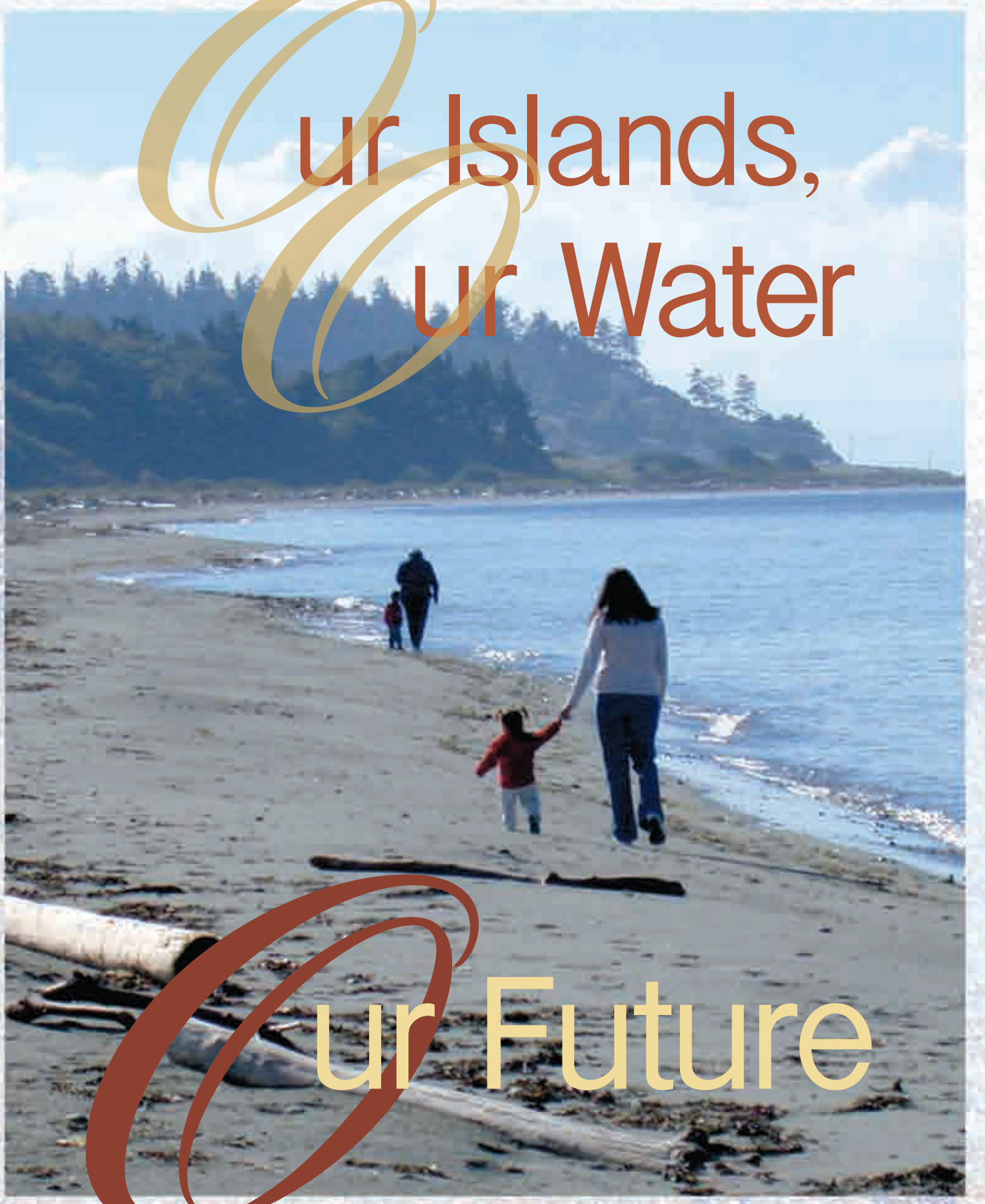
Our Islands, Our Water



Our Future

Together we can keep our water healthy

By changing just one or two small habits, we can make all the difference.

Water defines many aspects of life in our island communities. People, birds, animals, plants and fish all rely on our waters. How we go about our daily routines largely determines how clean these waters stay.

Inside:

New septic rules and you

Save money and prevent pollution

Household hazardous waste – free disposal

Keep pet waste from polluting

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We all live downstream

Our state's Growth Management Act (GMA) encourages growth in urban areas, to preserve open space and maintain water quality. Island County is one of the fastest growing rural counties in Washington. In the 1960s, our population was under 20,000. But since the GMA's enactment in 1990, our county's population has grown to more than 75,000. By 2025 we can expect over 100,000 permanent residents in our county (excluding part-time residents and our many visitors). This puts pressure on our water quality and resources.

Even before the GMA, Island County adopted regulations to protect our lands and waters, because the citizens thought it was important to do so. Land use regulations are designed to protect both our valuable natural resources and the rights of private land owners.

Working for our watersheds

County programs

SURFACE WATER QUALITY MONITORING PROGRAM

Island County Planning and Community Development is currently monitoring the water quality in wetlands and streams in 48 different watersheds on Whidbey and Camano Islands. "Watershed" is a term that describes an area of land that drains down slope to one common low point. A watershed can be as small as just the land that drains into neighborhood creeks – like the terrain surrounding South Whidbey's Maxwelton Creek, or Camano Island's Kristoferson Creek. Or, it can be as large as all of the land in Canada, Washington, Oregon, Idaho, Montana, Wyoming, Utah and Nevada that drains water downhill into the mighty Columbia River.

Here in Island County, monitoring occurs at the bottom of a watershed, where all the fresh water drains into Puget Sound. Water samples are collected and evaluated for fecal coliform, nitrates, pH, dissolved oxygen, temperature, turbidity and phosphorous. Monitoring can help us understand what upland activities are or are not contributing to water pollution. It enables us to focus our outreach where it will be most effective, and apply regulation only where a specific activity adversely affects water quality. Then we can make site-specific corrections rather than involving all other property owners.

GROUNDWATER MONITORING PROGRAM

Island County administers one of the most advanced hydrogeologic programs in Washington State. Island County Public Health evaluates the condition of groundwater used for drinking, cooking and bathing. Monitoring groundwater is important because the activities that occur on top of the ground can affect the quality of water contained in our aquifers. A

■ SEE PROGRAMS, PAGE 3

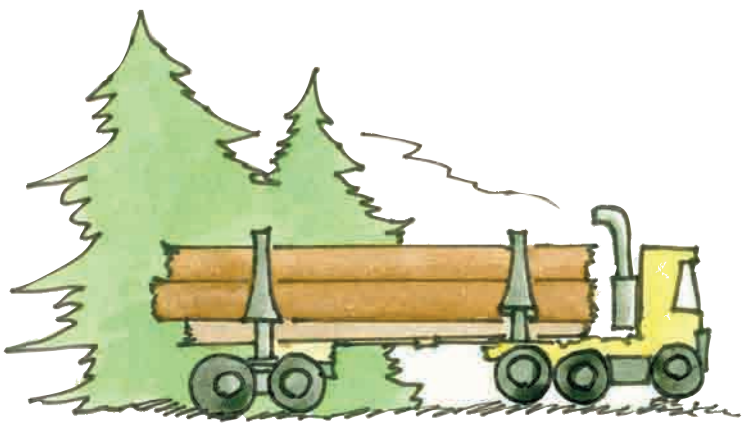
Riding the waves of change

Then and now

Whidbey and Camano Islands are changing. We are gaining many new neighbors who, like us, value our beautiful islands, their natural wonders and lifestyle. Balancing change and livability is a big challenge as our population grows. Over the last 150 years we have altered the landscape with our activities. More recently, we have begun to better understand our environment. Working together, we are making progress toward avoiding impacts to our natural environment, while restoring what has been altered.

FIRST PEOPLE

Native peoples lived for thousands of years on our islands' abundant natural resources. The Coast Salish fished, hunted, gathered shellfish and berries, built plank houses and traveled by canoe among permanent and seasonal villages. They practiced agriculture on what later became known as Ebey's Prairie. On both Camano and Whidbey they trapped salmon, harvested clams and other shellfish, hunted game and harvested wild bulbs, berries and other plants.



SETTLERS

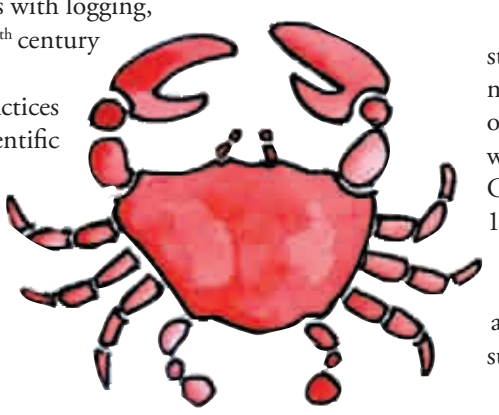
Settlers of European descent began homesteading in the northern Puget Sound regions in the 1800s. As more people moved to our islands to raise their families and engage in trade and commerce, they began to alter their surroundings to make it more liveable. At first there were so few settlers, there was little effect on the natural environment. But as the populace grew, more changes to the land and waters took place.

Logging altered the landscape. It removed vegetation that had absorbed water and held soil in place, stabilizing streams and embankments. Where intense logging occurred, erosion and stream sedimentation resulted. Shade disappeared from stream banks, causing water temperatures to rise and jeopardize aquatic life.

Current requirements and forest practices are balancing environmental protections with economical considerations. The logging industry has improved practices by adapting to more cost effective, environmentally friendly methods. Regulations are in place to balance resource protection with economic needs, and restoration is taking place in some areas.

By the turn of the last century, our islands had become known for their agricultural output. Farmers transported their milk and butter, berries and vegetables, poultry and eggs, hay and other products to mainland markets, besides provisioning local families. Just as with logging, farming practices in the first half of the 20th century also changed the land and waters.

Over the past decades, agricultural practices have changed and improved with scientific advances. Farmers know their land best, and many utilize management practices that sustain their crops and livestock, and also protect our valuable natural resources. Productive farming can be balanced with ecological needs.



CHANGING TIMES

Today, more homes, businesses, schools and churches dot the landscape where forests and rolling farmlands were once prominent. With construction comes removal of vegetation (trees, underbrush and grasses) resulting in increased potential for erosion and sedimentation in streams. Paving (driveways, roads and parking lots) creates more stormwater runoff and flooding *and* prevents surface water from filtering into the ground to replenish the aquifers that provide our drinking water. Population growth brings increased risk of pollution. Yet as we change practices and update regulations, impacts can be reduced.

TROUBLED WATERS

Shellfish can serve as an early warning that our waters are becoming polluted.

Island County is comprised of 214 miles of marine shoreline—more than 8 percent of greater Puget Sound's 2,500 miles of saltwater beaches. With our lush and fertile nearshore habitat we boast some of the finest shellfish beds in the country, including our famous Penn Cove mussels. Dungeness crabs thrive in the eelgrass beds around our two islands.

Shellfish harvesting contributes to Island County's economy and is a popular recreational pursuit for many. But without clean water this activity can grind to a halt. Shellfish are among the first organisms affected by poor water quality because they filter large amounts of water in order to obtain their food. Bacterial contaminants in the water can accumulate in shellfish and cause harm to any human who eats them.

Shellfish contamination is generally from pollutants in stormwater runoff coming from our uplands.

Statewide septic system and stormwater management technologies are now in place to protect shellfish beds and our water quality. New septic system rules were implemented in July, 2007. Island County will phase them in over the next 18 months. Proper care and maintenance of our septic systems will ensure that we can continue to harvest shellfish and also keep our valuable groundwater and surface water safe.

