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Western Ecological Research Center http://www.werc.usgs.gov

Studies in Coastal Ecosystems

Research by the Western Ecological Research Center (WERC) on nearshore communities and coastal environments is providing important insight into how coastal ecosystems function.

WERC sea otter research focuses on this smallest marine mammal's role as keystone species in a nearshore food web, with long-term studies in Alaska's Aleutian Islands, in California, and in Washington.

The white abalone is a deep-water, marine snail, sought as a precious food resource from southern California until its crash in the 1970s. WERC research is contributing information on the species' habitat and needs and development of a captive breeding program similar to what has been used to replenish imperiled terrestrial species.

Invasive plants and animals affect coastal maritime communities including terrestrial and nearshore ecosystems. The European green crab is decimating shellfish populations and altering natural systems on the east and west U.S. coasts. WERC research is testing biological controls to find an effective and safe response to stem this invasion. Invasive, exotic plants have displaced native plants that have become rare on island and coastal lands. Research on treatments for invasives provides resource managers with management options for conserving natural environments and plant diversity.

Urban, industrial, and agricultural activities have contaminated the San Francisco Bay area with petroleum hydrocarbons, organochlorine pesticides, PCBs, metals, and trace elements, reducing the quality and quantity of wildlife in the estuary. WERC scientists are studying the effects of these contaminants on wildlife in the estuary and in California rivers where contaminants are still leached from mines that suspended operation over a century ago. Their studies on contaminants in nesting bald eagles in the Aleutians indicate that organochlorine pesticides can be transported long distances on air and sea currents and affect wildlife populations in remote and pristine areas.

Sea otter. Photo: Courtesy G. Jameson.

Examples of where research is still needed:

- Wetland rehabilitation
- Sea otter demographics
- Toxicological impacts
- Nearshore marine communities
- Determinants of species declines

San Francisco Bay is the largest estuary on the west coast and a highly urbanized ecosystem, where more than 90 percent of tidal wetlands have been lost to reclamation for farmland, salt evaporation ponds, or homes and industry. WERC is providing science support for rehabilitation of diked wetlands and salt ponds to tidal marsh, important to the recovery of the estuarine ecosystem.

Human population growth, urbanization, and loss of habitat are affecting migratory birds and associated coastal systems. WERC research is adding information on migratory bird distributions, life histories, and habitat use in coastal maritime communities. This science can be used for future land-use decisions critical for conserving coastal natural resources, human quality of life, and economic prosperity.

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