

SHORE STEWARDS

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# GUIDE FOR SHORELINE LIVING



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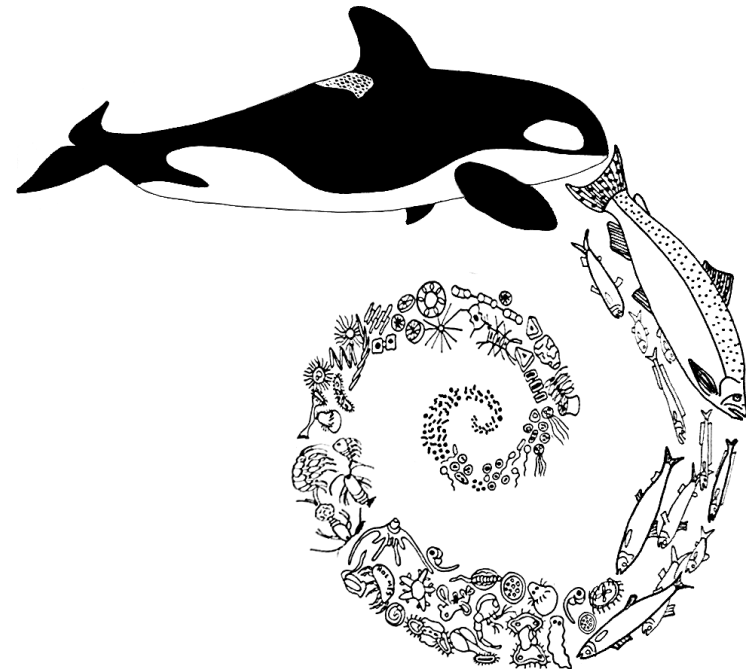
## INTRODUCTION

Congratulations on your decision to be a Shore Steward! Your stewardship will have a significant and positive impact on all forms of life that make up the diverse nearshore ecosystem, and will help to preserve the beauty of this area. The quality of life of the nearshore neighborhood is impacted by your decisions and actions as neighbors and caretakers. Your neighbors include the majestic Orca to the playful sea lion, from salmon to their prey of smelt, herring and sand lance, down to the tiny planktonic creatures and other invertebrates upon which the salmon's prey feed.

This handbook will help you be the best neighbor possible. It focuses on the 10 guidelines for shoreline property owners that have the biggest impact on the nearshore neighborhood. Use it to learn more about a topic as you fill out the Shore Stewards application, or stash it somewhere handy and refer to it when you have questions. It is full of practical information and resources.

The future of our natural resources depends on this type of conscious care. Thank you for being a part of the Shore Stewards Program.

ILLUSTRATION: RESIDENTS OF NEIGHBORHOOD/MINI FOOD WEB



# GUIDELINE 1

## USE WATER WISELY

### WATER IS A LIMITED RESOURCE

The reserves of drinkable water in Island County are limited. The water that we pump from wells is recharged (or re-filled) solely by the rain or snow that falls on the soil and slowly works it's way down into water-bearing zones. These zones are called aquifers. *For more information on the geology of our area, refer to Guideline #4, Manage Your Groundwater.*

### WAYS TO CONSERVE WATER

There are many things you can do, both inside and outside your home, to conserve water.

#### In your home:

- Check toilet for leaks by placing food coloring in the tank and checking the bowl (without flushing) for the appearance of color.
- Install a low-flow or ultra-low flow toilet or use a half-gallon plastic bottle filled with pebbles and water in the tank. Be sure it doesn't interfere with the flushing mechanism and don't use a brick.
- Fix leaky faucets. A small drip wastes 20 gallons of water each day.
- Install a water-efficient showerhead and take shorter showers.
- Turn off the water while brushing your teeth.
- Use dishwashers and washing machines only with full loads.
- Use a broom to clean walks and driveways, not a hose.
- Install a water meter if you don't have one and keep track of your water usage. (All new homes built in Island County since the early 1990's with individual wells, and homes in new community water systems, are required to have water meters.)
- Take monthly readings and make a table to track your water usage. See how well your water-saving measures are working.

#### In your yard and garden:

- Avoid watering during the heat of the day or when it's windy.
- Use a soaker hose or drip irrigation or system for garden beds.
- Avoid frequent, light watering which tends to encourage shallow root growth that makes plants more susceptible to droughts.
- Consider using low or non-water landscaping instead of lawns. Native plants usually require less care and water.

- Place 2-4 inches of mulch around plants and trees to reduce soil evaporation and thus minimize watering requirements.
- Weekly watering should be sufficient for most plants during the summer.
- Lawns west of the Cascades use about one inch of water per week during hot, dry weather. Apply no more than 1/2 inch of water per hour depending on type of soil and it's absorption rate.
- Monitor your watering and prevent runoff from occurring.
- Arrange sprinklers so that they don't water the street, the driveway or sidewalks.
- Use only hoses with a shutoff nozzle.

### TYPICAL WATER CONSUMPTION

In this country, the in-home use of water averages about 80-100 gallons per day, per person. That's 29,000 to 36,000 gallons per year per person. This does not include lawn/garden and other outdoor uses of water. So where does all this water go?

Activity	Gallons Used
Flushing toilet (conventional)	5
Showering	30
Bathing	40
Brushing teeth	1
Washing dishes (by hand)	30
Dishwasher	15
Washing machine	35
Cooking (meal/person)	3
Washing car	20
Watering lawn/garden for 30 min.	240

#### DID YOU KNOW?

A conventional toilet is perhaps the single biggest water guzzler, accounting for 38% of the water used in the average home. By replacing old toilets with the new low consumption toilets you may permanently reduce your overall water consumption by 25% or more.

The following table provides some examples of water-saving devices in gallons per typical use.

	Conventional	Low Use
Toilet	5.0	3.5-1.9
Faucet	3.0	2.5
Washing machine	35.0	21.0
Showerhead (quick shower)	5.0	2.5

**TIP:** A high efficiency washing machine uses 30-50% less water, which is equivalent to about 5000 gallons per year (and 50-60% less energy and 1/3 less detergent).

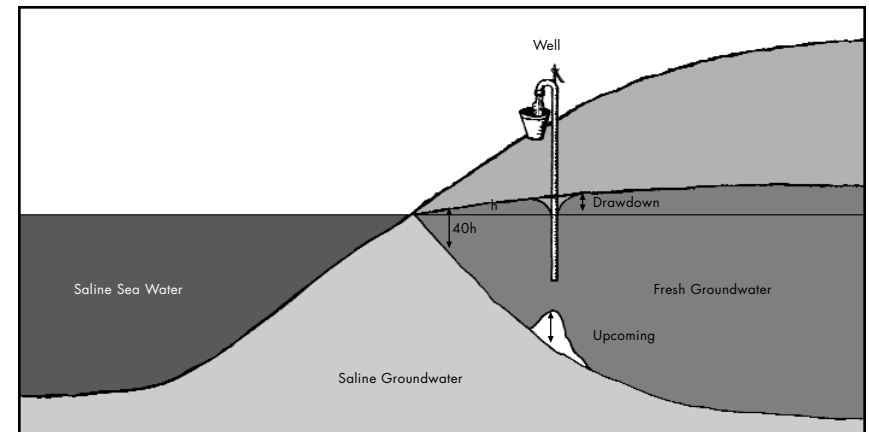
#### SEAWATER INTRUSION EXPLAINED

As the population increases, the demands placed on our groundwater resources also increase. As a result, certain parts of the County have significant saltwater intrusion problems. Some wells have become unusable.

Normally the groundwater flowing into an aquifer keeps seawater from displacing the freshwater. However if freshwater is pumped out of an aquifer faster than it can be recharged, seawater can enter the aquifer and mix with the freshwater. If this seawater intrusion continues, the salt content of the freshwater will increase to unsafe levels for human consumption.

Once seawater intrudes in an aquifer it can be very difficult and very costly to restore the water quality. Island County Health Department is currently analyzing data from water samples collected from hundreds of wells on both Camano and Whidbey to understand the extent of seawater intrusion in local aquifers. The Water Resources Advisory Committee (WRAC) is working on procedures to protect the quality of our limited groundwater resources.

ILLUSTRATION: SEAWATER INTRUSION Source: Doug Kelly, Island County Hydrogeologist



Caption: Over pumping water causes "upconing," which draws underlying seawater into the aquifer, or the well itself.

#### HOW TO TEST FOR SEAWATER INTRUSION

The amount of chloride in groundwater is used as an indicator of seawater intrusion.

The Washington State Dept. of Health has set a limit of 250 milligrams per liter (mg/L) for chloride in drinkable water. An elevated salt content makes drinking water unpalatable for most people. It can also represent a health concern to those on a salt-restricted diet, and it can have a harmful effect on plants. (It's the sodium in saltwater that represents the primary health risk not the chloride.)

There are a number of laboratories that test your water for mineral content and bacteria. These can usually be found in a phone book listing under "Laboratories," but three companies (listed below) actually provide sample bottles and pickup service at one or more of the following locations:

Camano Annex, 121 N.E. Camano Drive, Camano Island.

