

Little River State Beach

Nearshore Dunes Restoration Project

Annual Report



North Coast Redwoods District
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INTRODUCTION

Since the 1930's, European beachgrass (*Ammophila arenaria*) has steadily displaced the native plant communities at Little River State Beach (LRSB), contributing to the loss and degradation of the nearshore dunes found in this area. These impacts were exacerbated in the 1960's by the construction of the current Highway 101 alignment that led to a complete loss in upland dune communities. Currently the a significant portion of the is being heavily impacted by European beachgrass and yellow bush lupine (*Lupinus arboreus*), both non-native invasive plant species.

Sensitive species such as the western snowy plover (*Charadrius nivosus nivosus*) and pink sand verbena (*Abronia umbellata* spp. *breviflora*) are currently found within the Park. Historic occurrences of the federally listed beach layia (*Layia carnosa*) were extirpated from Little River with at least one of these occurrences was lost due to the construction of 101 and the invasion of non-native plant species in the 1960's. These species often occur in sand verbena-beach bursage and native dunegrass floristic series, vegetation types that are considered rare and worthy of special consideration by the California Department of Fish and Game (CDFG 2004) in and of themselves. The expansion of the non-native plant species into dune habitats has degraded or eliminated suitable habitat for these sensitive species and vegetation communities at this site.

In 1999, the dredge *M/V Stuyvesant* (the "*Stuyvesant*") spilled at least 2,100 gallons of Intermediate Fuel Oil 180 into the Pacific Ocean near the mouth of Humboldt Bay, California (Hampton et al. 2007). The expanse of the spilled oil reached from the mouth of the Eel River to Patrick's Point State Park. Both state and federal law require that liability be established for natural resource damages caused by the oil spill and require the responsible parties to make the environment whole for the damage and loss of natural resources resulting from the oil spill into navigable and/or marine waters (Hampton et al. 2007). The Stuyvesant Trustee Council was established to fulfill this mandate. The Stuyvesant Trustee Council was designated and authorized to act on behalf of the public to assess and recover natural resource damages and to plan and implement actions to restore, replace, or acquire the equivalent of the affected natural resources injured as a result of the oil spill (Hampton et al. 2007). The Stuyvesant/Humboldt Coast Oil Spill Final Damage Assessment and Restoration Plan Environmental Assessment (DARP) was prepared for this oil spill and describes the injuries resulting from the spill and proposes restoration alternatives (Hampton et al. 2007). As part of this process the Stuyvesant Trustee Council identified and evaluated restoration alternatives and provided the public with an opportunity to review and comment on the proposed restoration alternatives (Hampton et al. 2007).

The Park was impacted by the Stuyvesant Oil Spill in 1999 and was subsequently identified as a preferred location to restore and rehabilitate some of the affected resources injured as a result of the spill. Many species of birds were affected by the spill, including the western snowy plover. This Park is part of one of the few remaining active breeding sites for snowy plovers in Humboldt County. The purpose of this project, as outlined in the DARP, is "to make the environment and the public whole for injuries resulting from the Spill by implementing restoration actions that return injured natural resources and services to baseline conditions and compensate for interim losses" (Hampton et al. 2007).

PROJECT LOCATION

Located near McKinleyville, California, LRSB spans from the Pacific Ocean to Highway 101 and is comprised of beach, dunes, and wetlands (Figure 1). The Little River, for which the Park is named, flows through the northern portion of the Park. The project area consists of 42 acres of nearshore dune habitat (Figure 1)

PROPOSED PROJECT

This project has two primary goals which are 1) to restore the ecological function and the native flora and fauna found within approximately 40 acres of nearshore dunes at LRSB and 2) to enhance breeding and sheltering habitat for the western snowy plover. In addition, the Stuyvesant DARP has two primary goals relating to this project. These goals are 1) to restore at least 7.1 acres of snowy plover nesting habitat and 2) to improve nesting fledging success and add 10 more plovers to the population. Four objectives have been developed to help achieve these goals. These objectives are 1) initially treat 30 acres of nearshore dunes through the removal of non-native plant species using heavy equipment removal techniques, 2) retreat approximately 40 acres of nearshore dunes (10 acres of which was previously treated under another project), 3) restore approximately 20 acres of treated dunes by revegetating with native plant species, and 4) assess pre- and post- treatment the flora, fauna, and dune morphology found within the project area.

