NEARSHORE LIVING

A Homeowner's Guide to Creating Better Ground in Our Community

Developed by:

WHIDBEY ISLAND CONSERVATION DISTRICT
preserving natural resources
WICD

With funding support from:

SNOHOMISH CONSERVATION DISTRICT

DEPARTMENT OF ECOLOGY State of Washington

and

BETTERGROUND.ORG

“If there is magic on this planet, it is contained in water.” *- Loren Eiseley*

The Pacific Northwest is a unique and magical place – where else can you stand on a sandy bluff, a muted green forest at your back, harbor seals sunning on sharp black rocks over the white capped sea, and look up over fir covered islands at a snowcapped, slumbering volcano? For us devoted inhabitants of the Puget Sound, with our salt-brined skin and moss tinged hearts, protecting and preserving the glorious landscape of the Pacific Northwest is part of life here. In our pursuit of better ground, we can’t overlook our region’s defining resource. Water is the first authority of our land.

In this publication, we’ll show you the water systems that you live within, and give you some actions you can take to protect water resources on your property and in your community. We are your local conservation district, and our mission is to inspire stewardship of our shared natural resources.

Stewardship means taking intentional actions that benefit not just ourselves, but the ecosystem around us as well. It’s the path to improving our water resources and all the beings that depend on them, humans included. It’s the knowledge that we are all in this together.

How can we be good stewards of our waters, which give us life? And not just any life, our unique and stunning PNW island life. We live with herons and eagles. We glide down snowy volcanoes, kayak through glacier-cold rivers, swim in murky salt waters, and make driftwood forts on rocky, windswept beaches. This is our place and this is how we like it. Together, we can keep it this way.

"[Stewardship means] how we live every day. We take care of that which we love, and we cannot love something unless we know about it. Learn about how the real world works, and strive to find one or two ways you can live as a steward by being more in harmony with the natural order and function of things."

- Robert Pelant, Pacific Rim Institute

Your Boots on the Ground for Better Ground

Your local conservation district provides free, non-regulatory resources, advice, and site visits to landowners in service areas including water management, farms, forests, and backyard habitats. With almost 3,000 conservation districts across the country, we are one of America's best kept secrets. **Find a conservation district serving your location in Puget Sound at www.BetterGround.org.**

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OUR UNIQUE ECOSYSTEM

17,000 years ago, our homes here in the Pacific Northwest were buried under a giant glacier. When the glacier receded, it left behind an eclectic landscape of craggy coastlines, rain-soaked evergreen islands, and pockets of prairie. The ocean rushed in to form the Salish Sea, which filled up with life – sea anemones, limpets, salmon, seals, orcas, kelp – creatures clinging onto rocks as tides rush with record-breaking speeds through the quirky inlets and bottlenecks from Tacoma Narrows to Deception Pass and north through Vancouver Island's Inside Passage.

Towering over the busy saltwater ecosystem, our volcanoes and mountains ambitiously collect snow, sometimes in record-breaking quantities. Snowmelt in the spring begins a long journey to the ocean, past Glacier Lilies, Bluebells, and Western Trillium flowers, churning and pushing through rocky gullies and quiet forests, it's progress marked by flashy Big Leaf Maples and Western Red Cedars, mountain goats, indifferent deer.

These freezing rivers and creeks carry one of our keystone species – the salmon. They fight their way upstream to spawn in the same upland waters from which they first hatched, historically in such great numbers that you could reach into the river and pull them out by hand.

From mountains to ocean, Pacific Northwest waters have provided for human communities for thousands of years. We are partners, the water and humans. We depend on each other now for survival.

Rain falls here like nowhere else.

It runs where it pleases, wearing down boulders, collecting in low areas of our lawns, spreading up out of oceans and flooding valleys. The rain settles in wetlands, bogs, and marshes. It fills ponds, lakes, and small divots in boulders. It's captured by the soil and sinks slowly into our underground island aquifers. Rain, and it's many activities and idiosyncrasies, shapes life here in Puget Sound. It's as much an icon of the landscape as Mt. Rainier or the black and white breaching orca.

The damp sprouts mushrooms of every shape and color. Moss hangs off the deeply grooved branches of Douglas, Noble, and Grand Firs and creeps over quiet rocks, fallen trees, stalwart fence posts. Ferns the size of cars preen in the gloom. There is rarely a time when the world surrounding us isn't green, and it's all thanks to our water.

The way we think about our water has changed over time. We haven't always known or appreciated the power of water. We've paved over massive areas of spongy forestland, increasing the amount of rainwater entering the ocean. We've changed the shape of island bluffs, and now we know that the bluff landscape is delicate and unstable. We've removed trees and plants along waterways that provided protection, shade, and habitat for insects and plankton on which forage fish dine.

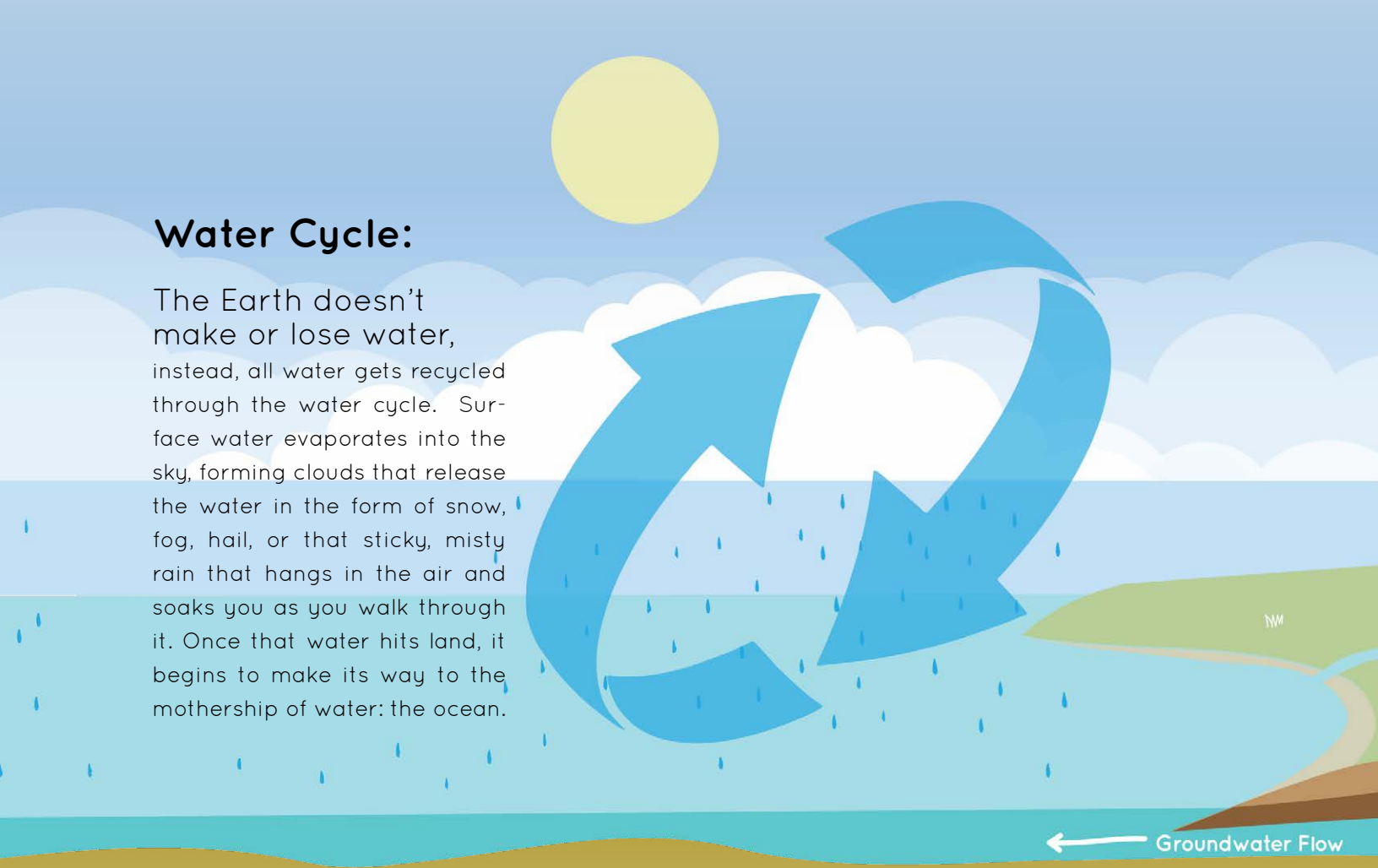
What we now know is that we all live in a water cycle, in a watershed, in an ecosystem, and the more we allow those natural systems their beautiful performances, the healthier our world becomes.

Our human spaces can become more a part of the landscape, releasing just a little bit of control so that all inhabitants of the Pacific Northwest can thrive, and we can preserve the magic around us.

photo © Kelsi Moffet

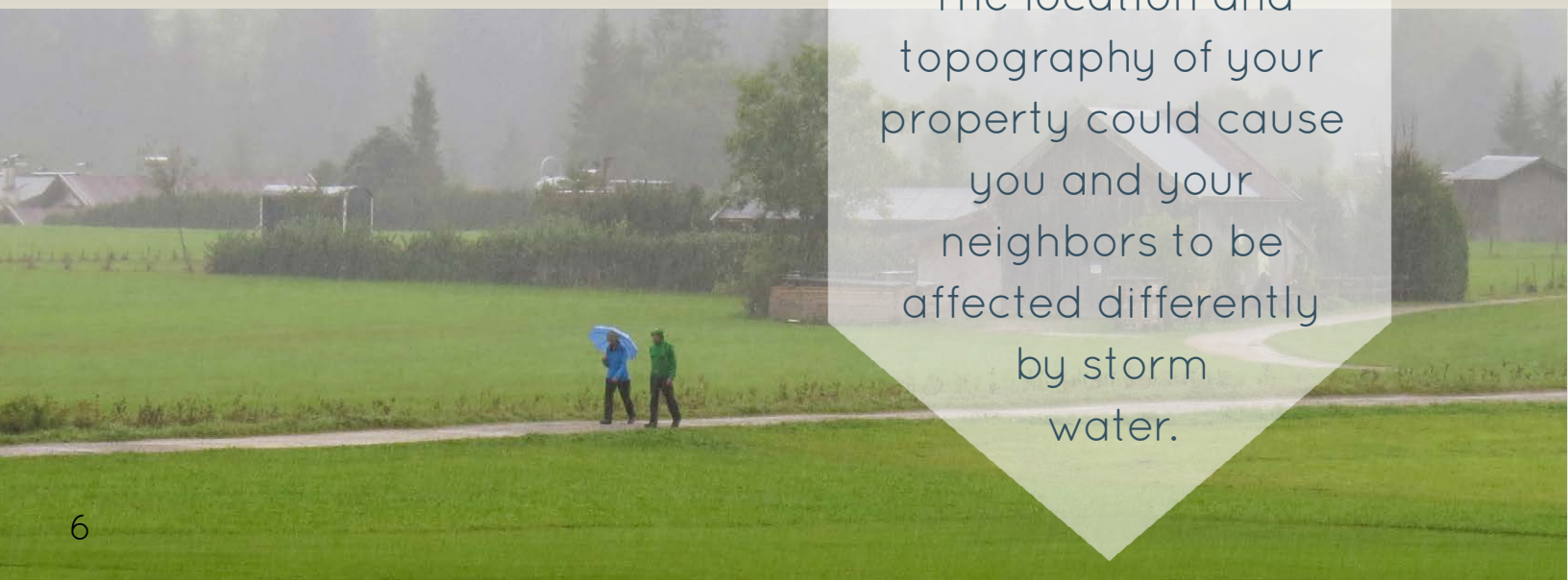
Water Cycle:

The Earth doesn't make or lose water, instead, all water gets recycled through the water cycle. Surface water evaporates into the sky, forming clouds that release the water in the form of snow, fog, hail, or that sticky, misty rain that hangs in the air and soaks you as you walk through it. Once that water hits land, it begins to make its way to the mothership of water: the ocean.