Island County Health Dept., Coupeville, Whidbey Island.

Island H2O Systems, 70 N.E. Midway Blvd., Oak Harbor, Whidbey Island.

B&W Pump Co., 18181 State Route 525, Freeland, Whidbey Island.

For instructions on collecting samples as well as for information about available tests, costs and sample bottle pick-up times, please contact the labs at the following numbers:

Edge Analytical (pick up at all four locations): 1-800-755-9295.

Lauck Testing Laboratories: 1-206-767-5060.

Avocet Environmental Testing: 1-360-734-9033.

#### HELPFUL RESOURCES FOR USING WATER WISELY

##### Seawater intrusion:

Doug Kelly

Island County Hydrogeologist

(360) 679-7350

##### Water quality issues:

Island County Health Department

Camano: 387-3443

Whidbey: 679-7390 or 321-5111 x. 7390

##### For a list of website resources, please visit:

[www.shorestewards.org](http://www.shorestewards.org)

#### BIBLIOGRAPHY

*Island County Groundwater: Treasure It!*, available at Island County offices

*Water Conservation: Guidelines to Being Waterwise*, available from

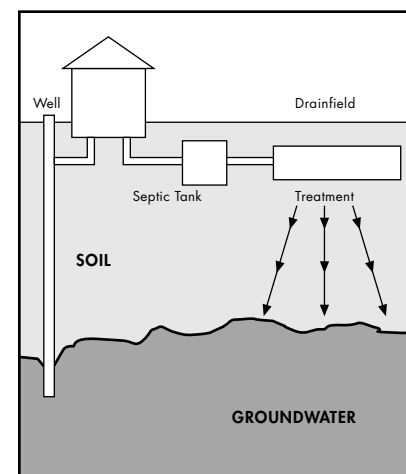
Washington State Department of Health at 1-800-521-0323.

#### HOW A SEPTIC SYSTEM WORKS

Household wastewater flows into the septic tank, where heavy solids settle to the bottom forming a *sludge layer*, while grease and light solids float to the top forming a *scum layer*. As additional wastewater enters the tank, the wastewater between the scum layer and sludge layer is pushed or pumped into the drainfield, where microorganisms consume leftover waste.

The scum and sludge layers remain in the tank, where “good” bacteria work to break them down. All the solids cannot be digested, and will eventually fill up the tank. These need to be pumped out every few years.

ILLUSTRATION: THE SEPTIC TANK Source: Island County Health Department



#### INSPECTING AND PUMPING YOUR SYSTEM

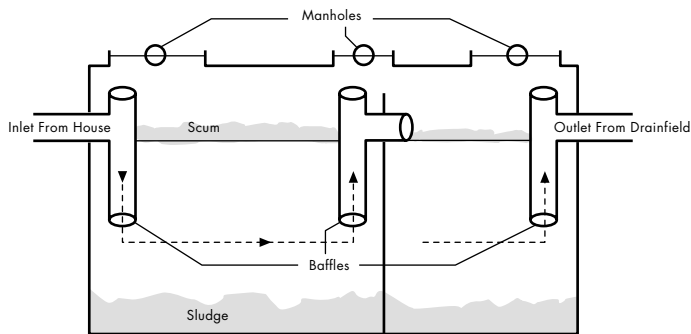
It is recommended that you inspect scum and sludge layer levels inside the tank once a year to monitor when it should be pumped. Pumping should be done on a regular basis, with the average time being once every three years. Family size and use of the system may require the pumping frequency to be more or less often. Keep a schedule of tank maintenance and pumping. A properly maintained and pumped septic system should give you about 25 years of service before it needs to be repaired or replaced.

#### TANK AND DRAINFIELD LOCATION

The location of your tank and drainfield are important. Your tank should be located a distance from your home as specified in the local building codes. Your drainfield should be located at *least* 100 feet away from your well, and that of your neighbors, to avoid contamination of your drinking water. It is recommended that you keep a sketch of where your septic tank and drainfield are located for quick reference in the future.

Water runoff from your roof, gutters and downspouts, patios and driveways should be diverted away from your drainfield, as the excess water dilutes the effectiveness of the bacterial action. If you have a water softening system, you should also avoid discharging the system onto the drainfield.

ILLUSTRATION: A SEPTIC SYSTEM



**OTHER DRAINFIELD POINTERS:**

- Do not build any structures, such as sheds or greenhouses, on your drainfield.
- Do not pave the area over your drainfield, or place non-permeable materials (like plastic) over it.
- Avoid driving over, or parking on, your drainfield. Unnecessary weight compacts the soil around the distribution pipes, harming the effectiveness of your drainfield. It's expensive to repair or replace a drainfield.
- Plant shallow-rooted native plants or drought-tolerant grasses. You don't want to water plantings over a drainfield.
- Trees should not be planted within 30 feet of the system, as the roots can break the pipes. Shrubs and hedges should be avoided, for the same reason. Vegetable plantings are not recommended, especially root vegetables.

**SEPTIC SYSTEM FAILURE**

So much of the septic system action takes place underground that it's hard to tell if your system is doing its job. A failed septic system along the shoreline can contaminate the nearshore with bacteria and other pollutants. The runoff makes shellfish from these sites inedible and can also cause nearby waters to be unhealthy for wading or swimming. Here are some indicators of a failing system:

- Water pooling in your yard or accumulating elsewhere.
- Foul odors.
- Dark grey or black stains in soil of the drainfield or surroundings.
- Poorly flushing or backed-up toilets.

- Excessive algae growth on drainage pipe outlet on bulkhead or as visible seeps on the beach.

If you notice any of these signs, you may need to pump your system or have other maintenance work performed. Contact the health department or a septic system professional for advice.

**WHAT SHOULD GO INTO YOUR SEPTIC SYSTEM**

Only three things should go into your septic system on a regular basis—human waste, toilet paper and water from everyday bathing and washing activities.

Normal, non-toxic household cleaners, disinfectants, laundry soaps, bleaches, etc. are not harmful to your system when used in moderation. Liquid laundry and dishwasher soaps should be used whenever possible to avoid clogging baffles and pipes.

**TIP:** If you are using your washing machine, try to do so only once a day. It's wise to limit the amount of water put into a septic system. Typical water use is approximately 80-100 gallons per person per day. More than that can overload your system. *For more pointers on water conservation, refer to Guideline #1, Use Water Wisely.*

**WHAT SHOULD NOT GO INTO YOUR SEPTIC SYSTEM**

Toilet tissue is meant to decompose. There are other items you might use that will not decompose, and should be thrown in the garbage instead of flushed. If not disposed of properly, they will fill up the tank or harm the beneficial bacteria.

<b>Taboos:</b>		
facial tissues	paper towels	paper towels
rags	cat litter	plastic
coffee grounds	grease	cooking oils
newspapers	cigarette butts	matches
tampons and/or applicators	sanitary napkins	disposable diapers
<b>Big taboos:</b>		
gasoline	motor oil	paint
paint thinner	solvents	fertilizers
pesticides	lye-based drain openers	

## LIMIT USE OF PESTICIDES &amp; FERTILIZERS

**GARBAGE DISPOSALS, PAINT AND DRAIN OPENERS**

In-sink garbage disposals may harm your septic system. If you use one, plan to pump your system more often. The bacteria in your system cannot easily break down food wastes and they will accumulate in your tank.

Do not clean paintbrushes in your sink, especially when you use paint thinners or solvents. Thinners and solvents can be re-used and then recycled at the transfer station. Paintbrushes can be wrapped in plastic and frozen in between use. It is best to discard a paintbrush after use in the trash can rather than risking expensive damage to your septic system by flushing paint down the drain.

If your pipes or toilet get clogged, do not use lye based drain openers. These kill the beneficial bacteria in your tank. A “snake” is the best way to clean your pipes.

**SEPTIC TANK ADDITIVES**

There are chemical additives on the market that claim to improve the “health” of your system so you won’t need to pump as frequently. These chemicals are costly and unnecessary. Although they will probably not hurt your system, they won’t help it. None have been shown to be effective.

**HELPFUL RESOURCES FOR MAINTAINING YOUR SEPTIC SYSTEM****Island County Health Department**

Camano: 387-3443

Whidbey: 679-7390 or 321-5111 x. 7390

The Health Department offers a selection of videos on septic system implementation and maintenance.

For a list of website resources, please visit:

[www.shorestewards.org](http://www.shorestewards.org)

**BIBLIOGRAPHY**

*Caring for your Septic System*, available from the Island County Health Department

*Save Money by Maintaining Your Septic System*, published by Dept. of Ecology, Padilla Bay, and NOAA (need DOE pub number)

**COMMON SENSE ON PESTICIDES**

Commonly used pesticides are chemicals that may have a harmful impact on non-target plants and animals, including humans. Many are slow to breakdown and may end up contaminating surface water run-off and groundwater. You can eliminate or reduce the use of dangerous chemicals and still control unwanted plants or animals.

