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WA Contractor ID: PENINEG813MC



**PENINSULA  
ENVIRONMENTAL**

— Consultant & General Contractor —

**Date:**

May 31, 2022

**Client**

Carla Sebastian

Anderson Homes

P: 360-775-3333

[carla@andersonhomesllc.com](mailto:carla@andersonhomesllc.com)

**Project Address**

1790 31st Street, Port Townsend, Washington

Jefferson County Parcels: 972600211

Lot 3 of O'Meara Short Plat

**Consultants**

John Bornsworth, Senior Ecologist

Liz Donadio, Wetland & Wildlife Biologist

**Report Compliance**

Wetland Mitigation Plan



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## 1 Summary

Peninsula Environmental Group, Inc. (the “Consultant”) completed this Wetland Mitigation Plan (the “Plan”) for wetlands found on Lot 3 of O’Meara Short Plat, located at 1790 31<sup>st</sup> St in Port Townsend, WA (the “Site”). The total Site acreage is 0.115 acres.

This Plan should be read in conjunction with and refers to and incorporates another professional report entitled “Wetland Delineation of Parcel 972600211” authored by Crescent Environmental PLLC dated October 28<sup>th</sup>, 2021, referred to in this Plan as the “Delineation Report”. This Delineation Report includes a site characterization, wetland observations, determination forms, wetland delineation, wetland rating and associated documents. In this report, we refer to the wetland in the above report as Wetland A and Wetland A’s Buffer.

Wetland A’s prescribed buffer extends over the entire Site. As such, the Wetland Delineation Report recommended a reduced buffer width of between 55 and 140 feet, narrow towards the northern property boundary and wider towards the southern boundary. This Plan describes impacts to the offsite wetland and it’s buffers, and proposes mitigation measures to reach a no-net loss of ecological value and reduce cumulative impacts. The proposed development includes a house, garage, covered porch/deck, and sidewalk, totaling 2,538 (0.058 acres, 50.7% of lot) square feet of impervious surfaces. Stormwater will be managed onsite via a raingarden. Mitigation measures include replanting native plants in areas of development, installing native species in the raingarden, installing a fence and signs across the reduced wetland buffer edge. Mitigation also includes avoidance and impact reduction measures identified in Port Townsend Municipal Code. Cumulative impacts are reduced by the public ownership of the offsite wetland to the west.

City of Port Townsend (“COPT”) determined in LUP22-010 that the Delineation Report did not meet the requirements of Port Townsend Municipal Code (“PTMC”) 19.05.050 A4. As such, the Consultant was asked to write this Plan meeting those requirements.

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### Impacts and Mitigation Summary

The entire site is encompassed within a Wetland A's buffer. Indented development will reduce buffer size by 0.058 acres, or 50.7% of the Site.

Wetland mitigation will be reached through a combination of BMPs:

- 1) Construction of wooden fence along the western portion of the building envelope. Posting of a Wetland Protection Area sign near 31<sup>st</sup> street.
- 2) All stormwater must be detained and infiltrated on site using the two rain gardens in the construction plans. During extreme precipitation, outflow from the two rain gardens should direct towards the wetland. Rain gardens should be planted with 70% or greater native drought tolerant plants.
- 3) Reed canarygrass (*Phalaris arundinacea*) should be removed from the eastern portion of the property edge and restored with native plants.
- 4) Himalayan blackberry (*Rubus bifrons*) should be removed from the southern roadside portion of the property and restored with native plants.
- 5) Construction should not occur when artificial light is required. If artificial light is required, the light should be pointed towards the east away from the wetland.
- 6) All temporary disturbances identified in PTMC Table 18.22.730(1)(b) should be implemented during construction.
- 7) Silt fencing installed on the western edge of the construction zone.

Cumulative impacts of nearby development are reduced by the western parcel itself being owned by City of Port Townsend. To the west of the Site, including where Wetland A exists, is a 1.25 acre City of Port Townsend property. Provided this 1.25 acre lot preserve wetland function, no cumulative impacts will occur in the nearby area as a result of this proposal.

