



Distribution of Kelp in Washington State

Kelp are large seaweeds in the Order Laminariales. Twenty-six species of kelp grow along Washington State's shorelines, making Washington one of the sites of highest kelp diversity in the world (Gabrielson et al, 2000). Kelp beds support commercial and sport fish, invertebrates, marine mammals and marine birds (Dayton 1985, Duggins et al. 1989). Many factors, both natural and anthropogenic, affect the extent and composition of these important nearshore habitats (Duggins 1980, Dayton and Tegner 1984, Foster and Schiel 1985).

Kelp species can be grouped based on their growth forms: canopy-forming kelp produces buoyant bulbs and blades that spread out on the water surface, while understory kelp canopies extend horizontally near the bottom. There is a gradient in the occurrence of kelp in Puget Sound due to natural environmental conditions (Figure 1). Kelp is most common in rocky, high energy environments, with greatest abundance in the San Juan Archipelago and the Strait of Juan de Fuca. Kelp beds gradually decrease in size and frequency in central and southern Puget Sound. Kelp is uncommon in Hood Canal.

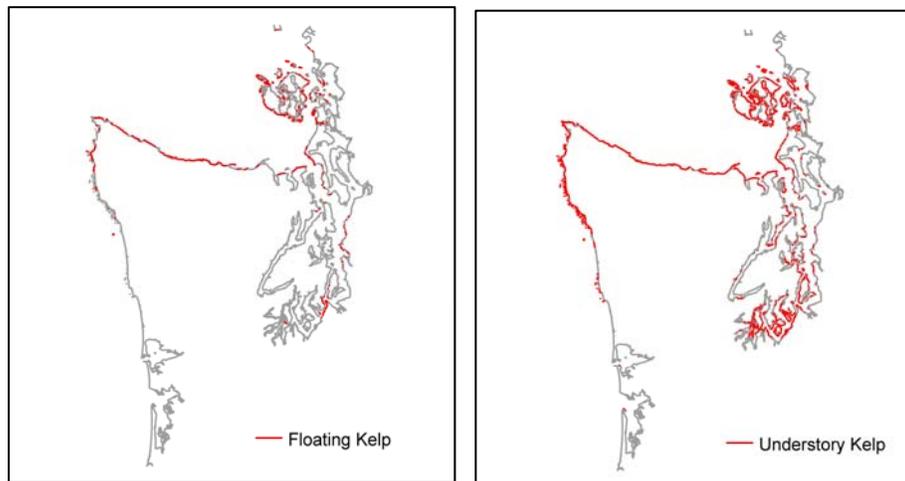


Figure 1. The distribution of canopy-forming kelp and understory kelp in Washington State (Nearshore Habitat Program 2001).

Canopy-forming kelp occurs along approximately 11% of Washington State's saltwater shorelines (Nearshore Habitat Program 2001). Bull kelp (*Nereocystis luetkeana*) is the primary canopy-forming kelp species found throughout Puget Sound. The southernmost persistent bull kelp bed is located off Squaxin Island, near Olympia. Along the western Strait of Juan de Fuca and outer coast, giant kelp (*Macrocystis integrifolia*) also occurs. Giant kelp forms extensive surface canopies that are either intermixed with bull kelp or grow closer to shore. Bull kelp is

generally more abundant than giant kelp along the Strait of Juan de Fuca, in terms of total bed area. However, giant kelp forms denser beds. While both species are fairly variable from year-to-year, bull kelp exhibits higher interannual variation.

Understory kelp is more common than canopy-forming kelp, it occurs along 31% of the shoreline (Nearshore Habitat Program 2001). Much less is known about the status and trends of understory kelp because it is more difficult to map and monitor.

References

Dayton, P.K., and M.J. Tegner. 1984. Catastrophic storms, El Nino, and patch stability in a southern kelp forest community. *Science*, 224: 283-285.

Dayton, P.K. 1985. Ecology of Kelp Communities. *Ann. Rev. Ecol. Syst.* 16: 215-45.

Duggins, D.O., C.A. Simenstad and J.A. Estes. 1989. Magnification of secondary production by kelp detritus in coastal marine ecosystems. *Science* 245(4914):170-173.

Foster, M. S., and D. R. Schiel. 1985. The Ecology of Giant Kelp Forests in California: A Community Profile. U. S. Fish and Wildlife Service Biological Report 85(7.2) 152 pp.

Gabrielson, P.W., T.B. Widdowson, S.C. Lindstrom, M.W. Hawkes, and R.F. Scagel. 2000. Keys to the Benthic Marine Algae and Seagrasses of British Columbia, Southeast Alaska, Washington and Oregon. Phycological Contribution #5, University of British Columbia, Department of Botany. 189p.

Nearshore Habitat Program, 2001. The Washington State ShoreZone Inventory. Washington State Department of Natural Resources, Olympia, WA.