



Living  
Responsibly  
in a  
Green  
Community

  
THE  
**Highlands**  
AT LANGLEY

A Low Impact Development  
Neighborhood



*Prepared by:*

Whidbey Island Conservation District

*With funding support from:*

Washington State Department of Ecology



# Acknowledgements

This document was created using information and images from the following sources:

City of Oak Harbor, Washington.

Eric Floyd, Floyd Photography, [www.floydphotography.com](http://www.floydphotography.com).

*Grow Smart, Grow Safe: A Consumer Guide to Lawn and Garden Products* - King County and Washington Toxics Coalition.

*Home Tips for Healthy Streams* – brochure developed by Fisheries and Oceans Canada, printed locally by the City of Mount Vernon and Skagit Fisheries Enhancement Group.

*Low Impact Development Technical Guidance Manual for Puget Sound* - Puget Sound Action Team and Washington State University, Pierce County Extension.

*Practically Easy Landscape Maintenance A Care Manual for Natural Drainage Systems* - Fall 2006 – Seattle Public Utilities

*Rain Garden Handbook for Western Washington Homeowners* – Washington State University, Pierce County Extension.

*The Scoop on Poop...an Island County guide to safe and environmentally friendly pet waste disposal.* Brought to you by: WSU/Island County Waste Wise, Island County Public Works and Island County Health Department.

*Water Efficient Lawn Watering Practices*, Minnesota Department of Natural Resources

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Compiled by Stacy Smith

Layout and design by S. Welch Designs  
Cover and Appendix C photos by Eric Floyd



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# A Low Impact Development Neighborhood

## Introduction

When new development covers the land with buildings, roads, driveways and sidewalks less rain soaks into the ground. The rainwater stays on the surfaces and runs off into our streams and oceans through ditches, and storm drains becoming “stormwater.” As the stormwater travels to the streams and oceans it collects anything that will float or dissolve such as litter, oil, gas, fertilizers and pesticides.

Photograph by Stuart Glasoe,  
Puget Sound Action Team



*Traditional storm water pond.*

The Highlands at Langley is an example of a development that was constructed to meet the standards of Low Impact Development (LID). LID is an alternative approach to managing and treating stormwater run-off. Traditional methods send storm water run-off into ponds and pipes that dump the water without treatment into Puget Sound.

In a mature Pacific Northwest forest very little rain-water runs off the land. Instead, approximately 50 percent of annual rainfall is intercepted by foliage and evaporates or soaks into the ground where the soils and plants remove the pollutants naturally.

LID encourages small above ground drainages along with networks of gardens and swales to slow down and clean stormwater run-off and allow the water to be absorbed back into the ground, mimicking what happens naturally in a forested area. LID techniques can be integrated into any site or building project with multiple or single elements within one site.

Photo by Seattle Public Utilities



*Rain gardens and natural swales being used instead of storm drains and pipes.*

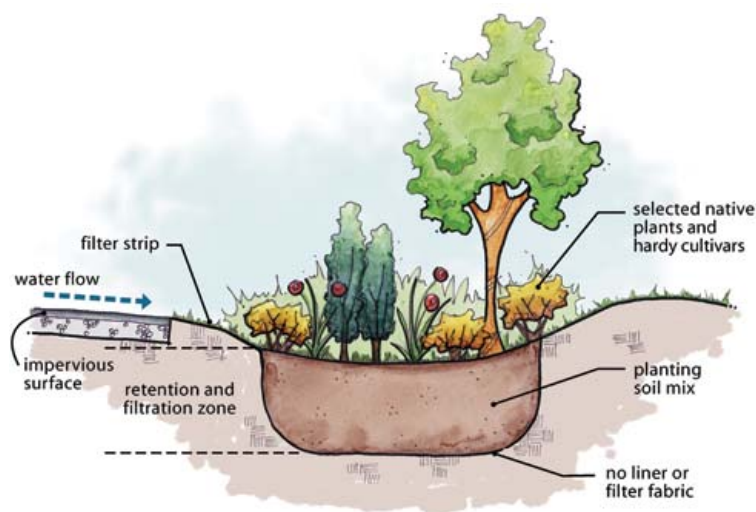


In The Highlands Community, the natural swales and gardens networked among the streets and homes are mimicking nature. These features slow the water down and clean it just like it would have been treated naturally in a north-west forest. In The Highlands project, bio-swales and in a few areas, underground pipes, take any overflow to large rain garden chambers for further infiltration.



Photograph by Eric Floyd,  
<http://floydphotography.com/>

*Mature Pacific Northwest Forest.*



*Basic rain garden.*

*Image by AHBL Engineering, Low Impact Development Technical Guidance Manual for Puget Sound.*

In order to make this natural drainage system work well, the architects, planners and developers wanted to limit the amount of impervious or hard surfaces throughout the community. To accomplish this, the team:

- ✓ Maintained much of the native vegetation (over 70%).
- ✓ Constructed narrower roadways and driveways
- ✓ Provided a suite of home designs with a smaller footprint

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 storm water runoff. This water should infiltrate (or soak in) within a day or two.



# How to Help Keep the Natural Drainage Systems Working

## Trash Removal



Rain gardens act like a native forest by collecting, absorbing and filtering stormwater runoff from your roof, driveway, patio and other areas that don't allow water to soak in. While these systems mimic nature, they will require human help to keep functioning. As a resident, you have a few basic responsibilities.

Pick up trash within your yard, in the natural drainage system, and in the right of way in front of your home. Trash will collect and create debris dams and block water flow.



Photo courtesy: City of Oak Harbor

Removing the trash will help keep the natural drainage system functioning well in addition to keeping the community clean.

## Weeding

Rain gardens will still soak up and filter stormwater if weeds are present. However, the plants selected for the rain garden will likely not grow as well with competition, and your rain garden will not be as attractive in your landscape.

Weeding is easiest when done regularly. The easiest time to weed is when soil is moist and weeds are small – especially in the spring and again in fall. To discourage weeds apply a three to four inch thick layer of organic mulch\* such as compost.

