

Eelgrass Restoration

The Washington State Department of Ecology (Ecology) is funding an eelgrass restoration project to be carried out by the Washington State Department of Natural Resources (DNR) Nearshore Habitat Program in partnership with researchers at the Pacific Northwest National Laboratory (PNNL).

Seagrasses, such as Washington's native eelgrass (*Zostera marina*), have been declining to a point where it has been deemed a worldwide crisis (Orth et al. 2006, Waycott et al. 2009, Short et al. 2011) and are considered a "habitat of particular importance" in Puget Sound (Washington Administrative Code 220-110-250). Although not easily quantified, it is believed that eelgrass area has been lost in Puget Sound because of increased shoreline development and periodic physical disturbances as well as degradation in water quality (Thom and Hallum 1990, Thom 1995, Thom et al. 2011). Climate change effects are expected to further exacerbate eelgrass losses (Snover et al. 2005).

In response to this need, the Puget Sound Partnership's Action Agenda specifically targets an increase of 20% more eelgrass by 2020 (http://www.psp.wa.gov/interim_targets.php). This target equates to approximately 10,000 acres of eelgrass. Restoring eelgrass will benefit a multitude of species valued in Puget Sound, including threatened and endangered species (e.g., Plummer et al. 2012), as well as contribute to water quality improvements (Nelson 2009), shoreline stabilization (Fonseca et al. 1985) and carbon sequestration (Kaldy 2006; Fourqurean et al. 2012).

This project will restore approximately 2 acres of eelgrass in Port Gamble Bay. In addition, this project helps leverage funding for eelgrass restoration work in the Nisqually, Skokomish and Elwha River deltas. Areas transplanted with eelgrass are intended to restore the natural ecological functions of local eelgrass dispersal, recruitment, and expansion to enhance natural recolonization over the remaining potential habitat at a site.



Examples of work to be completed in Port Gamble Bay

Photo Credit to Pacific Northwest National Laboratory

Methods

Prior to transplanting of eelgrass, a resource assessment will be completed to determine the historic and current distribution of eelgrass in Port Gamble Bay. Transplant sites will be generated from a site selection model using a combination of previous and recently collected eelgrass distribution data and environmental data.

After a list of test transplant sites is generated, several small eelgrass transplant sites will be planted in the field and monitored. Test transplant monitoring results will be evaluated to prioritize sites suitable for large scale eelgrass restoration in the bay. Monitoring will include surveys of eelgrass test transplant survival and shoot density plus an assessment of factors that may affect transplant success. Sites will then be ranked for large scale eelgrass transplanting. The large scale eelgrass transplant effort will entail transplanting eelgrass at a shoot density of 20 shoots m⁻² over multiple transplant areas (100 m²). The ecological function of the transplanted eelgrass is expected to increase through the recruitment of new shoots from vegetative and reproductive expansion.

Monitoring the large scale eelgrass restoration will include surveys of eelgrass presence, extent, and bed structure using remote sensing instrumentation and research divers to answer the following questions:

- What is the survival rate of transplanted eelgrass?
- What factors are affecting success?
- How is the transplanted eelgrass performing compared to natural (reference) beds?

Schedule

Modeling to determine suitable test transplant locations will be completed by the spring of 2014. The test transplant sites will be planted in the late spring or early summer of 2014 and monitored throughout the summer and fall. Test transplant monitoring results will be evaluated to identify full-scale transplant sites that will be planted in the late spring of 2015. Funding for the project ends on June 30, 2015.

References

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