Westport Light State Park Vegetation Survey Report

1595 West Ocean Avenue
Westport, Washington 98595

Washington State Parks and Recreation Commission

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1. INTRODUCTION

On behalf of the Washington State Parks and Recreation Commission (WSPRC), AECOM conducted vegetation surveys in Westport Light State Park, on the Westport peninsula, in Grays Harbor County, Washington (Figure 1). The survey area comprises 237 acres in the southern portion of the park and is bordered by West Ocean Avenue to the south and the cleared portion of the park to the north. The east side of the survey area/park is bordered by forest and residential areas. Due to the proximity of the City of Westport, illegal campsites have been found in the park; three sites (all appeared inactive) were observed during surveys. The western study area/park boundary follows the edge of a short stabilized dune upon which a pedestrian trail (Westport Light Trail) was developed. The stabilized nature of the dune has resulted in a steep drop-off to the beach below. The beach is not included in the survey area for this report. The survey area is in the Northwest Coast Ecoregion. This ecoregion is the westernmost and wettest ecoregion in Washington. This ecoregion comprises 11 percent of Washington.

The survey area is relatively flat with very little topographic diversity. Elevations in the survey area range from approximately 12 to 20 feet. No streams are present on the site, but forest and shrub-dominated wetlands cover a large amount of the survey area. A few trails cross through the forest.

The objectives of this vegetation survey were to identify and delineate the approximate boundaries of distinct plant associations, survey and document rare vascular plant populations, and survey noxious weed locations. Distinct plant associations were defined by criteria in one or more plant association guides provided by the Washington State Natural Heritage Program (WNHP).

The field surveys in Westport Light State Park were conducted on May 25, 26, and 27, 2021, and August 5 and 6, 2021. The survey found four distinct upland plant associations and four wetland plant associations. A list of the 132 vascular plant species observed during the surveys is included in Appendix A. The list includes 5 tree species, 23 shrubs, 70 herbs, 30 grasses/sedges/rushes, and 4 ferns/horsetails. Based on the results of these surveys, management recommendations include noxious weed control, campsite removal, protection of rare wetland types, and upland dune restoration.

2. METHODS

2.1 Plant Community Surveys

2.1.1 Plant Community Classification

Three documents were used to classify the plant communities in Westport Light State Park. The Washington Department of Natural Resources *Field Guide to Wetland and Riparian Plant Associations of Washington State, Draft Version 2.1* (Rocchio et al. 2020) was used to classify wetland plant communities. There is no existing key for Washington coastal upland plant associations. There are several provisional associations that are not yet included in the United States Nations Vegetation Classification (USNVC). Therefore, two recent studies along the southwest Washington Coast were used to classify upland plant communities: *Willapa NWR Phase II Ecological Integrity Assessment Pilot Project* (Crawford and Rocchio 2013) and *Lewis and Clark National Historic Park Vegetation Classification and Mapping Project Report* (Kagan et al. 2012). AECOM has previously conducted vegetation surveys at the northern half of the park (AECOM 2017), which aided in the determination of habitat types along the northern edge of the 2021 survey area. Where plant species names have changed, the most current plant association nomenclature is used. Plant association communities were described using their current vegetation, not the eventual or climax community.

2.1.2 Plant Community Ranks

The WNHP uses a ranking system to facilitate a quick assessment of plant community rarity. Each ecosystem is assigned both a global (G) and state (S) rank on a scale of 1 to 5. A rank of G1 indicates critical imperilment on a global basis; the community is at great risk of extirpation. S1 indicates critical imperilment within Washington State, regardless of its status elsewhere. A number of factors, such as number and condition of occurrences, total acreage occupied by the ecosystem type, geographic range, and threats contribute to the assignment of global and state ranks for plant communities. Table 2-1 describes the ranks and definitions.

Table 2-1
Global and State Plant Community Ranks and Definitions

Global and State Rank	Definition
1	Critically imperiled
2	Imperiled
3	Vulnerable to extirpation or extinction
4	Apparently secure
5	Demonstrably widespread, abundant, and secure
NR	Not ranked

Source: WNHP 2021

2.1.3 Plant Community Delineation

Vegetation communities within Westport Light State Park were mapped using a combination of remote sensing and field survey techniques. Remote sensing techniques consisted of manually delineating preliminary plant associations or mosaics of plant associations from ortho-rectified aerial photography and topographic mapping data. Following this exercise, AECOM conducted field surveys, during which the preliminary plant association community polygons created during the remote sensing process were visited for validation. The preliminary community polygons were hand-corrected on field maps while at the park. These polygons were then digitized using Geographical Information Systems (GIS) software and further refined based upon Global Positioning System (GPS) survey points that were taken in the field to document the edges of communities (where GPS reception was available).

The delineation of upland plant associations can be a somewhat subjective undertaking based on the heterogeneity of the resources and professional experience. Under homogeneous conditions, polygons may span tens of acres. In areas of high heterogeneity, polygons as small as 2 acres were mapped. Upland plant association areas smaller than 2 acres were generally lumped into larger plant association polygons and noted as a secondary plant association in the survey data for the larger polygon. On occasion, communities smaller than 2 acres were mapped at the discretion of AECOM where the area seemed to warrant individual attention. In cases where the forest habitat contained a complex mosaic of tiny, closely related, or inextricable communities, it was necessary to designate the most prevalent community and describe the sub-communities as secondary or tertiary plant associations.

AECOM wetland scientists completed a wetland delineation of the entire Westport Light State Park (AECOM 2021). This information was used to aid in the determination and mapping of wetland vegetation communities.

2.1.4 Plant Community Data Points

Within each type of plant community, a representative data point was surveyed. Each data point required the documentation of several community characteristics requested by the WSPRC. These characteristics included dominant/co-dominant vegetation cover in each stratum, non-vegetative cover characteristics, non-native species information, plant association(s), and site conditions such as recreation use. Additionally, any additional comments were recorded, especially if the given plant community did not fit within the parameters of the plant association guides. Data were recorded using a standardized format for cover values provided by the WSPRC. Data were collected with a GPS unit loaded with a data dictionary created specifically for this project. Appendix B contains a reference sheet for the cover values and other data used in the data dictionary. Appendix C contains a plant community profile for each data point.

2.2.3 Survey Routes

The route chosen for the surveys was based on aerial photo interpretation. All areas with obvious community differences were visited. Because differences in forested plant communities cannot always be discerned from aerial photo interpretation, meanders were taken through forested tracks that appeared homogenous. During these meanders through the plant communities,

biologists documented dominant vegetation, non-native vegetation, and associated cover classes. Where possible, the routes were recorded with a GPS unit. Where GPS coverage was not available, routes were sketched on field maps and digitized in the office.

2.2 Rare Plant Surveys

2.2.1 Review of Existing Literature/Data

Available literature and data were gathered and reviewed prior to conducting the rare vascular plant surveys. AECOM staff obtained special status plant information from the WSPRC and WNHP to identify all rare plant species with potential to occur within Westport Light State Park. In addition, the online database for the University of Washington Burke Herbarium was consulted for any rare plant occurrences within park boundaries, and knowledgeable park staff were consulted for any additional species-specific information, such as local blooming periods and identification tips. All special status plant information collected from outside sources was kept confidential. While the rare plant field surveys only included vascular plants, one rare lichen species is known to occur in the park and that site is discussed in Section 4.0.

2.2.2 Survey Timing

AECOM conducted the rare plant surveys on May 25, 26, and 27, 2021, and August 5 and 6, 2021.

2.2.3 Survey Method

An "intuitive controlled" survey method was used for Westport Light State Park. This method consists of meandering through the entire survey area, with more intensive focus on areas with known plant populations or appropriate special status plant habitat. To ensure that special status species were not overlooked, a complete species list was kept throughout the survey. The species list recorded every vascular plant species observed within the park (Appendix A). Synonymy for the list comes from the second edition of *Flora of the Pacific Northwest* (Hitchcock and Cronquist 2018). The rare vascular plant survey protocol also met the WNHP's *Guidelines for Conducting Rare Plant Surveys* (WNHP 2020).

2.2.4 Rare Plant Status and Ranks

The WNHP uses two ways to classify the rarity of plants: status and ranks. The status for rare plants is determined by the WNHP. The rare plant status definitions for Washington State are shown in Table 2-2.

Table 2-2
Rare Plant Statuses and Definitions

State Status	Definition
E	Endangered. In danger of becoming extinct or extirpated from Washington.
T	Threatened. Likely to become Endangered in Washington.

State Status	Definition
S	Sensitive. Vulnerable or declining; could become Endangered or Threatened in the state.
X	Possibly extinct or extirpated from Washington
R1	Review Group 1. Of potential concern but needs more field work to assign conservation priority.
R2	Review Group 2. Of potential concern but with unresolved taxonomic questions.
W	Watch. Plant abundance is more abundant and/or less threatened in Washington than previously assumed.

Source: WNHP 2021

The ranking for rare plants is similar to plant communities, as described in Section 2.1.2. A number of factors such as total number and conditions of occurrences, total population size, range and extent of area occupied, and threats contribute to the assignment of global and state ranks for plant species. The global and state ranks and definitions are the same as for plant communities, as listed in Table 2-1.

2.2.5 Rare Plant Site Documentation

If a new special status plant site was located, a WNHP Rare Plant Sighting Form was completed. These site reports contain sensitive information and should remain confidential. Where GPS coverage was available, sites were mapped using a GPS unit. Species on the WNHP "Watch" list were not documented using Rare Plant Sighting Forms. However, if "Watch" species were encountered, they were mapped with the GPS unit.

2.3 Noxious Weeds Surveys

Noxious weeds are non-native, invasive species that threaten agriculture, rangelands, waterways, parks, wildlife, property values, public health and safety, and general ecological health and diversity of native ecosystems. Noxious weed infestations are the second leading cause of wildlife habitat degradation. Where observed, AECOM documented noxious weeds as described below.

2.3.1 Noxious Weed Status

The Washington Noxious Weed Control Board identifies lists of noxious weed species that require control, eradication, or monitoring. Class A noxious weeds are non-native species with a limited distribution within a state and require eradication to reduce the potential of becoming more widespread. Class B noxious weeds are regionally abundant but may have limited distribution in some counties. In regions where a Class B noxious weed is unrecorded or of limited distribution, prevention of seed production is required. In these areas, the weed is a "Class B designate." However, in regions where a Class B species is already abundant or widespread, control is a local option. In these areas, the weed is a "Class B non-designate."

Class C noxious weeds are already widely established, but placement on the state list allows counties to enforce local control if desired. Weeds of Concern are not listed as noxious weeds under state law. However, these invasive, non-native plants are recommended for control or containment.

