

Stormwater and Coastal Bluffs

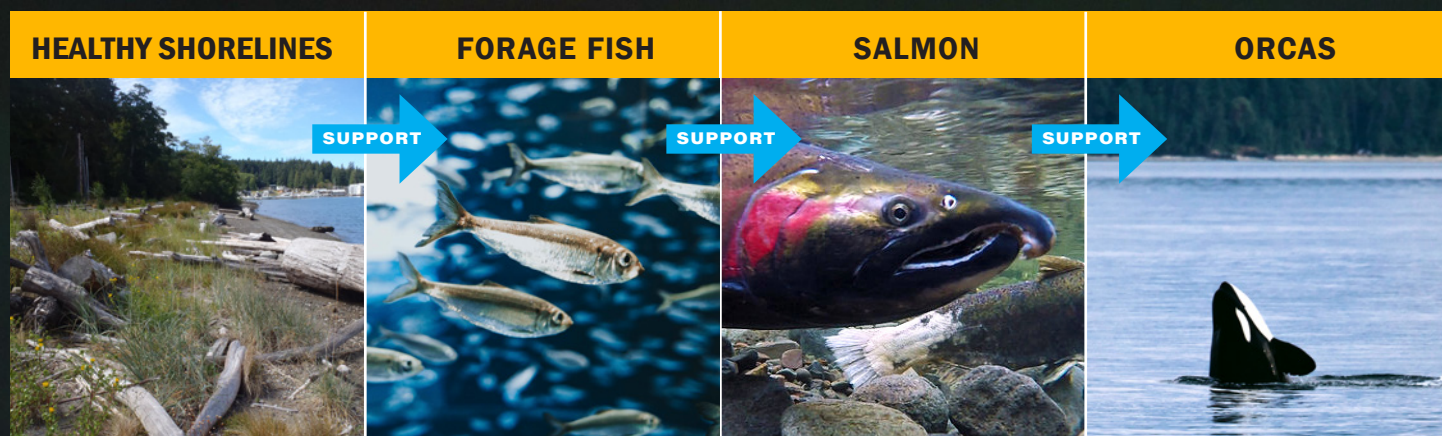
A Guide to Improving Stormwater Management on Your Property

What is Stormwater?

Rainwater becomes stormwater runoff once it lands on the ground and flows downhill into either a drainage system (pipes, ditches, swales, cisterns, etc.) or by overland route to an outfall or a natural confluence with marine waters.

Why Does it Matter?

If not properly managed, stormwater runoff can cause erosion, destabilize coastal bluffs, and damage beaches. Damage caused by poorly managed stormwater can pose a threat to private property and structures as well as degrading shoreline habitat and the health of the marine food web in Puget Sound.



This brochure aims to enhance homeowner understanding of stormwater and to provide strategies for improving (or avoiding) issues caused by poor stormwater management.

Interested in learning more about the benefits of healthy shorelines? Check out this link:

[Your Marine Waterfront: A Guide to Protecting Your Property While Promoting Healthy Shorelines \(WDFW\)](#)



