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Westport Light State Park Vegetation Survey Report

1595 West Ocean Avenue
Westport, Washington 98595

Washington State Parks and Recreation Commission

Project Number: 60541146

June 2017

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Table of Contents

Tables

Figures

Appendices

PREFACE

Washington State Park vegetation survey and reporting was limited to the period between April and June 2017; therefore, the plant community data collected and described in this report represent conditions observed during a relatively brief phenological window. Seasonal timing and the limited duration of the survey period are likely to influence the survey results for individual species and, to a lesser extent, plant associations. The delayed onset of normal spring conditions this year may result in select species of concern and weeds not reaching phenological stages where identification is possible. The brief survey window may also result in an underestimate of populations of species that mature later in the season. A fuller picture of vegetation conditions in this park could be realized if future surveys encompassed the entire growing season.

1.   INTRODUCTION

AECOM surveyed a recently acquired portion of Westport Light State Park (acquired in 2015). This area is 290 acres and located at the north end of Westport Light State Park and immediately south of Westhaven State Park. The survey area is located on the Westport peninsula in Grays Harbor County, Washington (Figure 1) in the Northwest Coast Ecoregion. This ecoregion is the westernmost and wettest ecoregion in Washington. This region comprises 11 percent of Washington. As of 1991, about 5 percent had been converted to urban and agricultural uses (WNHP 2007).

The park boundary follows the edge of a short stabilized dune. The stabilized nature of the dune has resulted in a steep drop-off to the beach below. In the survey area, the beach appears to be outside of the park boundary.

The survey area contains a portion of the Westport Light Trail on the far west end. There are no other maintained trails or facilities in the survey area. An access road runs southwest from the northeastern corner of the survey areas to the Hoquiam Radio Range Station. The eastern entrance is overgrown and a few trees lay across the road. The Westhaven State Park parking lot is immediately north of the survey area. Due to the proximity of the City of Westport, illegal campsites have been found in the park. Two sites (one inactive and one active) were observed during surveys.

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 wetlands cover a large amount of the survey area.

Review of an aerial photo from 1990 shows that the survey area was mostly non-forested. The shore pines (*Pinus contorta* var. *contorta*) have expanded extensively during the last 27 years. Prior to acquisition by the Washington State Parks and Recreation Commission (WSPRC), a golf course was planned for the survey area. Construction was started and portions of the area were cleared and many wetlands were circled with silt fences. Some construction materials and poles (see photo) are scattered around the park. In addition, two ponds were excavated just south of the Westhaven State Park parking lot. The cleared areas are now covered with non-native grasses, Scotch broom (*Cytisus scoparius*), and small shore pines.

The objectives of this vegetation survey were to identify and delineate the approximate boundaries of distinct plant associations, survey and document rare 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 survey on Westport Light State Park was conducted on June 7, 8, and 9, 2017. The survey found three distinct upland plant associations and four wetland plant associations. A list of the 107 vascular plant species observed during the surveys is included in Appendix A. The list includes 5 tree species, 19 shrubs, 54 herbs, 25 grasses/sedges/rushes, and 4 ferns/horsetails. Based on the results of these surveys, management recommendations include noxious weed control, construction debris and 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 *Draft Key to Washington Wetland and Riparian Plant Associations* (Rocchio et al. 2016) was used to classify wetland plant communities. There is no existing key for Washington coastal upland plant associations. In addition, 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). 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 2015

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.

All wetland plant communities that were encountered were mapped if they were large enough to be visibly separate from the surrounding polygons at the scale of mapping used for this effort. The use of GPS aided in areas where locations and boundaries of wetland were not evident in the aerial photography (especially in forested wetland situations). While the approximate boundary of wetland plant communities was mapped as part of this effort, the mapping does not constitute a formal wetland delineation.

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. Since 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. Routes for the plant community surveys can be found on Figure 2.

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 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.

2.2.2 Survey Timing

AECOM conducted the rare plant surveys on June 7, 8, and 9, 2017.

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 project 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). The rare plant survey protocol also met the WNHP's *Suggested Guidelines for Conducting Rare Plant Surveys for Environmental Review* (WNHP 2008).

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.
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 2015

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 2017).

