

PUGET SOUND
VITAL SIGNS

INDICATOR
FEEDER BLUFFS IN FUNCTIONAL
CONDITION



This indicator measures the amount (length and percent) of Puget Sound feeder bluffs shorelines that are in functional or impaired condition (Figure 1). Feeder bluffs are eroding coastal bluffs that deliver the majority of sediment to maintain Puget Sound’s beaches and spits (Keuler 1988). Beaches and bluffs provide critical habitat for the region’s fish and wildlife, including spawning beaches for forage fish and rearing habitat for juvenile salmon. Shoreline armor is the main factor that impedes the functional of feeder bluffs (Johannessen and MacLennan 2007; MacDonald et al. 1994) and therefore the presence of armor along feeder bluff shores is used as a proxy to assess feeder bluff function in our region.

Indicator Progress



Target Status



Target

No targets are currently set for this indicator.

Data Source

Feeder Bluffs Conditions Assessment (Natural Systems Design, 2025)

Changes in Shoreline Armoring in San Juan County, Washington, 2009-2019: Mapping, Analysis, and Regulatory Review (Friends of the San Juans 2022)

The WRIA 9 Marine Shoreline Monitoring and Compliance Project Phase 2 Final Report (King County, 2019)

Final WRIA 8 & 9 Beach Feeding Sources and Accretion Areas (Coastal Geologic Services et al., 2005 modified by Anchor 2011)

Department of Ecology 2021 Surveys (not published)

Indicator Lead

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Last Updated

07/07/2025

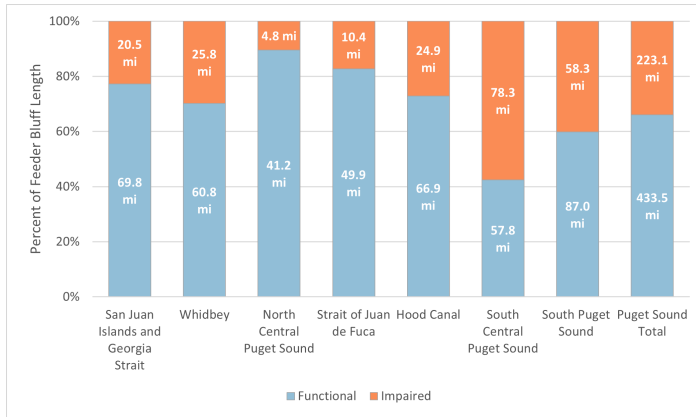


Figure 2. Percentage of feeder bluff (FB, FBE, FB-T) in functional and impaired condition by PSNERP sub basin and for the entire Puget Sound based on presence and absence of shore armor. Data includes compilations by Coastal Geologic Services (2017) and Natural Systems Design (2025).

Key Vital Sign Indicator Results

- Just over one third (34%) of feeder bluffs or 223 miles have impaired function due to shoreline armor Sound-wide (Figure 2).
- There has been no significant change or improvement in feeder bluff function in the last few decades based on a subsampling of 32% of feeder bluff length in the region.
- The highest levels of feeder bluff impairment are concentrated in South Central and South Puget Sound, whereas the Strait of Juan de Fuca and North Central Puget Sound retain the highest percentage of functional feeder bluffs.
- The majority of armor was categorized as in “OK” condition, substantially reducing the ability of feeder bluffs to deliver sediment to nearshore ecosystems.
- Restoration through armor removal along feeder bluffs has shown localized areas of notable improvements in feeder bluff function.

CONTRIBUTING PARTNERS



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 Department of
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 WILDLIFE**



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