A functioning, resilient Puget Sound ecosystem is defined to include tidally-influenced wetland habitats at the estuaries of Puget Sound's major rivers that provide ecosystem functions, goods, and services. 75 percent of river delta tidal wetlands have been lost or degraded in Puget Sound. River delta estuaries, a unique environment where freshwater mixes with salt water and sediments collect, provide important feeding and resting habitat for young salmon, migratory birds, and many other species that cannot find these unique benefits in any other place in our landscape. These wetlands consist of several distinct habitat types ranging from tidal forests to unvegetated mudflats, all of which have a unique ecological role. Tidal wetland habitat also contributes to the Puget Sound ecosystem through the production of plant material, which fuels a rich food web as it decays. These areas are also highly valuable for people: they have been heavily developed and they provide some of the most fertile agricultural lands in the region. The Estuaries Vital Sign tracks indicators of restoration in the 16 largest river deltas in Puget Sound.

### 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

**Vital Sign Reporter**
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### Key Vital Sign Messages
- There has been extensive historic loss of tidal wetland habitat in Puget Sound. While much of this loss has been in the large river deltas, smaller estuaries are also currently a fraction of their historic extent.

- 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.

- The estuaries of North Puget Sound (Nooksack, Samish, Skagit, Stillaguamish and Snohomish) historically made up over 80 percent of the tidal wetland habitat in Puget Sound. However, these large river deltas have experienced the greatest absolute loss of tidal wetlands and recovery at the Puget Sound scale is not possible without substantial restoration in this region. A number of watershed-based local teams, in collaboration with tribal and agency partners, are working to accelerate the pace of estuary restoration while maintaining landscape-scale benefits for agriculture, waterfowl and shellfish management, flood hazard reduction, and recreational use of these large deltas.

- Since 2006, approximately 3,430 acres of estuarine wetland have been restored to tidal flooding in the 16 largest river deltas in Puget Sound, which is 46 percent of the recovery target set for 2020. Large gains have been made in the Nisqually, Snohomish, Skagit and Skokomish deltas in this time.
period, with the Nisqually and Skokomish being notable because they represent large proportions of the historic tidal extent for these deltas. Early restoration progress often represents the least expensive and challenging projects in the region comparatively, with future actions increasing 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.

### Background Documents

- Floodplains and Estuaries Implementation Strategy
- Estuaries Vital Sign report March 2019
- 2020 Ecosystem Recovery Target
  - Leadership Council Resolution 2011-12, Adopting a 2020 ecosystem recovery target for estuaries (PDF)
  - Estuary Restoration Target briefsheat (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 results and maps
- Estuary common indicator protocol
- Publication on mapping maximum extent of tidal wetlands (Brophy et al. 2019)
- Puget Sound Nearshore Ecosystem Restoration Project Technical Reports

### Contributing Partners