Cornet Bay Phase I and II Monitoring Report 2018

Introduction

The Cornet Bay Phase I planting project was completed in 2012 and 2013. Phase II of the Cornet Bay planting project was installed in the fall of 2015 and spring of 2016. Both of the planting projects were planted with a similar planting scheme, but had different goals in terms of species stratification throughout the site. Phase I focused on creating zones throughout the beach, and Phase II focused on primarily introducing trees and shrubs to the more elevated plateau. Zone 4 is the highest elevation planting and planted with a back beach tree and shrub community. Zone 3 is considered a salt-spray community which was planted with the expectation of occasional salt water exposure. Zone 2 was designated as a beach grass community and expected to experience tidal inundation during part of the day. This monitoring report is intended to track survival of vegetation planted to date and to make suggestions for replanting. The Cornet Bay Phase I and II planting project was monitored on July 16th, 18th, 19th, and 26th by staff, interns, and volunteers from Skagit Fisheries Enhancement Group (SFEG).

Figure 1. Phase I of Cornet Bay taken from the fence line facing Northeast. Photos taken (top to bottom, left to right) pre-planting in 2012, April 2013, November 2016, and December 2018

METHODS

This analysis combined Zones 2 and 3, with Zone 4 tree and shrub monitoring planned for summer 2019. Zones 2 and 3 were combined because it is difficult to distinguish between those two planting schemes at this juncture, considering that many of the plants have spread or seeded in between these areas. Transects were laid throughout the planting area parallel to the shoreline and spaced 4 ft. apart from each other, spanning from the shoreline to the border where shrubs began to grow. Along the transect 4 ft. X 4 ft. quadrats were placed at 5 evenly spaced intervals, randomly selected along the line. For each quadrat sampled, the surveyors identified all plants and determined the density of native plants in each quadrat.

To determine stocking, quadrat density was determined by the number of native plants per quadrat. If a quadrat had 3 or more native planted plants, the survival rate was considered to be 80% or higher. Anything less than 3 plants per quadrat was considered under-stocked. SFEG determined 3 plants per quadrat was approximately the spacing during initial planting in 2013 (for the Phase I area) or 2016 (for the Phase II area.)

Coverage was estimated for each quadrat in four categories: native vegetation, non-native vegetation, large woody debris and bare ground. This was done by counting vertices within the quadrat grid for each cover class. Each quadrat was comprised of 169 vertices created by crossing 11 lines of string spaced 4" apart by 11 perpendicular lines of the same spacing, and including the corners where the lines crossed the pvc piping. At each vertex the cover class was recorded. Native cover and large woody debris are considered desirable cover for the purposes of restoration and habitat creation, while bare ground is less desirable and non-native cover is undesirable. Targets for control of non-native cover are < 5%.

RESULTS: PHASE I

Phase I was broken up into three sections to better summarize the cover and species distribution along different sections of the beach. See map below for breakdown of the different beach areas.