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Clean water

Clean water is essential to the quality of life, natural beauty, healthy livelihoods and outdoor recreational opportunities unique to Whidbey and Camano Islands.

Drinking water – We have no great rivers on our islands to bring us fresh water, unlike the mainland. We Camano and Whidbey Islanders must therefore be particularly cautious, as our communities grow, to take care of our ground or drinking water supplies and our surface waters.

Food – We enjoy easy access to fishing from shore or boat, and collecting clams, mussels, crabs and other shellfish from our beaches and marine waters. We expect our catch to be safe for consumption because it comes from clean water.

Recreation – The waters that we live so close to provide opportunities for safe boating, swimming, waterskiing, wading, playing or just plain viewing. And, we want our children and grandchildren to be able to continue to do the same for years to come.

Wildlife – Residents and visitors enjoy a wide variety of species in our waters and woods. Fish, birds, whales and a wealth of other marine life thrive upon the salty sea that surrounds our islands. In our uplands are deer, songbirds and other creatures that depend as we do upon fresh water.

Our water is only as clean as what we put into it. Our practices and habits play an important part in keeping our waters clean. If each of us will improve even a few individual habits, then together we can assure we will have cleaner water underground, in Puget Sound and in our island streams and wetlands.

In the past, when our islands were more sparsely populated, such small changes may not have made much difference overall. But as more folks are attracted to our communities each year, the significance of each one of us changing just a couple of things becomes more meaningful. We hope the tips in these pages will help you live healthier, save money and leave something better to the next generation.

This guide is presented by Island County Planning and Community Development with funding from a Centennial Clean Water Grant awarded through the State Department of Ecology.

■ PROGRAMS, FROM 2

substantial quantity of water that sits on the surface eventually percolates through the ground and ends up in our drinking water supply. Malfunctioning septic systems, poor manure management or improper land development activities all have potential to impact groundwater.

NON-POINT POLLUTION PREVENTION PLANS

"Non-point pollution" is different from the type of pollution many of us commonly envision. Unlike pollution emitted by a factory or other known source, non-point pollution comes from many small, nondescript sources. Any one of these sources may contribute very little pollution to our waters, but when combined, the many sources become significant. For example, applying too much fertilizer on a lawn may not cause much damage to water quality, but over-applied fertilizer on 1,000 lawns creates considerable risk to water quality. Our County has developed non-point pollution prevention plans for Camano Island, North Whidbey and Central/South Whidbey. These plans rely on education and public involvement to reduce non-point pollution, rather than instituting new regulations.

AGRICULTURAL BEST MANAGEMENT PRACTICES

Island County has rules that encourage farmers to work with their local Conservation District to develop and implement plans for managing their farms. Called BMPs (Best Management Practices), they allow the farmers and the Conservation Districts to craft farming practices appropriate for their land, while protecting water quality. The BMPs are supported by state agencies, environmental groups and the Washington State Farm Bureau.

County scientists test water quality.

HOLMES HARBOR SHELLFISH PROTECTION DISTRICT

Late last summer, State Department of Health officials closed South Holmes Harbor to shellfish harvesting, because elevated levels of fecal coliform bacteria were found there. Shellfish must have clean water in order to be safely eaten by humans.

The Island County Board of Commissioners subsequently established a non-taxing, non-regulatory Shellfish Protection District. It encompasses all areas that drain into the south end of the harbor, and shoreline properties bordering the prohibited area.

Scientists with Island County's Water Quality Monitoring program are analyzing the surface water that drains through Freeland. They are looking for potential sources of fecal coliform bacteria that may have contaminated the harbor. Probable sources are pet wastes, wildlife, manure (livestock), and malfunctioning septic systems.

Residents, businesses, professional service providers and community groups are working together to reduce the pollution. Island County's goal is to ensure that shellfish collected on the beaches of South Holmes Harbor are once again safe for human consumption, and the waters are free of bacterial contamination. Then, the District can be dissolved.

■ SEE PROGRAMS, PAGE 8

NEW STATEWIDE SEPTIC RULES

Whether newly installed or long existing, septic systems need regular maintenance to keep from polluting our waters. New laws are now in effect statewide that require recorded inspections.

All homeowners with septic systems will be required to inspect them regularly. The location and type of system will determine the frequency of required inspections and whether the homeowner can be certified to do the inspections.

Every year a number of our county's existing septic systems fail. Some shoreline properties still discharge raw sewage directly into our marine waters. This program aims to reduce or eliminate leaking systems, ensuring the protection of your health and environment.

Inspection schedule

Conventional septic systems consisting only of a septic tank and drainfield must be inspected every three years.

All other systems must be inspected every year.

Who may inspect/evaluate

The homeowner may inspect their own on-site sewage disposal system *after completion of a training program by Island County Public Health* if:

- **The system is conventional** and the evaluation is not associated with sale of the property, or
- **The system is a conventional pressure** system and is not located in a Sensitive or Marine Recovery Area, and the evaluation is not associated with sale of the property. Areas that drain into **Penn Cove** and **South Holmes Harbor** are mapped as Sensitive Areas. Currently, Island County has *no* Marine Recovery Areas.
- In all other cases, the inspection must be done by a professional provider.

Implementation period

The new state rules are being phased in over an 18-month period for Island County residents and landowners. The process for licensing professional maintenance service providers locally, and training and certifying homeowners, is being initiated by County Public Health. Homeowner training will begin early next year; to receive information about dates and locations, send your name, address and phone number to HomeownerSeptic@co.island.wa.us.

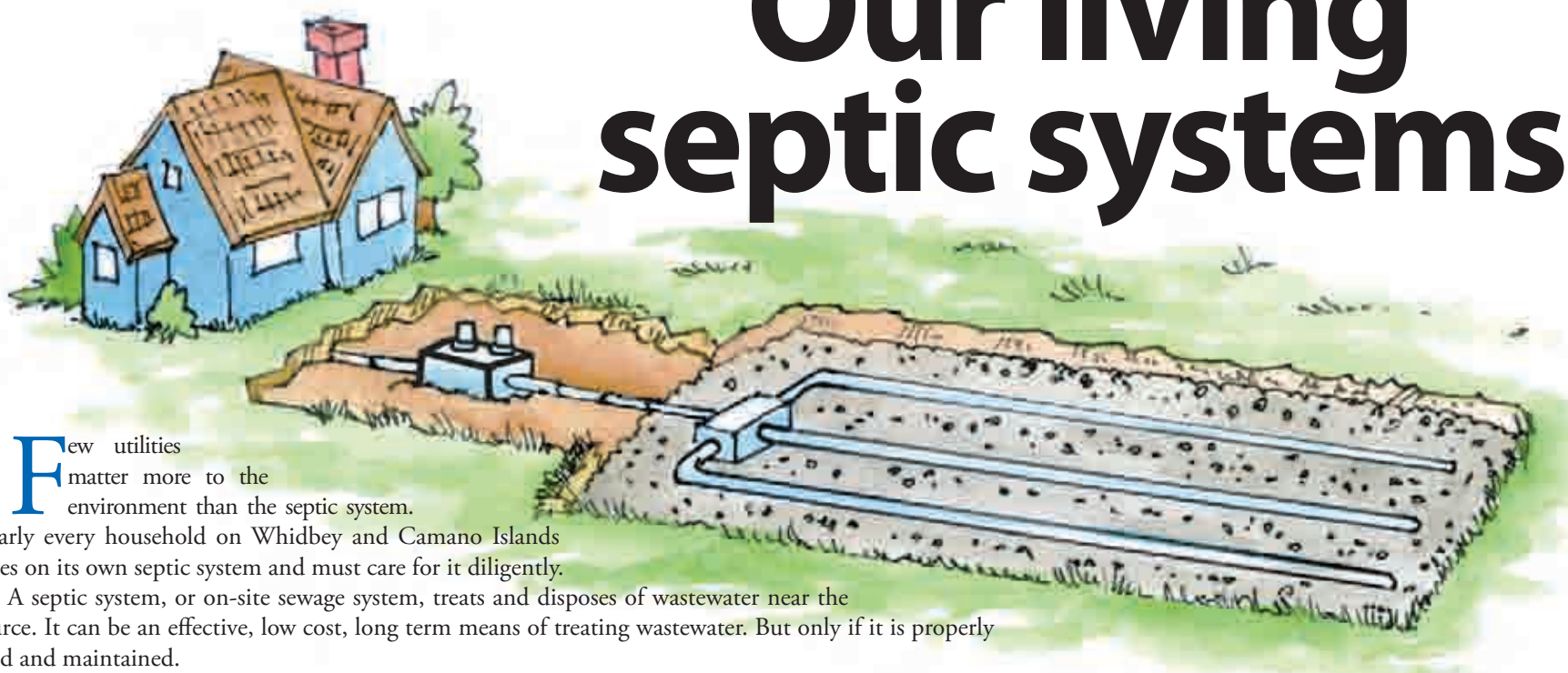
Once the program is established and the maintenance industry is in position to meet the demands, the Health Department will accept evaluation forms only from licensed maintenance providers and certified homeowners. Information about future reporting requirements will be provided by Island County Public Health officials.

The Department is committed to working with you to ensure your septic system is functioning properly. Although penalties for non-compliance with the inspection requirements can range from $25 a day for low-risk violations to $250 a day for high risk violations, the Department will impose fines only as a last resort.

No fines will be levied during the 18-month implementation period.

The new regulations only apply to on-site sewage treatment systems. Homeowners served by a sewage treatment plant are not affected by these new rules.

Our living septic systems



Few utilities matter more to the environment than the septic system. Nearly every household on Whidbey and Camano Islands relies on its own septic system and must care for it diligently.

A septic system, or on-site sewage system, treats and disposes of wastewater near the source. It can be an effective, low cost, long term means of treating wastewater. But only if it is properly used and maintained.

A conventional, gravity-fed system relies on three working parts: the **septic tank**, the **drainfield**, and the **soil** surrounding the drainfield. Settling and biological breakdown occur in the tank. From there, the effluent flows to the drainfield, which filters the wastewater into the soil. Soil conditions or other limitations of a particular property determine how complex a septic system must be. Some lots have conditions that may require an alternative septic system which uses pumps, treatment devices and controls.

THE SEPTIC TANK

Wastewater from your toilet, bath, kitchen and laundry flows into an underground septic tank. Heavier solids settle to the bottom, where bacteria partially decompose them to **sludge** and gas. Lighter solids such as soap, grease and toilet paper float to the top and form a **scum** layer. Between the sludge and scum is a liquid layer that flows into the drainfield for treatment and disposal.

Septic tanks can have one or two compartments. Two-compartment tanks do a better job of settling solids and are required for most newer systems. The tank's inlet and outlet pipes should have tees or baffles. The inlet tee slows the incoming wastes and reduces disturbance of the settled sludge. The outlet tee keeps the solids and scum in the tank. All tanks should have accessible covers for checking the condition of the baffles and for pumping both compartments.

Solids should always remain in the tank. If not removed by periodic pumping, solids will accumulate until they eventually flow into the drainfield and cause it to clog. Most septic tanks need pumping every three to five years.

From the tank, a liquid called effluent flows to the drainfield. The septic tank is always "full" to the bottom of the outlet pipe. As wastewater enters, effluent exits. It's critical that the solids remain in the tank and only liquids exit to the drainfield.

THE DRAINFIELD

The tank can be pumped but the drainfield cannot. The drainfield is a network of perforated pipes buried underground in shallow, gravel-filled trenches. The effluent flows through the pipes and slowly trickles into the gravel to be dispersed evenly throughout the drainfield. The filtering action of the gravel and soil continues to remove suspended solids, pollutants and bacteria.