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 seven different plant associations, within Westport Light State Park. Vegetation community polygons are either a stand-alone plant association or mosaics of multiple plant associations. Table 3-1 lists the plant associations and/or cover types found on Westport Light State Park. Figures 3 and 4 illustrate the location of the vegetation community polygons. Note that these polygons may contain secondary or tertiary 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]	Map ID[3]
ALRU/CAOB	*Alnus rubra / Carex obnupta* Ruderal Flooded Forest	Red Alder / Slough Sedge Ruderal Flooded Forest	Rocchio et al. 2016	GNA/SNA	2%	7
CYSC	*Cytisus scoparius* Shrubland	Scotch Broom Shrubland	Crawford and Rocchio 2013	GNR/SNR	6%	5
JUFA – JU(LE,NE)	*Juncus falcatus – Juncus (lesueurii, nevadensis)* Wet Meadow	Falcate Rush – (Brewer's Rush, Dune Rush) Wet Meadow	Rocchio et al. 2016	G3/S1?	4%	1
PICO/CAOB	*Pinus contorta* var. *contorta / Carex obnupta* Swamp Forest	Shore Pine / Slough Sedge Swamp Forest	Rocchio et al. 2016	G2/S1	1%	4
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	41%	2
PICO-PSME/MOCA-VAOV	*Pinus contorta* var. *contorta – Pseudotsuga menziesii / Morella californica – Vaccinium ovatum* Forest	Shore Pine – Douglas Fir / Pacific Bayberry – Evergreen Huckleberry Forest	Crawford and Rocchio 2013	GNR/SNR	27%	6
SAHO/CAOB – (AREG)	*Salix hookeriana / Carex obnupta – (Argentina egedii* spp. *egedii)* Shrub Swamp	Hooker Willow / Slough Sedge – (Pacific Silverweed) Shrub Swamp	Rocchio et al. 2016	G4/S1?	17%	3

NR = Not Rated. NA = Not Applicable. ? = Rating is in question.
[1] Statuses of plant communities were received from WNHP (2017).
[2] Percentage of the total acreage of the park occupied by the plant association. The remaining percentage consists of developed areas such as campgrounds, offices, and roads that were not surveyed.
[3] See Figures 3 and 4.

3.1 *Alnus rubra / Carex obnupta* Ruderal Flooded Forest

Distribution and Environment: This community occurs in one location in Westport Light State Park. It is located on the east side of the survey area near North Forrest Street. This community does not have a global or state rank.

Vegetation: The dominant tree in this community is red alder (*Alnus rubra*) with very few Sitka spruce (*Picea sitchensis*) at the end of the community. Slough sedge (*Carex obnupta*) dominates the understory of this community. A few shrubs are scattered and include red elderberry (*Sambucus racemosa* var. *racemosa*), salmonberry (*Rubus spectabilis*), and evergreen huckleberry (*Vaccinium ovatum*). Sword fern (*Polystichum munitum*) is also scattered in this community.

This community is discrete and does not contain inclusions of any other communities within it.

Ecological Condition: In Westport Light State Park, this community type is represented by a moderate-aged stand in good condition. This alder stand is visible in the 1990 aerial photo, when most of the shore pine forests are not established yet. Due to the proximity of the adjacent road, a campsite was noted in this community.

Approximate Total Area: 5.9 acres

3.2 *Cytisus scoparius* Shrubland

Distribution and Environment: This community occurs in one location in Westport Light State Park. It is located on the north east edge of the survey area adjacent to North Montesano Street. This community does not have a global or state rank.

Vegetation: The dominant shrub in this community is Scotch broom. Other common species include velvetgrass (*Holcus lanatus*) and sweet vernalgrass (*Anthoxanthum odoratum*). Trailing blackberry (*Rubus ursinus*) is also present.

Ecological Condition: This community is in poor condition as it is dominated by non-native species adjacent to a road.

Approximate Total Area: 16.5 acres

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

Distribution and Environment: This is the common herbaceous wetland community type in Westport Light State Park survey area. This community has a global rank of 3 and a state rank of 1(?). This wetland type is located across the non-forested portions of the site, as well as around the excavated ponds in the northwest corner of the survey area.

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 it 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*]) creating higher than normal foredunes.

Vegetation: These wetlands are dominated by rushes and sedges. 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 are slough sedge and sand sedge (*Carex pansa*). Other herbaceous species common in these wetlands include marsh speedwell (*Veronica scutellata*), purslane speedwell (*Veronica peregrina* var. *xalapensis*), and cows clover (*Trifolium wormskioldii*). These wetlands do contain scattered coastal willow (*Salix hookeriana*) and Douglas' spiraea (*Spiraea douglasii*) shrubs.

Ecological Condition: In Westport Light State Park, this community type is in good to excellent condition. Many of these herbaceous wetlands appeared to have been protected during the initial clearing work done for the golf course. Remnants of silt fences are still present around some of the wetlands (see photo). In addition, there are very few non-native species in these wetlands. Spatula-leaf loosestrife (*Lythrum portula*) was observed in one of the wetlands at the southern end of the survey area.

