fungi *Kretzschmaria deusta* and *Ganoderma applanatum* were observed on the tree base. Existing non-tree vegetation are is limited to a homogenous understory of Himalayan blackberry and common horsetail (*Equisetum arvense*).
- **Backshore & Aquatic:** Rock bulkhead exists along shore to the north and south. Himalayan blackberry is growing along the upper edges of the bulkhead. Surficial beachface substrate is 3-5-centimeter cobble, with underlying gravel and sand. Low levels of natural woody debris recruitment are observed throughout the backshore. Surficial debris from shellfish are deposited



across the upper wrack line. Patchy fringe colonies of eelgrass (*Zostera marina*) is mapped on the shoreline and in either direction (east/west) in each direction.

- **Coastal Processes** of the shoreline is mapped as a non-exceptional feeder bluff landform with a southerly (LtR) accretion by the Ecology's Coast Atlas.
- Geomorphic shoretype: high bluff
- A list of plant species observed is Table 2 below.
- Annual precipitation in the area is between 30-40 inches, predominantly falling in the fall and winter.
- Water quality: Section 303(d) of the 1972 Federal Clean Water Act (CWA) requires states to identify and list threatened and impaired water bodies. There are no waterbodies in the direct vicinity of the project listed as an impaired for any assessed criteria (Ecology 2018).
- **Shoreline Buffers and Property Dimensions:** The property extends approximately 165 feet upland from the OHWM to Rose Loop NE, on the western side, and 145 feet on the eastern side. Neighboring parcels to the east and west of the subject parcel are developed lots with single-family dwellings. Existing shoreline buffers on those two properties are approximately 45 feet and 50 feet (measured from the OHWM to existing marine riparian plants).

3.4 Observed Plants

Table 2: Plant species observed during site visit

	Species	Common Name	Origin	Abundance
Trees	<i>Thuja plicata</i>	Western redcedar	Native	Uncommon
Woody plants >35 ft.	<i>Pseudotsuga menziesii</i>	Douglas-fir	Native	Uncommon
	<i>Salix spp</i>	Willow	Native	Uncommon
	<i>Alnus rubra</i>	Red alder	Native	Uncommon
	<i>Rubus spectabilis</i>	Salmonberry	Native	Rare
Shrubs Small trees <35 ft and woody shrubs of all sizes	<i>Rosa gymnocarpa</i>	baldhip rose	Native	Uncommon
	<i>Rosa nutkana</i>	Nootka rose	Native	Common
	<i>Solanum dulcamara</i>	Bittersweet nightshade	Exotic	Common
	<i>Cirsium vulgare</i>	Bull thistle	Exotic	Uncommon
Herbaceous Herbaceous vegetation are non-woody plants and include grasses, ferns, and forbs (herbaceous flowering plants that are not grasses).	<i>Convolvulus arvensis</i>	field bindweed	Exotic	Common
	<i>Galium aparine</i>	common bedstraw	Native	Uncommon
	<i>Polystichum munitum</i>	sword fern	Native	Common
	<i>Rubus armeniacus</i>	Himalayan blackberry	Exotic	Common
	<i>Ranunculus repens</i>	Creeping buttercup	Exotic	Common



3.5 Observed Wildlife and Habitat

- No snags, perching branches or whitewash was observed on the site.
- Washington State Forage Fish Spawning Map shows the beachface mapped as smelt spawning. Figure 3.



4 Species of Concern

4.1 Listed Species, Critical and Priority Habitats

A species and habitat list for the project site was compiled from United States Department of Fish & Wildlife (USFWS) Information for Planning and Consultation (IPaC) database, the Washington State Department of Fish & Wildlife (WDFW), the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries (NMF), Pacific Fisheries Management Council (PFMC).

Species, Habitat, ESU ² or DPS ³	Scientific Name	Status
Surf Smelt	<i>Hypomesus pretiosus</i>	N/A
Estuarine and Marine Wetlands	Aquatic habitat	USFW – Priority Habitat WDFW – Priority Habitat
Southern resident Orca	<i>Orcinus orca</i>	WDFW – Endangered
Coho salmon	<i>Oncorhynchus kisutch</i>	EFH ⁴
Pink salmon	<i>Oncorhynchus gorbuscha</i>	EFH

Table 3: Occurrence of listed species and critical habitats near project area.

4.2 Species and Habitats Descriptions

Surf smelt (*Hypomesus pretiosus*): Surf smelt occur abundantly throughout the nearshore marine waters of Washington, from the Columbia River to the Canadian border and into southernmost Puget Sound and Hood Canal. Genetic research suggests that, despite this broad distribution, surf smelt throughout Puget Sound represent a single stock.

Surf smelt populations can generally be divided into summer spawners and fall/winter spawners, though year-round spawning has been documented in the Whidbey Basin, Port Susan, portions of the San Juan Islands, and central Puget Sound (Eagle Harbor and Sinclair Inlet). Spawning occurs along the central outer coast of Washington (i.e., from the Quillayute River to just south of the Quinault River) from January through October. Spawning generally occurs in the Strait of Juan de Fuca, northern Saratoga Pass, Birch Point, and Cherry Point from May to October. Spawning occurs from at least July to April in the Bremerton-Poulsbo area, southernmost Puget Sound, and southern Hood Canal. Currently, about 259 lineal statute miles of Washington State shoreline are documented surf smelt spawning beach.

Bull Trout (*Salvelinus confluentus*): The historical range of bull trout included Alaska, California, Idaho, Montana, Nevada, Oregon and Washington. Two forms of bull trout exist: migratory and resident. Migratory bull trout move to larger bodies of water to overwinter, then migrate back to smaller water bodies to reproduce, whereas resident bull trout spend their entire lives in the same stream or creek. There also exists an anadromous form in the Coastal-Puget Sound population, which spawn in rivers and streams but rear their young in the ocean. Adult migratory bull trout feed primarily on fish, while resident and juvenile bull trout feed on invertebrates and small fish.

The most common threats to bull trout are loss of historical habitat and fragmentation of remaining habitat, predation by invasive species, fish passage issues, and rising water temperatures due to climate

² ESU: Evolutionarily Significant Unit which include Pacific salmon.

³ DPU: Distinct Population Unit

⁴ EFH: Essential Fish Habitat



change and other natural or manmade factors. Current recovery plans aim to protect the remaining good habitat and restore what has been degraded to ensure enough connectivity among populations.

Bull trout require cold water to survive, and thus seldom venture into waters above 59-64 degrees Fahrenheit. Additional Primary Constituent Elements (PCEs) of the species include stable stream channels, clean spawning and rearing gravel, complex and diverse cover, and unblocked migratory corridors.

Southern resident Orca (*Orcinus orca*): The Southern Resident Killer Whales spend several months of the summer and fall in the Puget Sound. The population is made up of three family groups, known as the J, K, and L pods. The population of all three pods have fluctuated considerably over the last 40 years due to captures for marine parks that took place between 1965-1975. As of July 1st, 2016, only 83 individuals remained in the population.

Current population decline is likely due to a reduced quantity and quality of prey, oil spills, persistent pollutants that cause immune and reproductive system dysfunction, and noise disturbances from vessels.

