Rain Garden

Handbook for Western Washington Homeowners

Designing your landscape to protect our streams, lakes, bays, and wetlands









WASHINGTON STATE UNIVERSITY
PIERCE COUNTY EXTENSION

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Designing your landscape to protect our streams, lakes, bays, and wetlands

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A digital copy of this handbook can be obtained at: http://www.pierce.wsu.edu/Water_Quality/LID

Cover art, clockwise from left: City of Maplewood MN rain garden, City of Seattle WA rain garden, red-flowering currant, planting a new rain garden Olympia WA

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INTRODUCTION TO RAINGARDENS









NATIVE SOILS AND FORESTS

of Western Washington store, filter, and slowly release cool, clean water to streams, wetlands, and the largest estuary on the west coast—Puget Sound. The rich diversity of life in marine and fresh water, as well as on land, depends on clean water to thrive.



As the region grows, native forests and soils are replaced with roads, rooftops and other hard surfaces. When it rains or snows, more water flows from these surfaces than undisturbed areas, carrying oil, fertilizers, pesticides, sediment and other pollutants downstream. In fact, much of the pollution in streams, wetlands and Puget Sound now comes from stormwater (water flowing off developed areas). The added volume of water and associated contaminants from developed land are damaging water resources and harming aquatic life in western Washington.





Rain garden, City of Maplewood MN

You can make an important contribution to reduce the amount of stormwater and pollutants coming from your property by incorporating rain gardens into your yard.

What is a rain garden?

A rain garden acts like a native forest by collecting, absorbing, and filtering stormwater runoff from roof tops, driveways, patios, and other areas that don't allow water to soak in. Rain gardens are simply shallow depressions that:

- Can be shaped and sized to fit your yard.
- Are constructed with soil mixes that allow water to soak in rapidly and support healthy plant growth.
- Can be landscaped with a variety of plants to fit the surroundings.

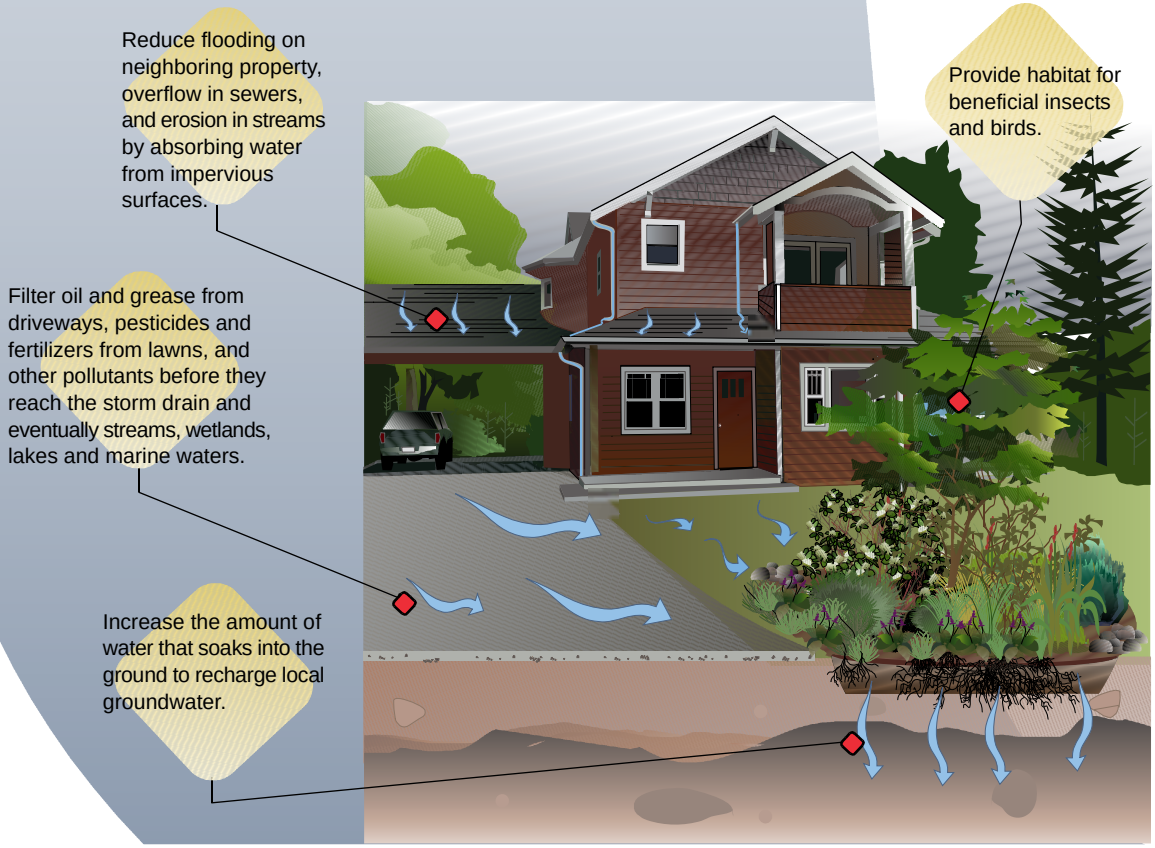


Photo by Seattle Public Utilities

THE BIG PICTURE

Rain gardens are one of the most versatile and effective tools in a new approach to managing stormwater called low impact development (LID). An LID project may incorporate several tools to soak up rain water, reduce stormwater runoff, and filter pollutants. Some examples of these tools include permeable paving, compost-amended soils, vegetated roofs, rainwater collection systems, and rain gardens.

Rain gardens provide multiple benefits, including:



4 STEPS TO BUILDING A RAIN GARDEN

1 LOCATE



- Identify areas draining to the rain garden.
- Identify the best location for the rain garden.
- Test the soil.

2 DESIGN & BUILD







- Determine the size and shape of the rain garden.
- Excavate soil (18-30 inches typical).
- Level bottom of rain garden **(do not compact).**
- Mix compost with soil.
- Place soil mix and leave at least 6 inches below edge of rain garden for ponding.
- Level surface of soil.
- Create an entry for water (swale, pipe or landscape area) into rain garden.
- Provide a rock-lined overflow.

3 PLANT



- Use a variety of small trees, shrubs, herbs, or grasses.
- Select plants that enhance the area and have appropriate water needs (native plants and hardy cultivars are preferred).
- Cover exposed soil with 2-3 inches of mulch.
- Water to establish plants.