Every new drainfield must have a **designated replacement area**. It should be maintained as if a drainfield was already there, in case the existing drainfield needs an addition or repair.

THE SOIL

Final treatment of sewage occurs in the soil around the drainfield. The wastewater percolates downward and outward, eventually entering the groundwater. Chemical and biological processes treat the effluent as it moves through the soil pores. Pollutants stick to soil particles and are consumed by microscopic organisms living in the spaces between soil particles. These processes work best where the soil is dry, permeable and contains plenty of oxygen for several feet below the drainfield.

ALTERNATIVE SYSTEMS

Alternative septic systems are used when there is too little suitable soil present for effective treatment of the wastewater or where critical areas are located near the drainfield. They usually require a pump. Alternative systems require more frequent servicing because they are more complex with more parts that can malfunction. Types of alternative septic systems include:

Mounded drainfields, which have a layer of sand to increase treatment.

Sand filters and aerobic treatment units, which treat the effluent by filtration and oxygenation.

KEEP IT WORKING

A septic system is a delicately balanced biological machine that requires proper care and maintenance to work well. Servicing is not enough. Maintenance begins with how you treat your system.

If a septic system fails, sewage may back up into the house or flow out onto the ground where it can contaminate surface water, groundwater and wells, creating a public health hazard.

Septic failure occurs when the system stops working. Some causes of failure:

- Solids escaping from the tank and clogging the soil. This could result from failure to pump the tank in time, or from overdosing the system with too much water and not leaving enough time for solids to separate from liquid.
- Drainfields are paved over, parked on or invaded by tree roots. Driving on your drainfield can crush the pipes or compact the soil.
- Toxic substances poured down the drain poison the microbes that digest the waste.

Drainfield failure is permanent. A failed drainfield cannot be revived. You will have to install a new drainfield in your drainfield reserve area. The comparative costs show why maintaining a healthy system saves you money:

Typical cost of a septic inspection:
$150 to $200

Typical cost to pump a septic tank:
$400

Typical cost to replace a failed alternative system:
$15,000 to $20,000

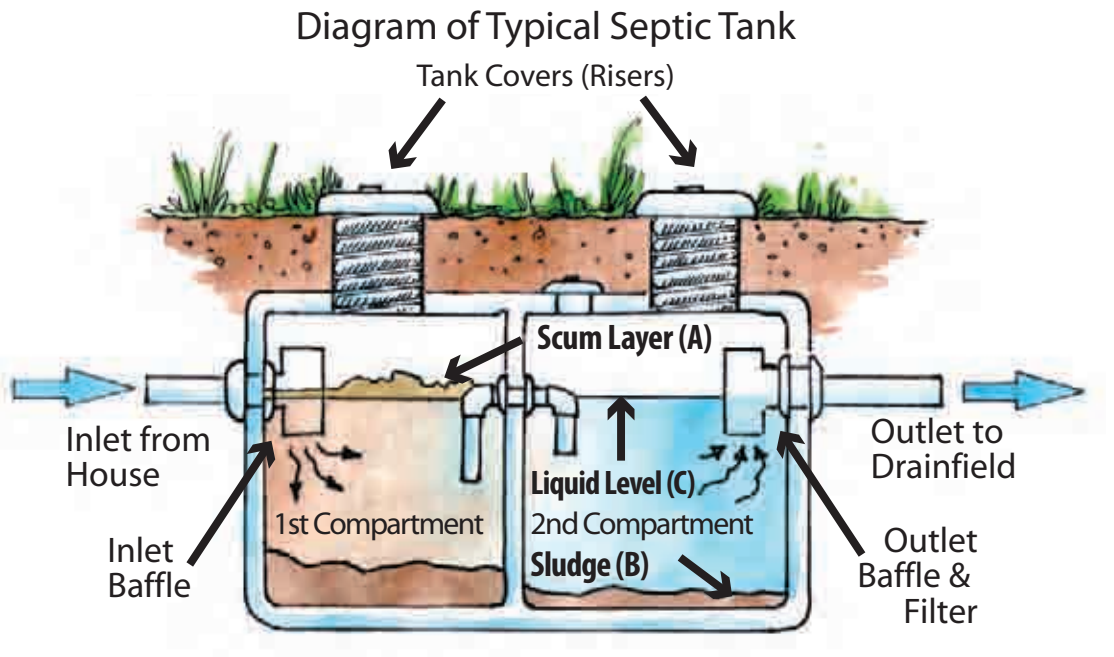
Plan to invest in maintenance of your septic system just as you perform regular maintenance on your car. Although you may not get a monthly sewer bill in the mail, you should plan to put aside small amounts of money each month for periodic maintenance.

What if I'm on a sewer system?

The three municipalities and certain unincorporated areas in Island County are served by sewers. Even if you live in a community with a sewage treatment plant, we recommend you follow the pointers in this pamphlet about conserving water and not putting harmful substances down the drain. This will hold down your sewer costs and help prevent pollution from getting into our water resources.

Can you find your 'As Built' drawing?

An As-Built, or Record Drawing, is a drawing that details where your tank, drainfield, well and house are located. It will describe what components make up your septic system, who installed the system, and how it operates. You need the Record Drawing to properly service your system. If no plans or drawings exist, a licensed installer or inspector can help you locate your tank and drainfield, and create and file a Certification Record Public Drawing with Island County Public Health. Remember to make a copy for your records.



The septic tank should be pumped when the height of A + B (solids) = .33 x C (height of liquid)

SEPTIC MAINTENANCE

Keep your system working!

Why proper care matters so much

A septic system is an elegant biological machine. It functions because of the action of microbes and properties of the soil.

If not maintained, this biological machine could shut down – a very unpleasant and costly setback. So it is crucial to care for it by watching what goes down the drain, reducing water use, inspecting regularly, pumping as necessary and protecting your drainfield and reserve area.

Most people know better than to put gasoline into a car radiator or oil into the gas tank. The same principles apply to septic systems: to avoid killing the all-important microbes and clogging the soil with grease and solids, be aware of what goes down the drain.

DO'S

- **Know where your drainfield is**, protect it and let it breathe.
- **Inspect your system frequently** and keep records of system maintenance.
- **Pump your septic tank** as needed, or when the amount of solids (scum plus sludge) equals or exceeds one-third the volume of the tank. It is critical to ensure that the scum layer doesn't overflow the top of the outlet tee and that the top of the sludge layer doesn't come near the bottom of the outlet tee. Generally, get the septic tank pumped every three to five years. Inspection by the owner or a professional may show the need to pump it more, or less, often. Regular pumping helps prevent solids from getting into the drainfield. *Solids can destroy the drainfield. Once that happens, pumping will not bring a failed drainfield back to life.*
- **Inspect outlet filter regularly.** Most systems installed after 1995 have an effluent filter on the outlet side of the septic tank. The filter prevents hair and other solids from clogging the pump and pipes, but it must be cleaned regularly. Inspecting a filter, and cleaning it when necessary, is quick and easy. It will help prevent costly damage due to solids entering the drainfield.
- **Conserve water**. Using too much water at once reduces your system's ability to treat the waste and may cause system failure.
- **Use liquid laundry detergent** instead of powdered, which can cake in the system.
- **Direct rain water** from downspout drains away from your drainfield. The soil can only absorb a limited amount of liquid.
- **Keep cars, trucks and livestock off** the septic tank, drainfield and reserve areas.

DON'TS

- **Don't use a garbage disposal.** It can double the amount of solids added to the tank, requiring more frequent pumping. The bacteria and other microorganisms in the tank like their food pre-digested.
- **Don't flush toxic substances** down sinks or toilets. Strong bases, acids, paints, paint thinners, varnish, insecticides, motor oils, gasoline and degreasers kill beneficial bacteria and other microorganisms in the septic system. They also contaminate ground and surface water. Dispose of them at your county or city hazardous waste facility.
- **Don't use septic system additives** or "miracle" system cleaners unless approved by the Washington State Department of Health. Also avoid home remedies like yeast, raw hamburger or cabbage. They provide little if any benefit to the function of a septic system. Everything necessary for proper system function is found naturally in wastes. Again, *the microorganisms in your septic tank like their food predigested.*
- **Don't plant trees,** water-loving plants or other vegetation with extensive root systems on or near drainfields. Use grasses or other shallow-rooted plants to cover drainfields. The shallow-rooted vegetation prevents erosion while providing additional water up-take, unlike the roots of water-loving plants and trees that seek the water in your drainfield, resulting in clogged pipes.
- **Don't wash greases** and oils down the drain, regardless of the amount of hot water you run afterward. Grease can clog the drainfield, making it impossible for soil to absorb liquids. Remove grease from pots and pans using a paper towel.
- **Don't use your toilet as a wastebasket.** Never flush solid waste. This includes cigarette butts, coffee grounds, diapers, sanitary napkins, tampons, condoms, paper towels, facial tissues, dental floss and cat litter. All these items can clog systems or ruin pumps.
- **Don't construct patios**, carports, sidewalks, driveways or structures over the drainfield. Do not put landscaping plastic over your drainfield; it can prevent oxygen from reaching the soil. Bacteria need oxygen to break down the sewage.

Warning signs of septic system failure

Odors, surfacing sewage, wet spots or lush vegetation growth in the drainfield area

Chronic ponding of liquid in drainfield inspection pipes

Slow draining pipes or gurgling sounds in the plumbing system

Plumbing backups or sewage surfacing over the septic tank

Evidence of high water levels in the septic tank. Water in the tank should never be above the outlet pipe inside the tank.

Water running back into the septic tank from the drainfield after pumping

If you notice signs of a system failure, contact Island County Public Health Department for assistance. They can provide a list of licensed Island County septic system professionals. A permit may be required to repair your system. Financial assistance including low interest loans may be available to repair failing septic tank systems. Island County Public Health regularly conducts free workshops on septic system operation and maintenance where you can learn more about taking care of your system.

If you have an alternative septic system you need to take additional maintenance steps. Get the instructions for your type of system from the County or State Departments of Health.

Health hazard

Sewage is a hazardous material that can contain disease-causing agents and can form dangerous gasses. Wear gloves, masks and other protective clothing when working with the system. Thoroughly wash your hands afterwards. Never, for any reason, enter any tanks or confined spaces.

CONSERVING WATER

Reduce the strain on your septic system – use less water

- **Turn off tap whenever** possible while preparing food, rinsing dishes, shaving or brushing teeth.
- **Use water-saving faucets,** showers and toilets. Take short showers.
- **Run dishwashers and washing machines** one at a time.
- **Do laundry** over the entire week. Wash one load every day rather than on "laundry day". Avoid partial loads, or reduce water levels for small loads. Consider upgrading to a front-loading machine that uses half the water.
- **Fix any faucet or toilet leaks** promptly. Pour food coloring in toilet tank to check for slow leaks. The food coloring moves from the tank to the bowl if your toilet is leaking.