Approximate Total Area: 11.6 acres

3.4   *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. This community has a global rank of 2 and a state rank of 1.

Vegetation: This plant community type contains little species diversity in the survey area. The dominant tree is shore pine and the dominant herbaceous species is slough sedge. Western crabapple (*Malus fusca*) is scattered throughout the community. Evergreen huckleberry, Pacific bayberry (*Morella californica*), and sword fern are present on small hummocks.

Common plant community inclusions in this type include *Pinus contorta* var. *contorta – Pseudotsuga menziesii / Morella californica – Vaccinium ovatum* Forest and *Salix hookeriana / Carex obnupta – (Argentina egedii* spp. *egedii)* Shrub Swamp.

Ecological Condition: In Westport Light State Park, this community type is represented by young stands in good condition. These forested communities are less than 25 years old.

Approximate Total Area: 119.4 acres

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

Distribution and Environment: This community type was observed through the non-forested uplands of the survey area. It is usually intermixed in a mosaic pattern with the deflation plain wetland plant associations *Juncus falcatus – Juncus* (*lesueurii*, *nevadensis*) Wet Meadow and *Salix hookeriana* / *Carex obnupta* Shrub Swamp. 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. Areas with very thick European beachgrass contain few other species. More open areas with some bare sand contain sheep sorrel (*Rumex acetosella*), sandmat (*Cardionema ramosissima*), dune tansy (*Tanacetum bipinnatum*), lesser hawkbit (*Leontodon saxatilis* ssp. *saxatilis*), hairy cat's-ear (*Hypochaeris radicata*), shepherd's cress (*Teesdalia nudicaulis*), and seashore lupine (*Lupinus littoralis*).

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

Approximate Total Area: 79.2 acres

3.6   *Pinus contorta* var. *contorta – Pseudotsuga menziesii / Morella californica – Vaccinium ovatum* Forest

Distribution and Environment: This upland forest community type is uncommon in the Westport Light State Park survey area. It is most commonly found as a small inclusion in the *Pinus contorta* var. *contorta / Carex obnupta* forest. This community does not have a global or state rank.

Vegetation: The dominant tree in this community is shore pine. Common shrubs include

evergreen huckleberry, Pacific bayberry, and western crabapple. Sword fern and slough sedge are uncommon herbaceous species. In addition, rattlesnake plantain (*Goodyera oblongiflora*) was observed in this community. This community type does not contain much, if any, Douglas-fir (*Pseudotsuga menziesii*), but it was the best choice to represent the small upland forest patches located in the matrix of wetland forest.

Ecological Condition: In Westport Light State Park, this community type is represented by a young stand in good condition.

Approximate Total Area: 4.2 acres

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

Distribution and Environment: This community type is common shrub wetland in Westport Light State Park and was observed throughout the survey area. This community has a global rank between 4 and a state rank of 1(?).

Vegetation: This community is consistently dominated by coastal willow and slough sedge in

the survey area. In addition, Douglas spiraea, black twinberry (*Lonicera involucrata* ssp. *involucrata*), and shrub-size shore pine are often present. Sand sedge and marsh speedwell are common herbaceous species found in this wetland type in the survey area. The shrub-dominated wetlands range from woody thicket (pictured) to more open communities with a larger herbaceous component.

Ecological Condition: In Westport Light State Park, this community type is in good to excellent condition. Many of these wetlands appeared to have been protected during the initial clearing work done for the golf course. Remnants of silt fences are still present around some of the wetlands.

Approximate Total Area: 50.5 acres

4.   RARE PLANTS

The WNHP does not have any current or historical records of rare plant occurrences within Westport Light State Park. There are no known rare vascular plant occurrences within 5 miles of the survey area.

No rare plant species were observed during the June 2017 vegetation surveys. Special attention was paid to rare plant species that prefer sandy coastal habitats, such as bear's foot sanicle (*Sanicula arctopoides*) 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 (*Leymus mollis* ssp. *mollis*) and coastal sand verbena (*Abronia latifolia*) (Camp and Gamon 2011). There is only one extant known site of this plant in Washington, which is on the north end of the Long Beach Peninsula in a beach restoration site where European beachgrass was removed. 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 either wetland, forested, or dominated by European beachgrass.

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 June 2017 surveys are listed in Table 5-1. The noxious weeds were mostly found in disturbed areas associated with the golf course. However, a few bird-dispersed weeds were found in the forest (Figure 5).