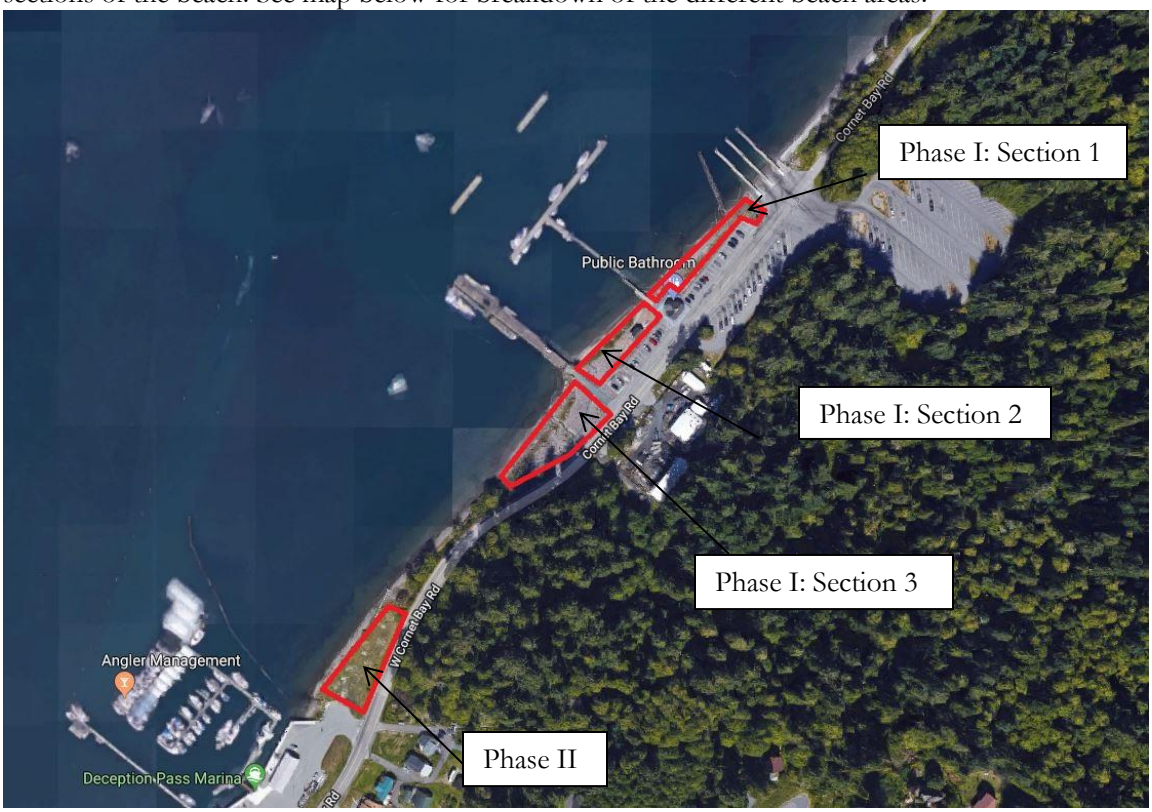

Figure 2. Map of Cornet Bay with labeled beach sections, please refer to this map in following sections.

Overall, Section 1 of Phase I is meeting standards for restoration success. Stocking of native species in all transects was above 3 natives/quadrat, and overall cover was at 54%, similar to the average cover recorded in 2016 (51%). Sections 2 and 3 on the beach exceeded the average of 2016 native cover while Section 1 on the beach was lower in native cover. Large woody debris is still prevalent on all sections of Phase I, representing between 9-10% of total cover. The project is meeting targets for weed load.

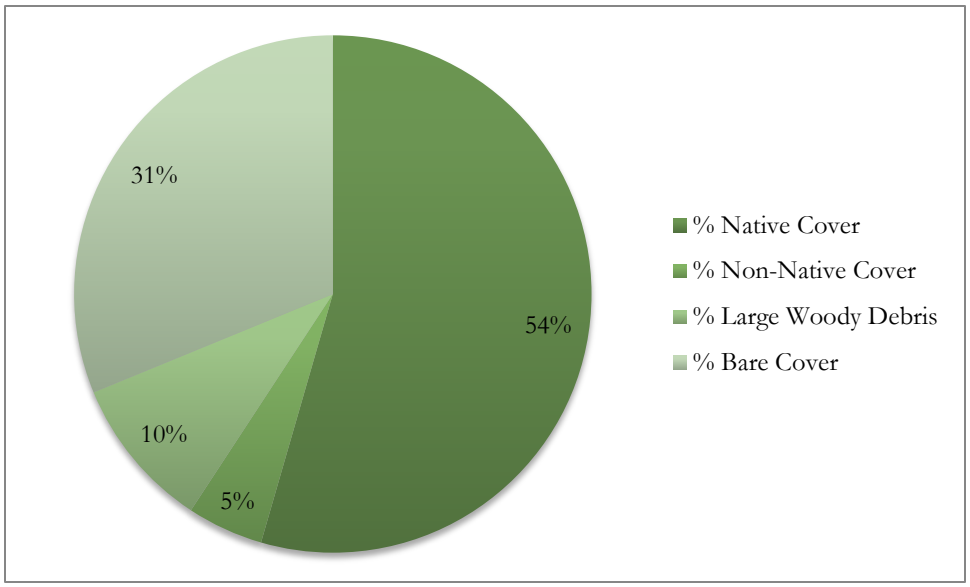

Figure 3. Summary of percent cover in the entire Phase I area. Native cover is represented by dark green, non-native cover by medium green, large woody debris by light green, and bare cover by seafoam green (lightest).