When you decide to deal with plant or animal “pests” there are a number of guidelines that you can employ to target the pests while minimizing the impact on beneficial organisms, including the natural predators of the pests you want to control. Keep in mind:

- When using pesticides, follow the directions carefully and use them only when they are appropriate. Even then, use them sparingly. The goal is to decrease the use of chemicals.
- For almost every pest there is another organism that preys on it. By using some “broad spectrum” pesticides you may be killing the natural predators of the pest.
- Horticultural oils, insecticidal soaps and the bacteria *Bacillus thuringiensis* (Bt) are sometimes referred to as “soft pesticides.” They do less damage to beneficial insects.
- Plants can tolerate some pest damage, and without a source of food the beneficial predator insects will likely leave. Try to tolerate some pests.
- Create an environment friendly to beneficial insects and animals. Provide pollen and nectar from a variety of plants throughout the growing season. Small flowers can be attractive to many of the tiny predators.
- According to Washington State University, healthy plants that are attacked by pests produce chemicals that attract beneficial insects. Keep your plants healthy by giving them compost and mulch.

**ALTERNATIVES FOR SLUG CONTROL**

Instead of using a slug bait that contains the chemical metaldehyde, which is harmful to dogs and cats, you can:

- Use iron phosphate instead of metaldehyde.
- Use slug traps (such as a bowl of beer).

- Hand pick slugs at night.
- Keep the garden free of debris (home to slug eggs).
- Keep grass near garden trimmed.
- Avoid heavy ground covers near susceptible plants.

#### ALTERNATIVES FOR WEED CONTROL

Instead of resorting to chemicals as a first line of defense, you can:

- Mulch flower beds.
- Hand weed (or mulch where appropriate) vegetable beds.
- Design out weed habitats and focus on proper plant selection and horticulture.
- Hand-pull, hoe or mow weeds before they set seed.
- Not expect to totally eradicate weeds.

#### If herbicides are necessary:

- Approach the use of broadcast or wide-spray applicators with caution.
- Limit or avoid usage in vegetable gardens.
- Limit “weed-and-feed” mixtures of fertilizer and pesticide.
- Buy the least harmful chemicals.
- Apply herbicides by squirting or painting individual plants.

#### ALTERNATIVES FOR TENT CATERPILLAR CONTROL

Instead of using pesticides containing diazinon or carbaryl, which are harmful to bees as well as the natural predators of tent caterpillars, you can:

- Remove caterpillar nests by pruning (dispose of them in a sealed paper bag in garbage or compost pile).
- Use the biological insecticide Bt (*Bacillus thuringiensis*, which acts as a stomach poison for all caterpillars) if pruning fails to solve the problem.

#### DISPOSING OF PESTICIDES

If you have switched to “soft” pesticides (safer alternatives) and discover other unused pesticides around the house or garage, remember all pesticides are considered hazardous waste and must be disposed of at a hazardous waste site. In Washington it’s illegal to dump them in the trash or down the drain.

#### GREEN LAWNS AND FERTILIZERS

Many of us have a love affair with vast green lawns. The darker the green, the better. But our “perfect” lawns have become huge consumers of water, fertilizers and pesticides and a significant source of water pollution from runoff. One solution is to reduce the size of your lawn by replacing grass with native plants that require less water than lawns and provide food and habitat for wildlife.

Even if you choose to maintain a lawn there are a number of things you can do to minimize the cost involved, the amount of labor and the over-consumption of water.

For the Northwest, a healthy lawn is a medium “meadow” green in color. Used in moderation, natural or natural/synthetic slow release combination fertilizers build soil nutrient reserves and biodiversity. Make several applications over a period of time instead of a single large application.

Over fertilizing may pollute surface and groundwater as rain (or over-watering) washes the soluble fertilizer off the lawn. Overuse causes thatch build-up (a naturally maintained lawn rarely has a thatch problem) and the reduction of earthworms and soil microorganisms. On the shoreline, over fertilizing also contributes to algae blooms and adversely affects important nearshore plants such as eelgrass. *For more information on the role of eelgrass in a healthy nearshore ecosystem, please refer to Guideline #10, Preserve Eelgrass Beds and Forage Fish Spawning Habitat.*

#### DID YOU KNOW?

*Non-point pollution* comes from many small, widespread sources such as excess pesticides and fertilizers or failed septic systems. Nitrates from fertilizers, manures and some pesticides leach through the soil and may contaminate groundwater. *For more information on non-point pollution and water quality, please refer to Guideline #4, Manage Upland Water Runoff.*



## MANAGE UPLAND WATER RUNOFF

HELPFUL RESOURCES FOR LIMITING YOUR USE OF PESTICIDES,  
HERBICIDES AND FERTILIZERS

## Safe disposal of pesticides and herbicides:

Island County Solid Waste  
 Camano: 387-9696  
 Whidbey: 679-7340 or 321-5111 x 7340

## Alternatives to chemicals:

The Washington Toxics Coalition  
 (206) 632-1545  
[www.watoxics.org](http://www.watoxics.org)

## For a list of website resources, please visit:

[www.shorestewards.org](http://www.shorestewards.org)

## BIBLIOGRAPHY

*Bug Busters*, Bernice Lifton

*Ecologically Sound Lawn Care for the Pacific Northwest*, Seattle Public Utilities  
[www.ci.seattle.wa.us/util/lawn/lawnreport.htm](http://www.ci.seattle.wa.us/util/lawn/lawnreport.htm)

## Or request a printed copy from:

Seattle Public Utilities  
 Community Services Division  
 Resource Conservation Section  
 710 Second Avenue, Suite 505  
 Seattle, WA 98104  
 (206) 684-7560

## A GROUNDWATER AND SURFACE WATER PRIMER

Groundwater is simply rainfall or surface water that has infiltrated into the soil.

Surface water is water that flows across or “ponds” on the ground’s surface. It results from rainfall or irrigation practices. In many cases, the water that’s absorbed into the ground is not good. Typically, excessive amounts of groundwater exacerbate slope stability problems at coastal bluffs by “lubricating” masses of soil that may be in unstable positions, sometimes triggering landslides.

Surface water volumes and velocities can be large, especially after heavy rainfall. At such a time, you may have noticed a thin layer of water flowing over smooth areas such as parking lots, roofs, driveways and large expanses of lawn. This is “sheet flow,” which can concentrate into small channels that enlarge rapidly. When groundwater and surface water are not properly managed, erosion and property damage can result.

## NON-POINT POLLUTION AND WATER QUALITY

Rainwater can pick up a nasty assortment of pollutants as it flows across the land. This is called non-point pollution. This type of runoff can be harmful to marine plants and wildlife and make waters unhealthy for swimming. People eating fish and shellfish from the polluted waters can get sick.

## To keep runoff clean:

- Keep your car maintained to prevent leaks.
- Sweep rather than hose off driveway and parking areas to prevent pollutants from entering water.
- Avoid storing machinery, equipment or substances outside or in areas where pollutants can leak into the ground and surface waters.
- Clean up after your pet or any livestock to prevent pollution of surface waters.
- Wash cars and boats on a lawn using a mild, phosphate-free soap; or visit a professional car wash where soapy water is recycled.

## LOW IMPACT DEVELOPMENT

Materials that mimic natural processes to reduce the amount of impervious (non-penetrable) surfaces are the foundation of low impact development. These include permeable pavers and driveways, rain gardens, green roofs and rain barrels. Low impact development can attractively and efficiently offset some of the problems of stormwater runoff.

#### Low impact strategies for your property:

- When building, minimize impervious surfaces such as paved driveways, and leave as much undisturbed vegetation and soil as possible. “Traditional” site development tends to cause more rapid and concentrated runoff.
- Where soils have been disturbed, supplement with compost to increase water-absorbing capabilities. Minimize water added through lawn watering, car washing, etc. because the disturbed soils will not infiltrate water.
- Collect stormwater runoff through gutters and downspouts and either tightline it to a safe location or retain in an approved manner. Rain gardens effectively disperse roof water and “green roofs” absorb the rainfall. Rain barrels can be used to collect the water for later use in landscape maintenance. Consult the current County regulations for specifics on these low impact techniques.

#### WHEN TO AVOID LOW IMPACT DEVELOPMENT PRACTICES

Low impact development practices that infiltrate surface water into the ground are not recommended near bluffs, unstable or eroding slopes and shoreline areas, or where soils have low permeability. If that is the case, use the practices that filter water quality and then remove the water by way of tightlines rather than infiltrating.

#### CONCERNS ABOUT EXCESS GROUNDWATER AND SURFACE WATER

Prevention or reduction of surface water runoff should be the first, and is often the least expensive, approach to reducing drainage problems. **However it’s important to remember that drainage issues are site specific.** If you have concerns about excess groundwater or surface water on your property, contact the Planning department at the numbers listed below. *For more information on site drainage issues on a bluff, please refer to Guideline #7, Develop on Bluffs with Care.*

#### TIGHTLINES TO THE BEACH

If your groundwater and surface water are tightlined to your beach, it is very important that these lines are properly designed, constructed and maintained. Water from a tightline should never be discharged at the top or middle of a slope (or break due to use of inferior pipe) as severe erosion can occur. Also, as the flow of water discharging from these tightlines can be quite strong, especially during storms, it is very important to carefully consider and protect the discharge point. Again, consult the current County regulations. The Planning department can also provide a list of qualified engineers to design a system for you.