4 MAINTAIN



Rain garden, City of Maplewood MN

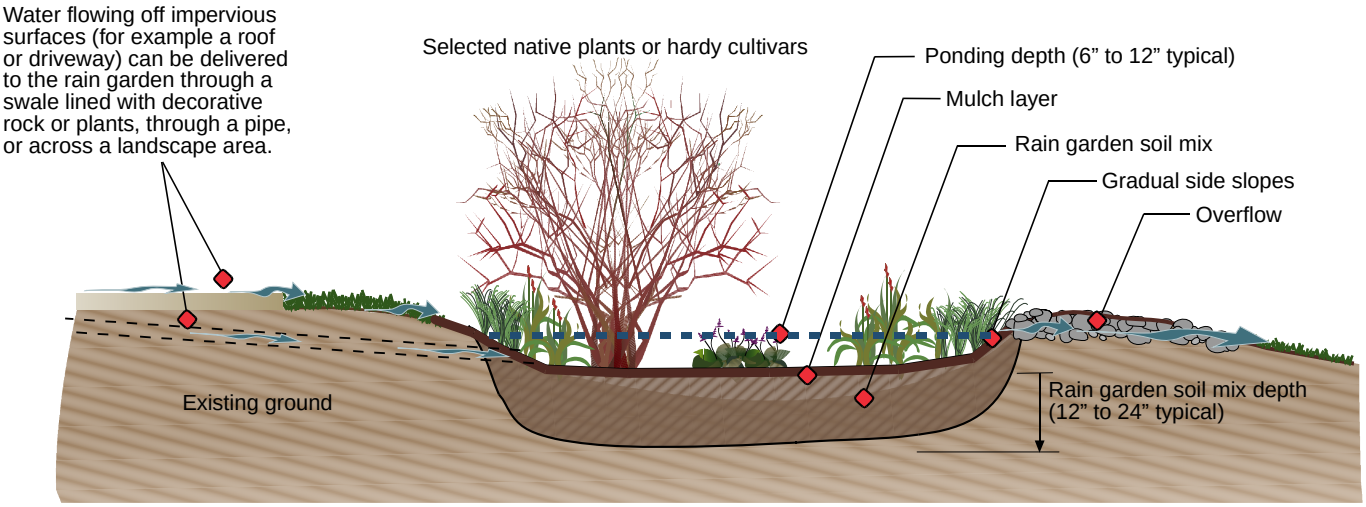
- Mulch as needed to prevent erosion and weeds.
- Keep inlet and outlet clear of debris and well protected with rock.
- Do not fertilize or use pesticides.
- Water as needed.

ANATOMY OF A RAIN GARDEN



Newly planted Seattle rain garden

Photo by Seattle Public Utilities



When properly designed and constructed, rain gardens drain rapidly with surface water present for only 1-2 days. Mosquitos take a minimum of about 4 days (many types of mosuitos take several days longer) to become adults after eggs are deposited in water.



Evergreen huckleberry



Sword fern

LOCATING THE RAIN GARDEN

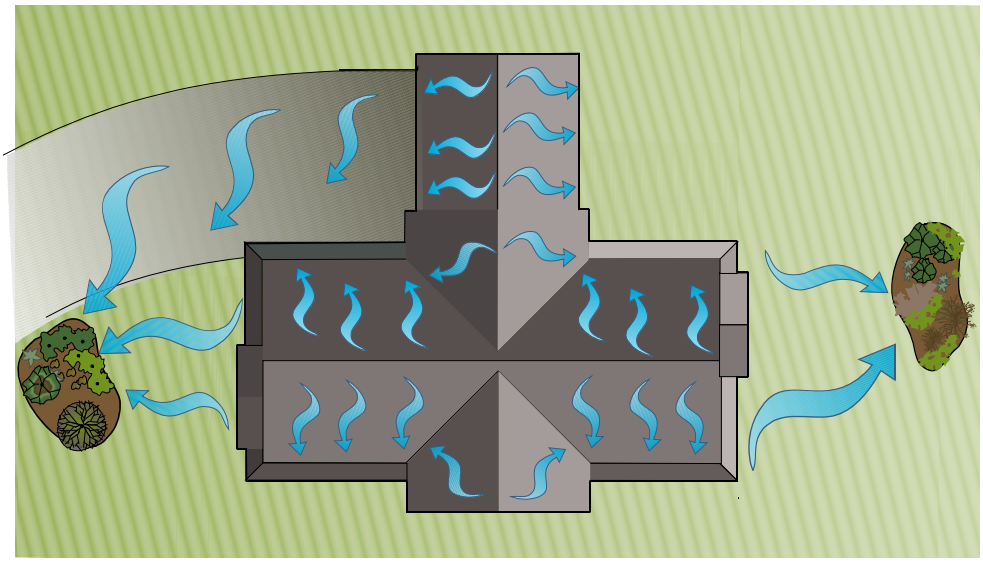
IN THIS SECTION

- Identify areas draining to the rain garden
- Do's and don'ts for locating a rain garden
- Testing the soil

Rain gardens can be sized and shaped to fit into a variety of locations on your property; however, there are important considerations for a successful design.

What areas will drain to the rain garden?

First, you need to assess your property to determine the areas that will drain to the rain garden. Roof tops, driveways, patios, and landscaped areas with compacted soils produce runoff that rain gardens can absorb and filter. You may want to capture all or part of the water from these areas in one or more rain gardens.



Consider the following when determining what areas you want to drain to the rain garden:

- Water can be delivered to the rain garden across a landscaped area, through an open swale lined with plants or decorative rock, or through an underground pipe (for example from a roof downspout). See page 17 for details.
- Rain gardens can be placed in more than one location. For example, you can direct water from one part of the roof to a rain garden in the back yard and water from another part of the roof to a garden in the front yard.



Tall Oregon grape

1 Locate

DO LOCATE A RAIN GARDEN



Wild ginger

- Where it improves the appearance of your home. Rain gardens can provide attractive visual buffers from roads or neighboring homes.
- Where an overflow can direct water safely away from the home and neighboring property.
- Where water drains to the garden by gravity. While it is possible to pump water up to a rain garden, this will increase costs and maintenance.



Rain garden, City of Maplewood MN

If you live on a steep bluff or you want to place your rain garden on or near a slope greater than 15%, have a qualified geotechnical or geologic engineer evaluate the site for potential problems. Collecting and allowing water to soak into steep slopes can cause instability.

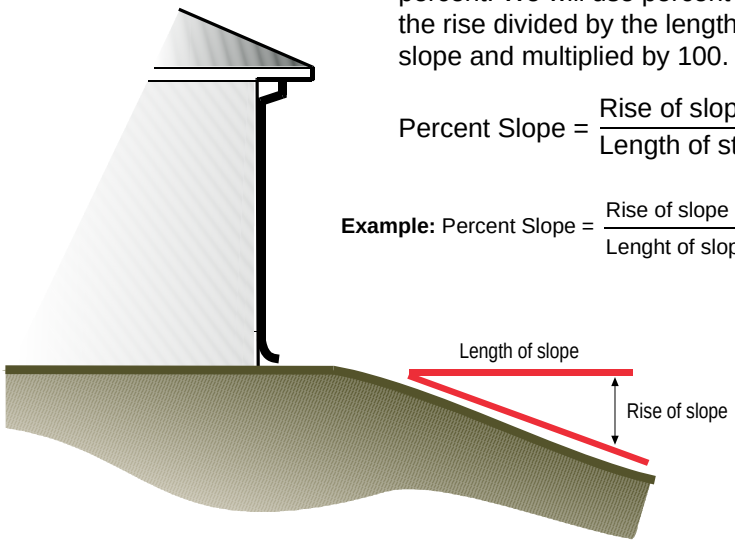
Slope can be described in degrees or percent. We will use percent which is the rise divided by the length of the slope and multiplied by 100.

$$\text{Percent Slope} = \frac{\text{Rise of slope}}{\text{Length of stlope}} \times 100$$