The Grays Harbor County Noxious Weed Control Board website was consulted for the latest information on weeds within the county (Grays Harbor County 2021).

2.3.2 Survey Method

The survey for noxious weeds occurred while conducting the vegetation community and rare plant surveys. If Class A weeds were observed, they were mapped with the GPS unit and immediately reported to the WSPRC. Designated Class B weeds were either mapped or noted if very common. Class C weeds were not mapped but are noted in the text.

3. VEGETATION COMMUNITIES

AECOM mapped distinct vegetation community polygons, including eight different plant associations, within Westport Light State Park. Each vegetation community polygon is either a stand-alone plant association or a mosaic of multiple plant associations. Table 3-1 lists the plant associations and/or cover types found in Westport Light State Park. Figures 2 and 3 illustrate the location of the vegetation community polygons. Note that these polygons may contain secondary plant association inclusions. Several of the plant associations do not yet have global and state ranks due to their provisional nature.

Table 3-1
Plant Associations of Westport Light State Park

Community Code	Scientific Name	Common Name	Reference	Status[1]	Amount[2]
JUFA-JU(LE,NE)	*Juncus falcatus* – *Juncus (lesueurii, nevadensis)* Wet Meadow	Falcate Rush – (Brewer's Rush, Dune Rush) Wet Meadow	Rocchio et al. 2020	G3/S1?	>1%
PICO/VAOV-CYSC	*Pinus contorta* var. *contorta* / *Vaccinium ovatum* – *Cytisus scoparius* Forest	Shore Pine / Scotch Broom – Evergreen Huckleberry	NA	GNR/SNR	7%
PICO/CAOB	*Pinus contorta* var. *contorta* / *Carex obnupta* Swamp Forest	Shore Pine / Slough Sedge Swamp Forest	Rocchio et al. 2020	G2/S1	56%
PICO/CYSC/AMAR	*Pinus contorta* var. *contorta* / *Cytisus scoparius* / *Ammophila arenaria* Semi-Natural Shrubland	Shore Pine / Scotch Broom / European Beachgrass Semi-Natural Shrubland	Crawford and Rocchio 2013	GNR/SNR	7%
PISI-PICO/GASH-VAOV	*Picea sitchensis* – *Pinus contorta* var. *contorta* / *Gaultheria shallon* – *Vaccinium ovatum* Forest	Sitka Spruce – Shore Pine / Salal – Evergreen Huckleberry Forest	Kagan et al. 2012	G3/S2	3%
SAHO/CAOB-(AREG)	*Salix hookeriana* / *Carex obnupta* – (*Argentina egedii* spp. *egedii*) Shrub Swamp	Hooker Willow / Slough Sedge – (Pacific Silverweed) Shrub Swamp	Rocchio et al. 2020	G4/S1?	12%
Salix spp.-SPDO / Carex	*Salix* ssp. – *Spiraea douglasii* / *Carex* (*aquatilis* var. *dives*, *obnupta*, *utriculata*) Wet Shrubland	Willow – Douglas Spiraea / (Water Sedge, Slough Sedge, Inflated Sedge) Wetland Shrubland	Rocchio et al. 2020	G3G4/S2Q	>1%
VAOV-CYSC-MAFU/LEMO-AMAR	*Vaccinium ovatum* – *Cytisus scoparius* – *Malus fusca* / *Leymus mollis* – *Ammophila arenaria* Shrubland	Evergreen Huckleberry – Scotch Broom / American Dunegrass – European Beachgrass Shrubland	NA	GNR/SNR	15%

G = Global; NA = Not Applicable; NR = Not Rated; S = State. "?" indicates that the numeric rank is inexact. "Q" indicates that the uncertainty is in relation to taxonomy.
[1] Statuses of plant communities were either listed in reference documents or listed as GNR/SNR if not in a reference document.
[2] Percentage of the total acreage of the survey area occupied by the plant association. The remaining percentage consists of developed areas (1.54 acres), which includes areas such as parking lots that do not contain plant communities.

3.1 *Juncus falcatus* – *Juncus* (*lesueurii*, *nevadensis*) Wet Meadow

Distribution and Environment: This herbaceous wetland community type was observed in two locations in the northwest corner of the survey area. It was observed more frequently in the northern portion of the park (north of the current survey area) during prior vegetation surveys (AECOM 2017). This community has a global rank of 3 and a state rank of 1(?).

This is a deflation plain wetland, a wetland type with a very limited distribution in Washington. A deflation plain is a relatively flat region located directly behind the foredunes that is blocked from receiving any new sand. As a result, the strong sea breezes scour its surface, eroding down to the water table and creating sprawling wetlands. During the last century, in particular, the wetlands in deflation plains have grown substantially, the result of invasive plant species (like European beachgrass [*Ammophila arenaria* spp. *arenaria*]) creating higher than normal foredunes.

Vegetation: This wetland is dominated by rushes, sedges, and grasses. The rushes are species that have a high fidelity to interdunal communities: falcate rush (*Juncus falcatus* ssp. *sitchensis*), Brewer's rush (*Juncus breweri* = *J. lesueurii*), and dune rush (*Juncus nevadensis* var. *inventus*). The common sedges and grasses include sand sedge (*Carex pansa*), seashore bentgrass (*Agrostis pallens*), sweet vernalgrass (*Anthoxanthum odoratum*), and early silvergrass (*Aira praecox*). Other herbaceous species include lesser hawkbit (*Leontodon saxatilis* var. *saxatilis*), sandmat (*Cardionema ramosissima*), and Douglas's aster (*Symphyotrichum subspicatum*).

Ecological Condition: In the survey area, this community type in good to excellent condition. While surrounding uplands contain a lot of Scotch broom (*Cytisus scoparius*) and European beachgrass, the wetland is in a slight depression that contains a lower percentage of non-native species cover and shows little signs of disturbance.

Approximate Total Area: 0.05 acre

3.2 *Pinus contorta* var. *contorta* / *Vaccinium ovatum – Cytisus scoparius* Forest

Distribution and Environment: This upland forest community occurs in two locations near the eastern and southern edges of the survey area. This community does not have a global or state rank.

Vegetation: The dominant tree in this community is shore pine (*Pinus contorta* var. *contorta*); a few Sitka spruce (*Picea sitchensis*) are also present. Understory shrubs include Scotch broom and evergreen huckleberry (*Vaccinium ovatum*), with scattered kinnikinnick (*Arctostaphylos uva-ursi*) and salal (*Gaultheria shallon*). Herbaceous species include sweet vernalgrass, hairy cat's-ear (*Hypochaeris radicata*), false lily-of-the-valley (*Maianthemum dilatatum*), and velvetgrass (*Holcus lanatus*).

This community is not described in reference documents. It is similar to the *Pinus contorta* var. *contorta* / *Cytisus scoparius* / *Ammophila arenaria* community (Section 3.4). However, it was delineated as a separate community type because the European beachgrass is no longer a dominant species, and evergreen huckleberry is more common.

Ecological Condition: In the study, this community type is represented by a moderate-aged stand in fair to good condition.

Approximate Total Area: 16 acres

3.3 *Pinus contorta* var. *contorta* / *Carex obnupta* Swamp Forest

Distribution and Environment: This community type is the most common forested plant association in the survey area, making up over half of the survey area. This community has a global rank of 2 and a state rank of 1. The community is distributed throughout most of the central portion of the survey area.

Vegetation: This plant community type contains forested upland/wetland mosaic. It has little species diversity within the survey area. The dominant tree is shore pine, and the dominant herbaceous species is slough sedge (*Carex obnupta*). Western crabapple (*Malus fusca*), evergreen huckleberry, Pacific bayberry (*Morella californica*), and black twinberry (*Lonicera involucrata* var. *involucrata*) are frequent understory species, with a few scattered red alder (*Alnus rubra*).

Common plant community inclusions in this community include small patches of *Salix hookeriana* / *Carex obnupta* – (*Argentina egedii* spp. *egedii)* Shrub Swamp.

Ecological Condition: In the survey area, this community type is represented by young stands in excellent condition. These forested communities are less than 25 years old.

Approximate Total Area: 131 acres

3.4 *Pinus contorta* var. *contorta* / *Cytisus scoparius* / *Ammophila arenaria* Semi-Natural Shrubland

Distribution and Environment: This community type was observed throughout the non-forested uplands of the survey area. It is usually intermixed in a mosaic pattern with small depressions containing wetland plant associations such as *Juncus falcatus – Juncus* (*lesueurii*, *nevadensis*) Wet Meadow, especially in the northwest corner of the larger Westport Light State Park, north of the survey area. A "forest" version of this plant community is contained in the *Willapa NWR Phase II Ecological Integrity Assessment Pilot Project* (Crawford and Rocchio 2013). AECOM modified the association as a "shrubland" for this community due to the stature/age of the woody species. This community does not have a global or state rank.

Vegetation: The dominant species in this community are European beachgrass, Scotch broom, and shore pine, with large amounts of velvetgrass and sweet vernalgrass. Due to its proximity to the ocean, the shore pines in this community are typically stunted by strong winds and better approximate a shrubland, rather than a forest. Areas with very thick European beachgrass contain few other species. However, within the dense beachgrass there are more open areas with some bare sand, which contain sheep sorrel (*Rumex acetosella*), sandmat, dune tansy (*Tanacetum bipinnatum*), lesser hawkbit, hairy cat's-ear, shepherd's cress (*Teesdalia nudicaulis*), and seashore lupine (*Lupinus littoralis*).

Where this community type occurs in the southeastern part of the survey area, it primarily includes American beachgrass (*Ammophila breviligulata* ssp. *breviligulata*) in the herbaceous strata, with lesser amounts of European beachgrass.

Ecological Condition: This community is in poor condition, as it is dominated by non-native species.

Approximate Total Area: 17 acres

3.5 *Picea sitchensis – Pinus contorta* var. *contorta* / *Gaultheria shallon – Vaccinium ovatum* Forest

Distribution and Environment: This upland forest community type is uncommon in the survey area. It was observed along the southeastern sedge of the survey area where topography rose up to the east above the relatively flat back dune/marsh habitat. This community has a global rank of 3 and a state rank of 2.

Vegetation: The dominant tree species in this community are shore pine and Sitka spruce. Sitka spruce trees were typically larger and older than the co-dominant shore pine. Common shrubs include evergreen huckleberry, Pacific bayberry, and western crabapple. Herbaceous understory species include sword fern (*Polystichum munitum*) and false lily-of-the-valley. Some scattered non-native species such as Scotch broom and English holly (*Ilex aquifolium*) are present. This community was separated from the larger *Pinus contorta* var. *contorta* / *Carex obnupta* Forest for two reasons: it is entirely on upland slopes, and it contains more Sitka spruce.