**TIP:** Inspect your tightline and its discharge frequently, especially after a major storm. In case of a failure, severe erosion can occur over a very short period of time.

#### THE GEOLOGY OF A LANDSLIDE

Puget Sound geology has been heavily influenced by glaciation, which has left varying soil layers. These layers include a weathered zone (including topsoil), and thick deposits of sand, gravel and glacial till (hard pan). The long-term effect of bluff toe erosion contributes to the over-steepened nature of our bluffs. Changes in the volume and location of surface water runoff that occur with development can significantly change the potential for landslides.

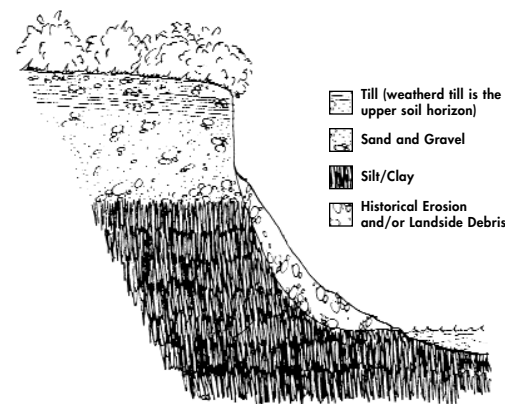
In combination with flowing overland during heavy rains, rainfall and surface water infiltrate into the soil, becoming groundwater, which often accumulates or “perches” above the glacial till or less permeable clay layers. Water that accumulates above the impermeable sediment layer may then flow laterally (or in a side direction) until it “daylights” as seepage on the slope face. This water can act as a soil lubricant and can cause the sand (or other upper) layer to slide on top of the clay layer, resulting in slides.

If your property is on a bluff, knowing the geology of the land is important to help you determine how best to manage the surface water and groundwater to prevent landslides. Vegetation is also a critical element that effects slope stability, as fibrous roots can “knit” soils together at a bluff or on a bluff face. *For information on using native plants to control erosion on a bluff, please refer to Guideline #7, Develop on Bluffs with Care.*

#### ILLUSTRATION: COMMON SOIL LAYER SEQUENCE ON COASTAL SLOPES

Source: Department of Ecology, Surface Water and groundwater on Coastal Bluffs:

A Guide for Puget Sound Property Owners



## ENCOURAGE NATIVE PLANTS &amp; TREES

## HELPFUL RESOURCES FOR MANAGING YOUR GROUNDWATER AND SURFACE WATER

Island County Public Works

Camano: 629-4522 x 7331

Whidbey: 679-7331 or 321-5111 x 733

Island County Planning Department

Camano: 629-4522 x 7339

Whidbey: 679-7339 or 321-5111 x 7339

[www.islandcounty.net/planning/](http://www.islandcounty.net/planning/)

Island County Planning and Community Development

Information Bulletins (DIB's)

#501 Clearing & Grading

#502 Drainage Requirements for Single-Family Residences

#505 Drainage Narratives

#511 Development in Geologically Hazardous Areas

For a list of website resources, please visit:

[www.shorestewards.org](http://www.shorestewards.org)

## BIBLIOGRAPHY

Below are valuable publications available to you from the Department of Ecology with their publication numbers.

You may request copies online or by mail or phone.

Department of Ecology

Publication Distribution Center

(360) 407-7472

[www.ecy.wa.gov/programs/sea/shorelan.html](http://www.ecy.wa.gov/programs/sea/shorelan.html)

(click on "Publications")

*Surface Water and Groundwater on Coastal Bluffs: a Guide for Puget Sound Property Owners*, #95-107

*Slope Stabilization and Erosion Control Using Vegetation: A Manual of Practice for Coastal Property Owners*, #93-30

## THE ROLE OF NATIVE PLANTS

On shorelines, native plants act as filtration systems by slowing water runoff and trapping pollutants. Keeping one's property as "natural" as possible has many advantages. Native trees, shrubs and plants absorb large quantities of water during rainstorms, thereby helping in the reduction of potentially damaging runoff and landsliding. *For information on using native plants to control erosion on a bluff, please refer to Guideline #7, Develop on Bluffs with Care.*

## ADVANTAGES OF USING NATIVE PLANTS IN YOUR LANDSCAPE

- Native plants are well adapted to our climate.
- They have developed over the millennia means of dealing successfully with insects and disease.
- Natives seldom require fertilizers or pesticides.
- Once established, natives generally require no watering.
- Wildlife is adapted to native plants and dependent on them for food, cover and breeding places. Hence wildlife is encouraged to visit and/or live on property with native flora.

## OVERHANGING AND FALLEN TREES

Trees that overhang the beach or have fallen downward onto the beach may protect embankments from wave action and thus help in soil retention, as well as provide vitally important shade, shelter and insect food for fish and other marine life. Some downed nearshore trees may live for a number of years. Therefore the pruning of these fallen trees is more desirable than their removal. *For more information on the importance of shade trees to forage fish, refer to Guideline #10, Preserve Eelgrass Beds and Forage Fish Spawning Habitat.*

## PRUNE FOR VIEWS

Trees are vital to the good health of shoreline properties and should be cut only when they are a hazard. To make the most of your waterfront panorama, frame views by pruning your trees rather than cutting them down.

## RECOMMENDED PRUNING STRATEGIES

ILLUSTRATION: WINDOWING, THINNING, LIMBING UP

Source: Department of Ecology, Vegetation Management: A Guide for Puget Sound Bluff Property Owners

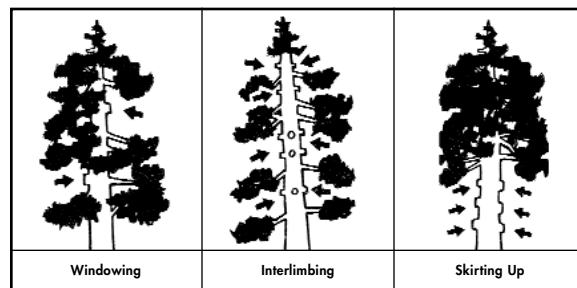
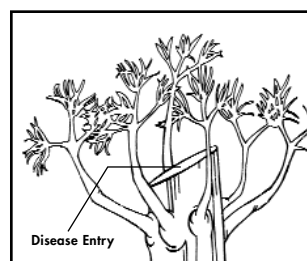


ILLUSTRATION: A "TOPPED" TREE Same source as above



### NEVER TOP A TREE!

Topping can lead to disease and re-growth of weak upper limbs.

### KEEP YARD WASTE OFF BLUFFS AND BEACHES

Yard waste kills underlying vegetation, adds dead weight (usually wet and soggy) to the upper portion of a slope and can easily slide, possibly precipitating a larger slide or doing downslope damage. The discarded plant material may be washed away by tidal action. Although out of sight, the breakdown of plant material consumes the limited amounts of oxygen dissolved in offshore waters—oxygen that marine animals need.

By definition under statewide Solid Waste Regulations, yard waste and grass clippings are considered solid waste and therefore must be handled and disposed of properly. It is unlawful to dispose of any type of solid waste by dumping it on the ground, into the water or burying it. Solid waste should be dumped and buried at a permitted landfill. Parties illegally dumping can be fined up to \$125 per violation per day.

Two alternatives to dumping:

- Compost yard waste.
- Leave lawn clippings on the lawn.

## SPARTINA IS A NASTY NOXIOUS WEED

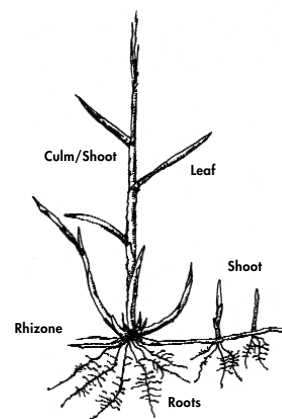
At first glance, Spartina appears to be just grass growing in the water. But look closer and you'll see that it severely disrupts the native saltwater ecosystems, alters fish, shellfish and bird habitat, and increases the threat of floods.

### HOW TO IDENTIFY SPARTINA

Spartina appears as individual plants, small clumps, or when established, as large circular masses of plants several feet tall in the intertidal zone. Its stems are round

and hollow with leaves spreading out from the stem at nearly right angles.

ILLUSTRATION OF SPARTINA PLANT



Sprouting in the spring, Spartina flowers and seeds from mid-summer to fall. The seed heads top the long stalks that grow straight up from the plant. Spartina turns brown in the fall and generally remains dormant until early spring.

Early control of an infestation is essential. Care must be taken to remove not only the visible plant but all roots or rhizomes. Those removed then must be disposed of far from the shore, preferably in a landfill to prevent re-sprouting. **Do not compost Spartina!** When established, Spartina is far more difficult to eradicate. All Spartina invasions should be reported to the local Noxious Weed Control Board.