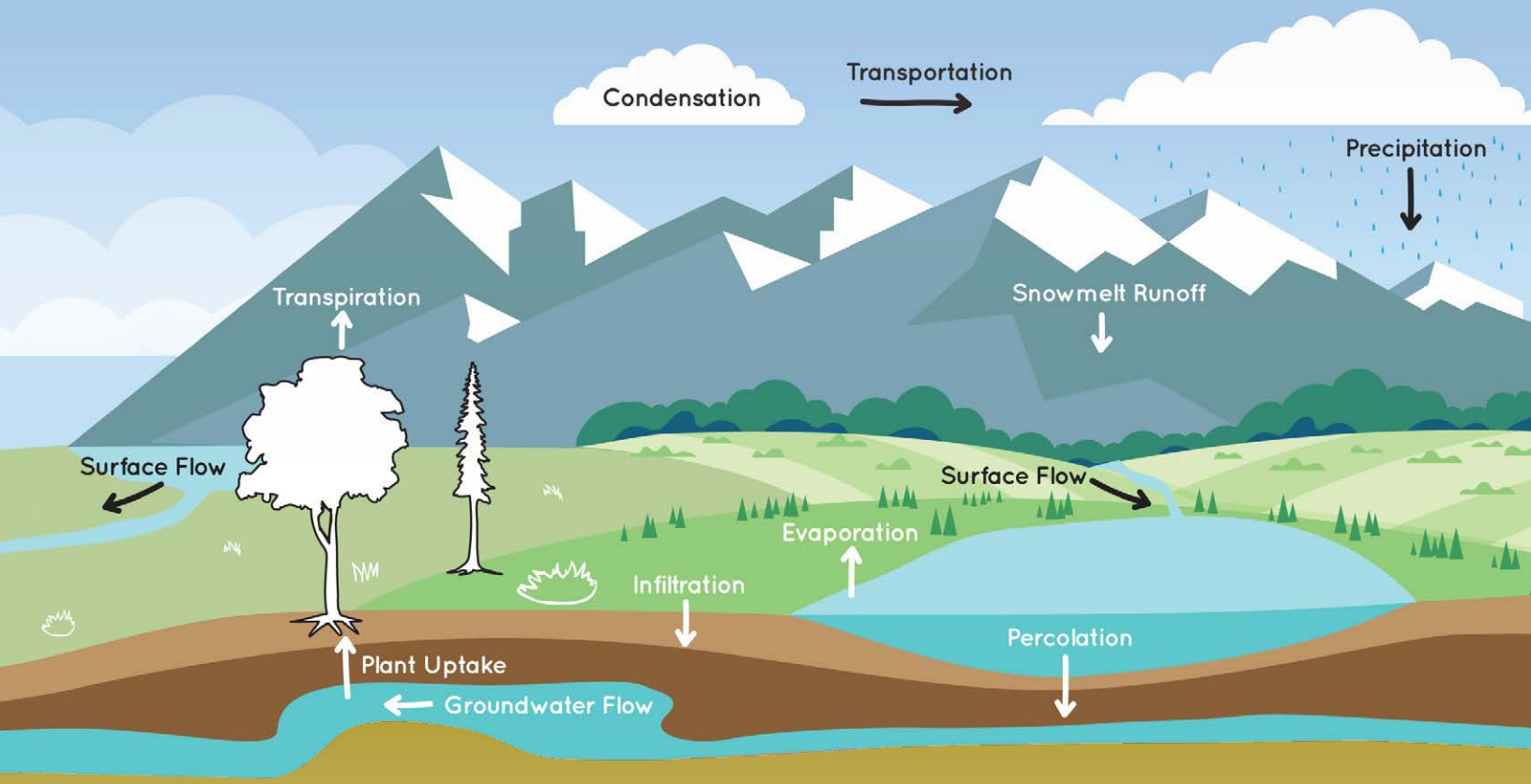
Let it Rain

Nature never disperses storm water fairly or evenly. The Olympic Peninsula is one of the wettest areas in the continental U.S., receiving over 100 inches of rain a year. Friday Harbor, less than 50 miles from the perpetually soaked Hoh Rainforest, receives only 25 inches of rain a year. On a smaller scale, your property may be affected differently by storm water than your neighbor's, depending on location and topography. This is especially visible when development at the top of a slope causes more run-off for properties at the bottom. As the climate changes, the timing and amount of rainfall in the PNW is expected to change. Finding solutions to storm water challenges is an important part of future planning.



The location and topography of your property could cause you and your neighbors to be affected differently by storm water.

WATER SYSTEMS REFRESHER



Aquifers

60% of Washington residents get their drinking water from groundwater, either by tapping springs that bubble to the land's surface or by drilling wells.

It takes surface water a minimum of 40 years to infiltrate the ground and seep into an aquifer. In times of drought, aquifers are important because they provide a stable water source while rivers and surface water may get low. But drought conditions can also cause us to draw more water from our wells, depleting aquifers too quickly. Paving can also have a negative impact on aquifers, because it prevents water from seeping down into our underground water supplies.

Map your Property's Water Systems Throughout the Year

Walk your property during each season of the year and observe all the ways water interacts with your property.

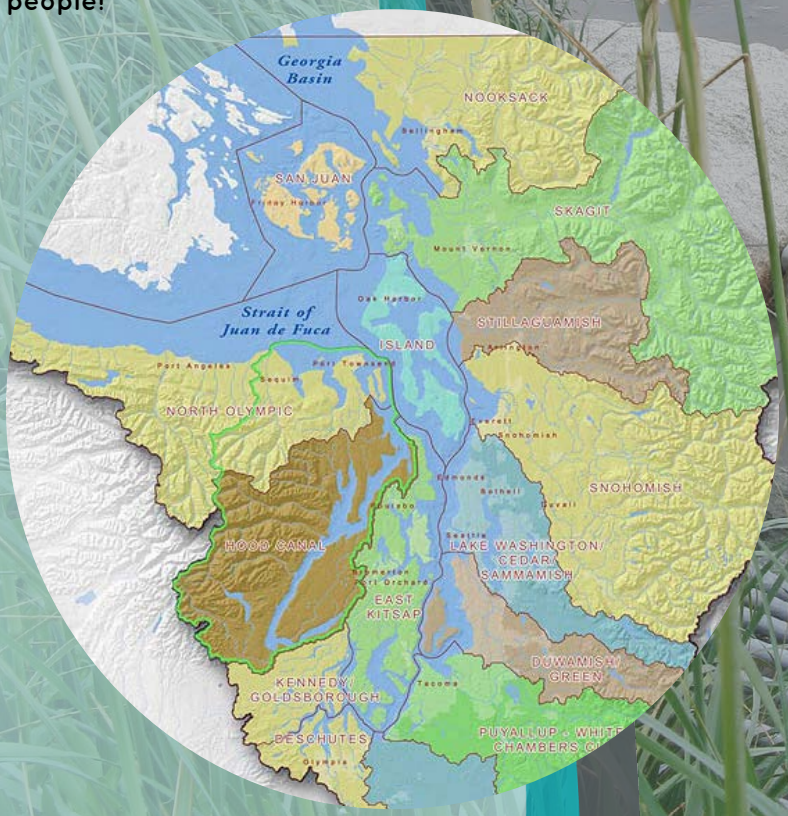
How does water enter your property – rain? slope? creek? Where does that water land – on roofs, driveways, cars, grass, gardens? How does the water travel once it's on your property – where does it puddle, where does it exit, what are the wettest and driest areas? Are there areas that flood, and at what times of year? How does water drain from your roof and driveway, and the streets/sidewalks around your home?

The answers to these questions will help you determine how you can be a water steward on your land. **Review some of your potential options on page 12.**

WATERSHEDS

Each watershed is defined by the collective path the water takes from headwaters in the mountains, down through foothills and coastal flats, through every city, town, and property, until it reaches the ocean.

The map below shows the watersheds that drain into the Puget Sound. Over 4 million people live in these watersheds. Think of the collective impact of so many people!



Your Yard is a Watershed

On an island, there are many small watersheds. Any water that doesn't get soaked up by the soil runs off into the ocean. In watersheds where the ocean is a great distance away, like East of the Cascades, it may be difficult to see the connection between your storm water run-off and the ocean, although the connection does exist! It may even be difficult to visualize in the city, where storm water is collected in drains and piped out to the ocean.

But on an island, you can watch rainwater rush down grassy ditches and seep straight out of snowberry-topped bluffs onto the beach, where a trail of freshwater carves a path to meet the sea.

STORM WATER

The water that falls on our land is called storm water, and its health is of great importance to our Puget Sound ecosystem.

Storm water falls on our homes, our roads, our driveways, parking lots, lawns and green spaces, and it immediately starts its journey to the ocean. Every place our water passes over has an effect, however small, in the direction and quality of that water. Storm water is greedy and easy to please. It will take anything in its path into our waterways, holding tightly to all it can before the ocean finally absorbs it. In this way, the residue from empty oil cans left outside the garage, rust and paint from unused cars, and hazardous waste from discarded old batteries and appliances becomes storm water run-off that pollutes rivers and oceans.

Each of our personal watersheds can contribute to the pollution of storm water. Anything on our property that gets wet from rain – especially containers of chemicals, gas, or paint – can pollute storm water. The more impervious surfaces we have, such as roofs and driveways, the more storm water run-off we create. Making changes and improvements on each of our properties affects the entire water system.
One person can make a difference!

photo © WICD staff

IMPERMEABLE SURFACES

Some of our storm water will never achieve its goal of merging into the ocean. In fact, we don't want all our fresh rain water to flow into the ocean. Some of it should seep into the soil to nourish plants or to recharge underground aquifers. Some must be diverted from rivers to water crops or livestock, and some must be collected as our drinking water. It's important to create lots of space for the land to soak up storm water.

