Healthy shorelines equal a healthy Puget Sound

While most people may not live on Puget Sound's 2,500 miles of shoreline, we do treasure the area where our land meets our waters. Shorelines are where we harvest clams and take a dip on a hot August day. They are where we catch a ride on a state ferry and connect with the salmon, orcas and other natural wonders that make Puget Sound such a special place to live.

Natural shoreline

Bulkheads and other shoreline armoring reduce the services and values provided by Puget Sound. In the past, we saw shoreline erosion as a problem and installed armoring in an attempt to stop it. We know now that "erosion" is really Puget Sound's way of replenishing and maintaining its beaches.

More than 25 percent of Puget Sound is already armored. We need to find new ways to provide access to our shorelines for water-dependent uses yet still protect this unique resource and its natural processes.

Armored shoreline

We need to find ways to manage growth and protect and preserve the environmental health of Puget Sound. Restoring and safekeeping our shorelines is a high priority for the Washington Department of Ecology (Ecology) and Puget Sound Partnership. The Partnership was formed to specifically develop and oversee an Action Agenda to help restore, protect and preserve the Sound by 2020, based on broad community and scientific input.

WHY IT MATTERS

More than 25% of Puget Sound's shorelines are armored with bulkheads and similar structures.

Armoring can protect upland sites from short-term erosion, but can harm shoreline habitat and dramatically change beaches. Each change may be small, but the combined effect adds up.

What is shoreline armoring?

Shoreline armoring is the construction of bulkheads, seawalls, riprap or any other structure to harden a shoreline against erosion.

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Special accommodations:

To ask about the availability of this document in a version for the visually impaired call the Shorelands & Environmental Assistance Program at 360.407.7291.Persons with hearing loss, call 711 for Washington Relay Service. Persons with a speech disability, call 877.833.6341.

Bulkheads and other armoring have cumulative impacts

Landowners typically use bulkheads and other structures to stabilize shorelines, improve access to the water, and create dry land to enhance commercial or recreational activities. Although one bulkhead may not seem like much, the cumulative impacts of individual actions add up. In Puget Sound, there are now long stretches of armored shoreline consisting entirely of end-to-end small bulkheads.

Scientists currently estimate that 700 miles of Puget Sound shorelines are armored. This is about the distance from Seattle to San Francisco! The amount of armoring varies by the type of shoreline, local regulations, and level of urbanization. The more urban the shoreline, the more armoring exists. Between Everett and Tacoma, 90 percent of the shoreline is armored while in San Juan County, only five percent is armored.

Armoring harms habitat, changes our beaches

There is broad scientific consensus that armoring is generally harmful to marine ecosystems including Puget Sound and its associated habitats, plants, and animals. Armoring has varying degrees of environmental impacts related to disruption of natural shoreline processes. This is particularly true when armoring is placed where wave and tidal forces are the greatest.

Many fish and wildlife species require healthy intertidal habitats for food, migration, cover, and spawning. Armoring structures that run parallel with the shoreline, such as bulkheads, can negatively affect high intertidal habitat by burying habitat and altering beach sediment composition and supply. Additional impacts (such as removing overhanging vegetation and large woody debris on the beach or altering groundwater flow) can have either direct or indirect effects on marine shore areas, fish spawning habitats, eelgrass beds, and shellfish beds.

Puget Sound beaches depend on local sources of beach material. Armoring can disrupt this supply of material and change the characteristics of beaches and habitat.

- Sand and other glacial sediment from "feeder bluffs" replenish and maintain Puget Sound beaches. Placing armoring structures on bluff–backed beaches can block this supply.

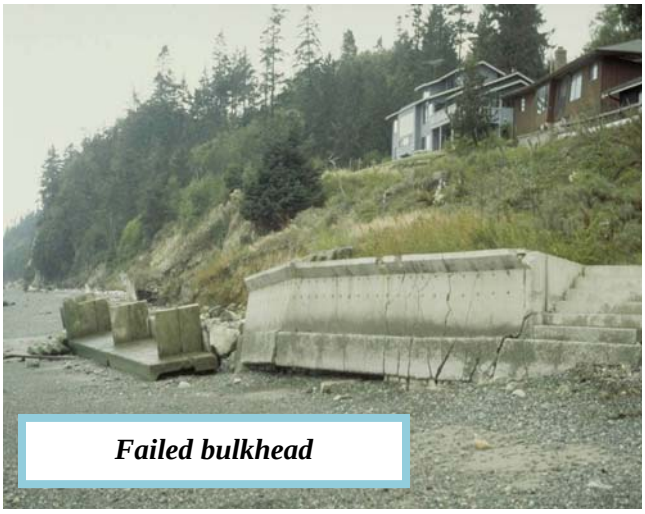
- Shorelines are dynamic, especially in "drift zones" where currents run in a particular direction and constantly move material along the beach.