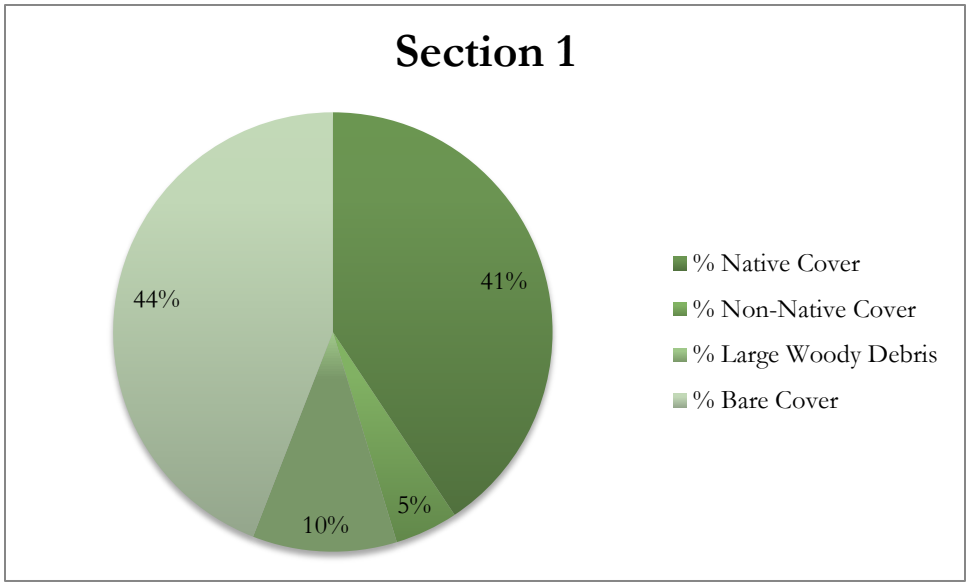

Figure 4. Percent cover summary for Section 1 of the Phase I restoration site. Native cover is represented by dark green, non-native cover by medium green, large woody debris by light green, and bare cover by seafoam green (lightest).

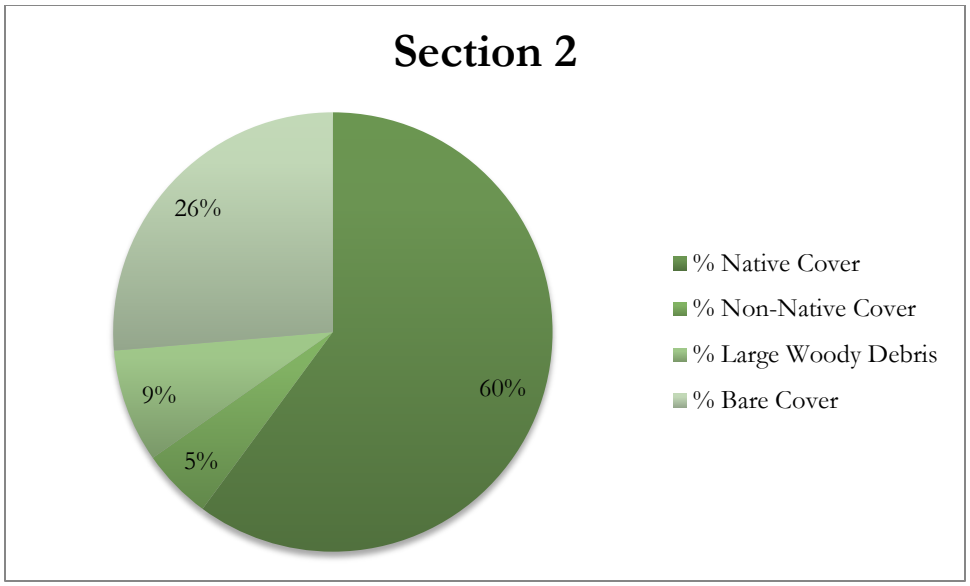

Figure 5. Percent cover summary for Section 2 of the Phase I restoration site. Native cover is represented by dark green, non-native cover by medium green, large woody debris by light green, and bare cover by seafoam green (lightest).