PCEs for this species is limited to the open waters of the Puget Sound, with adequate prey and clean water that is free of contaminants and other pollutants.

Estuarine and Marine Wetlands: WDFW identifies estuarine and marine wetlands along the shoreline of the subject parcel. This is the standard critical habitat designation given to all Washington State shorelines. Site investigation did not reveal any non-marine shoreline wetland habitat features, such as inundation in the backshore, tidal flats, or other estuarine vegetation.

Priority Habitat Features – Snags & Logs: WDFW identifies priority habitat features of snag and logs. Priority habitat of snags are defined as native trees, a minimum of 6 feet in height, and a minimum of 20 inches in diameter 54 inches above grade.



5 Mitigation Sequence

Table 4: Mitigation Sequence

Mitigation Step	Mitigation Action(s)
Avoiding the impact altogether by not taking a certain action or parts of an action.	Avoidance does not result in building a SFD, and provides the least amount of shoreline impact.
Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to avoid or reduce impacts.	Low impact development methods will be utilized to prevent erosion into the slope or shoreline during development, and to avoid impact existing vegetation adjacent to development areas.
Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.	Any areas temporary impacted by constructions practices will be restored to pre-construction conditions, or further enhanced.
Reducing or eliminating the impact over time by preservation and maintenance operations.	- Proper stormwater management of the new structures will ensure runoff for impervious surfaces does not reduce slope stability or increase erosion on site. - Impacts from new impervious surfaces will be reduced by installing semi-pervious pavers, and other semi-pervious surfaces, where feasible.
Compensating for the impacts by replacing, enhancing, or providing substitute resources or environments.	- Areas where invasive plants are removed will be restored with native plants. - Planting density will be high, to ensure rapid plant succession. 95% of landscape plan will incorporate native plants.
Monitoring the impact and the compensation project and taking appropriate corrective measures.	Native plant installations will need to be monitored for survival annually for at least five years, following contingency plan in Appendices.



6 Effects of Proposed Action

6.1 [Effects on Listed Species and Critical Habitats](#)

Estuarine and Marine Wetlands: Demolish/construction activities from the proposed actions, given they follow prescribed mitigation strategies, will have **no effect** on the marine wetland (Puget Sound).

Surf smelt: Some proposed actions **may affect, but not likely to adversely affect**, the surf smelt populations on the beachface. This includes the removal of the western redcedar tree currently shading the beach, and any work performed on the docks, potentially spilling toxins into the beachface.

No significant impacts are expected for prey species, passage conditions, or water quality that would adverse effect Southern resident Orca, bull trout or salmonid EFHs.

6.2 [Effects on Shoreline & Coastal Processes](#)

Both FEMA floodplain and Washington's Shoreline Management act require a review of potentially affected shoreline functions. These include water quality/quantity affects, coastal shoreform and sediment drift modifications, bank protection, nutrient cycling, and animal and plant habitat. The extents of both the FEMA shoreline process compliance and SMP shoreline compliance are different. COBI SMP's jurisdiction covers the entirety of the project, including all demolition and construction, while FEMA's floodplain covers only the natural area enhancement phase of the project.

Washington State's standard for protection of marine and freshwater shoreline resources is "no net loss".⁵ Net loss is measured by identifying shoreline ecological functions "as they currently exist" against shoreline functions after a specific action modifies a specific shoreline. "As they currently exist", refers to current shoreline conditions immediately prior to the action. These current conditions may be a natural setting or a degraded setting. Shoreline resources will incur a net loss if their functions, values and processes are not sustained after the action. Net loss does not compare historical ecosystems.

Specific shoreline functions of this property include:

- 1) Bank stability/Sediment recruitment
 - Project actions include a planned removal of English ivy from the slope and replacement with native plants.
 - Project actions include construction of single-family dwelling at top of slope.
 - i. All geotechnical bank stability opinions are rendered by geotechnical/geological engineers in their appropriate opinions.
 - Actions will positively affect slope stability.
 - Landform is a feeder bluff shoreform, sediment transport will not be negatively affected by vegetation alterations.
- 2) Nutrient cycling
 - Limited detritus is accumulated from current vegetation within 50 feet of beach.
 - Installation of native shrubs within the shoreline will increase detrital fall, beachface organic deposits and insect abundance.
- 3) Fish & wildlife habitat

⁵ WAC 173-26-201(2)(c)



- Beachface is currently shaded in afternoon by eastern facing slope. Vegetation does not contribute to beachface shading at this time. Installation of shall shrubs on the beachface will unlikely increase beachface shading in a measurable way.
 - Large trees, proving the primary wildlife habitat on the site, are being retained. The removal of invasive/exotic plants form the upland and nearshore slope will positively contribute to native/regional vegetative habitat, as opposed to exotic vegetative habitat.
 - Fish & wildlife habitat will be improved under this plan, given invasive plants are removed and replaced with native/equivalent/non-native species.
- 4) Woody debris recruitment
- No grading and limited soil disturbance will occur on the upper beachface. Invasive plants will be hand-pulled and extracted from the site and replanted with native plants, resulting in limited soil disturbance.
 - Project will have no impact on woody debris recruitment.
- 5) Stormwater pollution control
- Current stormwater on site is being conveyed into the Puget Sound. As planned, stormwater will be collected and allowed to infiltrate into soils. Excess stormwater will be routed into Puget Sound, resulting in a net decrease in stormwater pollution.
 - Where applicable, evergreen plants will be chosen for revegetation/replacement to contribute to rainwater attenuation.
 - Project will demonstrate net-increase in stormwater pollution control.

6.3 FEMA Floodplain Habitat Assessment

Limited hand digging and planting will occur in the within the FEMA floodplain Zone AE. The project results in removal of invasive vegetation on the sloe, and restoration with native/equivalent plants. The proposed action is landward the OWHM of the Puget Sound and above the rock bulkhead. No construction, grading, storage or heavy machine beach access is required within this are. Results from this action will decrease abundance of invasive plants and increase abundance of natives. The restoration project will have **no effect** on flood storage, flood velocity, water quality or water quantity of the Puget Sound. Federally and state listed species were reviewed above.

Water Quality and Quantity

There will be the above stated increased impervious surfaces that would lead to increased stormwater discharge or runoff, both of which could nominally alter the quantity and quality of the water in nearby waterbodies. Mitigation strategies indicate all stormwater will be routed into a tightline with end-cap dissipator and released onto the shoreline beach, below the bulkhead. This stormwater management system is currently installed and has been prior to the submission of this development application.

There will be no change to water temperatures from this development, as there is no removal of vegetation that results in shading of any bodies of water. The proposed development **may affect but is not likely to adversely affect** water quality or quantity to the marine riparian environment of the Puget Sound.

Flood Volumes and Velocities

No grading, fill or sediment is being brought into the floodplain. The proposed projects will have **no effect** on flood volumes or velocities.

Spawning Substrate/Gravel Recruitment



Site is mapped by the WDFW as surf smelt spawning habitat. The proposed project includes on-dock maintenance and repair, and high-risk tree removal. The project **may affect, but is not likely to adversely affect** on spawning substrates or gravel recruitments along the shoreline.

