



# Coastal Dune Restoration at Abbotts Lagoon

## Background Information

In 2001, Point Reyes National Seashore initiated the first year of a coastal dune restoration project aimed at removing European beachgrass (*Ammophila arenaria*) and iceplant (*Carpobrotus edulis*) from dunes near Abbotts Lagoon. These dunes are adjacent to some of the most intact native habitats in the park and support large populations of the endangered plants Tidestron's lupine (*Lupinus tidestromii*) and beach layia (*Layia carnosa*). Restoration goals include increasing nesting habitat for Western Snowy Plovers (*Charadrius alexandrinus nivosus*), expanding the ranges of endangered plants, and providing a foundation for dune restoration throughout the seashore.



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Abbotts Lagoon, located within Point Reyes National Seashore, contains some of the most intact dune habitat in the park.



Contract and volunteer crews as well as heavy equipment are restoring dune ecosystems.

## Restoration Process

During the pilot work for this project, contract crews and volunteer groups pulled small patches of European beachgrass by hand. Follow-up surveys showed a large amount of re-growth, suggesting that initial removal using hand removal techniques alone did not remove enough of the plant material underground. Roots and rhizomes (horizontal underground stems) left underground allowed beachgrass to re-sprout.

Using heavy equipment instead of hand removal techniques improved the efficiency and effectiveness of removing beachgrass. The heavy equipment is used to dig up and bury beachgrass in large pits on site. Excavators start by digging up beachgrass to a depth of the deepest root/rhizome, usually 1 to 3+ meters. The weed-filled sand is then piled up nearby. Continued excavation removes clean sand below which will eventually be used to cover the excavation site. The large pit (created through this process) is then filled with the beachgrass and weedy sand, then capped with about 1.5 meters of clean sand. Efforts are made to maintain the original dune topography. Restoration using this technique takes 50 to 60 hours of machine operation per acre. This technique is most appropriate in areas that contain almost exclusively beachgrass and few if any native plants. Later, hand removal techniques are used to pull re-sprouts once to 6 times a year by severing the roots with tree spades at

a minimum depth of one foot. The removal of beachgrass re-sprouts using hand removal takes from 50 to 115 person hours per acre, and is most appropriate in sensitive areas of high native plant cover. The final results are encouraging. Overall, results show the return of natural geomorphic processes and little change in overall dune topography.



## Progress and Successes

In total about 50 acres of dunes have been cleared of invasive, nonnative European beachgrass, iceplant, European searocket (*Cakile maritime*), and New Zealand spinach (*Tetragonia tetragonioides*) to improve habitat for federally listed species and restore natural dune processes. For example, the two federally endangered plants Tidestrom's lupine (*Lupinus tidestromii*) and beach layia (*Layia carnosa*) have begun natural recolonization of the restoration area. In the area restored by heavy equipment, almost 200 lupine and over 550 layia plants were found growing, presumably from newly exposed seed. A total of 9 species of native dune plants have appeared within the heavy equipment restored area.

Another focus of the restoration project is to restore habitat for the federally threatened Western Snowy Plover. Since March 2004, plovers have begun to nest in the dune area restored with heavy equipment. This is the first time plovers have used these back dunes since research began in 1972. Normally, plover nesting activity has been restricted to a narrow strip of sand between the beachgrass formed sea wall and the high tide line. Plovers are using the restoration area for chick rearing as well. Male plovers have been seen moving chicks to this area from as far as a mile and a half away. The restored area is open enough for plovers to see approaching predators and provides areas of protection (chicks are much harder to find in open sand fields) and native food sources.

## Next Steps

Oil spill recovery funds continue to provide support for dune restoration. We hope to restore another 20 acres in 2008-2009. In 2011, a large (300-acre) dune restoration project is planned for the dunes of Point Reyes National Seashore.

## For More Information

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Several federally threatened species including Tidestrom's lupines and Western Snowy Plovers as well as more common species such as dragonflies and goldfinch (all represented above) contribute to intact dune ecosystems.