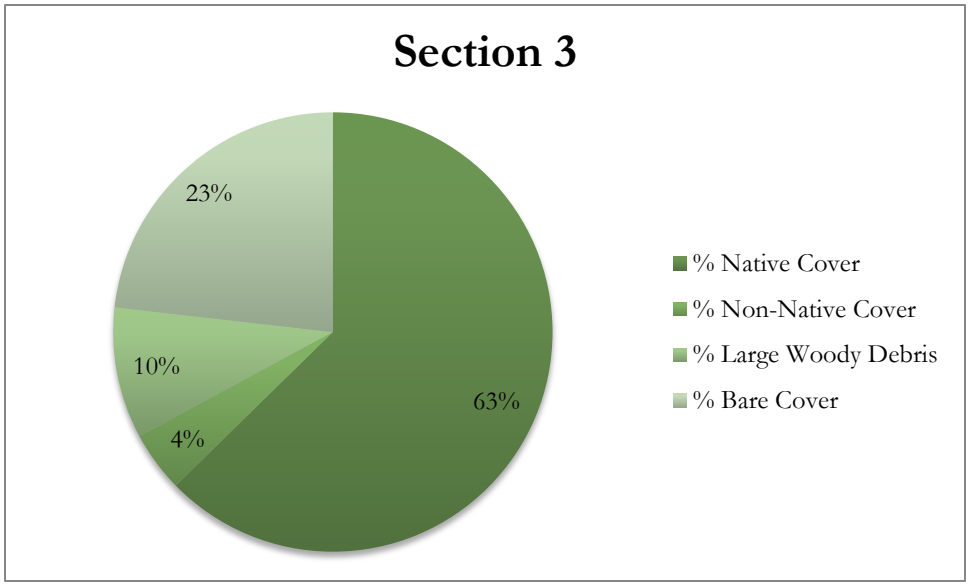

Figure 6. Percent cover summary for Section 3 of the Phase I restoration site. Native cover is represented by dark green, non-native cover by medium green, large woody debris by light green, and bare cover by seafoam green (lightest).

Table 1. Abundance of species, both native and non-native, found in transects on Phase I of Cornet Bay. Includes species common name, scientific name, and the total number of individuals found in all of the transects measured in Phase I.

Plant Species	Scientific Name	Number Alive
Native		
Baltic Rush	*Juncus balticus*	91
Beach Sand Spurry	*Spergularia macrotheca*	15
Sedge spp.	*Carex spp.*	142
Dune Wild Rye	*Elymus mollis ssp. mollis*	362
Grass (Unknown)	Graminoid	1279
Gumweed	*Grindelia squarrosa*	1338
Horsetail	*Equisetum spp.*	27
Lyngby's Sedge	*Carex lyngbyei*	515
Nootka Rose	*Rosa nutkana*	17
Pacific Silverweed	*Argentina pacifica*	1434
Pickleweed	*Salicornia virginica*	20
Queen Ann's Lace	*Daucus carota*	1
Rush (Unknown)	*Juncus spp.*	7
Scouler's Willow	*Salix scouleriana*	1
Sedge (Unknown)	*Carex spp.*	115
Snowberry	*Symphoricarpos albus*	6
Soft Rush	*Juncus effusus*	106
Tall Oregon Grape	*Berberis aquifolium*	8
Tufted Hairgrass	*Deschampsia cespitosa*	67
Willow spp.	*Salix spp.*	2
Invasive		
Blackberry	*Rubus armeniacus*	3
Clover	*Trifolium spp.*	40
Dandelion	*Taraxacum spp.*	6

Discussion: Phase I

Future maintenance of the Phase I restoration area at Cornet Bay should focus on the fence line of Section 1 and waterfront of Sections 2 & 3. While this is not true of all areas within those sections, pervasive weeds such as thistle and dandelion have become more prevalent, and should be the target of maintenance efforts in the summer of 2019. Some of the non-native cover may have been overstated due to limited knowledge of grass, rush, and sedge ID from samplers. Overall, diversity of species is high, with the most abundant herbaceous/graminoid species being gumweed, pacific silverweed, and Lyngby's sedge. The most abundant shrubs on site were snowberry and Nootka rose, although Nootka rose and tall Oregon grape were favored in the replanting in fall 2018 due to the healthy appearance of both those species. All sections are exceeding the original stocking numbers, and the site is well on its way to becoming a functional beach habitat.

RESULTS: PHASE II

Native cover in the beach area of the Phase II site has increased since 2016, now covering 52% of the Zone 2 and 3 areas. About 45% of that area is still bare sand/soil. The Phase II beach area is meeting weed targets, but based on observation, thistle and dandelion are growing more prevalent in the upper beach portions. Thistle control in particular will become important in the summer of 2019. Large woody debris is present at Phase II, but is not in the planting area and was therefore not captured by the transect cover data. The most abundant (desirable) natives in Phase II continue to be grasses, specifically dune wild rye.

