



Sandy Beaches and Lagoons

IMPORTANCE

Sandy beaches are a major component of the intertidal region of the northern Channel Islands. On Santa Rosa Island, sandy beaches make up approximately 30 km of shoreline, encompassing a wide variety of exposures and beach types. Approximately 20 percent of the shoreline of the California Channel Islands is sandy beach, in comparison to 80 percent of the shoreline of the southern California mainland coast. Though often overlooked, sandy beach communities offer a dynamic arena for the interaction of marine and terrestrial ecosystems. Sandy beaches harbor high densities of detritus, infauna, and macro-invertebrates that supply food and habitat for both marine and terrestrial organisms. Many bird species utilize sand beaches as nesting and foraging habitat. Terrestrial mammals and birds prey and scavenge on sand beach organisms. All these organisms in turn play a vital role in the functioning ecosystem we classify as sandy beaches. Sand beaches are utilized by a wide variety of species for feeding, resting, and breeding. Sea and shorebirds feed on beach macrofauna, snowy plovers breed on beaches, pinnipeds haul out to rest and molt on island beaches, and people enjoy the solitude and sweeping vistas of wilderness beaches. Coastal lagoons are a rare resource in southern California yet they play an important role for spawning fish and breeding waterfowl.

OBJECTIVES

- Estimate trends in abundance of sand crabs, beach hoppers, olive snails, and Pismo clams
- Determine annual reproductive phenology and productivity of sand crabs
- Determine abundance of beach wrack available to community organisms
- Determine physical cycles of the coastal lagoons at Santa Rosa Island



Sand crab, *Emerita analoga*, with eggs.



Snowy plovers use the sandy beaches to forage and nest.

MONITORING EFFORTS

Park researchers use a variety of sampling techniques to monitor the population dynamics of beach and lagoon organisms.

- Beaches are sampled annually in late summer, while the lagoons are sampled quarterly.
- Macrophyte debris, primarily algal wrack and a major source of energy for beach communities, is measured on point contact transects.
- Abundance and distribution of sand crabs, *Emerita analoga* and *Blepharipoda occidentalis*, the isopod *Excirolana chiltoni*, beachhoppers, *Megalorchestia* spp., purple olive snails, *Olivella biplicata*, and Pismo clams, *Tivela stultorum*, are measured with clam gun transects, band transects, and trench transects.
- Pismo clams populations are estimated with mark-recapture techniques.
- Size frequency data are also collected for sand crabs, pismo clams, and purple olive snails.
- Abundance and distributions of birds are determined by census.

MANAGEMENT IMPLICATIONS

Information collected will be used to:

- Determine population health and abundance of common beach fauna.
- Identify relations to the larger marine ecosystem.
- Improve our understanding of beach and lagoon ecosystems.
- Inform regional assessments of sensitive species status.
- Improve our understanding of park intertidal zone health.

For more information:

Dan Richards, dan_richards@nps.gov