Floodplain Connectivity

The proposed development will have **no effect** on the 100-year floodplain connectivity of the Puget Sound.

Stormwater Discharge

The proposed development will result in 1,285 square feet of new impervious surface. The increase in impervious surface will lead to a nominal increase in stormwater discharge. The development **may affect but is not likely to adversely affect** stormwater discharge with proper stormwater management methods.

Riparian Vegetation/Bank Stability

The proposed invasive control and planting is above the rock bulkhead, and thus will have **no effect** on bank stability. Natural restoration and invasive control **may affect, but is not likely to adversely affect**, the marine riparian vegetation. One high-risk tree is being removed from the waterfront, this tree is heavily decayed and likely has reduced root stability, as such it's removal from the slope will not likely impact mechanical slope stability.

Channel Migration

The proposed development does not involve any stream channel activities, and as such will have **no effect** on channel migration.

Large Woody Input

The proposed action, as it is above the rock bulkhead, will have **no effect** on large woody input to the shoreline.

6.4 [Non-conforming Shoreline Buffer](#)

Existing shoreline buffer according to the COBI Shoreline Master Plan is 50 feet from top of bluff. Zone 1 extends from the OHWM 30 feet upland or to the extent of native vegetation. Zone 2 is the remaining buffer. Zone 1 would be measured at 30 feet, as no native vegetation exists on site. Zone 2 is inapplicable to this site, as nearly the entire parcel rests shore-side of the top of bluff. The top of bluff in this scenario, is roughly 20 feet shoreside from Rose Loop NE.

As such, the prescriptive shoreline buffer is inadequate to address this site and requires a Site-Specific Vegetation Management Area.

According to Herrera Environmental Consultants (Herrera 2011), a marine riparian protection zone *with existing properly functioning riparian habitat* is recommended at between 30 and 200 feet. Moreover, Herrera 2011 notes "in areas completely lacking native riparian vegetation, the City would establish a minimum 30-foot RPZ zone." This parcel has very limited intact native riparian vegetation, to include a large red alder, and a high-risk western redcedar. Ground cover and shrubs are dominated by invasive species.

This area, referred to as Zone 1 by COBI, will be restored to a native plant community, and native deciduous shrubs and ground cover will be installed along the shoreline, upland of the bulkhead. Other shrubs plan to be installed on the western and eastern edges of the 30-foot Zone 1 area. This is a **net increase in shoreline function in Zone 1**.



The existing gravel parking lot, invasive/noxious weeds, and a western redcedar, a line of Douglas-firs, and Rose Loop NE make up Zone 2. Table 1 in Herrera 2011, notes mean and median Existing Distance from Structures to OHWM are 60-68 feet. This is below the proposed 70-79 foot marine riparian setback from the building envelope. Given the planned improvements on riparian vegetation in Zone 2 (removal of noxious weeds and installation of natives plants) and the known benefits of native plants on ecological function, habitat function and shoreline processes (Battelle 2003), we expect **no net loss in shoreline function in Zone 2**.

If the guidelines and mitigating strategies in this report are followed, we find proposed project will result in a **no-net-loss of shoreline function** using the proposed Site-specific Vegetation Management Area.

In conclusion: the proposed dimensional standards for the non-conforming shoreline buffer are as follows:

Zone 1: 30 feet

Zone 2: 70 feet



7 Closing

Work for this project was performed and this report prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. No warranty, expressed or implied, is made. Neither the Consultants, nor Peninsula Environmental Group, Inc., has any current or prospective interest in the plants or properties discussed. Acceptance of this report acknowledges receipt and agreement with Peninsula Environmental Group, Inc. attached Assumptions & Limiting Conditions.

If the guidelines and mitigating strategies in this report are followed, we find proposed project will result in a **no-net-loss of shoreline function**, the proposed project **may affect, but is not likely to adversely affect**, ESA listed species or the FEMA floodplain.

A handwritten signature in black ink, which appears to read "John Bornsworth", is positioned above the contact information.

John Bornsworth | Senior Ecologist
ISA Board Certified Master Arborist® | Municipal Arborist® #PN-7955BM
Tree Risk Assessment Qualified® | Washington Community Forestry Council
Member, American Society of Consulting Arborists



8 References

- Alaska Department of Fish and Game. "Short-tailed Albatross, Species Profile."
<http://www.adfg.alaska.gov/index.cfm?adfg=shorttailedalbatross.main>
- Dalton, M.M., P.W. Mote, and A.K. Snover [Eds.]. 2013. Climate Change in the Northwest: Implications for Our Landscapes, Waters, and Communities. Washington, DC: Island Press.
- Federal Emergency Management Agency. "FEMA Flood Map Service Center."
<https://msc.fema.gov/portal/home>
- Johnson, David H., and Thomas A. O'Neil. Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press, 2001
- Priority Habitats and Species List. Washington Department of Fish and Wildlife. WDFW Habitat Program. Olympia, WA. 2008. Print.
- Rocchio J.F. and R.C. Crawford [Eds.]. 2015. Ecological Systems of Washington State: A Guide to Identification. Washington Natural Heritage Program, Washington State Department of Natural Resources. Report 2015-04.
- Documentation of Marine Shoreline Buffer Recommendation Discussions, Memorandum, 2011, Herrera Environmental
- Addendum to Summary of Science, 2011, Herrera Environmental
- Bainbridge Island Current and Historic Coastal Geomorphic/Feeder Bluff Mapping, 2010, Coastal Geologic Services, Inc.
- Bainbridge Island nearshore assessment: Summary of best available science. Prepared for: City of Bainbridge Island. October 2003.
- Bainbridge Island Nearshore Habitat Characterization and Assessment, 2004 Battelle.