*\* Mulch with a coarse compost rather than chipped wood. Chipped wood and bark mulch do not work well in rain gardens because they float, which means re-mulching more often to cover up exposed soils.*



## Weeding Tips

- ✓ Dig or pull out weed roots or they will grow right back.
- ✓ Remove weeds before they go to seed!
- ✓ For easier weeding, pull weeds when they are small and when the soil is moist.
- ✓ Use a sharp pointed trowel or garden fork to loosen soil and dig out weeds and roots. A long handled weed puller can help if bending is difficult.
- ✓ Find the source – look around the yard and neighborhood to identify trees and other plants that may be spreading seeds, remove where permitted and appropriate.
- ✓ State-regulated noxious weeds are listed online at: [http://www.nwcb.wa.gov/weed\\_list/weed\\_list.htm](http://www.nwcb.wa.gov/weed_list/weed_list.htm) make efforts to contain, suppress and/or eliminate these weeds.
- ✓ For more information on weeds in Island County please visit the Island County Noxious Weed Control Board website, <http://www.island.wsu.edu/weeds/weedinfo.htm>



Photo courtesy: Rain Garden Handbook for Western Washington Homeowners

For help identifying weeds in your yard please see Appendix B and other online resources presented in Appendix C.

## Treating Your Yard as Wildlife Habitat

Natural drainage systems use native plants to absorb urban runoff and improve water quality before the runoff flows into local streams, lakes and eventually Puget Sound. Many of these plants are attractive to local wildlife. Do not use 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 as well as be full of birds, beneficial insects and other wildlife to watch and enjoy.

*Please see the list of alternative weed and pest control products in Appendix A.*



Photo courtesy: NRCS



## Rain Garden Maintenance

Rain gardens, like any garden area, need maintenance to perform well and look nice. However, a well-designed rain garden needs minimal care.

Photo courtesy: Seattle Public Utilities



### Basic Maintenance Rules

- Mulch\* as needed to prevent erosion and weeds
- Keep inlet and outlet clear of debris and well protected with rock
- Keep inlets and outlets in rain garden clear of vegetation
- Do not fertilize or use pesticides
- Water as needed

Check the mulch layer each year and, if needed, add shredded or chipped hardwood or softwood to maintain a layer that is about 2-3 inches thick. Mulch can be applied any time of the year, but assuring an adequate mulch layer for the dry summer and rainy winter months is of great benefit.

### Erosion and Exposed Soils

Sediment flowing into the rain garden can clog the soil mix and slow drainage. Sediment carried out of the rain garden can harm streams and wetlands by transporting pollutants and degrading habitat for aquatic wildlife.

- ✓ Check the rain garden for areas of exposed soil in the fall before the wet season begins and throughout the winter months.
- ✓ Mulch areas along the sides and bottom of the rain garden.
- ✓ Maintain a healthy cover of plants.
- ✓ If sediment is deposited by water entering the rain garden, immediately find the source and stabilize the eroded area.
- ✓ If erosion persists, too much water may be flowing into the garden too rapidly. In this case, the slope of the pipe or swale directing water to the garden or amount of water may need to be reduced.

*\* Mulch with a coarse compost rather than chipped wood. Chipped wood and bark mulch do not work well in rain gardens because they float, which means re-mulching more often to cover up exposed soils.*



## How to Care for Your Lawn and Garden to Protect the Water Supply

As a resident of The Highlands Community, you can help keep your drinking water safe. The following guidelines for natural lawn and garden care will make sure that every drop of water that is absorbed into the ground is as clean as possible.

It is also important to conserve our water supply. All watering should be done during the cool part of the day to minimize water lost to evaporation; early morning hours (4 a.m. to 8 a.m.) are best.

- Adding organic matter before seeding will help improve water and nutrient retention.
- Reduce water requirements by using drought-tolerant grass seed and sod.
- Reduce turf areas by planting drought-tolerant trees, shrubs and plants.

For information on where to purchase native plants contact the Whidbey Island Conservation District at (360) 678-4708 or <http://www.whidbeycd.org> and sign up for the annual Native Plant Sale (ordering typically runs from October through January and plants are picked up in February).



### What Goes on the Ground Goes in the Sound, or Comes Out of Your Faucet

The Highlands was constructed within the watershed that is home to the well for the City of Langley. This means that a portion of the rain water that is absorbed into the ground will work its way through the soil to the City of Langley well, and eventually come back to your house as your drinking water. Therefore, every resident must exercise care choosing the methods and products they use on house and garden.





## Lawn Care

In The Highlands setting, with community commons areas available, the best choice is to limit the amount of lawn you install in your personal garden and instead focus on native habitat plantings.



*A simple test for determining if grass needs water is to walk on the lawn and if you leave footprints, it may be time to water the lawn.*

If you do choose to install a lawn, follow these care guidelines, and plant drought tolerant seed. A healthy lawn requires regular mowing and 1" of water (including rain) per week to stay green. To avoid over-watering, monitor how much rain and sprinklers are applying (see *Sprinklers*, page 13)

Do not use a fixed schedule for lawn watering; apply water only when it is needed. Over-watering can promote diseases and affect the health of the lawn. A good soaking once or twice a week is better than watering every day. Allowing the soil to dry between watering will allow the roots to grow to greater depths and help make turf more drought tolerant.

Consider letting grass go brown (dormant) by not watering in summer. This cuts down on mowing and the grass will green up with fall rain. Hand weeding, fertilizing (with organic fertilizers only) and raking off leaves in fall are other tasks you can do to keep lawns looking good. You can reduce your need for fertilizer by up to 1/3 by leaving grass clippings on the lawn.

