



Final Report

Plant Associations Known or With Potential to Occur within Ebey's Landing National Historic Reserve, Fort Vancouver National Historic Site, Lewis and Clark National Historic Park, San Juan National Historic Park.

National Park Service
North Coast and Cascades Network

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Acronyms:

IVC/NVC	International Vegetation Classification/National Vegetation Classification
EBLA	Ebey's Landing National Historic Reserve
FOVA	Fort Vancouver National Historic Site
LEWI	Lewis and Clark National Historic Park
NCCN	North Coast and Cascades Network
NPS	National Park Service
SAJH	San Juan National Historic Park
WNHP	Washington Natural Heritage Program, Dept. of Natural Resources

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Introduction

The Washington Natural Heritage Program (WNHP) was contracted by the National Park Service to compile existing vegetation classification data to identify which plant association types (as classified by the International Vegetation Classification) are present or are thought to occur within the boundaries of Ebey's Landing National Historic Reserve, Fort Vancouver National Historic Site, Lewis and Clark National Historic Park, and San Juan National Historic Park. In addition, geographic locations (i.e. private lands at EBLA) and/or habitats where vegetation classification data gaps occur would be identified for each park.

Methods

We referenced all plant associations that we knew, or suspected, to occur in one or more of the four parks of interest relative to the most current state of both the NVC (Grossman et al. 1998, NatureServe 2005) and the WNHP state vegetation classification. The NVC includes all plant associations recognized by NatureServe (2005), as well as new associations and future revisions to NatureServe (2005) from the coastal forests correlation project (Meidinger et al. 2005). This project utilizes the Federal Geographic Data Committee (FGDC 1997, FDGC 2008) -adopted National Vegetation Classification (NVC) standard.

The coastal forests correlation project (Meidinger et al. 2005) was a recent effort to quantitatively compare previously-defined plant associations from southeastern Alaska south to southwestern Oregon. Data sets of defined plant associations were collected into a single database and then compared with similarity indices and constancy/cover tables. A group of ecologists with regional expertise in vegetation classification reviewed the analyses and made proposals for lumping and naming of plant associations on a global scale.

The WNHP state vegetation classification includes citations of all plant associations described in Washington. We reviewed the list of plant associations described in the state by all authors for associations that were not captured adequately by the list of NVC and Coastal Correlation associations and that were likely to occur in one or more of the four parks. We included these associations recognized within the state, but not globally, within the preliminary classification for the four parks. We noted them in the preliminary classification as "new" to denote they would be potential new additions to the NVC, above and beyond the additions and revisions of the Coastal Correlation.

The draft list of plant associations of the four parks (Appendix A) was initially derived from the following existing sources:

Ebey's Landing National Historic Reserve

- (a) Island County Department of Planning and Community Development. 2007. Island County Wetland Identification Report. Coupeville, WA. [UUUhttp://www.islandcounty.net/planning/documents/Wetland%20ID%20Guide2PA%20010208%200958.pdf](http://www.islandcounty.net/planning/documents/Wetland%20ID%20Guide2PA%20010208%200958.pdf)

- (b) Sheehan, M. 2007. Prairie and Oak Woodland Habitats and Associated Rare Species on Whidbey Island. Prepared for the Whidbey Camano Land Trust.

Fort Vancouver National Historic Site

- (a) Robson, K.A. 2000. Botanical Resources Report & Inventory. Fort Vancouver National Historic Site. Prepared for National Park Service, Vancouver, WA.

Lewis and Clark National Historic Park

- (a) Sayce, K. and N. Eid. 2004. Vascular Plant Species and Plant Community Inventory. Cape Disappointment State Park. Prepared for Washington Parks and Recreation Commission.
- (b) Sayce, K. 2003. Tidal Vegetation Survey – 2007 – Lewis and Clark River, Fort Clatsop National Memorial. Prepared for Fort Clatsop National Memorial, Astoria, OR.
- (c) Christy, J.A. 2004. Native Freshwater Wetland Plant Associations of Northwestern Oregon. Oregon Natural Heritage Program, Oregon State University. <http://oregonstate.edu/ornhic/documents/christy2004.pdf>
- (d) Christy, J.A., J.S. Kagan, and A.M. Wiedemann. 1998. Plant Associations of the Oregon Dunes National Recreation Areas, Siuslaw National Forest, Oregon. United States Department of Agriculture, Forest Service. Pacific Northwest Region. Technical Paper R6-NR-ECOL-TP-09-98. <http://www.reo.gov/ecoshare/Publications/documents/Plant%20Associations%20Of%20The%20Oregon%20Dunes%20.pdf>
- (e) Christy, J.A. and J.A. Putera. 1993. Lower Columbia River Natural Area Inventory. Submitted to The Nature Conservancy, Washington Field Office, Seattle, WA. Oregon Natural Heritage Program. <http://oregonstate.edu/ornhic/documents/colrep.pdf>
- (f) Kunze, L.M. 1994. Preliminary classification of native, low elevation, freshwater wetland vegetation in western Washington. Washington Natural Heritage Program, Department of Natural Resources, Olympia, WA. 120 pp.

San Juan National Historical Park

- (a) Agee, J.K. 1987. The Forests of San Juan Island National Historical Park. Report CPSU/UW 88-1. National Park Service Cooperative Park Studies Unit, College of Forest Resources, University of Washington. Seattle, WA. 98195.
- (b) Sprenger, C., A. Larson, M. Almaguer-Bay, and S. Martin. 2005. Conservation Area Plan for Cowlitz Bay and Bitte Baer Preserves, Waldron Island, Washington. Prepared by Rain Shadow Consulting, LLC for the Nature Conservancy.
- (c) Peterson, D. 2002. Survey of Vegetation and Fuels in San Juan National Historic Park. PowerPoint presentation (received from the National Park Service).

The types identified in these documents (i.e. source types) were then cross-walked, when possible, to the synonymous NVC type. We first attempted to cross-walk the source type to a NVC plant association but if this was not possible, we then moved up and identified the lowest possible unit in the NVC hierarchy which could be equated to the source type. If no NVC type fit the description of the source type, then it was labeled as Unknown. This was true for all levels of

the NVC hierarchy. Additional data collection for these unknown types may show that they are previously unrecognized plant associations or that they may represent variations of existing NVC types.

Next, we overlaid the Washington Natural Heritage Program's GIS layer of Element Occurrences (EO) to determine if the EOs represented a plant association or vegetation type not documented from the sources above. We also consulted our general management files to determine whether any field notes from previous field surveys by WNHP ecologists might identify potential plant association within park boundaries.

Finally, NatureServe's Ecological Systems Map (Comer et al. 2003) was overlaid on top of the four park boundaries to determine which ecological systems (i.e. NVC Groups) are mapped as occurring in the parks. Although Ecological Systems are not explicitly part of the NVC, for the most part they cross-walk easily into the Group level in the NVC. Therefore, we used the Ecological System map as a surrogate map for Groups. Any Groups not captured by the above sources were added to the list of potential plant association which might occur in the parks. Then, we reviewed each mapped Group in relation to each park's ecological characteristics to determine which plant associations associated with each group have the potential to occur in each park. In some cases, we could not confidently identify potential vegetation types lower than the Group level.

Following the above analysis, we identified vegetation types and geographic areas in need of future data collection efforts. These included any types which were:

- (1) potential plant associations (or Groups) lacking confirming data;
- (2) known plant associations with very little data;
- (3) portions of the parks which have received minimal attention from past classification efforts.

Findings

Appendix A lists the 141 plant associations (55 preliminary alliances) or Groups known or thought to occur within the parks. Appendix B places those types into the NVC hierarchy. We were able to cross-walk 81 source types to NVC plant association (Appendix A & B). Ten source types were considered to be Cultural or Cultivated types. Of the remaining 50 types, we were able to classify them to NVC Groups.

