

MAPPING THE POTENTIAL DISTRIBUTION OF SHALLOW-SUBTIDAL EELGRASS IN THE GREATER PUGET SOUND REGION OF WASHINGTON STATE

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Eelgrass (*Zostera marina*) is known to support a number of ecosystem services. As a habitat-forming species, it provides spawning, rearing, foraging and refuge habitat for numerous ecologically and economically important species; helps regulate environmental conditions via carbon sequestration, sediment assimilation, and shoreline stabilization; and has high cultural and aesthetic values. As such, it can be argued that the distribution of *Z. marina* within its historic and current range can serve as a strong indicator of local and regional environmental conditions.

With over 3500 km of sinuous shoreline and numerous protected bays, eelgrass is widespread throughout greater Puget Sound and is a key ecological player in the region. Numerous studies designed to identify the factors that control eelgrass growth have been conducted in the greater Puget Sound region, but to date no effort has been made to identify the intrinsic potential of coastal areas to support eelgrass across the entire area. In this study, we used GIS tools and MaxEnt, a species distribution modeling program, to classify the nearshore areas of our region in terms of their potential to support shallow-subtidal eelgrass. Our predictive model delineated 596 square km of potential shallow-subtidal eelgrass habitat around the greater Puget Sound region, of which 145 square km are currently known to be populated with eelgrass. By comparing our derived intrinsic potential maps with known occurrences of shallow-subtidal eelgrass and local survey data, we were able to assess the current status of *Z. marina* in terms of its potential versus realized distribution. Our potential distribution maps are being used to inform management scenario evaluations, in which the outcomes of various management actions are framed in terms of the possible effects specific actions may have on eelgrass distribution and abundance, and consequently the important ecosystem services that *Z. marina* provides.

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