**Buffer Reduction.** Prescriptive wetland buffers significantly reduce usage of the lot. As such, we propose to reduce wetland buffers to encapsulate the entire parcel outside of the building envelope, and enhance the reduced wetland buffer on site. The proposed buffer reduction complies with PTMC 19.05.110.g.5.

The reduction of Wetland A's Buffer will not reduce habitat functions or cause short- or long-term adverse impacts.

All water runoff will be directed away from Wetland A and outside of the buffer.

The current conditions onsite are relatively undisturbed forest with a gentle slope less than 15 percent throughout all parcels.

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## 2 Background

### 2.1 Purpose of Project

- Perform wetland function assessment and develop wetland mitigation plan per the request in LUP22-010.

### 2.2 Professional Assumptions & Limitations

This Report summarizes the data collected during the Consultants' site assessment, conversations regarding the project, and the Consultants' professional opinions and recommendations. The results and recommendations contained in this report represent the Consultants' professional opinions derived from biological forensics, information provided to the Consultants, referenced material and the Consultants' experience. The Consultants' recommendations are compiled using industry standards, best available science, and currently accepted best management practices.

- Consultants visited the Site on May 23<sup>rd</sup> 2022. This Report summarizes site characteristics as they were observed this day 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 property for any purpose.
- Further limitations may be found in General Assumptions and Limitations.

### 2.3 Methodology

To determine what buffer size is required by Port Townsend, we assess the quality of the wetland based on functions and value to society. The wetland buffer was determined using the Washington State Wetland Rating System for Western Washington (Hruby 2014).

Consultants determined wetlands by using observable vegetation, hydrology, and soils in conjunction with data from the U.S. Geographic Survey (USGS) topographic map, the Natural Resources Conservation Service (NRCS) Soil Survey, National Wetlands Inventory (NWI), U.S. Fish and Wildlife Service (USFWS), Port Townsend GeoData Center, local precipitation data (NOAA), and various orthophotographic resources.

Consultants determined wetland boundaries by using the routine approach described in the *USACE's Wetlands Delineation Manual* (Environmental Laboratory, 1987) and modified according to the guidelines established in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE, 2010).

Hydrophytic vegetation is determined based on estimates of percent aerial cover by plant species and indicator status ratings of those plant species. Plant species were identified and given an indicator status according to the *National Wetland Plant List: Western Mountains, Valleys & Coast. U.S. Army Corps of Engineers* (NWPL, 2018 v3.4). In order for a determination plot to qualify for hydrophytic vegetation, wetland plant species must show at least one of five hydrophytic vegetation indicators: rapid test, dominance test greater than 50%, prevalence index less than 3.0, morphological adaptations, and/or wetland non-vascular plants.

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The wetland is characterized using the Cowardin Wetland Classification system (Cowardin 1979). This system characterizes wetlands based on their landscape setting, dominant vegetative community, hydrologic regime, and other modifiers based on soils, human impact, and water chemistry. The wetland is further characterized using the hydrogeomorphic (HGM) wetland classification system, which emphasizes the primary geomorphic and hydrologic attributes of the wetland (Brinson 1993). To determine what buffer size is required, we assess the quality of the wetland based on functions and value to society. Consultants used the Washington State Wetland Rating System for Western Washington (Hruby 2014) to determine wetland buffers.

### Desktop Review

PEN staff reviewed the following sources for the Wetland Assessment:

- Parcel, contour, and critical area layers were sourced from Jefferson County GeoData Center and City of Port Townsend;
- Soils map and hydric soil list from the United States Department of Agriculture Natural Resources Conservation Service;
- Climate data from the NRCS National Water Climate Center;
- Aerial Photographs sourced from Google Earth;
- National Wetlands Inventory;
- WDFW Priority Habitat and Species List;
- Washington State Department of Natural Resources (WDNR) GIS Lidar Portal;
- WDNR GIS Open Data; and
- WDNR Natural Heritage Information Request Self-Service System data.
- **References and Resources** contains further details for the methods and tools used to prepare this Report.