Data Gaps

Specific data gaps associated with the source types are identified in Appendix A, which has a column labeled "Needs More Data". Source types with a 'Y' indicate that more data collection is needed to confirm whether the type occurs in the parks or to confirm the comparable NVC plant association(s) of the source type. Appendix A also lists whether each source type occurs (Y) or is thought to occur (P) in each park. General data gaps are presented below for each park.

Ebey's Landing National Historic Reserve

Other than a few element occurrence records in WNHP's database and work by Sheehan (2007), very little previous vegetation classification work has been completed at Ebey's Landing National Historic Reserve. Thus, the entire geographic extent of this site should be a target for future classification work although Chappell (2004, 2006) classifications cover most of the natural and semi-natural vegetation.

Fort Vancouver National Historic Site

Very little work has been completed at Fort Vancouver National Historic Site. Most of this park consists of cultural vegetation of some sort. However, native vegetation appears to be present along the floodplain of the Columbia River within the Water Resources Education Center portion of the site. Additional work should focus on this area as well as classifying the cultural vegetation types present.

Lewis and Clark National Historic Park

Classification efforts and Lewis and Clark National Historic Park have mostly focused on Cape Disappointment State Park and Fort Clatsop National Memorial. The other units within this park need to be targeted. In addition, much of the work cited for LEWI seemed to be heavily focused on wetlands and riparian types. Thus, upland vegetation types may be a data gap at Cape Disappointment State Park and Fort Clatsop National Memorial.

San Juan National Historical Park

The San Juan National Historic Park has had much emphasis placed on forested plant associations while non-forested types have received much less attention. Future work should focus on cross-walking current line work (and types) to NVC types and sampling non-forested vegetation (both upland and wetland).

References Cited

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- Chappell, C. B. 2004. Plant Associations in Washington's Puget Trough Ecoregion. Wash. Natural Heritage Prog., Wash. Dept. of Natural Resources. On-line publication. [<http://www.dnr.wa.gov/nhp/refdesk/communities/index.html>].
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- Grossman D.H., Faber-Langendoen D., Weakley A.S., Anderson M., Bourgeron P., Crawford R., Goodin K., Landaal S., Metzler K., Patterson K.D., Pyne M., Reid M., and Sneddon L. 1998. International classification of ecological communities: terrestrial vegetation of the United States.

Volume I, The National Vegetation Classification System: development, status, and applications. The Nature Conservancy: Arlington, VA.

Federal Geographic Data Committee. 2008. National Vegetation Classification Standard, Version 2. FGDC-STD-005-2008. Vegetation Subcommittee, Federal Geographic Data Committee. FGDC Secretariat, U.S. Geological Survey. Reston, VA. 126 p. Online at: http://www.fgdc.gov/standards/projects/FGDC-standards-projects/vegetation/NVCS_V2_FINAL_2008-02.pdf

Meidinger, D, C. Chappell, C. Cadrin, G. Kittel, C. McCain, K. Boggs, J. Kagan, G. Cushon, A. Banner and T. DeMeo. 2005. International Vegetation Classification of the Pacific Northwest: International correlation of temperate coastal forest plant associations of Oregon, Washington, British Columbia and Alaska. Contributors: B.C. Ministry of Forests, USDA Forest Service, B.C. Conservation Data Centre, Alaska Natural Heritage Program, Washington Natural Heritage Program, Oregon Natural Heritage Information Center.

NatureServe. 2005. NatureServe explorer. [<http://www.natureserve.org/explorer/>]

Appendix A. Plant Associations Known or Thought to Occur within Ebey's Landing National Historic Reserve, Fort Vancouver National Historic Site, Lewis and Clark National Historic Park, San Juan National Historic Park.

Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Agrostis stolonifera - Argentina egedii	Sayce, 2004	Unknown	N/A	N/A	Y				Could be Temp Pacific Salt Marsh	Y
Alnus rubra - Picea sitchensis / Carex obnupta	Sayce, 2004	Picea sitchensis / Carex obnupta - Lysichiton americanus Forest	CEGL000400	G2G4	Y					N
Alnus rubra / Carex obnupta	Sayce, 2004	Alnus rubra / Rubus spectabilis / Carex obnupta - Lysichiton americanus Forest	CEGL003390	G3G5	Y					Y
Alnus rubra / Rubus spectabilis / Carex obnupta	Sayce, 2004	Alnus rubra / Rubus spectabilis / Carex obnupta - Lysichiton americanus Forest	CEGL003389	G3G4	Y					Y
Alnus rubra / Sambucus racemosa / Rubus spectabilis	Sayce, 2004	Alnus rubra / Rubus spectabilis - Sambucus racemosa Forest	CEGL003463	G3	Y				NatureServe currently only documents in CA but suggest OR & WA; not on our State list	Y
Alnus rubra / turf grasses - forbs (mix of introduced species)	Sayce, 2004	Unknown	N/A	N/A	Y				invasive type	N
Ammophila arenaria	Sayce, 2004	Ammophila arenaria Semi-Natural Vegetation	A.1206	N/A	Y					N
Ammophila arenaria - Ammophila breviligulata - Leymus mollis	Sayce, 2004	Ammophila arenaria Semi-Natural Vegetation	A.1206	N/A	Y					N
Ammophila breviligulata	Sayce, 2004	Unknown	N/A	N/A	Y					N
Ammophila breviligulata - Lathyrus japonicus	Sayce, 2004	Ammophila breviligulata - Lathyrus japonicus (Atlantic Coast type; nonnative here)	A.1206	N/A	Y					Y

¹ Derived from NatureServe Explorer, March, 2009: <http://www.natureserve.org/explorer/>

² As identified in NVC.

³ Global Conservation Status Rank; Derived from NatureServe Explorer, March, 2009: <http://www.natureserve.org/explorer/>

⁴ Lewis and Clark National Historic Park (Y = occurs in Park; P = May occur in Park)

⁵ San Juan National Historic Park

⁶ Ebey's Landing National Historic Reserve

⁷ Fort Vancouver National Historic Site

North Coast and Cascades Network

Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Aquatic Bed	Island County Wetland docs	Unknown	N/A	N/A			P			
Aster subspicatus - Potentilla pacifica	Christy and Putera 1994	Argentina egedii - Symphyotrichum subspicatum Herbaceous Vegetation	CEGL003288	G3G4	P					Y
Athyrium filix-femina - Oenanthe sarmentosa - Lysichiton americanus	Sayce, 2004	Athyrium filix-femina C.T.	Kunze	N/A	Y					Y
Baccharis pilularis / Calamagrostis nutkaensis	Sayce, 2004	Calamagrostis nutkaensis / Baccharis pilularis Herbaceous Vegetation	CEGL003377	G2	Y					N
Baccharis pilularis / Festuca rubra - Sedum oreganum	Sayce, 2004	Unknown	N/A	N/A	Y					Y
Bidens cernua	Christy and Putera 1999	Unknown	N/A	N/A	P					Y
Bog/poor fen	Island County Wetland docs	Unknown	N/A	N/A			P			Y
Calamagrostis nutkaensis / Gaultheria shallon / Elymus glaucus	Sayce, 2004	Calamagrostis nutkaensis - Elymus glaucus Herbaceous Vegetation	CEGL001564	G3	Y					N
Carex aquatilis var. dives - Nuphar polysepala (floating mat)	Sayce, 2004	Carex aquatilis var. dives - Comarum palustre Herbaceous Vegetation	CEGL003433	G2	Y					Y
Carex aquatilis var. dives (floating mat)	Sayce, 2004	Carex aquatilis var. dives - Comarum palustre Herbaceous Vegetation	CEGL003433	G2	Y					Y
Carex lyngbyei	Sayce, 2004	Carex lyngbyei Herbaceous Vegetation	CEGL003369	G4	Y				could also be intertidal freshwater wetland, EO at Cape Disappointment State Park	Y
Carex lyngbyei - Argentina egedii	Sayce, 2004	Carex lyngbyei - Argentina egedii Herbaceous Vegetation	CEGL003289	G4	Y				could also be Interdunal wetland	Y
Carex lyngbyei - Eleocharis palustris	Sayce, 2004	Unknown	N/A	N/A	Y				could also be Interdunal wetland	Y
Carex lyngbyei - Juncus balticus	Sayce, 2004	Unknown	N/A	N/A	Y				could also be Interdunal wetland	Y