### LIST: KNOWN INFESTATIONS OF SPARTINA IN ISLAND COUNTY

#### On Camano:

Arrowhead Beach  
North Leque Island  
Mountain View

Eagle Tree Estates  
Livingston Bay  
Elger Bay

English Boom  
Triangle Cove

#### On Whidbey:

Cornet Bay  
Mariner's Cove  
Race Lagoon  
Sunlight Beach  
Sandy Hook

Ala Spit  
Mayler's Point  
Lake Hancock  
Cultus Bay  
Coupeville Wharf & Beach

Dugualla Bay  
Monroe Landing  
Deer Lagoon  
Scatchet Head

## HELPFUL RESOURCES FOR ENCOURAGING NATIVE PLANTS AND TREES

### Gardening with native plants:

Island County/WSU Master Gardeners  
Camano: 629-4522 x 7327  
Whidbey: 679-7327 or 321-5111 x 327  
[www.island.wsu.edu/mginfo.htm](http://www.island.wsu.edu/mginfo.htm)

### Native plant sales:

Washington Native Plant Society  
888-288-8022  
[www.wnps.org](http://www.wnps.org)  
(Salal Chapter in Mt. Vernon has two sales per year in April and September)  
  
Snohomish Conservation District  
(425) 335-5634  
[www.snohomishcd.org](http://www.snohomishcd.org)  
(annual plant sale held in March)  
  
Skagit Conservation District  
Phone + url

### To dispose of yard waste:

Island County Solid Waste  
Camano: 387-9696  
Whidbey: 679-7340 or 321-5111 x 7340

### To report illegal dumping:

Island County Sheriff  
Camano: 629-4523  
Whidbey:

### Composting:

Island County/WSU Waste Wise Program  
Camano: 629-4522 x 391  
Whidbey: 679-7391 or 321-5111 x 391

### To report *Spartina* invasions and other noxious weeds:

Island County Noxious Weed Control Board  
Camano: 629-4522 x 7327  
Whidbey: 679-7327 or 321-5111 x 7327  
  
Camano Community Backyard Wildlife Project  
387-2236  
[camanobwh@yahoo.com](mailto:camanobwh@yahoo.com)

### For a list of website resources, please visit:

[www.shorestewards.org](http://www.shorestewards.org)

## BIBLIOGRAPHY

*Gardening with Native Plants of the Pacific Northwest*, Arthur Kruckeberg

*Native Plants in the Coastal Garden*, April Pettinger

*Plants of the Pacific Northwest Coast*, Jim Pojar and Andy McKinnon

*Landscaping for Wildlife in the Pacific Northwest*, Russell Link

Below is a valuable publication available to you from the Department of Ecology with a publication number. You may request a copy online or by mail or phone.

Department of Ecology  
Publication Distribution Center  
(360) 407-7472  
[www.ecy.wa.gov/programs/sea/shorelan.html](http://www.ecy.wa.gov/programs/sea/shorelan.html)  
(click on "Publications")

*Vegetation Management: A Guide for Puget Sound Bluff Property Owners*, #93-31

## GUIDELINE 6

### KNOW THE PERMIT PROCEDURES FOR SHORELINE DEVELOPMENT

#### WHY YOU NEED A PERMIT TO DEVELOP YOUR SHORELINE

Shoreline resources are finite and must be effectively managed if their many values are to be preserved. Planning under Washington State's Growth Management Act provides a unique opportunity to consider shorelines and their relationship to the community as a whole and its overall development strategy.

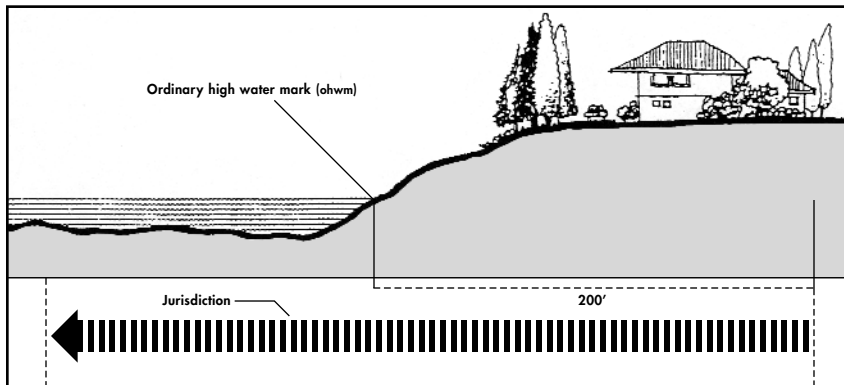
#### THE SHORELINE MANAGEMENT ACT (SMA)

In 1971, the Washington State Legislature passed the Shoreline Management Act. Validated by voters in the November, 1972 election, its objectives are:

- To protect and preserve shoreline resources.
- To provide for reasonable use of the state's shorelines.
- To preserve the public's right to access the shorelines.

The Shoreline Act covers more than 20,000 miles of Washington State saltwater, river and like shoreline. This includes more than 2,600 miles of saltwater shoreline. Island County has an estimated 221 miles of saltwater shoreline.

ILLUSTRATION: SMA COVERAGE Source: Department of Ecology, Shoreline Master Program Handbook



Caption: The Shoreline Management Act along marine shorelines applies to the area from 200 feet landward of the "ordinary high water mark" extending offshore to the county line.

#### DID YOU KNOW?

Anchor buoys in the middle of a bay are covered by SMA permitting processes. Why? Because the SMA jurisdiction includes the water to the middle of the Sound, or wherever the county across the water (or Canadian border, in some cases) intersects.

#### SHORELINE MASTER PROGRAMS

The provisions of the Shoreline Management Act established a planning and regulatory program, which is initiated at the local level under state guidance. This cooperative effort balances local and statewide interests in the management and development of shoreline areas by requiring local governments to plan (via shoreline master programs, or SMPs) and regulate (via permits) shoreline development.

In Island County, compliance with SMP is monitored by the Planning department and the Department of Ecology. Island County and Ecology coordinate with the State Departments of Fish and Wildlife and Natural Resources and the US Army Corps of Engineers. The Department of Natural Resources may be a participant where state-owned tidelands and bedlands are involved.

Island County's Shoreline Master Program is designed to:

- Protect fragile shorelines.
- Minimize inappropriate development.
- Help property owners design *with* instead of *against* Mother Nature.
- Fix past mistakes.

#### THE SHORELINE PERMIT PROCESS

All permits for development on your shoreline property originate at the local level. Substantial development permits for work such as clearing, grading and construction are approved locally. Some conditional use permits and variances are locally approved and then sent to the Department of Ecology for their approval. Appeals to denied permits are made through the local hearing examiner and the state shorelines hearing board.

Some minor types of shoreline development may be "exempt" from permit requirements. They must still be reviewed by the Planning department for consistency with the Shoreline Master Program and the Shoreline Management Act.

#### DEVELOPMENT REQUIRING A PERMIT

##### Major saltwater activities requiring a permit include:

Bulkheads	Fills	Boat launches
Piers	Dry docks	Artificial reefs
Dock floats	Marinas	Pile driving
Dredging	Placement of utility lines	

The above are only examples of major types of activities. Any construction activity below the ordinary high water line requires a permit, even if the activity is outside the water at the time it is undertaken.

In some cases, a Department of Fish and Wildlife Area Habitat Biologist will visit the project site. They will work with you to help achieve your objective while protecting fish, shellfish and their habitat.

#### COMPLIANCE WITH SHORELINE REGULATIONS

You play a vital role in shoreline administration through peer education and bringing shoreline issues to the attention of state and local personnel. With ever-increasing work loads and reduced funding of staff positions, local and state agencies must rely more and more on citizen help in protecting and preserving our shoreline resources and letting local officials know how they feel about shoreline issues.

#### HELPFUL RESOURCES FOR UNDERSTANDING THE PERMIT PROCEDURES FOR SHORELINE DEVELOPMENT

##### Island County Planning Department

The County website or a planner can assist you with current shoreline regulations on setbacks, bulkheads, buffers and beach access.

Camano: 629-4522 x 7339  
Whidbey: 679-7339 or  
321-5111 x 7339  
[www.islandcounty.net/planning/](http://www.islandcounty.net/planning/)

#### Department of Ecology

Ecology maintains oversight of the Island County Shoreline Master Program and the shoreline permit process. They also maintain a large and informative website.

Puget Sound: [www.ecy.wa.gov/programs/sea/pugetsound/](http://www.ecy.wa.gov/programs/sea/pugetsound/)  
Shoreline aerial photos: [www.ecy.wa.gov/apps/shorephotos/](http://www.ecy.wa.gov/apps/shorephotos/)  
Landslides: [www.ecy.wa.gov/programs/sea/landslides](http://www.ecy.wa.gov/programs/sea/landslides)

Permit Assistance Center  
(360) 407-7037

Alice Schisel, Regional Enforcement Officer  
(360) 678-3691 or (206) 649-4309

For a list of website resources, please visit:  
[www.shorestewards.org](http://www.shorestewards.org)

#### BIBLIOGRAPHY

Below are valuable publications available to you from the Department of Ecology with their publication numbers. You may request copies online or by mail or phone.