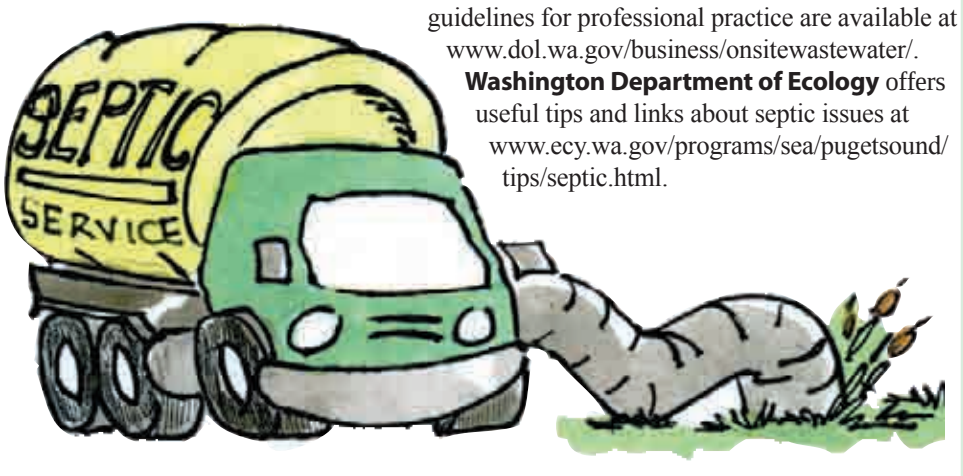
FOR SEPTIC INFORMATION

Island County Public Health for information about septics, sewage, safe shellfish and groundwater. (360) 679-7350, South Whidbey (360) 321-5111 x7350, Camano (360) 387-3443 x7350, or online at www.islandcounty.net/.

Washington State Department of Health for standards that guide the use of onsite sewage systems throughout the state: www.doh.wa.gov/. Follow the links to Publications and Wastewater.

Licensing. All persons who provide professional septic services in Island County must be licensed by the State Department of Licensing or Island County Public Health. Information about licensing requirements and guidelines for professional practice are available at www.dol.wa.gov/business/onsitewastewater/.

Washington Department of Ecology offers useful tips and links about septic issues at www.ecy.wa.gov/programs/sea/pugetsound/tips/septic.html.



LOW COST LOANS FOR SEPTIC REPAIRS

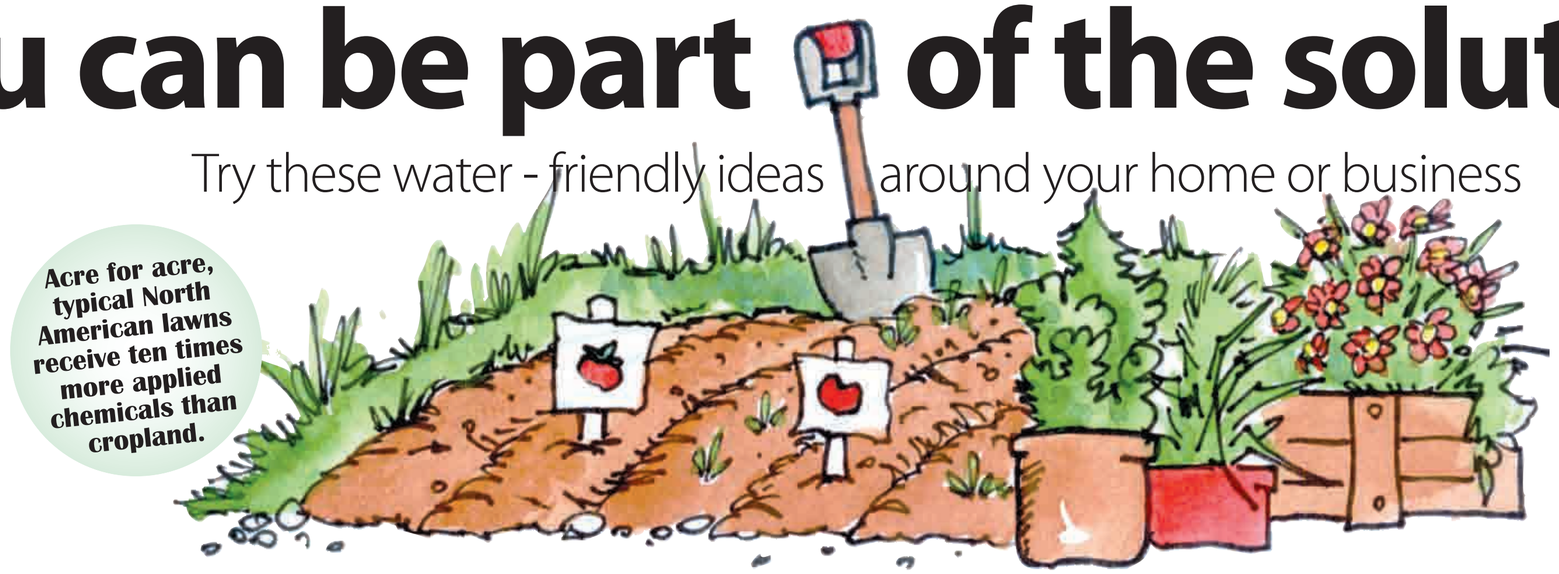
Island County offers low-interest loans and grants for septic system repair or replacement. If your system is failing, you may qualify. The repair cannot be part of a remodel or replacement proposal. Call the Island County Public Health department for more information on this program or for general septic system care.

ENERGY STAR WASHER

Consider getting a front-loading washing machine with the EPA's Energy Star label. It will save on both your water and energy bills. Through December 2007, Puget Sound Energy is offering its electric customers rebates of $50 to $100 on qualifying washers. Snohomish County PUD customers can get rebates on the purchase of a qualifying resource-efficient clothes washer ($75) or dishwasher ($35) through November 15, 2008. Information on their web pages.

You can be part of the solution

Try these water - friendly ideas around your home or business



Acre for acre, typical North American lawns receive ten times more applied chemicals than cropland.

LANDSCAPE

Green gardening techniques conserve water, limit chemical use and reduce runoff.

- **Reduce lawn area.** Lawns need chemical support and require more irrigation than a landscape of established groundcovers, shrubs and trees. And you'll have less mowing to do!
- **Avoid overwatering your lawn.** Deep infrequent watering is more effective than frequent shallow watering. Water early or late, not in the heat of the day. Or don't water at all. In western Washington, most lawns can successfully go dormant in summer and revive naturally with the return of fall rains.
- **Use a mulching mower** or leave clippings on the lawn to return nitrogen and fertilize naturally.
- **Use drought-resistant** native plants that need less supplemental water to survive.
- **Keep slopes planted** with trees and shrubs that prevent erosion.
- **Use terraces or water bars** to reduce runoff velocity on steep slopes.
- **Pull weeds by hand** or with hand tools instead of using chemical herbicides.
- **Avoid disturbing soil** during the fall and winter rainy season, when bare soil is more likely to wash away.
- **Plant a temporary ground cover** such as clover, or apply a mulch such as bark chips or straw to prevent erosion of exposed soil.
- **Test your soil before** applying fertilizers. Over-fertilization is a common problem, and the excess can leach into groundwater or contaminate surface water. Follow directions on package. Soil test kits are sold at nurseries.
- **Reduce or eliminate use of pesticides,** herbicides and chemical fertilizers. Choose the least toxic option and apply only to target areas. Follow package directions carefully.
- **Keep pesticides,** herbicides and chemical fertilizer applications away from wells, ditches, streams, lakes, wetlands and bodies of water.
- **Do not use pesticides,** herbicides and chemical fertilizers when it is windy or likely to rain within the next day.
- **Do not dispose of garden chemicals** in septic systems, storm drains or any other connection to drainage systems.
- **Rely on beneficial insects** and non-toxic pest control methods whenever possible.
- **If you use a professional lawn care** service, select a company that follows practices designed to minimize the use of fertilizers and pesticides.
- **Maintain native plant buffers** along waterfronts, streams, wetlands, ditches and storm drains to prevent erosion and filter pollutants from stormwater.
- **Use fencing to keep pets and livestock out of streams,** ditches, ponds and wet areas. One horse can produce 50 pounds of manure a day.
- **Keep manure piles covered** and where rain cannot wash the waste into ditches, streams and wetlands.
- **Establish watering and feeding areas** for animals away from slopes leading to water.
- **Minimize impervious surfaces** to reduce stormwater runoff.
- **Use natural fertilizers** such as compost, rotted manure and mulch.
- **Compost yard waste** to reduce garbage going to the landfill (and keep your garbage fee down). Composting also saves on your costs for fertilizer and mulch. To learn how to properly compost food waste without attracting pests contact the WSU Island County Waste Wise Program.

AROUND YOUR HOME

- **Take unused household chemicals to hazardous waste collection centers.** DO NOT pour them on the ground, in the sink or down the storm drain. Pouring chemicals down a house drain may damage your septic system or contaminate treatment plant sludge. Whatever goes down a storm drain ends up in the Sound. Use Island County's free hazardous waste collection centers.
- **Pick up pet waste** and dispose of it properly in the garbage. See special section in this Guide.
- **Use water-based paints** and finishes instead of toxic oil-based products.
- **Use disposable paint brushes** that can be bagged and thrown in the trash after use.
- **Direct downspouts** away from paved areas and onto lawns or other absorbent surfaces—but not your drainfield or reserve area!
- **Repair plumbing leaks** promptly.

BOATS

- **Clean your boat** from the waterline up, using only a sponge and water to avoid rubbing off toxic particles of paint and varnish.
- **Haul your boat away from water** and onto grassy areas for hull cleaning and painting. Conventional bottom paint contains copper. If copper is released from the paint, it accumulates in the water and in sediments. Copper kills small marine organisms and is toxic to salmon.
- **Contain chemicals** and messes from sanding or painting. Use power sanders with attached vacuum bags for dust collection. Sweep up or vacuum paint, varnish chips and dust.
- **Inspect and fix leaks** and drips in your engine.
- **Install a filter** on your bilge pump to capture oil and fuel.
- **Avoid fuel spills** while fueling. Fill up at established fueling facilities and use absorbent collars. Don't fuel over water from hand-carried containers. Have absorbent pads or rags on hand in case of a spill.

Washing car on lawn – the recommended way.

CARS AND TRUCKS

- **Fix oil and fluid leaks** in your vehicle. Use ground cloths and drip pans under the car when working on it at home.
- **Soak up oil spills** with absorbent rags or use kitty litter, then dispose of the oily waste in the garbage. Do not hose brake fluid, oil, grease and antifreeze into the street where they will eventually reach water.
- **Recycle used motor oil.** Never dump it. Island County's Solid Waste division provides free and convenient drop-off sites.
- **Reduce your vehicle use.** Consolidate errands. Try alternate transportation, such as carpooling, walking, biking, and Island Transit's free bus service.
- **Park your vehicles on gravel** to prevent erosion and pollution runoff.
- **Wash your car on a grassy strip** to prevent dirty, soapy water from running into storm drains or ditches. Use biodegradable, low-phosphate cleansers. Or take your vehicle to a commercial car wash that recycles and treats water. Some car washes offer reduced prices or promotional discounts — watch their ads for savings.

  Groups that hold car wash fundraisers may borrow, at no cost, special kits to keep pollutants out of storm drains. Inside Oak Harbor city limits, call 360-279-4674. Starting early next year, Island County Planning will provide a similar service.

AIM FOR BELOW AVERAGE

A 2003 study estimated that Island County residents used an average of 105 gallons of water at home a day, slightly above the national average of 80-100 gallons. Try to be *below* average!

- **Run only full loads** in the dishwasher and washing machine.
- **Install aerators** on faucets, and flow restrictors on showerheads.
- **Turn off water** when shaving, brushing teeth or washing dishes
- **Equip your garden hose** with an automatic shut-off nozzle.
- **Water garden thoroughly** once a week, instead of shallowly once a day.
- **Water early in the morning** or in the evening, to avoid loss of water to evaporation.
- **Install an automatic or drip irrigation** system or use a soaker hose instead of sprinklers.
- **Collect roof runoff** for irrigation.
- **Sweep** your porch, sidewalk, and driveway instead of hosing or spraying.

A dripping faucet can waste 2,160 gallons a year.

A family of four can save over 500 gallons a week by installing low-flow showerheads.