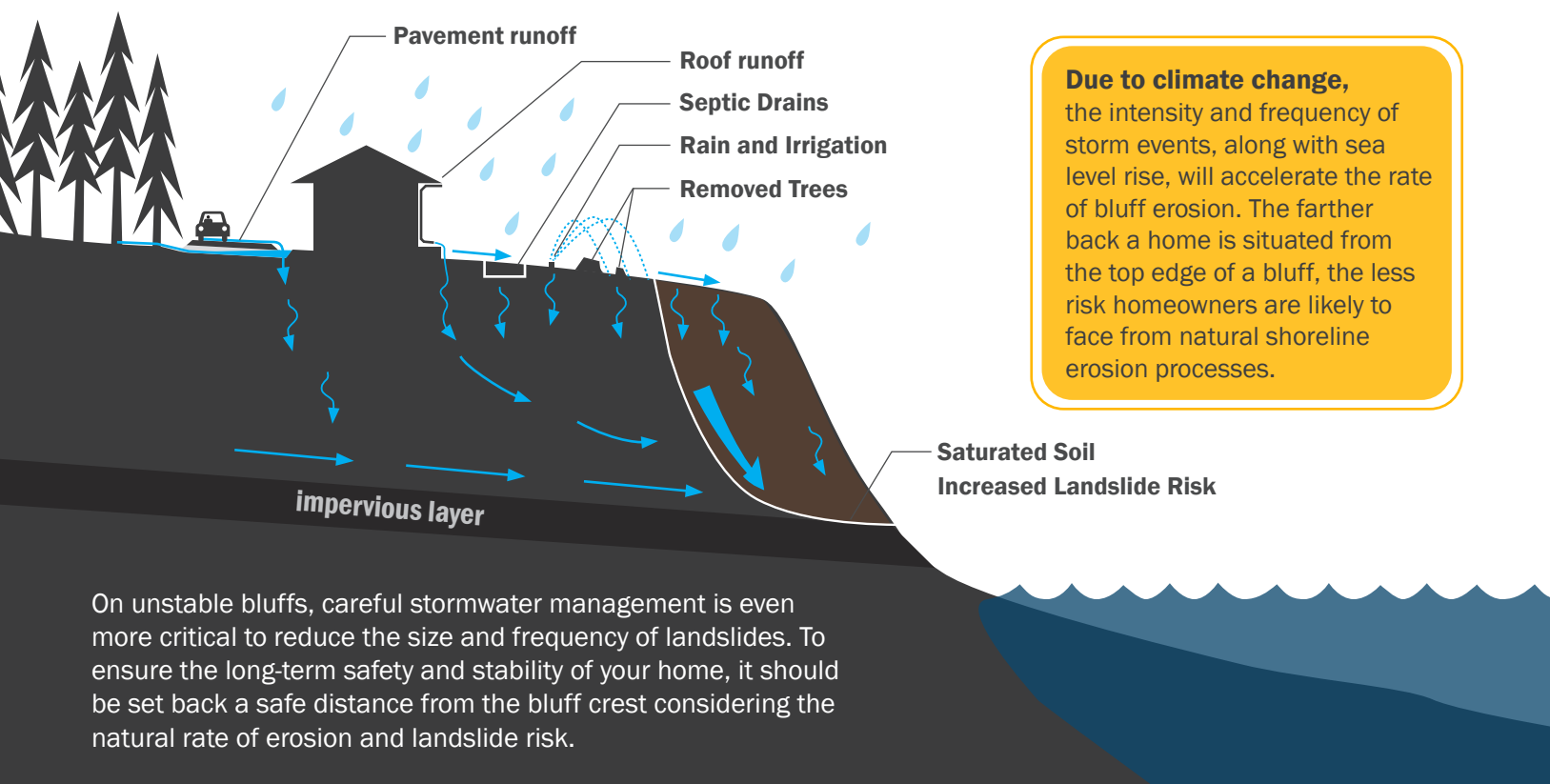
Step 1. Understanding Stormwater On Your Property

Understanding Bluff Drainage

Natural patterns of stormwater flow include overland “sheet flow” that runs freely across the surface, but also groundwater flowing beneath the surface. Sheet flow can flow over bluffs and down the bluff face, causing erosion, scour, and shallow landslides. Groundwater often flows out to the marine environment via seeps or springs, which emerge from the bluff face at the contact between a permeable (like sand or loose gravel) and a less permeable geologic layer (cemented till or clay). Flow patterns can vary greatly

across small distances along the shore due to geology, topography and coastal development and regrading.

When native vegetation is removed and replaced with impermeable surfaces (roofs, driveways, etc.) the evapotranspiration provided by the vegetation is lost and the ability of the ground to absorb water is diminished. These modifications can result in additional sheet flow and saturated soils, which increases the risk of slope instability or landslides.



On unstable bluffs, careful stormwater management is even more critical to reduce the size and frequency of landslides. To ensure the long-term safety and stability of your home, it should be set back a safe distance from the bluff crest considering the natural rate of erosion and landslide risk.

