

# PUGET SOUND VITAL SIGNS

## INDICATOR FEEDER BLUFFS IN FUNCTIONAL CONDITION

This indicator measures the amount (length and percent) of Puget Sound feeder bluff shorelines that have been armored. Feeder bluffs are eroding coastal bluffs that deliver the sand and gravel to maintain Puget Sound's beaches and spits. 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 disrupts the natural supply of sediment and can lead to the loss of beaches and degraded nearshore habitat.

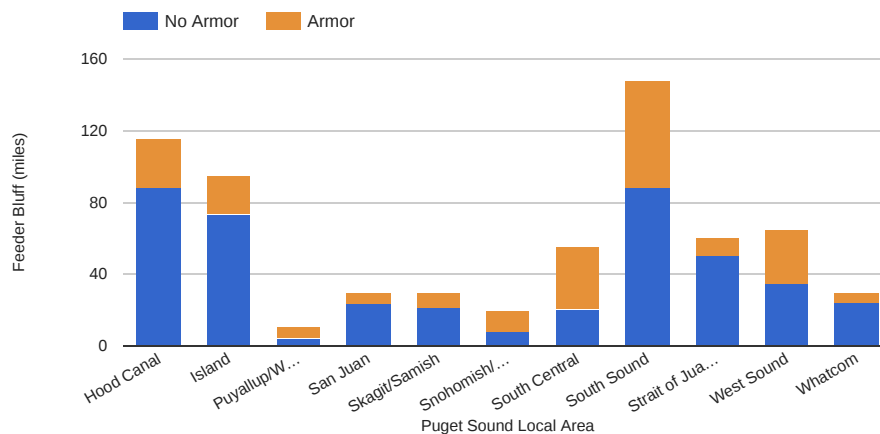
Indicator  
Progress

Target  
Status



### Feeder bluffs in functional condition

By: Shoreline Length



Extent of feeder bluff shorelines where armor is present (orange) or not present (blue) by Puget Sound Local Area. The 11 Local Area geographies are derived from the Puget Sound Partnership Action Areas to represent local communities working to advance the Partnership's Action Agenda.

Target

No targets are currently set for this indicator.

### Data Source

Beach Strategies Phase 1. Estuary and Salmon Restoration Program Learning Project #14-2308. Prepared by Coastal Geologic Services (2017).

Changes in Shoreline Armoring in San Juan County, WA 2009-2019: Mapping, Analysis and Regulatory Review. NTA 2018-0828. Friends of the San Juans (2022).

### Indicator Lead

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### Last Updated

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## Key Vital Sign Indicator Results

- Feeder bluffs stretch along 656 miles (27%) of Puget Sound's total 2,460 marine shoreline miles. 34% (224 miles) of the feeder bluff shoreline is armored.
- Feeder bluffs are present throughout the Puget Sound region; however, their relative length and the extent of armor varies by Local Area. We see higher rates of armor on feeder bluffs in the more developed parts of Puget Sound, including the Puyallup/White, South Central, and Snohomish/Stillaguamish Local Areas. See the indicator's [Interpretation of Results](#) for details.
- Shoreline armor on feeder bluffs negatively impacts several ecosystem processes, including reducing the supply, transport, and deposition of both sediment and large wood. These impacts extend to nearshore and marine habitats beyond the location of the armor.
- We do not have comprehensive data to describe changes in feeder bluff armoring over time. However, the Friends of the San Juans Armor Mapping Project provides a good example of how one Local Area quantified changes in armor and then linked those results to permit records.
- Friends of the San Juans mapped changes in shoreline armor between 2009 and 2019. They found that more armor was installed than removed on San Juan County shorelines over the 10-year period. 1.8 miles of new hard armor was installed (0.26 miles on feeder bluffs), while just 0.3 miles of armor was removed (257 feet on feeder bluffs).
- Friends of the San Juans also reviewed permit records for the waterfront sites where new armor was installed. They found that a significant amount of shoreline armoring is occurring without legal authorization or in sizes greater than permitted.

## CONTRIBUTING PARTNERS



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**San Juans**

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