

**A Success Story
Lanphere Dunes Unit, Northern California**

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The Setting

The Lanphere Dunes Unit of the Humboldt Bay National Wildlife Refuge is the largest remaining stand of pristine coastal dunes in the Pacific Northwest. Many dunefields on the Pacific coast have already been destroyed by industrial and residential development and others are threatened by recreational impacts, such as the use of off-road vehicles.

The Lanphere Dunes have been restored to protect coastal sand dune habitats and species. The dune mat community is home to the native dunegrass, *Leymus mollis* subsp. *mollis*. Once found along the coast as far south as Morro Bay in California, this native grass now occurs in only two places along the California coast, Point Reyes and Lanphere Dunes. Other inhabitants include the federally and state listed endangered Humboldt Bay wallflower, *Erysimum menziesii* subsp. *eurekaense*, which is endemic to Humboldt Bay, and the beach layia, *Layia carnos*a. The rare pink sand-verbena, *Abronia umbellata* subsp. *breviflora*, and the threatened Western Snowy Plover, *Charadrius alexandrinus* subsp. *nivosus*, also occupy the Dunes.

The Invader - European Beachgrass (*Ammophila arenaria*)

European beachgrass invades coastal dunes on the Pacific coast and can change dune morphology and hydrology significantly. Dunes that form under cover of native beachgrasses and forbs have low slopes perpendicular to the beach. Infestations of *A. arenaria* trap more sand than the native species and consequently dunes that form under its cover have steeper slopes and are aligned nearly parallel to the shoreline. This change in dune morphology and topography prevents the movement of sand from the beach to interior dunes and disrupts conditions that support native plant communities. These changes also tend to promote *A. arenaria* so that it becomes more and more dominant while species richness declines sharply until nearly pure stands of *A. arenaria* form.

A Success Story

European beachgrass had invaded a roughly 10 acre area at the Lanphere Dunes by 1990. In 1992, an intensive monitoring and removal program was initiated. The area was mapped on a GIS (Geographic Information System) and 4.7 acres were designated for treatment. *A. arenaria* stands were cleared manually. First, workers dug out *A. arenaria* bunches and used their shovels to sever its rhizomes 4 inches (20 cm) below the soil surface. Later, resprouts were removed using a hand trowel. Treated areas were revisited and *A. arenaria* resprouts pulled an average of eight times from February to

December the first year. The second year, plants were pulled an average of seven times between March and December. By this time, the density of resprouts had dropped and the native plant cover was returning. On the primary foredune, the *A. arenaria* stands were extremely vigorous and resprouts in this area required a third year of treatment. Treatment of the remaining 5.4 acres was successfully complete in 1997.

The entire 10 acre infestation of European beachgrass has now been eliminated. Annual monitoring and manual removal, although time consuming and expensive, eradicated this invasive weed from the Lanphere Dunes. It was estimated that 2,951 person-hours/acre (ph/A) was the labor necessary for the initial three years of control at the dunes. The majority (2,108 ph/A) was in the first year. The second and third year required 723 ph/A and 120 ph/A respectively. A large proportion of the cost (roughly a third) was due to transportation costs because of the remoteness of the area.

The elimination of *A. arenaria* is a success story for the Lanphere Dunes Unit. After initiating restoration in 1992, native plant cover increased 47% by 1997 without the assistance of active re-planting. Best of all, the successful control of European beachgrass inspired other agencies managing similar dune areas to remove European beachgrass and begin restoration of this heavily impacted, yet distinctive community.

More Information

For more information, contact Andrea Pickart at 707-822-6378 or andrea_pickart@mail.fws.gov. The Lanphere Dunes project and dune restoration on the U.S. Pacific coast are described in a book authored by A.J. Pickart and J.O. Sawyer, titled *Ecology and Restoration of Northern California Coastal Dunes*, and published in 1998 by the California Native Plant Society (Sacramento, California). A chapter with information on the ecology and control of *Ammophila arenaria* is included in the book titled *Invasive Plants of California's Wildlands* published in 2000 and edited by C.C. Bossard, J.M. Randall, and M.C. Hoshovsky.

A review article with more detailed information about European beachgrass, including a description of its diagnostic characteristics, range, ecology, and methods for its control, is available on the TNC Wildland Invasive Species Program website (<http://tncweeds.ucdavis.edu/esadocs/ammoaren.html>).

References

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