King County project: eelgrass monitoring and restoration

Nearshore habitats support a wide range of valued species, including salmon, forage fish, and Orcas. Because of their critical ecosystem role, regulatory protections are in place to minimize human impacts. However, our ability to protect these habitats is limited by major information gaps.

In 2018, DNR partnered with King County to address gaps in nearshore knowledge through a major survey effort. DNR comprehensively surveyed the shorelines with underwater towed imagery, and classified a suite of species of marine vegetation (eelgrass, kelp and other macrovegetation), and invertebrates (sea stars, cucumbers and crabs). The results provide an assessment of vegetated habitats and key invertebrates that is unprecedented in its detail and spatial extent.

Results are being applied to a diverse set of projects. DNR is using eelgrass survey results to identify sites for restoration. The understory kelp data address a key information gap identified in the Puget Sound Kelp Conservation and Recovery Plan. Invertebrate surveys provide data on species of commercial and ecological importance.

In addition to providing valuable information on current nearshore habitat characteristics, this dataset has potential for monitoring trends because it is based on DNR's long-term eelgrass monitoring framework.

Transects sampled using towed underwater videography south of Elliott Bay.

Why does this matter to DNR?

Nearshore habitats, including eelgrass and kelp beds, are important ecosystem components that provide critical habitat for threatened species, including Chinook Salmon and Pacific Herring.

DNR manages 2.6 million acres of State-owned Aquatic Lands. DNR's stewardship responsibilities include protecting and restoring nearshore habitat.

Collaborations with local governments and tribes greatly enhance our ability to monitor and restore marine vegetation, such as eelgrass and kelp.

Project outcomes: monitoring

Eelgrass was present at 137 out of 152 1-km sites, but absent or sparse along the southwestern shoreline of Vashon Island, inner Quartermaster Harbor, and the inner portion of Elliott Bay. Individual eelgrass beds were relatively small (median bed size was 3.4 ha per 1 km of shoreline.)

Approximately 95% of eelgrass in King County grew between 0.2 and -4.45 m relative to Mean Lower Low Water (MLLW). Eelgrass grew less deep in the southern part of King County, and inside Quartermaster Harbor. These patterns likely reflect gradients in water clarity.

At 29 sites, we were able to assess change in eelgrass area over time based on previous data collected by DNR's long-term monitoring program between 2000 and 2018. In total, 7 sites declined, 3 increased and 19 sites showed no trend over time. Declines were most pronounced along the northern section of Colvos Passage, Dumas Bay, and the inner portion of Quartermaster Harbor.

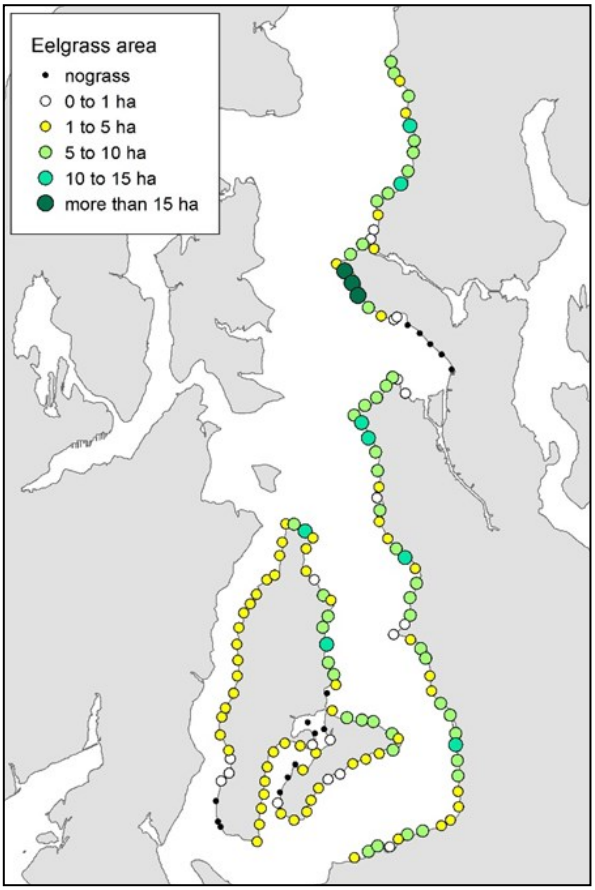
Understory kelp was common, although less abundant than eelgrass along the King County shorelines. Sea star species that are known to be sensitive to Sea Star Wasting Syndrome were rare, while the least sensitive species were common.

Future project outcomes: restoration

The first project to apply survey results is eelgrass restoration. In 2020, DNR used eelgrass data to identify potential restoration sites. Detailed assessment is underway using light sensors and other instrumentation. Between 2020 and 2023, DNR will test transplant eelgrass at many sites in order to further assess site suitability, complete large scale transplants at optimal locations and monitor results.

Project participants

Funding for this project was provided by King County Department of Natural Resources and Parks, Wastewater Treatment Division.



Size of eelgrass beds along 1 km stretches of shoreline in King County (in ha).

Project outputs

Christiaen B, Gaeckle J, Ferrier L (2020). Eelgrass abundance and depth distribution in King County. Final Report to King County. DNR IAA 93-097520. Nearshore Habitat Program. Washington State Department of Natural Resources, Olympia, WA

For more information

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