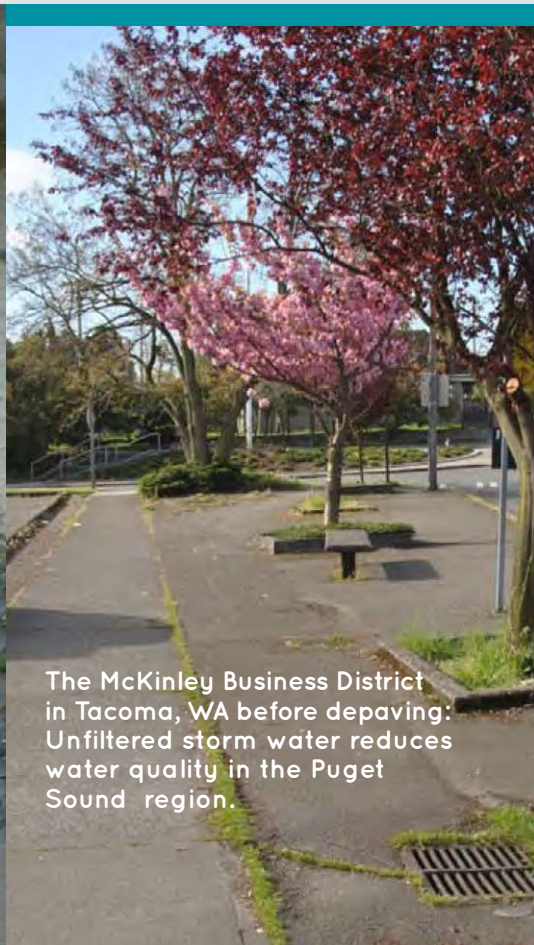
The rain is doing its part to refresh our water supply and keep our landscape lush and green, but it's hitting against impermeable surfaces that change its path.

Impermeable surfaces are solid structures, such as pavement, rooftops, concrete, asphalt, and heavily compacted soils, which don't allow water to pass through, forcing it to run off.

When we pave an area of land, water isn't able to percolate below the surface. It can't be captured and filtered by green spaces. Instead, it runs quickly down the impermeable surfaces, into storm drains or other catchment systems that take it to the ocean. Development creates a high volume of impermeable surface – think parking lots, roads, sidewalks, driveways – and over the whole area, no water is soaking into the ground.

Some ways to handle run-off from your property's impermeable surfaces are to depave, install rain barrels, and build rain gardens. Learn more on pages 12-13.

The ocean accepts everything that drains off the land. We eat out of it, swim in it, boat on it, fish from it, and we also deposit a large amount of our waste into it. But its capacity to absorb our pollution isn't infinite.



The McKinley Business District in Tacoma, WA before depaving: Unfiltered storm water reduces water quality in the Puget Sound region.

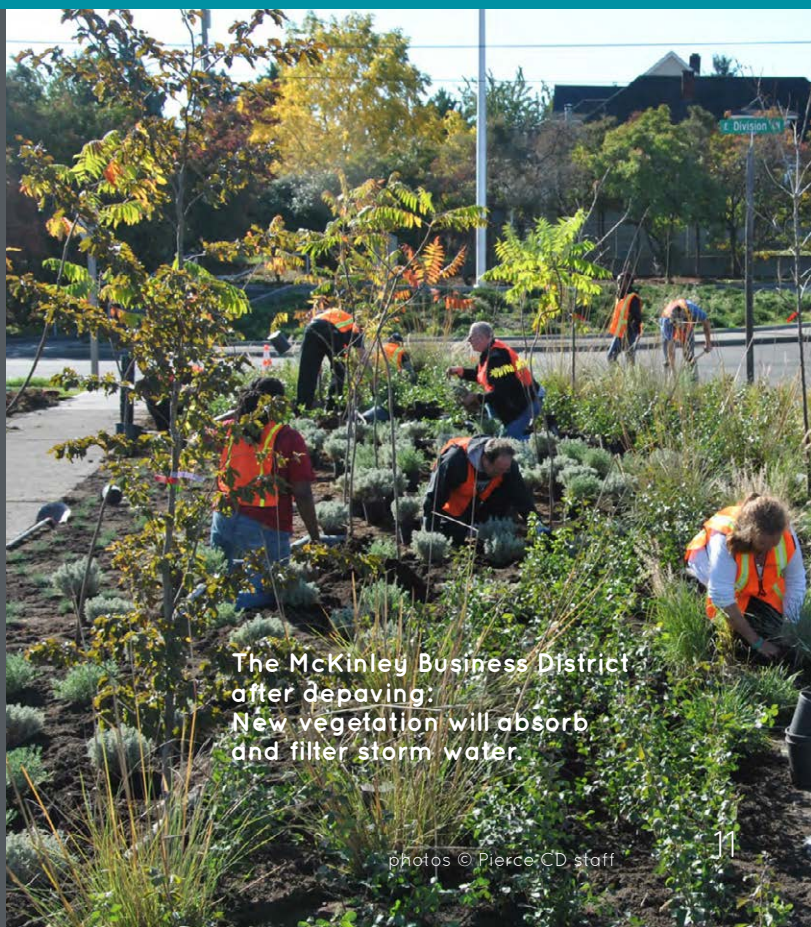
photo © WICD staff

Soil soaks up water in storm events and holds and filters it, using it to water plants and sustain the natural ecosystem.

Does this really need pavement?

The McKinley Business District DePave project in Tacoma Washington used a grassroots approach to identify and remove unused impervious surfaces contributing to water impairment in the Puget Sound region. This business district site was nominated by the Dometop Neighborhood Council, and the project was managed through the Pierce Conservation District. Grant funding provided by the Russell Family Foundation and the Make a Splash program paid for the permits and plants. Through two community events and donated services and materials from local contractors, 100 community volunteers removed 7,000 square feet of pavement along McKinley Ave E and planted 2,800 shrubs and 30 trees.

Need advice to plan your depaving project? Contact your local Conservation District through www.BetterGround.org.



The McKinley Business District after depaving: New vegetation will absorb and filter storm water.

photos © PierceCD staff

RAIN CATCHMENT

You did an inventory of your water systems to orient your yard within the greater landscape (page 7). Now let's explore some different options for conserving water on your property, reducing run-off pollution and erosion, and improving water quality.

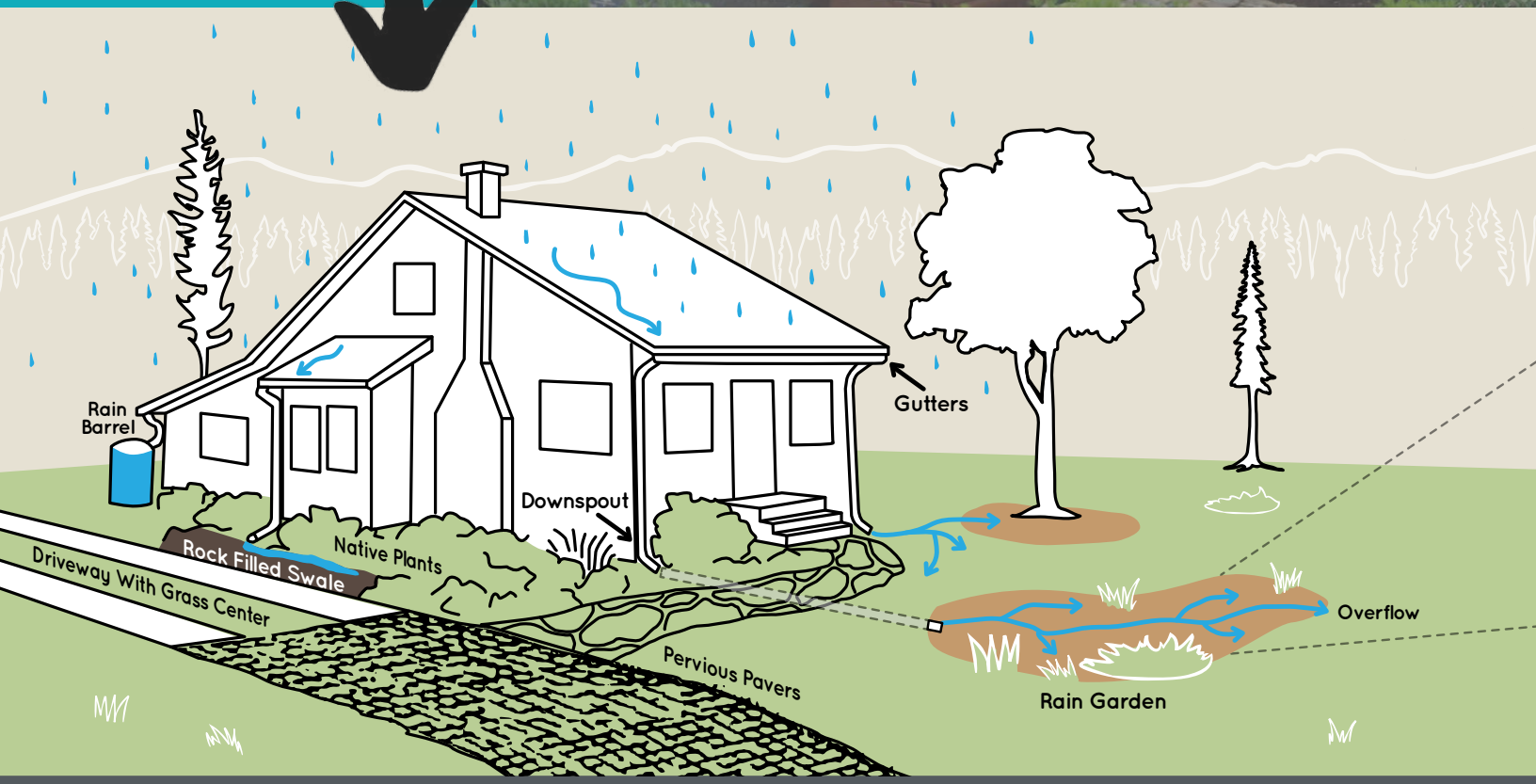
Review the illustration below.

At some point in late spring, the rains in our region slow. Aside from a spell of cool, wet weather in "June-uary," our summers are dry and very occasionally hot! During this lovely time of extended light and heat, we become faithful gardeners setting ourselves to the arduous task of watering. At that point, everything you can do to save water matters. This is where the storm water that fell earlier in the year can be put to good use. If we capture some of it, we'll be reaping the double benefit of slowing its run off into drains and saving it for later use.