Example: Percent Slope = $\frac{\text{Rise of slope} = 3 \text{ ft.}}{\text{Lenght of slope} = 20 \text{ ft.}} = 0.15 \times 100 = 15\%$



Salal



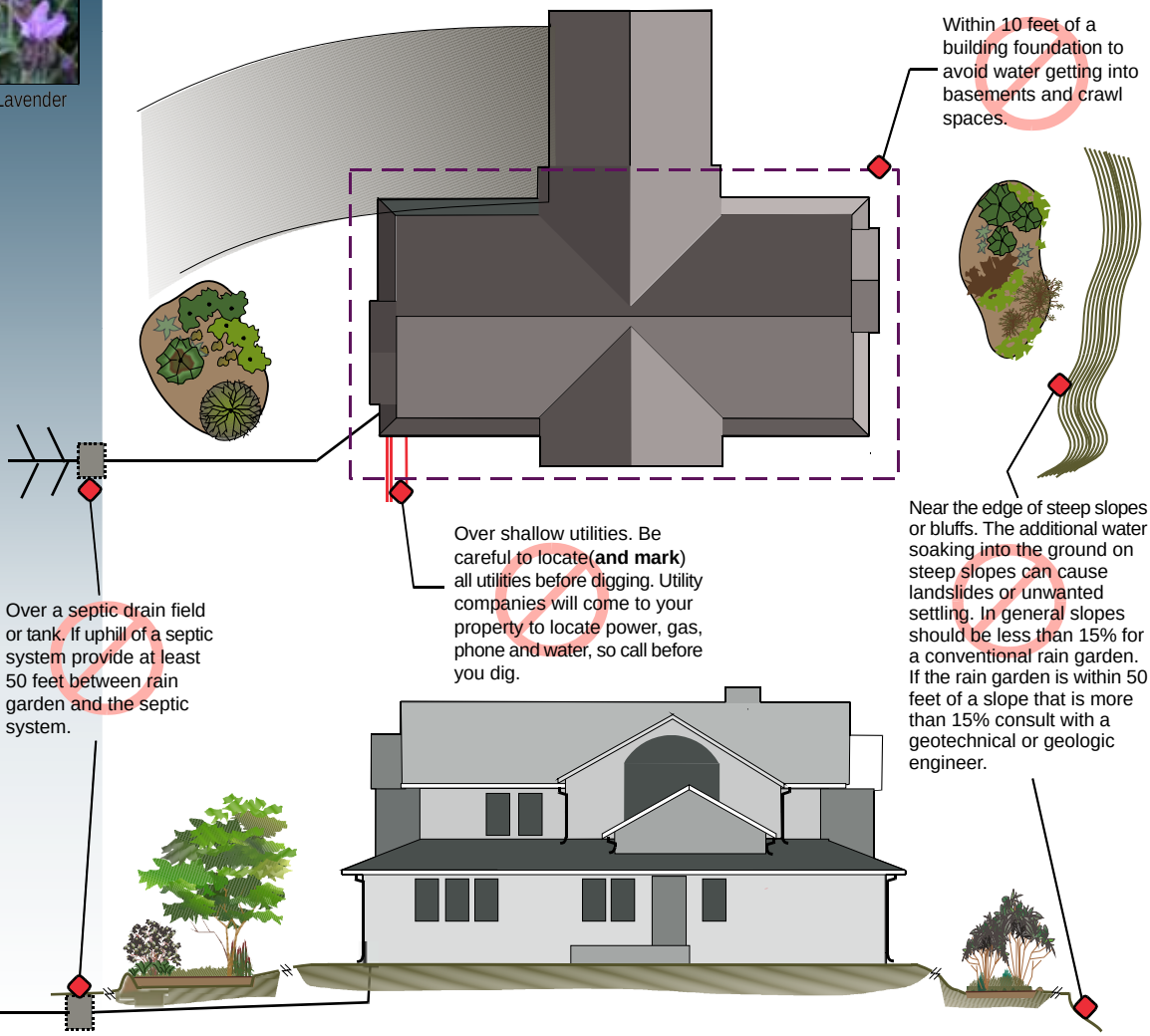
*consult an geotechnical engineer or geologist if the slope is 15% or more.

1 Locate

DON'T LOCATE A RAIN GARDEN



Lavender



Within 10 feet of a building foundation to avoid water getting into basements and crawl spaces.

Over shallow utilities. Be careful to locate(**and mark**) all utilities before digging. Utility companies will come to your property to locate power, gas, phone and water, so call before you dig.

Near the edge of steep slopes or bluffs. The additional water soaking into the ground on steep slopes can cause landslides or unwanted settling. In general slopes should be less than 15% for a conventional rain garden. If the rain garden is within 50 feet of a slope that is more than 15% consult with a geotechnical or geologic engineer.

Over a septic drain field or tank. If uphill of a septic system provide at least 50 feet between rain garden and the septic system.

In low spots that do not drain well. These areas may be helpful for slowing and storing stormwater on your property, but poor draining depressions will not support typical rain garden plants and soils very well.

In areas that would require disturbing healthy native soils and vegetation.These areas already do a good job of filtering and storing stormwater.

Where groundwater is within one foot of the bottom of the finished rain garden.



Dagger-leaf rush

1 Locate



Coastal wild strawberry



Strawberry bloom

So, you've found a good location for the rain garden. What's next? Before sizing and figuring out the design details the next step is to test the soil and find how well the area drains.

Soil drainage test

Testing soil drainage is best performed in the winter months. The test includes digging a hole, filling the hole with water and timing how long it takes to drain. If water seeps into the hole while digging and stays there, then the area has high ground water and is not a good location for a rain garden. If water does not seep into the hole, then continue. Note: It's OK to do an infiltration test in the drier months as long as you are confident that the area does not have groundwater near the surface in the winter.

Three steps to perform the test:

1) Dig a small hole about two feet deep and 1-2 feet in diameter. A bigger hole is OK if you have a backhoe or mini-excavator.
2) As you dig, and before adding water to the hole to test drainage, observe the characteristics of the soil.

- If the soil is moist, put some in the palm of your hand and try to squeeze it into a ball. Note if the soil falls apart or can be broken up easily and is gritty feeling (suggests a sandier well-draining soil) or if it is sticky, smooth and forms a ball that can worked like modeling clay (suggests poor-draining soil with higher clay content). If the soil is smooth but not sticky then it is likely a silty soil and moderate- to poor-draining.

- If the soil is dry, add water a few drops at a time, break down the chunks to work the water into soil, and perform the test described above.

On the Worksheet (page 18) record your observations. These observations will help determine how the rain garden is constructed in the next section.

Soil texture is determined by the amount of sand, silt and clay in the soil. The mix of these components affects how well the soil drains, and how well it holds water and nutrients for plants to use.



Evergreen huckleberry fruit



Sandy soil

Sandy soils feel gritty and crumble easily.



Clay soil

Clay soils feel sticky, smooth and can be molded like modeling clay.

