PUGET SOUND
VITAL SIGNS

VITAL SIGN
BEACHES AND MARINE VEGETATION

A functioning, resilient Puget Sound ecosystem includes dynamic shorelines maintained by coastal processes such as shoreline erosion and ecological exchange between terrestrial and aquatic systems. Shorelines are among the most valuable and fragile of our natural resources. Shoreline armoring, the practice of constructing bulkheads (also known as seawalls) and rock revetments, disrupts the natural process of erosion, which supplies much of the sand and gravel that forms and maintains our beaches and creates habitat for many other species.

Marine vegetation provides important habitat functions and services. Kelp, a large brown seaweed, provides an enormous amount of primary production in nearshore waters, supplying food and energy to many species. A variety of species also depend on the vast physical spaces created by kelp forests for shelter and refuge. Eelgrass, a marine plant in the shallow waters of Puget Sound, serves as food source, nursery and shelter for many species. Eelgrass also filters sediments and nutrients, improving water clarity, and protects shorelines from erosion.

This Vital Sign tells us about the extent and condition of beaches and nearshore habitats in Puget Sound and helps us understand whether efforts to protect beaches and reduce shoreline hardening are working.

VITAL SIGN > INDICATOR	PROGRESS	STATUS
Beaches and Marine Vegetation		
Eelgrass Area	NO TREND	NO TARGET
Extent of forest cover in nearshore marine riparian areas	INSUFFICIENT OR NO DATA	NO TARGET
Floating kelp canopy area	INSUFFICIENT OR NO DATA	NO TARGET
Percent of feeder bluffs in functional condition	INSUFFICIENT OR NO DATA	NO TARGET
Short and long-term eelgrass site status	INSUFFICIENT OR NO DATA	INSUFFICIENT OR NO DATA

Related Strategies

- Awareness of Effects of Climate Change
- Climate Adaptation & Resilience
- Education Partnerships
- Floodplains & Estuaries
- Funding
- Greenhouse Gas Emissions & Carbon Sequestration
- Healthy Shorelines
- Invasive Species
- Research & Monitoring
- Riparian Areas
- Smart Growth
- Stewardship & Motivating Action
- Stormwater Runoff & Legacy Contamination
- Strategic Leadership & Collaboration
- Submerged Aquatic Vegetation
- Wastewater Systems
- Working Lands Runoff

Vital Sign Reporter

PSEMP Nearshore Work Group
(coordinator is Jason Toft)
tofty@uw.edu

Last Updated

7/20/2022

Key Vital Sign Messages

- Puget Sound shorelines offer habitat for small fish such as juvenile salmon migrating along the shores to reach the ocean, and beach spawning forage fish like surf smelt. Shoreline armor reduces habitat for fish and blocks the movement of sand and sediment, disrupting natural beach processes, and can block safe and easy access to the water.
- Shoreline armor is present on 715 miles (29%) of Puget Sound shorelines.

- Feeder bluffs (34% of which have been armored) and the use of soft shoreline techniques are getting significant attention for targeted restoration and best practices, respectively, but quantifying restoration actions and impacts is a challenge. Examples meant to overcome this challenge include Ecology's web app for soft shore projects and a summary of shoreline restoration monitoring compiled by the Puget Sound Ecosystem Monitoring Program Nearshore work group.

- There are approximately 56,000 acres of eelgrass in greater Puget Sound. Approximately half of all eelgrass grows in small beds that fringe the shoreline. The remainder grows on broad tidal flats. The largest eelgrass beds are found in Padilla, Samish and Skagit Bays.

- Soundwide eelgrass area has been relatively stable since 2000, as has overall eelgrass area in herring spawn locations during the last forty years. This is reassuring and sets Puget Sound apart from other developed areas where large scale declines are ongoing.

- Although eelgrass populations appear to be stable soundwide, there is greater variability at smaller spatial scales, with individual sites increasing or decreasing. Declines are more common in certain areas, such as South Puget Sound and the San Juan Islands. Heads of bays and inlets, where water exchange is reduced, are locations of particular concern. Local declines are likely due to a variety of stressors, such as physical damage, local water quality impairments, and eelgrass wasting disease.

- Eelgrass health is linked to the Marine Water Vital Sign. Excessive input of nutrients and organic matter can lead to algae blooms, and overgrowth by epiphytes and nuisance macroalgae. These organisms shade eelgrass beds, and lower density and the maximum depth to which eelgrass grows. Additionally, loss of eelgrass to eelgrass wasting disease has the potential to become a major stressor under increasing climate change, as the severity of outbreaks has been linked to warmer water temperatures.

Background Documents

- Shoreline Armoring Implementation Strategy
- Eelgrass 2030 and 2050 Recovery Target Fact Sheet
- 2020 Ecosystem Recovery Targets
    - Leadership Council Resolution 2011-01: Adopting a 2020 ecosystem recovery target for eelgrass
    - Leadership Council Resolution 2011-15: Adopting a 2020 ecosystem recovery target for shoreline armoring
    - Eelgrass 2020 Target briefsheet
    - Shoreline Armoring 2020 Target briefsheet
    - Developing Indicators and Targets for Eelgrass in Puget Sound: A Science Assessment (2010)

Other Resources

- Puget Sound Kelp Conservation and Recovery Plan (2020)
- Puget Sound Eelgrass Recovery Strategy. Washington State Department of Natural Resources (2015)
- Eelgrass Restoration in Puget Sound. Washington State Department of Natural Resources (Gaeckle, 2019)
- Beach Strategies Phase 1 and Phase 2 Reports, prepared by Coastal Geologic Services, Inc.
    - Armor survey methods
- Washington Department of Ecology Coastal Atlas map of drift cells, latest armor, and shoreforms (based on the Beach Strategies program data)
- Puget Sound Eelgrass Monitoring Data Viewer, Washington Deparmtent of Natural Resources
- Eelgrass surveys, Island County Marine Resources Committee
- Shore Friendly Program
- Shore Friendly regional effort, Northwest Straits Foundation
- Relationship between shoreline armor and sense of place in Puget Sound (Trimbach, 2019)

Contributing Partners

DEPARTMENT OF ECOLOGY State of Washington

Washington Department of FISH and WILDLIFE

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES
HILARY S. FRANZ | COMMISSIONER OF PUBLIC LANDS