Ecological Condition: In the survey area, this community type is represented by a young stand in good to excellent condition.

Approximate Total Area: 7 acres

3.6 *Salix hookeriana* / *Carex obnupta* – (*Argentina egedii* ssp. *egedii*) Shrub Swamp

Distribution and Environment: This community type is the common shrub-dominated wetland in the survey area. Large, sinuous patches are surrounded by the larger *Pinus contorta* var. *contorta* / *Carex obnupta* Wetland Forest. This community has a global rank of 4 and a state rank of 1(?).

Vegetation: This community is consistently dominated by Hooker's willow (*Salix hookeriana*) and slough sedge in the survey area. In addition, few low-stature Douglas spiraea (*Spiraea douglasii* var. *douglasii*) and Pacific crabapple are present in some patches. Herbaceous species include marsh speedwell (*Veronica scutellata*), small bedstraw (*Galium trifidum*), purslane speedwell (*Veronica peregrina* var. *xalapensis*), marsh violet (*Viola palustris*), and Douglas's aster. Noxious weed presence in this community is limited to one small patch of reed canarygrass (*Phalaris arundinacea*) observed in the center of the community along an informal trail.

This community does not quite match the description in *Field Guide to Wetland and Riparian Plant Associations of Washington State* (Rocchio et al. 2020), as the reference guide description states that Pacific crabapple is absent. Pacific crabapple is present at the edge of this wetland type in some spots (and more common in the surrounding *Pinus contorta* var. *contorta* / *Carex obnupta* Swamp Forest). The other potential plant community type is *Salix hookeriana* – (*Malus fusca*) / *Carex obnupta – Lysichiton americanus* Wet Shrubland, but it is less of a match due to a total lack of skunk cabbage (*L. americanus*).

Ecological Condition: In the survey area, this community type is excellent condition. No invasive species were noted in this community.

Approximate Total Area: 28 acres

3.7 *Salix* spp. – *Spiraea douglasii* / *Carex* (*aquatilis* var. *dives*, *obnupta*, *utriculata*) Wet Shrubland

Distribution and Environment: This community type was observed in one location in the northwest corner of the survey area. This community has a global rank between 3/4 and a state rank of 2Q.

Vegetation: This community is dominated by Douglas spiraea. It also has a few Hooker's willow present. Herbaceous species include dune rush, slough sedge, sand sedge, lesser hawkbit, and marsh speedwell.

Ecological Condition: In the survey area, this community type is in excellent condition.

Approximate Total Area: 0.2 acre

3.8 *Vaccinium ovatum – Cytisus scoparius – Malus fusca* / *Leymus mollis – Ammophila arenaria* Shrubland

Distribution and Environment: This community type is present along the western edge of the survey area along the foredune above the ocean. This community does not have a global or state rank.

Vegetation: This wind-swept community is dominated by evergreen huckleberry, Scotch broom, Pacific crabapple, American dunegrass (*Leymus mollis* ssp. *mollis*), and European beachgrass.

This community is not described in reference documents. It was delineated from the *Pinus contorta* var. *contorta* / *Cytisus scoparius* / *Ammophila arenaria* community (Section 3.4) to the north because of the higher cover of native species. However, in the southern portion of the community there are dense patches of Himalayan blackberry (*Rubus bifrons*) on either side of the Westport Light pedestrian trail.

Ecological Condition: In the survey area, this community type is in good condition.

Approximate Total Area: 35 acres

4. RARE SPECIES

4.1 Vascular Plants

The WNHP does not have any current records of rare vascular plant occurrences within Westport Light State Park. There are also no known current rare vascular plant occurrences within 5 miles of the survey area. However, one historical record of bear's foot sanicle (*Sanicula arctopoides*) is in the general vicinity. The record is from a 1929 herbarium collection (EO 8837), with an imprecise geographic location that overlaps the whole park.

No rare plant species were observed during the May and August 2021 vegetation surveys. Special attention was paid to rare plant species that prefer sandy coastal habitats, such as bear's foot sanicle and pink sand-verbena (*Abronia umbellata* var. *acutalata*).

Bear's foot sanicle is a low taprooted perennial plant that grows near salt water. It grows on coastal bluffs and grassy sand dunes. In Washington, its associated species include red fescue (*Festuca rubra*), bracken fern (*Pteridium aquilinum*), western buttercup (*Ranunculus occidentalis*), strawberry (*Fragaria* sp.), and hooked-spur violet (*Viola adunca*) (Camp and Gamon 2011). Only one of these species (bracken fern) was observed in the survey area. Dave Hays at the Washington Department of Fish and Wildlife was contacted regarding this species prior to conducting surveys. He is knowledgeable about this species in southwestern Washington. He said most of the known sites for this species in southwest Washington have disappeared due to development, loss of habitat, encroaching trees, and predation. Based on our field observations and the conversation with Dave Hays, it is unlikely that habitat for bear's foot sanicle occurs in the survey area.

Pink sand-verbena grows in sandy areas and beaches along the coast. It is associated with American dunegrass and coastal sand verbena (*Abronia latifolia*) (Camp and Gamon 2011). There was only one extant known site of this plant in Washington, on the north end of the Long Beach Peninsula in a beach restoration site where European beachgrass was removed. However, the species was recently observed in July 2021 on a beach near North Cove, south of Grayland State Park. This annual plant is adapted to the disturbance common in habitats with shifting sands (Camp and Gamon 2011). The survey area does not contain much of this type of habitat, as most of the site is wetland, forested, or dominated by European beachgrass.

4.2 Lichen

One rare lichen species, *Kaernefeltia californica*, is recorded within Westport Light State Park. WNHP mapping shows the element occurrence (EO6577) in the southwest corner of the park, north of the parking lot. It appears to have first been observed in 1908, and again in 1909, 1951, and most recently in 1994.

The general habitat description is "shoreline (*Pinus contorta*) area; dunes between older *Picea sitchensi*s forest and beach". The substrate was reported to be the bark of both live and dead

shore pine. This lichen is a Washington State Threatened species. It has a global rank of 3 and a state rank of 2. The WNHP element occurrence form is located in Appendix D.

5. NOXIOUS WEEDS

The survey area in Westport Light State Park contains several noxious weed species, particularly Scotch broom. The weed species observed during the surveys are listed in Table 5-1. The species that were not widely distributed, or that occurred in isolated patches away from denser population areas, were recorded with GPS and mapped (Figure 4).

Table 5-1
Noxious Weed Observations on Westport Light State Park

Scientific Name	Common Name	Status	Mapped?
Cytisus scoparius	Scotch broom	Class C	No
Hedera hibernica	Atlantic ivy	Class C	Yes
Hypochaeris radicata	Hairy cat's-ear	Class B	No
Jacobaea vulgaris	Tansy ragwort	Class C	Yes
Phalaris arundinacea	Reed canarygrass	Class C	Yes
Rubus bifrons/R. armeniacus	Himalayan blackberry	Class C	Yes
Rubus laciniatus	Evergreen blackberry	Class C	No
Soliva sessilis	Burrweed	Class C	Yes
Ulex europaeus	Gorse	Class B	Yes

Scotch broom is ubiquitous in several portions of the survey area. Hairy cat's-ear is also common in the park in the sandy areas in the northwest corner of the survey areas, along Westport Light Trail, around the parking lot, and in scattered locations in the forest. Himalayan blackberry was also observed in patches along Westport Light Trail.

Atlantic ivy (*Hedera hibernica*) was observed in a few isolated locations in the forest, likely distributed by birds. Tansy ragwort (*Jacobaea vulgaris*) was mostly observed adjacent to the Westport Light Trail. Burrweed (*Soliva sessilis*) was only observed in one location in the parking lot. Gorse (*Ulex europaeus*) was only observed in the survey area on the southern boundary of the park, adjacent to the sidewalk that runs along West Ocean Avenue.

6. RECOMMENDATIONS

Based on field assessments, AECOM recommends the following actions to protect plant communities and improve overall ecological conditions at Westport Light State Park:

- **Control invasive species –** Some weeds, like Atlantic ivy and gorse, have limited distribution and can be easily eradicated from the survey area by hand pulling. Because of its potential for aggressive spread, gorse removal is recommended as a priority. Gorse removal may require coordination with the roadway manager, as much of this population is in road right-of-way adjacent to the southern park boundary. Scotch broom is widespread and would require a multipronged effort. Because the Scotch broom infestation is interwoven among sensitive wetlands, manual and mechanical control methods are recommended. However, chemical methods may be required for smaller plants. Mature plants with a stem diameter of greater than 2 inches are the most susceptible to mechanical control and may not require other methods. They can be cut at the base between flowering and seed set (late July–August) for best results.
- **Campsite removal** – Because the park is adjacent to Westport, it is attractive and convenient for campers. Three unauthorized campsites were observed during field surveys; one was inactive and the other active. The campsites and associated debris should be removed from the park. Periodic surveys should be conducted to ensure that unauthorized camps are not damaging resources in the park.
- **Wetland protection –** The herbaceous and shrub wetlands in Westport Light State Park are uncommon in the landscape and in good to excellent condition. These wetlands should be protected, as potential projects are planned for the survey area. Low elevation freshwater wetlands in the Pacific Coast ecoregion are listed at the highest priority (Priority 1) for protection in the State of Washington Natural Heritage Plan (WDNR 2018). These wetlands can be protected by enhancing surrounding upland buffers and redirecting foot traffic/dispersed informal trails away from these resources.
- **Upland dune restoration –** The upland dune communities in the survey area are degraded by a high percentage of noxious weed cover. These areas could be restored with removal of Scotch broom, European beachgrass, and encroaching shore pines. If European beachgrass is removed, a native species capable of stabilizing the foredune will need to be established to protect inland communities.

