

Thatcher Bay Nearshore Restoration Monitoring, 2015

by Thomas Peterman, Kern Ewing, Jim Fridley, and Sandy Wyllie-Echeverria

Summary

Thatcher Bay on Blakely Island in the San Juan Archipelago underwent restoration work in December 2014 to remove sediment that had been contaminated from wood waste from a milling operation. The goals of restoration were to improve both ecosystem functions and nearshore habitat for flora and fauna. Monitoring of the site is a critical task towards for assessing the project's ability to achieve predetermined objectives. The specific elements of this monitoring plan include (1) assessing intertidal sediment characteristics, (2) evaluating benthic macroinvertebrate assemblages, (3) surveying for forage fish spawning activity, and (4) observing for the potential spread of native eelgrass (*Zostera marina*) into the restoration site. The project's parameters are being met through the coordinated efforts of state agencies, universities, local tribes, and both private and nonprofit organizations. Forage fish spawning surveys completed in June 2015 indicate that surf smelt (*Hypomesus pretiosus*) have utilized the restoration site for spawning habitat.

What is the Issue?

In the Pacific Northwest, wood waste contamination is a serious concern. Wood waste in large volumes, which natural systems and organisms are not adapted to, can overwhelm the assimilative capacity of sediment in aquatic environments and can potentially harm the environment. The success of restoration work hinges on two stipulations; that ecosystems can be altered to recreate a desired condition, and whether it can be determined if the alterations have produced the desired condition. Monitoring is a vital component of any comprehensive restoration project. This project is meant to function as a model for future efforts to restore nearshore areas impacted by wood waste. There are currently only a few sawmills in operation statewide, but there were potentially hundreds of mills operating in Washington State at the

height of the timber industry. It is likely that other sites in Puget Sound will undergo wood waste restoration work in the future. The monitoring criteria established in this report can provide a template for those remediation efforts that have goals and objectives similar to this project.

How was the Project Conducted?

Monitoring of the site was funded by the Salmon Recovery Funding Board and overseen by the Skagit Fisheries Enhancement Group (SFEG), a non-profit based in Skagit County. In 2015, SFEG collaborated with the University of Washington to design and implement a monitoring plan for years one and two following restoration work. Four parameters were established with the intention that monitoring would be accomplished according to the current regulatory standards and guidelines for each element. Sediment was collected in September and analyzed for grain size, total solids, and total volatile solids. Forage fish spawning surveys were conducted quarterly at the restoration site and at reference sites meant to represent non-impacted sites. Sampling for epibenthic and benthic macroinvertebrates took place in July and will be repeated in year two. Observations for native eelgrass (*Zostera marina*) were made in September using underwater video techniques.

Major Elements

Effectiveness monitoring, which is what this project aimed to accomplish, is defined by the Puget Sound Nearshore Restoration Project as evaluating whether or not restoration actions are achieving their stated goals. Sediment analysis showed a reduction in total volatile solids when compared to analysis of the site's sediment in 2009. This can be considered the sediment's overall organic content and is crucial to potentially restoring the site's historical natural processes. An analysis of grain size also demonstrated a high percentage of sediment sizes that are appropriate for forage fish spawning. By improving habitat, surf smelt spawning, which had not been previously observed at the project site, is an indication that site conditions and natural processes are being restored and that project objectives are being met. Monitoring of the site was essential in determining that restoration had been effective towards enhancing habitat and environmental functions.