1 Locate

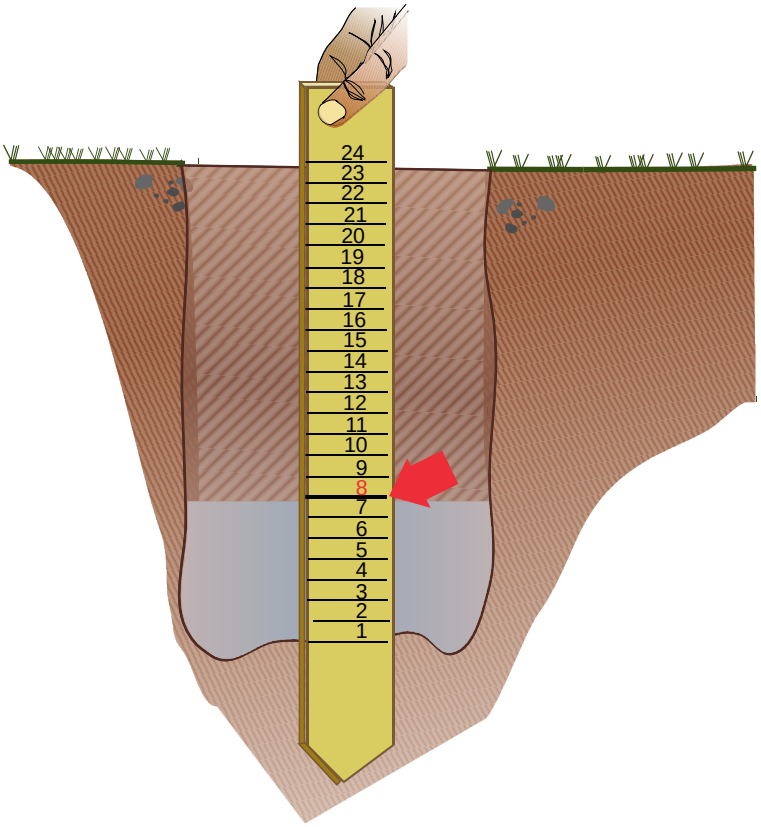


Columbine



Dogwood

3) Finally, fill the hole with 8 to 12 inches of water. A board secured in the hole with markings every inch from the bottom works well for measuring. Time how long it takes for the water to drain out completely. If it's the wet season, do the test once. If it's the dry season, do the test three times and use the third test as your infiltration rate (measured as inches per hour). Testing three times during the dry season provides a better estimate of wetter conditions present in the winter when the rain garden is doing the most work.



Example:

- Fill the hole with 8 inches of water.
- If the water drains from the hole in 12 hours, the drainage or infiltration rate is:

  8 inches divided by 12 hours = 0.67 inches per hour.
- Record the infiltration rate on the Worksheet (page 18).

Important information from the soil drainage test

- If water drains from the hole at a rate of less than 0.5 inches per hour, then the soil is poor-draining. If it is more than 0.5 inches per hour, then it is well-draining (this information is needed for using Table 1, page 11).
- If the drainage or infiltration rate is less than 0.25 inches per hour but more than 0.1 inches per hour, then the location may be OK for the rain garden, but standing water may be present for extended periods during the wettest months (November-March).
- If the infiltration rate is less than 0.1 inches per hour, then consider a different location for the rain garden.



Pacific tree frog



Camas

DESIGNING AND BUILDING THE RAIN GARDEN

IN THIS SECTION

- Sizing and shaping the rain garden
- Layout and excavation
- Website resources and cost estimates
- The rain garden soil mix
- Getting water to the rain garden

Using the guidelines in the last section, one or more possible areas for a rain garden have been located. The next step is designing the rain garden.

Sizing

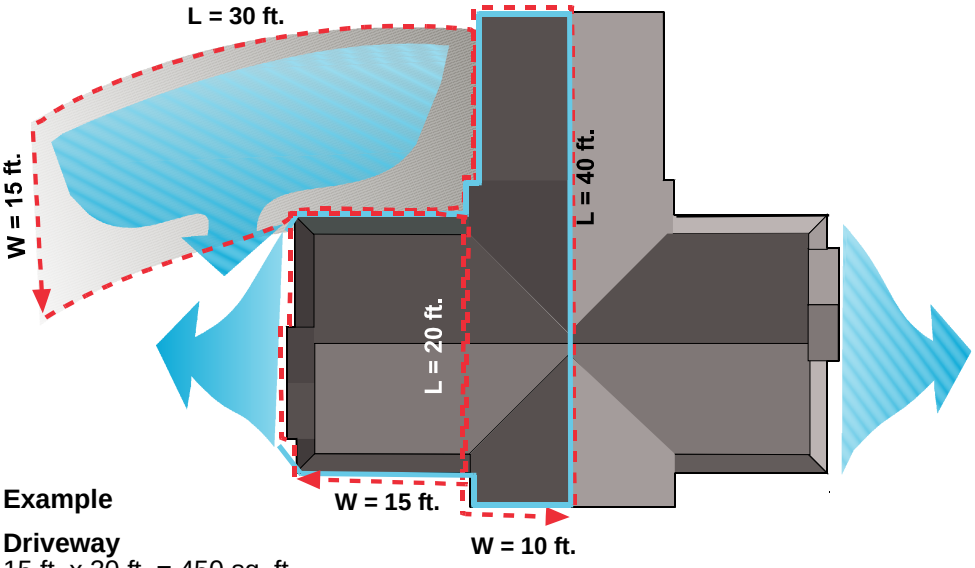
First, determine how big the rain garden will be. Three questions are important:

1) How much area is draining to the rain garden?
2) How much space is available?
3) How much water from the drainage area will the rain garden hold?

1) How much area is draining to the rain garden?

To determine the drainage area, measure the driveway, rooftop, landscape areas with compacted soils or other impervious surfaces and note the area in square feet. To find the area of a rooftop, measure the perimeter of the building plus the overhang (don't worry about the slope of the roof since it doesn't influence the drainage area). Enter the drainage area on the Worksheet on page 18.

length x width = area in square feet



Example

Driveway
15 ft. x 30 ft. = 450 sq. ft.
Roof
15 ft. x 20 ft. = 300 sq. ft.
10 ft. x 40 ft. = 400 sq. ft.
Total = 1150 sq. ft.



Lady fern



Oceanspray

2) How much space is available?

Next, measure how much space is available for the rain garden. Remember that rain gardens can be placed in more than one location or built so that one drains to another. Enter the area available for the rain garden on the Worksheet on page 18.

3) How much water from the drainage area will the rain garden hold?

Finally, look at Table 1 to determine how much water the rain garden can hold for a given drainage area. The table gives two different columns for the amount of water the rain garden can hold depending on how well the soil drains. Remember that determining if your soil is well-draining or poor-draining is found by using the infiltration test explained in Section 1.

Table 1: Annual volume of water held in a rain garden with 12 inches of rain garden soil mix and a 6-inch ponding depth (18 inches total).

Size of rain garden (as a percent of imprevious area and measured in square feet)	Annual volume of water held in rain garden for poor-draining soils	Annual volume of water held in rain garden for well-draining soils
10%	70%	99%
20%	90%	100%
50%	99%	100%
80%	100%	100%

If the depth of the rain garden is increased to 30 inches* on poor-draining soils, then you can reduce the square foot area by 5% and hold the same amount of water. On well-draining soils depth does not significantly increase how much water the rain garden can hold.

