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THE HABITAT OF THE CALIFORNIA SEA OTTER

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ABSTRACT

The sea otters of California live mainly within nearshore kelp forests. These forests of giant kelp plants are extremely productive and they contain a rich variety of plants and animals. Energy flow through trophic levels within the forests is dynamic and complex. We are currently attempting to quantify the spatial and trophic structure in the kelp forest of the Hopkins Marine Preserve of Pacific Grove. This forest has been a sea otter habitat for over a decade and feeding by sea otters has profoundly influenced and altered the forest structure and productivity.

Primary production of the giant kelp alone is very high and comparable to levels reached in cultivated sugar cane fields. Major grazers on the giant kelp plants include several species of turban snails which, at densities of over 50 per m², consume roughly 5-10% of the kelp produced. Much of the kelp forms pieces of drift that litters the forest floor and are consumed by several species of spider crabs, abalones, sea urchins and bat stars. Smaller pieces of kelp add to the detritus suspended in the water, providing food to many sessile, suspension-feeding animals including vermetid snails, bivalves, barnacles and tube worms.

Over half of the kelp produced in the forest is exported out of the forest as drift kelp. This drift kelp contributes material and energy to other animal communities such as the extensive assemblages of worms, crustaceans and fishes on soft bottoms. In terms of material and energy flow, therefore, the kelp forest ecosystem extends far beyond the boundaries of the forest itself.

The major predators in the kelp forests include sea stars feeding on snails and sessile animals, fishes feeding on crabs and other crustaceans, and, of course, sea otters feeding on a wide spectrum of invertebrates including snails, crabs, sea urchins, abalones, bivalves, barnacles, and sea stars. Feeding by sea otters seems especially important in forming kelp forest community structure. Prey species such as sea urchins and abalones are restricted to relatively low densities in crevices. These animals have been able to reach high densities in the open in some areas where sea otters are absent. Large numbers of abalones in the open occupy space suitable for sessile animals and plants, including kelp itself, while high densities of sea urchins and other grazers feed directly on attached kelp plants. Before the return of sea otters to the Hopkins Marine Preserve, high densities of these invertebrates precluded the full potential of kelp production. Sea otter

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predation on invertebrate grazers and space competitors is therefore an important factor in maintaining high algal production within kelp forests and maximizing the area supported by drift kelp and detritus far distant from the edges of these forests.

Conference, Biology and Conservation of Marine Mammals, University of California, Santa Cruz, California, December 4-7, 1975.
(2-page abstract).