By installing rain barrels or larger water catchment systems you can reduce the amount of potable drinking water you're drawing from your well to water plants and lawns, which is especially helpful in drought years.

Visit BetterGround.org HERE to learn more about constructing and installing a rain barrel on your property.

photo © WICD staff



RAIN GARDENS

One great way to slow and reduce storm water run-off from your property, encouraging water to soak into your soil, is to install a rain garden.

Gutters and impervious surfaces funnel water into the rain garden, which holds the excess water. Unlike a rain barrel, rain gardens allow the water to slowly soak into the ground. Rain gardens have the added benefit of growing beautiful native plants that attract pollinators like native bees and hummingbirds.

During heavy rainstorms, you may see standing water in the rain gardens and drainage swales. This means the natural drainage features are hard at work, cleaning the stormwater runoff. This water should infiltrate, or soak into the soil, within a day or two.

Visit BetterGround.org HERE to get your rain garden started.

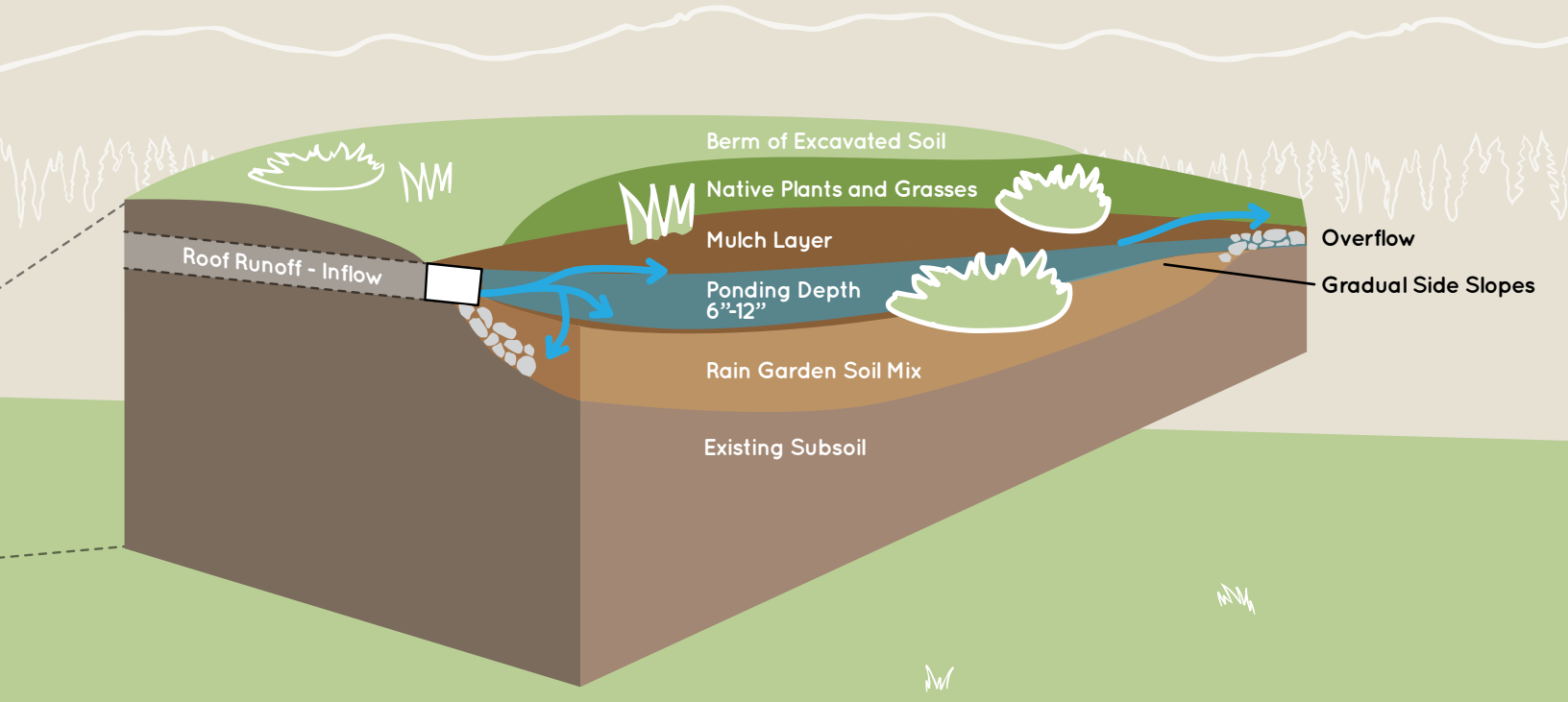
photo © WICD staff

Rain Garden Maintenance

Rain gardens need maintenance to perform well and look nice. However, a well-designed and established rain garden needs minimal care or water, especially after 2 or 3 years.

Basic Maintenance Rules

- Mulch as needed to prevent erosion and weeds and to keep moisture in.
- Keep inlet and outlet clear of debris and vegetation, and well protected with rock.
- Do not fertilize or use pesticides.
- Water as needed.



SOIL HEALTH

Another way to reduce storm water run-off is to increase your soil's capacity to absorb and hold water on your property – on your lawn, in your garden, and anywhere else with exposed soil or plants. Soil is a quiet yet key player in water quality. It can be easier to focus on the myriad of beings growing out of the soil, or the multitude of structures built on top of it.

Pause for a moment and give your full attention to the busy world existing beneath us.

A teaspoon of healthy soil contains about 4 billion organisms. This community of insects, bugs, micro-organisms, fungi, and bacteria exist together in a magnificent web, each one intently feeding, pooping, and reproducing. One organisms' waste is the next one's food, on down the line until single-celled bacteria are fixing carbon atoms to miniscule bits of clay particles.

Without the soil web ecosystem, soil becomes infertile. Plants growing in infertile soil require more fertilizer and water and are more susceptible to disease. Areas of your property that are most likely to have poor soil health include patches that have lots of weeds, heavily compacted areas like walkways, and lawns without proper care. How does infertile soil impact water quality? It can cause erosion, increased storm water run-off, and increased pollution from fertilizer and chemicals.

Building healthy soil means fostering an environment in which all of the interactions between organisms can happen. In order to build and encourage healthy soil, we need to meet the needs of the soil community.

Feed it: The soil community needs food to survive, just like the human community. Most soils naturally contain the nutrients that support plant growth, but those nutrients can come in a variety of forms, some of which can be accessed by plants and some of which are unavailable. It's the soil organisms that release new nutrients and make them accessible to plants. Instead of adding synthetic fertilizer to the soil, try adding compost to feed the soil organisms.

Mulch it: Fall leaves, compost, grass clippings, and wood chips can be spread on top of soil at 1-3" thick. Mulch conserves water, prevents weeds, and adds organic material to the soil for a more robust microbial community and healthier plants. Skip bagging your grass clippings, and instead return the nutrients in cut grass back to your lawn as another way to foster soil health.

Let it breathe: Soil needs a loose but reliable soil structure that allows air, water, and roots to move around. If soils are compacted too much from being walked or driven on, they aren't able to absorb and hold much water. Compacted soils can prevent grass roots from growing down deep, creating thatch - a condition where grass roots grow sideways and in clumps, leading to unhealthy lawn.

Avoid chemicals and synthetic fertilizers: Storm water run-off can carry away up to 65% of the chemicals and fertilizers that we put on our gardens. That's a lot of money and time washed away by the rain. A healthy soil community will release nutrients to gardens and lawns so plants are well-fed and able to defend themselves against diseases and pests without the use of chemicals.

NATURAL LAWN CARE

Your lawn is a plant! It needs light, fertile soil, and the right amounts of water to grow healthy, just like other plants. We often use the most pesticides, fertilizers, and water on our lawns, producing waste and working too hard. Consider switching to natural lawn care, which provides grass with all it needs to grow its best.

HERE are some tips for practicing natural lawn care.

1. **Mow higher - 2-3" - and more often.** The first inch of grass stalk is extra food storage. When we routinely cut into that storage supply, it puts stress on the plant. Also, when we let the lawn grow very tall and then mow it, the huge cut stresses out the plant.
2. **Leave the clippings.** This practice doesn't cause thatch build up. It makes lawns healthier by returning the plant nutrients to the lawn, rather than bagging them and taking them off site. This way, the lawn can reuse those nutrients and stay healthier.
3. **Use natural, organic, or slow release fertilizer.** The best time to fertilize is September when grass plants are building root reserves for the next year.
4. **Make the choice to water or not.** In summer, grass needs an inch of water a week to stay growing. If it doesn't get that water, it will go dormant. Decide at the beginning of summer whether you'll water or not, and stick with your choice. That way, you'll waste less water.
5. **Aerate and top dress in spring.** These spring practices reduce compaction and feed the soil, which in turn will feed your plants.

Natural lawn care will reduce dependence on chemical fertilizers and develop a healthy lawn that is naturally resistant to weeds, insects, and diseases.

Establishing New Lawns

Lawns often require a lot of maintenance and water, so choose other plant groups where turf is not necessary or won't grow well (heavily shaded, sloped, or poorly drained sites). Lawns require at least 6-8 inches of compost-amended soil to get started, whether by seed or sod. Seeding gives better long-term root establishment, hardiness, and drought-tolerance than sod. Single-species sod should be avoided.

For best lawn establishment, seed April 15-May 15 or Sept. 15-Oct. 15, and irrigate through the first dry season. Select a blend of Northwest-adapted grasses, plus broadleaf plants like clover and lawn daisies, for durable turf where a few "weeds" won't look out of place.

photo © WSCC

Honey, I Shrunk the Lawn!

Grass grows best on level, well-drained soil in full sun or partial shade. Areas of your yard with steep slopes, shady or forested areas, or land near lakes and streams won't be great at growing healthy lawn.

There are many beautiful plants that love wet ground, shade, and rocky soils. Native plants are well-suited for our climate, and provide erosion control on slopes, buffers for streams and creeks, and storm water filtration around the yard. They also provide habitat and food for pollinators and birds.

The type of lawn alternative you want will depend on the area you wish to landscape. If it's a stream bank, or steep slope, native plants such as shrubs and groundcovers may be best. If it's a shady area, you might create a moss garden. In a wet area, you may consider adding rocks and hardy ground cover so you don't have to mow.

SMART WATERING & WEED CONTROL

Giving your plants the right amount of water keeps them healthy and protects them from many common plant problems. Smart watering saves money on water bills and conserves fresh water supplies during hot summer months.

Recommended watering methods:

- **Soaker hoses and drip irrigation:**

Installing soaker hoses or drip systems in garden beds and landscapes can increase watering efficiency up to 50% compared to sprinklers. Cover soaker hoses with mulch to save even more water.