PROJECT ACCOMPLISHMENTS

Implementation of project began in early 2009 and the majority of the project objectives have been accomplished. This report summarizes the project accomplishments that occurred during 2011. The majority of the work over the last year has focused on the retreatment and revegetation of the project area and project monitoring. Since the previous report in 2010, new aerial imagery has become available showing the project area after the initial treatment (Figure 2).

RETREATMENT OF NEARSHORE DUNES

In the last year one partial and one complete retreatment effort has occurred. Due to scheduling conflicts with work crews, a partial retreatment effort was conducted in February 2011. In the fall of 2011, the entire 42-acre restoration area was retreated. This retreatment effort, which began in October 2011 and was completed in December 2011, consisted of 855 total person hours (ph) for an average of 20 ph's/acre. This is lower than the previous retreatment effort by 10 person hour per acre (33%).

REVEGETATION OF NEARSHORE DUNES

In 2010, seeds from four native dune species were collected and in February 2011 these seeds were sown into four areas within the restoration area (Figure 3). In addition, two other native dune plant species from the surrounding untreated area were transplanted into the restoration area (Figure 3). During 2011, seeds from four additional native dune plant species were collected and three additional areas were planted with these seeds in November 2011 (Figure 3). A total of 1.3 acres have been sown in the last year. With the recently seeded areas and the partially revegetated pilot project plots (9 acres) there is approximately 10 acres within the 42-acre restoration area that will be considered completely revegetated within two to three growing seasons.

PROJECT MONITORING AND REPORTING

This project includes the monitoring of restoration results annually and compliance monitoring that occurred during the initial treatment activities. Restoration monitoring includes vegetation, dune morphology, and photo monitoring.

Vegetation

Vegetation sampling was conducted pre and post initial treatment effort and annually since the initial treatment was completed. Annual vegetation monitoring occurred in June 2010 and 2011. Table 1 and 2 summarizes the percent cover of European beachgrass and all non-native and native plant species for 2009-2011.

Table 1. Percent cover of European beachgrass and total all non-native species for before and after initial treatment of the nearshore dunes at LRSB.

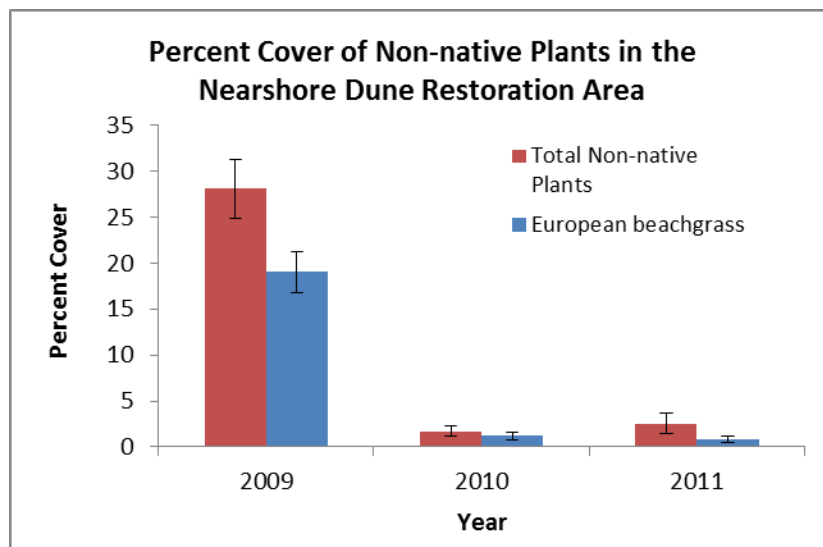
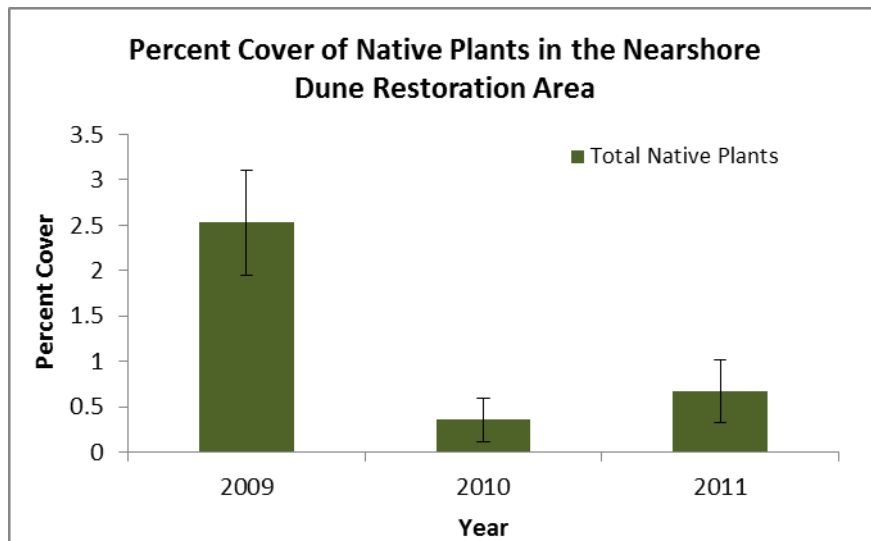