### Consultant Maps

Field GPS points were gathered using the Juniper Geode GNS2, which can get up to sub-meter accuracy depending on canopy cover, cloud cover, and satellite availability. Geospatial analyses were made using ESRI ArcGIS using projected coordinate system NAD83 2011 US Feet for Washington State (North). Critical area site maps were produced using data gathered during the site visits, data acquired from local and state jurisdictions, and information furnished from the Client. These maps are intended to show the relevant critical areas in relation to approximate proposed development. They should not be assumed to be survey accurate, nor should they function as the official site plan.

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## 3 Project Description

### 3.1 Project Specifics

- Proposed actions: Client intends to develop single family dwelling on Site, using Anderson Homes as general contractor.

### 3.2 Site Accessibility and Properties

The subject parcel is located between off Hancock Street, between 32<sup>nd</sup> and 30<sup>th</sup>. The Site was accessed by parking along 31<sup>st</sup> Street and walking north through the Site.

#### Site Details

- Client: Carla Sebastian, Anderson Homes
- Owner: Anderson Homes LLC
- Jurisdiction: Port Townsend – Parcel 972600211
- Total Site Acreage: 0.115
- Zoning: R-I(SF) - Single Family Residential (City)
- Legal Description: Identified in the Delineation Report
- Existing Structures: None

## 4 Existing Conditions

Please see review the Delineation Report for existing conditions on Site.





## 5 Regulatory Setting

### 6.1 Local Requirements

Port Townsend manages wetlands under Port Townsend Municipal Code (PTMC) Chapter 19.05 Critical Areas Wetlands 19.05.110 (Port Townsend 2020). Table 8 below shows the standard required buffer size for the wetland assessed.

Table 1. Prescribed Buffer Width and Reduced Buffer Width for Wetland A			
Wetland Name	Rating Summary Category	Buffer Sizes	
		Prescribed	Reduced
Wetland A	<b>Class II and High Habitat Score</b>	225 feet	55-140 feet

- The level of impact from residential development is considered as Moderate.
- Wetland A rating is described in the Wetland Delineation Report.
- Wetland A buffer prescribed buffer extends over the entire Site.



## 6.2 Proposed Buffer Reduction

Standard wetland buffers in PTMC deny opportunity to develop on the southern three parcels. As such we and the Wetland Delineation Report propose to reduce prescriptive wetland buffers to allow reasonable development and mitigate for impacts on site. The proposed buffer reduction is in compliance with PTMC 19.05.110.g.5.

The reduction of Wetland A’s buffer will not reduce habitat functions or cause short- or long-term adverse impacts. All water runoff will be directed away from Wetland A and outside of the buffer, towards a native plant raingarden.

The proposed Wetland Buffer Reduction meets the criteria in PTMC 19.05.110.G(5):

- There will be no direct, indirect short or long-term adverse impacts to the regulated wetland as a result of this development activity.
- The site (where Wetland A exists and the remaining buffer will exist) is currently extensively vegetated and has less than 15 percent slope,
- The project contains provisions to restore and enhance buffers using native vegetation which will provide additional protection for the wetland’s functions and values

Table 2. Buffer And Enhancement Areas					
Original Wetland Buffer Area	Proposed impervious development	Proposed lawn/use area	Enhancement Area		
			Noxious Weed Removal	Raingarden Planting	Replanting After Construction
0.115 acres	0.058 acres	0.008 acres	800 square feet	300 square feet	1,500 square feet