- **Sprinkler systems:** Make sure your sprinkler systems have a rain shutoff device. Adjust the watering schedule at least once a month to make sure the sprinklers are coming on in the early morning and only when watering is needed
- **Spot watering:** If watering systems aren't possible in your yard, try to water the root zones of each plant deeply. If water puddles, stop watering for a while and then restart, allowing the water to soak in to the soil.

Remember - healthy soil conserves water! Build your soil with compost so it can hold onto more water, and add mulch to bare soil to prevent evaporation. Compost and mulch also help prevent erosion.

1 Inch Water Test

Take some time today to see how long it takes your sprinkler to water an inch and you'll be set to water efficiently all summer long! Here's how:

Place tuna cans or other straight-sided containers in a few locations around the yard or garden, and time how long it takes to fill the cans with 1 inch of water. In average soils, 1 inch of water will moisten the soil to about 1 foot.

This Summer - Go Gold!

Our lawns love the spring and fall rains. They thrive so happily that you might feel the grass growing behind you as you mow. But once your lawn feels the hot, dry summer hit, it goes dormant, it retreats into itself and waits for cooler, wetter weather.

You can choose to artificially keep the good ol' wet times going by giving your lawn an inch of water a week during the summer. But if there's a break in that regular watering – say for instance, during a summer vacation – the lawn will go dormant. If that happens, future waterings will go to waste.

Once your lawn has gone dormant, it stops taking up food and water, instead relying on its storage of carbohydrates that it built up in the first inch of its stalk. During dormancy, any water and fertilizer you lay down won't have an effect on the plant. It may look brown and dead, but it's not!

Choose not to water – go gold this summer! – and watch your grass return to green when rains begin again in fall.

Weeds. They can be invasive and relentless, taking over whole areas of the landscape if left unchecked, and that's not beneficial to the environment. They can also be unassuming or even helpful, providing food for pollinators and cover for bare or infertile soil. Weeds will always be a part of our landscapes, and it's important to find a balance between weed eradication and environmental health.

HERE are some weed control tips - the natural way

Let your healthy plants and lawns outcompete the weeds on their own by building healthy soil and mulching. Plan to weed and replace mulch layers each year. Weeds are persistent, but you can be even more so.

- Dig or pull out weed roots. Otherwise, they'll grow right back.
- Remove weeds before they go to seed. Weeds can release thousands of seeds per plant, which will make removal harder in future years.
- Find the source - look around the yard and neighborhood to identify weeds that may be spreading seeds. Remove where permitted and appropriate.
- To remove larger areas of weeds, lay down cardboard, then cover with compost for growing plants or gravel, stone, or wood chips to create paths.
- If spraying for weeds is unavoidable, try less-toxic products like vinegar solutions and soaps.

Make special effort to remove state-regulated noxious weeds. Additional information is available from the **Washington State Noxious Weed Control Board HERE**. Some common offenders are shown below:

Scotch Broom (*Cytisus scoparius*)
Roadsides, pastures, recently disturbed areas;
Toxic to livestock, displaces native plants;
Repeat removal methods over many years.

Canada Thistle (*Cirsium arvense*)
Pastures, streambanks, wet prairies;
Outcompetes natives, reduces crop yield;
Difficult to control once established.

English Ivy (*Ilex aquifolium*)
Forested areas;
Berries poisonous for people; Aggressive growth habitat; Pull or dig out.

Poison Hemlock (*Cytisus scoparius*)
Roadsides, pastures, recently disturbed areas;
Toxic to livestock, displaces native plants;
Repeat removal methods over many years.

Spurge Laurel (*Daphne laureola*)
Forest understory;
Highly toxic, displaces native plants;
Hand pull or cut below soil line.

Common Cordgrass (*spartina anglica*)
Intertidal zone;
Highly agressive, destroys wildlife habitat;
Pull shoots and roots or repeated mowing.

NATIVE PLANTS

As we spend increasing efforts watering our flowers and lawns, all around us nature remains more or less green.

The wiley, saltsprayed and windblown PNW native plants have adapted to survive our short, dry summers without much water.

Native plants bridge the human and natural worlds. They flower spectacularly, burst into deep fall color, and even feed us delicious berries. Native plants need less water, help with erosion, and provide natural habitat.

For wildlife, birds, and pollinators, they provide all the essentials in food, shelter, and places to raise their young. They are the first to flower as the Rufous Hummingbirds return from their 4,000 mile migration. They weave themselves into thick hedges in which red-breasted nuthatches can hide from hawks and house cats. Best of all for our yards, they don't require much maintenance or water after the first few years.

Many of our native plants grow best with some shade – they choose to spend their lives under the protective arms of towering evergreens and umbrella-like maples and alders. The plant family *Ericaceae*, which includes many of our iconic Pacific Northwest plants such as madronas, salal, and rhododendrons, grow in symbiotic relationship with mushroom fungus called mycorrrhiza. Together, the soil, mycorrhiza, and tree roots create a hidden underworld that gently sags beneath our hiking boots.

A Sampling of Puget Sound Lowland Favorite Native Plants

Here are just a few species commonly found in our region. Most local Conservation Districts offer a Native Plant Sale in early spring. This is your chance to plan your dream garden and ask the professionals for tips and tricks on planting, gardening, or any other questions you may have about your property. Find information about the sale in your area by visiting **BetterGround.org HERE.**

Red Flowering Currant
(*Ribes sanguineus*)
Mature Height: 5'-10'
Well drained soil; Partial shade to full sun.

Tall Oregon Grape
(*Mahonia Aquifolium*)
Mature Height: 3'-10'
Well drained soil; Partial shade to full sun.

Pacific Rhododendron
(*Rhododendron macrophyllum*)
Mature Height: 5'-25'
Moist to dry soil; Shade to partial shade.

Kinnikinnick (*Arctostaphylos uva-ursi*)
Mature Height: 6 - 8" inches
Prefers dry soil; Partial to full sun;
Spreading evergreen ground cover.

Nootka Rose (*Rosa nutkana*)
Mature Height: 6'-8'
Well drained soil; Partial shade to full sun;
Valued for soil stabilization and wildlife habitat.

Vine Maple (*Acer circinatum*)
Mature Height: 15'-25'
Wet to moist soil; Part shade to full sun;
Highly adaptable; Vivid fall color.

Douglas Spirea (*Spirea douglasii*)
Mature Height: 3'-8'
Moist to dry; Partial shade to full sun;
Riparian species creates large thickets.

Sword Fern (*Polystichum munitum*)
Mature Height: 2'-4'
Dry to moist soil; Shade to partial sun;
Drought tolerant fern.

Salal (*Gaultheria Shallon*)
Mature Height: 1'-4'
Dry to moist soil; Shade to sun;
Highly adaptable; roots stabilize soil.

CREATE WILDLIFE HABITAT

Your property lines are legal and official, but they aren't recognized by bees, hummingbirds, squirrel, deer, or birds. Our PNW wildlife and pollinator populations travel among our properties, seeing them as one big landscape in their search for food and shelter.

Our yards and areas planted with native plants are attractive to local wildlife. Consider not using or at least limiting the use of chemicals to kill weeds, pests, and diseases, or to fertilize plants. Without chemicals, your garden will be healthier and safer for you, your family, and your pets, and will be full of birds, beneficial insects, and other wildlife to watch and enjoy.

Birds need places to feed, rest, sing, hide, and court. The places they choose can vary from evergreen ground cover to tall tree tops. If your yard has no habitat, consider adding some native plants, shrubs, and trees to support local bird populations and attract other wildlife. If you've got trees and habitat already, protect it! Natural habitat will attract birds as well as the caterpillars, insects, and worms that birds feed upon.

You may also want to consider placing a water source in an area in your yard, such as a bird bath or large rock with a depression that can collect water. Shady spots are best to keep the water cool. Protect the water source from chemicals and polluted storm water run-off, but know that muddy puddles provide trace minerals to the wildlife that drink from them.

Native Bees

We see their busy little selves amongst our lavender, thyme, flashy yellow Oregon grape, and delicate white and pink apple blossoms. Our dedicated pollinators are always out buzzing between blooms. Bee populations are generally stressed in many areas and have seen a sharp decline, especially in native bee populations. Creating habitat for our pollinators is a great way to help!

Most of our native bees, including bumblebees, miner bees, and sweat bees, either dig nests in the ground, burrow into dead wood or berry canes, or move into abandoned bird nests. Providing areas on your property where bees can nest and hibernate, including rock or compost piles, native plant thickets, and undisturbed natural areas, increases their habitat and chances of survival.

Native bees rarely travel more than 1,000 feet when foraging for food, which means that your property can serve as both habitat and food supply. Provide a variety of blooms throughout the year so native pollinators can eat without the stress of travelling long distances.

Go to **BetterGround.org HERE** or visit the **Xerces Society** for tips to create bee-friendly habitat.