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### Make Your Own Organic Fertilizer

*Recipe from the Territorial Seed Catalog, printed in the "Grow Smart, Grow Safe" publication*

4 parts seedmeal (such as cotton seed meal) or fishmeal  
1 part agricultural lime or dolomite  
1 part rock phosphate or ½ part bonemeal  
½ part kelpmeal  
(All measurements by volume)

Measure all ingredients with a scoop or measuring cup and place in a large bucket. Mix well by stirring. (Avoid breathing the dust while you do this.) Fertilizer can be used in the garden or on the lawn. It can also be placed directly beneath seeds or seedlings or used as a side dressing for vegetables.

These ingredients can be found at most garden stores. Purchasing in bulk makes this fertilizer much cheaper than commercial organic fertilizer.



## Pet Waste

Cleaning up after your pet helps preserve water quality and sets a good example for other pet owners. Waste from dogs, cats and other meat-eating animals can carry diseases and parasites that make it unhealthy to handle and tricky to dispose of safely.

Please dispose of pet waste properly: scoop it, bag it and throw it in the trash. Picking it up protects water quality by moving waste to the landfill where it belongs. Leaving pet waste out in the open allows rain water to carry disease and bacteria from the waste down into the well head or into Puget Sound.



## Watering Plants

For the first two to three years most plants need deep watering during the dry season to establish healthy root systems. If you have selected the appropriate natives or plants adapted to Western Washington, then the rain garden will need little or no watering after two or three years. However, watering may be necessary during prolonged dry periods even if plants are established. During dry periods watch plants for signs of stress such as wilting leaves or fading evergreen needles.

Deep, infrequent watering that moistens the top 12 to 18 inch root zone is recommended to keep plants healthy and to promote deep roots. Deep root systems help plants become drought tolerant.

Small plants and flowers may need more water in hot weather (up to twice a week). After 3-5 years your plants should be well-established, deep rooted and drought tolerant. Only water when plants show signs of stress during hot, dry weather.

| Summer Watering Schedule First Year |                 |                      |
|-------------------------------------|-----------------|----------------------|
| Type of Plant                       | Amount of Water | Frequency            |
| Tree                                | 5-10 gallons    | once every 1-2 weeks |
| Shrub                               | 3-5 gallons     | once every 1-2 weeks |
| Ground Cover                        | 1-2 gallons     | once or twice a week |

| Summer Watering Schedule Second Year |                 |                      |
|--------------------------------------|-----------------|----------------------|
| Type of Plant                        | Amount of Water | Frequency            |
| Tree                                 | 5-10 gallons    | once every 2-4 weeks |
| Shrub                                | 3-5 gallons     | once every 2-4 weeks |
| Ground Cover                         | 1-2 gallons     | once every 2-4 weeks |

Table courtesy: Rain Garden Handbook for Western Washington Homeowners



## Tips for Determining How Much You are Watering

- Drill or poke holes in a 5-gallon bucket, place at the base of a tree or shrub, fill and let drain slowly.
- Time how long it takes to fill a 5-gallon bucket with the hose and nozzle that you normally use.

## Watering Tips and Signs to Look for

✓ Signs of stressed plants in need of water:

- Wilted leaves that don't perk up overnight.
- Fading of evergreen needles.

✓ Be careful to avoid over watering and under watering.

- **Too Little:** Hand spraying water wets leaves and soil surface but does not apply enough water to soak soil down to thirsty roots.
- **Too Much:** Over watering can literally rot the roots, invite disease, drown and starve plants; they cannot absorb nutrients from soggy soil. Soggy soil reduces the oxygen, which is necessary for healthy soil and plants.
- Refer to the watering table on page 11.

✓ How to know if you are giving plants enough water:

- Dig down (to the side of the plants; do not disturb roots) after an hour or so of watering to see if the top 12 to 18 inches of the soil is moist.
- If not, add watering time until at least the top 12 inches is moistened.

✓ Save time and money on watering and weeding by keeping the mulch layer thick.



## Soaker Hose Watering

Soaker hoses save water and can be covered in mulch to save even more water. Soaker or leaky hoses slowly release water drops all along their length. Moisture is applied directly and efficiently to the soil and plant root zones.

- Snake soaker hoses through planting areas and close to plant trunks or stems.
- To water an entire area, space soaker hose loops 18 inches (sandy soils) to 24 inches apart (clay soils).
- Evaporation is minimized, particularly if the hose is covered with 3 to 4 inches of mulch.
- Start with 40 to 60 minutes of soaking and check that water is penetrating 12 to 18 inches deep.

Photo courtesy: Rain Garden Handbook for Western Washington Homeowners





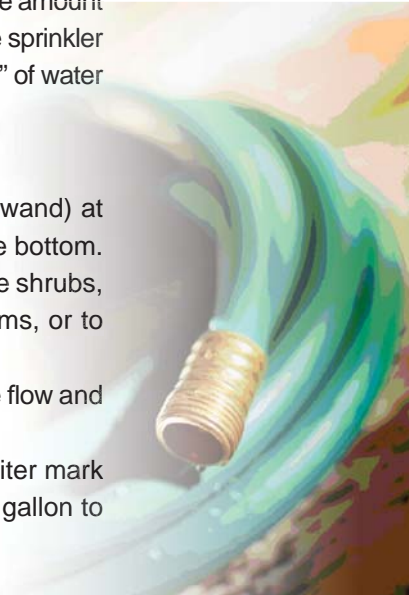
## Sprinklers

Use a shallow, straight-sided can (such as a tuna can) to measure the amount of water you have applied to your lawn. Place this can out where the sprinkler is running or where it can catch rainwater. When you have applied 1" of water on your lawn or rain garden, turn off the sprinklers.

## Spot Watering

Spot watering is simply running a hose (best with shower-type wand) at the base of a plant or into a 2 to 5-gallon bucket with holes at the bottom. Spot watering takes more time but helps establish trees and large shrubs, which need more water to reach their larger, deeper root systems, or to rescue drought stressed plants.

- Use a garden soaker or shower on the hose end to spread out the flow and reduce erosion.
- Turn the hose on softly (enough to fill a bucket to the 2 gallons/8 liter mark in 1 minute or so) and let it run for 30 seconds to 5 minutes (1/2 gallon to 10 gallons), depending on the plant type and size.
- Hold hose end or place bucket on the uphill side of the plant.



