California Wildlife Habitat Relationships System
California Department of Fish and Game
California Interagency Wildlife Task Group

Marine

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General Description

Structure-- Marine habitats extend from the upper limit of the unvegetated shore to the ocean, including the 12-mile contiguous zone. Four zones are included in this habitat. The pelagic zone is characterized by open water with depths greater than required for growth of canopy-forming kelps and extending offshore to include the 12-mile contiguous zone. The subtidal zone extends seaward from the low-low tide line to and including the depth that supports canopy forming kelps given the proper substrate. The intertidal zone includes the area exposed by lowest-low tide up to and including the spray zone. Finally, the shore zone consists of any barren land between the spray zone to where terrestrial vegetation exceeds 10 percent canopy closure and may vary in width from a few feet to several hundred meters.

Aquatic Environment

Vegetation in the pelagic zone is limited to phytoplankton (diatoms and microalgae) and is produced in the euphotic zone (depth of light penetration). Phytoplankton together with the animal component, zooplankton, are the primary food source for filter-feeding organisms such as anchovies and many invertebrates which are eaten directly by marine birds and mammals or are forage for fish and invertebrates consumed by marine birds and mammals. In the subtidal zone in addition to phytoplankton, canopy forming macroalgaes and other forms of macroalgaes occur, if suitable substrates are available for them in depths to approximately 36.6 meters (120 feet) in southern California. North of San Francisco, canopy-forming kelps such as bull kelp are generally restricted to water depths less than 12 meters (40 feet) and most are annual species except in a few protected areas. Also in the subtidal zone are a large number of short kelps, coraline algaes and other algae. One species of flowering plant, surf grass, is found in the marine habitat. Surfgrass occurs in subtidal and intertidal zones. Macroalgaes, which provide cover for sea otters and a large variety of fish, are eaten by a few fish and several invertebrates and are a major source of organic detritus for filter feeders (Ricketts and Calvin 1968). Within the subtidal and intertidal zones, sessile forms of flora and fauna are distributed according to exposure to wave action, water depth, type of substrate, water temperature and latitude.

Other Classifications-- Similar classifications of marine habitats include Marine System (Cowardin et al. 1979); Exposed Open Coast -1.3 and Protected Open Coast -1.4

(Cheatham and Haller 1975); Beach Surf Zone - 22.1, Headlands and Rocky Islands - 2.3 and Oceanic Zones - 3.0 (Proctor et al. 1980).

Aquatic Zones and Substrates

The marine habitat exists in structural classes 1,2-4:O-B. Manmade changes in marine habitat zones are usually permanent and are caused by dredging and filling in the intertidal zone and construction in the shore zone. Vegetation changes in marine habitats are attributed to pollution (turbidity), warm water from power generating facilities or current changes, high surf condition, and major increases or decreases in herbivore populations such as the expansion of sea urchin populations, which may be related to pollution, or the depletion of herbivores resulting from sea otter foraging. Re-establishment can be rapid as in the case of plankton or slow and requiring human intervention, as in the re-establishment of kelp in sea urchin dominated areas. Re-establishment is an annual event for some species of macroalgae such as sea palm and bull kelp. Vegetation changes may alter the value of the habitat zones to wildlife but do not change the WHR classifications. Substrates are also generally stable in the marine environment except when modified by human intervention such as dredging, filling, construction of artificial reefs, breakwaters, and jetties which, in addition to their physical presence, may affect sand transport. Substrates occurring in marine habitat include mud, sand, gravel/cobble, rubble/boulders, and bedrock. Marine habitats are permanent unless eliminated by human actions.

Biological Setting

Habitat-- The shore zone of the marine habitat may occur in association with Estuarine (EST) habitats where freshwater is discharged into the ocean through river systems. Also along the length of the State, several types of terrestrial habitat are associated with the shore zone including Annual Grassland and Perennial Grassland (PGS), Coastal Scrub (CSC), Valley Foothill Riparian (VRI), and Montane Riparian (MRI), Redwood (RDW), Douglas-fir (DFR), Cropland (CRP), and Residential Park (RSP).

Wildlife Considerations-- Marine habitats are used almost exclusively by seven species of marine mammals, and 31 pelagic birds. They receive extensive use by shore and wading birds, gulls, terns, sea ducks, and ospreys. Other species that use marine habitats in varying amounts are island foxes, river otters, raccoons, and common ravens. The endangered bald eagle feeds on fish taken from the Marine habitats.

Physical Setting

Water depths in the Marine habitat range from 0 to over 1,000 fathoms. Salinities exceed 30 ppt. with little or no dilution except near the mouths of estuaries (Cowardin 1979) or near submarine sewage discharges. Water temperatures vary with seasonal

currents, but generally increase from north to south and will range between a low of 6 C (43 F) and a high of 21.5 C (71 F). Wind and wave action generally increase from south to north, with periods of highest activity associated with winter storms.

A phenomenon called upwelling is caused by onshore winds and brings cold, nutrient-rich water from ocean depths to replace nearshore surface water which has been driven offshore by the wind. This phenomenon is responsible for sustaining much of the extensive assemblage of flora and fauna that occur in California nearshore ocean waters.

Distribution

Marine habitats are found along the entire length of the California coast from Oregon to Mexico.

Literature Cited

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