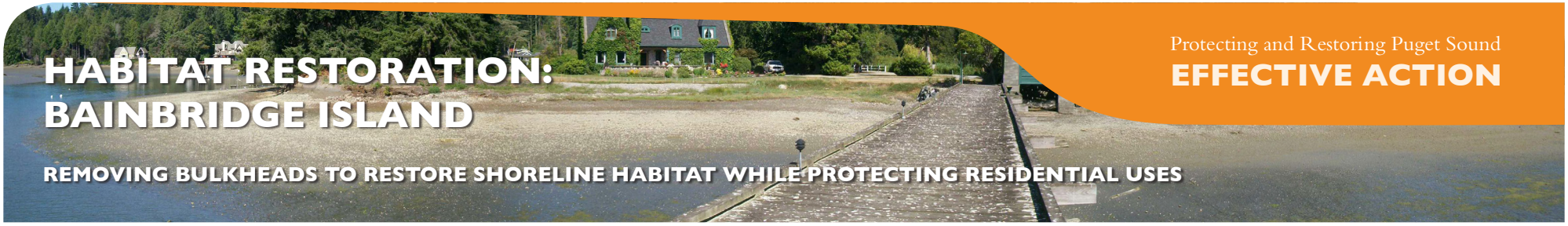


HABITAT RESTORATION: BAINBRIDGE ISLAND

REMOVING BULKHEADS TO RESTORE SHORELINE HABITAT WHILE PROTECTING RESIDENTIAL USES

Protecting and Restoring Puget Sound
EFFECTIVE ACTION

A LOOK AT SUCCESSES AND LESSONS LEARNED

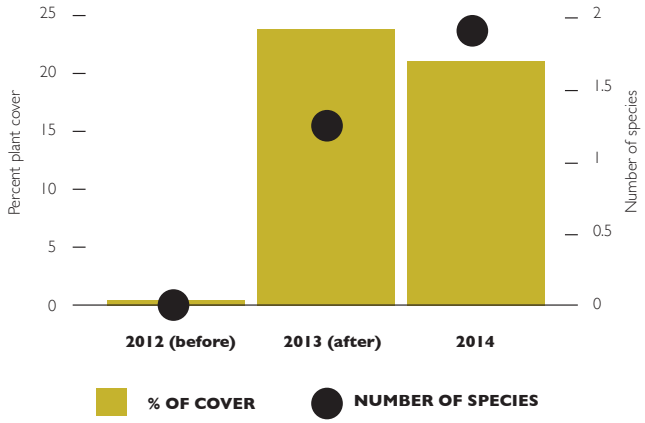
The Salish Sea's nearshore begins in shallow salt water and extends up the beach to the land and plants beyond the reach of high tide. The nearshore is a critical habitat where sediment and food move from the land to the sea. These rich habitats allow fish and wildlife to thrive. The exchange of food is lost when shoreline armoring, also called bulkheads, is placed on the beach and natural vegetation is removed. The Powel Shoreline Restoration Project removed nearly 1/4 mile of bulkheads from a private residential property and restored native vegetation. The project restored natural shoreline connections, while also improving residential uses.

Removing bulkheads increased beach area, saltmarsh plants, and insects for salmon to eat.

WHAT WORKED

- The landowners and local community enjoy and appreciate the natural shoreline.
- Shoreline erosion is very limited across the entire site.
- Beach habitat has increased.
- Native saltmarsh plants now cover a larger area near the high tide line.
- Insect prey for fish has increased where native vegetation has been established.

SALTMARSH PLANTS INCREASED WHERE BULKEADS WERE REMOVED



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MORE INFORMATION IS AVAILABLE AT: WWW.PSP.WA.GOV/EFFECTIVEACTION.PHP

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OVERVIEW OF THE POWEL BULKHEAD REMOVAL AND SHORELINE RESTORATION PROJECT

GOAL	ACTIONS	RESULTS	CHALLENGES
Restore nearshore	• Removed 1,540 feet of bulkhead and fill material behind bulkhead • Exposed 0.4 acres of intertidal area • Removal completed in 16 days Cost: $223,500	• Saltmarsh vegetation expanded • Insect food for fish increased • Erosion was not observed on property • Natural shoreline has no future costs for maintenance or repair of bulkheads	• Obtaining permits to remove bulkheads was expensive and unpredictable • Planning construction around residential property owners during construction • Project funding did not support monitoring costs
Restore native plants	• Removed nearly 1 acre of non-native plants • Planted 2,500 native plants • Volunteers donated 325 hours to plant and maintain vegetation • Landowner continues to maintain plants Cost: $60,655	• 85% of new plants survived • Experimental pickleweed planting survived and spread • Photos demonstrate changes in vegetation and shoreline	• Landowner preference restricted plant diversity and planting area • Shell middens, indicating historic cultural resources, restricted weed control and increased maintenance costs
Educate and engage community	• Hosted outreach events • Engaged and coordinated with neighbors Cost: $60,000	• More than 500 decision makers, scientists, students, volunteers, and community members have visited the property since 2008 • Landowners and neighbors overwhelmingly pleased with outcome	• The large number of requests to visit property was unanticipated

See background narrative for total costs

Bainbridge Island bulkhead removal advanced 2014 Action Agenda Strategies B2 (Protect and Restore Nearshore and Estuary Ecosystems) and B5 (Protect and Restore the Native Diversity and Abundance of Puget Sound Species).

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INSIGHTS FROM BAINBRIDGE ISLAND:

- Early, regular landowner involvement and clear communication of benefits and risks is critical to project success.
- Expect challenges, including permitting, protecting cultural resources, and addressing concerns of adjacent property owners.
- Use the Shoreline Monitoring Toolbox to measure the effectiveness of restoration actions.
- Best measures for this site were beach slope, plant cover, and insects.