

# Coastal Sand Dunes



## What is a coastal sand dune?



George G. Hawxhurst © California Academy of Sciences 2005

Coastal dunes are not common in California as the relatively steep Pacific coast doesn't often allow the permanent accumulation of sand. However, there are areas with a more gradual slope where dunes can develop, and where there's a ready supply of sand. Dunes are found locally at Pt. Reyes, Pescadero, and near Monterey. One of the state's largest historical dune areas now lies beneath Golden Gate Park in San Francisco. This is a difficult habitat for plants. Near-constant wind carries toxic salt and abrasive sand inland and discourages tall growth.

Sand makes poor soil, as it is very low in nutrients and highly porous so that water drains through it quickly. The dunes themselves are mobile, shifting with the wind and through the seasons, making it difficult for plants to anchor themselves. The light color of the dunes makes them very reflective, adding to light intensity and heat.



Sand Dollar

Gerald and Buff Corsi © California Academy of Sciences

## What animals inhabit coastal sand dunes?

Opossum



© 2002 John White

Animals are harder to see in the dune community. Often all one sees of them is the delicate tracery of tracks left during nocturnal foraging. Small rodents and insects feed small predators such as opossums, raccoons and gray fox.



Western Snowy Plover

Marguerite Gregory © California Academy of Sciences

The endangered western snowy plover, a sparrow-sized shorebird, nests in dune and high beach areas. Unfortunately the bird and its offspring are very sensitive and vulnerable to disturbance of any kind, whether it be a dog running off-leash, an all-terrain vehicle or even birders. Areas the plover use are often cordoned off during nesting season to protect them from damage.



Black-bellied Plover

© Joyce Gross



Harbor Seal

Dr. Thomas Charles Poulter © California Academy of Sciences

## How are plants adapted to such a harsh environment?

As challenging a habitat as it is, its characteristic plants have adaptations permitting their survival. Many dune plants have flexible, whip-like roots that allow them to shift and adjust to the dunes' movement. Many have leaves protected by tiny white hairs that reflect heat and intense light. Most species either hug the ground or grow in low mounds, helping them to deflect the wind. And many plants are quite succulent, and can store water when it is available and counteract the

dehydrating effects of high salinity. In short, these plants make the best of a harsh habitat!

Dune plants include bush lupine, beach strawberry, seaside daisy, coyote brush, sand verbena and buckwheat. Backed by sculptural fore-dunes and the rolling surface of the Pacific, a coastal dune community in full bloom is a spectacular sight.

Yellow Bush Lupine



© 2006 Annie Presler De Anza College

Sea Dahlia



© 2006 Annie Presler De Anza College

Sea Thrift



© 2006 Annie Presler De Anza College

## Why should coastal sand dunes be protected?

Coastal sand dunes not only provide a home for numerous plants and animals, they protect our coastlines from damaging winds and storm surges. Sand dunes provide a natural barrier that helps to deflect flooding associated with hurricanes and tropical storms. Along with coastal wetland communities, plants in sand dune communities act as natural sponges to absorb the excess water and hold the sand in place. These natural sand dune barriers are often removed during development, leaving the coastline more vulnerable to storm surges and flooding.

Developers often build unnatural barriers to protect the beaches around buildings, but this does not allow for the natural movement and progression of sand dunes along the coast. The unintended result is that other areas along the coast become even more vulnerable to the destructive forces of wind and water. By protecting our sand dunes we protect vital habitat for birds, marine mammals and ourselves.

American Avocet



Dr. Lloyd Glenn Ingles © California Academy of Sciences

Point Reyes National Seashore



George G. Hawxhurst © California Academy of Sciences 2005