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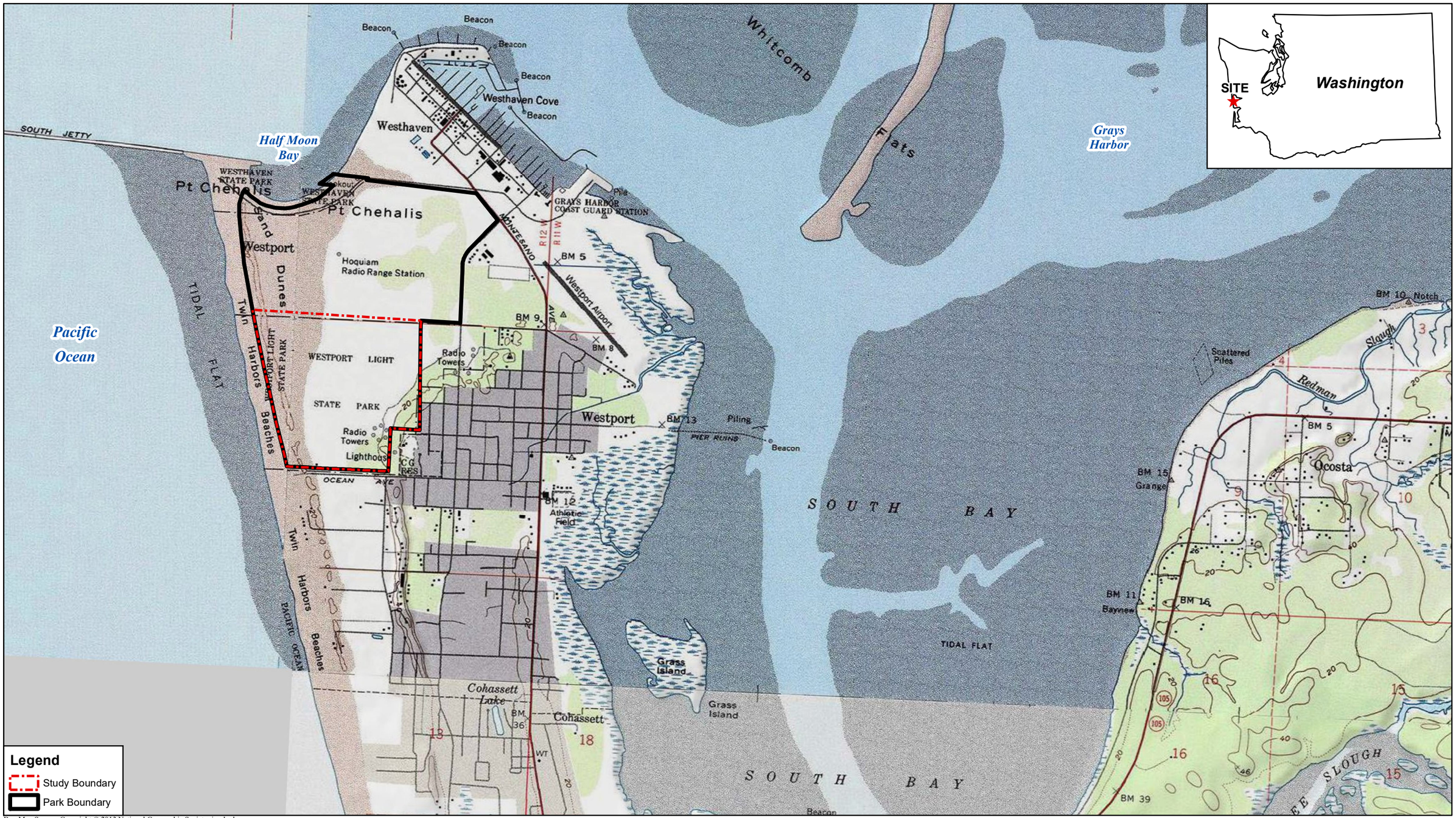

BaseMap Source: Copyright:© 2013 National Geographic Society, i-cubed

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SCALE IN FEET

AECOM

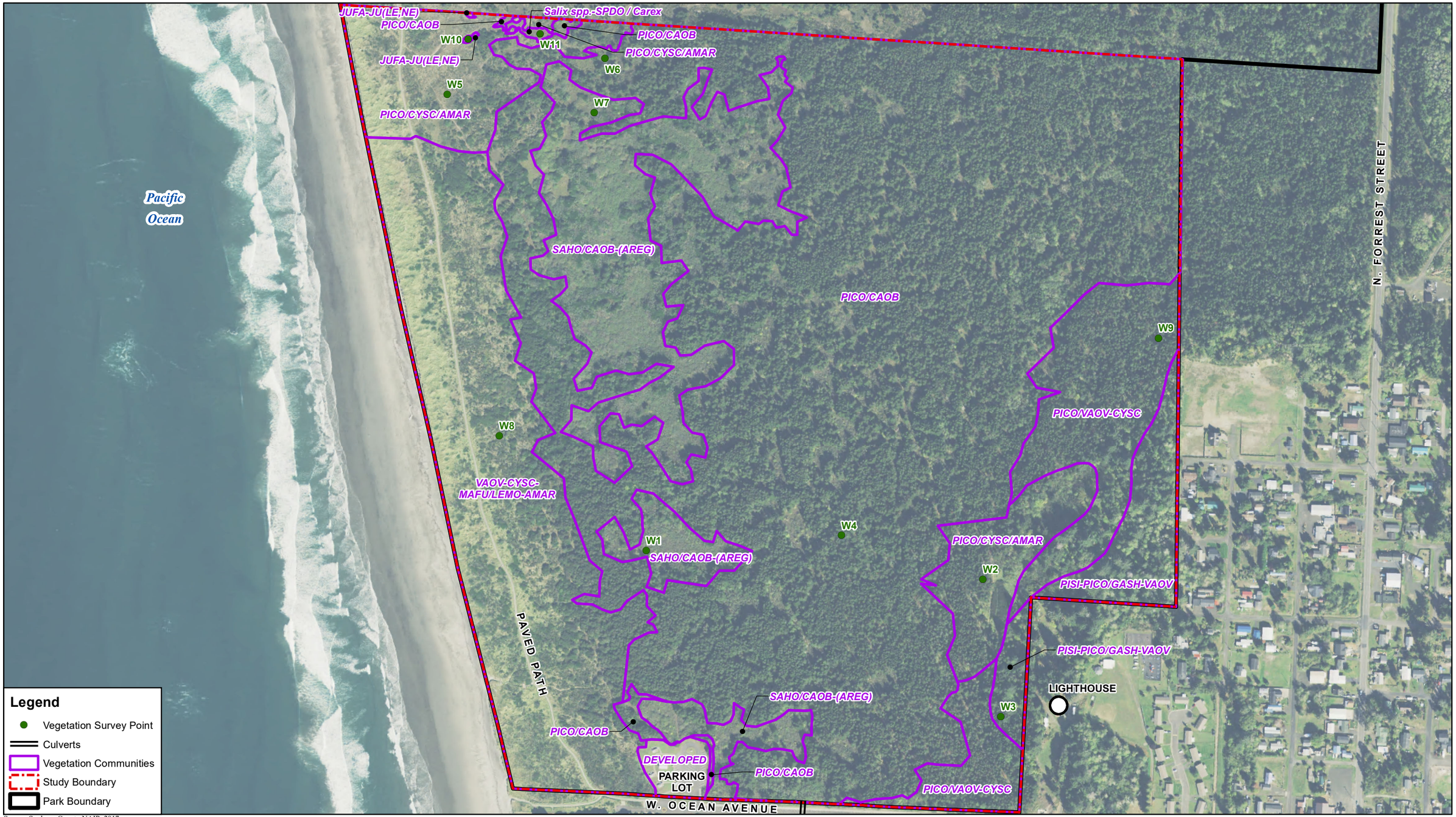
VICINITY MAP

SEPTEMBER 2021

WESTPORT LIGHT STATE PARK SOUTH
WESTPORT, GRAYS HARBOR COUNTY, WA
WASHINGTON STATE PARKS AND RECREATION COMMISSION

FIGURE 1

K:\Westport\MXD\Fig 1 Vicinity Map.mxd



Source: Spokane County NAIP, 2017.

200 0 200 400
SCALE IN FEET

AECOM

K:\Westport\MXD\Fig 2 Plant Communities with Aerial Photo.mxd

PLANT COMMUNITIES WITH AERIAL PHOTO

SEPTEMBER 2021

WESTPORT LIGHT STATE PARK SOUTH
WESTPORT, GRAYS HARBOR COUNTY, WA
WASHINGTON STATE PARKS AND RECREATION COMMISSION

FIGURE 2

N

Pacific Ocean

W10
W11
W6
W5
W7
W8
W9
W4
W1
W2
W3

N. FORREST STREET

PAVED PATH

PARKING LOT

LIGHTHOUSE

W. OCEAN AVENUE

Legend

- Vegetation Survey Point
- Culverts

Vegetation Communities

- JUFA-JU(LE,NE)
- Salix spp.-SPDO / Carex
- PICO/VAOV-CYSC
- PICO/CAOB
- PICO/CYSC/AMAR
- PISI-PICO/GASH-VAOV
- SAHO/CAOB-(AREG)
- VAOV-CYSC-MAFU/LEMO-AMAR
- Developed
- Study Boundary
- Park Boundary

Source: Spokane County NAIP, 2017.

200 0 200 400
SCALE IN FEET

AECOM

K:\Westport\MXD\Fig 3 Plant Communities.mxd

PLANT COMMUNITIES

SEPTEMBER 2021

WESTPORT LIGHT STATE PARK SOUTH
WESTPORT, GRAYS HARBOR COUNTY, WA
WASHINGTON STATE PARKS AND RECREATION COMMISSION

FIGURE 3

Source: Spokane County NAIP, 2017.