## Compost

Compost is a recycled product made from aged yard waste, manure and other bio-solids. Compost provides organic matter that improves soil structure, feeds earthworms and other soil creatures and helps retain water and nutrients. Compost can be mixed into the soil or a thin layer can be added on top as mulch to improve fertility or raked into the grass to restore an old lawn. Compost breaks down quickly meaning more frequent re-mulching may be necessary.

Compost is available commercially or free from your own home compost bin. Composting kitchen wastes is a great way to reduce your wastes and have great fertilizer for your yard. Want to learn how to compost? Visit the Waste Wise website through Washington State University's Island County Extension at: <http://www.wastewise.wsu.edu/>. Note: do not compost pet waste, diseased leaves or plants or weeds with seeds.

## Fall Leaves

Rake leaves off of lawns in the fall, but let leaves lie on planting beds as mulch. Or compost leaves and add to planting beds in the spring as a soil amendment. Letting the leaves lie on the planting beds as mulch will help suppress the weeds in your garden and enrich the soil.

### Compost Instead of Installing a Garbage Disposal



The installation of a garbage disposals or kitchen waste disposers is discouraged due to their affects on the sewer system. Food wastes and kitchen scraps are best put into a home compost bin or the trash. Your home is served by the city's low-pressure sewer system fed by a grinder pump in your home that breaks up solid materials so they can be processed by the system. Adding any of the materials listed below could cause problems in the sewer system or your pump; please do not put any of the following items down the drains in your home: glass, metal, goldfish stone, seafood shells, plastic objects (toys, utensils, etc.), sanitary napkins or tampons, diapers, socks, rags or cloth, kitty litter.



## Pruning

Your new plants should need very little, if any, pruning. If you do prune, only prune shrubs and ground covers as needed to keep sidewalks clear and sightlines open from street corners and driveways. You can remove broken or dead limbs and tree suckers. For more information on pruning, visit [www.plantamnesty.org](http://www.plantamnesty.org).

## Fertilizing

Planting soils that have been amended with compost should not require any other fertilizer, other than re-mulching with compost, leaves or tree trimming mulch. If you have selected the appropriate native plants no fertilizing is necessary.



**Please do not use chemical fertilizers in this sensitive area; remember, what goes on the ground, goes into Puget Sound, or comes out your faucet!**

Plants need food to grow, just like us. They make their food from nutrients mostly supplied by the soil (nitrogen (N), phosphorus (P), potassium (K) and a variety of micronutrients). Additional fertilizer is sometimes necessary for food crops and exotic plants, but unless measured and applied very precisely fertilizers are likely to run off into surface and ground water.

Additional fertilizer is sometimes necessary for food crops and exotic plants, but unless measured and applied very precisely fertilizers are likely to run off into surface and ground water.

## Mulch

Photo courtesy: Rain Garden Handbook for Western Washington Homeowners



Mulching can save time and money. Mulch can help keep the soil moist, replenish organic material, prevent erosion, and discourage weed growth. Mulching planting beds with a 3 to 4 inch layer of organic material such as wood chips or tree trimmings, leaves, bark or compost retains moisture, and keeps roots cool and discourages weed growth.

Don't be afraid to install a thick layer of mulch initially – as much as 6 to 8 inches of tree trimming or leaf mulch, or 4 to 6 inches of bark or compost. Be careful to leave plant trunks and stems open to air – burying plants in mulch will rot them. After settling and composting, the mulch layer will quickly shrink to the recommended 3 to 4 inches.

Mulching can be done at any time of the year; however it is best to have it in place before the hot, dry summer months and rainy winter months. Install mulch during fall, winter or spring. Then sit back, take a summer “vacation” and enjoy the benefits of a healthier, water-conserving garden.



### Mulch and Your Rain Garden

Place mulch on the sides and around the edges. Chipped wood tends to float easily; coarse compost works well for the bottom of the rain garden. Maintain a layer at least 2-3 inches thick on both the sides and the bottom of the rain garden.

### Mulching Types & Sources

- **Wood Chip or Tree Trimming Mulch\*:**

Often available free from commercial tree services as a by-product of pruning, tree trimming mulch is a variable mix of shredded wood (limbs), leaves and conifer needles. Although it may contain weed seeds, spread disease and/or grow mushrooms (do not eat!), chipped tree trimmings make an effective, inexpensive moisture-holding mulch that lasts longer and has more structure (woody material) than leaf, bark or compost mulches.

*\* Not recommended for rain gardens; mulch bottom of rain gardens with a coarse compost rather than chipped wood or bark. Chipped wood and bark mulches do not work well in rain gardens because they float, which means more work re-mulching more often to cover up exposed soils.*

- **Leaves and Grass Clippings\*\*:** Available free from your yard (or from neighbors), fall leaves and grass clippings may be added to planting beds as mulch and allowed to compost in place. If you dislike the odor and appearance of composting leaves or grass clippings, compost the materials before putting them on planting beds.

*\*\* Do not use grass clippings as mulch in your rain garden; decomposing grass clippings can be a source of excess nutrients that can harm streams and wetlands if water flows out of the rain garden and into the storm drainage system.*

- **Bark Mulch\*:** Available commercially by the cubic yard, bark mulch is a by-product of the timber industry. Consisting primarily of Douglas Fir and Hemlock bark, it comes in course, medium-fine and fine textures and is often installed for aesthetics as much as for mulch. Bark mulch may be contaminated with weed seeds and salt. It is naturally waxy and repels rain - all creating poor conditions for plant growth. It can also be tough on hands! Avoid using fine bark, cedar chip or sawdust products as they can be especially water-repellant.