North Coast and Cascades Network

Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Carex lyngbyei - Lilaeopsis occidentalis	Sayce, 2004	Unknown	N/A	N/A	Y				could also be Interdunal wetland	Y
Carex lyngbyei - Scirpus americanus	Sayce, 2004	Unknown	N/A	N/A	Y				could also be Interdunal wetland	Y
Carex lyngbyei - Triglochin maritimum	Christy and Putera 1993	Carex lyngbyei - (Distichlis spicata, Triglochin maritima) Herbaceous Vegetation	CEGL003285	G4	P					Y
Carex macrocephala	WNHP Element Occurrence	Carex macrocephala	CEGL003368	G1G2			P		CEGL003368	Y
Carex obnupta	Sayce, 2004	Carex obnupta Herbaceous Vegetation	CEGL003313	G4	Y				could be marsh	Y
Carex obnupta - Argentina egedii ssp. egedii	Sayce, 2004	Carex obnupta - Argentina egedii ssp. egedii Herbaceous Vegetation	CEGL001820	G4	Y				could be marsh	Y
Carex obnupta - Eleocharis palustris - Argentina egedii ssp. egedii	Sayce, 2004	Carex obnupta - Argentina egedii ssp. egedii Herbaceous Vegetation	CEGL001820	G4	Y				could be marsh	Y
Carex obnupta - Juncus effusus	Sayce, 2004	Unknown	N/A	N/A	Y				Maybe wet meadow instead?	Y
Carex obnupta (floating mat)	Sayce, 2004	Carex obnupta Herbaceous Vegetation	CEGL003313	G4	Y				not sure about Group; may be marsh but floating mat suggests bog/fen	Y
Carex obnupta (upland?)	Sayce, 2004	Carex obnupta Herbaceous Vegetation	CEGL003313	G4	Y				Probably still wetland	Y
Cornus stolonifera - Salix sitchensis	Christy and Putera 2005	Cornus sericea - Salix (hookeriana, sitchensis) Shrubland	CEGL003292	G3	P					Y
Cultivated	Agee 1987; Peterson mapping; Ecological System Map	Cultivated	N/A	N/A	P	Y	P	P		Y
Cultural	Ecological System Map	Cultural	N/A	N/A	P	P	Y	Y		Y

North Coast and Cascades Network

Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Cytisus scoparius / Picea sitchensis / Ammophila arenaria (shrubland version)	Sayce, 2004	Nonnative type	N/A	N/A	Y				invasive type	N
Deschampsia caespitosa - Agrostis stolonifera - Argentina egedii	Sayce, 2004	Unknown	N/A	N/A	Y					Y
Deschampsia caespitosa - Argentina egedii	Sayce, 2004	Deschampsia caespitosa - Argentina egedii Herbaceous Vegetation	CEGL003383	G3G4	Y					N
Douglas-fir/grass	Agee 1987; Peterson mapping	Pseudotsuga menziesii Cover Type	N/A	N/A		Y			may be cultural; early seral	Y
Douglas-fir-bigleaf maple/grass	Agee 1987; Peterson mapping	Unknown	New			Y				
Douglas-fir-Garry oak-Pacific Madrone/grass	Agee 1987; Peterson mapping	Pseudotsuga menziesii - Quercus garryana - Arbutus menziesii Forest	New	GU		Y			type recommend by DLP	
Douglas-fir-grand fir-western hemlock/salal-ocean spray	Agee 1987; Peterson mapping	Pseudotsuga menziesii-Tsuga heterophylla/Gaultheria shallon Forest	CEGL000084	G3		Y				
Douglas-fir-grand fir-western hemlock/sword fern	Agee 1987; Peterson mapping	Pseudotsuga menziesii-Tsuga heterophylla/Polystichum munitum Forest	CEGL000085	G3?		Y				
Douglas-fir-lodgepole pine/ocean spray-snowberry	Agee 1987; Peterson mapping	Pseudotsuga menziesii/Symphoricarpos albus-Holodiscus discolor Forest	CEGL000461	G1		Y				
Douglas-fir-Pacific Madrone/ocean spray-snowberry	Agee 1987; Peterson mapping	Pseudotsuga menziesii/Symphoricarpos albus-Holodiscus discolor Forest	CEGL000460	G1		Y				
Douglas-fir-western juniper/grass	Agee 1987; Peterson mapping	Pseudotsuga menziesii - Juniperus scopulorum Forest	New	GU		Y			type recommend by Peterson	
Eleocharis palustris - Argentina egedii ssp. egedii	Sayce, 2004	Unknown	N/A	N/A	Y				could be marsh	Y
Elodea canadensis	Christy and Putera 1996	Unknown	N/A	N/A	P					Y

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Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Equisetum fluviatile	Christy and Putera 2001	Equisetum fluviatile Herbaceous Vegetation	CEGL002746	G4	P					Y
Festuca rubra - (Grindelia stricta - Camassia leichtlinii)	Element occurrence; Sheehan, 2007	Festuca rubra - (Grindelia stricta - Camassia leichtlinii) Herbaceous Vegetation	CEGL003347	G1			Y		confined to bluffs	Y
Festuca rubra Coastal Headland Herbaceous Vegetation	Sayce, 2004	Festuca rubra Coastal Headland Herbaceous Vegetation	CEGL001567	G2	Y					N
Festuca roemerii - Camassia quamash - Cerastium arvense	Sheehan, 2007	Festuca roemerii - Camassia quamash - Cerastium arvense Herbaceous Vegetation	New	GNR			Y		found at Smith prairie	Y
Festuca roemerii - Cerastium arvense - Koeleria macrantha	WNHP Element Occurrence	Festuca roemerii - Cerastium arvense - Koeleria macrantha Herbaceous Vegetation	CEGL003349	G2			Y			N
Festuca rubra - Ambrosia chamissonis	WNHP Element Occurrence	Festuca rubra - Ambrosia chamissonis Herbaceous Vegetation	CEGL003290	G1			Y		could be Hypermaritime Headland too	N
Forested swamp	Island County Wetland docs	Unknown	N/A	N/A			P			Y
Freshwater wetland	Island County Wetland docs	Unknown	N/A	N/A			P			Y
Holcus lanata - Anthoxanthum odoratum	Sayce, 2004	Unknown	N/A	N/A	Y					N
Hydrocotyle ranunculoides	Sayce, 2004	Hydrocotyle ranunculoides Aquatic Vegetation	Christy 2004	N/A	Y				Could be marsh?	Y
Intertidal Salt Marsh/Lagoon	Agee 1987; Peterson mapping	Salicornia virginica - Distichlis spicata - Triglochin maritima - (Jaumea carnosa) Herbaceous Vegetation	CEGL003366	G3		Y			not sure about Plant Association	Y
Intertidal Salt Marsh/Lagoon	Island County Wetland docs	Unknown	N/A	N/A			Y			Y
Juncus balticus - Potentilla pacifica	Christy and Putera 1995	Argentina egedii - Juncus balticus Herbaceous Vegetation	CEGL003382	G3G4	P					Y
Juncus effusus - Juncus supiniformis - Ludwigia palustris var. pacifica	Sayce, 2004	Unknown	N/A	N/A	Y					Y
Juncus lesueurii	Sayce, 2004	Unknown	N/A	N/A	Y					Y
Juncus supiniformis	Sayce, 2004	Unknown	N/A	N/A	Y					Y