Table 2.. Percent cover of native species for before and after initial treatment of the nearshore dunes at LRSB.



Western Snowy Plover

A permitted snowy plover biologist was on site to monitor all project operations that occurred on the waveslope and in the nearshore dunes. To determine if the proposed restoration provides suitable habitat for breeding snowy plovers, permitted snowy plover biologists monitored the breeding success (nesting and fledging success) within the project area. Table 3 summarizes the breeding success at LRSB over the last 10 years.

Table 3. Western snowy plover breeding success at Little River State Beach.

Year	Number of Nests	Number of Fledged	Comments
2002	9	0	
2003	4	1	
2004	1	2	
2005	3	3	1 st breeding season after the 10-acre pilot restoration project
2006	2	0	Stopped using next exclosures due to predation of adult plovers
2007	0	0	
2008	0	0	
2009	0	0	
2010	5	0	1 st breeding season after the 30-acre nearshore dune restoration project
2011	3	0	

Dune Morphology

Before the initial large scale treatments commenced, a pre-treatment topographic survey of the entire State Park, using RTK (real time kinematics) GPS was performed. These surveys were scheduled to be conducted pre, post, and one year after treatment occurred. Due to staffing levels and equipment availability post treatment monitoring did not occur immediately after the initial removal efforts. However, dune morphology monitoring did occur prior to initial treatment and one and two years after. Data analysis has not been completed but the results will be included in the 2012 annual report. Annual dune morphology monitoring will continue for the next two years.

Photo Monitoring

Thirteen photo points were established and a GPS point was recorded for each point prior to initial treatment efforts. Photos were taken prior to initial treatment, directly after initial treatment, and pre and post all retreatment efforts (Figure 4 to 9). Photo monitoring will continue on an annual basis for at least the next four years.

Project Reporting

Project reporting is important for the overall success of the project and to help direct adaptive management. This report acts as the third of four annual project reports to be prepared for this project.

PROEJCT TIMELINE

The proposed project time line was revised due to unforeseen delays that occurred during completion of the LRSB Restoration and Enhancement Plan and associated environmental documents and permits. Due to this delay, the proposed timeline was adjusted. As the majority of the project has been completed Table 4 shows the remaining tasks and timeline.

Table 4.0. Project timeline for the completion of the LRSB Nearshore Dunes Restoration Project.

TASKS	SPRING 2012	SUMMER 2012	FALL 2012	WINTER 2012
Project Management	X	X	X	X
Retreatment of Nearshore Dunes	X			
Monitoring of Project Success/Results	X	X		
Project Reporting				X

PROJECT EXPENDITURES

The proposed budget of \$132,000.00 was based on preliminary estimates and was to be spent over a four year period (2009-2011). Actual costs may have varied due to unforeseen costs associated with the actual implementation of the project. The total project expenditures through 2011 have been summarized below in Table 5.

Table 5. Project tasks and associated expenditures through 2011 for the LRSB Nearshore Dunes Restoration Project.

Tasks	Estimated Cost
Project Management and Environmental Permitting	\$11,389.79
Initial Treatment of Nearshore Dunes (32 acres)	\$70,795.99
Retreatment of Nearshore Dunes (42 acres)	\$19,253.10
Revegetation of Nearshore Dunes (20 acres)	\$6,984.24
Monitoring of Natural Resources	\$18,602.09
Total Cost to Date	\$127,025.20

LITERATURE CITED

California Department of Fish and Game. 2004. Natural Diversity Data Base. Sacramento California.

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Hampton, Steve, Matt Zafonte, Julie Yamamoto, Katherine Verrue-Slater, Daniel Welsh, Charlene Hall, Janet Whitlock, Charles McKinley (Stuyvesant Trustee Council). 2007. Stuyvesant/Humboldt Coast Oil Spill Final Damage Assessment and Restoration

Plan/Environmental Assessment. California Department of Fish and Game, California State Lands Commission, United States Fish and Wildlife Service.