200 0 200 400
SCALE IN FEET

AECOM

WEED LOCATIONS

SEPTEMBER 2021

WESTPORT LIGHT STATE PARK SOUTH
WESTPORT, GRAYS HARBOR COUNTY, WA
WASHINGTON STATE PARKS AND RECREATION COMMISSION

FIGURE 4

K:\Westport\MXD\Fig 4 Weed Locations.mxd

Appendix A
Plant Species Observations

Westport Light State Park
Plant Species Observations

Family	Species	Common Name	Synonym	Species Code	N/I	Status
TREES						
Betulaceae	*Alnus rubra*	red alder		ALNRUB	n	
Pinaceae	*Picea sitchensis*	Sitka spruce		PICSIT	n	
Pinaceae	*Pinus contorta* var. *contorta*	shore pine		PINCON	n	
Pinaceae	*Pseudotsuga menziesii* var. *menziesii*	Douglas fir		PSEMEN	n	
Pinaceae	*Tsuga heterophylla*	western hemlock		TSUHET	n	
SHRUBS						
Aquifoliaceae	*Ilex aquifolium*	English holly		ILEAQU	i	
Araliaceae	*Hedera hibernica*	Atlantic ivy		HEDHIB	i	Class C
Caprifoliaceae	*Lonicera ciliosa*	orange honeysuckle		LONCIL	n	
Caprifoliaceae	*Lonicera involucrata* var. *involucrata*	black twinberry		LONINV	n	
Ericaceae	*Arctostaphylos uva-ursi*	kinnikinnick		ARCUVA	n	
Ericaceae	*Gaultheria shallon*	salal		GAUSHA	n	
Ericaceae	*Vaccinium macrocarpon*	cultivated cranberry		VACMAC	i	
Ericaceae	*Vaccinium ovatum*	evergreen huckleberry		VACOVA	n	
Ericaceae	*Vaccinium parvifolium*	red huckleberry		VACPAR	n	
Fabaceae	*Cytisus scoparius*	Scotch broom		CYTSCO	i	Class B
Fabaceae	*Ulex europaeus*	gorse		ULEEUR	i	Class B
Myricaceae	*Morella californica*	Pacific bayberry	*Myrica californica*	MORCAL	n	
Rhamnaceae	*Frangula purshiana* ssp. *purshiana*	cascara	*Rhamnus p.*	FRAPUR	n	
Rosaceae	*Cotoneaster simonsii*	Simon's cotoneaster		COTSIM	i	
Rosaceae	*Malus fusca*	western crabapple	*Pyrus f.*	MALFUS	n	
Rosaceae	*Rosa nutkana* ssp. *nutkana*	Nootka rose		ROSNUT	n	
Rosaceae	*Rubus bifrons*	Himalayan blackberry	*R. discolor, R. armeniacus*	RUBBIF	i	Class C
Rosaceae	*Rubus laciniatus*	evergreen blackberry		RUBLAC	i	Class C
Rosaceae	*Rubus spectabilis*	salmonberry		RUBSPE	n	
Rosaceae	*Rubus ursinus*	Pacific dewberry		RUBURS	n	
Rosaceae	*Sorbus aucuparia*	European mountain-ash		SORAUC	i	
Rosaceae	*Spiraea douglasii* var. *douglasii*	Douglas' spiraea		SPIDOU	n	
Salicaceae	*Salix hookeriana*	Hooker's willow		SALHOO	n	
HERBS						
Asparagaceae	*Hyacinthoides* xmassartiana	common bluebells		HYAMAS	i	
Asparagaceae	*Maianthemum dilatatum*	lily-of-the-valley		MAIDIL	n	
Asteraceae	*Achillea millefolium*	common yarrow		ACHMIL	n	

Synonymy from Washington Flora Checklist

N/I = Native or Introduced

Red type: noxious weed

Westport Light State Park
Plant Species Observations

Family	Species	Common Name	Synonym	Species Code	N/I	Status
Asteraceae	*Anaphalis margaritacea*	pearly everlasting		ANAMAR	n	
Asteraceae	*Bellis perennis*	English daisy		BELPER	i	
Asteraceae	*Conyza canadensis*	horseweed		CONCAN	n	
Asteraceae	*Erechtites minimus*	toothed burnweed		EREMIN	i	
Asteraceae	*Gamochaeta ustulata*	Pacific cudweed	*Gnaphalium purpurea*	GAMUST	n	
Asteraceae	*Gnaphalium palustre*	lowland cudweed		GNAPAL	n	
Asteraceae	*Hypochaeris glabra*	smooth cat's-ear		HYPGLA	i	
Asteraceae	*Hypochaeris radicata*	hairy cat's-ear		HYPRAD	i	Class C
Asteraceae	*Leontodon saxatilis* ssp. *saxatilis*	lesser hawkbit	*Leontodon nudicaulis*	LEOSAX	i	
Asteraceae	*Matricaria discoidea*	pineapple weed		MATDIS	n	
Asteraceae	*Pseudognaphalium stramineum*	cotton-batting plant	*Gnaphalium s.*	PSESTR	n	
Asteraceae	*Senecio* sp.	groundsel			i	
Asteraceae	*Jacobaea vulgaris*	tansy ragwort	*Senecio jacobaea*	JACVUL	i	Class C
Asteraceae	*Soliva sessilis*	burrweed		SOLSES	i	Class C
Asteraceae	*Sonchus asper* ssp. *asper*	prickly sow-thistle		SONASP	i	
Asteraceae	*Symphyotrichum subspicatum*	Douglas's aster	*Aster s.*	SYMSUB	n	
Asteraceae	*Tanacetum bipinnatum*	dune tansy	*Tanacetum camphoratum*	TANBIP	n	
Asteraceae	*Taraxacum officinale*	common dandelion		TAROFF	i	
Boraginaceae	*Myosotis discolor*	yellow and blue forget-me-not		MYODIS	i	
Brassicaceae	*Cardamine hirsuta*	hairy bittercress		CARHIR	i	
Brassicaceae	*Teesdalia nudicaulis*	shepherd's cress		TEENUD	i	
Caryophyllaceae	*Cardionema ramosissima*	sandmat		CARRAM	n	
Caryophyllaceae	*Cerastium fontanum* ssp. *vulgare*	mouse-ear chickweed		CERFON	i	
Caryophyllaceae	*Cerastium glomeratum*	sticky chickweed	*C. viscosum*	CERGLO	i	
Caryophyllaceae	*Moenchia erecta* ssp. *erecta*	upright chickweed		MOEERE	i	
Caryophyllaceae	*Sagina procumbens*	procumbent pearlwort		SAGPRO	i	
Caryophyllaceae	*Silene gallica*	windmill-pink		SILGAL	i	
Caryophyllaceae	*Stellaria longipes* ssp. *longipes*	long-stalk starwort		STELON	n	
Caryophyllaceae	*Stellaria media*	common chickweed		STEMED	i	
Colvolvulaceae	*Convolvulus soldanella*	beach morning-glory		CONSOL	n	
Crassulaceae	*Crassula tillaea*	mossy stonecrop		CRATIL	i	
Fabaceae	*Lathyrus japonicus*	sea pea	*L. maritimus*	LATJAP	n	
Fabaceae	*Lathyrus littoralis*	beach pea		LATLIT	n	
Fabaceae	*Lupinus littoralis* var. *littoralis*	seashore lupine		LUPLIT	n	

Synonymy from Washington Flora Checklist

N/I = Native or Introduced

Red type: noxious weed

Westport Light State Park
Plant Species Observations

Family	Species	Common Name	Synonym	Species Code	N/I	Status
Fabaceae	*Trifolium dubium*	least hop clover		TRIDUB	i	
Fabaceae	*Trifolium pratense*	red clover		TRIPRA	i	
Fabaceae	*Trifolium repens*	white clover		TRIREP	i	
Fabaceae	*Trifolium subterraneum*	subterranean clover		TRISUB	i	
Fabaceae	*Trifolium wormskioldii*	springbank clover		TRIWOR	n	
Fabaceae	*Vicia sativa* var. *angustifolia*	common vetch		VICSAT	i	
Gentianaceae	*Centaurium erythraea*	common centaury	*Centaurium umbellatum*	CENERY	i	
Geraniaceae	*Erodium cicutarium* ssp. *cicutarium*	redstem stork's-bill		EROCIC	i	
Lamiaceae	*Prunella vulgaris* var. *lanceolata*	self-heal		PRUVUL	n	
Lythraceae	*Lythrum portula*	spatula-leaf loosestrife		LYTPOR	i	
Orchidaceae	*Goodyera oblongifolia*	western rattlesnake plantain		GOOOBL	n	
Orchidaceae	*Platanthera elegans* ssp. *elegans*	elegant rein-orchid	*Piperia e.*	PLAELE	n	
Orchidaceae	*Spiranthes romanzoffiana*	hooded ladies'-tresses		SPIROM	n	
Orobanchaceae	*Triphysaria pusilla*	dwarf owl-clover	*Orthocarpus pusillus*	TRIPUS	n	
Plantaginaceae	*Callitriche stagnalis*	pond water-starwort		CALSTA	i	
Plantaginaceae	*Digitalis purpurea* ssp. *purpurea*	foxglove		DIGPUR	i	
Plantaginaceae	*Plantago coronopus*	Buckhorn plantain		PLACOR	i	
Plantaginaceae	*Plantago lanceolata*	English plantain		PLALAN	i	
Plantaginaceae	*Plantago major*	common plantain		PLAMAJ	i	
Plantaginaceae	*Veronica arvensis*	wall speedwell		VERARV	i	
Plantaginaceae	*Veronica peregrina* var. *xalapensis*	purslane speedwell		VERPER	n	
Plantaginaceae	*Veronica scutellata*	marsh speedwell		VERSCU	n	
Plumbaginaceae	*Armeria maritima* ssp. *californica*	sea thrift		ARMMAR	n	
Polygonaceae	*Polygonum aviculare*	knotweed		POLAVI		
Polygonaceae	*Polygonum paronychia*	beach knotweed		POLPAR	n	
Polygonaceae	*Rumex acetosella*	sheep sorrel		RUMACE	i	
Polygonaceae	*Rumex crispus*	curly dock		RUMCRI	i	
Rosaceae	*Aphanes arvensis*	field parsley-piert	*Alchemilla a.*	APHARV	i	
Rosaceae	*Fragaria chiloensis* ssp. *pacifica*	coastal strawberry		FRACHI	n	
Rosaceae	*Potentilla anserina* ssp. *pacifica*	Pacific silverweed	*Potentilla pacifica*	POTANS	n	
Rubiaceae	*Galium aparine*	common cleavers		GALAPA	n	
Rubiaceae	*Galium trifidum*	small bedstraw		GALTRI	n	
Violaceae	*Viola palustris*	marsh violet		VIOPAL	n	
GRASSES, SEDGES, RUSHES						