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## 7 Conclusions

- The Client intends to build single-family dwelling on Site. This Site is entirely encumbered by the buffer of Wetland A.
- Wetland A is entirely located and preserved offsite, on City of Port Townsend Owned Property.
- Prescriptive wetland buffers deny opportunity to develop the Site, as such we propose to reduce wetland buffers to reduce Wetland A's buffer around the building envelope and implement mitigation measures identified in the attached **Mitigation Plan**.
- Cumulative impacts for this project are reduced by the City of Port Townsend ownership of Wetland A, on the lot west of the Site where Wetland A is located. Provided the public ownership of Wetland A and no other developable lots nearby, cumulative impacts from other nearby development are not applicable.
- Wetland functions and processes provided by the prescribed wetland buffer will not be impacted by the proposed reduced wetland buffer. The area of vegetation around Wetland A is entirely native and non-sloped.
- The proposed buffer enhancement plan will install native vegetation and remove noxious weeds throughout the Site. Other mitigation actions include impact avoidance.



## 8 Closing Remarks

This Report and the related work was performed and 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 Groups, Inc. attached Assumptions & Limiting Conditions.

### 4 Consultant Qualifications

#### **John Bornsworth | Senior Ecologist | [john@peninsulaeg.com](mailto:john@peninsulaeg.com)**

John Bornsworth is the senior ecologist, project manager and general contractor with Peninsula Environmental. John is a Board-Certified Master Arborist & Registered Consulting Arborist with over 17 years of resource management experience specifically managing trees, vegetation and water in Washington shorelines and other critical areas. John is trained on shoreline restoration and construction, USACOE 1987 Wetland Delineation Manual, Western WA 2014 Wetland Rating System, WA Ecology's coastal permitting, and other relevant topics. John provides project management, general contractor services and technical assistance to shoreline, steep slope, wetland and riparian construction and restoration, and stormwater management and commonly provides expert testimony on related matters. John sits on the Washington State Department of Natural Resource's Washington Community Forestry Council as an executive advisor of commercial arboriculture.



#### **Liz Donadio | Wetland (WPIT) & Wildlife Biologist | [liz@peninsulaeg.com](mailto:liz@peninsulaeg.com)**

Liz Donadio is a wetland and wildlife biologist with Peninsula Environmental. She has consulted on aquatic resources throughout western Washington since 2015. Liz has graduate level education in wetland and soil sciences and is trained through the Washington Department of Ecology to assess hydrogeomorphic classifications and provide wetland ratings. Liz is trained to on the USACOE 1987 Delineation Manual. Liz is certified as a Wetland Professional in Training by the Society of Wetland Scientists and is a Certified Erosion and Sediment Control Lead (CESCL). In 2005, Liz obtained a Bachelor of Science in Wildlife Management and Conservation from Humboldt State University. For 20 years Liz has worked on numerous resource projects throughout the United States, including wetland delineating and rating, mitigation planning and monitoring, critical area assessments, bird, mammal, fish, amphibian and reptile surveying and monitoring, marine and riverine restoration.



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## 9 General Assumptions and 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, identify 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.



## 10 References and Resources

JURISDICTION INFORMATION	
City of Port Townsend (PT)	Port Townsend Municipal Code. <a href="https://www.codepublishing.com/WA/PortTownsend/">https://www.codepublishing.com/WA/PortTownsend/</a>
	Port Townsend GIS.. <a href="https://jeffcowa.maps.arcgis.com/home/index.html">https://jeffcowa.maps.arcgis.com/home/index.html</a>

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## Appendix A. Mitigation Measures

### E.1 Mitigation Sequence

Impacts are only considered mitigated for if compensatory mitigation is successfully established. This extends beyond the initial native plant installation or invasive control and necessitates that certain performance standards for the mitigation are met in the subsequent years. If part of the mitigation plan is not meeting a performance standard, as measured during monitoring, enact the contingency plan to help the mitigation get back on track. Failure to do so may result in incomplete mitigation with Kitsap County, and additional mitigation requirements beyond the original plan.