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[www.ecy.wa.gov/programs/sea/shorelan.html](http://www.ecy.wa.gov/programs/sea/shorelan.html)  
(click on "Publications")

*Washington State Permit Assistance Center*, #00-06-041

*Introduction to Ecology's New Shoreline Master Program Guidelines*, #01-06-04

*Working in the Water*, #99-06

*Shoreline Master Program Handbook*, #93-104C

## GUIDELINE 7

### DEVELOP ON BLUFFS WITH CARE

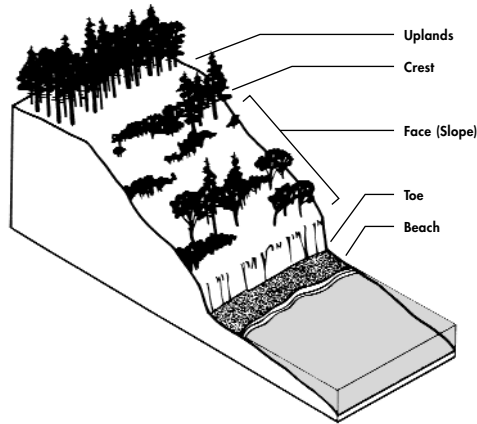
#### THE IMPORTANCE OF BLUFFS

The coastal bluffs of Island County result from thousands of years of erosion and are an important natural feature of the Puget Sound's shoreline.

Many of Island County's beaches "feed" sediments to adjacent beaches and nearby "accretion" beaches, which are typically either low spits of land that jut into the intertidal zone or coves between headlands. When seawalls or bulkheads are placed on beaches with feeder bluffs, the natural process is halted. Without continual replenishment, beaches and accretion beaches erode, threatening homes and wildlife populations. Ironically, bulkheading of bluffs to protect property often lead to the loss of adjacent beaches and increased erosion of neighboring bluffs.

#### ILLUSTRATION: ANATOMY OF A BLUFF

Source: Department of Ecology, Vegetation Management: A Guide for Puget Sound Bluff Property Owners



#### YOUR ACTIONS IMPACT BLUFF EROSION

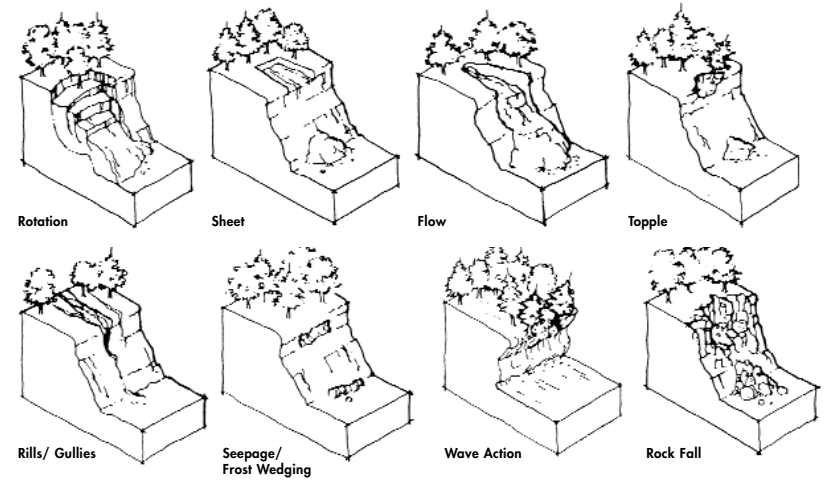
Property owners often unknowingly exacerbate bluff erosion. Clearing of vegetation, disturbance of soils, poor site drainage and modifications to the bluff for access can all lead to landsliding and accelerated erosion. Improper clearing of vegetation can also lead to increased danger from tree falls and wind damage.

#### DID YOU KNOW?

Bluff erosion is often characterized by decades of gradual change, punctuated by sudden landslides. Slides can undermine structures at the top of the bluff or bury structures at the bottom.

#### ILLUSTRATION: TYPES OF BLUFF EROSION

Source: Department of Ecology, Vegetation Management: A Guide for Puget Sound Bluff Property Owners



#### LEAVE STUMPS IN PLACE

Please keep in mind that it is best to save all stumps near a shoreline bluff or slope. Their roots alone will help stabilize soil. Likewise the removal of invasive plants such as Himalayan blackberry or Scotch broom from unstable shore property is unwise without an immediate revegetation plan.

#### NATIVES HELP CONTROL EROSION

Bluff shoreline property owners have yet other considerations. Excessive erosion must be contained. If not, the particles slipping down onto the beaches and into the water can cover and smother the dwelling places of many marine plants and animals. Hence, "buffer zones" of trees and shrubs and plants along bluffs are a must—plants that will best prevent erosion.

#### GOOD CHOICES FOR STABILIZING THE SOIL AND EROSION CONTROL:

##### Trees:

Douglas fir  
Bigleaf maple  
Madrone  
Red cedar  
Willow

##### Shrubs:

Ocean spray  
Salal  
Snowberry  
Vine maple  
Serviceberry



**DID YOU KNOW?**

English ivy is not a good erosion control option. It is invasive and will smother native plants. It is being considered as a noxious weed by the state and should not be planted.

*For more information on the role of native plants in shoreline landscapes, please refer to Guideline #5, Encourage Native Plants and Trees.*

**SIX WAYS TO LIMIT BLUFF EROSION**

- 1 For new construction, locate your home sufficiently landward so it is not susceptible to wave damage, erosion or landsliding. View local setback requirements (100 feet) as an absolute minimum. Resist the urge to trade off safety for the sake of a slightly improved view. When developing your site, do so with a minimum of disturbance. Leave as much native vegetation as possible, including an undisturbed vegetation buffer along the top of the bluff.
- 2 Where practical, replant bare places. Use hardy, deep-rooted native species appropriate to the site. Avoid landscaping that requires watering. Instead of removing or topping trees, selectively thin or window them to improve views. This action also promotes root vigor. *Refer to section #5, Encourage Native Plants and Trees, for an illustration of thinning and windowing trees.*
- 3 Divert runoff away from the bluff face. Excessive groundwater and surface water runoff are leading causes of landsliding and bluff erosion. Coordinate with neighbors to avoid concentrating runoff if possible. *For more information on this topic, please refer to section #4, Manage Your Upland Water Runoff.*
- 4 Plan beach access carefully for minimal soil and vegetation disturbance. Where possible, consider sharing access with neighbors to minimize disturbance and costs. Consider building a “hybrid” system (a combination of trail, ladder, winding paths and stairs) to limit impacts on the bluff.
- 5 Avoid building bulkheads or other erosion control structures. Increased wave activity in front of and to the sides of a bulkhead encourage unnecessary erosion, often to your neighbor’s property. *For more information on the effects of bulkheading, please refer to section #8, Minimize Bulkheads.*
- 6 Do not dump yard waste over the edge of your bluff. It sets the stage for future erosion because these piles of green waste smother out native plants holding fragile slopes in place. Even small heaps of grass clippings can take years to break down.

**HELPFUL RESOURCES FOR DEVELOPING ON BLUFFS WITH CARE**

Island County Planning Department  
 Camano: 629-4522 x 7339  
 Whidbey: 679-7339 or 321-5111 x 7339  
[www.islandcounty.net/planning/](http://www.islandcounty.net/planning/)

(The Planning department can also supply contact information for qualified geologists and geological engineers. It’s a good idea to consult with a geologist prior choosing a site or building a home on a bluff.)

**For a list of website resources, please visit:**

[www.shorestewards.org](http://www.shorestewards.org)

**BIBLIOGRAPHY**

*Living with the Shore of Puget Sound and the Georgia Strait,*  
 Thomas A. Terich

*The Coast of Puget Sound—Its Processes and Development,* John Downing

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[www.ecy.wa.gov/programs/sea/shorelan.html](http://www.ecy.wa.gov/programs/sea/shorelan.html) (click on “Publications”)

*Slope Stabilization and Erosion Control Using Vegetation:*  
*A Manual of Practice for Coastal Property Owners, #93-30*

*Vegetation Management: A Guide for Puget Sound Bluff Property Owners, #93-31*

*Surface Water and Groundwater on Coastal Bluffs:*  
*A Guide for Puget Sound Property Owners, #95-107*

*Bluff Erosion Monitoring on Puget Sound: A Guide for Volunteers, #00-06-022*

## GUIDELINE 8

### MINIMIZE BULKHEADS

#### THE IMPACT OF BULKHEADS

Shoreline bluffs and beaches are dynamic environments where erosion and storms are the rule rather than the exception. The shoreline actually depends on continuing erosion to maintain beaches and to support nearshore habitat, yet development is often intolerant of even relatively gradual erosion. Landowners often go to great expense to engineer rock, wood and concrete structures to stabilize eroding property. This is called shoreline hardening, or bulkheading.