8.1 General Assumptions & Limitations

1. Any legal description provided to Consultant is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. Consultant assumes no responsibility for verification of ownership or locations of property lines, or for results of any actions or recommendations based on inaccurate information. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes or other governmental regulations, unless explicitly stated otherwise.
2. Consultant assumes no responsibilities for legal matters in character. Consultant assumes all property appraised or evaluated is free and clear and is under responsible ownership and competent management.
3. Any evaluation or assessment carried out was restricted to the property and the plants or landscapes within the Scope of Assignment. No assessment of any other plants or landscapes has been undertaken by Consultant. The conclusions of this report do not apply to any zones, landscapes, trees, plants, or any other property not explicitly covered in the Scope of Assignment.
4. The total monetary amount of all claims or causes of action the Client may have as against Consultant, including but not limited to claims for negligence, negligent misrepresentation, and breach of contract, shall be strictly limited to solely the total amount of fees paid by the Client to Consultant pursuant to the Agreement for Services as dated for which this Assignment was carried out. Further, under no circumstance may any claims be initiated or commenced by the Client against Consultant, or any of its directors, officers, employees, contractors, agents, or Assessors, in contract or in tort, more than 12 months after the date of this Assignment.
5. Although Consultant has taken care to obtain all information from reliable sources and to verify the data insofar as possible, Consultant does not guarantee and is not responsible for the accuracy of information provided by others.
6. Consultant shall not be required to testify or attend court due to any report unless mutually satisfactory contractual arrangements are made, including payment of an additional fee for such Services as described in a Consulting Arborist Agreement.
7. Unless otherwise required by law, possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the parties to whom it is addressed, without the prior expressed written or verbal consent of the Consultant.
8. Neither all or any part of the contents of this report, nor copy thereof, shall be conveyed to anyone, including the client, to the public through advertising, public relations, news, sales or other media, without prior expressed written consent of Consultant. Particularly as to value conclusions, identity of Consultant, or any reference to any professional society or to any initial designation conferred upon Consultant as stated in its qualifications.
9. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event or upon any finding to be reported.
10. All photographs included in this report were taken by Consultant during the documented site visit, unless otherwise noted.
11. Sketches, drawings and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys. The reproduction of any information generated by architects, engineers or other Consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by Consultant as to the sufficiency or accuracy of the information.
12. Unless otherwise agreed, (1) information contained in this report covers only the items examined and reflects the condition of those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring. Consultant makes no warranty or guarantee, express or implied, that the problems or deficiencies of the plans or property in question may not arise in the future.
13. This report is based on the condition of the trees, landscape, or plants at the time of inspection.
14. Loss or alteration of any part of this report invalidates the entire report. This report is only valid if reproduced from a digital file.



9 Figures

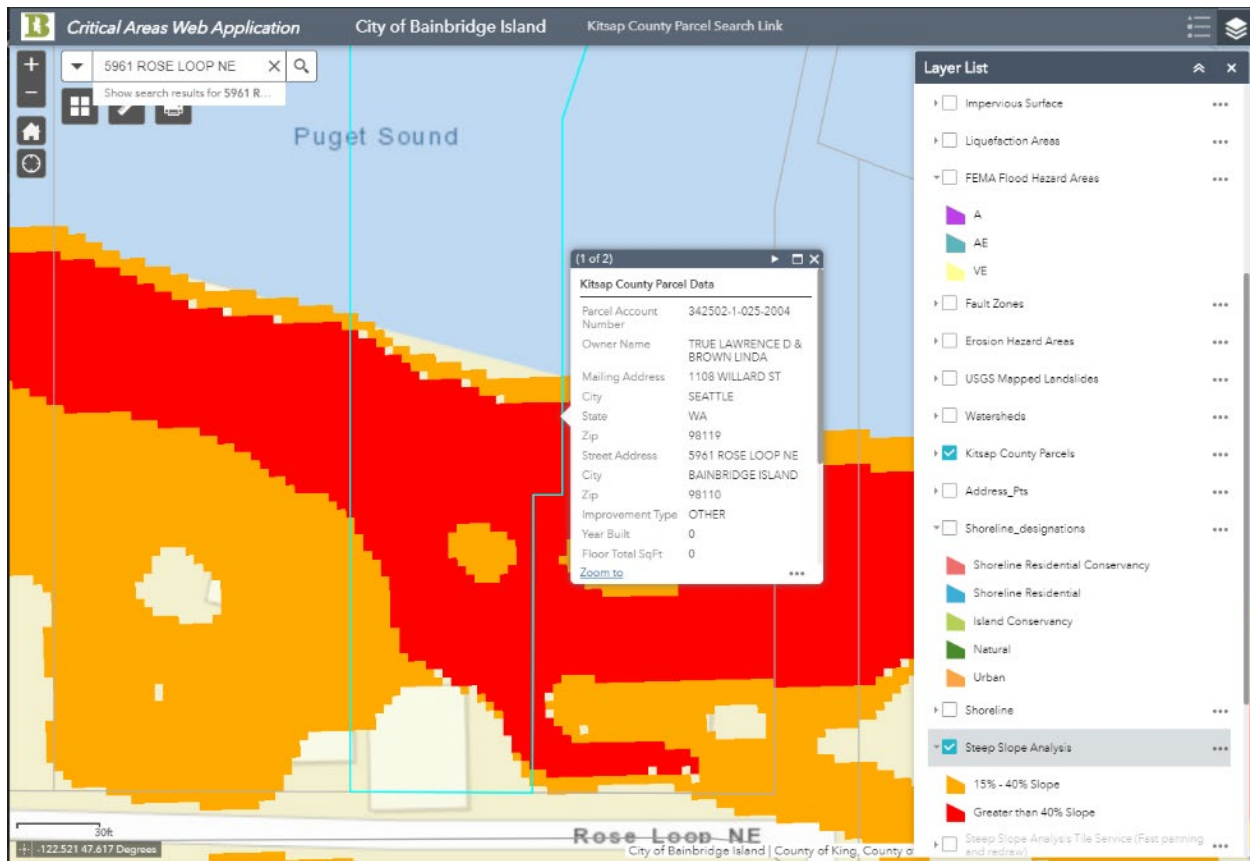


Figure 1: Steep slope analysis of property. Bainbridge Island Critical Areas Web Application.