As per PTMC 19.05.060 mitigation shall include avoiding, minimizing, rectifying, reducing, compensating, and monitoring. Washington State sets forth the following mitigation sequence to be followed when development proposals impact critical areas. This mitigation sequence was followed while developing the plan and construction methods.

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

Mitigation Step	Mitigation Action(s)
<b>Avoiding</b> the impact altogether by not taking a certain action or parts of an action.	<ul style="list-style-type: none"><li>• Development should occur outside of the reduced wetland buffers.</li><li>• Port Townsend provided critical area signs shall be posted every 50 feet along the eastern property setback.</li></ul>
<b>Minimizing</b> 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.	<ul style="list-style-type: none"><li>• All construction equipment and material will access the Site from the main road and existing street approach.</li><li>• The proposed project will utilize low impact development methods. This includes creation of a raingarden to manage stormwater.</li><li>• Lights, noise, dust and runoff will be directed and managed away from the wetland buffer.</li></ul>
<b>Reducing</b> or eliminating the impact over time by preservation and maintenance operations.	<ul style="list-style-type: none"><li>• As vegetation becomes established and more developed, the infiltration and stormwater buffering functions will improve.</li><li>• Invasive plant control will reduce the spread of invasive species within and from the controlled area, supporting a healthier native plant community.</li></ul>
<b>Compensating</b> for the impacts by replacing, enhancing, or providing substitute resources or environments.	<ul style="list-style-type: none"><li>• Invasive plant species will be controlled across the Site.</li></ul>

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<p><b>Monitoring</b> the impact and the compensation project and taking appropriate corrective measures.</p>	<ul style="list-style-type: none"><li>• Monitoring of plant health and survival will occur annually for the first 3 years after planting.</li><li>• Monitoring of the invasive plant control areas, Zone A and B, for reemergence after initial treatment.</li></ul>
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## E.2 Mitigation

### Avoidance & Minimization

#### Temporary Erosion and Sediment Control

1. Install silt fence around wetland buffer prior to any work.
2. Silt fence can ignore the 15-ft building setback from the wetland buffer.
3. Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered

#### Wetland Signage Installation

1. Add signage at 50-ft intervals along the buffer edge to ensure future work does not further trespass the wetland buffer.
2. Place signage along the entirety of the entirety of the wetland buffer edge, inside the property.
3. Signage must be maintained by the property owner in perpetuity.
4. Sign shall be made of wood or metal and attached to a wood or metal post and must contain the following language: "Wetlands and Wetlands Buffer Protected by Law Contact City of Port Townsend Community Planning & Development for Information".

#### Light, Noise, Dust

1. Direct lights away from wetland
2. Locate activity that generates noise away from wetland
3. Perform noise generation activities during daylight hours only
4. Use best management practices to control dust

### Reduction and Compensation

#### Noxious Weed Removal

1. Eradicate reed canary grass and blackberry from the entire site.
2. Use the guidelines outlined in **E.3 Noxious Weed Control**.
3. Perform noxious weed removal for 3 years.
4. Remove all other invasives encountered using a systematic grided search of the entire Site.

#### Native Plant Installation

1. Follow **E.5 Plant Installation Guidelines**.
2. Install 207 native plants in wetland buffer using **Table 14. MZB Native Plant List**. This table includes facultative and facultative upland plants that are appropriate for wetland buffer and upland conditions.
3. Install native plants in areas where noxious weeds were removed and in areas where other non-native species occur, including introduced creeping buttercup.
4. Install native plants in areas of bareground or limited diversity.



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### E.3 Noxious Weed Control

The Washington State Noxious Weed Control Board establishes county Noxious Weed Control Boards throughout the state to provide resources and education to help control invasive plant species. A State Noxious Weed List is developed to designate non-native plant species that are harmful to agriculture, the environment, and people. Listed plants are divided into three classes:

- Class A: these species are generally not well-established; the possibility of eradicating them still exists. Eradication of Class A Noxious Weeds is required by State law.
- Class B: these species are generally sporadically found. Control is required where they are not yet established; OR when local county weed boards determine control is necessary.
- Class C: these species are generally widespread throughout Washington and well-established. Example: Himalayan blackberry. Control of these species is not required by the state, although individual counties may require control at their discretion.