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Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Lemna minor	Christy and Putera 1997	Lemna minor Herbaceous Vegetation	CEGL003305	G5	P					Y
Leymus mollis	Sayce, 2004; Element occurrence for EBLA	Leymus mollis ssp. mollis - Abronia latifolia Herbaceous Vegetation (similar)	CEGL001796	G2	Y		Y			Y
Lilaeopsis occidentalis - Tillaea hydropiperoides	Christy and Putera 2002	Unknown	N/A	N/A	P					Y
Malus fusca - Salix hookeriana / Carex obnupta	Sayce, 2004	Malus fusca - (Salix hookeriana) / Carex obnupta Shrubland	CEGL003294	G3	Y					N
Malus fusca / Carex obnupta	Sayce, 2004	Malus fusca - (Salix hookeriana) / Carex obnupta Shrubland	CEGL003294	G3	Y					N
Malus fusca / Carex obnupta (upland)	Sayce, 2004	Malus fusca - (Salix hookeriana) / Carex obnupta Shrubland	CEGL003294	G3	Y				Probably still wetland	Y
Mesic Grassland	Agee 1987; Peterson mapping	Cultivated	N/A	N/A		Y				Y
Mesic Grassland w/ shrubs	Agee 1987; Peterson mapping	Cultivated	N/A	N/A		Y				Y
Mesic Grassland w/ shrubs and tree regeneration	Agee 1987; Peterson mapping	Cultivated	N/A	N/A		Y			could be Vancouverian Dry Douglas-fir-(Madrone) Forest and Woodland type?	Y
Mesic Grassland w/ tree regeneration	Agee 1987; Peterson mapping	Cultivated	N/A	N/A		Y			could be Vancouverian Dry Douglas-fir-(Madrone) Forest and Woodland type?	Y

North Coast and Cascades Network

Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Mesic prairies	Sheehan, 2007	Unknown	N/A	N/A			Y		historically present; unclassified degraded site exist on Whidbey Island; see Chappell upland field guide	Y
Moist swales	Robson, 2000;	Unknown	N/A	N/A				P	potentially Willamette Valley Wet Prairie	Y
Myriophyllum hippuroides	Christy and Putera 1998	Unknown	N/A	N/A	P					Y
North Pacific Herbaceous Bald and Bluff	Ecological System Map	Unknown	N/A	N/A		P	P			Y
North Pacific Hypermaritime Western Redcedar-Western Hemlock Forest	Ecological System Map	Unknown	N/A	N/A	Y					Y
North Pacific Maritime Eelgrass Bed	Ecological System Map	Zostera marina Herbaceous Vegetation	CEGL004336	G4G5		P				Y
North Pacific Montane Massive Bedrock, Cliff and Talus	Ecological System Map	Unknown	N/A	N/A			P			Y
North Pacific Silver Fir-Western Hemlock Forest	Ecological System Map	Unknown	N/A	N/A	N					Y
Nuphar polysepalum ssp. luteum [sic]	Sayce, 2004	Nuphar lutea ssp. polysepala Herbaceous Vegetation	CEGL002001	G5	Y					N
Oenanthe sarmentosa - Lilaeopsis occidentalis	Sayce, 2004	Unknown	N/A	N/A	Y					Y
Picea sitchensis - Alnus rubra / Rubus spectabilis / Carex obnupta	Sayce, 2004	Picea sitchensis / Carex obnupta - Lysichiton americanus Forest	CEGL000400	G2G3	Y					N
Picea sitchensis / Calamagrostis nutkaensis	Sayce, 2004	Picea sitchensis/Calamagrostis nutkaensis Woodland	CEGL003266	G3G4	Y					N
Picea sitchensis / Carex obnupta	Sayce, 2004	Picea sitchensis / Carex obnupta - Lysichiton americanus Forest	CEGL000400	G2G4	Y					N

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Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Picea sitchensis / Carex obnupta - Lysichiton americanus	Sayce, 2004	Picea sitchensis / Carex obnupta - Lysichiton americanus Forest	CEGL000400	G2G4	Y					N
Picea sitchensis / Carex obnupta (upland)	Sayce, 2004	Unknown	N/A	N/A	Y				on headlands... maybe still a wetland type just not in typical position for this type... seems to be a localize seep scenario	Y
Picea sitchensis / Cytisus scoparius / Ammophila arenaria	Sayce, 2004	Unknown	N/A	N/A	Y					N
Picea sitchensis / Gaultheria shallon	Sayce, 2004	Picea sitchensis/Gaultheria shallon Forest	CEGL000401	G3	Y				EO Cape Disappointment State Park	N
Picea sitchensis / Gaultheria shallon - Rubus spectabilis	Sayce, 2004	Picea sitchensis / Gaultheria shallon - Rubus spectabilis Forest	CEGL000402	G3	Y					N
Picea sitchensis / Menziesia ferruginea - Vaccinium parvifolium	Sayce, 2004	Picea sitchensis / Menziesia ferruginea - Vaccinium parvifolium Forest	CEGL000056	G3	Y					N
Picea sitchensis / Polystichum munitum	Sayce, 2004	Picea sitchensis - Tsuga heterophylla / Polystichum munitum Forest	CEGL003787	G3?	Y					Y
Picea sitchensis / Rubus spectabilis	Sayce, 2004	Picea sitchensis / Rubus spectabilis Forest	CEGL000060	G3	Y					N
Picea sitchensis / Vaccinium ovatum	Sayce, 2004	Picea sitchensis/Vaccinium ovatum Forest	PNWCOAST_060		Y					N
Pinus contorta - Pseudotsuga menziesii	Sprenger et al. 2005	Pinus contorta var. contorta - Pseudotsuga menziesii / Cladina spp. Forest	CEGL003375	G2		P			not sure about NatureServe type	Y
Pinus contorta / Cytisus scoparius / Ammophila arenaria	Sayce, 2004	Nonnative type	N/A	N/A	Y				invasive type	N
Potamogeton natans	Sayce, 2004	Potamogeton natans Herbaceous Vegetation	CEGL002925	G5?	Y					N

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Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Pseudotsuga menziesii - (Tsuga heterophylla) / Holodiscus discolor / Polystichum munitum	WNHP Element Occurrence	Pseudotsuga menziesii - Tsuga heterophylla / Polystichum munitum Forest	CEGL000085	G3?			Y			N
Pseudotsuga menziesii - Arbutus menziesii / Holodiscus discolor - Lonicera hispidula	Sprenger et al. 2005	Pseudotsuga menziesii - Arbutus menziesii / Vicia americana Forest	CEGL000422	G1G2		P				Y
Pseudotsuga menziesii - Quercus garryana / Symphoricarpos albus	Sprenger et al. 2005	Pseudotsuga menziesii - Quercus garryana / Symphoricarpos albus Forest	CEGL000929	G2G3		P				Y
Pseudotsuga menziesii - Tsuga heterophylla / Gaultheria shallon - Holodiscus discolor	WNHP Element Occurrence	Pseudotsuga menziesii - Tsuga heterophylla / Gaultheria shallon Forest	CEGL000084	G3			Y			N
Pseudotsuga menziesii - Tsuga heterophylla / Rhododendron macrophyllum - Vaccinium ovatum	WNHP Element Occurrence	Pseudotsuga menziesii - Tsuga heterophylla / Rhododendron macrophyllum - Vaccinium ovatum - Gaultheria shallon Forest	CEGL002615	G2			Y			N
Pseudotsuga menziesii / Holodiscus discolor - Rosa gymnocarpa / Festuca occidentalis	WNHP Element Occurrence nearby	Pseudotsuga menziesii / Rosa gymnocarpa - Holodiscus discolor Forest	CEGL000456	S2		P				Y
Quercus garryana - Pseudotsuga menziesii woodland	Chris Chappell field notes	Unknown	N/A	N/A		P				Y
Quercus garryana / Carex inops - (Camassia quamash)	Sheehan, 2007	Quercus garryana / Carex inops - (Camassia quamash) Woodland	CEGL000548	G1			P		probably extirpated from Whidbey Island; may have once been present in Oak Harbor area	Y
Quercus garryana / Symphoricarpos albus / Carex inops	WNHP Element Occurrence	Quercus garryana / Symphoricarpos albus / Carex inops	CEGL003358	G2			P		CEGL003358	Y
Quercus garryana / Festuca roemerii	Sheehan, 2007	Quercus garryana / Festuca roemerii Woodland	CEGL001714	G1			P		not known on Whidbey Island; may have historically been at Oak Harbor	Y