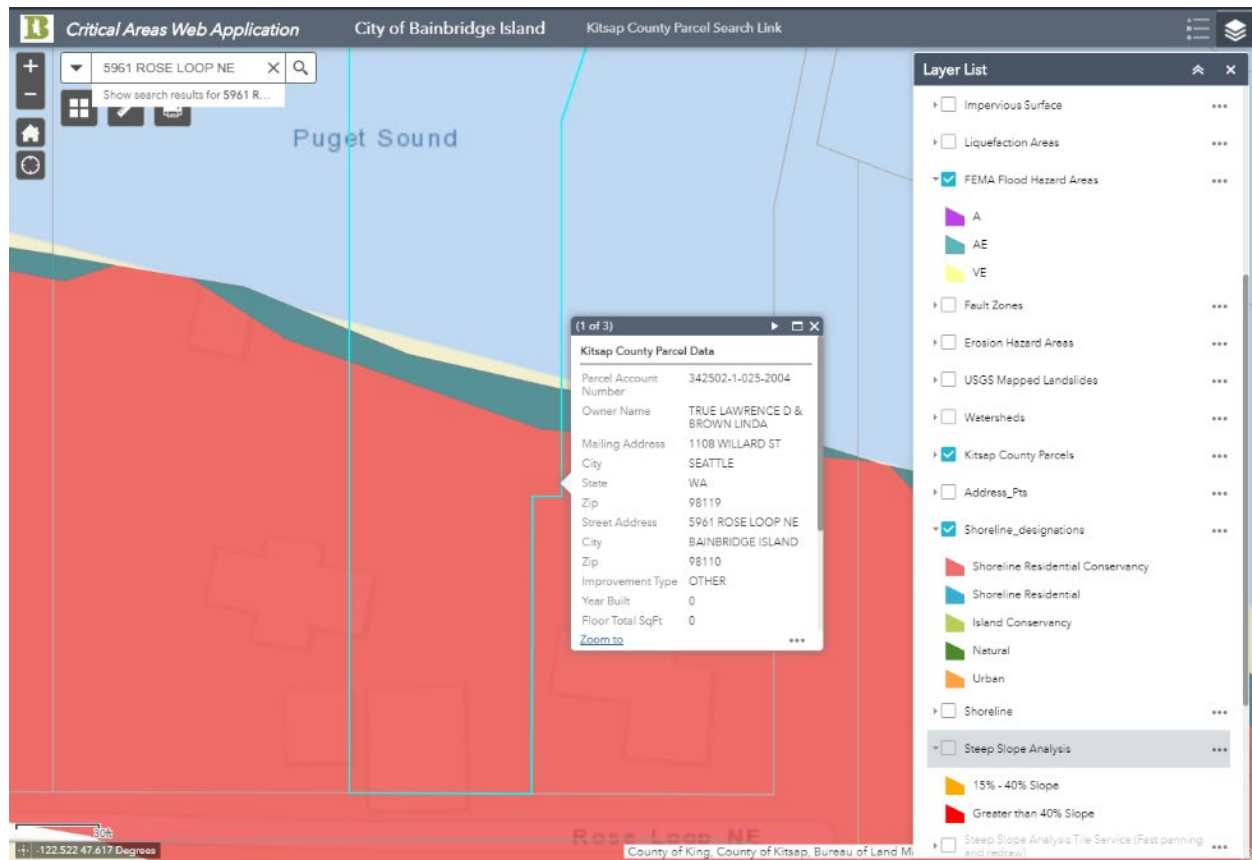


Figure 2: FEMA flood zone and shoreline designations of property. Bainbridge Island Critical Areas Web Application.

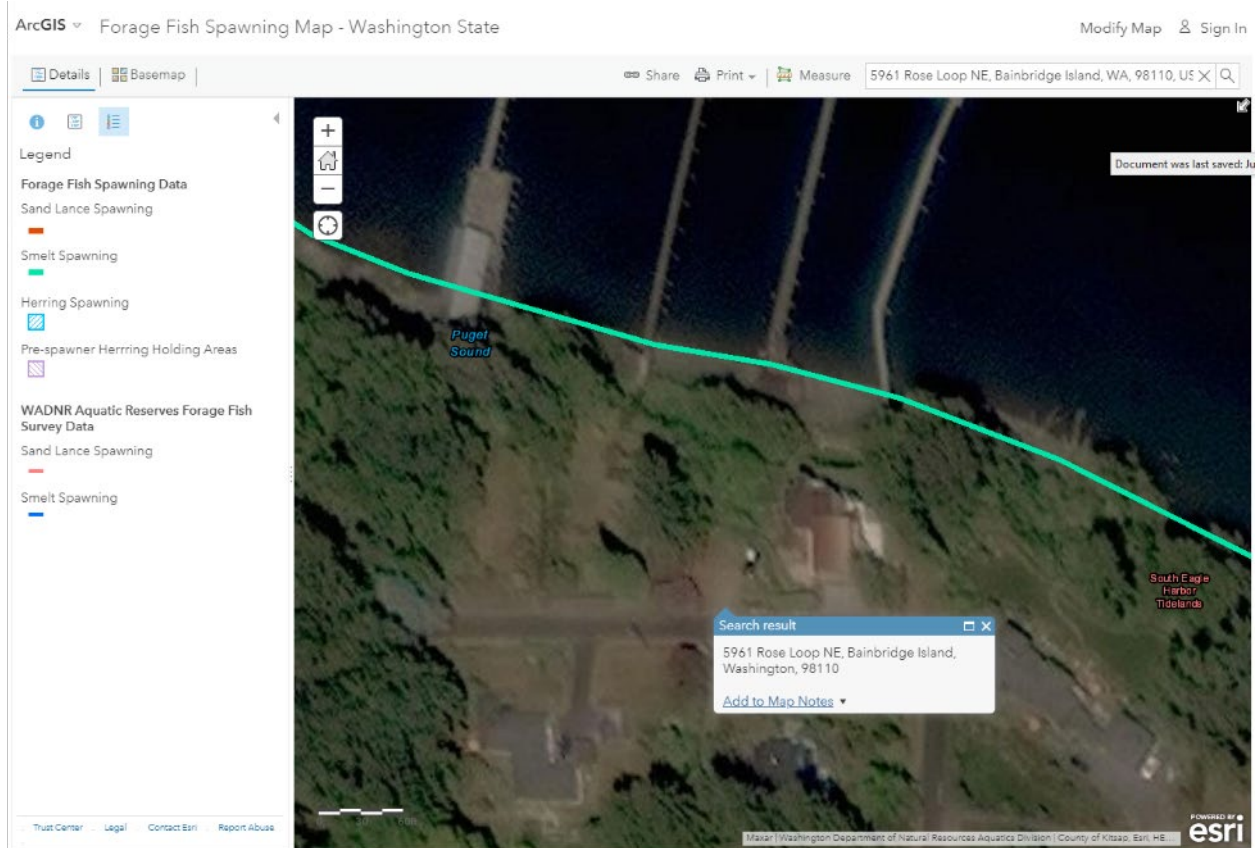


Figure 3: Smelt spawning mapped on site.