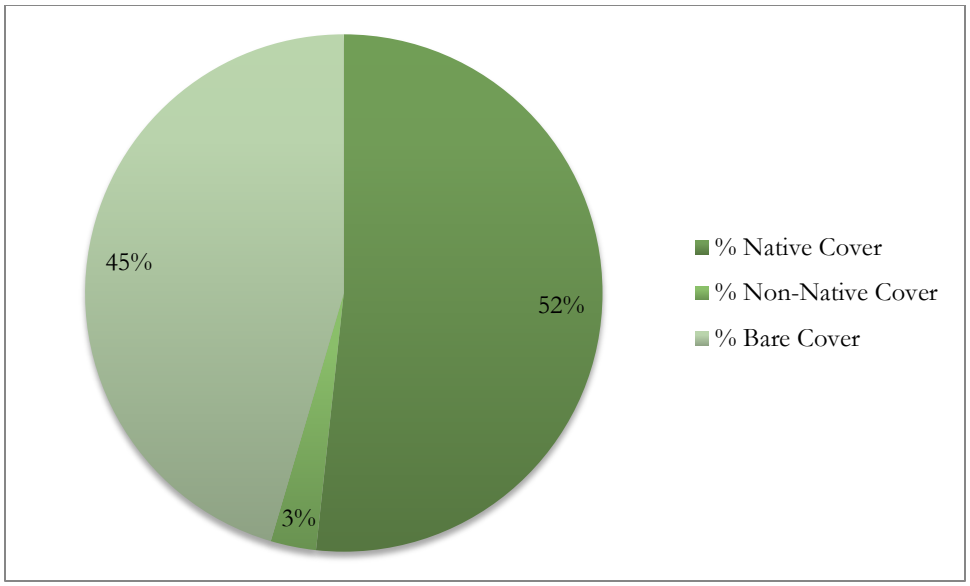

Figure 7. A summary pie chart of the three cover classes, representing the Phase II project as a whole. Native cover is represented by dark green, non-native cover by medium green, and bare cover by seafoam green (lightest).

Table 2. Abundance of species, both native and non-native, found in transects on Phase II of Cornet Bay. Includes species common name, scientific name, and the total number of individuals found in all of the transects measured in Phase II.

Plant Species	**Scientific Name**	**Number Alive**
Native		
Dune Wild Rye	*Elymus mollis ssp. mollis*	70
Horestail	*Equisetum spp.*	8
Pacific Silverweed	*Argentina pacifica*	4
Red Alder (seedlings)	*Alnus rubra*	24
Soft Rush	*Juncus effusus*	4
Tufted Hairgrass	*Deschampsia cespitosa*	4
Invasive		
Clover	*Trifolium spp.*	7
Dandelion	*Taraxacum spp.*	13

DISCUSSION: PHASE II

The beach planting zone of the Phase II site is progressing well, with bare areas filling in (Figures 8 and 9). Large woody debris is beginning to accumulate, generally below the planting area. In this planting scheme, dune wild rye was the predominant plant installed along the beach area, along with small amounts of Baltic rush and silverweed. Dunegrass is thriving and spreading, but neither Baltic rush or silverweed is currently abundant in the planting area.

The shrub and tree zones that were planted above the beach area will be monitored in 2019 in order to assess plant survival and current stocking. At this time, many of the shrubs appear to be struggling, unable to put on the amount of biomass required to thrive and reproduce. With this consideration in mind, SFEG installed additional plants in the upland area Phase II with volunteers in the fall of 2018. Plants installed included 100 Nootka rose, 100 tall Oregon grape, 50 oceanspray, and 36 Hooker's willow in both Phase II and Section 1 of Phase I. SFEG will water those recently planted shrubs in particular to help them survive the expected dry summer. Desirable natives are available in much lower quantities than in Phase I, and one possibility is to continue to introduce more grasses, rushes, and herbaceous species to Phase II to increase native cover. With new plants installed and a plan for reducing weed load, Phase II is on the path to becoming quality beach habitat.

Figure 8. Cornet Bay Phase II beach zone planting area looking east, December 2018.


Figure 9. Cornet Bay Phase II beach zone planting area looking west, December 2018.

RECOMMENDATIONS:

PHASE I:

SFEG will continue to host monthly weeding parties in the summer months, May – September, to reduce the weed load competing with the native community. Excess red alders and Sitka spruce will be thinned where they are crowding. Weeding within the grasses will be important after thistle targeting, and reducing the cover of non-native species in the lower tidal area. Zone 4 monitoring will take place in the summer of 2019 to assess the survival and health of trees and shrubs.

PHASE II:

SFEG will continue to host monthly weeding parties in the summer months, May – September, to reduce the weed load competing with the native community with an emphasis on thistle removal. Replanting of the Phase I and II areas was completed in October 2018. Upland tree and shrub zone monitoring will take place in the summer of 2019 to assess the survival and health of trees and shrubs.