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<b>Reed Canarygrass (<i>Phalaris arundinacea</i>)</b>	<b>Year Listed: 1995</b> <span style="float: right;"><b>Class C</b></span>
<p><b>Identification:</b> Large, coarse perennial wetland grass that grows 3 to 9-ft tall. Hairless stems with gradually tapering leaf blades. <b>Leaves</b> are flat and have a rough texture on both sides and are at a 45-degree angle to stem. <b>Flower</b> heads are found in narrow clusters on the stems high above the leaves. <b>Leaves</b> are bright green. Grows mostly in wet places.</p> <p><b>Impact:</b> Can cause indigestion or illness in livestock; Displaces native plants due its aggressive, dense root system; wetland species diversity declines drastically; Increases flooding; Rhizomes accumulate sediment and clog small streams and drainages; Dense colonies can form a physical barrier to migrating salmon.</p> <p><b>Control:</b> <b>Manual:</b> Hand pulling or digging is only practical for small patches. Make sure to remove the entire root mass. Small infestations that are up from the shoreline (stems not underwater) can be controlled by tarping with heavy duty black plastic or non-woven geotextile fabric. However, this method will not completely eliminate the infestation, only reduce the density. <b>Mechanical</b> If the stems are not underwater and access is possible, mowing may be a viable control method as it removes seed heads. This might be enough to allow surrounding vegetation to move in, although it is unlikely to completely eliminate the reed canarygrass. <b>Chemical:</b> Larger patches most likely will need herbicide treatments to be effective which will likely require a permit issued by the state Department of Ecology if the site is wet or along the water's edge. Using an aquatic formulation of glyphosate or imazapyr will be most effective in the summer or early fall. Mowing first and allowing the reed canarygrass to grow back to a few feet tall can increase the effectiveness of herbicide spraying. Established populations will usually require at least 2 of follow-up treatment and several herbicide applications may be necessary.</p>	<p>Photo: Barry A. Rice, TNC</p> <p>Photo: Barry A. Rice, TNC</p> <p>Photo: John M. Randall, TNC</p> <p>Photo: John M. Randall</p> <p>Photo: Michael Shepherd</p> <p>Photo: Elizabeth Czarapata</p>

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Himalayan blackberry ( <i>Rubus armeniacus</i> )	Class C
<p><b>Year Listed:</b> 2009      <b>Native to:</b> Asia</p> <p><b>Identification:</b> rambling evergreen, perennial, woody shrub with stout stems that possess stiff, hooked prickles. It may grow up to 13.1 feet. Plants grow into impenetrable thickets. <b>Flower</b> clusters are flat-topped and have 5 to 20 flowers. Each flower has 5 petals that are white to rose colored and about 1 inch in diameter. <b>Leaves</b> are alternately arranged on stems. Each leaf is palmately compound and made up of 3 to 5 (typically 5) leaflets with toothed margins.</p> <p><b>Impact:</b> Outcompetes native vegetation and prevents the establishment of native trees that require sun for germination. It forms impenetrable thickets that block access to water and lacks the deep, bank stabilizing roots of native wetland shrubs and trees. Has vegetative propagation and is spread through root and stem fragments.</p> <p><b>Control: Mechanical:</b> Make sure to wear thick gloves and protective clothing when controlling blackberry to try to avoid, or at least minimize, injury from the thorns. Brushcutting prior to spraying reduces amount of chemical</p> <p><b>Chemical:</b> Use a foliar application in areas away from nontarget species and cut stump in areas heavily interspersed with native plants. Products containing glyphosate are most effective when applied in late summer or early fall when canes are actively growing and after berries have formed. Selective broadleaf herbicides with the active ingredient of triclopyr, 2,4-D and metsulfuron work well for lawn areas as they won't harm most grasses. When using this type of herbicide or one with glyphosate, do not cut down the treated blackberry bushes until they have died completely. This can take two weeks or more.<b>Fall:</b> Foliar herbicide treatment. <b>Winter:</b> no action</p> <p><b>Spring:</b> Foliar herbicide treatment. <b>Summer:</b> Foliar herbicide treatment</p>	  <p><b>Distribution:</b></p>