One quart of motor oil leaking from a car can pollute 250,000 gallons of water

MORE CLEAN WATER INFO & HELP

Island County Government
www.islandcounty.net
(ALL AREA CODE 360)

- From North/Central Whidbey, dial the listed 7-digit number directly or call 678-5111.
- From South Whidbey, local toll free **321-5111** + 4-digit extension (in parentheses)
- From Camano Island, local toll free **629-4522** + 4-digit extension (in parentheses)

PLANNING AND COMMUNITY DEVELOPMENT: 679-(7339)
Clearing and grading, land use and building permits
Resource Enhancement Program: **679-(7339) X 6069**
Water Quality Monitoring
Holmes Harbor Shellfish Prot. Dist.
Non-Point Pollution Plans
Salmon Recovery Program

PUBLIC HEALTH – ENVIRONMENTAL HEALTH SECTION: 679-(7350)
Drinking water/septic/sewers
Shellfish/Swim Beach advisories
Wells/Water Systems/Hydrogeology
Water Resources Advisory Committee

PUBLIC WORKS: 679-(7331)
Stormwater Management
Public Road access
Solid Waste: **679-(7386)**
(Recycling, waste disposal, yard debris)

ISLAND CO. WSU EXTENSION: 679-(7327)
Admiralty Head Lighthouse volunteers • Agriculture Sustainability and Land Stewardship • Backyard Wildlife Habitat Program • Beach Watchers and Shore Stewards • 4-H • Livestock and Small Farm Advisors • Master Gardeners • Waste Wise Program

Municipal Governments Inside Island County
Utilities inside city limits – stormwater, sewer, water and recycling

- Coupeville Town Hall **360-678-4461**
- Langley City Hall **360-221-4246**
- Oak Harbor City Hall **360-279-4500**

Conservation Districts
Free non-regulatory technical assistance on farming, forest plans and low impact development

- Camano Island (served by Snohomish Conservation Dist.) **425-335-5634 ext 4**
- Whidbey Island Conservation Dist. **360-678-4708**

Waste disposal
Garbage, recycling, construction debris, household and hazardous waste, yard trimmings, old appliances, tires, junk vehicles

- Island County Solid Waste Transfer Stations – Camano, Oak Harbor, Coupeville, South Whidbey/Bayview. Call during regular business hours: **679-(7386)** www.islandcounty.net/publicworks/Solid%20Waste/index.htm
- Island Disposal (commercial & residential garbage pickup; fee) North/Central Whidbey, dial direct **678-5701** South Whidbey, dial direct **321-1331**
- Island Recycling Freeland **331-1727** Coupeville **678-7478**
- NAS Whidbey Island – Recycle Center **257-5481**
- Waste Management (commercial & residential garbage pickup; fee) Camano Island **800-592-9995**

SAFE DISPOSAL OF TOXINS

Most of us use products containing hazardous substances – items as common as flashlight batteries, paints, and cleansers. Do not toss these out with your ordinary garbage. Instead, dispose of hazardous products (and containers) at any Island County Solid Waste transfer station (no fee for residential disposal). Hazardous products include:

- **fluorescent bulbs**, including compact fluorescents (they contain mercury)
- **paints**
- **stains**
- **solvents**
- **strong cleaners**
- **gas or oil**
- **lubricants**
- **automotive** fluids
- **pool/spa** chemicals
- **yard and garden** chemicals
- **hobby** chemicals
- **household batteries**, including rechargeable batteries from cell phones, tools, toys, toothbrushes, etc.
- *any* **products containing lead, cadmium or mercury.**

You can protect the health of your family, and the safety of our water, by choosing safer products. Read labels carefully and follow instructions. For non-toxic cleaning product recipes contact Island Co. WSU Waste Wise Program. For disposal or recycling of electronic products, or other information, contact Island County Solid Waste.

DON'T DUMP OVER THE BLUFF

It is illegal in Island County to dump yard debris over the bluff or along the beach. This includes leaves, grass clippings, branches, trees and brush. Such dumping can increase erosion, introduce lawn chemicals, create hazards for boaters, and add excessive nutrients to the water.

Instead:

- **Practice "grasscycling":** leave lawn clippings on the lawn. This reduces watering needs, provides free fertilizer, and doesn't cause thatch buildup.
- **Compost yard waste,** turning it into mulch or rich soil.
- **Take large branches** and trees to a facility that accepts them for composting, or utilize a local private business or handyman service. For assistance contact Island County Solid Waste's Recycling and Hazardous Waste Coordinator.

Getting started. Clip this out and put on your refrigerator at home or at work. Try one new practice every month. By the end of the year, you will have made a big difference in helping keep our waters clean.

Month	Practice	Accomplished	Month	Practice	Accomplished
Jan		Yes ☐	July		Yes ☐
Feb		Yes ☐	Aug		Yes ☐
Mar		Yes ☐	Sept		Yes ☐
Apr		Yes ☐	Oct		Yes ☐
May		Yes ☐	Nov		Yes ☐
June		Yes ☐	Dec		Yes ☐

WATER

We drink it. We wash it down the drain. Then we drink it again.

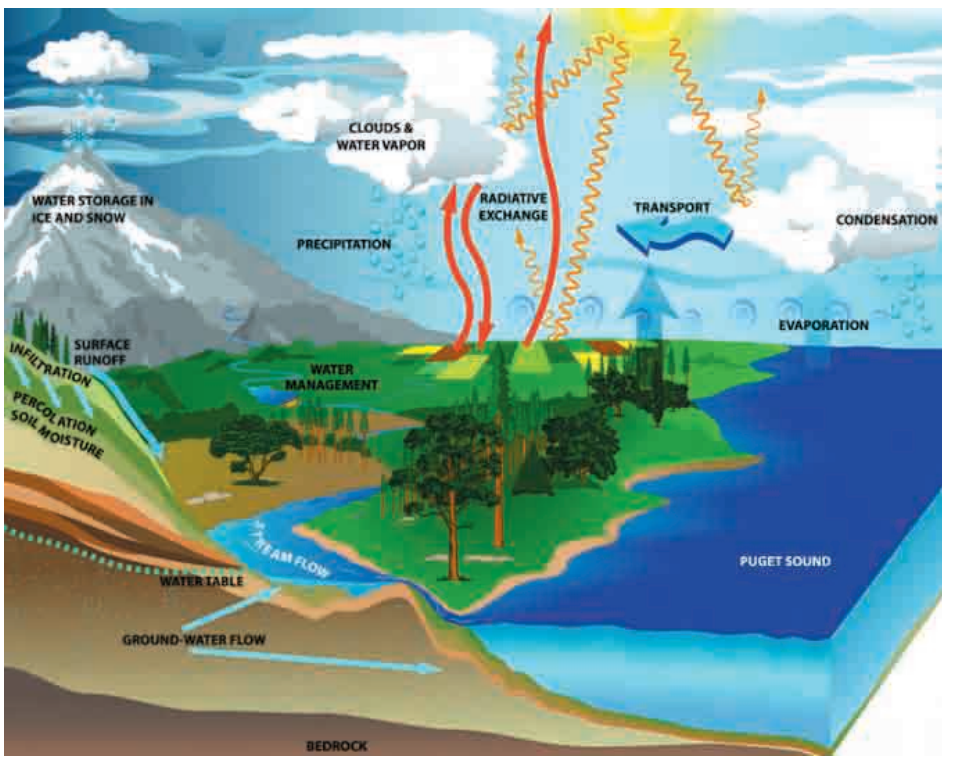
Just how fresh is "fresh" water? It has all been used before. Water is always on the move, cycling from one phase to the next and back again.

The water cycle, also called the hydrologic cycle, is how water continuously circulates from the Earth to the atmosphere and back to the Earth.

The sun drives the water cycle, heating surface water and causing it to evaporate. As the vapor rises it meets cooler air, condensing into clouds. From the clouds, water falls on the land as rain or snow. At any time a droplet in the water cycle could be in the form of ice, seawater, groundwater or even vapor.

On Camano and Whidbey, most of our drinking water comes from groundwater, and all of our groundwater comes from rainfall or, occasionally, snowmelt. There are no underground rivers from the Cascade or Olympic mountain ranges to tap into. And unlike mainland areas, Island County has no annual snowpack to store winter precipitation. Rainfall in Island County varies from 17 to 40 inches a year by geographic region.

Water is drawn by gravity to seek the lowest level. Some of the water runs off the land before it can seep into the soil. This is called stormwater runoff. It enters our ditches, streams and storm drains and eventually flows into the Sound. This



runoff picks up whatever it encounters, from natural sediment and leaf litter to oil from leaky automobiles or contaminants from malfunctioning septic systems.

Rain may be absorbed by trees and plants, which consume water in large quantities. Water from plants returns to the atmosphere as water vapor, through the process of evapotranspiration. Vegetation helps soak up rain and slow runoff.

Replacing vegetation with impervious surfaces such as our roads, rooftops, patios, driveways and parking areas prevents rain water from infiltrating the ground or being filtered by plants as it flows downhill.

When rain falls on our islands and enters the soil, it percolates through the ground where it enters our aquifers**.** An aquifer is a water bearing layer of sand, gravel or rock. Aquifers are the source of our well water. It can take months or even years for surface water to reach the aquifer.

The process of rain moving through soil and entering the aquifer is called aquifer recharge. As we withdraw water with our wells, new water replenishes the aquifer through aquifer recharge areas. These are areas where rainwater can infiltrate the ground and seep down to the water table. Our County Public Health Department requires that additional care be taken in these areas to ensure that the water entering our aquifers remains clean.

■ *The U.S. Environmental Protection Agency designates Island County a "sole source aquifer." This does not mean we have only one aquifer. It is a designation meaning groundwater is the principal drinking water source for the area, which if contaminated would create a significant public health hazard.*

Island County Public Health monitors **groundwater** conditions throughout the county, ensuring that we have adequate and safe drinking water. The County Planning Department's Resource Enhancement Program monitors **surface water** quality, and the Public Works Department oversees **stormwater** treatment. The State Health Department monitors **marine water** quality.

All of Camano Island and about 70 percent of Whidbey households depend upon well water. The city of Oak Harbor and Whidbey Island Naval Air Station purchase most of their water from the Anacortes water plant on the Skagit River in Mount Vernon. This water is piped along Highway 20 and across Deception Pass Bridge. But they also require reserve wells in case this supply is interrupted.

Completing the water cycle is evaporation, in which water – from the land, streams, lakes and oceans – is heated by the sun and transformed into water vapor. Water vapor rises until it cools enough to fall again as rain or snow.

A Puget Sound Report Card

This year our state legislature initiated a broad new program to protect and restore Puget Sound's marine water quality, habitat and species. A new state agency called the Puget Sound Partnership was created to lead this effort.

People have enjoyed the beauty and bounty of Puget Sound for centuries. While parts of the Sound are still healthy, there have been sharp drops in some fish and wildlife populations, and closures of shellfish beds. All are signs that the Sound's health is at risk.

One of goals of the Puget Sound Partnership is to ensure that efforts to protect the Sound's natural resources and restore damaged areas are coordinated.

The new agency has brought together citizens, governments, tribes, scientists and the business community to develop a 2020 Action Agenda, based on the best available science and covering the entire watershed from the mountains to the water.

The Partnership has 8 objectives:

- Protect habitat
- Restore habitat
- Reduce toxic pollution
- Reduce human and animal waste
- Better manage stormwater
- Assure an adequate water supply for people and wildlife
- Protect ecosystem biodiversity and recover imperiled species
- Increase the capacity for action

Several indicators illustrate the problems facing Puget Sound habitat and species: water quality concerns in several marine and fresh water areas, sediments that contain toxic compounds, toxic chemicals found in fish and marine mammals, loss of forest, increase in impervious surfaces, and declining populations of salmon, orcas, marine birds and rockfish. Overall, stormwater pollution remains the greatest threat to water quality.