Get to Know Your Drainage System

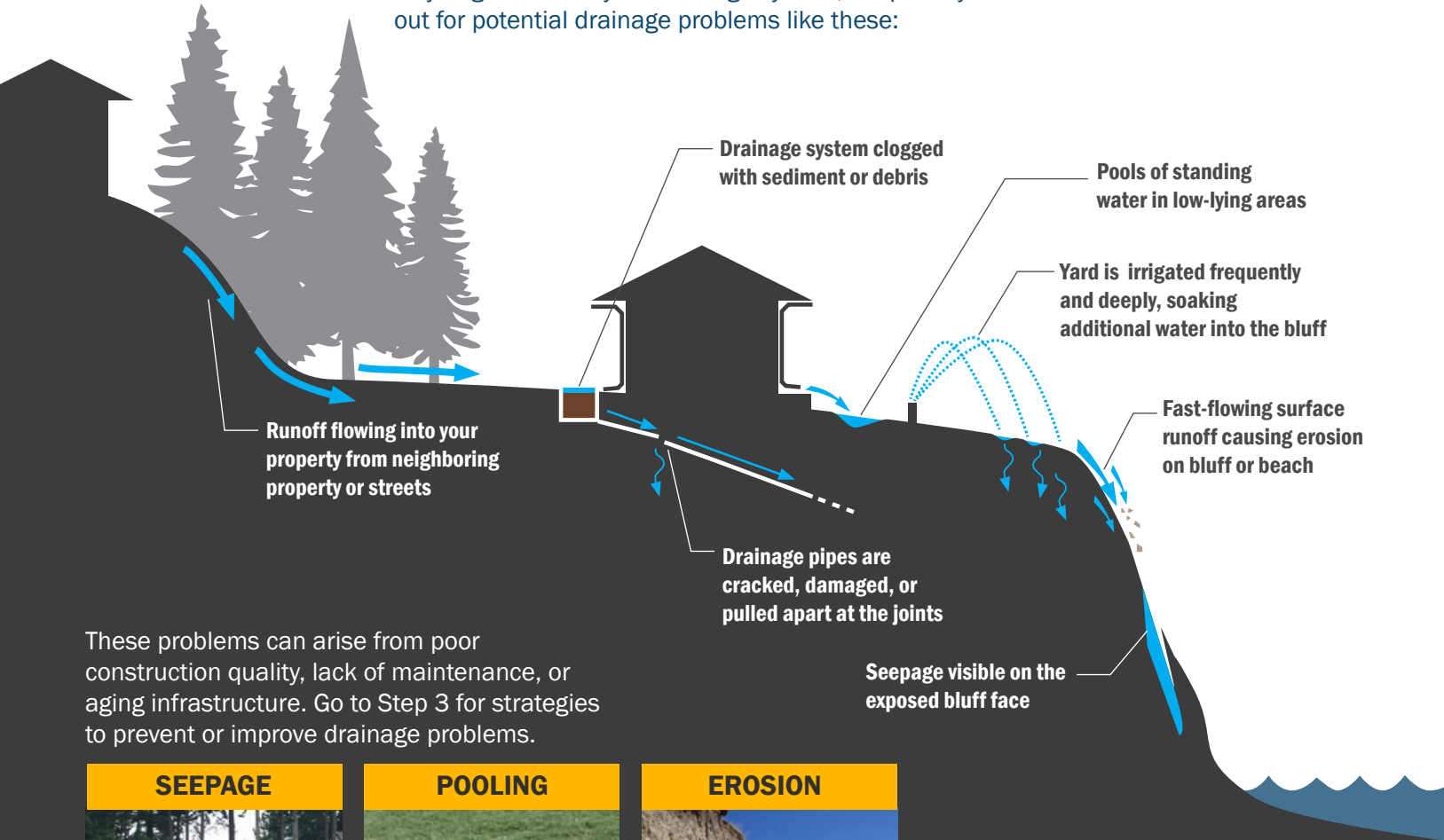
Do you know where your stormwater drains to? If not, investigate where your property’s runoff goes, if a piped drainage system is in place, and what condition it’s in. Create a sketch to identify significant drainage features on your property. This should include:

- What ditches or pipes are present, and where do they go?
- Are you connected to a shared system, such as a neighbor’s system or public system?
- How is runoff managed from the driveway and other pavement?
- How does runoff get from your yard to the Puget Sound? Is there an outfall structure?
- How is runoff managed from the roof, deck or other structures?
- Do you have a septic system? If so, where is the septic drainfield located?
- Do you have an irrigation system? How is it controlled?