Bulkheads cut off the sediments supplied to the beach by erosion. This leads to sediment starved conditions that exacerbate erosion and alter beach composition.

The cumulative impact of numerous bulkheads along a reach of shoreline may be the long-term, irreversible loss of habitat and increased erosion on the property of others.

#### DID YOU KNOW?

Currently, just over 30%, or about 700 miles of Puget Sound's shoreline, is altered by bulkheads or some other kind of man-made structures. On Camano Island, 23% of the shoreline is hardened.

#### OTHER SIDE EFFECTS OF BULKHEADS:

- Hard structures, especially when vertical, reflect wave energy back onto the beach, modifying the energy regime on the beach and frequently undermining the bulkhead.
- Increased wave energy and loss of sediment supplies can lead to coarsening of the beach as sand and small gravel are progressively winnowed from the beach. The result is a shift to coarser gravel and cobble beaches and more frequent exposure of underlying hardpan or bedrock.
- Installation of bulkheads often requires that upland vegetation be removed and can prevent mature native vegetation from becoming re-established.

#### DID YOU KNOW?

It is natural for our beaches to erode and long-term erosion rates are generally quite slow. The rates vary from one site to the next but an average range is one foot per decade (0.1 foot/year), often reflecting the loss of several feet of bluff or bank in a landslide every twenty or thirty years.

#### DRIFTWOOD AND VEGETATION ARE OUR FRIENDS

The presence of driftwood and other large woody debris helps to retain sediments and absorb wave energy. If you find them washed up on your beach, leave them in place. Also, dune grass and berm vegetation can greatly increase the resilience of beaches to storm waves.

#### SO YOU NEED A BULKHEAD

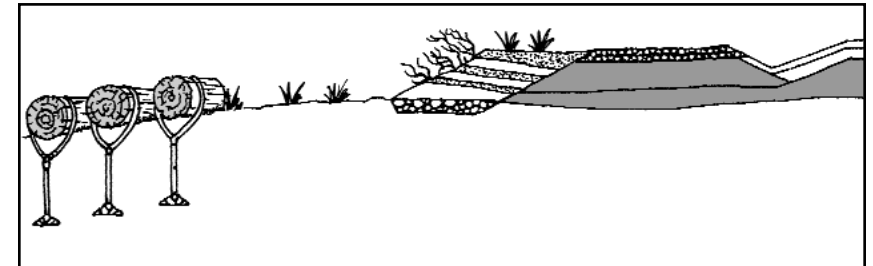
If it's necessary for you to have a bulkhead, build it to recognized standards. Construct them as far landward as possible and build only as much structure as necessary. (A 200' bulkhead is not necessary to protect the base of a stairway.) Consult the Planning department for assistance with design and permits.

#### ALTERNATIVE MEANS OF EROSION CONTROL

Soft-shore protection projects, as an alternative to bulkheads, rip-rap or other "hard" measures, rebuild the high-tide beach to provide protection of property and homes and increase coastal sediment supply. This approach uses indigenous materials such as gravel, sand, logs and root masses to absorb wave energy.

ILLUSTRATION: EXAMPLE OF A LOW-ENERGY ZONE SOFT-SHORE PROTECTION PROJECT

Source: Department of Ecology, Alternative Bank Protection Methods for Puget Sound Shorelines



**Soft-shore protection designs are not suitable for all sites.** The erosion rate, the causes of erosion and an evaluation of wave energy are critical for determining whether a soft-shore protection strategy will work on a particular beach. If you're interested, please contact the Planning Department for a list of coastal geologists who design soft-shore protection systems.

## RESPECT INTERTIDAL LIFE

## HELPFUL RESOURCES FOR MINIMIZING BULKHEADS

Island County Planning Department  
 Camano: 629-4522 x 339  
 Whidbey: 679-7339 or 321-5111 x 339  
[www.islandcounty.net/planning/](http://www.islandcounty.net/planning/)

(The Planning department can advise on geologists with soft-shore protection expertise.)

For a list of website resources, please visit:

[www.shorestewards.org](http://www.shorestewards.org)

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 (click on "Publications")

*Alternative Bank Protection Methods for Puget Sound Shorelines*, #00-06-012

## COMMON BEACH SENSE

Beach etiquette is an important issue. "Use but don't abuse" is a good motto to remember when you're on the beach. Investigate, learn, have fun and leave the beach cleaner than you found it.

## A few things to keep in mind as you explore

- Walk gently on barnacle covered rocks and around tidepools.
- Handle sea creatures with care and put them back where you find them.
- Look carefully under rocks and seaweed. Replace exactly the way you find them. Critters live underneath rocks and seaweed to protect themselves from air, sun and from being eaten by their enemies. If you leave them uncovered, you destroy their home and possibly them too.
- Leave all vegetation where you find it. Plants prevent erosion, are food for animals and insects and add variety and beauty to the beach.
- Refill holes you dig in the sand. Unfilled piles leftover from clamming may suffocate other critters.
- Respect the birds and mammals that you see on the beach. Give them plenty of space to go about their business. They are probably eating, and who wants to be disturbed at mealtime?



## BOATING ON INTERTIDAL WATERS

Boating in any type of craft should be done in a safe and conscientious manner. Using common sense will limit further damage to salmon and forage fish habitats. *For more information on these habitats, please refer to Guideline #10, Preserve Eelgrass Beds and Forage Fish Spawning Habitats.*

- When boating, slow to a wakeless speed within 300 feet of the shoreline. This prevents excessive erosion and respects forage fish and salmon habitat.
- Inspect your boat's motor regularly and make sure that it isn't leaking fuel into the water. Consider purchasing a motor that meets or better EPA 2006 guidelines.
- When refueling, make sure hoses are tightly connected and no gas spills into the water.



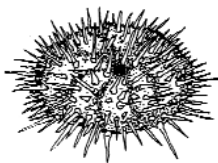
- Do not pump any sewage or waste material into the water. Use only designated State pumpout locations (see below for contact info.)
- Avoid dragging your anchor. It may damage clam, oyster and eelgrass beds.
- Personal Water Crafts (PWCs) disturb fragile intertidal areas when used irresponsibly. Do not operate them in shallow water (less than 24 inches deep), avoid creating a wake, which causes erosion to the shoreline, and do not dock in reeds and grasses.

#### FIRES ON THE BEACH

Beach fires can be a great part of going to the beach. However driftwood fires are a genuine concern to firefighters and local residents on neighboring uplands. Because of these dangers, beach fires should only be built under strictly controlled circumstances. Fires near bluffs are not encouraged due to tree root fires and dry grasses on bluffs. Bring your own wood and do not burn driftwood off the beach, as this is part of the habitat structure.

Usually a campfire or bonfire is legal without a burning permit if:

- The fire is at least 50 feet from any structure.
- The fire is less than 4 feet in diameter.
- You have a shovel nearby.
- The surrounding area is free of flammable materials.
- You douse a fire completely with water prior to leaving the site.
- It is also advisable to check with your city and county on the legality of beach fires. In some areas they are illegal. Do not build a beach fire when a burn ban is in effect.



#### MARINE MAMMALS ON THE BEACH

Seals and sea lions often rest on the shoreline, eventually returning to the water. Otters and whales do not use the shoreline and their appearance indicates distress. If any of these marine mammals appear to be stranded on the beach, it's imperative

that you report it to the Marine Mammal Stranding Network. Do not touch the animal or allow a pet near the animal. Wild animals in a stressed condition bite, and they often carry diseases that are harmful to humans and dogs.

#### To report a stranding

1. Note the condition of the animal (without getting too close) and the location.
2. Do not touch, disturb, feed or pour water on the animal.
3. Contact National Marine Fisheries Services immediately at (800) 853-1964.

#### SEAL PUPS REST ON THE SHORE

Before you report a seal pup to the authorities, remember that they may be resting. Do not touch a pup or allow a pet to approach it. If the pup appears to be in distress, contact National Marine Fisheries Services immediately at (800) 853-1964.

