



Fall 2016

Evaluating Shoreline Protection Options

By Scott Chase, WSU Shore Stewards Coordinator, Island County..

In the Spring 2016 newsletter, we discussed how bulkheads change the shoreline. The Late Summer 2016 edition covered several natural alternatives to bulkheads. This edition will provide information on what steps to consider if you are seeking a natural alternative to bulkheads.

Planning Your Property's Future

Perhaps you were able to find a piece of undeveloped waterfront property along Puget Sound, and are now preparing to plan every step in its development. Possibly you purchased an existing shoreline bluff home, and are considering what you can do to protect it from erosion. Or you may have concerns about the property and house that's been in your family for decades, and what to do when the old, deteriorating bulkhead topples over in a winter storm. The following pages should provide some thoughts on what you can do to minimize erosion, while at the same time protecting your property's wildlife habitat.

Undeveloped Property: The Property Assessment

One of the best actions you can take at this stage would be to do a site assessment of your property, which will help you understand the location and amount of erosion taking place, as well as what is causing the erosion. This could include hiring professionals who understand shoreline processes, examining the property yourself, and talking with neighbors who can provide observations on what they have observed over the years, as well as measures they have taken to address erosion on their own properties.



*Neighbors sharing observations about erosion that has taken place along the bluff over the years.
Photo by Scott Chase*

Some of the factors you will want to take into consideration in assessing the property and amount of erosion are included in this checklist from Washington Dept. of Fish and Wildlife:

GEOLOGY

- Slopes and bluffs
- Backshore characteristics (width, presence of large logs)
- Beach material and composition
- Evidence of landslide activity
- Presence of fill or excavated areas

COASTAL PROCESSES

- Long term rate of erosion
- Landform (beach, bluff, stream mouth)
- Location in drift cell (beginning, middle, end, or no appreciable drift)
- Direction of net drift (sediment movement)
- Barriers to sediment movement (bulkheads, groins, fill) within the drift cell, especially updrift of the site

HYDROLOGY

- Seeps, springs, and streams
- Irrigation systems, water lines, drainfields
- Hydrophilic vegetation
- Drainage measures (discharges, impervious surfaces)

OTHER SITE CHARACTERISTICS

- Plant species present
- Structures and setback distances
- Presence of key wildlife and associated habitat
- Potential for cultural resources
- Past and present erosion control measures

Prior to hiring a professional, you should research what type of assessments they provide, their expertise with shoreline properties similar to yours, and if their report will include all that you require, or if you'll need to hire additional professionals. A geotechnical engineer can help determine the amount of erosion that may have occurred over the years, what may have caused that erosion, and the steps you should consider to limit erosion in the future, but may recommend that you hire a landscape designer to help you determine what you should plant to further protect your property. Other professionals who specialize in shoreline properties include coastal engineers, structural engineers, hydrologists, geologists, engineering geologists, arborists, and others. You may only need to hire one, but the challenge is figuring out which one, and what choices you have in your area. Visiting websites of these professionals can tell you a lot about their past projects and expertise. Talking to others in your community to find out who may have hired a professional and whether they would recommend that person or not could be quite helpful. If a nearby neighbor hired a professional, many of the observations in their report may be applicable to your property as well; ask your neighbor if you could possibly see their report.

You may also want to drop into your local planning office, and possibly meet with your county or city planner. They can assist you in finding out what regulations you may need to consider, permits that may be required from other agencies, the timeframe for permitting, and any special studies that may be required.

Keeping Things Natural

You bought your shoreline property for the spectacular view and access to the water. You know that having a natural looking beach will provide much more satisfaction and maintain property value than having a vertical bulkhead between your house and the beach. And, after professional consultation, you have a better understanding as to whether you require hard armoring (bulkhead) or if you can get by with no armoring or natural-looking soft shore protection, examples of which were described in the last newsletter. What are some of the other steps you can take to ensure additional protection from erosion in the future?

Create a Site Plan

A site plan can be as simple as a simple diagram you draw yourself, showing key features such as property lines, locations of the house and other structures, septic tank and drainfield locations, driveways and paths, slope, vegetation, and setback distances. Or you can have a professional draw a more complex plan like the one shown below. You should try to site your structures as far back on the property as possible, to protect against future erosion. Vegetation can be planted to not only provide bluff stability and erosion protection, but also to maintain your views. You'll likely want to work with your contractor and architect for this stage of development.



Determine Your Choice of Shoreline Erosion Protection

The chart below, from the publication “Your Marine Waterfront”, shows cost and complexity considerations for the different methods of shoreline protection. The method you choose, after consultation with professionals, will need to be designed by an engineer who specializes in this field. See the pages on soft shore alternative permitting to get an idea of what will be required of you during the permitting process. Your contractor should be able to help you in this stage.

DESIGN TECHNIQUE TYPE	DESIGN TECHNIQUE	COST	PROJECT COMPLEXITY	
 <p>NATURAL</p> <p>Hugh Shipman</p>	Natural	LEAVE NATURAL	N/A	N/A
	 VEGETATION	\$		
	 DRAINAGE	\$ - \$\$		
	 LOCATING STRUCTURES	\$ - \$\$\$		
 <p>SOFT</p> <p>Hugh Shipman</p>	Natural	 LOG PLACEMENT	\$	
		 BEACH NOURISHMENT	\$\$	 - 
		 RESLOPE AND REVEGETATION	\$ - \$\$\$	 - 
 <p>HARD</p> <p>Theresa Mitchell</p>	Man-Made Structures	 BULKHEAD INSTALLATION	\$\$\$	

Plan Drainage to Minimize Erosion

When you remove trees and other vegetation to construct your house, driveways and paths, septic system and drainfield, patios and decks, and other impervious surfaces, rainwater that normally would have been absorbed into the soil now flows off the property, increasing the chances for erosion. There are various ways to control this runoff. Water can be piped over a slope using an engineered tightline system, channeling the water to a diffuser on the beach. Low impact development techniques can be used to infiltrate the runoff into the ground. And vegetation can be employed to absorb the water in the soil and evaporate it into the atmosphere, removing the weight to minimize slide potential. Be sure to consult experts when planning your drainage control.

