PUGET SOUND
VITAL SIGNS

VITAL Sign
ESTUARIES

Estuaries occur where freshwater from streams and rivers mixes with salt water from the ocean. These unique, tidal environments are some of the most productive ecosystems on earth and provide important feeding and resting habitat for young salmon, migratory birds, and many other species. The Estuaries Vital Sign tells us about the extent of intact estuary habitat in Puget Sound.

Estuaries also have important commercial, recreational, and environmental value for people. Historically, these areas have been heavily developed for agricultural and industrial needs. Throughout Puget Sound, people are working to implement strategic restoration actions to restore the natural processes that create and maintain these valuable nearshore habitats.

Skokomish River Delta

VITAL SIGN > INDICATOR	PROGRESS	STATUS
Estuaries		
Estuary area in functional condition	GETTING BETTER	NO TARGET
Number of accessible pocket estuaries and embayments	INDICATOR TO BE DEVELOPED	NO TARGET

Related Strategies

- Awareness of Effects of Climate Change
- Climate Adaptation & Resilience
- Education Partnerships
- Floodplains & Estuaries
- Funding
- Healthy Shorelines
- Research & Monitoring
- Riparian Areas
- Smart Growth
- Stewardship & Motivating Action
- Stormwater Runoff & Legacy Contamination
- Strategic Leadership & Collaboration
- Working Lands

Vital Sign Reporter

PSEMP Nearshore Work Group

Last Updated

05/22/2025

KEY VITAL SIGN MESSAGES

- There has been extensive historic loss of tidal wetland habitat in Puget Sound's large river delta sand smaller estuaries. The North Puget Sound has experienced the greatest absolute loss of tidal wetlands, requiring substantial restoration in this region to achieve Puget Sound scale recovery.
- From 2006 to 2023, approximately 3,420 acres of estuarine wetland have been restored to tidal flooding in the 16 largest river deltas in Puget Sound. Additional investments have increased habitat quality despite not increasing acres of estuary (thus are not captured by our indicator).
- Estuarine habitat is shaped by the influences of tides, freshwater, sediment transport and sediment deposition. Restoration efforts that target these ecological processes maximize resilience and help to sustain continued ecosystem function in the face of change. Early restoration progress often represents the least expensive or challenging projects, whereas delayed actions increase in cost and complexity.
- The number of large-scale estuary restoration projects implemented depends on a successful combination of funding, available land, community support, knowledge, project development, and permitting. Restoration activity must maintain landscape-scale benefits for agriculture, waterfowl and shellfish management, flood hazard reduction, and recreational use of these large deltas.
- Healthy estuaries in turn can support the recovery of other Vital Signs including salmon, forage fish, birds, marine water quality, toxics in aquatic life, outdoor activity, and sense of place.

BACKGROUND DOCUMENTS

Implementation Strategy

The Partnership and its affiliated network of researchers works with the three Strategic Initiative Lead Teams on Implementation Strategy development and operationalization. Please read more about these teams and our shared work at https://pugetsoundestuary.wa.gov/recovering-puget-sound/

- Habitat Strategic Initiative
  - Floodplains and Estuaries Implementation Strategy

Indicator Targets

- 2020 Ecosystem Recovery Target
  - Leadership Council Resolution 2011-12, Adopting a 2020 ecosystem recovery target for estuaries (PDF)
  - Estuary Restoration Target briefsheet (PDF)

OTHER RESOURCES

- Articles related to estuarine habitat in the Encyclopedia Of Puget Sound
- State of our Watersheds Report by the Northwest Indian Fisheries Commission
- State of Salmon
- Estuary Common Indicator: protocol, results, and maps
- Estuary Vital Sign Indicator Report: Tracking Estuarine Wetland Restoration in Puget Sound (March 2019)
- Publication on mapping maximum extent of tidal wetlands (Brophy et al. 2019)
- Puget Sound Nearshore Ecosystem Restoration Project Technical Reports

CONTRIBUTING PARTNERS

Washington Department of FISH & WILDLIFE

PUGETSOUND PARTNERSHIP