Synonymy from Washington Flora Checklist

N/I = Native or Introduced

Red type: noxious weed

Westport Light State Park
Plant Species Observations

Family	Species	Common Name	Synonym	Species Code	N/I	Status
Cyperaceae	*Carex obnupta*	slough sedge		CAROBN	n	
Cyperaceae	*Carex pansa*	sand sedge		CARPAN	n	
Juncaceae	*Juncus breweri*	Brewer's rush	*Juncus lesueurii*	JUNBRE	n	
Juncaceae	*Juncus bufonius* var. *bufonius*	toad rush		JUNBUF	n	
Juncaceae	*Juncus falcatus* ssp. *sitchensis*	Alaskan sickle-leaved rush		JUNFAL	n	
Juncaceae	*Juncus nevadensis* var. *inventus*	dune rush		JUNNEV	n	
Juncaceae	*Luzula subsessilis*	prairie woodrush		LUZSUB	n	
Poaceae	*Agrostis capillaris*	colonial bentgrass		AGRCAP	i	
Poaceae	*Agrostis pallens*	seashore bentgrass		AGRPAL	n	
Poaceae	*Agrostis stolonifera*	spreading bentgrass	*Agrostis alba* var. *stolonifera*	AGRSTO	i	
Poaceae	*Aira caryophyllea* var. *caryophyllea*	silver hairgrass		AIRCAR	i	
Poaceae	*Aira praecox*	early silvergrass		AIRPRA	i	
Poaceae	*Ammophila arenaria* ssp. *arenaria*	European beachgrass		AMMARE	i	
Poaceae	*Ammophila breviligulata* ssp. *breviligulata*	American beachgrass		AMMBRE	i	
Poaceae	*Anthoxanthum odoratum*	sweet vernalgrass		ANTODO	i	
Poaceae	*Bromus diandrus*	ripgut brome	*B. rigidus*	BRODIA	i	
Poaceae	*Bromus hordeaceus* ssp. *hordeaceus*	soft brome	*B. mollis*	BROHOR	i	
Poaceae	*Dactylis glomerata*	orchardgrass		DACGLO	i	
Poaceae	*Dichanthelium acuminatum* ssp. *fasciculatur*	hairy panicgrass	*Panicum a.*	DICACU	n	
Poaceae	*Holcus lanatus*	common velvetgrass		HOLLAN	i	
Poaceae	*Leymus mollis* ssp. *mollis*	American dunegrass	*Elymus mollis*	LEYMOL	n	
Poaceae	*Lolium perenne*	perennial ryegrass		LOLPER	i	
Poaceae	*Phalaris arundinacea*	reed canarygrass		PHAARU	i	Class C
Poaceae	*Poa annua*	annual bluegrass		POAANN	i	
Poaceae	*Poa confinis*	beach bluegrass		POACON	n	
Poaceae	*Poa pratensis* ssp. *pratensis*	Kentucky bluegrass		POAPRA	i	
Poaceae	*Schedonorus arundinaceus*	tall fescue	*Festuca arundinacea*	SCHARU	i	
Poaceae	*Trisetum cernuum*	nodding trisetum		TRICER	n	
Poaceae	*Vulpia bromoides*	brome fescue		VULBRO	i	
Poaceae	*Vulpia myuros*	rat-tail fescue		VULMYU	i	
FERNS, CLUBMOSS, HORSETAIL						
Dryopteridaceae	*Polystichum munitum*	common sword fern		POLMUN	n	
Lycopodiaceae	*Lycopodium clavatum*	common clubmoss		LYCCLA	n	
Ophioglossaceae	*Sceptridium multifidum*	leathery grapefern	*Botrychium multifidum*	SCEMUL	n	

Synonymy from Washington Flora Checklist

N/I = Native or Introduced

Red type: noxious weed

Appendix B
Plant Community Data Reference Sheet

Plant Community Data Reference Sheet

This reference sheet contains the definitions and guidelines used to collect the plant community data. The data plot summaries are found in Appendix C.

Park Name

Region

Eastern
Northwest
Southwest

Contractor

Observer

Date of Survey

Survey Intensity

High = walked or saw >67% of polygon interior
Moderate = walked or saw 33-67% of polygon interior
Low = walked perimeter or saw <33% of polygon interior
Remote = photo interpretation or other remote survey

Acres

Slope Categorize the average angle of the slope in the polygon.

0 = 0-20%
1 = 20-35%
2 = 35-50%
3 = 50-70%
4 = 70-90%
5 = >90%

Aspect Categorize the overarching aspect of the polygon.

N = north
NE = northeast
E = east
SE = southeast
S = south
SW = southwest
W = west
NW = northwest

Total Vegetation Cover (%) (Includes all vascular plants, mosses, lichens, and foliose lichens [crustose lichens excluded; they are considered rock]; this never exceeds 100%. Space between leaves/branches is included in "cover.")

0
<1
1-5
5-10
10-25
25-50
50-90
>90

Total Tree Cover (%) Same cover classes as used for total vegetation cover.

Dominant Tree Species

Stand Age

1 = very young, 0-40 years
2 = young, 40-90 years
3 = mature, 90-200 years
4 = old growth, 200+ years
5 = young with scattered old trees (2-10 trees/ac)
6 = mature with scattered old trees
7 = young and mature

Median Diameter at Breast Height (DBH) of Dominant/Co-Dominant Trees

Categorize the median diameter at breast height (DBH), or the diameter at 4.5 feet, for dominant/co-dominant trees in the canopy of the polygon.

0 = <10"
1 = 10-20"
2 = 20-30"
3 = 30-40"
4 = 40-50"
5 = 51-60"
6 = >60"

Median Dominant/Co-Dominant Tree Height Categorize the median height of dominant/co-dominant trees in the canopy of this polygon.

0 = <10'
1 = 10-25'
2 = 25-50'
3 = 50-75'
4 = 75-100'
5 = 100-150'
6 = 150-200'
7 = 200+'

Number of Vegetative Strata

0 = No vegetation
1 = Only one distinct layer of vegetation in the polygon
2 = Two distinct layers of vegetation in the polygon
3 = Three distinct layers of vegetation in the polygon
4 = Four or more distinct layers of vegetation in the polygon

Where…
0 = No vegetation in polygon.
1 = Only one distinct layer of vegetation in the polygon. Usually applies to polygons with a herbaceous understory layer only, but it could be a dense shrub layer with little herbaceous understory or even a dense cohort of trees with no vegetation occurring below the canopy level.
2 = Two distinct layers of vegetation in the polygon. This can include an understory and a tree canopy, a shrub layer and a herbaceous understory, or some other combination.
3 = Three distinct layers of vegetation in the polygon. This can include any three of the following in a variety of combinations: herbaceous understory, shrub layer, subcanopy, and/or tree canopystrata.
4 = Four or more distinct layers of vegetation in the polygon. This usually includes an understory, shrub layer, subcanopy, and tree canopy.

Canopy Base Height Categorize the minimum gap between the top of the understory and the base of the tree canopy that occurs across the polygon, and which occurs across at least 10% of the area occupied by the understory-canopy gap.

0 = 0 (branches touching ground)-2’
1 = 2-5’
2 = 5-8’
3 = 8-11’
4 = 11-14’
5 = 14-17’
6 = 17-20’
7 = >20’

Understory Vegetation/Surface Fuels Categorize the median height of understory vegetation. At least 10% of the understory should occupy the category that you choose.

0 = 0-6’
1 = 6-9’
2 = 9-12’
3 = 12-15’
4 = 15-18’
5 = 18-20’
6 = 20+’

Total Shrub Cover (%) Same cover classes as used for total vegetation cover.

Dominant Shrub Species

Tall >1.5ft Shrub Cover (%) Same cover classes as used for total vegetation cover.

Small <1.5ft Shrub Cover (%) Same cover classes as used for total vegetation cover.

Total Graminoid Cover (%) Same cover classes as used for total vegetation cover.

Dominant Graminoid Species

Perennial Graminoid Cover (%) Same cover classes as used for total vegetation cover.

Annual Graminoid Cover (%) Same cover classes as used for total vegetation cover.

Total Forb Cover (%) Same cover classes as used for total vegetation cover.

Dominant Forb Species

Perennial Forb Species (%) Same cover classes as used for total vegetation cover.

Annual Forb Species (%) Same cover classes as used for total vegetation cover.

Ferns Total Cover (%) Same cover classes as used for total vegetation cover.

Fern Species

Evergreen Fern Cover (%) Same cover classes as used for total vegetation cover.

Deciduous Fern Cover (%) Same cover classes as used for total vegetation cover.

Total Exotics Cover (%) Same cover classes as used for total vegetation cover.

Perennial Exotics Cover (%) Same cover classes as used for total vegetation cover.

Annual Exotics Cover (%) Same cover classes as used for total vegetation cover.

Noxious Species 1-8 (text or drop down menu as in weed survey database)

Noxious Species 1-8 Cover (%) Same cover classes as used for total vegetation cover.

Other Exotic Species

Water Cover (%) Note whether water is seasonal or perennial in notes.

Hydrology-Riparian Condition

None = No hydrologic features
A = Excellent
B = Very Good
C = Good
D = Fair
E = Poor

Where…

None = No hydrologic features in polygon.
A = Excellent. Slight evidence of human disturbance (<1% of polygon impacted); natural processes appear to be at work (includes presence of naturaldisturbance events like beaver dams and channel migration)
B = Very Good. Low evidence of human disturbance (1-5% of polygon impacted); natural processes appear to be at work (includes presence of naturaldisturbance events like beaver dams and channel migration)
C = Good. Moderate evidence of human disturbance (5-10% of polygon impacted); natural processes generally appear to be at work (includes presence of natural disturbance events like beaver damsand

channel migration)
D = Fair. High evidence of human disturbance (10-25% of polygon impacted bydams, ditches, dikes, culverts, grazing impacts, etc.); natural processes may or may not be properly functioning
E = Poor. Severe evidence of human disturbance (>25% of polygon impactedby dams, ditches, dikes, culverts, grazing impacts, etc.); natural processes unlikely to be properly functioning

Rock Outcrop Cover (%) Exposed bedrock including detached boulders over 1 yard across. Same cover classes as used for total vegetation cover.

Gravel/Cobble Cover (%) Large fragments between sand and boulder.

Bare Ground Cover (%) Bare ground = exposed mineral soil.

Moss and Lichen Cover (%) Mosses/lichens = nonvascular plant cover on soil.

Litter Cover (%) Litter = includes logs, branches, and basal area of plants.

Talus Cover (%) Same cover classes as used for total vegetation cover.

Cave Cover (%) Same cover classes as used for total vegetation cover.

Mines Cover (%) Same cover classes as used for total vegetation cover.

Logging
0 = non-applicable
1 = unlogged or very limited cutting
2 = selectively logged
3 = heavily logged with natural regeneration
4 = tree plantation

Where…
1 = unlogged, no evidence of past logging or occasional cut stumps not part of systematic harvest of trees, no or very little impact on stand composition
2 = selectively logged: frequent cut stumps but origin of dominant or co-dominant cohort appears to be natural disturbance
3 = heavy logging disturbance with natural regeneration: many cut stumps that predate the dominant or co-dominant cohort with no tree planting
4 = tree plantation: dominant cohort appears to be planted after clearcutting

Agriculture
0 = non-applicable
1 = active annual cropping
2 = active perennial herbaceous cropping
3 = active woody plant cultivation
4 = fallow, plowed no crops this year
5 = federal CRP
6 = other

Grazing
1 = active heavy grazing (most forage used, soil disturbance)
2 = active moderate grazing (25-75% forage used)
3 = active light grazing (lots of last year's litter left)
4 = no current, heavy past grazing
5 = no currently, light past grazing
6 = no obvious sign of grazing

Development
1 = actively used facilities
2 = roads
3 = established trails
4 = abandoned facilities
5 = none obvious
6 = multiple types (detail in comments)

Wildlife
1 = heavy ungulate use
2 = moderate ungulate use
3 = light to no ungulate use
4 = burrowing animals
5 = active beaver
6 = active porcupine
7 = other (list animal in comments)

Recreation Use Severity
0 = no evidence of recreational use impacts
1 = heavy, abundant soil and vegetation displacement
2 = moderate, frequent soil and vegetation displacement
3 = light use, little sign of activity off trail/road

Recreation Use Primary Type
0 = no evidence of recreational use
1 = wheeled
2 = hoofed
3 = pedestrian
4 = combination of above
5 = other (detail in comments)

Plant Association (PA) 1-5 List all PAs encountered in polygon survey, in comments list sourceof name if not on provided key. NOTE: Contractor is required to consult with the WNHP to obtain the most current classification and condition ranking information available.