* 24 inches of rain garden soil mix and a 6-inch ponding depth (30 inches total).

Any amount of water that the rain garden can hold and filter is a big help. However, the more the better and keeping a majority of the runoff on site, particularly in the wettest months, can really help protect our water resources.

Example for sizing and estimating the annual volume of water held in the rain garden:

1) Drainage area: 1150 sq. ft. impervious area (from pg. 10)

2) Soil type: poor-draining (from pg. 8)

3) Available area for the rain garden is about 250 sq. ft.

You've decided to build a 250 sq. ft. rain garden given the available space.

Using Table 1: 20% of 1150 sq. ft. equals

230 sq. ft. for a 18 in. deep rain garden

218 sq. ft. for a 30 in. deep rain garden (5% reduction)

250 sq. ft. is slightly more than 20% of 1150 sq.ft., so the rain garden should hold just over 90% of the annual volume of water flowing off the drainage area.



Red-flowering currant

If you are building a rain garden to meet stormwater management requirements in your local jurisdiction, consult with the development permitting department for specific sizing requirements.



Cascara

Shaping the rain garden

So, now that you know about how big the rain garden will be, what about the shape? Rain gardens can be shaped to fit your yard and personal preference. Some suggested shapes are shown in the sample planting plans in Section 3. When placing on a slope, make the rain garden longer than wider (about twice as long as wide is a good starting point) and orient the garden so that the long dimension follows the contour of the slope. This reduces the amount of excavation because you want to keep the bottom of the rain garden flat so water doesn't flow to one end and pool while the rest is dry.

Building the Rain Garden

The planning is over and it's time to start construction.

These are the main tasks ahead:

- Lay out and excavate the rain garden area.
- Lay out the pipe or swale that will deliver water to the rain garden.
- Determine where the overflow will be.
- Place the soil mix in the rain garden.

TOOLS:
1) String
2) Wood stakes
3) Hammer
4) Shovel
5) Measuring tape
6) Level
7) Garden rake
8) Ground paint
9) 2x4 board 6ft. long

Layout and excavation

First, lay out the rain garden to see how it fits the area (remember the do's and don'ts in Section 1). Ground paint, string or stakes are good ways to mark the area because the boundaries can be easily adjusted to your preference.

Before excavating, make sure that water can easily flow to the garden across the landscaping or through a swale or pipe that will be installed after excavation. See page 17 for instructions on how to get water to the rain garden.



Removing sod with a sod cutter before building the rain garden.



Using a mini-excavator makes the work easier for larger rain gardens.

Best Time to Build

The best time to build a rain garden is fall or spring when the ground is moist but not soaking wet. Disturbing the ground in the winter can cause serious erosion during rain storms, and digging while the ground is wet can severly compact the soil. Compaction reduces the ability of the area to soak up water.



Fringecup

Some considerations for excavating the garden

- The deeper you make the rain garden the smaller the area required on poor-draining soils. So, in small yards with poor soil you may want to increase depth.
- If you are digging a small garden that's not very deep—say 12 inches—then digging by hand with friends may work well. If you're installing a larger rain garden, then renting a mini-excavator may be easier.
- **Important note: Using a mini-excavator or other heavy machinery in the bottom of the rain garden will compact the soil and reduce infiltration. Instead, operate the machine adjacent to the garden.**

Minimal excavation on good quality soils

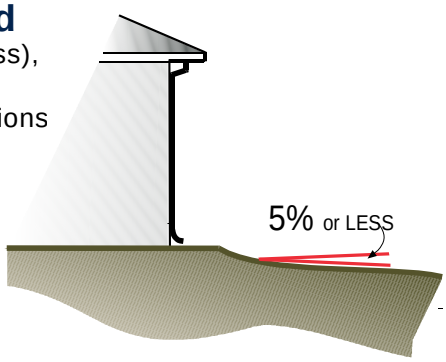
In Section 1 you examined the texture of the soil and determined the drainage or infiltration rate. If the area selected for the rain garden drains rapidly (1 inch or more per hour) and is good quality sandy soil, then do the following:

- Remove only enough soil (about 9 inches) to create the desired ponding depth.
- Spread three inches of compost on the surface of rain garden area and till to a depth of four to five inches (this will leave about 6 inches for ponding).

If the infiltration rate of the rain garden area is less than 1 inch per hour and the soil is not a sandy loose texture, then deeper excavation and additional amendment with compost is recommended. The following sections describe excavation techniques for deeper rain gardens on flatter ground and gradual slopes.

Excavation on fairly flat ground

If the rain garden area is fairly level (5% or less), then excavate soil to the desired depth (18-30 inches typical). Set soil aside and see instructions for replacing soil on pages 15 and 16.





COOL TOOL:
A good leveling tool is an inexpensive laser level and measuring stick.



Photo by Stewardship Partners



Photo by Stewardship Partners



Evergreen huckleberry

Excavation on slopes

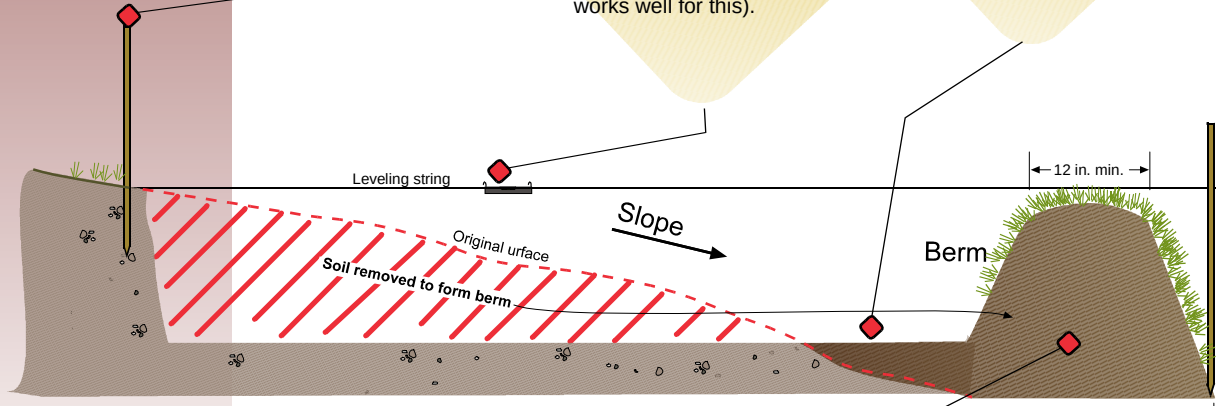
If the rain garden area is sloped more than 5%, then consider two methods for excavating soil to get the necessary depth. You can dig so that the downhill side is the desired depth (say 18-30 inches) and the bottom is flat. This means that the depth at the uphill side will be more than the downhill side. Set soil aside and see instructions for replacing soil on pages 15 and 16.