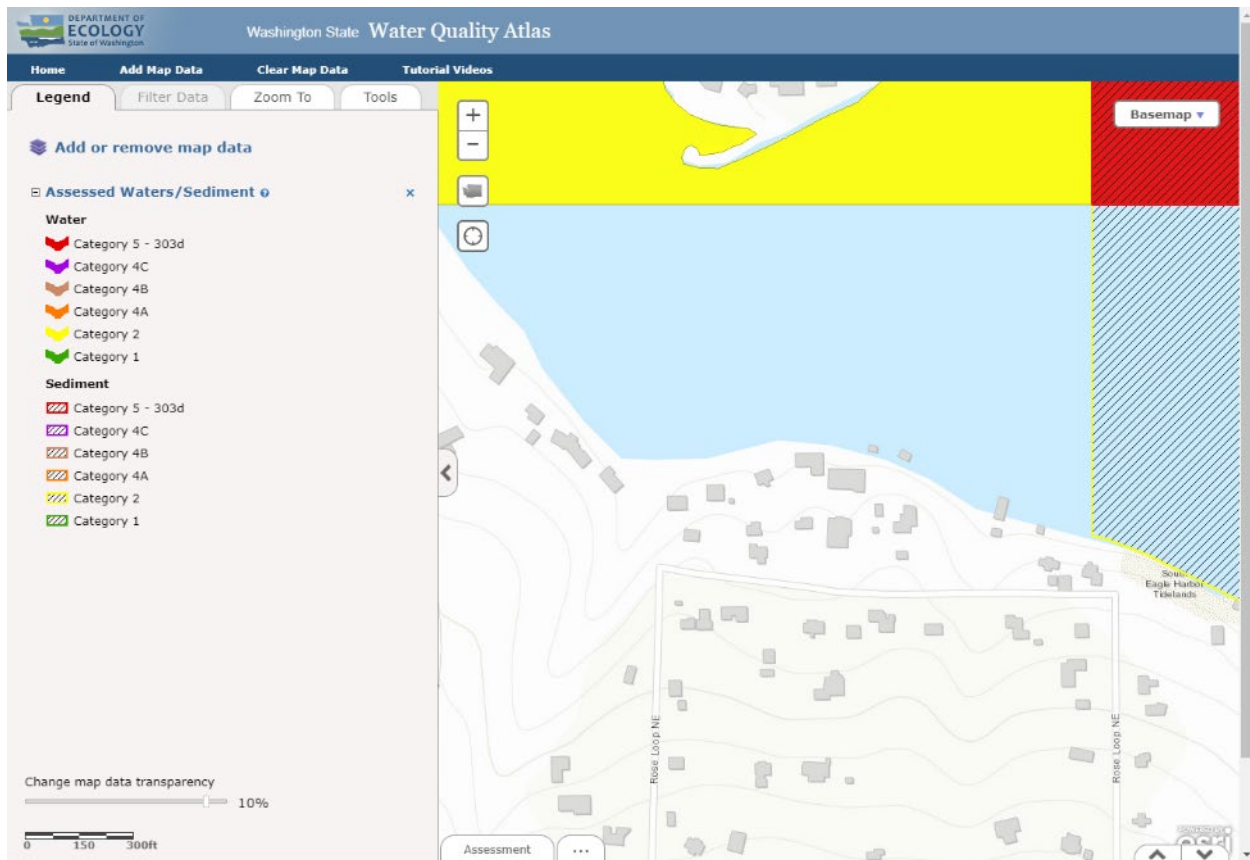


Figure 4: Washington Water Quality Atlas

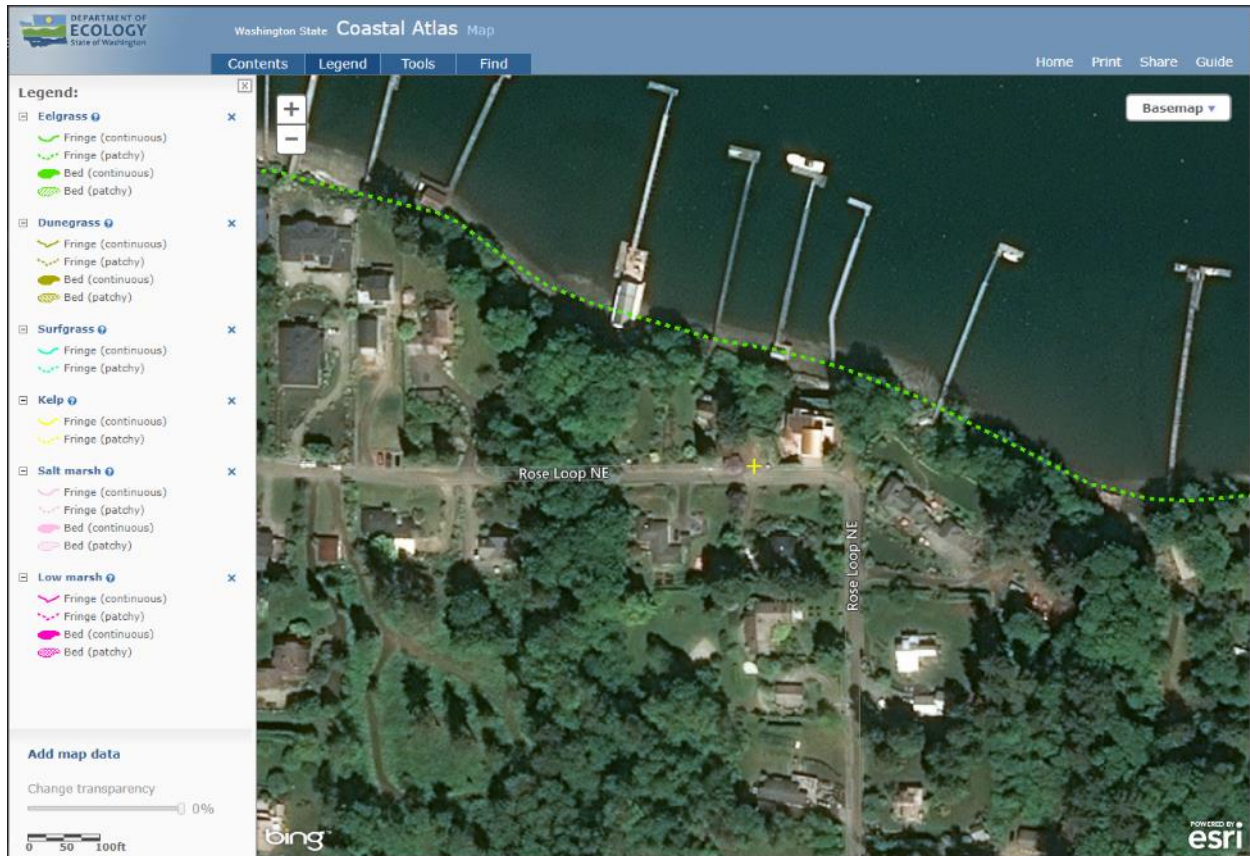


Figure 5: Location mapped as eelgrass patchy fringe.



Figure 6: View from upslope. Note blackberry, bindweed, nightshade, equisetum. Trees along shoreline.



10 Appendix A: Mitigating Strategies

All Mitigating Measures should be followed by contractors, subcontractors and agents during all phases of project construction.

Impact Avoidance and Minimization

- All stormwater from the new impervious and semi-pervious surface will be directed into the existing stormwater conveyance system.
- No work shall be performed below the OHWM.
- No maintenance work on the dock, boat structure, or any above-water structure shall be performed within 2 hours of high-tide (before and after).
- No task shall require beach access. No machinery, trucks or other heavy equipment shall enter the beach environment.
- Project access, staging, stockpiling, and laydown areas can be located upland, outside of tree protection areas. Do not disturb any native vegetation, restoration plants or habitat in this process.
- Heavy equipment for the construction project shall be brought to the site on existing roads.
- Construction clean-up, tool washing, and other contaminants shall be contained upland, at least 100 feet from the shoreline crest.
- Petroleum based chemicals, or other hazardous chemicals should be cleaned near Rose Loop NE or offsite.
- Emergency spill response and clean-up equipment shall be available on site during all work activities. At minimum, kit will include material for containment and clean-up of petroleum product.
- High-risk trees should be converted into 10-20-foot-tall habitat snags, rather than removed fully from the site.

Compensatory Mitigation

- Home's new footprint is roughly 82 feet setback from the OHWM.
- Noxious and invasive weeds will be removed and restored with native plantings. Herbicide will not be used for removal.
- Dense plantings are required; >90% post-installation ground cover minimum.
- Site Specific Vegetation Management Area will be maintained as native habitat.
- Stormwater management shall be designed to meet City of Bainbridge Island stormwater requirements (Stormwater Management Manual for Western Washington 2014 edition).

Monitoring

Compensatory mitigation activities should be monitored annually for a minimum of five years to confirm successful establishment of individual plants. The contingency plan in below be followed to determine if additional plant installation or invasive plant control is required. Dead or dying plants shall be replaced the following fall, as needed, to meet or exceed mitigation standards. Plant species substitutions may be made if recommended by an arborist or ecologist experienced in restoration.