Use Vegetation for Erosion Control

Appropriate vegetation can not only assist you with your drainage situation, but can also help prevent erosion. Native trees, shrubs and plants, installed on your upper beach area, slope, or in a buffer area at the top of your bluff, can not only reduce erosion, but can provide the stability needed to help prevent some landslides. In some low-energy locations, vegetation may be all that's required. A 2015 newsletter, based on Guidelines 2 and 5 of the *Guide for Shoreline Living*, discusses how you can use vegetation to your advantage. To see this newsletter, go to:



Cornet Bay photo by Kelsey Gianou, courtesy WDFW.

<http://shorestewards.cw.wsu.edu/wp-content/uploads/sites/3/2014/12/2015-Designing-with-nature-Issue-104.pdf>

Purchasing an Existing Home

When you purchased your already-built coastal home, you likely had it checked by a property inspector who provided you with a written report regarding the structural condition of the house, listing any current or potential problems. This helped you decide whether the house was acceptable in its current condition, whether repairs should be made prior to completing the transaction, or if the house wasn't what you wanted after all. The potential for near-future repairs, and associated costs, likely had a big part to play in your decision to complete the transaction.

At the same time, did you have the property evaluated for erosion, and what the condition and longevity is for your bulkhead, if you have one? If not, and you have any concerns about future erosion or bluff stability, you might consider having an inspection done soon. Some inspectors are now using "drones" to inspect bluffs and other locations not easily seen from the shoreline or at the top of a bluff. If you find there is any potential for rapid erosion or landslide, you may be able to take appropriate action now. You can also plan corrective measures for the future, which would likely be much less expensive or drastic than just waiting to take action until after a slide or other catastrophic event occurs. It's possible that simply adding native vegetation or making changes to your drainage can provide an affordable alternative to future problems. Your coastal expert's report should help guide you as to what you need to consider doing in the future.

Taking Care of Problems



Photo by Scott Chase

When your family bought the shoreline vacation cabin in the 1980s, the bulkhead showed some amount of deterioration, but still appeared to have a number of years of useful life remaining. A recent walk on the beach, however, revealed that winter storms and high tides had caused a huge drift log to crash through part of the bulkhead. You realized that the bulkhead was pretty much gone, having deteriorated over the decades, and all it would take is a few more years of winter storms to have it fail completely. You

are retiring next year, and plan to move to the property full time. You checked with the Planning Department, and found that unless there is an emergency and a threat to your property, getting permits to replace or repair a bulkhead is now quite difficult. What to do? If you, or an expert, determine that you still have a few years left before the bulkhead is no longer functional, now is the perfect time to begin exploring bulkhead alternatives. The Late Summer 2016 newsletter discussed several of these. Other alternatives can be seen in these 2 slide presentations made by the Washington Department of Fish and Wildlife, which have more information than can be covered in this newsletter:

- [Marine Shoreline Design Guidelines](https://www.islandcountywa.gov/Planning/Documents/CC_072314_MSDG.pdf) , Theresa Mitchell, WDFW, 2014:
https://www.islandcountywa.gov/Planning/Documents/CC_072314_MSDG.pdf
- Department of Ecology Soft Shore Webinar, Theresa Mitchell & Kelsey Gianou, WDFW:
<https://www.islandcountywa.gov/Planning/Documents/CCWebinarSoftShorelinesEcology7-23-2014.pdf>

If your property is eroding to the point where you fear losing your house in the near future, you might also consider moving your house further inland. Though this may be seen as a drastic move, it may be less expensive than replacing your failing bulkhead. There are a number of firms in the Puget Sound region who specialize in house moving; some even move homes on barges from one part of the Sound to the other!



Resources

1. Marine Shoreline Design Guidelines. Prepared for The Aquatic Habitat Guidelines Program, 2014. Washington Dept. of Fish and Wildlife.
<http://wdfw.wa.gov/publications/01583/wdfw01583.pdf>
2. Your Marine Waterfront, 2016. Washington Dept. of Fish and Wildlife.
<http://wdfw.wa.gov/publications/01791/wdfw01791.pdf>
3. Soft Shoreline Stabilization: Shoreline Master Program Planning and Implementation Guidance, 2014:
https://www.islandcountywa.gov/Health/DNR/Documents/Soft%20Shore%20Stabilization_ECY.pdf
4. Johannessen, J., MacLennan, Andrea. Beaches and Bluffs of Puget Sound, 2007.
http://www.pugetsoundnearshore.org/technical_papers/beaches_bluffs.pdf
5. Guide for Shoreline Living, 2015. Washington State University Extension.
<http://shorestewards.cw.wsu.edu/guidelines/>
6. Menashe, E., 2004. Shoreline Management and Stabilization Using Vegetation. Greenbelt Consulting, Clinton, Washington. <http://greenbeltconsulting.com/ctp.html>
7. Summaries: Shoreline Stabilization Measures, Washington Dept. of Ecology.
<http://www.ecy.wa.gov/programs/sea/shorelines/stabilization/summaries.html>
8. Shore Friendly: Protecting Your Property and Puget Sound.
<http://www.shorefriendly.org/>



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