

Bowman Bay Nearshore Restoration Project

Northwest Straits Foundation, Skagit County Marine Resources Committee (MRC) and Washington State Parks partnered to restore 540 linear feet of shoreline and 0.60 acres of beach at Bowman Bay in Deception Pass State Park. Bowman Bay, a 2,100 foot long pocket beach, is located on the southwest shore of Fidalgo Island within Skagit County, WA.

Bowman Bay has been documented by Washington Department of Fish and Wildlife (WDFW) as surf smelt spawning grounds and by U.S. Fish and Wildlife Service as critical and essential habitat for foraging and migration bull trout. Bowman Bay is also extensively used by juvenile salmon.

The area has a long history of work by the Civilian Conservation Corps in the 1930's and 1940's and was armored prior to the 1970's to protect a fish hatchery and marine biology station operated by the Washington Department of Fisheries (now Fish and Wildlife) since 1947. In 2006, the armor was damaged in a storm and was repaired in early 2011. The bulkhead consisted of approximately 2,050 tons of armor stone and quarry spall that interrupted shoreline processes and disrupted potential habitat for fish such as surf smelt, juvenile salmon, and bull trout.

This project is designed to restore natural erosion and sediment transport along and across the shoreline creating a viable habitat for juvenile salmon and bull trout migration, and forage fish spawning. The project removed the rock armoring, regraded the beach to match the natural contour, added beach nourishment material suitable for forage fish spawning, and substantially enhanced riparian vegetation.

PROJECT PROFILE

investment	\$226,357 537 volunteer hours
partners	Skagit County Marine Resources Committee Washington State Parks Skagit Fisheries Enhancement Group Salish Sea Stewards
benefit	540 linear feet of shoreline restored .60 acres of beach and upland restored 1,080 tons of beach material added
funders	Puget Sound Marine Nearshore Grant Program Estuary Salmon Restoration Program Northwest Straits Commission/Skagit MRC US Environmental Protection Agency Puget Sound Partnership ALCOA Foundation

Nearshore Processes

The nearshore habitat and habitat forming processes at the site were degraded and impeded by the riprap. Natural processes such as wave action, landslides, and erosion shape the shorelines of the Northwest Straits. Bulkheads, seawalls, docks and groins can interrupt sediment flow from naturally eroding shoreline bluffs.

Riprap causes a coarsening of beach sediment in front of the bulkhead by increasing turbulence and mobilizing and washing away finer sediment. This decreases the total volume of beach sediment and creates a mixture of fine and coarse sediments unsuitable for forage fish spawning.

This increasing turbulence and wave energy also degrades the nearshore habitat for smaller juvenile Chinook salmon, which favor nearshore habitats

with low gradient, shallow water, fine-grained substrates and low wave energy.

Forage Fish Habitat

Spawning of surf smelt has been documented on the shore of Bowman Bay, and spawning Pacific sand lance has been documented on shorelines to the north and south of the project area. These species are important prey for many marine fishes, birds and mammals. Surf smelt is also fished recreationally in Puget Sound.

Sand lance spawn on mid-intertidal sandy beaches while surf smelt spawn in high intertidal sands and gravels. Eggs of surf smelt have been shown to be highly susceptible to high summer temperatures on beaches that do not have at least partial shading to help keep the developing eggs cool and moist.

The riprap at Bowman Bay buried suitable forage fish spawning habitat. Removal of the riprap allows for natural sediment transport processes, a decrease in wave turbulence allowing finer sediments, large woody debris, and marine wrack to settle providing a suitable habitat for potential future forage fish spawning. The removal will also allow for the habitat to move landward as sea levels rise.

Monitoring

Pre and post-construction monitoring is being performed by citizen scientists and WDFW to determine what changes in habitat and habitat usage have occurred. Monitoring parameters include forage fish spawning surveys, nearshore fish use, large woody debris and wrack accumulation, sediment composition, elevation surveys, insect fallout, and surface epifauna and algae surveys. Interested volunteers are encouraged to get involved!

For more information contact:

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Map of Bowman Bay with project area highlighted in red



Project area before restoration including 540 linear feet and approximately 2,050 tons of riprap armoring to be removed.



Project area after restoration and first phase of planting. December 2015.