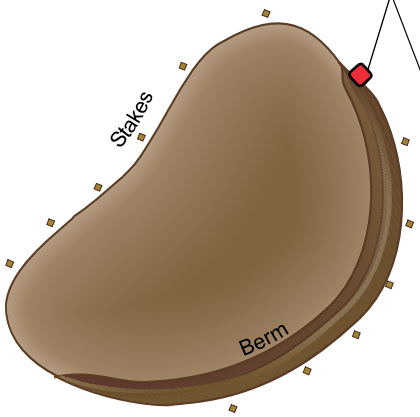
An alternative method to get the desired depth on slopes is to excavate soil from the uphill end and use the soil to fill and create a berm for the desired depth at the downhill end. If you choose this method do the following:

1. Place stakes at the uphill and downhill sides and about 5 feet apart along the length of the rain garden.

2. Tie a string from the ground level of the uphill stake to the downhill stake so that it's level (a small, light weight line level works well for this).

3. Use the soil excavated from the uphill side to fill the downhill area up so that the area is flat. Compact the soil by walking over the fill after every few inches added.





4. Create a berm at the downhill side to confine water in the rain garden. For the correct height, build the berm up to the string. To keep the top level, the berm will be highest at the downhill end and then become shorter up the sides until tapering off at the uphill end.The berm should be a minimum of 24 inches wide at the base, have gently sloping sides, and be well compacted.



Vine maple

Important note if you build up a berm to hold water in the rain garden:

- Water flowing into the rain garden can erode the berm if the soil is loose and unprotected, so pack the berm with firm foot pressure, mulch and plant fast growing groundcover (for example Sunrose).
- The berm should be at least 6 inches above the maximum ponding depth.
- If an overflow is located in the berm, cover the overflow area with rock to protect it from erosion (see pg.17).



Columbine

Whichever method is used, excavate the rain garden so the bottom is flat. An easy way to determine if the bottom is flat is to use a straight board with a level on top. Place the board at different locations and in various directions and dig or fill areas to get the bottom flat. Another technique for leveling is to use an inexpensive laser level (see pg.13).



Replacing the soil excavated from the rain garden

In Section 1 you examined the texture of the soil in the rain garden area. If the soil is very high in clay (soil forms a cohesive ball and can be shaped like modeling clay), then the soil may not be good for absorbing water or supporting plants. In this case consider replacing excavated soil with a rain garden soil mix that consists of:

- About 60% screened sand and 40% compost by volume (screened or utility sand can be purchased from many landscape and soil supply companies)

Do not add sand to a soil with high clay content (mixing sand in soils with lots of clay makes a concrete-like mixture).



Nootka rose





Salmonberry

Using the soil excavated from the rain garden

If the soil that is excavated does not have too much clay set it aside for mixing with compost and refilling the rain garden. The rain garden soil mix should be:

- About 65% excavated soil and 35% compost by volume

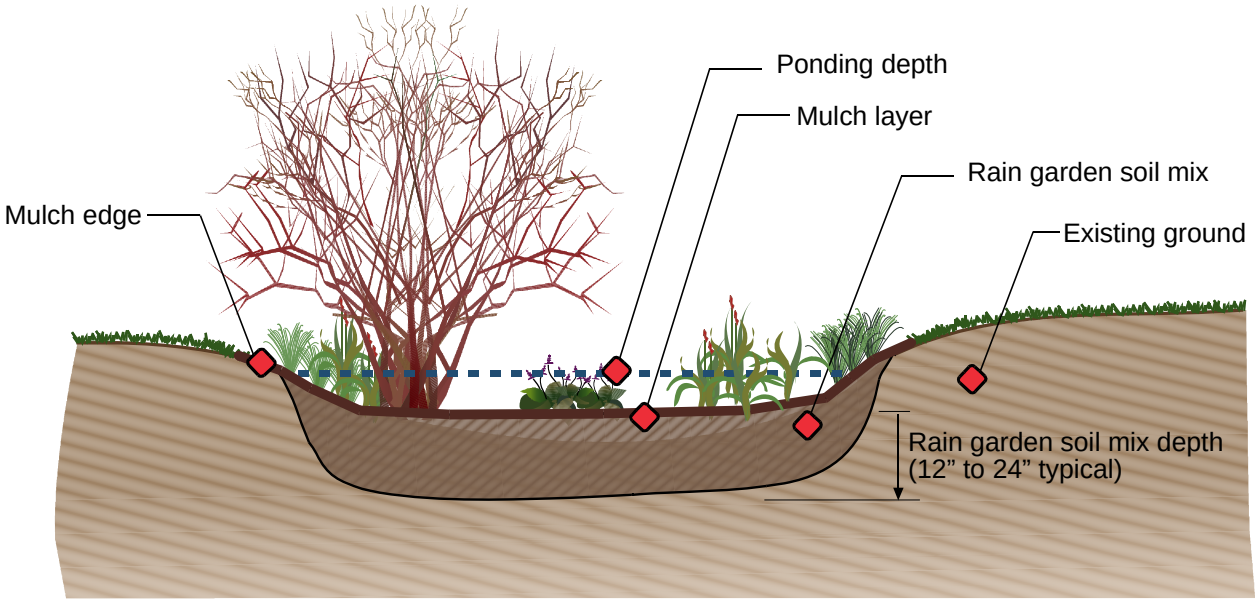
Compost should be stable and mature and made from organic waste materials such as yard debris or wood wastes. Don't use mushroom compost or uncomposted manure or sawdust. Manure can be too high in nitrogen and introduce pathogens in the rain garden, mushroom compost can also be too high in nitrogen and create a mix with an undesirable texture, and sawdust will likely lead to a shortage of nitrogen. A simple way to judge compost quality is to smell and examine the finished product which should have the following characteristics:

- Earthy smell that is not sour, sweet or ammonia like.
- Brown to black in color.
- Mixed particle size.
- Stable temperature that doesn't get hot when re-wetted.
- Crumbly texture.

Placing the rain garden soil mix

Rain gardens have some area above ground to allow water to pond. Six to 12 inches is recommended. So, replace the soil in the rain garden about 6 inches at a time and walk on each layer to lightly compact. Fill the soil up to a level that provides the desired ponding depth.







Piggyback plant

Getting water to the rain garden

Water can be delivered to the rain garden across a landscaped area, through an open swale lined with plants or decorative rock, or through a pipe. Whatever technique is used, consider the slope and protect against erosion. If the slope is gentle (about 2% or less) and the swale or landscaped area is well protected with vegetation or rock, then no special design is needed. If the slope is more than 2% and water is directed through a swale, consider adding small rock check dams every 5 to 10 feet to slow the water. Where water enters the rain garden from a swale or pipe place a pad of rock to slow the water and guard against erosion.



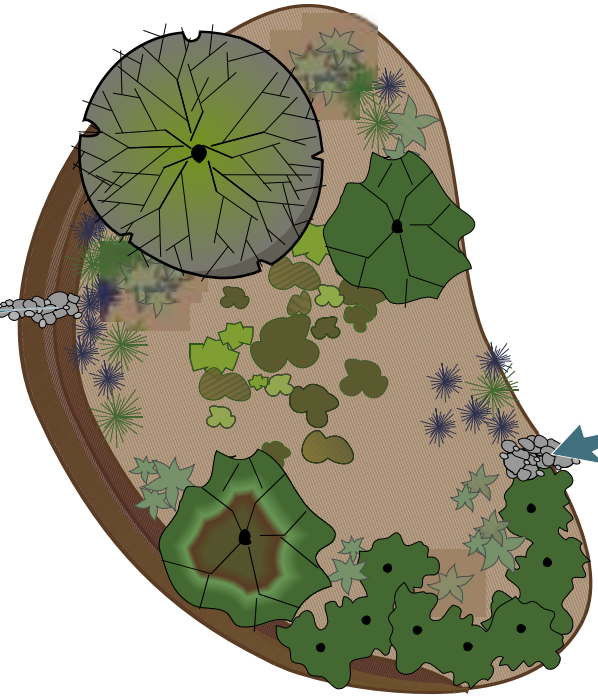
Placing washed rock around inlet



Photo by Sassafras Gardens
Rock lined swale



Rock lined overflow





Rock lined inlet. Rock should be free of sediment, so order "washed."