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

Scientific Name	Common Name	Status	Mapped?
Cytisus scoparius	Scotch broom	Class C	No[1]
Hypochaeris radicata	Hairy cat's-ear	Class B	No
Ilex aquifolium	English holly	Plant of Concern	Yes
Phalaris arundinacea	Reed canarygrass	Class C	Yes
Rubus bifrons/R. armeniacus	Himalayan blackberry	Class C	No
Rubus laciniatus	Evergreen blackberry	Class C	No

[1] Individual scotch broom plants were not mapped. However, Scotch broom is so widespread in the survey area, it is included in the plant association mapping (e.g. *Cytisus scoparius* Shrubland).

Scotch broom is ubiquitous in some of the areas cleared for the golf course. In addition, a Scotch broom plant community was mapped adjacent to North Montesano Street. English holly (*Ilex aquifolium*) is not a listed noxious weed, but is included as a "plant of concern" by the Grays Harbor County Noxious Weed Control Board (Gray Harbor County 2017). It also was mapped because it is not widespread in the survey area and can be easily removed by hand pulling.
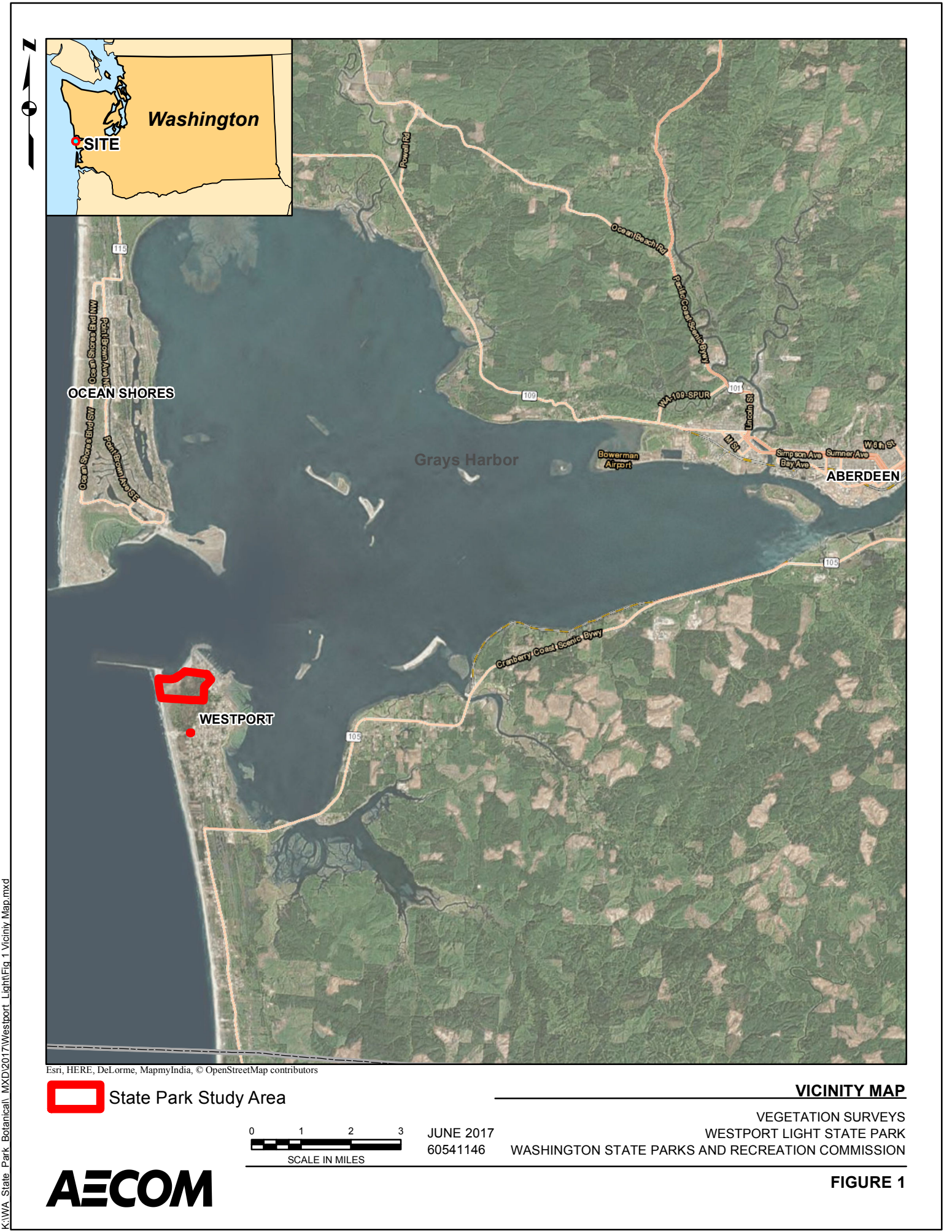
6.   RECOMMENDATIONS

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 English holly, can be easily eradicated from the survey area by hand pulling. Scotch broom is widespread and would require a multipronged effort. Since 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.