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Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Quercus garryana / Symphoricarpos albus / Carex inops	Sheehan, 2007	Quercus garryana / Symphoricarpos albus / Carex inops Woodland	CEGL003358	G2			P		may be fire suppressed type; one occurrence on Whidbey Island at seaplane base at Oak Harbor	Y
Red alder-cottonwood/salmonberry	Agee 1987; Peterson mapping	Alnus rubra/Rubus spectabilis Forest	CEGL000639	G4G5		Y				
Red alder-Douglas-fir/snowberry	Agee 1987; Peterson mapping	Alnus rubra-Pseudotsuga menziesii/Symphoricarpos albus Forest	New	GU		Y			type recommend by Peterson not sure right alliance- may need new one	
Red alder-western hemlock/sword fern	Agee 1987; Peterson mapping	Alnus rubra/Polystichum munitum Forest	CEGL000638	G4		Y				
Riparian Forest	Island County Wetland docs	Unknown	N/A	N/A			P			Y
Riparian Shrubland	Island County Wetland docs	Unknown	N/A	N/A			P			Y
Sagittaria latifolia	Christy and Putera 2003	Unknown	N/A	N/A	P					Y
Salicornia virginica	Sayce, 2004; WNHP Element Occurrence for EBLA	Salicornia virginica Herbaceous Vegetation	CEGL003380	G3	Y		Y			Y
Salix hookeriana - Spiraea douglasii / Carex obnupta	Sayce, 2004	Salix (hookeriana, sitchensis) - Spiraea douglasii Shrubland	CEGL003386	G3G4	Y					N
Salix hookeriana / Carex obnupta	Sayce, 2004	Unknown	N/A	N/A	Y					Y
Sand Dunes	Agee 1987; Peterson mapping	Unknown	N/A	N/A						Y

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Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Scirpus acutus	Sayce, 2004	Schoenoplectus acutus Herbaceous Vegetation	CEGL001840	G5	Y				Could be marsh; NatureServe type may not be equivalent as it represents inland types.	Y
Scirpus americanus	Sayce, 2004; EO for EBLA	Schoenoplectus americanus Tidal Herbaceous Alliance (Atlantic)	A.2007	N/A	Y		Y			Y
Scirpus americanus - Juncus balticus - Lilaeopsis occidentalis	Sayce, 2004	Schoenoplectus americanus Tidal Herbaceous Alliance (Atlantic)	A.2007	N/A	Y					Y
Scirpus americanus - Lilaeopsis occidentalis	Sayce, 2004	Schoenoplectus americanus Tidal Herbaceous Alliance (Atlantic)	A.2007	N/A	Y					Y
Scirpus validus	Christy and Putera 2004	Schoenoplectus tabernaemontani Temperate Herbaceous Vegetation	CEGL002623	G5	P					Y
Shrub	Agee 1987; Peterson mapping	Cultivated	N/A	N/A		Y				Y
Shrub swamp	Island County Wetland docs	Unknown	N/A	N/A			P			Y
Sparganium emersum	Sayce, 2004	Unknown	N/A	N/A	Y					Y
Sparse Xeric Grassland	Agee 1987; Peterson mapping	Cultivated	N/A	N/A		Y				Y
Spiraea douglasii / Carex obnupta	Sayce, 2004	Spiraea douglasii Shrubland	CEGL001129	G5	Y					N
Stands of Populus balsamifera subsp. trichocarpa	Robson, 2000;	Unknown	N/A	N/A				P	could also be North Pacific Red Alder-Bigleaf Maple-Douglas-fir Forest	Y
Temperate Pacific Intertidal Mudflat	Ecological System Map	Unknown	N/A	N/A	P		P			Y
Typha latifolia - Carex lyngbyei - Argentina egedii	Sayce, 2004	Unknown	N/A	N/A	Y				Could be Temp Pacific Freshwater Marsh	Y

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Source Type	Source	NatureServe Synonym ¹	CODE ²	Global Rank ³	LEWI ⁴	SAJH ⁵	EBLA ⁶	FOVA ⁷	Comments	Needs More Data
Typha latifolia - Eleocharis palustris	Sayce, 2004	Typha (latifolia, angustifolia) Herbaceous Vegetation	CEGL002010	G5	Y					Y
Vancouverian- Californian Deciduous Oak (Garry oak, black oak) Woodland Group	Ecological System Map	Unknown	N/A	N/A		P				Y
Willamette Valley Wet Prairie	Ecological System Map	Unknown	N/A	N/A	N					Y
Xeric Grassland	Agee 1987; Peterson mapping	Cultivated	N/A	N/A		Y				Y
Xeric Grassland with Shrub Islands	Agee 1987; Peterson mapping	Cultivated	N/A	N/A		Y				Y
Zostera japonica - Zostera marina	Sayce, 2004	Unknown	N/A	N/A	Y					Y

Appendix B. U.S. National Vegetation Classification Hierarchy (FGDC 2008) of Potential and Known Plant Associations within Ebey’s Landing National Historic Reserve, Fort Vancouver National Historic Site, Lewis and Clark National Historic Park, San Juan National Historic Park.

Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source	
1 Mesomorphic Tree Vegetation (Forest & Woodland)	1.C Temperate Forest	1.C.1 Warm Temperate Forest	1.C.1.c Madrean Forest	Californian- Vancouverian Foothill and Valley Forest & Woodland	Vancouverian Dry Douglas- fir-(Madrone) Forest and Woodland	Pseudotsuga menziesii - Arbutus menziesii Forest Alliance	Pseudotsuga menziesii - Arbutus menziesii / Holodiscus discolor - Lonicera hispidula	Pseudotsuga menziesii - Arbutus menziesii / Vicia americana Forest	Sprenger et al. 2005	
						Pseudotsuga menziesii-(Arbutus menziesii) Forest and Woodland Alliance	Douglas-fir-Garry oak- Pacific Madrone/grass	Pseudotsuga menziesii - Quercus garryana - Arbutus menziesii Forest	Agee 1987; Peterson mapping	
							Douglas-fir-lodgepole pine/ocean spray- snowberry	Pseudotsuga menziesii/Symphoricarpos albus-Holodiscus discolor Forest	Agee 1987; Peterson mapping	
							Douglas-fir-Pacific Madrone/ocean spray- snowberry	Pseudotsuga menziesii/Symphoricarpos albus-Holodiscus discolor Forest	Agee 1987; Peterson mapping	
							Pinus contorta - Pseudotsuga menziesii	Pinus contorta var. contorta - Pseudotsuga menziesii / Cladina spp. Forest	Sprenger et al. 2005	
							Pseudotsuga menziesii / Holodiscus discolor - Rosa gymnocarpa / Festuca occidentalis	Pseudotsuga menziesii / Rosa gymnocarpa - Holodiscus discolor Forest	WNHP Element Occurrence nearby	
						Semi-Natural Woodland Alliance(Preliminary)	Douglas-fir/grass	Pseudotsuga menziesii Cover Type	Agee 1987; Peterson mapping	
						Unknown	Douglas-fir-western juniper/grass	Pseudotsuga menziesii - Juniperus scopulorum Forest	Agee 1987; Peterson mapping	
						Vancouverian- Californian Deciduous Oak (Garry oak, black oak) Woodland	Pseudotsuga menziesii - Quercus garryana Woodland Alliance	Pseudotsuga menziesii - Quercus garryana / Symphoricarpos albus	Pseudotsuga menziesii - Quercus garryana / Symphoricarpos albus Forest	Sprenger et al. 2005

