



**U.S. Fish and Wildlife Service**

**Humboldt Bay National Wildlife Refuge**  
*Humboldt County, California*

# Lanphere Dunes Restoration Photodocumentation



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# INTRODUCTION

The Lanphere Dunes restoration project was the first of its kind. European beachgrass (*Ammophila arenaria*) was manually removed by repeatedly digging and removing plants from the foredune and middunes between 1992 and 1996. The project was funded by The Nature Conservancy and carried out primarily with labor from the California Conservation Corps. Restoration was implemented in three phases, using a patchwork pattern to minimize destabilization. The first phase was implemented between 1992 and 1994, and the last areas were restored between 1995 and 1997. This effort was followed by several years of intensive iceplant (*Carpobrotus* spp.) removal by the U.S. Fish and Wildlife Service. No revegetation was used in this project, which relied on recruitment and spread from interspersed native plants and adjacent native areas. An annual sweep still occurs to detect and remove any newly colonizing iceplant and beachgrass. And since 2002 a large initiative has been in place to remove invasive annual grasses, the most recent threat to these dunes.

The photographs on the following pages show changes in the dunes following restoration. The photodocumentation was carried out primarily during Phase 3, although Photopoint 2 illustrates one area beginning before restoration in 1992. Some of the Phase 3 photos begin at a point just after the first dig and illustrate the recovery of native vegetation. Although photos were taken more frequently, this report shows three time periods: 1. Before or just after beachgrass removal in 1992 or 1995; 2. A photograph from 2001, when native plants were increasing in cover and diversity; and 3. A photograph from 2011. Keep in mind that Phase 3 photos can include patches of already restored dunes from 1992 and 1994, so beachgrass appears less dense.

The 2011 photos show that vegetation and dune forms have continued to change since restoration ended, in keeping with the dynamic nature of dunes. In some places (e.g. Photopoint 4b), the foredune shifts from less stable to more stable during the past decade. In other places (e.g. Photopoint 12B) naturally forming blowouts in the foredune have resulted in less stability. The 1992 and 2001 photographs for Photopoint 2 have been used in a number of ecological publications to illustrate the dramatic recovery of diversity after beachgrass removal. The 2011 photograph shows that this area has continued to change, exhibiting greater stability and a dramatic increase in native dunegrass. Another phenomenon of note is that when restoration started in 1992 an incipient foredune colonized primarily by beachgrass was present. By 2001 this feature had eroded, but by 2011 the incipient foredune had reformed in many places, built primarily by native dunegrass.



# Photopoint 1

1995



2001



2011



## Photopoint 2



# Photopoint 3a

1995



2001



2011



# Photopoint 3b

1995



2001



2011



# Photopoint 4b

1995



2001



2011



# Photopoint 6a

1995



2001



2011



# Photopoint 6b

1995



2001



2011



# Photopoint 6c

1995



2001



2011



# Photopoint 11

1995



2001



2011



# Photopoint 12B

1995



2000



2011



# Photopoint 12D

1995



2001



2011