- **Construction debris removal** – There are corrugated pipes, metal stakes, plastic poles, silt fences, and other debris from the golf course construction that was started (some materials visible in photo). These materials should be removed.

- **Campsite removal** – Since the park is adjacent to Westport, it is attractive and convenient for campers. Two 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.

- **Upland dune restoration –** The upland dune communities in the survey area are in poor condition. These areas could be restored with removal of Scotch broom, European beachgrass, and encroaching shore pines.

7.   REFERENCES

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Washington

SITE

N

OCEAN SHORES

Grays Harbor

ABERDEEN

Bowerman Airport

Cranberry Coast Scenic Bywy

WESTPORT

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

State Park Study Area

0 1 2 3
SCALE IN MILES

JUNE 2017
60541146

VICINITY MAP

VEGETATION SURVEYS
WESTPORT LIGHT STATE PARK
WASHINGTON STATE PARKS AND RECREATION COMMISSION

AECOM

FIGURE 1

K:\WA State Park Botanical\ MXD2017\Westport Light\Fig 1 Viciniy Map.mxd

Developed portion
of study area

WESTPORT

Facilities

- - - **Trails**

- - - **Routes Traversed**

☐ **State Park Study Area**

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

SURVEY ROUTES

400   0   400   800

SCALE IN FEET
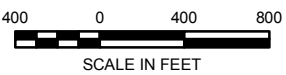
JUNE 2017
60541146

VEGETATION SURVEYS
SOUTH WHIDBEY ISLAND STATE PARK
WASHINGTON STATE PARKS AND RECREATION COMMISSION

AECOM

FIGURE 1

Legend
- Vegetation Survey Boundary
- Plant Community Area
- Trails
- 20' Elevation Contours
- Park Boundary

Map ID	Plant Community
1	JUFA-JU(LE,NE)
2	PICO/CYSC/AMAR
3	SAHO/CAOB-(AREG)
4	PICO/CAOB
5	CYSC
6	PICO-PSME/MOCA-VAOV
7	ALRU/CAOB
	OPEN WATER

JETTY HAUL RD

N MONTESANO ST

N FORREST ST

Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

K:\WA_State_Park_Botanical_MXD\2017\Westport_Light\Fig 3 Plant Communities.mxd

PLANT COMMUNITIES WITH AERIAL PHOTO

AECOM

300 0 300 600
SCALE IN FEET

VEGETATION SURVEYS
WESTPORT LIGHT STATE PARK
WASHINGTON STATE PARKS AND RECREATION COMMISSION

FIGURE 3

Legend

- 🟩 Plant Community Point
- Vegetation Survey Boundary
- Trails
- 20' Elevation Contours
- Park Boundary