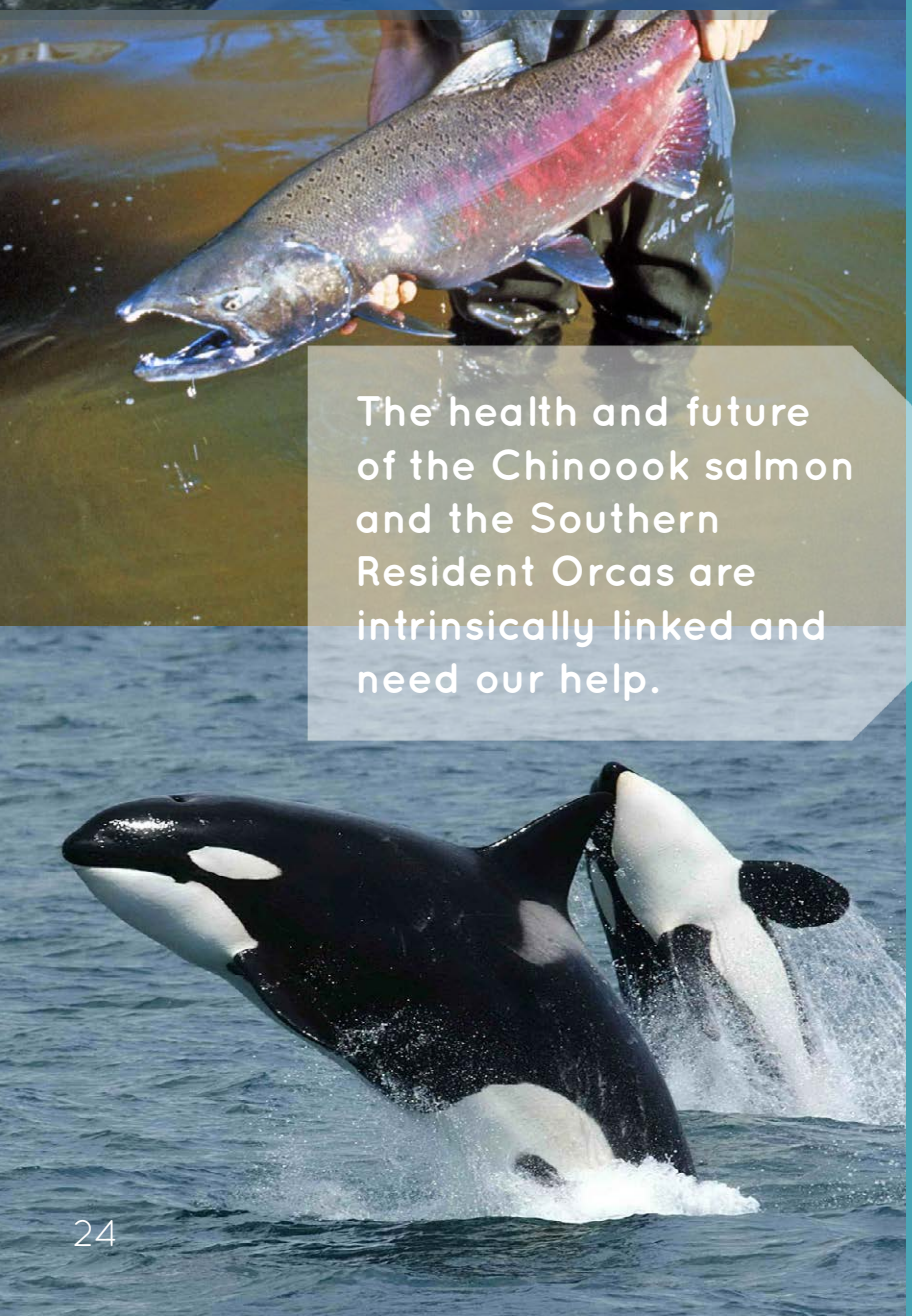
RIPARIAN & MARINE NEARSHORE

Picture a quiet, deep blue lake of icy water. It's fed from snow melt in the mountains, which travels down ancient, carved river bed paths, over smooth stones and shiny fish, through forest, farmland, and towns. The lake and the waterways that feed it draw plants, wildlife, fish, pollinators, and humans to their life-giving shores. These powerful watersystems exist in close relationship with the land they run through and over. The areas surrounding them are called riparian.

Riparian areas can regenerate underground aquifers, filter nutrients and sediments from the water, offer shade for aquatic creatures, and provide important habitat for wildlife. They are also some of our most fertile lands - shared spaces on which agriculture, wildlife, and salmon all depend.

How we share riparian spaces is an on-going community concern. We need to keep the waterways cool enough for fish, deep enough to keep running, and clear from pollution to sustain life. We also need to use the water for drinking, agriculture, and recreation. Bringing the diverse needs and demands of the riparian together sustainably will take creativity and innovation, skills that we humans have in abundance!

photo © Megan Martin Aust



The health and future of the Chinoook salmon and the Southern Resident Orcas are intrinsically linked and need our help.

Our Iconic Salmon & Orcas

Puget Sound has its own unique community of orca whales, the Southern Resident Orcas, and they are some of the most at-risk marine mammals in the world. In summer, the whales feed mainly on Chinook salmon returning to the Fraser River in British Columbia and Puget Sound. During other seasons of the year their diet expands to include other species like chum salmon which return to rivers all over the Puget Sound. As seasonal salmon populations dwindle, so has the orca population. Where the three family pods used to be seen all summer hunting in the Puget Sound, now they travel to other waters in search of food.

Southern Resident Orca recovery depends on the recovery of salmon populations in the Pacific Northwest, which depends on the improvement of the riparian areas in which the salmon travel up and down to spawn.

The salmon recovery plans are comprehensive, taking what is known as the "all-H" approach to reduce the impacts of Harvest, Hatcheries, Hydroelectric dams, and loss of Habitat that is essential to adult spawning and birth and rearing of juvenile fish.

Visit **BetterGround.org HERE** to learn where and how you can volunteer to help.

The marine nearshore is where our island lives are lived. It is the tumultuous, fantastical relationship between land, tide, and moon.

The near-shore is a provider of shellfish, seaweed, agates, and treasures tumbled by waves. Humans have historically depended on it for survival, as do hermit crabs, barnacles, seagulls, and sea stars. The Samish Tribe has a saying "When the tide goes out, our table is set for dinner." And from this feast-worthy ecosystem stretches out the heaving, enigmatic ocean. Our ocean is an underwater forest, cold and thriving. In its hidden depths, octopi squeeze into rock caves, continental shelves push back and send up whirlpools, and silver-scaled fish go about unhurried lives.

Those of us who live on that transition between land and ocean have a special responsibility to manage drainage and vegetation along bluffs. Natural shorelines feed the marine ecosystem, and provide the last line of defense in filtering pollutants before they reach the sea.

A checklist for bluff and shoreline landowners:

1. Find a **Shore Friendly** program in your area that provides assistance in assessing your shoreline property., or contact your local Conservation District. You can prepare by reviewing **Your Marine Waterfront** which includes a site assessment checklist to determine if there are actions you can take to improve the marine nearshore ecosystem under your stewardship.
2. Consider designs for natural erosion control, natural beachfronts, and native vegetation planting.
3. Contact a geologist for professional assistance before making changes to this delicate ecosystem.

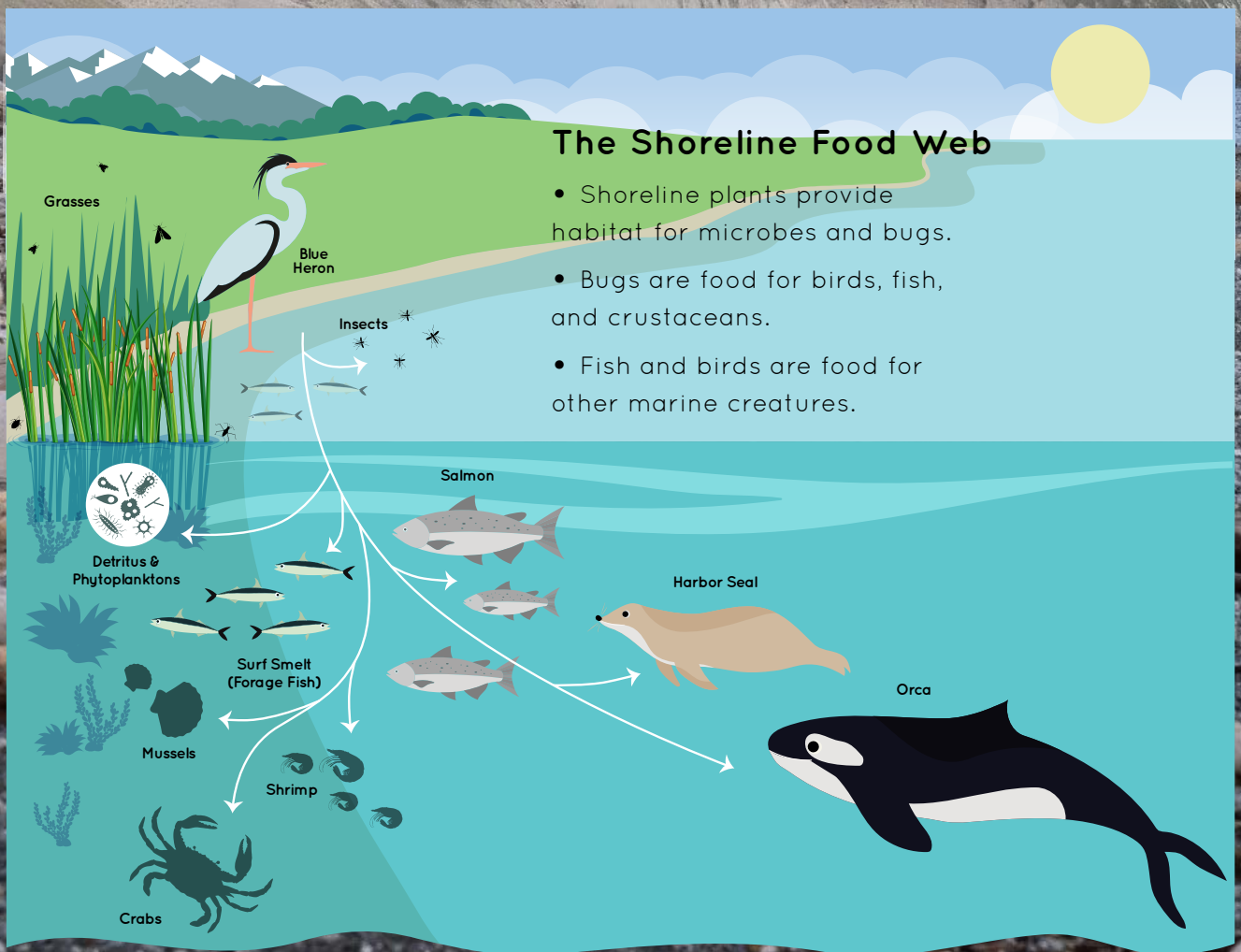
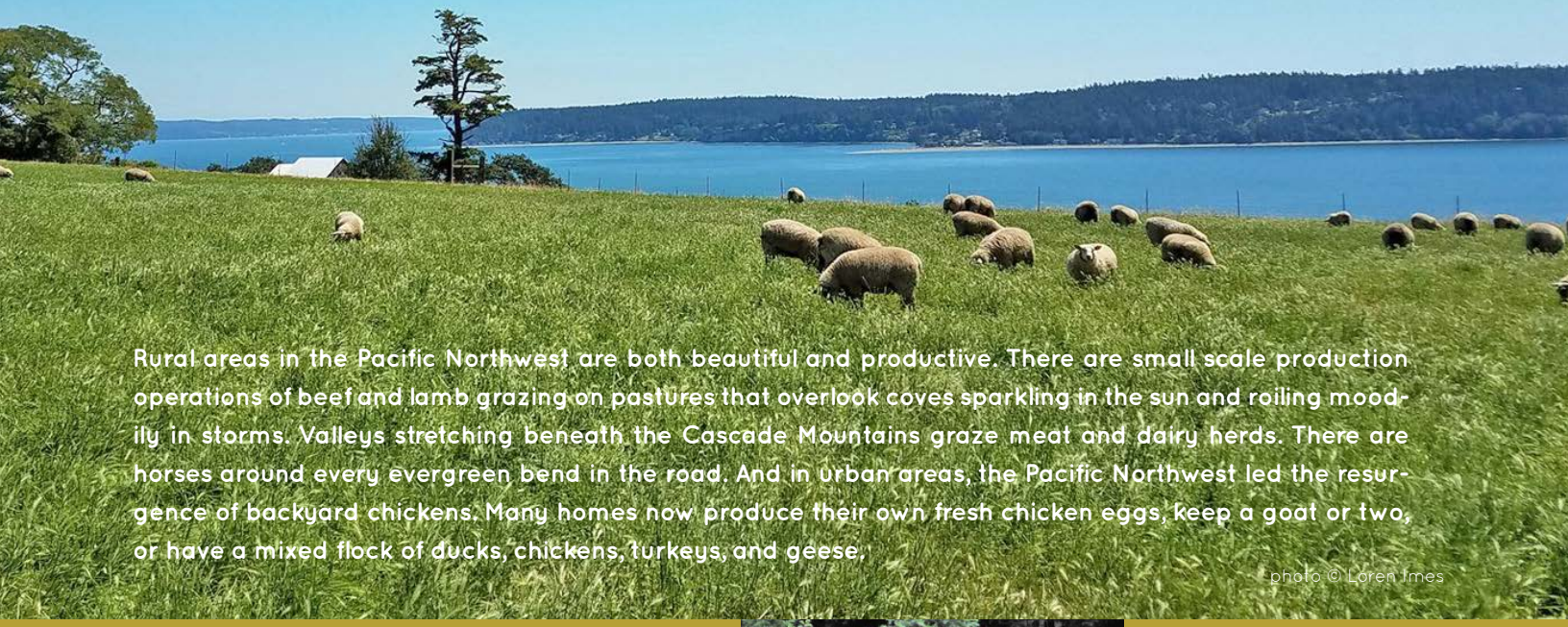