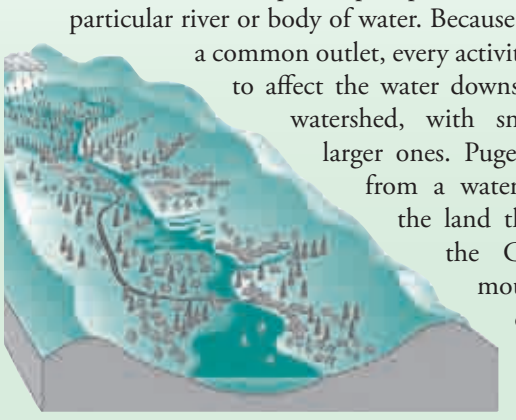
Working together and changing just a few things in our daily routines, we can help reverse this trend.

A dinosaur ate my apple

Although the balance of water on Earth remains fairly constant over time, individual water molecules can come and go in a hurry. The water in the apple you ate yesterday may have fallen as rain halfway around the world last year… or it could have been used 100 million years earlier by a thirsty dinosaur.

What's a watershed?

All the land that captures precipitation and funnels runoff to a particular river or body of water. Because the watershed drains to a common outlet, every activity on it has the potential to affect the water downstream. All land is in a watershed, with small watersheds inside larger ones. Puget Sound receives water from a watershed encompassing all the land this side of the crest of the Cascade and Olympic mountains. It is made up of thousands of smaller watersheds. Island County consists of about 190 watersheds.



■ PROGRAMS, FROM 3

SALMON RECOVERY PROGRAM

In response to the federal government's listing of Chinook salmon and bull trout as Endangered, the Washington State Legislature adopted the Salmon Recovery Act in 1999. Its goal is to restore fish stocks to sustainable levels. The Board of Island County Commissioners established a local Salmon Recovery Program (SRP) that same year. The program is administered by Island County Planning and Community Development. Recovery efforts range from the purchase of properties that contain important salmon habitats to the restoration of historical habitats. Citizen volunteers who serve on the County's Water Resources Advisory Committee (WRAC) help guide the policies and procedures for your County's SRP.

STORMWATER SYSTEMS

Island County Public Works manages and regulates stormwater run-off on Camano and outside city limits on Whidbey. Stormwater comes from roads, roofs, driveways and other impervious surfaces. The impervious surfaces we build prohibit water from percolating into the ground. The water runs off of these surfaces rapidly, entering roadside ditches and streams.

Island County manages stormwater in many ways. When roads are built or improved the County installs systems that collect and treat the stormwater before it is discharged into our waterways. These systems are designed to separate grit and oils from the water.

The County also manages the stormwater created by development of homes. In certain areas, homeowners are required to contain all of their stormwater on their property by constructing drywells, swales, or other features that filter the stormwater by allowing it to seep into the ground.

NON-POINT POLLUTION comes from everywhere

When rain falls, snow melts or irrigation water is sprayed, some of it soaks into the ground and some flows across the surface. In its travels, it picks up any pollutants on roads, parking lots, driveways, barnyards, lawns and fields.

This pollution comes from anywhere and everywhere, and it comes from all of us. We call it non-point pollution.

We create pollution every day. But only recently have we better understood how each of us contributes individually to pollution problems.

Since passage of the 1972 U.S. Clean Water Act, our country had greatly cut pollution from "point" sources such as sewer outfalls, industrial sites and leaking underground storage tanks.

Nowadays, many of our water quality problems simply originate with each one of us — from millions of small, seemingly insignificant personal actions.

Non-point pollution can come from malfunctioning septic systems; improper use and disposal of pesticides, herbicides and household products; erosion from construction sites; poor agricultural and land management practices; improper management of animal and pet wastes; and leaking vehicles. Non-point sources generally cannot be monitored at the source. Individual contributions from one property may be small, but from thousands of properties the combined effect is considerable.

Because non-point pollution is the major source of water pollution in our country today, we need to recognize all the places it comes from, so that we can make the choices necessary to help prevent it.

LANDSCAPE SOURCES

Erosion. Soils exposed by land-clearing and development can get washed downstream in the rain. Sediment running into streams, ponds and lakes smothers fish eggs and other aquatic life. It blocks sunlight from reaching aquatic plants, preventing photosynthesis. And it can clog drainage channels and cause flooding.

If you have exposed soil on your property you can help reduce erosion by quickly reestablishing vegetation. Hydro-seeding is an effective method, or you can cover the exposed surface with mulch or hay. You can also manage sediment by installing barriers, such as silt-fences and hay bales, down slope from the exposed soil to keep sediment from washing into ditches and storm drains.

Chemicals. When improperly applied, commercial pesticides and herbicides eradicate more than just weeds and nuisance bugs. Mishandled pesticides also kill beneficial insects such as ladybugs, that prey on harmful insects like aphids. Oversprayed herbicides that target broadleaf weeds like dandelions will also kill your lettuce and tomatoes. When washed downstream by stormwater runoff these chemicals may harm native plants and wildlife.

Many of us value the landscape around our homes. Consider using cost effective and watershed friendly methods to care for it. Public libraries and internet sites, nurseries and Island County's WSU Extension office all have information on techniques such as IPM (Integrated Pest Management) that use fewer or no toxins. If you do use chemicals to manage your yard, always follow directions closely and dispose of the container at one of Island County's hazardous waste collection sites.

Fertilizers. Excess fertilizers used on lawns, gardens and farm fields wash off and pollute fresh and marine waters. The added nutrients can lead to depleted oxygen in the water, which can cause fish die-offs and harm other aquatic creatures.

Natural fertilizers such as bone meal, alfalfa and blood meal, applied in the correct amounts, can be used to improve deficient soils. Other natural products can amend the acidic or basic characteristics of your soil as well.

Avoid wet or windy weather when applying fertilizers. Apply fertilizers as far as possible from any water body to make sure the nutrients in the fertilizer are filtered out before runoff enters a stream, ditch or water body.

Pets and livestock. Animal waste contributes fecal coliform bacteria to surface water, especially when pets and livestock roam freely near water bodies. Fecal pathogens can contaminate streams and wetland habitats and may make their way into groundwater and wells. If manure gets into surface waters, it can also cause nutrient pollution.

Proper livestock manure management prevents contaminants from entering our surface water. Manure should be stored out of the rain. Contact WSU Extension for helpful advice, or the Whidbey Island or Snohomish (Camano) Conservation District offices for info and tips. Make sure feeding and watering sites do not become compacted, and are not located where waste could wash into surface waters. Good livestock management practices include fencing to keep animals from coming near wetlands or ponds.

Pet owners have a daily obligation to clean up after their pets, whether in the home, yard or elsewhere. You should scoop pet waste into a plastic bag, seal it, deposit in the garbage and wash your hands. Burying or flushing is discouraged. Learn more in the Pet Waste section on page 10.

HOUSEHOLD SOURCES

Failed or leaking septic systems are a common source of household non-point pollution, allowing untreated sewage to escape into the environment.

Broken or blocked pipes, a failed pump, an overflowing tank or a failed drainfield can pollute groundwater and surface water with disease-causing organisms. Improper disposal of household chemicals or solids in septic systems

■ **SEE POLLUTION, PAGE 10**

Forging links in the food chain

Plankton form a microscopic soup of plants and animals at the bottom of the Puget Sound food chain. They need organic nutrients, oxygen and sunlight to grow near the surface of marine waters.

Herring, an abundant small fish found in coastal waters, feed mostly on plankton. They swarm into shallow bays with mud bottoms and spawn in eelgrass beds.

Eelgrass beds are fertile nurseries for herring, which lay their eggs on the stems and hide from predators in the waving green carpets.

Salmon smolts also feed in eelgrass meadows as they mature on the way from their fresh water spawning grounds to maturity in the bountiful cold waters of the Pacific.

Dungeness crab use the eelgrass for protection, and they feed on the herring and their eggs. Otters and humans feed on the delicious crab.

Herring are a major food source for **adult salmon** returning along the same migration corridor on their journey back to their home rivers to spawn.

Salmon are the favorite food of **orca whales**, harbor seals and sea lions, and are fished for by **humans**, who are at the top of the food chain.

PET WASTE IS RAW SEWAGE

If we didn't clean up after our dogs, cats and other domestic pets, more than 2.5 tons of raw sewage would be left on Camano and Whidbey backyards, sidewalks, parks, beaches and woods every day.

But it's what we do with the pet waste after it's picked up that matters. The modern-day, preferred disposal method is to **scoop the poop, bag it, and place it in the trash.** Picking it up protects water by moving waste to the landfill where it belongs. Otherwise, rainwater carries the disease-causing pathogens from pet waste to our roadside ditches and streams, and down into the Sound.

Harmful organisms can be transmitted from animal waste to your family and pets; some can persist in the soil for weeks, even years, waiting for a host. Anyone who then comes into contact with the soil, through gardening, playing sports, walking barefoot or other means, runs the risk of contracting these diseases. Children are most susceptible, since they often play in the dirt and put things in their mouths or eyes.

Many people already place their pet waste in the trash but hide it amongst other garbage, thinking it's prohibited to dispose of fecal matter in their trash can. Don't worry! That's what you're supposed to do. Landfills are designed to safely handle substances such as dog waste, cat litter and dirty diapers. Waste haulers anticipate that pet waste will be included in the garbage they pick up, but they prefer that you double bag and label it "pet waste".

Always use rubber gloves, a plastic bag, or a scoop when handling any pet waste. Wash hands thoroughly afterwards.

Despite wanting to reduce our daily contribution to landfill volumes, when it comes to pet waste, there is currently no safer alternative than disposing of the bagged droppings in the trashcan. Other common methods like burial, composting, and pet waste digesters simply do not kill the harmful pathogens. Flushing pet waste down the toilet is impractical for most people, and never advised for those who use a septic system. High volumes of hair and ash, not normally found in human waste, can interfere with septic system functions and clog drainfields. Kitty litter should never be introduced to septic systems.

Members of K9 Korps 4-H Club talk with North Whidbey residents about proper pet waste disposal. (Aug. 11 '07, Strawberry Point)


Finse's owner practices "scoop the poop."

There are about 15,000 dogs living in Whidbey and Camano neighborhoods, and similar numbers of cats. Native wildlife populations do not match that density. Proper disposal of dog and cat waste by pet owners in Island County is essential to protecting our water quality.

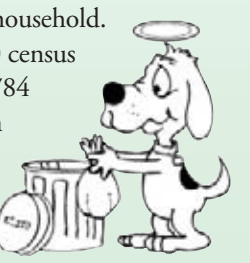
Scoop the poop from your yard as often as you can. Daily pick-up is best. Double bag the pet waste and place it into your garbage can.

Convenient ways to collect and double bag pet waste:

- Buy a 16" tall galvanized trash can with a lock-on lid – available at animal feed or hardware stores. Line it with two standard kitchen garbage bags. Scoop pet waste into the can. Once a week, seal the double bagged waste and place into your regular garbage can. If the bags are opaque, boldly label "pet waste" to alert disposal workers.
- Reuse empty pet food bags to contain pet waste. Once a week, tape or tie it closed, boldly label it "pet waste," and place in a garbage can.
- Purchase biodegradable pick-up bags for fecal waste, available at pet supply stores. Bright colors alert garbage haulers that the bags contain pet waste.
- Some pooper scoopers enable you to collect and bag the waste without bending to the ground.
- When you're out walking with your dog, carry along a plastic produce or grocery bag, and use it as a mitt to pick up the droppings. Then, turn the bag inside out, tie it shut, and place in trashcan. Carry a packet of sanitizing wipes in case you are not near a public hand washing facility.