Plant Association

- 🟩 SAHO/CAOB
- 🟪 ALRU/CAOB
- 🟨 CYSC
- 🟧 JUFA-JU(LE,NE)
- 🟩 PICO-PSME/MOCA-VAOV
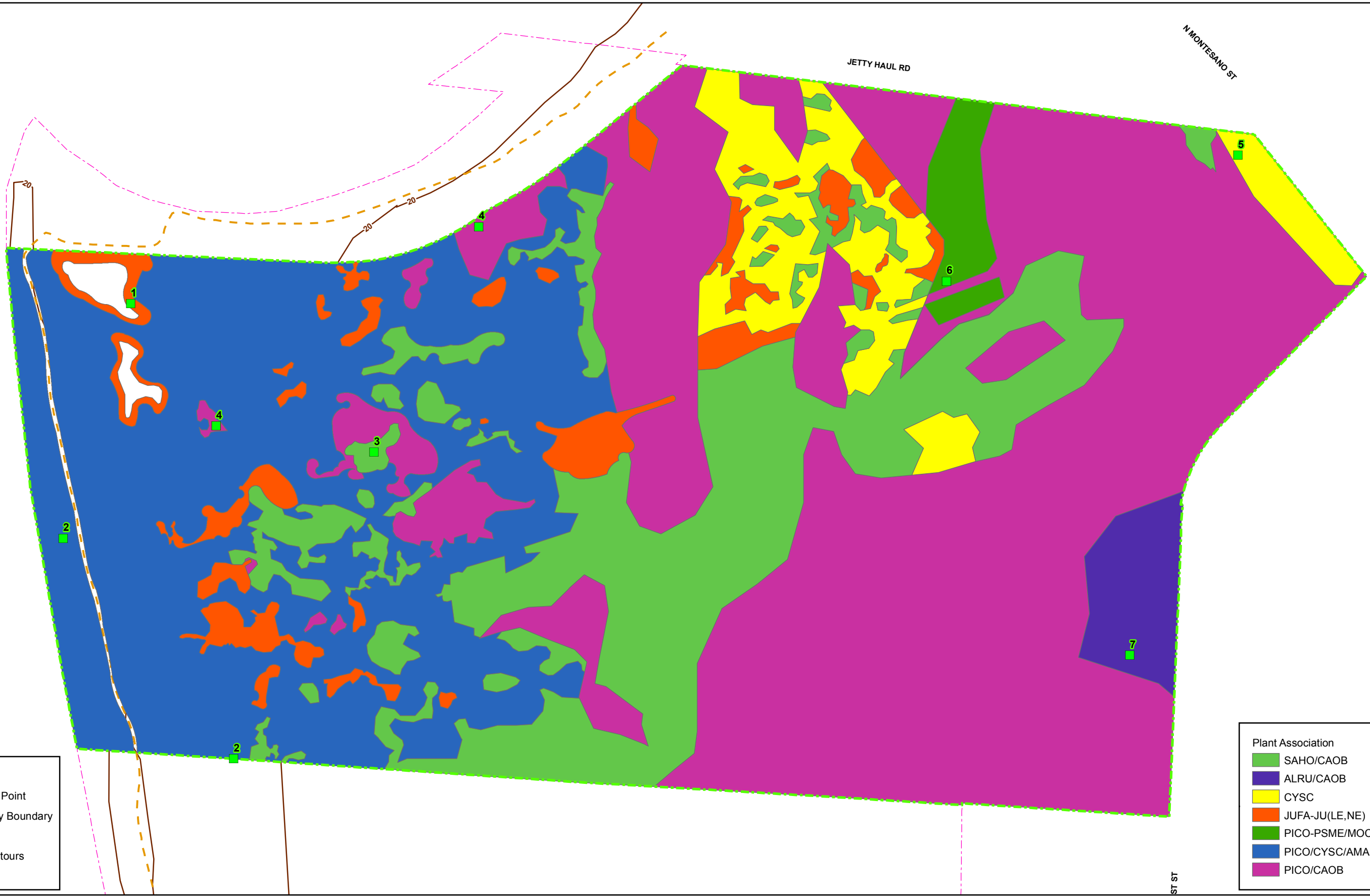- 🟦 PICO/CYSC/AMAR
- 🟪 PICO/CAOB

JETTY HAUL RD

N MONTESANO ST

ST ST

PLANT COMMUNITIES

VEGETATION SURVEYS
WESTPORT LIGHT STATE PARK
WASHINGTON STATE PARKS AND RECREATION COMMISSION

FIGURE 4

AECOM

SCALE IN FEET
300   0   300   600

K:\WA_State_Park_Botanical_MXD\2017\Westport_Light\Fig 4 Plant Communities_No Photo.mxd