Step 2. Spotting Stormwater Problems

What to Look For

As you get to know your drainage system, keep an eye out for potential drainage problems like these:



These problems can arise from poor construction quality, lack of maintenance, or aging infrastructure. Go to Step 3 for strategies to prevent or improve drainage problems.

SEEPAGE



POOLING



EROSION



What if it's not my system?

Drainage problems don't begin or end at the property line. Runoff from your property may affect your neighbors. Likewise, runoff from your neighbor's property or a public system could affect your property. Effective stormwater management needs to happen at the community level.

Typically, homeowners are responsible for stormwater management within their parcel boundary. Stormwater is also managed by public systems or shared private systems (such as a Homeowner's Association). For example, stormwater management along public or

private roads (including pipes or ditches) is typically the responsibility of the Homeowners Association or local city or county jurisdiction.

If a public system is not functioning properly or having a negative impact on your property, you can submit a drainage complaint to your local jurisdiction. Drainage complaints are often tied to regional drainage upgrade priorities, so it benefits you to make your voice heard.

Step 3. Implementing Best Practices for Stormwater Management

Understanding Bluff Drainage

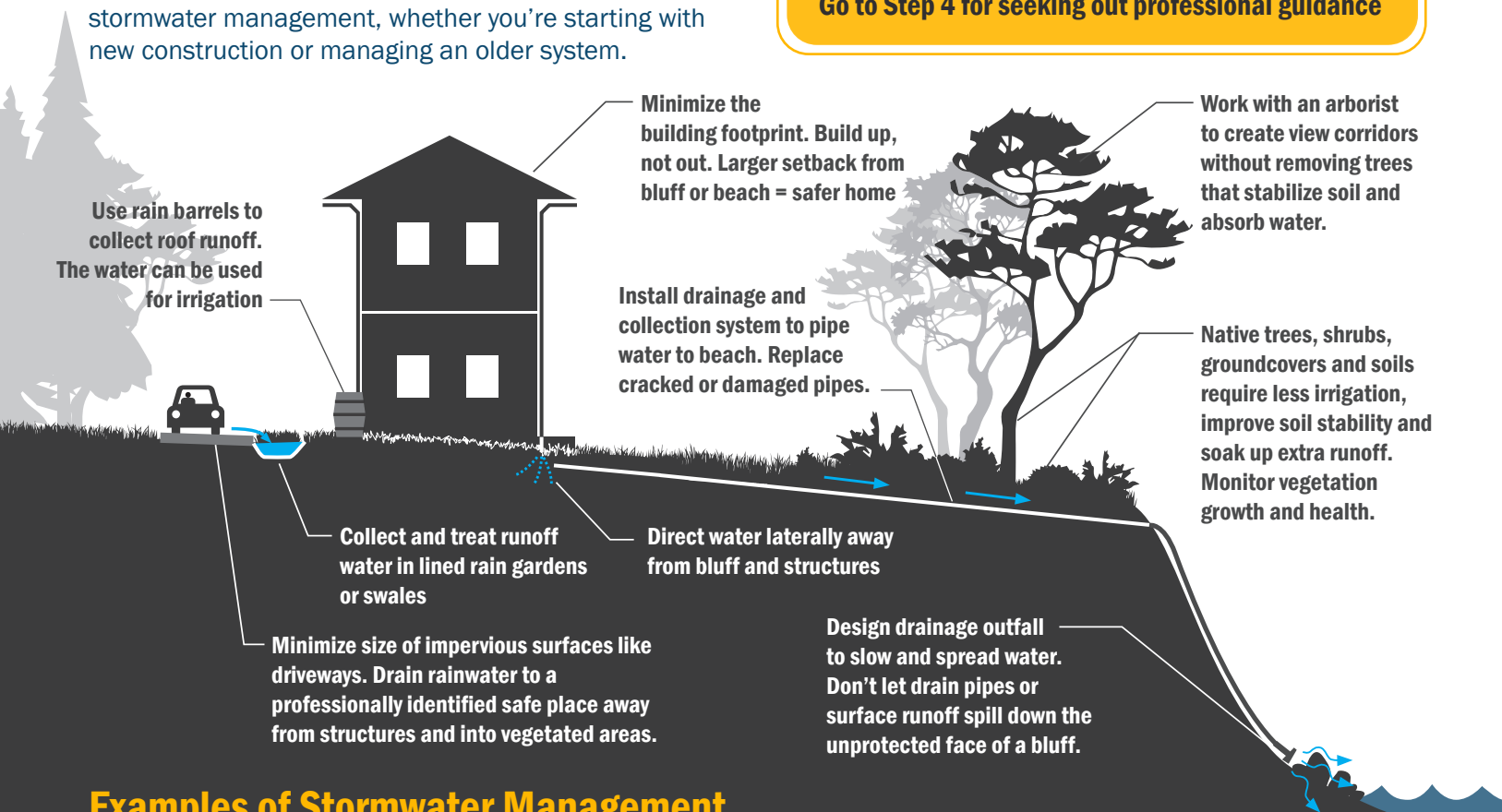
There is a wide range of options for improving stormwater management and bluff (or beach) stability on or near your property. A large project might consider removing hard armor and full restoration of the natural beach. Smaller adjustments, such as stormwater retrofits or vegetation choices, can also have a noticeable positive impact on bluff stability. The following strategies are focused on improving stormwater management, whether you're starting with new construction or managing an older system.

