Human Modification of the Puget Sound Landscape and Impact on the Nearshore Ecosystem

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ABSTRACT
The cumulative effects of human activities, such as over-harvesting, resource extraction, dredging, filling, discharges of industrial and municipal wastes, deforestation, and paving, are all taking their toll on the Puget Sound nearshore ecosystem. Evidence is growing of declining fish and wildlife populations, toxic contamination, eutrophication, habitat loss, increased exotic species, and altered hydrologic regimes. The Puget Sound Nearshore Project focuses on stressers in which the fundamental problem is a change in the ecological processes that create and maintain habitats, which in turn reduce valued ecosystem services. Combining data from a variety of sources, including spatially explicit data of nearshore change and data that generalize regional trends of urbanization, this project quantitatively and qualitatively describes alterations to the regional landscape that impact nearshore ecosystem processes. Approximately 70 percent of the original salt marshes around the Sound have been destroyed, as have virtually all river delta marshes in urbanized areas. More than 33 percent of the shoreline has been modified, much of it heavily armored; eelgrass habitat has been lost, and essential linkages between the terrestrial and marine ecosystems have been disrupted or eliminated.

Nearshore Structures in Puget Sound

Marine Overwater Structures
Area by Type within Action Area

Industrial use of the nearshore is limited, however impacts have been significant.

Human development of the nearshore modifies critical beach habitat and alters nearshore processes.

Overwater structures alter nearshore ecosystem processes by disrupting nearshore circulation and sediment transport and by limiting light penetration and surface-water-atmosphere exchange. Overwater structures include bridges, buildings, docks, piers, and seawalls.

Shoreline Modifications in Puget Sound

Shoreline armoring removes beach habitat and alters sediment exchange across the upland-marine interface.

Urban development of large river deltas and nearshore alters the landscape and modifies ecosystem processes.

Puget Sound has a long history of human modification; as the tidelands were legally sold into private ownership between 1889-1931. Only 48% of the Puget Sound tidelands remain in public ownership (Robert L. Rob, “Conserving Puget Sound,” Washington Sea Grant, University of Washington Press 1982).

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