

Bay and Estuarine Plants: Overview

From a biological perspective, no other complex is more important to bay and estuary ecosystems than their plant communities. Whether discussing tidal wetlands, shallow subtidal habitat, or marine algae, plant communities and the habitats they form are vital to the function and health of bays and estuaries. Two important plant components within the bay and estuary setting are the tidal wetland, and the subtidal eelgrass (*Zostera marina*) and *Gracilaria spp.* communities. While these two plant groupings are small fractions of the bay and estuarine plant assemblage and do not occur in all bays and estuaries of the state, they are significant contributors to the overall productivity and species diversity of these ecosystems. Other commonly occurring bay and estuarine plant communities, such as phytoplankton, algal mats, and sea lettuce are not addressed by this report, but are important food contributors and principal components of these ecosystem carbon budgets.

Bay and estuary ecosystems are the probably the most impacted and altered environments of the California coastline. Most of the state's bay and estuary ecosystems are intensively urbanized, serving as centers for industry, agriculture, and commerce. The impacts of such anthropogenic activities are acutely evident within the bay and estuarine plant communities. The loss of tidal and subtidal wetland habitats on a statewide level is substantial. Where once vast mosaics of tidal wetlands predominated, agriculture, housing, or other developments have been formed from lands diked from the bay or filled. Similarly, losses of subtidal plant communities are accelerating worldwide. In southern California, it has been estimated that as little as ten percent of the historical distribution of eelgrass remains. In the majority of cases, once bay and estuary plant communities are destroyed they are lost forever. Some restoration has occurred throughout the coastal region of California with significant efforts focused on southern California, particularly within Mission and San Diego bays and the reopening of Bataquitos Lagoon to tidal flow. However, in most cases, the goal remains one of preservation.

Bay and estuary plant communities provide critical habitats, which support a diverse array of fish and wildlife including species that are in danger of extinction. The diverse structure of bay and estuarine plants also helps to improve water quality, protect lands from flooding, provide energy to the marine and estuarine food web, and stabilize shorelines against erosion. Studies have found that subtidal plant communities are also principal contributors to primary productivity within bay and estuary ecosystems.

The economic value of bay and estuarine wetlands and subtidal habitats is considered to be among the highest of all natural resources. Such habitats support commercial harvests of fish and shellfish and provide millions of days of recreational fishing and waterfowl hunting each year. On a global level, such plant communities help stabilize available nitrogen, atmospheric sulfur, carbon dioxide, and methane. In the crowded urban environment, where many remnant populations of bay and estuary plant communities exist, such habitats contribute to open space and are a valuable aesthetic asset. A recent economic assessment of California's wetlands conducted by the California Coastal Commission established annual benefits valued at between \$6.3 billion and \$22.9 billion.

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