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## E.4 Plant Installation Guidelines

### **Plant installation and care should be implemented following these recommendations:**

1. Follow species selection, size, and quantity in **E.5.1 Native Plant Schedules**.
  - a. The estimated quantities are based on the available area and average on center distances. If there is additional room in the enhancement areas after installing the estimated number of plants, then more plants should be installed.
  - b. Plants should be installed at the numbers and spacing suggested, and shrubs and groundcover should be in small groups of 3-5, of the same species where possible.
  - c. Specific species can be based on personal preference and aesthetic, available space, and available stock.
2. All plant installation and irrigation work shall be done by hand and with hand operated equipment. No machinery shall be used.
3. Plant installation shall follow 2012 ANSI A300 Part 6: Tree, Shrub, and Other Woody Plant Management – Standard Practices (Planting) and 2012 International Society of Arboriculture Best Management Practices: Tree Planting.
4. Install plants in areas where non-natives have become established, such as areas with creeping buttercup.
5. Planting shall ideally be performed in the late fall, and at least in the window of October to March.
6. Local nursery stock should be used, when available, to ensure that the material has acclimated to local conditions and is genetically comparable with plants in the local area.
7. If specified plant species are not available due to limited inventories at local nurseries, or prove during monitoring to perform poorly onsite, substitutions may be allowed provided the plants are native or native hybrids within the same general plant stratum (tree, shrub, or groundcover).

### **Mulch Guidelines (in wetland buffer only)**

1. Add a source of nitrogen to soils before applying wood-derived mulches. Soil microorganisms that decompose organic materials such as wood-based mulches are effective competitors for limited soil nitrogen. This may cause temporary nitrogen deficiencies especially in annual and perennial plants. Yellowing of leaves often indicates a nitrogen deficiency. Lightly incorporate a source of nitrogen such as bloodmeal, urea or a high nitrogen lawn fertilizer before applying mulch.
2. Mulch around all newly installed plants with hardwood chips such as alder (uncomposted, non-cedar).
3. Chips are to be free of weed seed, sawdust, and shall not contain anything detrimental to plant growth. Pure bark or beauty bark should not be used. Bark is not as good a source of organic material for replenishing soil.
4. Start mulching **6-inches from the base of the plant working** out to the desired diameter.
5. Keep the mulch at least 6-inches away from the base of plants (no mulch volcanos). Keeping distance between plants and mulch helps to avoid plant rot and other diseases, prevents nesting grounds for insects, and promotes air circulation.
6. Apply mulch approximately 2 to 3-inches thick.

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E.4.1 Native Plant Schedules

Use the flowing native plant tables to restore and enhance the wetland and wetland buffer. By installing herbaceous cover, shrubs, and small trees where possible, a healthy, multistoried, plant community can be established. This community will be maintainable while still providing a variety of services including, interception of rainwater preventing some from reaching the ground, aiding in infiltration, helping bind soil and increasing soil cohesion, and providing habitat.

