

Little River State Beach Nearshore Dunes Restoration Project

Annual Report



**North Coast Redwoods District
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Prepared by Michelle Forys
Environmental Scientist**

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 entire Park is being heavily impacted by European beachgrass and yellow bush lupine (*Lupinus arboreus*), both non-native invasive plant species.

The Park provides habitat for the western snowy plover (*Charadrius alexandrinus nivosus*), pink sand verbena (*Abronia umbellata* spp. *breviflora*) and historically for beach layia (*Layia carnosa*). These species often occur in sand verbena-beach bursage and native dunegrass floristic series, vegetation types considered rare and worthy of special consideration by the California Department of Fish and Game (CDFG 2004). The expansion of the non-native plant species into dune habitat at LRSB has degraded or eliminated suitable habitat for the western snowy plover at this site. In addition, the non-native plants are degrading habitat for native sensitive plants.

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). To fulfill this mandate the Stuyvesant Trustee Council was established. 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).

Little River State Beach 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 and is a significant wintering area. 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 1.0). 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 1.0)

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 most of the project objectives have been accomplished over the last two years. As a project report for 2009 was completed in February 2010, this report focuses on the project accomplishments that occurred during 2010. The majority of the work over the last year has focused on the retreatment and revegetation of the project area and monitoring.

RETREATMENT OF NEARSHORE DUNES

Retreatment of the project area was to occur 3, 11, and 14 months after the initial treatment. Since the initial treatment was completed in November 2009, retreatment efforts were scheduled for February and October 2010 and January 2011. Due to crew availability and the onset of the western snowy plover breeding season, re-treatment efforts in February 2009 were limited. The retreatment of the entire project area (42 acres) began in October 2010 and was completed in December 2010. The retreatment of the 42 acres took approximately 1,216 total person hours which averaged out to be 29.1 person hours per acre. A second retreatment effort is scheduled for February 2011, which is anticipated to be accomplished in half the time.

REVEGETATION OF NEARSHORE DUNES

Native dune mat vegetation has been slowly establishing itself on approximately 9 acres of nearshore dunes that were treated under the original pilot project. These vegetated areas have already helped in the process of re-establishing the native plants to the newly treated area. During retreatment efforts in October 2010 multiple species of native plants were observed in recently treated area indicating that recolonizing of the area has begun. Although the plants are still rather small it is encouraging to see re-colonization within one year of initial treatment. In addition to natural recruitment from established native dune

plants, seed collection occurred throughout the 2010 flowering season. Four native dune species were collected and seeding of portions of the project site will occur in January 2011. In addition, native dune plants from the surrounding untreated area will be transplanted into the project area.

PROJECT MONITORING AND REPORTING

The project includes both compliance and restoration effectiveness monitoring. The restoration monitoring focuses on vegetation, sensitive natural resources, dune morphology, and photo monitoring. Compliance monitoring occurred during the initial restoration treatments and during on-going retreatment activities.

Vegetation

Vegetation monitoring consists of both rare plant surveys and vegetation sampling. A complete rare plant survey was conducted prior to the initial treatment to document any special status species that may have occurred within the restoration area. Vegetation sampling was also conducted pre and post initial treatment efforts. Vegetation sampling prior to the initial removal efforts occurred in September 2009 and the post treatment monitoring occurred in June 2010 prior to the first retreatment efforts. Table 1.0 summarizes the percent cover of European beachgrass, non-native plant species, and native plants species for before and after the initial treatment of the nearshore dunes at LRSB.

Table 1.0. Percent cover of European beachgrass, non-native plant species, and native plant species for before and after the initial treatment of the nearshore dunes at LRSB.

Year	% Cover European Beachgrass	% Cover All Non-native Species	% Cover Native Species
2009 (Before Initial Treatment)	21.4%	28.66%	2.83%
2010 (After Initial Treatment)	1.20%	2.01%	1.08%

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. No snowy plovers were observed within 100 m (330 ft) of the operational project area and no work stoppages were necessary. 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 2.0 summarizes the breeding success at LRSB over the last 9 years.

Table 2.0. Western snowy plover breeding success at Little River State Beach.

Year	Number of Nests	Number of Fledged	Comments
2002	8	0	
2003	4	0	
2004	1	0	
2005	4	2-3	1 st breeding season after the 10 acre pilot restoration project
2006	2	0	
2007	0	0	
2008	0	0	
2009	0	0	
2010	5	0	1 st breeding season after the 30 acres nearshore dune restoration project

Dune Morphology

Before the initial large scale treatments commenced, a pre-treatment topographic survey of the entire State Park property 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, prior to and one year after initial treatment dune morphology monitoring occurred. Data analysis has not been completed but the results will be included in the 2011 annual report. Figure 2.0 shows the data points taken by the RTK one year after initial treatment. Annual dune morphology monitoring will continue for the next three 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 (Figure 3.0), directly after initial treatment (Figure 4.0), and one year later (Figure 5.0). Photos will be taken on an annual basis to monitor project progress.

Project Reporting

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

PROEJCT TIMELINE

The proposed project timeline was revised last year 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 pushed back by approximately one year. The revised timeline is provided in Table 3.0.

Table 3.0. Project timeline for the completion of the LRSB Nearshore Dunes Restoration Project.

TASKS	SPRING 2010	SUMMER 2010	FALL 2010	WINTER 2010	SPRING 2011	Summer 2011	FALL 2011
Project Management	X	X	X	X	X	X	X
Retreatment of Nearshore Dunes			X	X			X
Revegetation of Nearshore Dunes				X			
Monitoring of Project Success/Results	X	X				X	
Project Reporting	X			X			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 2010 have been summarized below in Table 4.0.

Table 4.0. Project tasks and associated expenditures through 2010 for the LRSB Nearshore Dunes Restoration Project.

Tasks	Estimated Cost
Project Management and Environmental Permitting	\$5,650.71
Initial Treatment of Nearshore Dunes (32 acres)	\$56,657.84
Retreatment of Nearshore Dunes (42 acres)	\$10,747.50
Revegetation of Nearshore Dunes (20 acres)	\$7,165.41
Monitoring of Natural Resources	\$23,341.56
Administration Cost (10%)	\$13,200.00
Total Cost	\$116,763.02

LITERATURE CITED

- California Department of Fish and Game. 2004. Natural Diversity Data Base. Sacramento California.
- Forys, Michelle, Don Beers, and Patrick Vaughan. 2008. Little River State Beach Restoration and Enhancement Plan – Draft. California Department of Parks and Recreation, North Coast Redwoods District, Eureka, California.
- 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 1.0. Project area map.



Figure 2.0 Dune morphology data points taken by the RTK 1 year after initial treatment.



Figure 3.0 Pre initial treatment photo looking south (October 2009).



Figure 4.0 Post treatment photo looking south (November 2009).



Figure 5.0 Pre retreatment photo looking south (October 2010).