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
					Group				
						Quercus garryana Woodland Alliance	Quercus garryana / Carex inops - (Camassia quamash)	Quercus garryana / Carex inops - (Camassia quamash) Woodland	Sheehan, 2007
							Quercus garryana / Festuca roemerii	Quercus garryana / Festuca roemerii Woodland	Sheehan, 2007
							Quercus garryana / Symphoricarpos albus / Carex inops	Quercus garryana / Symphoricarpos albus / Carex inops Woodland	Sheehan, 2007
							Quercus garryana - Pseudotsuga menziesii woodland	Unknown	Chris Chappell field notes
							Quercus garryana / Symphoricarpos albus / Carex inops	Quercus garryana / Symphoricarpos albus / Carex inops	WNHP Element Occurrence
						Unknown	Vancouverian-Californian Deciduous Oak (Garry oak, black oak) Woodland Group	Unknown	Ecological System Map
		1.C.2 Cool Temperate Forest	1.C.2.b Western North America Cool Temperate Forest	Vancouverian Lowland and Montane Rainforest	North Pacific Hypermaritime Sitka Spruce Forest	Picea sitchensis-(Tsuga heterophylla) Forest	Picea sitchensis / Carex obnupta (upland)	Unknown	Sayce, 2004
						Picea sitchensis-(Tsuga heterophylla) Forest Alliance	Picea sitchensis / Gaultheria shallon	Picea sitchensis/Gaultheria shallon Forest	Sayce, 2004
							Picea sitchensis / Gaultheria shallon - Rubus spectabilis	Picea sitchensis / Gaultheria shallon - Rubus spectabilis Forest	Sayce, 2004
							Picea sitchensis / Menziesia ferruginea - Vaccinium parvifolium	Picea sitchensis / Menziesia ferruginea - Vaccinium parvifolium Forest	Sayce, 2004
							Picea sitchensis / Polystichum munitum	Picea sitchensis - Tsuga heterophylla / Polystichum munitum Forest	Sayce, 2004
							Picea sitchensis / Rubus spectabilis	Picea sitchensis / Rubus spectabilis Forest	Sayce, 2004

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
							Picea sitchensis / Vaccinium ovatum	Picea sitchensis/Vaccinium ovatum Forest	Sayce, 2004
					Picea sitchensis- Calamagrostis nutkaensis Woodland Alliance	Picea sitchensis / Calamagrostis nutkaensis	Picea sitchensis/Calamagrostis nutkaensis Woodland	Sayce, 2004	
				North Pacific Hypermaritime Western Redcedar- Western Hemlock Forest		Unknown	North Pacific Hypermaritime Western Redcedar-Western Hemlock Forest	Unknown	Ecological System Map
				North Pacific Maritime Douglas-fir- Western Hemlock Forest	Pseudotsuga menziesii var., menziesii - Tsuga heterophylla Dry Forest Alliance	Douglas-fir-grand fir- western hemlock/salal- ocean spray	Pseudotsuga menziesii- Tsuga heterophylla/Gaultheria shallon Forest	Agee 1987; Peterson mapping	
						Pseudotsuga menziesii - Tsuga heterophylla / Gaultheria shallon - Holodiscus discolor	Pseudotsuga menziesii - Tsuga heterophylla / Gaultheria shallon Forest	WNHP Element Occurrence	
						Pseudotsuga menziesii - Tsuga heterophylla / Rhododendron macrophyllum - Vaccinium ovatum	Pseudotsuga menziesii - Tsuga heterophylla / Rhododendron macrophyllum - Vaccinium ovatum - Gaultheria shallon Forest	WNHP Element Occurrence	
					Tsuga heterophylla- Pseudotsuga menziesii Mesic Forest Alliance	Douglas-fir-grand fir- western hemlock/sword fern	Pseudotsuga menziesii- Tsuga heterophylla/Polystichum munitum Forest	Agee 1987; Peterson mapping	
						Pseudotsuga menziesii - (Tsuga heterophylla) / Holodiscus discolor / Polystichum munitum	Pseudotsuga menziesii - Tsuga heterophylla / Polystichum munitum Forest	WNHP Element Occurrence	
					North Pacific Red Alder- Bigleaf Maple- Douglas-fir Forest	Acer macrophyllum- (Pseudotsuga menziesii) Forest Alliance	Douglas-fir-Bigleaf maple/grass	Unknown	Agee 1987; Peterson mapping
				Red alder-Douglas- fir/snowberry			Alnus rubra-Pseudotsuga menziesii/Symphoricarpos albus Forest	Agee 1987; Peterson mapping	

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
						Alnus rubra-(Picea sitchensis-Tsuga heterophylla) Forest and Woodland	Alnus rubra / turf grasses - forbs (mix of introduced species)	Unknown	Sayce, 2004
Alnus rubra-(Picea sitchensis-Tsuga heterophylla) Forest and Woodland Alliance	Alnus rubra / Sambucus racemosa / Rubus spectabilis	Alnus rubra / Rubus spectabilis - Sambucus racemosa Forest	Sayce, 2004						
	Red alder-western hemlock/sword fern	Alnus rubra/Polystichum munitum Forest	Agee 1987; Peterson mapping						
North Pacific Silver Fir-Western Hemlock Forest	Unknown	North Pacific Silver Fir-Western Hemlock Forest	Unknown	Ecological System Map					
1.C.3 Temperate Flooded & Swamp Forest	1.C.3.b Western North America Flooded & Swamp Forest	Vancouverian Flooded & Swamp Forest	North Pacific Hardwood-Conifer Swamp	Alnus rubra-(Rubus spectabilis) Swamp Forest Alliance	Alnus rubra / Carex obnupta	Alnus rubra / Rubus spectabilis / Carex obnupta - Lysichiton americanus Forest	Sayce, 2004		
					Alnus rubra / Rubus spectabilis / Carex obnupta	Alnus rubra / Rubus spectabilis / Carex obnupta - Lysichiton americanus Forest	Sayce, 2004		
Unknown	Forested swamp	Unknown	Island County Wetland docs						
North Pacific Lowland Riparian Forest and Woodland	Picea sitchensis-(Tsuga heterophylla, Alnus rubra) Riparian Forest Alliance	Acer macrophyllum-(Alnus rubra) Riparian Forest and Woodland Alliance	Red alder-cottonwood/salmonberry	Alnus rubra/Rubus spectabilis Forest	Agee 1987; Peterson mapping				
			Alnus rubra - Picea sitchensis / Carex obnupta	Picea sitchensis / Carex obnupta - Lysichiton americanus Forest	Sayce, 2004				
			Picea sitchensis - Alnus rubra / Rubus spectabilis / Carex obnupta	Picea sitchensis / Carex obnupta - Lysichiton americanus Forest	Sayce, 2004				
			Picea sitchensis / Carex obnupta	Picea sitchensis / Carex obnupta - Lysichiton americanus Forest	Sayce, 2004				

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source								
							Picea sitchensis / Carex obnupta - Lysichiton americanus	Picea sitchensis / Carex obnupta - Lysichiton americanus Forest	Sayce, 2004								
					Unknown	Unknown	Riparian Forest	Unknown	Island County Wetland docs								
							Stands of Populus balsamifera subsp. trichocarpa	Unknown	Robson, 2000;								
							Riparian Shrubland	Unknown	Island County Wetland docs								
										North Pacific Lowland Riparian Shrubland and Meadow	Unknown	Riparian Shrubland	Unknown	Island County Wetland docs			
												North Pacific Shrub Swamp	Malus fusca Seasonally Flooded Shrubland Alliance	Malus fusca - Salix hookeriana / Carex obnupta	Malus fusca - (Salix hookeriana) / Carex obnupta Shrubland	Sayce, 2004	
														Malus fusca / Carex obnupta	Malus fusca - (Salix hookeriana) / Carex obnupta Shrubland	Sayce, 2004	
														Malus fusca / Carex obnupta (upland)	Malus fusca - (Salix hookeriana) / Carex obnupta Shrubland	Sayce, 2004	
												North Pacific Shrub Swamp	Salix hookeriana Seasonally Flooded Shrubland Alliance	Salix hookeriana - Spiraea douglasii / Carex obnupta	Salix (hookeriana, sitchensis) - Spiraea douglasii Shrubland	Sayce, 2004	
														Spiraea douglasii Seasonally Flooded Shrubland Alliance	Spiraea douglasii / Carex obnupta	Spiraea douglasii Shrubland	Sayce, 2004
															Unknown	Salix hookeriana / Carex obnupta	Unknown
														Shrub swamp		Unknown	Island County Wetland docs
												2 Mesomorphic Shrub & Herb Vegetation (Shrubland & Grassland)	2.C Temperate & Boreal Shrubland & Grassland	2.C.1 Temperate Grassland, Meadow & Shrubland	2.C.1.a Vancouverian & Rocky Mountain Grassland & Shrubland	Vancouverian Lowland Grassland & Shrubland	North Pacific Herbaceous Bald and Bluff
Unknown	North Pacific Herbaceous Bald and Bluff	Unknown	Ecological System Map														