Interested in more design guidance for Shore Friendly Living? Check out these resources:

[Shore Stewards Guide for Shoreline Living](#)

[Friends of the San Juans Shoreline Living Guide](#)

Go to Step 4 for seeking out professional guidance



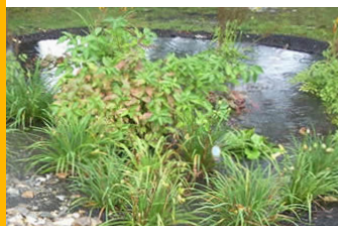
Examples of Stormwater Management

Tight Lines



Connect gutter downspouts to a drainage system that conveys stormwater to a safe discharge location. Buried pipe is more expensive than above grade pipe, which is easy to install and maintain and can be screened by vegetation.

Lined Rain Gardens



Rain gardens are designed to filter stormwater through soil and vegetation, allowing some of it to evaporate between storms. They should be carefully designed with liners and maintained away from a bluff's edge. Consult an engineer to explore this option.

Rain Barrels



Collected stormwater can be used to supplement irrigation needs. Avoid heavy irrigation that will saturate your soil.

Dispersion




Direct water laterally away from structures and pavement into vegetated areas. Stormwater should not be directed to drain freely down a bluff face.

Step 4. Call in the Professionals

When to Get Help

Professional assistance from shoreline experts is recommended or may be required for certain scenarios. These include but are not limited to:

- If bluff stability poses a safety concern or risk to a structure
- Getting design support for complex projects
- When navigating the regulatory process (permitting needs, legal issues, etc.)
- Work involving steep slopes, erosion, or bulkheads



Depending on your needs, a wide range of specialists are available to provide support, including stormwater engineers, permitting specialists, geomorphologists / geologists, landscape architects, and many others.

How to Find Support

The Shore Friendly Program is a great starting point for determining what professional assistance may be available for your property. Shore Friendly offers free site assessments and recommendations for next steps. Visit the Shore Friendly website for more information.

Qualifications for Professionals – What to Look For

To ensure that work is completed in a correct and cost-effective manner, use caution when choosing professionals to work on your property:

- Look for professionals that have experience working on the shoreline and bluffs and are properly insured, bonded, and licensed (if applicable).
- Before hiring anyone, ask for references for similar work and call the references.
- Request photos and drawings of their work to review.
- Most work along shorelines requires permits. Confirm this with your local planning department and be sure your chosen contractor follows the requirements.

Need help assessing your property?

The Shore Friendly program offers free site visits to help shoreline property owners make informed decisions about drainage to reduce the potential for increased erosion. Additional assistance with design, permitting, and implementation of solutions is also available to qualified landowners through a cost-share program.



<https://nwstraitsfoundation.org/nearshore-restoration/shore-friendly-landowner-outreach/>

Other Resources

[Surface Water and Groundwater on Coastal Bluffs: A Guide for Puget Sound Property Owners \(Ecology\)](#)

[Resources for Shoreline Property Owners \(King County\)](#)