Table 4. MZB Native Plant List					
Common Name	Scientific Name	Indicator Status <sup>1</sup>	Size <sup>2</sup>	Spacing (on center)	Quantity
<b>Upper Strata: Trees = 10</b>					
<b>Bigleaf maple</b>	<i>Acer macrophyllum</i>	FACU	1-gal +	15-ft	6
<b>Douglas fir</b>	<i>Pseudotsuga menziesii</i>	FACU	1-gal +	15-ft	
<b>Western redcedar</b>	<i>Thuja plicata</i>	FAC	1-gal +	15-ft	
<b>Middle Strata: Trees and Shrubs = 72</b>					
<b>Cascara</b>	<i>Frangula purshiana</i>	FAC	BR to 1-gal	Min. 7-ft	24
<b>Common Snowberry</b>	<i>Symphoricarpos albus</i>	FACU	BR to 1-gal	5-ft	
<b>Evergreen huckleberry</b>	<i>Vaccinium ovatum</i>	FACU	1-gal	4 to 6-ft	
<b>Oceanspray</b>	<i>Holodiscus discolor</i>	FACU	BR to 1-gal	6-ft	
<b>Osoberry</b>	<i>Oemleria cerasiformis</i>	FACU	BR to 1-gal	4 to 6-ft	
<b>Red elderberry</b>	<i>Sambucus racemosa</i>	FACU	BR to 1-gal	8-ft	
<b>Salal</b>	<i>Gaultheria shallon</i>	FACU	BR to 1-gal	4 to 6-ft	
<b>Serviceberry</b>	<i>Amelanchier alnifolia</i>	FACU	BR to 1-gal	10-ft	
<b>Vine maple</b>	<i>Acer circinatum</i>	FAC	BR to 1-gal	15-ft	
<b>Lower Stata: Herbaceous and subshrubs = 125</b>					
<b>Dull Oregon grape</b>	<i>Mahonia nervosa</i>	FACU	Plug to 4-in	2 to 3-ft	128
<b>Kinnikinnick</b>	<i>Arctostaphylos uva-ursi</i>	FACU	Plug to 4-in	2 to 3-ft	
<b>Western swordfern</b>	<i>Polystichum munitum</i>	FACU	4-in to 1-gal	3 to 5-ft	
<b>Youth-on-age</b>	<i>Tolmiea menziesii</i>	FAC	Plug to 4-in	2 to 3-ft	

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## E.5 Monitoring & Contingency

If part of the mitigation plan is not meeting a performance standard, as measured during monitoring, enact the contingency plan to help the mitigation get back on track. Failure to do so may result in incomplete mitigation and additional mitigation requirements beyond the original plan.

- A. Control and monitor **Class C noxious weeds** annually for 3 years either by hand or by a Washington Department of Agricultural Licensed Pesticide Applicator.
- B. Monitor native plant success for 3 years at the Sampling Locations specified on the Site Map.
  - i. Each year, hire a biologist to record the percentage of aerial cover of native plants and noxious weeds within mitigation zones.
  - ii. Dead or dying plants shall be replaced the following fall as needed to meet or exceed mitigation standards.
  - iii. Different species of plants taken from our recommended plant list should be used when other species fail.
  - iv. Plant species substitutions may be made if recommended by an arborist or ecologist experienced in restoration.

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### E.5.1 Performance Standards

#### **Year 1 Performance Standards**

- 1) In the first year, remove noxious weeds on entire Site as described in **Mitigation Measures**.
  - a. Noxious weed cover shall be below 10% after treatment.
  - b. Retreat area as needed to reduce invasive plant cover below performance standards.
- 2) Install plant species as outlined within the designated Mitigation Zones.
  - a. In Year 1, plants installed in shall meet a 90% survivability rate.
  - b. Reinstall plants according to this Mitigation Plan as necessary to meet required cover.

#### **Year 2-3 Performance Standards**

- 1) Noxious weed cover shall be below 20% within Site.
  - a. Retreat area as needed to reduce invasive plant cover below performance standards.
- 2) Native lower strata aerial cover in Site shall be over 50%.
  - a. Install herbaceous plants according to this Mitigation Plan as necessary to meet required cover.
- 3) Native middle strata aerial cover in Site shall be over 50%.
  - a. Install shrubs and small trees according to this Mitigation Plan as necessary to meet required cover.
- 4) Native upper strata survivability rate shall be 80%.