*\* Not recommended for rain gardens, see note above, under Wood Chip or Tree Trimming Mulch*

- **Compost:** (see #3 Compost, page 13)



Photo courtesy: Seattle Public Utilities



## Pests & Diseases

Our damp climate provides a great growing environment for powdery mildew, black spot and other diseases. Roses can be especially vulnerable. Choose disease-resistant and native plants that are meant to grow in our climate (*resources listed in Appendix C*). Most importantly, treat problems individually and naturally rather than using a product that combines ingredients for insects, diseases and fertilization. Instead of spraying at the first sign of pests or disease, try the environmentally friendly approaches listed below.

You can also contact the Natural Lawn and Garden Hotline for expert advice on pests and other gardening questions: (206) 633-0224 or email [info@lawnandgardenhotline.org](mailto:info@lawnandgardenhotline.org).

### Preventing pests and diseases

#### Baking Soda Fungicide Recipe\*

(For controlling powdery mildew)

Mix and keep in a labeled container:

- 1 teaspoon backing soda
- A few drops dishwashing liquid
- 1 quart water

This recipe can help control powdery mildew on garden plants such as roses. Although the recipe has not received EPA registration there is a considerable body of scientific evidence and field experience showing that it is reasonably effective if applied weekly in the spring before disease symptoms appear. To avoid unnecessary use, only treat if previous experience shows that mildew is almost certain to develop. Reportedly this mixture is not effective on black spot.

\*Commercial products based on potassium bicarbonate are similar.

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- ✓ Plant a variety of pest resistant species and those that attract beneficial insects and birds. If a plant doesn't do well in the landscape, replace it with one better suited to your yard.
- ✓ Nurture healthy soil with compost and mulch. Keep planting beds clean of diseased or dead plants. Pull weeds before they go to seed. Do not put diseased material or weeds with seeds in your home compost bin.
- ✓ Use a drip-watering system rather than a regular sprinkler, sprinklers can splash water from the ground and from diseased plants and spread the disease and also powdery mildew.
- ✓ Keep garden pathways clear of weeds and other objects that may harbor pests. Slugs for example like to hide under pots, boards and other objects.
- ✓ Select and maintain plants carefully – a healthy plant, suitable to your yard is less likely to succumb to pest and disease damage.

- ✓ Monitor struggling plants for a few days to find out what insect or disease is causing the problem. The insect you might see near a damaged leaf might be a beneficial insect devouring the pests. If you're not sure what you are seeing consult a local nursery, gardening book or the Internet (*see Appendix C for examples*).



## Controlling Pests and Diseases

- ✓ Attract birds and beneficial insects to your garden and protect them by avoiding toxic chemicals.
- ✓ Be patient and live with a little pest or disease damage. Given time nature may cure the problem without your help, or plants may simply “outgrow” the problem.
- ✓ Once you’ve determined the bad bugs, hand pick (squish) larger pests, prune out infected plant parts, or wash pests off with a strong spray of water from the hose. You can also use traps, lures and barriers around the most susceptible plants to keep out bugs and pests.

**Traps:** sticky traps are available for many different pests, or make your own rainproof traps with insect-specific lures and baits in them, such as beer for slugs.

**Barriers:** plastic sheeting works for some pests, copper sheeting, pea gravel or ground oyster or egg shells work well for slugs.

- ✓ Do not expect to kill all pests or to always have picture-perfect plants. Some pests and some damage should always exist in your garden. Low levels of pests keep beneficial species in your yard, such as birds and predator insects, actively controlling pest populations.
- ✓ Slugs — handpicking is best done after dark when they are active. Take a flashlight to locate and drop the slugs in a jar of soapy water, which will kill them immediately. This can be highly effective in the fall; stomp and crush pearly clusters of eggs to eliminate hundreds of future slugs.
- ✓ In late March, take a flashlight out into the garden around midnight to literally catch root weevils and cut worms in the act, munching new foliage. Pluck and pinch (squish) to manually remove these pesky critters.

## Natural Weed & Insect Controls

Appendix A contains a list of natural insect control products that can be used in the Highlands. These products are non-toxic and will not threaten the city water source or Puget Sound.

The Washington Toxics Coalition offers “Pesticide Free Zone” signs for your yard <http://www.watoxics.org>





## Four-legged Pests

Deer, dogs, cats, squirrels and moles can cause damage and be an annoyance in gardens and lawns. Please plant your yard and garden with these creatures in mind. Appendix C lists several non-toxic repellants that can be useful in protecting your plants.

**The diggers** - Dogs, cats and squirrels generally cause damage by digging; cover newly seeded areas or transplants with a mesh screen such as chicken wire until plants are large enough to withstand digging.



Deer will eat a large assortment of plants, and some deer will eat a plant that other deer won't touch. Your plants are especially vulnerable when they are young and in the winter when food is scarce. Fencing is the most effective control, individual plants and trees can be protected with strong wire cylinders or other tree protectors available at local nurseries and garden supply stores.

## Changing Oil and Fluids on Cars, Lawnmowers, etc.



Oil, gas and other fluids that spill onto the ground get picked up by the rainwater and carried into the ground water and may make their way to the city well water. Ideally, have oil and fluids changed at a service center that recycles these fluids responsibly. If you choose to do the maintenance yourself, make sure that no fluids spill onto the ground. All fluids should immediately be transported to a recycling center (see disposal instructions on page 19).

Fix oil and transmission leaks on your vehicles as soon as you notice them; place a drip tray under the car until the problem can be fixed.

## Washing Your Car

Soap from washing your car can make its way into the ground water and to the city well, therefore car washing at your home is discouraged. Instead, patronize a commercial car wash, where water is filtered and re-used. If a car or other equipment must be cleaned on site, use a minimal amount of biodegradable soap. Wash your car on a permeable surface, such as grass or gravel.



## Maintaining Your Home's Exterior

Use only biodegradable soaps and cleaning products to maintain your roof, siding, and deck surfaces. If you are power-washing your house, windows or other outside surfaces where the soapy water may soak into the ground, use only biodegradable household cleaning products. Do not use chlorine bleach, or products containing it, on any outdoor surface. *"When chlorine bleach is used, it reacts with soil and other chemicals on surfaces to form small amounts of a large number of chemical compounds, some of which are quite toxic, for example chloroform and carbon tetrachloride."* —Washington Toxics Coalition

Sweep your walks and driveways to remove leaves, pine needles and debris. Washing these surfaces with the garden hose sends pollutants into the storm drainage system and ultimately into the drinking water or Puget Sound.