Contingency Plan

Contingency specifications are present in order to verify successful implementation of the mitigation actions. If at any time the following criteria are not met, further mitigation is required.

- Greater than 10% installed plant mortality in any year.

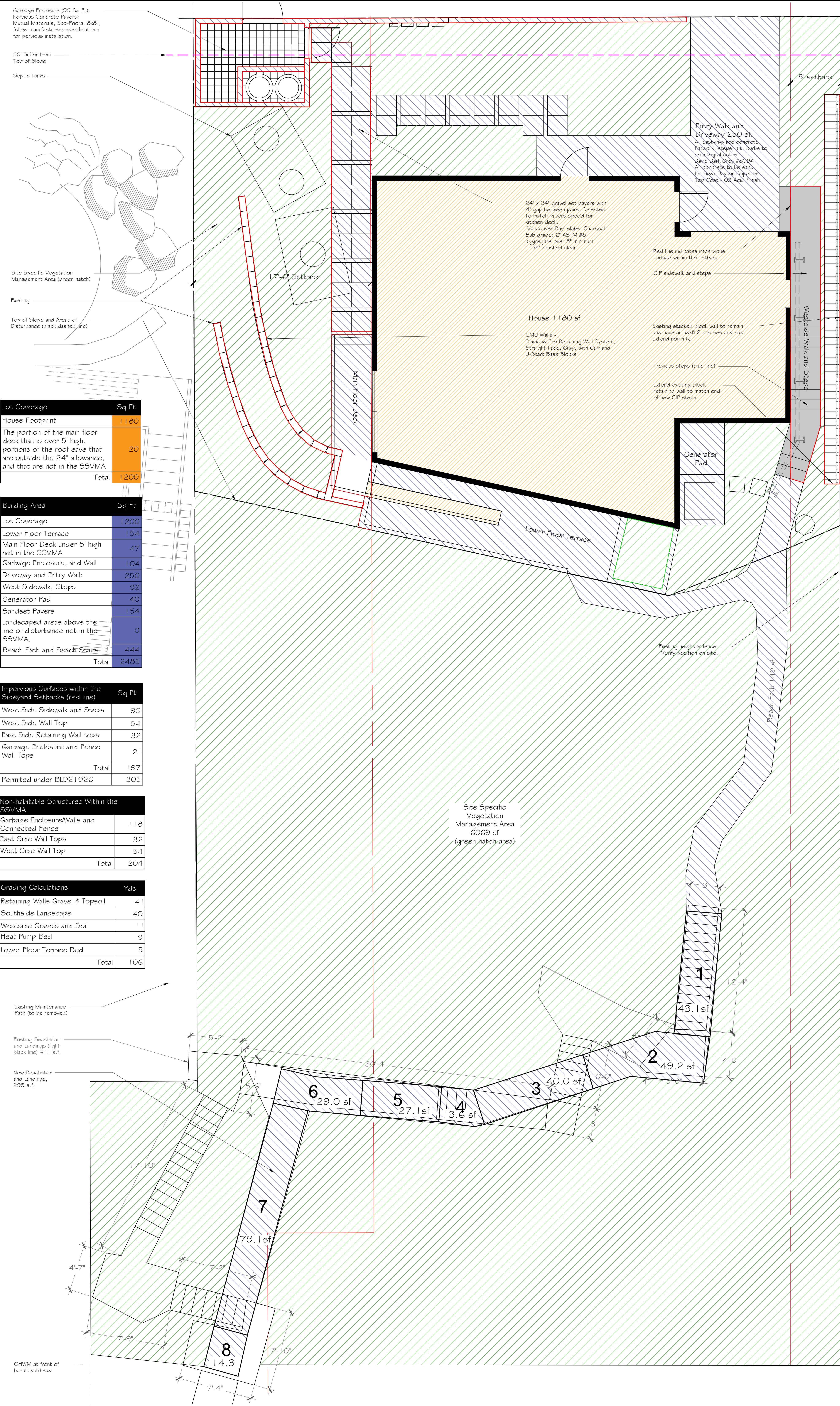


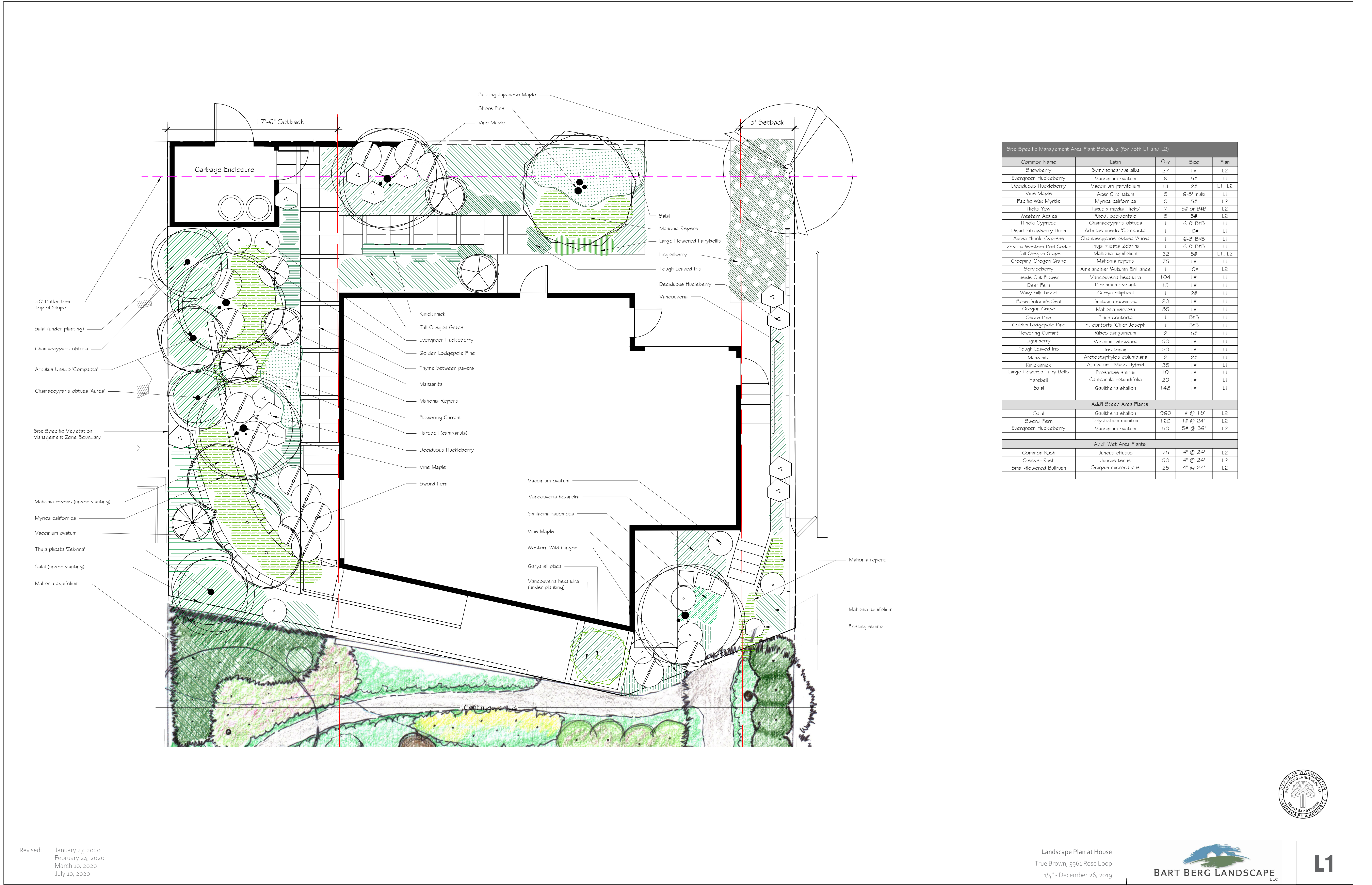
- Reinstall 90% the equivalent of the failed plants.
- Different species of plants taken from our recommended plant list could be used when other species fail. Substitutions must be authorized by an arborist or ecologist experienced in coastal restoration.
- Noxious weed abundance is above 10% of the site.
 - Control noxious weeds either by hand or a Washington Department of Agricultural Licensed Pesticide Applicator.