Figure 1. Project area prior to initial treatment.



Figure 2. Project area after initial treatment.

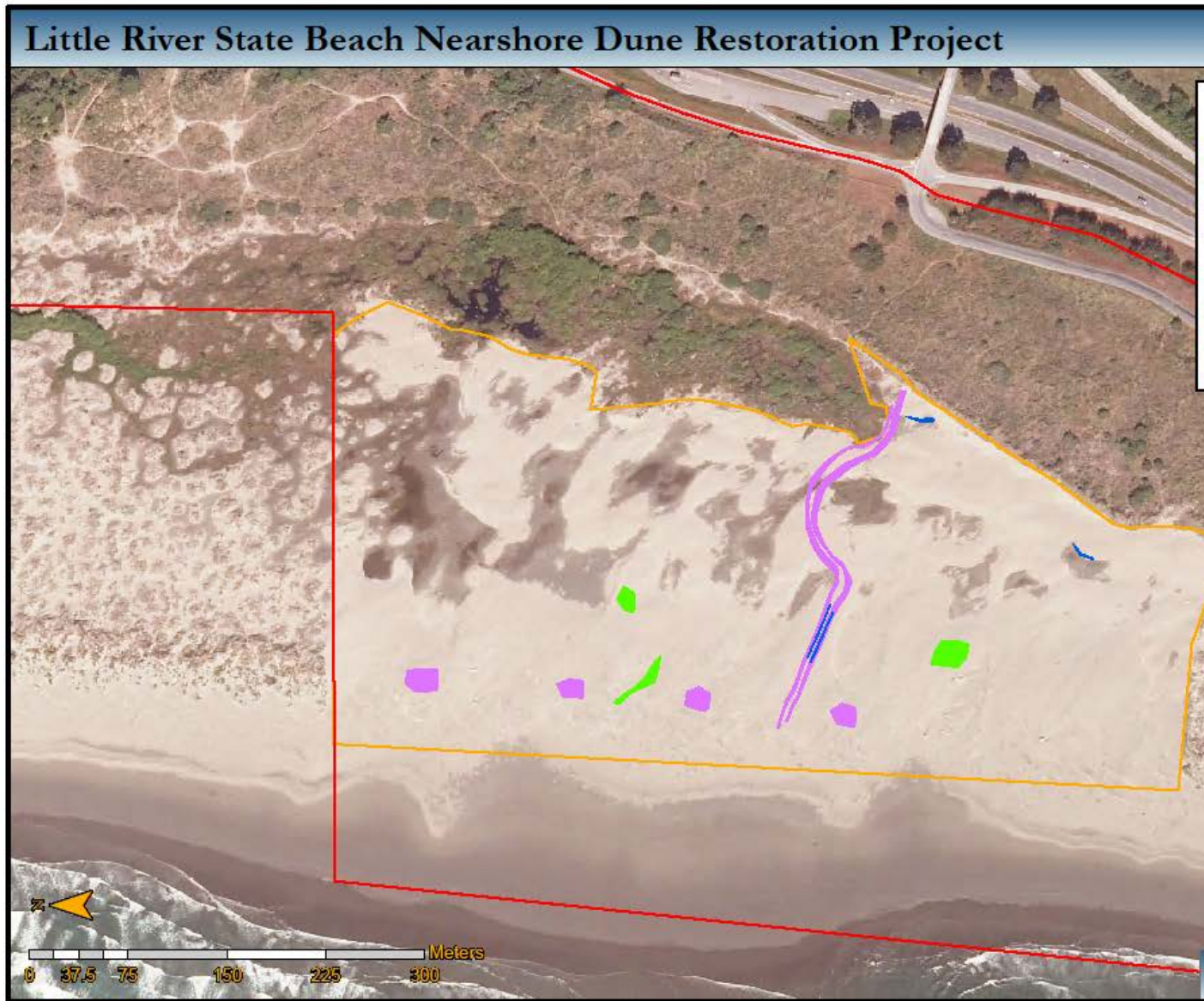


Figure 3. Revegetation areas.



Figure 4 - Pre initial treatment photo looking south (October 2009).



Figure 5 - Post treatment photo looking south (November 2009).



Figure 6 - Pre retreatment photo looking south (October 2010).



Figure 7 - Post retreatment photo looking south (December 2010).



Figure 8 – Pre fall 2011 retreatment looking south (September 2011).



Figure 9 – Post fall 2011 retreatment looking south (January 2012).