### Controlling Moss on Your Roof

Moss on the roof is a very common problem in our climate; prevention of moss growth and regular cleaning are the most effective means for moss control. This is especially important on the north-facing slopes of your roof and areas shaded by trees and other buildings. Thinning branches that cause shade on the roof will allow your roof to dry more quickly.

It is a good idea to clean roofs regularly (once or twice a year), sweeping to remove leaves, needles, moss and other debris. Wet sweeping will remove most of the moss if it is not too well established.

Please visit the Washington Toxics Coalition's web site for more information on a safe and healthy home. [www.watoxics.org](http://www.watoxics.org).

### Hot Tub and Pool Tips

Chemicals such as chlorine used in hot tubs and pools are very toxic to fish and other animals. When draining hot tubs or pools, direct the water into the ground or sewer system. Never drain into streets or storm drains.

### Disposing of Hazardous Wastes Properly

Never dump unused paint, pharmaceuticals, or chemicals down your toilets, sinks or outside ditches, storm drains or streams. Paints, solvents, yard and garden chemicals, hobby chemicals, household batteries, used motor oil and other household hazardous waste may be delivered to any of the Island County-operated drop box facilities for free disposal. Note: Island Recycling, located in Freeland, is a privately owned recycling business, which does not accept hazardous waste.

**The nearest location is at Bayview: 14566 SR 525, (360) 321-4504.**





## Appendix A

### Recommended Products for Natural Lawn and Garden Care

Adapted with permission from "Grow Smart, Grow Safe: A Consumer Guide to Lawn and Garden Products"

#### **General Pest Control**

| <b>BRAND NAME</b>                     | <b>ACTIVE INGREDIENT</b>                      |
|---------------------------------------|---|
| Orcon™ Beneficial Nematodes           | Live Nematodes                                |
| Orcon™ Green Lacewings                | Live Lacewings                                |
| Safer™ Deluxe Yellowjacket/Wasp™ Trap | Food Bait                                     |
| Safer™ Gypsy Moth Trap                | Pheromone Bait                                |
| Safer™ Sticky White Fly Trap          | Sticky Glue                                   |
| Sterling Rescue!™ Yellowjacket Trap   | Food Bait                                     |
| Tanlgefoot™ Codling Moth Trap         | Pheromone Bait                                |
| Tanglefoot™ Red Sphere Traps          | Sticky Glue                                   |
| Tangle-Trap™ Whitefly/Aphid Trap      | Sticky Glue                                   |
| Victor™ Yellowjacket Magnet™ Bag Trap | Food Bait                                     |
| Victor™ Yellowjacket Traps Disposable | Food Bait                                     |
| Concern™ Pesticide Spray Oil          | Canola Oil                                    |
| Garlic Barrier™ Insect Repellent      | Garlic Water                                  |
| Oil-Away™ Supreme Insecticidal Spray  | Cottonseed Oil                                |
| Tree Tanglefoot™ Pest Barrier         | Caster Oil, Natural Gum Resins, Vegetable Wax |

#### **Mildew, Black Spot and Other Disease Control**

*To Prevent and Stop Mildew, Black Spot and Other Diseases that Thrive in Our Damp Northwest Climate*

| <b>BRAND NAME</b>                     | <b>ACTIVE INGREDIENT</b>                 |
|---------------------------------------|--|
| Cornell Formula Baking Soda Fungicide | Sodium Bicarbonate (recipe on page 16)   |
| Bonide™ Bulb Dust                     | Cedar oil, Garlic powder and Dried Blood |
| Bonide™ Remedy                        | Potassium bicarbonate                    |
| Green Light™ Wettable Dusting         | Sulfur                                   |
| Green Guard™ Plant Growth Enhancer    | Harpin Protein                           |
| Lilly Miller™ Multi-Purpose Fungicide | Sulfur                                   |
| Messenger™ STS                        | Harpin Protein                           |
| Monterey E-rase™                      | Jojoba Oil                               |
| Serenade™ Solutions™ Biofungicide     | Bacillus subtilis                        |
| SoilGard™ Microbial Fungicide         | Gliocaladium virens spores               |



## **Slug and Snail Control**

### **BRAND NAME**

Slug Bar™  
Slug Saloon™  
The Pit  
Snail Barr™  
Slug & Snail deFence™

### **ACTIVE INGREDIENT**

Beer Trap  
Beer Trap  
Beer Trap  
Copper Barrier  
Sodium chloride, Polyethylene

## **Weed Prevention Products**

*Note: These will have no effect on existing weeds*

### **BRAND NAME**

Dalen™ Landscaping Fabrics  
DeWitt™ Weed Barrier  
Fabrico™ Landscaping Fabric  
Weed-X™ Porous Landscaping Fabric  
Concern™ Weed Prevention Plus  
Concern™ Weed Prevention Plus 8-2-4  
Concern™ Weed Prevention Plus No Phosphate  
Walt's Organic Weed Stopper Plus  
WOW!™ Pre-emergence Weed Control  
SoilGard Microbial Fungicide

### **ACTIVE INGREDIENT**

Fabric Barrier  
Fabric Barrier  
Fabric Barrier  
Fabric Barrier  
Corn Gluten  
Corn Gluten  
Corn Gluten  
Corn Gluten  
Corn Gluten  
Gliocaladium virens  
spores

## **Bird and Mammal Control**

### **BRAND NAME**

Dalen™ Bird-Ex™ Protective Netting  
Dalen™ Deer-Ex™ Protective Netting  
Ross Garden Netting  
Chicken Wire or Screening  
Victor Live Catch! Mole Trap  
Deer A-Tak™ Organic Deer Repellent