10.1 Mitigation Actions

Implement the following standards and best management practices within the timeframe allotted.

Timeframe	Measure	Details
Before project commencement	Erosion & Sediment Control	● Follow City of Bainbridge Island required stormwater controls/BMPs.
	Prior to actions affecting the beachface (red alder removal and maintenance on dock)	● Before all sanding, scraping, painting, pressure washing, or other action that has the potential to deposit material on the beachface, tarps must be laid down beneath the worksite, in order to collect the debris.
Tree Modifications	Retain Tree Debris and Wildlife Poles	● All woody debris from tree modifications, and removals shall be kept on site. ● Instead of full tree removal, retain 10-20 feet of trunk for a wildlife pole. This pole can be fracture pruned to emulate natural habitat. ● Retain all debris (branches, foliage, and trunk) on site. Incorporate into natural landscape, as necessary.
Immediately after construction	Site Specific Vegetation Management Area	● Remove noxious weeds using hand and mechanical methods. Do not use herbicide. ● Install plants per landscape architecture master landscape plan (Bart Berg Landscape LLC plans). ● Top dress with 2-3 inches mulch, as necessary. ● An 90% plant coverage rate is expected post-installation. ● Do not leave bare ground around plantings. ● Irrigate installed plants.
Annually as required	Site Specific Vegetation Management Area	● Control for noxious and invasive weeds present in the area, using cultural, hand and mechanical techniques. Do not use herbicide. ● Implement Contingency Plan above annually after the first year of project completion.





Site Specific Management Area Plant Schedule (for both L1 and L2)				
Common Name	Latin	Qty	Size	Plan
Snowberry	Symphoricarpos alba	27	1#	L2
Evergreen Huckleberry	Vaccinium ovatum	9	5#	L1
Deciduous Huckleberry	Vaccinium parvifolium	14	2#	L1, L2
Vine Maple	Acer Cronatum	5	6-8' multi	L1
Pacific Wax Myrtle	Myrica californica	9	5#	L2
Hicks Yew	Taxus x media 'Hicks'	7	5# or B4B	L2
Western Azalea	Rhod. occidentale	5	5#	L2
Hinoki Cypress	Chamaecyparis obtusa	1	6-8' B4B	L1
Dwarf Strawberry Bush	Arbutus unedo 'Compacta'	1	10#	L1
Aurea Hinoki Cypress	Chamaecyparis obtusa 'Aurea'	1	6-8' B4B	L1
Zebrina Western Red Cedar	Thuja plicata 'Zebrina'	1	6-8' B4B	L1
Tall Oregon Grape	Mahonia aquifolium	32	5#	L1, L2
Creeping Oregon Grape	Mahonia repens	75	1#	L1
Serviceberry	Amelanchier 'Autumn Brilliance'	1	10#	L2
Inside Out Flower	Vancouveria hexandra	104	1#	L1
Deer Fern	Blechnum spicant	15	1#	L1
Wavy Silk Tassel	Garrya elliptical	1	2#	L1
False Solomon's Seal	Smilacina racemosa	20	1#	L1
Oregon Grape	Mahonia nervosa	85	1#	L1
Shore Pine	Pinus contorta	1	B4B	L1
Golden Lodgepole Pine	P. contorta 'Chief Joseph'	1	B4B	L1
Flowering Currant	Ribes sanguineum	2	5#	L1
Ligonberry	Vaccinium vitisidaea	50	1#	L1
Tough Leaved Ins	Ins tenax	20	1#	L1
Manzanita	Arctostaphylos columbiana	2	2#	L1
Kinicknick	A. uva ursi 'Mass Hybrid'	35	1#	L1
Large Flowered Fairy Bells	Prosartes smithii	10	1#	L1
Harebell	Campanula rotundifolia	20	1#	L1
Salal	Gaultheria shallon	148	1#	L1
Add'l Steep Area Plants				
Salal	Gaultheria shallon	960	1# @ 18"	L2
Sword Fern	Polystichum munitum	120	1# @ 24"	L2
Evergreen Huckleberry	Vaccinium ovatum	50	5# @ 36"	L2
Add'l Wet Area Plants				
Common Rush	Juncus effusus	75	4" @ 24"	L2
Slender Rush	Juncus tenuis	50	4" @ 24"	L2
Small-flowered Bullrush	Scirpus microcarpus	25	4" @ 24"	L2

General Notes

Site Preparation - Trees to be removed as approved by the Shoreline Cleaning Permit will leave stumps intact. Invasive plants will be removed and maintained as follows:

- Morning glory - remove plants above the surface and pull roots as best possible. Weekly, during the growing season, tops shall be removed on the entire site.
- Blackberry (native and non-native) - shall be removed from the site including roots. Weekly, during the growing season, the entire site shall be checked for blackberry and removed.
- Horsetail - remove tops only. Weekly, during the growing season, the entire site shall be checked for new shoots and removed.
- Yellow archangel (*Lamium galeobdolon*) - shall be removed. Weekly, during the growing season, the entire site shall be checked for new plants and removed.
- English Ivy - remove plants and roots from the site. Weekly, the entire site shall be checked for ivy and removed.

Existing Natives - all existing native plants shall be retained

- Salmonberry - is spread throughout the bank and once the site is cleaned of invasives, choices will be made on some salmonberry removal although most will be retained.
- Indian Plum - there is one significant plant on the west property line which shall be cleaned of English Ivy and examined for structural stability. Retain other Indian Plum.
- Sword Fern, Oregon Grape and Salal - carefully retain these plants and cut back as necessary for structural stability.
- Tiralla - retain

Slope Stability -

- Jute Mesh - shall be applied on all slopes over 15% before planting.
- Irrigation piping shall be applied over the jute mesh
- Mulch - shall be applied on the entire landscape at a depth of 3" and reapplied at a depth of 2" every year at a minimum until plant maturity of 100% cover.

See plant schedule on LI for Site Specific Management Area

See LI for plant callouts at this NW house corner

Continued on LI