G Rank (text) NOTE: Contractor is required to consult with the WNHP to obtain the most current Global Ranking for the plant associations.

S Rank (text) NOTE: Contractor is required to consult with the WNHP to obtain the most current State Rankings for the plant associations.

Ecological Condition Rank
A = Excellent ecological condition
A/B = Good-excellent ecological condition
B = Good ecological condition
B/C = Good-fair ecological condition
C = Fair ecological condition
C/D = Fair-poor ecological condition
D = Poor ecological condition
Developed

Where…
A (Excellent) = Vegetation structure and composition, soil status, and hydrological function appear well within natural ranges of variation. Non-native species are essentially absent or have negligible negative impact.

B (Good) = Vegetation structure and composition, soil status, and/or hydrological function appear to deviate slightly from the natural ranges of variation. Non-native species are present, but the impacts are minimal.
C (Fair) = Vegetation structure and composition, soil status, and/or hydrological function appear to deviate substantially from the natural ranges of variation. Non-native species may be abundant.
D (Poor) = Vegetation structure and composition, soil status, and/or hydrological function deviate dramatically from the natural ranges of variation. Non-native species may be abundant. The association is so severely altered that restoration may not be possible.

PA 1-5 Cover (%) Percent coverage of polygon. Same cover classes as used for total vegetation cover.

Pattern 1-5 Pattern reflects how PA is distributed in polygon
1 = matrix (most of polygon)
2 = large patches
3 = small patches
4 = clumped, clustered, contiguous
5 = scattered, more or less evenly repeating
6 = linear
7 = other

Appendix C
Plant Community Survey Data

Note: Six-letter species codes are defined in Appendix A, *Plant Species Observations*.

Site: Westport SP	Plot ID: W1	Community: SAHO/CAOB-(AREG) Shrub Swamp
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-26	>90	Moderate = walked or saw 33-67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
<1	None	N/A	N/A

Vegetative Strata	Canopy Base Height	Stand Age
Two distinct layers of vegetation in the polygon	0 (branches touching ground)-2'	N/A

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
>90	SALHOO	>90	<1

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
50-90	CAROBN	50-90%	0

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
5-10	VERSCU, GALTRI, CALSTA, VERPER	1-5	1-5

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
0	None	0	0

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
0	0	0	None	None	None

Site: Westport SP	Plot ID: W1	Community: SAHO/CAOB-(AREG) Shrub Swamp		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
>90	No hydrologic features	0	0	<1

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
25-50	50-90	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
None	established trails	moderate ungulate use	light use little sign of activity off trail/road	pedestrian

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
SAHO/CAOB-(AREG)	4	1

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
Excellent ecological condition	matrix (most of polygon)	>90

NOTES
Currently dry but strong evidence of seasonal inundation throughout.

Site: Westport SP	Plot ID: W2	Community: PICO/CYSC/AMAR Semi-Natural Shrubland
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-26	>90	High = walked or saw >67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
50-90	PINCON	<10	50-75'

Vegetative Strata	Canopy Base Height	Stand Age
Three distinct layers of vegetation in the polygon	17-20'	young, 40-90 years

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
50-90%	CYTSCO	50-90	5-10

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
25-50	AMMARE, ANTODO	25-50%	<1

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
1-5	MAIDIL, HYPRAD	1-5	<1

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
1-5	POLMUN	0	1-5

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
50-90	50-90	<1	Scotch broom	None	AMMARE, AMMBRE, ANTODO, HOLLAN, ILEAQU

Site: Westport SP	Plot ID: W2	Community: PICO/CYSC/AMAR Semi-Natural Shrubland		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
<1	No hydrologic features	0	0	<1

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
1-5	25-50	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
unlogged or very limited cutting	established trails	moderate ungulate use	light use little sign of activity off trail/road	pedestrian

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
PICO/CYSC/AMAR	Not Designated	Not Designated

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
Fair ecological condition	matrix (most of polygon)	50-90

NOTES
Mostly *Ammophila breviligulata*. Includes patch with no trees <2 acres

Site: Westport SP	Plot ID: W3	Community: PISI-PICO/GASH-VAOV Forest
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-26	>90	Moderate = walked or saw 33-67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
50-90	PICSIT, PINCON	10-20”	75-100'

Vegetative Strata	Canopy Base Height	Stand Age
Three distinct layers of vegetation in the polygon	5-8'	young, 40-90 years

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
50-90%	VACOVA, GALSHA, MORCAL, MALFUS	50-90	5-10

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
<1	TRICER	<1	0

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
10-25	MAIDIL	10-25	<1

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
1-5	POLMUN	0	1-5

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
1-5	1-5	0	Scotch broom	English ivy - four cultivars only	ILEAQU

Site: Westport SP	Plot ID: W3	Community: PISI-PICO/GASH-VAOV Forest		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
<1	No hydrologic features	0	0	<1

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
25-50	25-50	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	established trails	moderate ungulate use	light use little sign of activity off trail/road	pedestrian

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
PISI-PICO/GASH-VAOV	3	2

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
good to excellent ecological condition	matrix (most of polygon)	>90

NOTES
Separated due to higher topo and co-dominant PISSIT

Site: Westport SP	Plot ID: W4	Community: PICO/CAOB Swamp Forest
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-26	>90	Moderate = walked or saw 33-67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
50-90	PINCON	10-20”	75-100'

Vegetative Strata	Canopy Base Height	Stand Age
Three distinct layers of vegetation in the polygon	5-8'	young, 40-90 years

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
50-90%	MORCAL, LONINV, SALHOO, VACOVA, ALNRUB, MALFUS	50-90	10-25

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
50-90	CAROBN	50-90	0

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
<1	VERSCU	<1	0

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
0	None	0	0

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
<1	<1	<1	Scotch broom	None	ILEAQU

Site: Westport SP	Plot ID: W4	Community: PICO/CAOB Swamp Forest		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
50-90	No hydrologic features	0	0	1-5

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
10-25	25-50	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	none obvious	moderate ungulate use	light use little sign of activity off trail/road	pedestrian

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
PICO/CAOB	2	1

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
Excellent ecological condition	matrix (most of polygon)	50-90

NOTES
Most common forest type. Upland/wetland mosaic

Site: Westport SP	Plot ID: W5	Community: PICO/CYSC/AMAR Semi-Natural Shrubland
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-26	>90	Moderate = walked or saw 33-67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
0	None	Not Applicable	75-100'

Vegetative Strata	**Canopy Base Height**	**Stand Age**
Two distinct layers of vegetation in the polygon	0 (branches touching ground)-2'	Very Young (0-40 years)

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
10-25	PINCON, CYTSCO, ARCUVA	10-25%	1-5

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
50-90	AMMARE, ANTODO, CARPAN	50-90	1-5

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
10-25	TANBIP, FRACHI, ACHMIL, PLALAN	10-25	<1

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
1-5	POLMUN	0	1-5

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
50-90	50-90	1-5	Scotch broom	None	AMMARE, ANTODO, HYPRAD, HOLLAN, TEENUD

Site: Westport SP	Plot ID: W5	Community: PICO/CYSC/AMAR Semi-Natural Shrubland		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
<1	No hydrologic features	0	0	0

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
1-5	50-90	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	established trails	moderate ungulate use	light use little sign of activity off trail/road	pedestrian

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
PICO/CYSC/AMAR	Not Designated	Not Designated

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
fair to poor ecological condition	matrix (most of polygon)	>90

NOTES
continuation of relatively open habitat extending north. Native Poa lots of ARCUVA

Site: Westport SP	Plot ID: W6	Community: PICO/CAOB Swamp Forest
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-26	>90	Moderate = walked or saw 33-67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
25-50	PINCON	<10	25-50'

Vegetative Strata	Canopy Base Height	Stand Age
Three distinct layers of vegetation in the polygon	0 (branches touching ground)-2'	very young, 0-40 years

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
50-90%	SPIDOU, VACOVA, SALHOO, LONINV	50-90	1-5

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
25-50	CAROBN	25-50	<1

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
1-5	VERSCU, POTANS	1-5	<1

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
<1	POLMUN	0	<1

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
1-5	1-5	<1	Scotch broom	None	None

Site: Westport SP	Plot ID: W6	Community: PICO/CAOB Swamp Forest		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
50-90	No hydrologic features	0	0	1-5

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
1-5	50-90	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	none obvious	moderate ungulate use	no evidence of recreational use impacts	no evidence of recreational use

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
PICO/CAOB	2	1

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
Excellent ecological condition	matrix (most of polygon)	50-90

NOTES
SIMILAR TO w3 but younger trees & slightly more open

Site: Westport SP	Plot ID: W7	Community: SAHO/CAOB-(AREG) Shrub Swamp
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-26	>90	Remote = photo interpretation or other remote survey

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
0	None	Not Applicable	Not Applicable

Vegetative Strata	Canopy Base Height	Stand Age
Two distinct layers of vegetation in the polygon	0 (branches touching ground)-2'	

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
50-90%	SALHOO, SPIDOU	50-90	1-5

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
50-90	CAROBN	50-90	<1

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
1-5	VERSCU, POTANS	1-5	<1

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
0	None	0	0

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
0	0	0	None	None	None

Site: Westport SP	Plot ID: W7	Community: SAHO/CAOB-(AREG) Shrub Swamp		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
>90	No hydrologic features	0	0	<1

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
10-25	50-90	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	none obvious	moderate ungulate use	no evidence of recreational use impacts	no evidence of recreational use

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
SAHO/CAOB	4	1

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
Excellent ecological condition	matrix (most of polygon)	>90

NOTES
MIX OF DENSE SAHO and patches pf SAHO/SPDO.