### **ACTIVE INGREDIENT**

Fabric Netting  
Fabric Netting  
Fabric Netting  
Steel Mesh  
Live Trap  
Rosemary oil, Cinnamon oil,  
thyme oil





# Appendix B

## Identifying Common Weeds

Table reprinted with permission from Seattle Public Utilities

### Some common weeds:

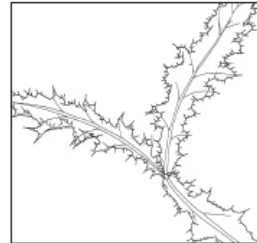
\*State-regulated noxious weeds may also be locally regulated. Make efforts to contain, suppress and/or eliminate these weeds. For more information, go to Washington State Noxious Weed Control Board website at [www.nwcb.wa.gov](http://www.nwcb.wa.gov)



**\*Bindweed**



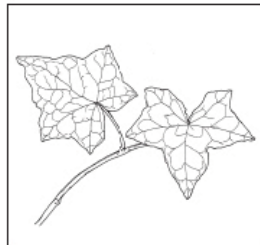
**\*Butterfly Bush**



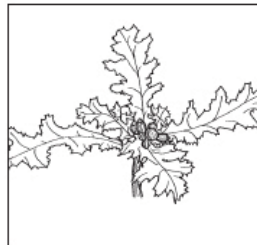
**\*Canada Thistle**



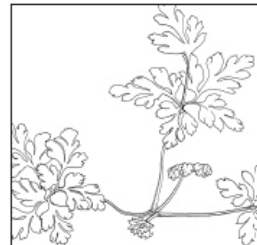
**\*Catsear**



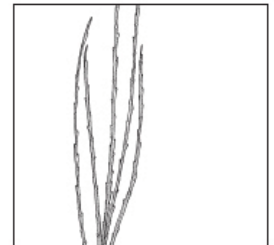
**\*English Ivy**



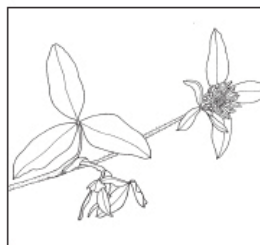
**\*Groundsel**



**\*Herb Robert**



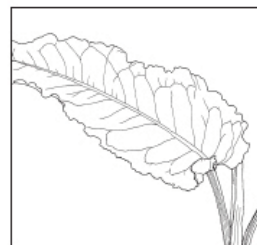
**\*Scotch Broom**



**Clover**



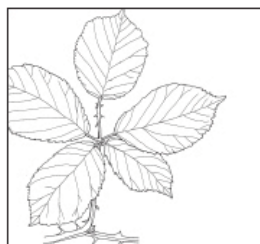
**Dandelion**



**Dock**



**Grass**



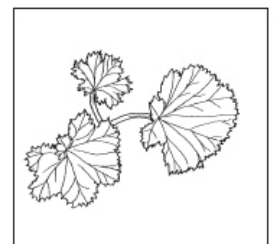
**Himalayan Blackberry**



**Holly**



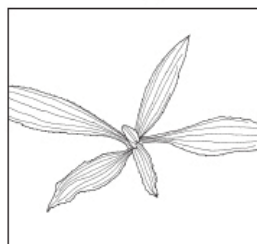
**Laurel**



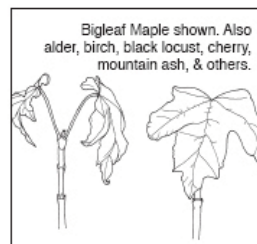
**Mallow**



**Nightshade**

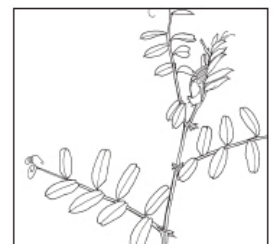


**Plantain**



Bigleaf Maple shown. Also alder, birch, black locust, cherry, mountain ash, & others.

**Tree Seedlings**



**Vetch**



## Appendix C

### Online Resources and Publications

#### Online Resources:

#### COMPOSTING

- WSU/Island County Waste Wise: <http://www.wastewise.wsu.edu/compost.html>
- Seattle Public Utilities' Guide: <http://www.seattle.gov/util/Services/Yard/Composting/index.asp>
- Compost sources and protecting water resources: <http://www.soilsforsalmon.org>
- Workshops & Bin Sales: Check with your local WSU Master Gardeners and Master Composters as well as city or county environmental offices.
- Washington Department of Ecology permitted composting facilities: <http://www.ecy.wa.gov/programs/swfa/compost/>

#### IDENTIFYING & ERADICATING WEEDS/INVASIVE PLANTS

- Washington State Noxious Weed Board: <http://www.nwcb.wa.gov/>
- Island County Noxious Weed Control Board: <http://www.island.wsu.edu/weeds/index.htm>
- King County Noxious Weed Board: <http://dnr.metrokc.gov/wlr/lands/weeds/>
- The Nature Conservancy Global Invasive Species Initiative: <http://tncweeds.ucdavis.edu/>
- *Invasive Species in the Pacific Northwest*, Edited by P.D. Boersma, S.E. Reichard and A.N. Van Buren, University of Washington Press, 2007. (not currently available online)
- *Grow Smart, Grow Safe: A Consumer Guide to Lawn and Garden Products*. Philip Dickey, Washington Toxics Coalition. Includes product reviews and sources for least-toxic products. Available at: [http://savingwater.org/docs/Grow\\_Smart\\_Grow\\_Safe.pdf](http://savingwater.org/docs/Grow_Smart_Grow_Safe.pdf)
- Horticultural Vinegar for treating weeds in unplanted walkways and driveways (ask your local nursery to stock it): [http://www.savvygardener.com/Reviews/Products/bradfield\\_vinegar.html](http://www.savvygardener.com/Reviews/Products/bradfield_vinegar.html)
- Flame Weeders, useful for killing weeds between pavers or in gravel in unplanted walkways or driveways, are available through local garden-supply and hardware stores or via the Internet
- Weeds - Gardening in Western Washington, presented by WSU Extension: <http://gardening.wsu.edu/text/weed.htm>