TIP: Before burying the inlet pipe check that water flows easily to the rain garden from the source.

Overflow

During much of the winter all the water that flows into the rain garden will soak into the ground. Occasionally, when the ground is wet and a big storm delivers a lot of rain the garden can fill up and overflow. So, design the garden with an overflow lined with rock to protect from erosion. Extend the rock about 4 feet outside the rain garden to slow the water as it exits. Direct water safely to the storm drain or disperse into the landscape. If you design a rain garden that is shared between homes, make sure everyone is in agreement about where excess water can be directed.

The depth from the bottom of the overflow to the bottom of the rain garden determines the maximum depth that the water will pond.

Worksheets for:

one square = one square foot

Sketching your rain garden

Soil observations (from pg.8)

Infiltration rate (inches per hour)(from pg. 9) _____

Drainage area (from pg. 10) _____

Area available for the rain garden (from pg. 11) _____

one square = one square foot

Web sites

Conservation at home
http://www.seattle.gov/util/Directory/Conservation_Index/

Natural garden care
http://www.metrokc.gov/soils

http://dnr.metrokc.gov/yardtalk

Water conservation
http://www.savingwater.org

Compost sources and protecting water resources
http://www.soilsforsalmon.org

Native plants
http://www.wnps.org

http://gardening.wsu.edu/nwnative/

Water-wise landscaping
http://nativeplantsalvage.org

Landscaping plants
http://oregonstate.edu/dept/ldplants

Planting guide (go to “Plant it Right: Restoration Planting Techniques”)
http://wawater.wsu.edu

Stewardship gardening
http://gardening.wsu.edu/stewardship

Portland stormwater solutions
http://www.portlandonline.com/bes/index.cfm?c=43110

Rain gardens in west Michigan
http://www.raingardens.org/Index.php

Rain gardens in Illinois
http://www.raingardennetwork.com/

Seattle Public Utilities Natural Drainage Systems
http://www.seattle.gov/util/naturalsystems

Low impact development in Puget Sound
http://psp.wa.gov

http://www.pierce.wsu.edu

Cost

Example 1: Large rain garden (deep excavation to provide additional capacity) located on very poor-draining soil. Excavated soil is mixed with compost and replaced in rain garden.

Area: approximately 250 square feet
Depth: 24 inches (18 inches of rain garden soil mix with a 6-inch ponding depth)

Excavator:	2 days @ $175.00/day	$350.00
Compost:	5 yards @ $20.00/yard	$100.00
Compost delivery:		$75.00
Drain pipe and fittings (15 foot from house to rain garden):		$70.00
Chipped mulch from tree service:		free
233 plants (combination of 1 gallon pots, bareroot, and tubes):		$800.00
Help of five friends:		priceless
Drain rock:		$15.00
Total:		$1,410.00

Example 2: Shallow rain garden located on well-draining soil. Rain garden is excavated to 9 inches and 3 inches of compost incorporated into soil.

Area: 200 square feet
Depth: 9 inches

Rototiller:	1 day @ $110/day	$110.00
Compost:	2 yards @ $20.00/yard	$40.00
Compost delivery:		$75.00
Drain pipe and fittings (15 feet from house to rain garden):		$70.00
Chipped mulch from tree service:		free
200 plants (combination of 1 gallon pots, bareroot, and tubes):		$700.00
Help of five friends:		priceless
Drain rock:		$15.00
Total:		$1,010

Plant costs
You can save money on plants by purchasing smaller stock such as 4-inch and 1-gallon pots. Look for bareroot plant sales offered by local conservation districts and join conservation groups who salvage plants from new development sites. Emergents, which can be used in planting zone 1, are sold in tubes for about $1.00 each—a great way to stretch your budget.

PLANTING THE RAIN GARDEN

IN THIS SECTION

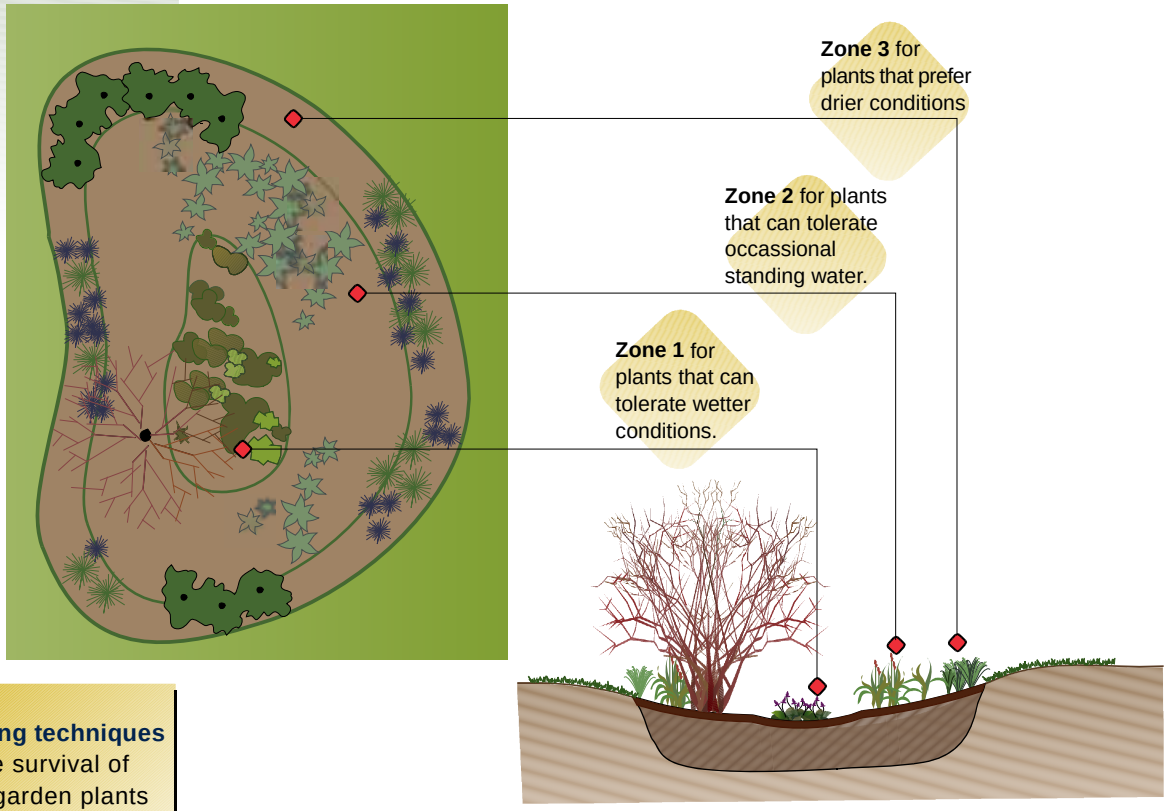
- Selecting plants
- Mulching
- Sample planting plans
- Plant list



Rain garden City of Maplewood, MN

In a rain garden the plants and soil work together. The plant roots and soil organisms build soil structure creating channels and pores to soak up and filter water, and allow nutrients and oxygen to flow in to support an abundance of life. While plants help the rain garden absorb stormwater, they also create an attractive landscape for your yard and neighborhood. For sample planting plans see pages 24 through 27.