photo © Ryan Palmateer

ANIMAL WASTE

The waste from single-celled organisms conveniently becomes food for our plants, but much further up the food chain, waste pollutes our water. Dogs, livestock, and humans all impact the watershed with waste. We live on top of our water supply, the ocean in full view, and we don't want excessive amounts of fecal bacteria from our waste to end up collecting in our waterways.



Rural areas in the Pacific Northwest are both beautiful and productive. There are small scale production operations of beef and lamb grazing on pastures that overlook coves sparkling in the sun and roiling moodily in storms. Valleys stretching beneath the Cascade Mountains graze meat and dairy herds. There are horses around every evergreen bend in the road. And in urban areas, the Pacific Northwest led the resurgence of backyard chickens. Many homes now produce their own fresh chicken eggs, keep a goat or two, or have a mixed flock of ducks, chickens, turkeys, and geese.

photo © Loren Imes

Pick up your dog poop.

It's no joke. Dogs in Skagit County, for instance, generate an estimated 5,400 pounds of poop every day.* Storm water washes over all that poop in all those backyards, dog parks, and sidewalk green strips, carrying fecal bacteria into the rivers, streams, and eventually the ocean out of which we eat and recreate. In just one day, a dog can produce 5 billion fecal coliform bacteria. It takes only 400 bacteria to contaminate a cup of water. That means in 24 hours, one dog can contaminate 12,500,000 cups of water. That's a LOT of water. Viruses, worm eggs and bacteria in poop can live as long as one year, depending on conditions.

*Source: Skagit Conservation Education Alliance.

To learn details about how to manage pet waste – and even the proper way for recreating humans to go to the bathroom outdoors – visit **Poopsmart.org**, an award-winning website developed by Skagit County's Clean Water Program.

Poop Smart
www.poopsmart.org

Every single animal creates manure every day, and that manure can generate a number of problems in our water systems.

Livestock manure can contain parasites, pests, and fecal bacteria that can be easily picked up by rain and taken to the water from which we irrigate our fields, drink, and swim. Managing manure is the dirty part of owning livestock, and it's easier with a plan in place.

photo © WICD staff

The best manure management for your specific site will vary.

HERE are some **basic tips**:

Cover your pile. This prevents nutrients and bacteria in the manure pile from washing away in the rain.

Give your pile a floor. An impermeable floor made of concrete will help prevent run-off from the manure pile, or a gravel floor will filter pollutants before they reach our groundwater. Direct water away from your pile. Storm water from gutters, buildings, and landscapes should be prevented from running through the manure pile and carrying away pollutants.

Spread responsibly. The best time to spread manure on your fields is in dry summer months. Test soil to make sure it's not already high in phosphorous and nitrogen, which are heavily concentrated in manure. Your local conservation district has resources, planning services, and even financial assistance to help create a plan to responsibly deal with livestock manure.

Toxic Algae Blooms

Manure contains nitrogen, phosphorous, and other nutrients that are essential for plants and soil. Nitrogen and phosphorous are water soluble, and when they are concentrated in manure piles, they are in quantities the soil can't absorb. Instead of benefiting the soil, they are picked up by storm water run-off and deposited in streams, rivers, and seas. Excess nitrogen and other nutrients in the water cause algae to grow faster than the ecosystem can handle. The algae chokes out other plants growing in the area, and can clog or contaminate boats and pipes.

Large growths of algae are called algae blooms, which can eliminate oxygen in the water and kill fish. Algae blooms produce toxins and elevated levels of bacteria that can harm humans who come into contact with the polluted water or eat contaminated shellfish.

Poor manure practices can cause fish deaths and contaminated shellfish.

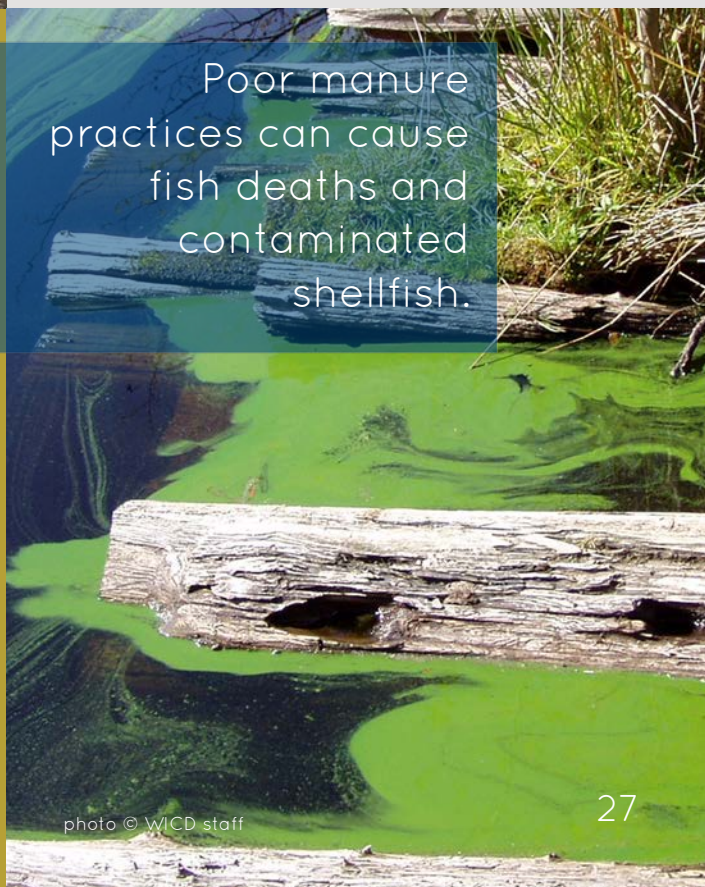


photo © WICD staff

COMPOST

Leaves fall to the ground. Plants and insects die. The husks of seeds are left behind by new growth. The breaking down of plants and creatures is the activity that creates healthy soil. Nature composts all the time.

We've shown that healthy soil grows healthy plants, retains water longer, and prevents erosion. Creating healthy soil depends on adding compost to the ground and facilitating the breaking down process, which encourages the soil microbial life to thrive and provide the benefits that healthy soil can offer.

Composting yard waste, grass clippings, and livestock manure keeps the nutrients and organic matter from these materials on your property. You'll send less waste to landfills, and you'll spend less money on compost and soil amendments from outside sources.

Worm Composting

Kitchen scraps can be composted by red worms (*Eisenia fetida*). These worms eat fruits and vegetables, egg shells, pasta, rice, tea bags, coffee grounds and even coffee filters. They'll decompose almost anything except meat and dairy products. Not only are you making compost to improve your soil, you're reducing the waste you produce that goes to the landfill.

Build your worm bin out of anything from wood to a plastic tub with holes. You can also buy premade bins online. Make sure that your worm bin has a cover to keep out wildlife. It's even possible to keep a worm bin in your office! Fill the bin with wet bedding such as shredded newspaper or dry leaves, drop in a few handfuls of worms, add your kitchen scraps, and watch the magic happen.

The end product is a nutrient rich compost that can be used as a mulch and soil amendment to improve soil health in your garden.

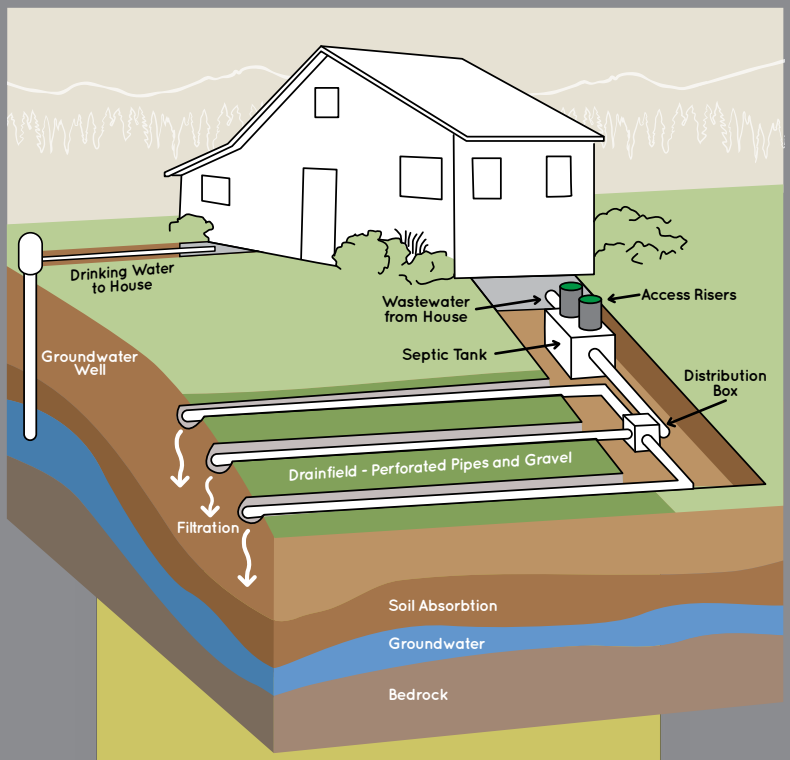
Compost Recipe

A hot compost pile will break down materials quickly. How to create and manage hot compost? You'll need:

1. **Brown materials** such as wood chips, saw dust, wheat straw, corn stalks, Christmas trees (chipped)
2. **Green materials** such as garden waste, grass clippings, chicken and rabbit manure, and kitchen scraps
3. **Raw materials** such as leaves, horse manure and bedding, and spoiled hay
4. **Water and air.**

Mix one part green to two parts brown for a good hot pile. Raw materials compost easily, and are a great addition to a compost pile to encourage quick break down of material.