#### PLANT IDENTIFICATION AND INFORMATION WEBSITES:

- Seattle Public Utilities – Plant Identification Guide by Pat Breen, Oregon State University [http://www.seattle.gov/util/stellent/groups/public/@spu/@esb/documents/webcontent/spu01\\_002603.pdf](http://www.seattle.gov/util/stellent/groups/public/@spu/@esb/documents/webcontent/spu01_002603.pdf)
- Landscape Plants – Images, Identification and Information, Oregon State University Department of Horticulture <http://oregonstate.edu/dept/ldplants/>
- Plants Database, United States Department of Agriculture, Natural Resource Conservation Service <http://plants.usda.gov>
- University of Washington Botanic Gardens, Elisabeth C. Miller Library [http://depts.washington.edu/hortlib/resources/hort\\_web\\_sites/plant\\_id.shtml](http://depts.washington.edu/hortlib/resources/hort_web_sites/plant_id.shtml)



## SUSTAINABLE LANDSCAPING IDEAS

- Island County Master Gardeners: <http://www.island.wsu.edu/mastergardener/mginfo.htm>
- Thurston County Common-Sense Gardening Program: <http://www.co.thurston.wa.us/health/ehcsg/index.html>
- City of Seattle Natural Yard Care: [http://www.seattle.gov/util/Services/Yard/Natural\\_Lawn\\_&\\_Garden\\_Care/index.asp](http://www.seattle.gov/util/Services/Yard/Natural_Lawn_&_Garden_Care/index.asp)
- The Common Sense Gardening Guide to Natural Lawn Care, Thurston County: [http://www.co.thurston.wa.us/health/ehcsg/pdf/lawn\\_care.pdf](http://www.co.thurston.wa.us/health/ehcsg/pdf/lawn_care.pdf)
- King County Yard & Garden Topics: <http://dnr.metrokc.gov/topics/yard-and-garden/>
- Ecologically Sound Lawn Care for the Pacific Northwest, Seattle Public Utilities, David McDonald, 1999. [http://www.seattle.gov/util/stellent/groups/public/@spu/@csb/documents/webcontentecological\\_200312021255394.pdf](http://www.seattle.gov/util/stellent/groups/public/@spu/@csb/documents/webcontentecological_200312021255394.pdf)

## WATER-WISE/DROUGHT-TOLERANT/NATIVE PLANTS

See lists of recommended plants at:

- Native Plant Information: <http://www.wnps.org/>
- Thurston County Common Sense Gardening: [http://www.co.thurston.wa.us/health/ehcsg/pdf/Plant\\_Lists/CSG\\_plants.pdf](http://www.co.thurston.wa.us/health/ehcsg/pdf/Plant_Lists/CSG_plants.pdf)
- Native Plant Salvage Foundation: <http://www.oly-wa.us/NPS/Resources.php>
- See “Choosing the Right Plants” and “The Plant List.” [http://www.savingwater.org/outside\\_garden.htm](http://www.savingwater.org/outside_garden.htm)
- WSU Extension Native Plants database: <http://gardening.wsu.edu/nwnative/>
- Native plant gardening tips <http://dnr.metrokc.gov/wlr/pi/go-native/index.aspx>
- Water-wise landscaping: <http://www.oly-wa.us/NPS/>



### **Water Conservation**

Saving Water Partnership: <http://savingwater.org/outside.htm>

### **Obtaining Plants**

Whidbey Island Conservation District's Annual Native Plant Sale: [www.whidbeycd.org](http://www.whidbeycd.org) Native plants are typically pre-sold during October through January and picked up at the end of February.

### **Lists of Native Plant Nurseries & Other Sources:**

<http://dnr.metrokc.gov/wlr/pi/npnursry.htm>

<http://www.oly-wa.us/NPS/GoodSources.php>

### **MISCELLANEOUS YARD, GARDEN AND OTHER WEB SITES**

- Less toxic gardening and pest control: <http://www.govlink.org/hazwaste/house/yard/>
- Improving your soils: <http://www.metrokc.gov/dnpr/swd/soils/index.asp>



- Photos and descriptions of beneficial insects: <http://www.govlink.org/hazwaste/house/yard/problems/goodbugs.cfm> <http://www.co.clark.wa.us/recycle/documents/Bugbook2.pdf>
- Washington Toxics Coalition: <http://www.watoxics.org>
- Disposal of hazardous wastes: <http://www.islandcounty.net/publicworks/Solid%20Waste/hazard.htm>
- Salmon info (Island County) <http://www.sharedsalmonstrategy.org/watersheds/watershed-island.htm>
- Washington State University Island County Extension <http://www.island.wsu.edu/>

#### HELPFUL PUBLICATIONS AVAILABLE ONLINE:

- How to be a Salmon Friendly Gardner  
[http://www.seattle.gov/util/Services/Yard/Natural\\_Lawn\\_&\\_Garden\\_Care/Salmon\\_Friendly\\_Gardening/SPU03\\_001902.asp](http://www.seattle.gov/util/Services/Yard/Natural_Lawn_&_Garden_Care/Salmon_Friendly_Gardening/SPU03_001902.asp)
- Make friends with your “good bugs”  
<http://www.govlink.org/hazwaste/house/yard/problems/goodbugs.cfm> From this site you can order a copy of “Stop Before You Spray: A photo guide to beneficial insects.”
- The Right Tree Book (Seattle City Light)  
[http://www.seattle.gov/light/printdocs/Right\\_Tree\\_Book.pdf](http://www.seattle.gov/light/printdocs/Right_Tree_Book.pdf)
- Low Impact Development  
[www.lowimpactdevelopment.org](http://www.lowimpactdevelopment.org)
- LID Technical Guidance Manual for Puget Sound  
[http://www.psp.wa.gov/publications/our\\_work/stormwater/lid/LID\\_manual2005.pdf](http://www.psp.wa.gov/publications/our_work/stormwater/lid/LID_manual2005.pdf)