#### HELPFUL RESOURCES FOR RESPECTING INTERTIDAL LIFE

WSU/Island County Beach Watchers

Camano: 629-4522 x. 7391

Whidbey: 679-7391 or

321-5111 x. 7391

[//beachwatchers.wsu.edu](http://beachwatchers.wsu.edu)

For an online ID guide to common nearshore creatures of Island County:

[//beachwatchers.wsu.edu/ezidweb/ezidindx.htm](http://beachwatchers.wsu.edu/ezidweb/ezidindx.htm)

#### To report a whale sighting:

Orca Network

(866) 672-2638

[info@orcانetwork.org](mailto:info@orcانetwork.org)

#### To report a marine mammal stranding:

National Marine Fisheries Service Enforcement Hotline:

(800) 853-1964

**Washington State pumpout locations:**

State Parks Commission  
(360) 902-8500  
[www.parks.wa.gov](http://www.parks.wa.gov)

**Boating safety:**

U.S. Coast Guard  
(811) 368-5647

**For a list of website resources, please visit:**

[www.shorestewards.org](http://www.shorestewards.org)

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*Seashore of the Pacific Northwest*, Ian Sheldon

*Marine Wildlife of the Puget Sound, San Juans and the Strait of Georgia*, Steve Yates

## **PRESERVE EELGRASS BEDS AND FORAGE FISH SPAWNING HABITATS**

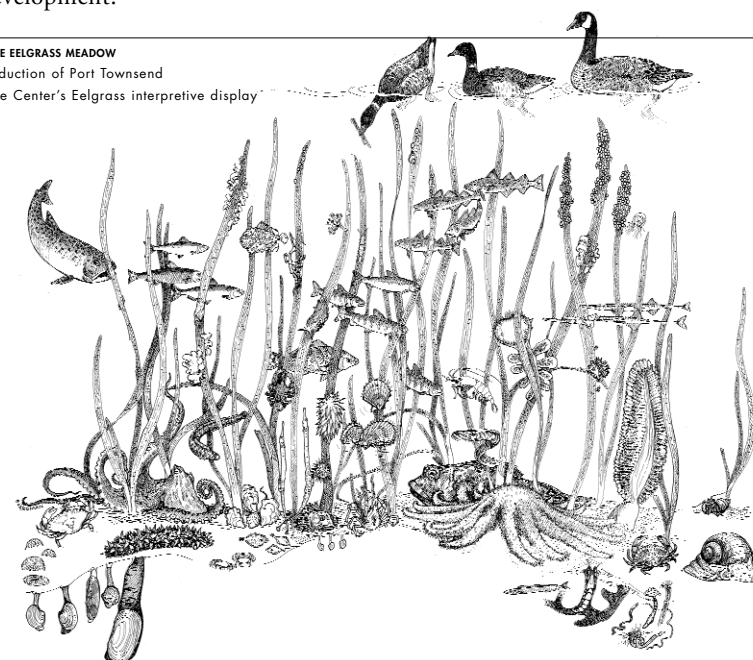
**EELGRASS PROVIDES A DIVERSE HABITAT**

Eelgrass is not technically a true grass or seaweed. It is a flowering, perennial plant that grows both by vegetative growth and by seed germination. Eelgrass needs adequate sunlight and water clarity to grow. In the Northwest, the maximum depth is about 22 feet. Structures such as docks can prevent eelgrass from getting enough light to grow. It is estimated that 33% of the eelgrass beds in Washington have been lost to development.

**ILLUSTRATION: THE EELGRASS MEADOW**

Source: Reproduction of Port Townsend

Marine Science Center's Eelgrass interpretive display

**EELGRASS FACTS:**

- Creates a highly structured habitat from loose and shifting sands.
- Softens the impact of waves and currents.
- Stabilizes the shoreline, providing a calm space where organic matter and sediments are deposited.
- Provides a diverse habitat for many species, as well as protection from predators for many juvenile fish, including salmon.
- Herring lay their eggs on it.
- During low tides, shelters small animals and plants from extreme temperatures.

- Decomposes into an important part of the food web for the coastal marine ecosystem.
- Grows in the spring and summer, then decays in the fall and winter.
- Blades can grow up to 3 feet in length.
- Dungeness crabs often use eelgrass to molt in the spring.
- Is a substrate for herring eggs and a hiding place for juveniles.
- Salmon feed and rest in it before and after traveling up and down river.

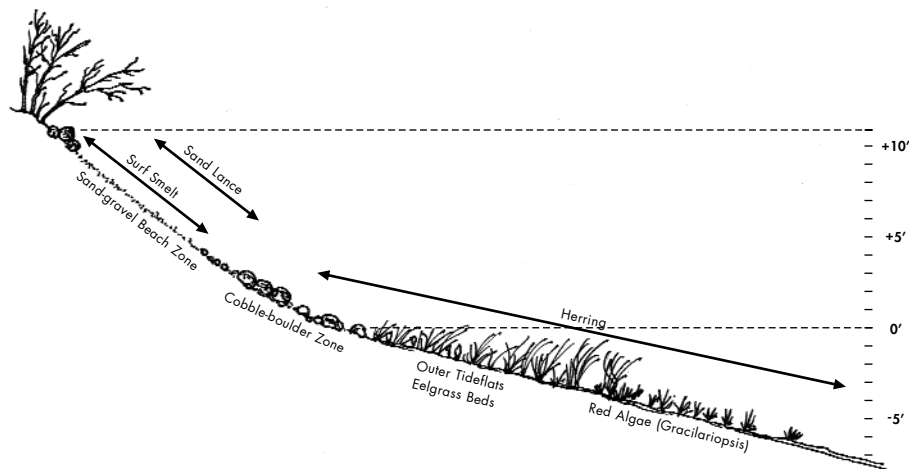
#### FORAGE FISH ARE INDICATOR SPECIES

Forage fish are an important and abundant fish species in Washington. As the name implies, the significance of forage fish is related to the critical role they play as a food source for a large variety of other marine organisms, including salmon. The more common forage fish species within Washington include, Pacific herring, surf smelt and Pacific sand lance (also known as candle fish).

The vitality of the total forage fish resources in Washington is a valuable indicator of the overall health and productivity of our marine environment.

ILLUSTRATION: FORAGE FISH SPAWNING HABITAT ZONE OF SARATOGA PASSAGE & PORT SUSAN

Source: Dan Penttila, Department of Fish & Wildlife



#### DID YOU KNOW?

Overhanging shade trees along the beach are vital to a surf smelt's egg survival during the summer months. To encourage surf smelt spawning it is wise to preserve existing trees and/or re-forest sections of the shoreline where the marine forest has been removed during the course of development.

#### PACIFIC HERRING FACTS:

- Herring eggs may be deposited on eelgrass or seagrass that appears anywhere between the upper limits of high tide to a depth of -40 feet, but most spawning takes place between 0 and -10 feet in tidal elevation.
- Herring stocks spawn from late January through early April.
- Natural mortality for herring is quite high with approximately 50-70 percent of the adult herring from Washington falling to predation each year.
- Herring spawning grounds are vulnerable to shoreline development.
- Each herring spawning ground is assumed to represent a distinct stock.

#### SURF SMELT FACTS:

- Surf smelt spawn in beach coarse sand and pea gravel.
- Surf smelt eggs are deposited near the water's edge around the time of high slack water at a tidal elevation between +7.0 and mean high-high water line.
- The maximum life span of a surf smelt is thought to be 5 years.

#### PACIFIC SAND LANCE (CANDLE FISH) FACTS:

- 60% of a juvenile Chinook salmon's diet is sand lance.
- Sand lance deposit eggs on a rather broad range of beach substrates, from fine sand beaches to gravel beaches up to 3cm in diameter.
- Sand lance spawning occurs at tidal elevations ranging from +5 feet to about mean higher high water line.
- Sand lance feed in open water during the day and burrow into the sand at night to avoid predation.
- Sand lance are an important part of the nutritional link between zooplankton and larger predators in the local marine food webs.

**HELPFUL RESOURCES FOR PRESERVING EELGRASS BEDS  
AND FORAGE FISH SPAWNING HABITATS**

**Map of eelgrass locations in Island County:**

[www.islandcountymrc.org/projects/eelgrass/eelgrass.htm](http://www.islandcountymrc.org/projects/eelgrass/eelgrass.htm)

If you would like to know if you have documented forage fish spawning habitat, please contact the Beach Watchers.

WSU Beach Watchers

Camano: 629-4522 x 7391

Whidbey: 679-7391 or 321-5111 x 7391

[//beachwatchers.wsu.edu](http://beachwatchers.wsu.edu)

Eelgrass harvesting licenses

(360) 902-1100

**For a list of website resources, please visit:**

[www.shorestewards.org](http://www.shorestewards.org)

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Design by Motive Design Research/[www.altmotive.com](http://www.altmotive.com)

**QUICK REFERENCES**

**WSU Beach Watchers**

Camano: 629-4522 x 7391

Whidbey: 679-7391 or

321-5111 x 7391

[beachwatchers.wsu.edu](http://beachwatchers.wsu.edu)

**Island County Health Department**

Camano: 629-4522 x. 350

Whidbey: 679-7390 or

321-5111 x. 350

**Island County Planning Department**

Camano: 629-4522 x 339

Whidbey: 679-7339 or

321-5111 x 339

[www.islandcounty.net/planning/](http://www.islandcounty.net/planning/)

**WSU Extension**

(Beach Watchers, Master Gardeners,  
Noxious Weeds and Waste Wise)

Camano: 629-4522 x 7327

Whidbey: 679-7327 or

321-5111 x 7327

[www.island.wsu.edu](http://www.island.wsu.edu)

**Community beach clean-up**

Cheryl May

(360) 678-4100

**Marine Biotoxin Hotline**

(800) 562-5632

[www.doh.wa.gov/ehp/sf/biotoxin.htm](http://www.doh.wa.gov/ehp/sf/biotoxin.htm)

**Puget Sound Action Team**

(800) 54-SOUND (547-6863)

[www.psat.wa.gov](http://www.psat.wa.gov)

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