



PROGRAM ON THE ENVIRONMENT

UNIVERSITY *of* WASHINGTON

SMALL BUT MIGHTY: FORAGE FISH SIGNAL THE NEED FOR SHORELINE RESTORATION IN THE PUGET SOUND

Session Day 2, In-Person

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Environmental health indicators are species that can be analyzed to assess ecological functioning and health of a habitat. Forage fish species (Sand Lance and Surf Smelt) are designated environmental health indicators and are vital pieces of the puzzle for Puget Sound bottom-up trophic influences serving as major links between phytoplankton and iconic Puget Sound species such as salmon, seals, and orcas. Forage fish have specific spawning habitat requirements that have major impacts on their ability to withstand human lead artificial disturbances along shorelines such as bulkheads, seawalls, and riprap. The aim of this study is to analyze Sand Lance and Surf Smelt use of nearshore beach sites during reproductive cycles across three strata of natural, armored, and restored beach types; as well as assess how ecological restoration efforts may have an impact on forage fish spawning behavior. Data for this study was collected from a variety of field surveys at eight beach sites on Vashon Island in the Southern Puget Sound. Sediment data was analyzed using WDFW lab protocols to identify and quantify forage fish eggs to connect egg quantities to habitat features with a focus on sediment size and composition. Sand Lance and Surf Smelt were more commonly found spawning on sediment sizes within their previously understood requirement range, however, these species exhibited a level of resistance to sediment diameters outside of their optimal range. Restored and Natural sites did show signs of higher ecological functioning and health and therefore provide healthier habitats for Sand Lance and Surf Smelt. The results of this study have management implications by providing up-to-date information and research on how vital Puget Sound species interact with restoration sites and shoreline armoring and can lead to increased shoreline restoration along the highly altered coastline of the Puget Sound.