Feeder Bluff

Disrupting the sediment supply can change the nature and composition of nearby beaches, changing their ability to support different types of fish and wildlife species.

- When beaches are undersupplied with material, critical habitat for species such as forage fish and shellfish can be reduced or lost. And areas of narrowed beaches may be subject to quicker, localized erosion from storm-driven waves.

Armoring also changes how wave energy behaves. Hard vertical surfaces reflect wave energy back, often resulting in lowering beaches and washing away fine materials, leaving gravel and larger rocks behind instead. These changes can reduce or eliminate habitat for spawning forage fish and other species. The lowered beach can also undercut a bulkhead, causing it to fail.



Failed bulkhead

What can we do?

We need to act now to ensure the future economic and environmental vitality of Puget Sound. More than 4.4 million people live in the Puget Sound region, which is expected to grow by at least another 1.5 million by 2030. As the region grows, the pressure to modify Puget Sound shorelines and the natural patterns of water flow, shoreline creation and erosion, and fish and wildlife habitat will, too. Modernizing shoreline master programs and using "softer" alternatives to bulkheads are two powerful tools.

Modernize local shoreline master programs

The Shoreline Management Act (RCW 90.58) requires local governments to have shoreline master programs that govern armoring and other shoreline activities (See www.ecy.wa.gov/programs/sea/shorelines/smp/index.html). Local shoreline master programs are currently being updated by towns, cities and counties throughout Puget Sound according to a timetable set by the 2003 legislature. These local programs are a mix of policies and regulations tailored to the specific needs of each local community.

The location and design of a bulkhead or other armoring must conform to local and state shoreline regulations. Local programs must be consistent with the minimum requirements set by state law, but may go further in regulating shoreline armoring. Property owners should consult with their local planning department to determine what specific standards apply and permits are required for armoring projects.

Updated local shoreline master programs are adopted jointly by each local government and Ecology. This gives the state an opportunity to ensure that local programs are based on the current scientific understanding of the problems caused by armoring.

Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) recommendations

The Puget Sound Nearshore Ecosystem Restoration Project was formed in 2001 to evaluate environmental degradation in Puget Sound, craft, evaluate and recommend solutions, and help carry the strategies through at the local level. The partnership includes representatives from Ecology, Washington Department of Fish & Wildlife, and U.S. Army Corps of Engineers. Among the group's recommendations is restoring damaged shorelines to make up for past harm, and minimizing damage in the future. Their recommendation for local shoreline regulations include:

- Categorize critical shoreline habitat as natural or another category that provides a high level of protection.
- In cases where protecting existing property is necessary, work with local governments to provide clear and speedy processes for reviewing armoring project proposals.
- Require property owners to provide site-specific information so local governments can make a reasoned determination on whether the armoring is needed and can be done with significant impacts.
- Work to prioritize areas where restoration can provide the greatest benefits.

Avoid shoreline armoring, use "softer" alternatives


"Soft armoring"

In many cases, shoreline properties can be developed without the need for a seawall or bulkhead. Placing buildings, roads, and other development back from the bluff or beach and doing careful site planning can avoid the need for armoring.

Managing vegetation and site drainage can also reduce risks from future problems. Stairs and beach access can be designed to minimize shoreline intrusion and associated problems.

Alternatives to armoring can provide protection without causing as many adverse impacts. Options include using large wood or gravel berms to provide wave protection and using vegetation and improved drainage to stabilize slopes. The success of armoring alternatives is site specific. More studies regarding armoring alternatives are needed to assess their long-term compatibility with the Puget Sound environment.

For more information:

City and county planning offices are the best source for information about policies and regulations governing local shorelines. Other resources include:

- Shoreline Master Programs – Washington Department of Ecology http://www.ecy.wa.gov/programs/sea/shorelines/smp/index.html
- "Alternative Bank Protection Methods for Puget Sound Shorelines" – Washington Department of Ecology, publication #00-06-012. Main receptionist: 360-407-6000 http://www.ecy.wa.gov/biblio/0006012a.html
- "Green Shorelines: Bulkhead Alternatives for a Healthier Lake Washington" – City of Seattle. Contact: Dave LaClergue, 206-733-9668, dave.laclergue@seattle.gov http://www.seattle.gov/dpd/Planning/Green_Shorelines/Overview/
- Puget Sound Shorelines http://www.ecy.wa.gov/programs/sea/pugetsound/index.html
- Technical studies and information on restoring near-shore ecosystems in Puget Sound. http://www.pugetsoundnearshore.org/
- Puget Sound Partnership's Action Agenda http://www.psp.wa.gov/

Photos taken by Hugh Shipman, Washington Department of Ecology