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source						
					North Pacific Hypermaritime Shrub and Herbaceous Headland	Calamagrostis nutkaensis Herbaceous Alliance	Baccharis pilularis / Calamagrostis nutkaensis	Calamagrostis nutkaensis / Baccharis pilularis Herbaceous Vegetation	Sayce, 2004						
							Calamagrostis nutkaensis / Gaultheria shallon / Elymus glaucus	Calamagrostis nutkaensis - Elymus glaucus Herbaceous Vegetation	Sayce, 2004						
						Festuca rubra Herbaceous Alliance	Festuca rubra Coastal Headland Herbaceous Vegetation	Festuca rubra Coastal Headland Herbaceous Vegetation	Sayce, 2004						
						Unknown	Baccharis pilularis / Festuca rubra - Sedum oreganum	Unknown	Sayce, 2004						
				Willamette Valley Upland Prairie and Savanna	Festuca roemerii Herbaceous Alliance	Festuca roemerii - Camassia quamash - Cerastium arvense	Festuca roemerii - Camassia quamash - Cerastium arvense Herbaceous Vegetation	Festuca roemerii - Camassia quamash - Cerastium arvense Herbaceous Vegetation	Sheehan, 2007						
										Festuca rubra Herbaceous Alliance	Festuca rubra - (Grindelia stricta - Camassia leichtlinii)	Festuca rubra - (Grindelia stricta - Camassia leichtlinii) Herbaceous Vegetation	Element occurrence; Sheehan, 2007		
						Unknown	Mesic prairies	Unknown	Sheehan, 2007						
							Moist swales	Unknown	Robson, 2000;						
	2.C.3 Temperate & Boreal Scrub & Herb Coastal Vegetation	2.C.3.b Pacific Coast Xeric Scrub & Herb Vegetation	Cool Pacific Coastal Beach, Dune & Bluff Vegetation	North Pacific Maritime Coastal Sand Dune and Strand	Ammophila arenaria Semi-Natural Vegetation Alliance	Ammophila arenaria	Ammophila arenaria - Ammophila breviligulata - Leymus mollis	Ammophila arenaria Semi-Natural Vegetation	Sayce, 2004						
													Ammophila breviligulata - Lathyrus japonicus	Ammophila breviligulata - Lathyrus japonicus (Atlantic Coast type; nonnative here)	Sayce, 2004
												Carex macrocephala Herbaceous Alliance	Carex macrocephala	Carex macrocephala	WNHP Element Occurrence

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
						Festuca rubra Intermittently Flooded Herbaceous Alliance	Festuca rubra - Ambrosia chamissonis	Festuca rubra - Ambrosia chamissonis Herbaceous Vegetation	WNHP Element Occurrence
						Leymus mollis Herbaceous Alliance	Leymus mollis	Leymus mollis ssp. mollis - Abronia latifolia Herbaceous Vegetation (similar)	Sayce, 2004; Element occurrence for EBLA
						Semi-Natural Herbaceous Vegetation Alliance (Preliminary)	Ammophila breviligulata	Unknown	Sayce, 2004
							Holcus lanata - Anthoxanthum odoratum	Unknown	Sayce, 2004
						Semi-Natural Shrubland Alliance (Preliminary)	Cytisus scoparius / Picea sitchensis / Ammophila arenaria (shrubland version)	Nonnative type	Sayce, 2004
						Semi-Natural Woodland Alliance(Preliminary)	Picea sitchensis / Cytisus scoparius / Ammophila arenaria	Unknown	Sayce, 2004
							Pinus contorta / Cytisus scoparius / Ammophila arenaria	Nonnative type	Sayce, 2004
						Unknown	Sand Dunes	Unknown	Agee 1987; Peterson mapping
		2.C.4 Temperate & Boreal Bog & Fen	2.C.4.a North American Bog & Fen	North Pacific Bog & Fen	North Pacific Lowland Bog & Poor Fen	Carex aquatilis var. dives Seasonally Flooded Herbaceous Alliance	Carex aquatilis var. dives - Nuphar polysepala (floating mat)	Carex aquatilis var. dives - Comarum palustre Herbaceous Vegetation	Sayce, 2004
							Carex aquatilis var. dives (floating mat)	Carex aquatilis var. dives - Comarum palustre Herbaceous Vegetation	Sayce, 2004
						Carex obnupta Seasonally Flooded Herbaceous Alliance	Carex obnupta (floating mat)	Carex obnupta Herbaceous Vegetation	Sayce, 2004
						Unknown	Bog/poor fen	Unknown	Island County Wetland docs
		2.C.5 Temperate & Boreal Freshwater	2.C.5.b Western North America	Western North America Freshwater Marsh	North Pacific Coastal Interdunal Wetland	Carex obnupta Seasonally Flooded Herbaceous Alliance	Carex obnupta	Carex obnupta Herbaceous Vegetation	Sayce, 2004

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
		Marsh	Freshwater Marsh						
							Carex obnupta - Argentina egedii ssp. egedii	Carex obnupta - Argentina egedii ssp. egedii Herbaceous Vegetation	Sayce, 2004
							Carex obnupta - Eleocharis palustris - Argentina egedii ssp. egedii	Carex obnupta - Argentina egedii ssp. egedii Herbaceous Vegetation	Sayce, 2004
							Carex obnupta (upland?)	Carex obnupta Herbaceous Vegetation	Sayce, 2004
						Eleocharis palustris Herbaceous Alliance (Preliminary)	Eleocharis palustris - Argentina egedii ssp. egedii	Unknown	Sayce, 2004
						Schoenoplectus acutus - (Schoenoplectus tabernaemontani) Semipermanently Flooded Herbaceous Alliance	Scirpus acutus	Schoenoplectus acutus Herbaceous Vegetation	Sayce, 2004
						Semi-Natural Herbaceous Vegetation Alliance (Preliminary)	Agrostis stolonifera - Argentina egedii	Unknown	Sayce, 2004
						Unknown	Juncus lesueurii	Unknown	Sayce, 2004
							Typha latifolia - Carex lyngbyei - Argentina egedii	Unknown	Sayce, 2004
					North Pacific Intertidal Freshwater Wetland	Carex lyngbyei- Eleocharis palustris Herbaceous Alliance (Preliminary)	Carex lyngbyei - Eleocharis palustris	Unknown	Sayce, 2004
						Cornus sericea Temporarily Flooded Shrubland Alliance	Cornus stolonifera - Salix sitchensis	Cornus sericea - Salix (hookeriana, sitchensis) Shrubland	Christy and Putera 2005
						Equisetum fluviatile Semipermanently Flooded Herbaceous Alliance	Equisetum fluviatile	Equisetum fluviatile Herbaceous Vegetation	Christy and Putera 2001