SEPTIC



It's important to keep as much animal waste as possible out of our water, and that includes from us humans as well.

In rural areas, on large acreage, and in our island communities, many people depend on septic systems for their gray and black water. Approximately 72% of Island County residents, for example, have an onsite septic system.

Buried out of sight, or with a mound in the lawn that stays green all summer, a septic system may seem like a magical, marvelous way to dispose of our waste. And while there is most certainly magic in the Pacific Northwest, it's not at the receiving end of the toilet.

A septic system is a miniature waste treatment plant. It is most commonly a cement block set into the earth beneath your lawn, with chambers that your waste passes through each time you flush. The water is pushed out of the block into a gravel pit (or mound, depending on what the glaciers left behind in your yard). The waste water filters through the gravel, eventually ending up in the soil or even washed away by storm water. Any solids entering the cement chambers sink to the bottom and stay there in the cement block that's buried in your yard, until you schedule a professional to come and pump it out.

In some local counties, Public Health officials estimate that only 25% of septic systems are in compliance with their recommended maintenance schedule.

How to stay in compliance

- **Use your system properly.** Practice water use efficiency, avoid chemicals, and only flush waste down the drain.
- **Have your septic system inspected by a Maintenance Service Provider.** These professionals may be known as Operation and Maintenance (or O&M) Specialist, Inspectors, or Monitoring Specialists.
- **Pump your tank.** Regular inspections will alert you when it's time to pump. Don't wait until there's a problem, because you don't want that problem!
- ***Washington State Department of Health - Caring for Your Septic System*** has resources and tips for best practices in maintaining your septic system, if any questions come up.

OTHER ACTIONS & CONSUMER CHOICES

Washington created 18.6 million tons of solid waste in 2017*, and that number doesn't count the waste that never made it into the garbage truck.

The ocean picks up a lot of waste as well.

As a Puget Sound steward, It's important to remember that every item that enters your property, including its packaging and the bag it's transported in, will eventually become waste.

So far, we've been able to utilize garbage dumps, sewer systems, recycling facilities, and second-hand stores, but as these options fill up and become increasingly costly, we need to really look at our choices and begin to reduce the amount of waste we create. Our consumer choices are powerful. Collectively, they are votes we cast with our dollars that can change entire markets.

We can **choose**:

- to buy items with fewer packaging and longer lifespans.
- to use public transportation - support that's key to making public transport better.
- to take time to reuse or compost some of our packaging and food waste.
- to shop for locally made products whenever possible, which not only reduces the environmental impacts of transportation but also keeps more money in our communities.

A lot of the problems that our waste production has generated have no clear answers yet. There are many, many people working on inventions, innovations, strategies, and practices that will help solve our waste problem. If you're one of those people, thank you! But even if you're not, you can support new and different products, companies, and legislation. You can test out their value, and if it works for you, spread the word!

* Source: WA State Department of Ecology

Support Local Businesses

For every $100 spent at a locally owned business, $58 stays in the local community, compared to $33 at a chain store*. A strong and robust local economy will be there to support you during times of crisis and uncertainty. Investing in local businesses makes our communities more resilient now and into the future.

Local agriculture is a staple of the Pacific Northwest. Its look is shaped by the land it sits on. From the sweeping lowlands of Skagit Valley to the fertile foothills of Whatcom County to the small farms of the San Juan Islands, local agriculture reflects and inspires the character of the community it serves.

When you buy from local farms, you're likely getting the freshest possible produce, without the carbon footprint of the global food distribution system. You're building relationships with community members who have a stake in the same environment and economy that supports you and your family. And you're contributing to the resilience of your community and your pantry. Supporting local agriculture is a type of emergency preparedness.

* Source: Institute for Local Self-Reliance

COMMUNITY INVOLVEMENT

We've gone over your property, connecting it to the soil community, the watershed, the wildlife and pollinators, and the rain. How do you feel? We hope that we've connected your individual actions to the PNW landscape, and helped you realize that

you matter to this place.

All your choices at home, in travel, at work, and out enjoying forests, mountains, and beaches have an effect on the water in all its many forms. You can't escape our region's exuberant waters, and the waters can't escape you.

Now it's time to pack up all your water steward knowledge and take it out into the greater community. Take it for a hike to a sweeping vista of evergreen and salal, ocean and distant blue mountain range. Take it to the beach and walk it along that playful nearshore paradise. Show it to family, friends, and neighbors. And use it to make an even bigger impact in our shared home.

Listed below are some ways to get involved with natural resource conservation in our area. You can show your support by following and sharing organizations on social media, by donating to support important environmental work, by giving your time in volunteering, and by participating in local government, schools, and environmental organizations.

We'll see you out there! Have fun and enjoy.

Ways to support conservation in the community:

1. Your local Conservation District: Conservation Districts offer resources, technical advice, site visits, farm plans, programs, and financial assistance to landowners at no charge. They can help with stewardship projects on your property, and also have opportunities for volunteering and education in the community. Go to BetterGround.org to find your local district.

2. Land Trusts: Land Trusts conserve land through ownership or conservation easements, for a number of reasons, including protecting natural habitat and water quality, ensuring the land is always available for farming, forestry, or recreation, and protecting open land from development. Land trusts will typically have on-going projects on the land they steward that need volunteers.

3. Salmon recovery organizations: Washington state has a Salmon Recovery Plan with many opportunities for participation in local efforts to restore salmon streams and preserve salmon habitat. Puget Sound Partnership and the Governor's Salmon Recovery Office are good places to start.

4. Community spaces: Volunteer to clean up public beaches, parks, and green spaces. Washington State Parks has a volunteer program. You can find habitat restoration, beach clean-ups, and trail maintenance opportunities to help out at your local parks.

5. Waste reduction: Zero Waste Washington is a state-wide effort to help individuals and businesses reduce their waste. There may be a plastic bag ban initiative in your local area that needs your support, such as Plastic Free Salish Sea.

photo © WICD staff

6. Citizen science: sign up to participate in a citizen science project through Washington Sea Grant or with a local marine resource conservation group.

7. Storm water enhancement: Improve storm water on your property and in your community by working with water conservation organizations such as 12,000 Rain Gardens. Your local government might have a storm water program for landowners and businesses to participate in as well.

8. Orca recovery: Help our endangered Southern Resident Orca populations with organizations such as Promise the Pod and Orca Network. June is Orca Month, and Orca Recovery Day - a day of collective action to support orca recovery - is held in October!

9. Be shore friendly: If you live on a shoreline, check out the Shore Friendly program in your area. Shore Friendly has information and programs to help landowners manage erosion while keeping the marine nearshore ecosystem healthy.

10. Go public: Let your local, state, and federal representatives know that water conservation is important to you. Support efforts to improve our PNW water and land. Go to a meeting, a workshop, or a community conversation. Share your conservation efforts on social media, and lead by example.

Contact www.BetterGround.org for more ideas to connect with the community for Better Ground.

Acknowledgements

This document was created using information
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BetterGround.org
Institute for Local Self-Reliance
Island County Public Health
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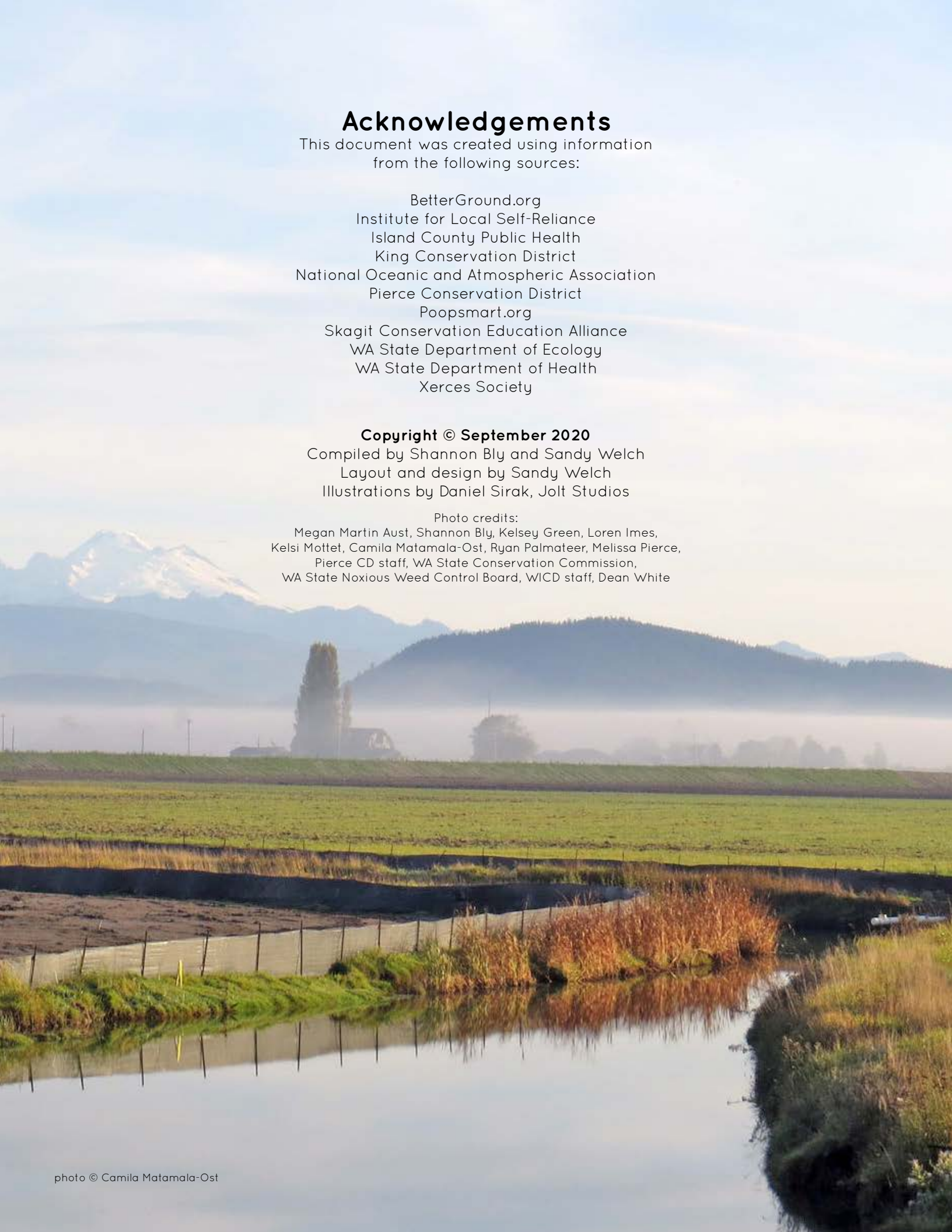

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