Site: Westport SP	Plot ID: W8	Community: VAOV-CYSC-MAFU/LEMO-AMAR Shrubland
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-26	>90	Moderate = walked or saw 33-67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
0	None	Not Applicable	Not Applicable

Vegetative Strata	Canopy Base Height	Stand Age
Two distinct layers of vegetation in the polygon	0 (branches touching ground)-2'	Not Applicable

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
50-90%	VACOVA, CYTSCO MALFUS	50-90	1-5

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
25-50	LEYMOL, AMMARE, HOLLAN	25-50	<1

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
1-5	RUMACE, GALAPA, STEMED	1-5	1-5

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
5-10	POLMUN	0	5-10

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
10-25	10-25	<1	Scotch broom	Himalayan blackberry	AMMARE, EREMIN, RUBBIF, RUMACE, STEMED

Site: Westport SP	Plot ID: W8	Community: VAOV-CYSC-MAFU/LEMO-AMAR Shrubland		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
0	No hydrologic features	0	0	0

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
<1	50-90	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	established trails	moderate ungulate use	light use little sign of activity off trail/road	pedestrian

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
VAOV-CYSC-MAFU/LEMO-AMAR	Not Designated	Not Designated

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
Good ecological condition	matrix (most of polygon)	>90

NOTES
Similar to W5 but higher, uneven topo, dense shrubs and more native

Site: Westport SP	Plot ID: W9	Community: PICO/VAOV-CYSC Forest
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-05-27	>90	Moderate = walked or saw 33-67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
50-90	PINCON	10-20”	75-100'

Vegetative Strata	Canopy Base Height	Stand Age
Three distinct layers of vegetation in the polygon	>20'	very young, 0-40 years

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
50-90%	VACOVA, CYTSCO, ARCUVA	50-90	<1

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
1-5	ANTODO, HOLLAN	1-5	<1

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
10-25	MAIDIL, HYPRAD	10-25	<1

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
1-5	POLMUN	0	1-5

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
25-50	25-50	5-10	Scotch broom	English ivy - four cultivars only	ANTODO, HOLLAN, HYPRAD, AMMBRE

Site: Westport SP	Plot ID: W9	Community: PICO/VAOV-CYSC Forest		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
<1	No hydrologic features	0	0	<1

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
10-25	50-90	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	established trails	moderate ungulate use	light use little sign of activity off trail/road	pedestrian

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
PICO/VAOV-CYSC	Not Designated	Not Designated

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
fair to good ecological condition	matrix (most of polygon)	>90

NOTES
Variable CYSC density in understory. Strong sere of PISI & TSHE saplings

Site: Westport SP	Plot ID: W10	Community: *Salix* spp.-SPDO / *Carex* Wet Shrubland
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-08-06	50-90%	High = walked or saw >67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
0	None	Not Applicable	Not Applicable

Vegetative Strata	**Canopy Base Height**	**Stand Age**
One distinct layer of vegetation in the polygon.	0 (branches touching ground)-2’	Not Applicable

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
<1%	PINCON	<1%	0

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
50-90%	JUNNEV, JUNBRE, CARPAN, AGRPAL	50-90%	0

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
10-25%	CARRAM	10-25%	1-5%

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
0	None	0	0

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
10-25%	10-25%	1-5%	None	None	LEOSAX, ANTODO

Site: Westport SP	Plot ID: W10	Community: *Salix* spp.-SPDO / *Carex* Wet Shrubland		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
>90	No hydrologic features	0	0	1-5%

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
5-10%	1-5%	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	none obvious	moderate ungulate use	no evidence of recreational use impacts	no evidence of recreational use

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
JUFA-JU(LE,NE)	3/4	2Q

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
Good to excellent ecological condition	matrix (most of polygon)	>90%

NOTES
Small deflation plain wetland containing graminoids with young PINCON saplings on periphery.

Site: Westport SP	Plot ID: W11	Community: *Salix* spp.-SPDO / *Carex* Wet Shrubland
Survey Date	**Total Vegetation Cover**	**Survey Intensity**
2021-08-06	>90	High = walked or saw >67% of polygon interior

TREES			
Total Tree Cover %	**Dominant Tree Species**	**Median DBH**	**Median Height**
0	None	Not Applicable	Not Applicable

Vegetative Strata	**Canopy Base Height**	**Stand Age**
Two distinct layers of vegetation in the polygon	0 (branches touching ground)-2'	

SHRUBS			
Total Shrub Cover %	**Dominant Shrub Species**	**Tall >1.5ft Shrub Cover %**	**Small <1.5ft Shrub Cover %**
50-90%	SPIDOU, PINCON (saplings)	50-90%	50-90%

GRAMINOIDS			
Total Graminoid Cover %	**Dominant Graminoid Species**	**Perennial Graminoid Cover %**	**Annual Graminoid Cover %**
25-50%	JUNNEV, CAROBN, CARPAN, AGRPAL	25-50%	<1%

FORBS			
Total Forb Cover %	**Dominant Forb Species**	**Perennial Forb Cover %**	**Annual Forb Cover %**
1-5%	VERSCU, LEOSAX, RUMCRI	<1%	1-5%

FERNS			
Total Fern Cover %	**Dominant Fern Species**	**Deciduous Fern Cover %**	**Evergreen Fern Cover %**
0	None	0	0

EXOTICS/NOXIOUS					
Total Exotics Cover %	**Perennial Exotics Cover %**	**Annual Exotics Cover %**	**Noxious Species 1**	**Noxious Species 2**	**Other Exotic Species**
1-5%	0	1-5%	None	None	LEOSAX, RUMCRI

Site: Westport SP	Plot ID: W11	Community: *Salix* spp.-SPDO / *Carex* Wet Shrubland		
UNVEGETATED SURFACES				
Water Cover %	**Hydrology-Riparian**	**Rock Outcrop Cover %**	**Gravel Cover %**	**Bare Ground Cover %**
>90%	No hydrologic features	0	0	1-5%

Moss & Lichen Cover %	Litter Cover %	Talus Cover %	Caves Cover %	Mines Cover %
<1%	1-5%	0	0	0

SITE CONDITIONS				
Logging, Ag, Grazing	**Development**	**Wildlife**	**Recreational Use Severity**	**Recreation Use Primary Type**
non-applicable	none obvious	moderate ungulate use	no evidence of recreational use impacts	no evidence of recreational use

PLANT ASSOCIATIONS		
Plant Association 1	**G Rank 1**	**S Rank 1**
Salix spp.-SPDO/*Carex*	3/4	2Q

Ecological Condition 1	Pattern 1	Plant Association 1 Cover %
Excellent ecological condition	Large Patches	>90%

NOTES
Extends north of study area.

Appendix D
WNHP Element Occurrence Form

Kaernefeltia californica

EO ID	6577	**1**	4612481
Shape_ID	5088	kaernefeltia lichen	9/28/2021

Identifiers — EO Dump Report

ELCODE_BCD NLT0000100 **EO Number** 1 **Field Office Number**

ID Confirmed Y - Yes **Protection Status** T **Data Sensitive** N

Basic EO Rank E - Verified extant (viability not assessed) **Precision_BCD** S

Site/Directions

Survey Site Westport Lighthouse State Park

Directions Westport Lighthouse State Park. Shoreline (Pinus contorta) area in dunes between older Picea sitchensis forest near lighthouse and beach.

Locators

Counties Grays Harbor **Watershed** 17100106 - Willapa Bay **Physiographic Province** OP

Mapsheet Code	Mapsheet Name	Margin Num	Dot Num	Ten Ten
46124-H1	Westport	7564	040	
46124-H2	Point Brown			

Latitude 465317N **Longitude** 1240729W **X Coordinate** 734433 **Y Coordinate** 587796

Town Range	Section	Meridian	TRS Note
016N012W	12	WM	NWOFSW

Rep. Detail

Representation Accuracy **Estimated** High

Comments

Rep. Extent

Confidence Extent **Additional Inventory Needed** N

Comments

Sources

SF ID	Shape_ID	Descriptor	Locator	Feat. Type	Distance	Location Use Class
9777	5087			Point	50 Meters	

Survey Information

Survey Type	Note

Surveyors Herre, Albert W.C.T., 1951 | Riley, Jim, 1994 | Foster, A.S., 1908, 1909

Survey Date 1994-11-26 **Last Observed** 1994-11-26 **First Observed** 1908-01-25

EO Data 1994: Growing on Pinus contorta. | 1951: Growing on Pinus contorta. Specimen collected. | 1909: Growing on dead and live trees, near sand dunes. Specimen collected. | 1908: Growing on Pinus contorta and old stumps. Specimen collected.

EO Rank

EO Rank Factor Survey Data

Condition of EO

Size of EO

Landscape Context

Basic EO Rank E - Verified extant (viability not assessed) **EO Rank Date** 1994-11-26

EO Rank Comment

Description

General Description Shoreline (Pinus contorta) area; dunes between older Picea sitchensis forest and beach. Grows on bark of Pinus contorta var. contorta.

Min. Elevation 20 **feet** 6 **meters** **Max. Elevation** **feet** **meters**

Protection

Protection Comments

MA/Ownership

Managed Area ID	Name	Type	Contained
256	Westport Light State Park	SPKSP	Y - Yes

Management Comments

Ownership Type	Name	Note
State/provincial government	State Parks	

Owner Comments

Additional Topics

Kaernefeltia californica

EO ID	6577	**1**	4612481
Shape_ID	5088	kaernefeltia lichen	9/28/2021

General Comments

Documentation

Boundaries N - No **Image** N

Reference Code	**Citation**	**Primary**
Specimen	Foster, A.S. (s.n. and 657). 1908. CUP, FH, US, COLO, FLAS, MICH, NEB, VT, WTU, MU, YPM.	
	Foster, A.S. (s.n.). 1909. PH, DUKE, FH, F, MSC, LSU, TLE, US, UC, UBC, COLO, FLAS, MICH, NEB, VT, WIS, YPM.	
	Herre, A.W.C.T. (4886). 1951. F, WTU, UC.	

Version/QC

Version Author WFF **Version Date** 10/07/2019

Digital Mapping By XXX **Digital Mapping Date** 02/24/1998

Data QC Status Incomplete **Data QC By** jlh **Map QC Status** Passed **Map QC By**

Optional Fields

Aspect **Slope**

Plant Association

Associated Species

Owner Code ST SPR **Special Status** SPK

Currrent Protection	**Intended Protection**	**Photograph**	**Reference**

Old Name

Best Source Riley, Jim, 1994 | Herre, Albert W.C.T., 1951 | Foster, A.S., 1908

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