HOW MUCH POOP?

We can estimate Island County dog populations by utilizing research from the American Veterinary Medical Association, which reports that more than 37 percent of Washington state households own dogs, with an average of 1.5 dogs per dog-owning household.



The 2000 census recorded 27,784 households in Island County. Thirty-seven percent of that is 10,280 families. Multiply by 1.5 and you get about 15,420 dogs.

A dog excretes an average of one third of a pound of solid waste daily. This gives us an estimate of 5,088 pounds of daily dog waste in Island County, or *more than 2.5 tons.*

You can see why pet waste can contribute to water quality problems, and why dog and cat owners need to properly dispose of pet wastes.

WHAT DO YOU THINK?

Please take a moment to help us improve our service by filling out this reader survey **by October 15, 2007.** You may complete it online, send it by U.S. mail, or drop it off at one of our public counters during business hours.

Online: www.islandcounty.net/planning. *Click on "Guide to Clean Water."*
By mail: *Non-Point Pollution Reader Survey/ICPCD*
Resource Enhancement Program, POB 5000, Coupeville, WA 98239-5000
In person: *County Seat – Planning Counter, 1 NE 6th St., Coupeville*
Camano Annex – Planning Counter, 121 N. East Camano Dr., Camano Island

1. Did you read this *Guide to Clean Water?* **Yes No**
2. Was it useful? **Yes No**
3. Did it give you a better understanding of what non-point pollution is? **Yes No**
5. Did it give you a better understanding of where non-point pollution originates? **Yes No**
4. After reading the guide, will you do anything differently? **Yes No**
   If so what? _____
5. Did you learn anything new? **Yes No**
   If so, what? _____
6. Would you like more educational guides like this? **Yes No**
7. Please tell us other topics you'd like to learn more about:
   _____
8. What did you like best? _____
9. What did you like least? _____
10. What could we do better? _____
11. Any other comments or suggestions _____
    _____

THANK YOU!

■ POLLUTION, FROM 9

can also contribute pollution.

Maintaining your septic system can protect water quality and save you money. Over the next 18 months, new statewide septic system rules are being phased in by your County Public Health department. Read about them in this Guide.

Dispose of your household chemicals and toxic products at the hazardous waste collection site at your local transfer station. Transfer stations are operated by Island County Public Works – Solid Waste division, and are located in Bayview (South Whidbey), Coupeville, Oak Harbor and on Camano Island.

AUTOMOTIVE SOURCES

Cars and trucks can pollute land and water with gasoline and oil leaks, coolant and lubricant leaks, tires, brake linings and the runoff from washing. All these pollutants can be carried in runoff water from streets, roads, parking lots and driveways. Even non-toxic, environmentally-friendly soap carries the grease and residue from internal combustion engines.

You can help prevent pollution by keeping your vehicle maintained. If you have a leak, repair it promptly. Wipe up any leaks using kitty litter. The litter will absorb the fluids, and then you can sweep up the pile and dispose of it in your trash can.

Washing your vehicle is one part of properly maintaining it. You can minimize the risk of polluting surface water by moving your car onto the lawn where the grass and soil will help filter the washwater. Always wash your vehicle as far as possible from ditches, streams and wetlands. Or take your vehicle to a commercial car wash where the washwater is collected and treated.

BOATS AND MARINAS

Boating can contaminate marine and freshwater environments when done carelessly. Fuel and oil leaks, exhaust from engines, and chemicals from paint and other substances can pollute water. Improper disposal of raw sewage from boats also contributes bacterial contamination to recreational waters. The increase in boat use during warm weather can increase the risk of pollution problems.

You can help by properly maintaining your boat and its engine. Always be careful when refueling your boat at the fuel dock. Use oil absorbent rags to keep fuel from entering the water. Only dispose of sewage and waste water from cooking and cleaning at appropriate pump-out facilities.

Low Impact Development Techniques

Imagine fewer puddles on streets, and no surges of stormwater sluicing down roadside ditches. That is what Low Impact Development (LID) can help us achieve in our communities. LID mimics natural drainage functions, so that surface water is retained on a developed parcel and cleansed of its pollutants, before it infiltrates our aquifers or flows off on its downhill route into Puget Sound.

On a site with sandy soils and high infiltration rates, LID applications can enable full on-site stormwater infiltration. Even on a site with impervious or saturated subsoils (*e.g.,* clay), LID can be used to slow, filter and clean runoff before releasing water into ditches or storm drain systems. LID often incorporates planted areas that absorb water and reduce runoff.

The simplest LID approach is to retain or restore native plant cover and minimize the area that is graded and cleared. Below are some other LID applications that can be used on your property to reduce surface water runoff.

BIORETENTION (RAIN GARDENS)

Description Utilizes shallow landscaped depressions with a designed soil mix and plants adapted to local conditions. Manages stormwater by using the chemical, biological and physical properties of plants, microbes and soils to retain runoff and effectively filter pollutants.


Volunteers installing rain garden at Bayview High School, June 2007.


Bioretention swale and pervious concrete sidewalk

Types/Designs
Bioretention Cells: Shallow depressions with designed planting soil mix and plants, trees, shrubs, etc. May or may not have under-drain. Does not support large amount of water.
Bioretention Swales: Like bioretention cells, but support runoff from large areas. Have gentle slopes and are generally less than 12 inches deep.
Biodetention: Uses vegetative barriers arranged in hedgerows across a slope to disperse, infiltrate and treat stormwater. Also used to detain runoff until filtered.

AMENDING SOILS

Description Amendment of construction site soils. Construction that occurs during development compacts soil, making it behave like an impervious surface, thereby generating overland and shallow subsurface flows. Organic matter from compost, stockpiled on-site soil, or imported topsoil can be used to enhance water storage and reduce storm flow. Works well for areas with poorly draining soils that are commonly found on Camano and Whidbey islands.

Types/Designs ***Protect native soil:*** The most effective LID technique, maintaining native soil and designating areas that protect native soil and vegetation.
Amend existing disturbed topsoil/subsoil: Till soil approximately 8 inches deep with amended soil. Do not disturb soil near existing trees and avoid roots.
Stockpile on-site topsoil: Stockpile and cover soil with weed barrier prior to grading. Test stockpiled material and amend with organic matter or topsoil to create soil with approximately 8-inch depth.

PERMEABLE PAVING

Description Designed to accommodate pedestrian, bicycle and vehicle traffic while allowing rainwater to filter through the paved surface into the ground or a storage container. Usually includes gravel sublayer to store water as it infiltrates soil or is moved to stormwater pipes. Applies to low-to-mid traffic areas such as parking lots, side streets, driveways. Not considered appropriate for high traffic uses.


Pervious concrete parking area and sidewalk at Bayview Corner (Sears House)


Interlocking stones with grass

Types/Designs ***Pervious concrete or asphalt:*** Similar to conventional pavement but structured with fine particles removed, creating a matrix of pores that allow water to infiltrate. Looks like a giant rice cake.
Aggregate or plastic pavers: Cast-in-place reinforced concrete made with reusable forms or pre-cast cement or plastic blocks. Openings filled with soil/grass/gravel.
Plastic grid systems (grass paving): Sections interlock and are pinned down, then covered with soil and grass or gravel.


Permeable plastic grid (grass paving) at Bayview Community Hall

PIN FOUNDATIONS

Description Minimal excavation foundations that combine careful site preparation for preventing soil compaction and driven piles and connectors that limit soil disturbance. An integrated stormwater dispersion system allows storm flows to more closely approximate natural shallow subsurface flow paths under and around the foundation. Piles are made with corrosion-protected steel, wood or concrete.


Pin foundation ready for installation.

Types/Designs ***Grading:*** Combination of using lightest possible construction equipment, applying compressible buffer material (pea gravel) for foundation site, and limiting grading practices.
Construction: Piles are installed before or after site-poured foundation casts are made. Piles support structure's foundation with minimal compaction to surrounding soil.
Stormwater dispersion: Runoff is infiltrated uphill to flow under piled foundation, which mimics predevelopment hydrology.

VEGETATED ROOFS

Description Effective means of reducing stormwater runoff by reducing the percentage of impervious surfaces on a property. Can be built onto new structures or retrofitted onto existing ones. Composed of waterproof membrane, light-weight growth medium and vegetation.


Vegetated roof at Clinton beach by the ferry dock

Types/Designs ***Intensive:*** Roofs designed with relatively deep soil profile, 6+ inches, and planted with ground covers, shrubs and plants. Accessible and can serve as landscape.
Extensive: Designed with shallow, lightweight soil profiles, 1-5 inches, and ground cover plants adapted to roof top conditions.

RAINWATER COLLECTION

Description Roof catchments, roof washers, cisterns, and conveyance systems to serve two purposes: water conservation, and elimination or large reduction of the contribution to stormwater, primarily from rooftops.

Types/Designs ***Catchment:*** Uses a certified drinking water system material for rainwater collection and use.
Roof washer: Removes sediment and debris from collection surfaces, diverting them away from rainwater storage system.
Cistern: Stores water for household or irrigation uses.
Conveyance: System of gutters to deliver water to use.
Water treatment: Filtration, disinfection and buffering of water for use; system depends on proposed use.

Where to see LID

Here are some public spaces where you can see LID techniques.

WHIDBEY ISLAND

OAK HARBOR

• Fort Nugent Park, Oak Harbor Parks & Rec, Fort Nugent Rd: 100% on-site stormwater retention using bioswales, ponds with native plants, & (due late 2007) a pervious concrete pathway to football field & beneath bleachers.

• Harbor Station, mixed use commercial development, corner NE 7th & SR 20 (due in 2008): Runoff directed into planted bioretention strips with under-drains, filters through plants & topsoil, then into perforated pipe to underground retention area. On-site subsoils infiltrate poorly, so stormwater must be piped off site, but LID systems will clean water & regulate runoff.

COUPEVILLE

• Coupeville High School, south of SR 20 at intersection of SE Main & Terry (new in 2007): Water from paved areas flows through bioswales into vegetated detention pond. Property is atop impermeable clay so on-site infiltration to groundwater not possible, but pond provides irrigation, wildlife habitat, education & surge protection as stormwater runoff is slowed, filtered & cleaned by plants and soil. Excess runoff is piped from pond into storm drain system.

SOUTH WHIDBEY

• Bayview Corner Redevelopment, a project of Goosefoot; at corner of Bayview Rd & Marshview, just off SR 525: Showcases multiple LID features, including porous concrete parking areas & sidewalks; interlocking plastic grid (grass pave) parking area; walkway using interplanted recycled concrete pavers; composting toilet (public restroom) with solar power & rainwater collection for flushing; & reused building materials. Call or e-mail to arrange personal tour: 360-321-4535, info@goosefoot.org.

• Bayview High School: Rain garden & native plant restoration in historic schoolyard captures roof runoff. Call South Whidbey School District for visitation info: 360-321-2343.

• Clinton Beach, Port District of South Whidbey Island, adjacent to ferry landing: Vegetated roof on picnic shelter; porous surfaces & native landscaping for stormwater infiltration.

For driving directions to off-island examples, check website for Island County Planning & Community Development, www.islandcounty.net/planning. Click on "Guide to Clean Water."

SNOHOMISH COUNTY

• Stratford Place, Sultan: Urban subdivision's main street, driveways, sidewalks & parking areas all pervious concrete.