Developed portion of study area

WESTPORT

Facilities

- - - **Trails**

State Park Study Area

Noxious Weeds

ILAQ

PHAR

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

| 400 | 0 | 400 | 800 |

SCALE IN FEET

NOXIOUS WEEDS

JUNE 2017
60541146

VEGETATION SURVEYS
WESTPORT LIGHTHOUSE STATE PARK
WASHINGTON STATE PARKS AND RECREATION COMMISSION

AECOM
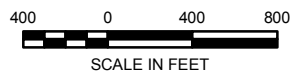
FIGURE 5

Appendix A
Plant Species Observations

Westport Light State Park
Plant Species Observations

Family	Species	Common Name	Synonym	N/I	Status
TREES					
Betulaceae	*Alnus rubra*	red alder		n	
Pinacaeae	*Picea sitchensis*	Sitka spruce		n	
Pinacaeae	*Pinus contorta* ssp. *contorta*	shore pine		n	
Pinaceae	*Pseudotsuga menziesii* var. *menziesii*	Douglas fir		n	
Pinaceae	*Tsuga heterophylla*	western hemlock		n	
SHRUBS					
Ericaceae	*Arctostaphylos uva-ursi*	kinnikinnik		n	
Rosaceae	*Cotoneaster* sp.	cotoneaster		i	
Fabaceae	*Cytisus scoparius*	Scotch broom		i	Class B
Rhamnaceae	*Frangula purshiana*	cascara	*Rhamnus p.*	n	
Ericaceae	*Gaultheria shallon*	salal		n	
Aquifoliaceae	*Ilex aquifolium*	English holly		i	
Caprifoliaceae	*Lonicera involucrata* ssp. *involucrata*	black twinberry		n	
Rosaceae	*Malus fusca*	western crabapple		n	
Myricaceae	*Morella californica*	Pacific bayberry	*Myrica californica*	n	
Rosaceae	*Rubus bifrons*	Himalayan blackberry	*R. discolor, R. armeniacus*	i	Class C
Rosaceae	*Rubus laciniatus*	evergreen blackberry		i	Class C
Rosaceae	*Rubus spectabilis*	salmonberry		n	
Rosaceae	*Rubus ursinus*	Pacific dewberry		n	
Salicaceae	*Salix hookeriana*	coastal willow		n	
Adoxaceae	*Sambucus racemosa* var. *racemosa*	red elderberry		n	
Rosaceae	*Sorbus aucuparia*	European ash		i	
Rosaceae	*Spiraea douglasii*	Douglas' spiraea		n	
Ericaceae	*Vaccinium ovatum*	evergreen huckleberry		n	
Ericaceae	*Vaccinium parvifolium*	red huckleberry		n	
HERBS					
Asteraceae	*Achillea millefolium*	yarrow		n	
Asteraceae	*Anaphalis margaritacea*	pearly everlasting		n	
Rosaceae	*Aphanes australis*	small-fruited parsley-piert		i	
Plumbaginaceae	*Armeria maritima* ssp. *californica*	sea thrift		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	N/I	Status
Asteraceae	*Bellis perennis*	English daisy		i	
Plantaginaceae	*Callitriche stagnalis*	pond water-starwort		i	
Caryophyllaceae	*Cardionema ramosissima*	sandmat		n	
Gentianaceae	*Centaurium erythraea*	common centaury	*Centaurium umbellatum*	i	
Caryophyllaceae	*Cerastium fontanum* ssp. *vulgare*	mouse-ear chickweed		i	
Caryophyllaceae	*Cerastium glomeratum*	sticky chickweed	*Cerastium viscosum*	i	
Caryophyllaceae	*Cerastium semidecandrum*	little chickweed		i	
Montiaceae	*Claytonia rubra*	red miner's lettuce	*Montia perfoliata* (in part)	n	
Colvolvulaceae	*Convolvulus soldanella*	beach morning-glory		n	
Onagraceae	*Epilobium ciliatum*	willowherb	*Epilobium watsonii*	n	
Rosaceae	*Fragaria chiloensis*	beach strawberry		n	
Rubiaceae	*Galium aparine*	common cleavers		n	
Rubiaceae	*Galium trifidum* ssp. *columbianum*	small bedstraw		n	
Geraniaceae	*Geranium dissectum*	cut-leaf crane's-bill		i	
Asteraceae	*Gnaphalium palustre*	lowland cudweed		n	
Orchidaceae	*Goodyera oblongifolia*	western rattlesnake plantain		n	
Apiaceae	*Heracleum maximum*	cow parsnip	*Heracleum lanatum*	n	
Asteraceae	*Hypochaeris radicata*	hairy cat's-ear		i	Class C
Fabaceae	*Lathyrus japonicus* var. *maritimus*	beach pea		n	
Asteraceae	*Leontodon saxatilis* ssp. *saxatilis*	lesser hawkbit	*Leontodon nudicaulis*	i	
Fabaceae	*Lotus corniculatus*	birds-foot trefoil		i	
Fabaceae	*Lupinus arboreus*	yellow bush lupine		i	
Fabaceae	*Lupinus littoralis*	seashore lupine		n	
Lythraceae	*Lythrum portula*	spatula-leaf loosestrife		i	
Asparagaceae	*Maianthemum dilatatum*	lily-of-the-valley		n	
Caryophyllaceae	*Moenchia erecta*	upright chickweed		i	
Boraginaceae	*Myosotis discolor*	yellow and blue forget-me-not		i	
Plantaginaceae	*Plantago lanceolata*	English plantain		i	
Polygonaceae	*Polygonum paronychia*	beach knotweed		n	
Rosaceae	*Potentilla anserina* ssp. *pacifica*	Pacific silverweed	*Potentilla pacifica*	n	
Ranunculaceae	*Ranunculus repens*	creeping buttercup		i	