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
						Schoenoplectus acutus - (Schoenoplectus tabernaemontani) Semipermanently Flooded Herbaceous Alliance	Scirpus validus	Schoenoplectus tabernaemontani Temperate Herbaceous Vegetation	Christy and Putera 2004
						Unknown	Athyrium filix-femina - Oenanthe sarmentosa - Lysichiton americanus	Athyrium filix-femina C.T.	Sayce, 2004
							Oenanthe sarmentosa - Lilaeopsis occidentalis	Unknown	Sayce, 2004
							Bidens cernua	Unknown	Christy and Putera 1999
							Lilaeopsis occidentalis - Tillaea hydropiperoides	Unknown	Christy and Putera 2002
							Sagittaria latifolia	Unknown	Christy and Putera 2003
					Temperate Pacific Freshwater Emergent Marsh		Juncus effusus Herbaceous Alliance (Preliminary)	Carex obnupta - Juncus effusus	Unknown
						Juncus effusus - Ludwigia palustris var. pacifica		Unknown	Sayce, 2004
						Juncus supiniformis		Unknown	Sayce, 2004
						Typha (angustifolia, latifolia) - (Schoenoplectus spp.) Semipermanently Flooded Herbaceous Alliance	Typha latifolia - Eleocharis palustris	Typha (latifolia, angustifolia) Herbaceous Vegetation	Sayce, 2004
						Unknown	Freshwater wetland	Unknown	Island County Wetland docs
							Sparganium emersum	Unknown	Sayce, 2004
				Western North America Wet Meadow & Low Shrub	Willamette Valley Wet Prairie	Unknown	Willamette Valley Wet Prairie	Unknown	Ecological System Map

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
				Carr					
		2.C.6 Salt Marsh	2.C.6.c Temperate & Boreal Pacific Coastal Salt Marsh	North American Pacific Coastal Salt Marsh	Temperate Pacific Tidal Salt and Brackish Marsh	Argentina egedii Tidal Herbaceous Alliance	Aster subspicatus - Potentilla pacifica	Argentina egedii - Symphyotrichum subspicatum Herbaceous Vegetation	Christy and Putera 1994
	Juncus balticus - Potentilla pacifica						Argentina egedii - Juncus balticus Herbaceous Vegetation	Christy and Putera 1995	
	Carex lyngbyei Tidal Herbaceous Alliance					Carex lyngbyei	Carex lyngbyei Herbaceous Vegetation	Sayce, 2004	
						Carex lyngbyei - Argentina egedii	Carex lyngbyei - Argentina egedii Herbaceous Vegetation	Sayce, 2004	
						Carex lyngbyei - Triglochin maritimum	Carex lyngbyei - (Distichlis spicata, Triglochin maritima) Herbaceous Vegetation	Christy and Putera 1993	
	Carex lyngbyei Tidal Herbaceous Alliance (Preliminary)					Carex lyngbyei - Juncus balticus	Unknown	Sayce, 2004	
						Carex lyngbyei - Lilaeopsis occidentalis	Unknown	Sayce, 2004	
						Carex lyngbyei - Scirpus americanus	Unknown	Sayce, 2004	
	Deschampsia caespitosa Tidal Herbaceous Alliance					Deschampsia caespitosa - Argentina egedii	Deschampsia caespitosa - Argentina egedii Herbaceous Vegetation	Sayce, 2004	
	Deschampsia caespitosa Tidal Herbaceous Alliance (Preliminary)					Deschampsia caespitosa - Agrostis stolonifera - Argentina egedii	Unknown	Sayce, 2004	
	Salicornia virginica Tidal Herbaceous Alliance					Intertidal Salt Marsh/Lagoon	Salicornia virginica - Distichlis spicata - Triglochin maritima - (Jaumea carnosa) Herbaceous Vegetation	Agee 1987; Peterson mapping	
							Salicornia virginica	Salicornia virginica Herbaceous Vegetation	Sayce, 2004; WNHP Element Occurrence for EBLA

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
						Schoenoplectus americanus Tidal Herbaceous Alliance (Atlantic)	Scirpus americanus	Schoenoplectus americanus Tidal Herbaceous Alliance (Atlantic)	Sayce, 2004; EO for EBLA
						Scirpus americanus - Juncus balticus - Lilaeopsis occidentalis	Schoenoplectus americanus Tidal Herbaceous Alliance (Atlantic)	Sayce, 2004	
						Scirpus americanus - Lilaeopsis occidentalis	Schoenoplectus americanus Tidal Herbaceous Alliance (Atlantic)	Sayce, 2004	
						Unknown	Intertidal Salt Marsh/Lagoon	Unknown	Island County Wetland docs
5 Hydromorphic Vegetation (Aquatic Vegetation)	5.A Saltwater Aquatic Vegetation	5.A.1 Marine and Estuarine Saltwater Aquatic Vegetation	5.A.1.c Temperate Pacific Saltwater Aquatic Vegetation	Temperate Pacific Eelgrass Bed	North Pacific Maritime Eelgrass Bed	Semi-Natural Aquatic Vegetation Alliance (Preliminary)	Zostera japonica - Zostera marina	Unknown	Sayce, 2004
						Zostera marina Permanently Flooded - Tidal Herbaceous Alliance	North Pacific Maritime Eelgrass Bed	Zostera marina Herbaceous Vegetation	Ecological System Map
						Unknown	Temperate Pacific Intertidal Mudflat	Unknown	Ecological System Map
	5.B Freshwater Aquatic Vegetation	5.B.1 Freshwater Aquatic Vegetation	5.B.1.a North American Freshwater Aquatic Vegetation	Western North American Freshwater Aquatic Vegetation	Temperate Pacific Freshwater Aquatic Bed	Lemna spp. Permanently Flooded Herbaceous Alliance	Lemna minor	Lemna minor Herbaceous Vegetation	Christy and Putera 1997
						Nymphaea odorata - Nuphar spp. Permanently Flooded Temperate Herbaceous Alliance	Nuphar polysepalum ssp. luteum [sic]	Nuphar lutea ssp. polysepalum Herbaceous Vegetation	Sayce, 2004
						Potamogeton spp. - Ceratophyllum spp. - Elodea spp. Permanently Flooded Herbaceous Alliance	Potamogeton natans	Potamogeton natans Herbaceous Vegetation	Sayce, 2004
						Unknown	Aquatic Bed	Unknown	Island County Wetland

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
									docs
							Hydrocotyle ranunculoides	Hydrocotyle ranunculoides Aquatic Vegetation	Sayce, 2004
							Elodea canadensis	Unknown	Christy and Putera 1996
							Myriophyllum hippuroides	Unknown	Christy and Putera 1998
6 Lithomorphic Vegetation (Nonvascular & Sparse Vascular Rock Vegetation)	6.B Mediterranean, Temperate, & Boreal Nonvascular & Sparse Vegetation	6.B.2 Temperate & Boreal Cliff, Scree, & Rock Vegetation	6.B.2.b Western North America Temperate Cliff, Scree and other Rock Vegetation	Vancouverian Cliff, Scree & Other Rock Vegetation	North Pacific Montane Massive Bedrock, Cliff and Talus	Unknown	North Pacific Montane Massive Bedrock, Cliff and Talus	Unknown	Ecological System Map
7 Agromorphic Vegetation (Agricultural Vegetation)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Cultivated	Cultivated	Agee 1987; Peterson mapping; Ecological System Map
							Mesic Grassland	Cultivated	Agee 1987; Peterson mapping
							Mesic Grassland w/ shrubs	Cultivated	Agee 1987; Peterson mapping
							Mesic Grassland w/ shrubs and tree regeneration	Cultivated	Agee 1987; Peterson mapping
							Mesic Grassland w/ tree regeneration	Cultivated	Agee 1987; Peterson mapping
							Shrub	Cultivated	Agee 1987; Peterson mapping
							Sparse Xeric Grassland	Cultivated	Agee 1987; Peterson mapping

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Class	Subclass	Formation	Division	Macrogroup	Group	Alliance	Source Type	NatureServe Synonym	Source
							Xeric Grassland	Cultivated	Agee 1987; Peterson mapping
							Xeric Grassland with Shrub Islands	Cultivated	Agee 1987; Peterson mapping
8 Hortomorphic Vegetation (Developed Vegetation)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Cultural	Cultural	Ecological System Map