• Snoqualmie Gourmet Ice Cream Company, Maltby: Pervious concrete drive & walkways; bioswale; herb & vegetable garden in place of detention pond.

• Lake Serene walkway, south of Mulkilteo: Pervious concrete sidewalk winds over a mile around lake. Built as alternative to impervious sidewalk, it saved trees & required no grading, road widening or ditching, & little under-walk preparation.

• Marysville Park-&-Ride, Ash Ave & 5th St: Permeable pavers in parking lot.

• 1241 State Ave, Marysville: Permeable pavers in parking lot.
100th St NE, Marysville: 900-foot pervious concrete sidewalk along south side between 48th Dr NE & 51st Ave NE.

• Lakewood Crossing Retail Center, Smokey Point/Marysville: Pervious asphalt in most parking strips. Rain gardens in streetside ditches.

BELLINGHAM

• City Hall Demo Project, 210 Lottie St: Parking lot rain garden.

• Depot Market Square, 1100 Railroad Ave (Bellingham Farmer's Market): Pervious pavers; rain garden adjacent to Maple St.

• Boundary Bay Brewery, 1103 Railroad Ave: Grass grid for outdoor beer garden parking.

• Bisese Pediatric Clinic, 1201 J St: Pavers & pervious concrete parking.

• WECU Building, 516 Holly St: Pervious pavers & rain garden.

• Mt. Baker Vision Clinic, 720 Birchwood Ave: Pervious pavement & pavers, rain garden.

• Dan Godwin Neighborhood Center, 2602 McLeod Rd: Pervious paver parking lot.

• Fraser Street sidewalk, 1900 block: Pervious concrete.

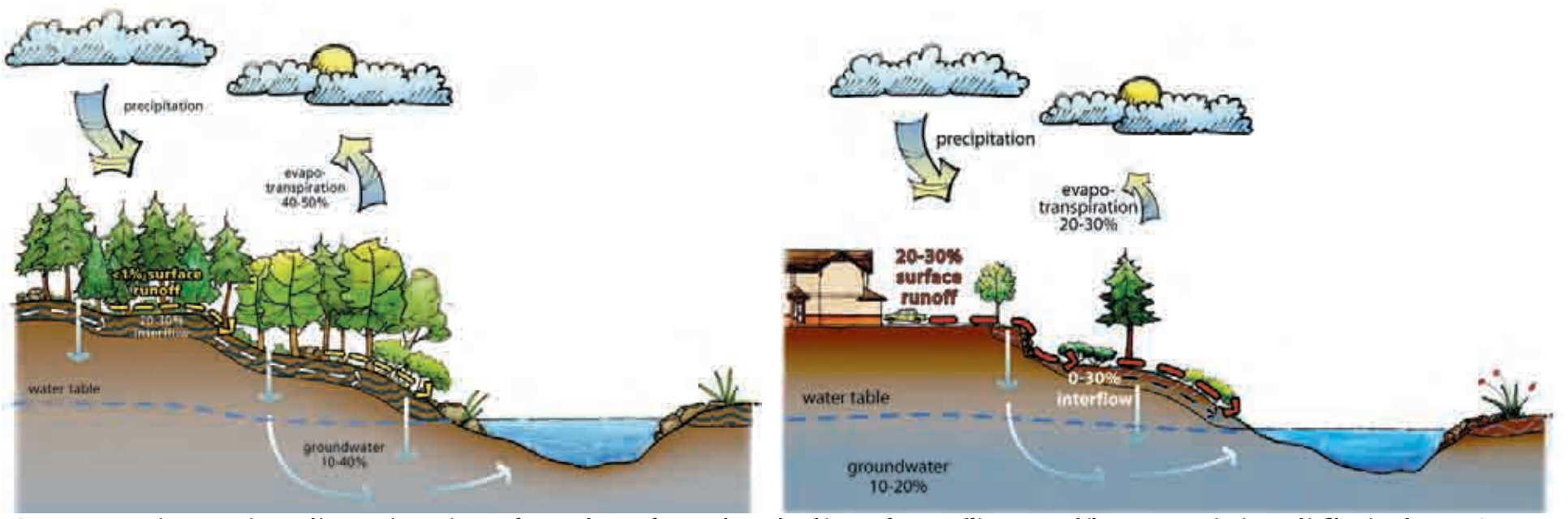
• Thomas Park Place, 506 S State St: Green roof; rainwater collection for irrigation; pervious paver driveways.

• Public Works Demonstration Alley, corner of 14th & Old Fairhaven Parkway: Pervious pavement.

SEATTLE

• Seattle Public Utilities—numerous projects incorporating a variety of LID techniques, including pervious sidewalks, streets & alleys, narrowed roadways for speed reduction & less pavement, vegetated swales, neighborhood gardens, & stormwater cascades. Sites include SEA Streets, 110th Cascade, & Broadway Green Grid (NW Seattle); High Point Redevelopment (West Seattle); & Pinehurst Green Grid (NE Seattle). "Two years of monitoring showed that SEA Street has reduced the total volume of stormwater leaving the street by 99 percent." For information & directions to each site: www.seattle.gov; search on "natural drainage systems."

Low Impact Development Techniques



As we remove native vegetation, and increase impervious surfaces such as rooftops and paved parking, surface runoff increases, while evapotranspiration and infiltration decrease. Less water reaches the aquifers that hold Camano and Whidbey drinking water; and more stormwater flows across the landscape, picking up and carrying pollutants downhill into Puget Sound.

New ideas for your home or business landscape

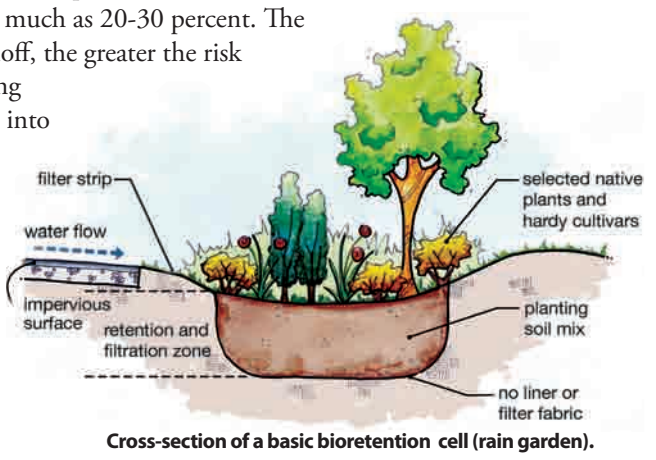
Low Impact Development is a relatively new approach to harmonizing stormwater runoff with land use. The purpose is to retain stormwater, recharge critical groundwater reserves and keep contaminants from reaching our aquifers and other vital water resources. Called LID for short, it is designed to mimic the naturally slow movement of water on undeveloped land. Many LID techniques are simple and often less expensive to implement than other methods.

LID works by first assessing how water travels on your site, and then applying a combination of recommended practices to mimic pre-development drainage patterns. This improves water resources by capturing water that otherwise would not soak into the ground because of impervious surfaces such as rooftops and paved areas.

On undeveloped land, very little rainwater leaves the property. If pollutants are present, most are filtered by vegetation and soils. The water in turn nourishes plants and recharges streams, wetlands and groundwater. On a typical undeveloped, forested site, less than one percent of rain or stormwater flows off the parcel.

In preparing a property for construction of a building, whether for residential, commercial or other use, some amount of land must be cleared. Conventional land development practices usually compact and remove soils and vegetation. The more impervious surface created–rooftops, roads, driveways, parking, sidewalks–and the more vegetation removed, the greater the amount of rainwater that will leave the site as surface runoff.

The Puget Sound Partnership, a new state agency, estimates that a typical suburban development's surface water runoff may be as much as 20-30 percent. The more surface runoff, the greater the risk of pollutants being washed downhill into wetlands and streams, and ultimately into the bays, straits and harbors of Whidbey and Camano Islands.



Cross-section of a basic bioretention cell (rain garden).

THREE PRINCIPLES

LID practices can help reduce these impacts by retaining and cleansing water on site, so there is less runoff and pollution. If native land has good drainage capacity, like sandy soils, water can be easily infiltrated on site. And if native soils are impervious or quickly saturated–such as clay or hardpan–LID systems can slow, filter and clean rainwater before it leaves the site.

Low Impact Development can be summed up in three principles:

- To protect and conserve native vegetation and soil as much as possible
- To recognize the available opportunities and limitations of each site
- To manage stormwater on-site so that it most closely reflects natural flow

■ Conserve and restore vegetation and soils

Conserve vegetation: Retain as much native forest and vegetative cover on the site as possible.

Restore vegetation: Replant with native shrubs and other vegetation to capture and retain precipitation. Many local nurseries and Conservation Districts offer native plants and advice.

Amend soils: To restore its ability to infiltrate rainwater, amend soil that has been disturbed, displaced or compacted.

Plant rain gardens: Filter and retain runoff from impervious surfaces—roofs, driveways, roads—by directing the water into areas composed of absorbent soil and a variety of low-maintenance plants.

■ Manage stormwater close to where the rain falls

Use small-scale, integrated management practices: Use bioretention, permeable pavement and vegetated roofs rather than diverting stormwater into one large pond or ditch.

Collect rooftop rainwater: Use catchment systems or a cistern to collect roof runoff for irrigation or other purposes.

Create a landscape that filters: Design a landscape that slows the amount of time storm runoff stays on your site. This helps retain and process pollutants from the water.

Integrate stormwater facilities: Integrate water treatment and transport systems into site designs to create an attractive landscape that protects the environment.

■ Design site to minimize impervious surfaces

Working as a team, design and construction professionals can help you to:

Minimize/eliminate impervious surfaces: Minimize size of rooftops, roads and parking lots that use impervious materials.

Incorporate vegetated roofs: These typically consist of a waterproof layer, drainage layer, growth media and plants.

Use permeable pavement: Options include pervious concrete, asphalt and pavers, and grid systems filled with grass or gravel.

Maximize infiltration: Locate buildings, roads and parking away from critical areas. Preserve porous soils.

You needn't hire outside experts to help improve your homesite. More ideas on LID uses are available through your Conservation District, and on the Puget Sound Partnership website: www.psp.wa.gov/our_work/stormwater/lid.htm.

Green buffers help filter and clean water

Maintain a planting strip between your yard and roadside ditch or storm drain, or along creeks or ponds, to reduce stormwater pollution. Plants filter sediments and slow runoff, allowing water to soak into the ground and trapping pollutants in the soil where they can eventually be processed.

Planting strips are also known as buffers, and can remove significant amounts of pollution from surface runoff: 50-80 percent of nutrients and pesticides, 95 percent of sediment, and over 60 percent of pathogens. Besides being an effective solution, buffers are a cheap and easy way to protect water quality.

Buffers are as simple as a border of tall native grasses or wild roses. No matter how elaborate, buffers slow down runoff, prevent pollution, enhance aesthetics and provide wildlife habitat.

Simple things you can do:

Allow the last two feet around your lawn to grow longer. This acts as a buffer.

Allow native vegetation to return. This provides a transition from your lawn to the surrounding land and helps keep chemicals and nutrients from waterways.

Try to avoid cutting down/clearing trees and shrubs near water bodies. You can leave dead trees in place to slow runoff and provide wildlife habitat.

Landscape creatively using non-invasive, native plants.

Planting strip between lawn and roadway traps and cleanses pollutants from runoff.

Tread lightly on tree roots

The top few inches of topsoil are filled with miles of tiny roots and quantities of beneficial soil organisms that require oxygen. Healthy soil contains plenty of air. When compacted by heavy equipment or large livestock, healthy soil is damaged, reducing its ability to filter water and damaging trees and other plants whose roots are crushed.