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	N/I	Status
Polygonaceae	*Rumex acetosella*	sheep sorrel		i	
Polygonaceae	*Rumex crispus*	curly dock		i	
Caryophyllaceae	*Sagina apetala*	annual pearlwort		i	
Caryophyllaceae	*Silene gallica*	windmill-pink		i	
Asteraceae	*Sonchus asper*	prickly sow thistle		i	
Caryophyllaceae	*Spergularia* sp.	sandspurry			
Caryophyllaceae	*Stellaria graminea*	grass-leaf starwort		i	
Caryophyllaceae	*Stellaria media*	common chickweed		i	
Asteraceae	*Tanacetum bipinnatum*	dune tansy	*Tanacetum camphoratum*	n	
Brassicaceae	*Teesdalia nudicaulis*	shepherd's cress		i	
Fabaceae	*Trifolium dubium*	least hop clover		i	
Fabaceae	*Trifolium pratense*	red clover		i	
Fabaceae	*Trifolium repens*	white clover		i	
Fabaceae	*Trifolium wormskioldii*	cows clover		n	
Orobanchaceae	*Triphysaria pusilla*	dwarf owl-clover	*Orthocarpus pusillus*	n	
Plantaginaceae	*Veronica arvensis*	wall speedwell		i	
Plantaginaceae	*Veronica peregrina* var. *xalapensis*	purslane speedwell		n	
Plantaginaceae	*Veronica scutellata*	marsh speedwell		n	
Fabaceae	*Vicia sativa*	common vetch		i	
GRASSES, SEDGES, RUSHES					
Poaceae	*Agrostis stolonifera*	spreading bent	*Agrostis alba* var. *stolonifer*	i	
Poaceae	*Aira caryophyllea* var. *caryophyllea*	silver hairgrass		i	
Poaceae	*Aira praecox*	early silvergrass		i	
Poaceae	*Ammophila arenaria*	European beachgrass		i	
Poaceae	*Anthoxanthum odoratum*	sweet vernalgrass		i	
Poaceae	*Bromus diandrus*	ripgut brome		i	
Poaceae	*Bromus hordeaceus* ssp. *hordeaceus*	soft brome		i	
Poaceae	*Bromus sitchensis*	Alaska brome		n	
Cyperaceae	*Carex macrocephala*	bighead sedge		n	
Cyperaceae	*Carex obnupta*	slough sedge		n	
Cyperaceae	*Carex pansa*	sand sedge		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	N/I	Status
Poaceae	*Cynosurus echinatus*	bristly dogtail		i	
Poaceae	*Dactylis glomerata*	orchardgrass		i	
Poaceae	*Danthonia decumbens*	common heathgrass	*Sieglingia decumbens*	i	
Cyperaceae	*Eleocharis* sp.	spikerush			
Poaceae	*Holcus lanatus*	common velvetgrass		i	
Juncaceae	*Juncus breweri*	Brewer's rush	*Juncus lesueurii*	n	
Juncaceae	*Juncus bufonius* var. *bufonius*	toad rush		n	
Juncaceae	*Juncus falcatus* ssp. *sitchensis*	Alaskan sickle-leaved rush		n	
Juncaceae	*Juncus nevadensis* var. *inventus*	dune rush		n	
Poaceae	*Leymus mollis* ssp. *mollis*	American dunegrass	*Elymus mollis*	n	
Poaceae	*Phalaris arundinacea*	reed canarygrass		i	Class C
Poaceae	*Poa palustris*	fowl bluegrass		i	
Poaceae	*Schedonorus arundinaceus*	tall fescue	*Festuca arundinacea*	i	
Poaceae	*Vulpia myuros*	rat-tail six weeks grass		i	
FERNS, HORSETAILS					
Equisetaceae	*Equisetum arvense*	common horsetail		n	
Polypodiaceae	*Polypodium glycyrrhiza*	licorice fern		n	
Dryopteridaceae	*Polystichum munitum*	sword fern		n	
Dennstaedtiaceae	*Pteridium aquilinum* var. *pubescens*	bracken fern		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 <u>never</u> 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 understory, shrub layer, subcanopy, and/or tree canopy strata.
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 <u>minimum </u>gap between the top of the understory and the base of the tree canopy that occurs across the polygon, <u>and </u>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	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 natural disturbance 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 natural disturbance 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 dams and channel migration)
D - Fair	High evidence of human disturbance (10-25% of polygon impacted by dams, 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 impacted by 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 yr
5 = Federal CRP
6 = other

Livestock
1 = active heavy grazing (most forage used, soil disturbance)
2 = active moderate grazing (25-75% forage used)
3 = active light grazing (lots of last yr'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 source
of name if not on provided key. <u>NOTE</u>: Contractor is required to consult with the WNHP to obtain the
most current classification and condition ranking information available.

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

S Rank (text) <u>NOTE</u>: 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

Jeff Walker
Project Manager and Senior Botanist

Noah Herlocker
Senior Ecologist

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