Rain gardens generally have three planting zones characterized by wetness. Select plants according to their water needs and sun exposure for these planting zones.



Ideally, all plants should be drought-tolerant.

For planting techniques to improve survival of your rain garden plants go to: “Plant it Right: Restoration Planting Techniques” at http://wawater.wsu.edu

3 Plant



Moor grass

While the creative possibilities are many, consider the following general tips for selecting plants:

- If the rain garden is near the road make sure the mature plants won't block drivers' vision.
- If there are underground utilities near the rain garden select plants that won't grow into and break or block pipes.
- Incorporate a diversity of plants, including small trees, shrubs, herbs, emergents, and grasses for color and interesting differences in height and texture.
- Consider the plants in the context of your home's landscape, as well as the surrounding neighborhood or native plant community.
- Consider plants that can provide a pleasing visual buffer between homes and roadways. For example, there are several attractive evergreen shrubs that perform well in Western Washington.

Mulching

Mulch helps keep the soil moist, replenishes organic material in the soil, prevents erosion, and discourages weeds in the rain garden. Two to three inches of shredded or chipped wood works well. Place the mulch on the sides and around edges of the rain garden. Coarse compost tends not to float as easily as chipped wood and works well for the bottom of the rain garden.



TIP: One cubic yard of mulch spread 3 inches thick will cover about 100 square feet.



Mulch should not be:



Deer fern

- Grass clippings. Decomposing grass clippings are a source of excess nutrients that can harm streams and wetlands if water flows out of the rain garden and into the storm drain system.

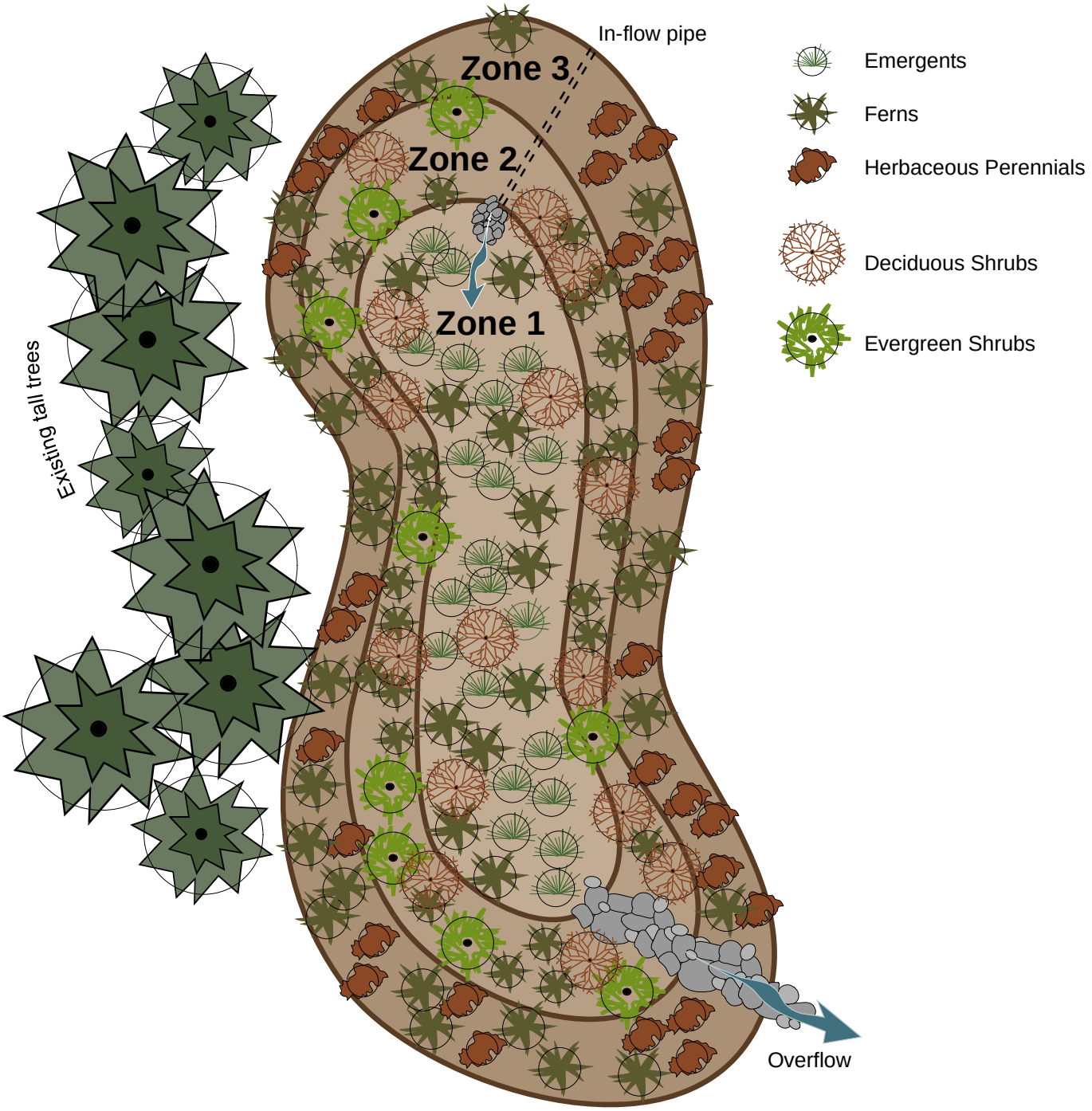
Sample Planting Plans

Garden 1: **Shade Garden**

ZONE 1 **Emergents**: Slough sedge (*Carex obnupta*) and small-fruited bulrush (*Scirpus microcarpus*).
Ferns: Lady fern (*Athyrium filix-femina*) and deer fern (*Blechnum spicant*).
Deciduous shrubs: Stink currant (*Ribes bracteosum*). If the garden is large add black twinberry (*Lonicera involucrata*).

ZONE 2 **Deciduous shrubs**: Snowberries (*Symphoricarpos albus*).
Evergreen shrubs: Evergreen huckleberry (*Vaccinium ovatum*).
Ferns: Sword fern (*Polystichum munitum*) and lady fern.

ZONE 3 **Evergreen shrubs**: Evergreen huckleberry, low Oregon-grape (*Berberis nervosa*).
Ferns: Sword fern.
Herbaceous perennials: Wild ginger (*Asarum caudatum*), inside-out flower (*Vancouveria hexandra*), and western bleeding heart (*Dicentra formosa*).

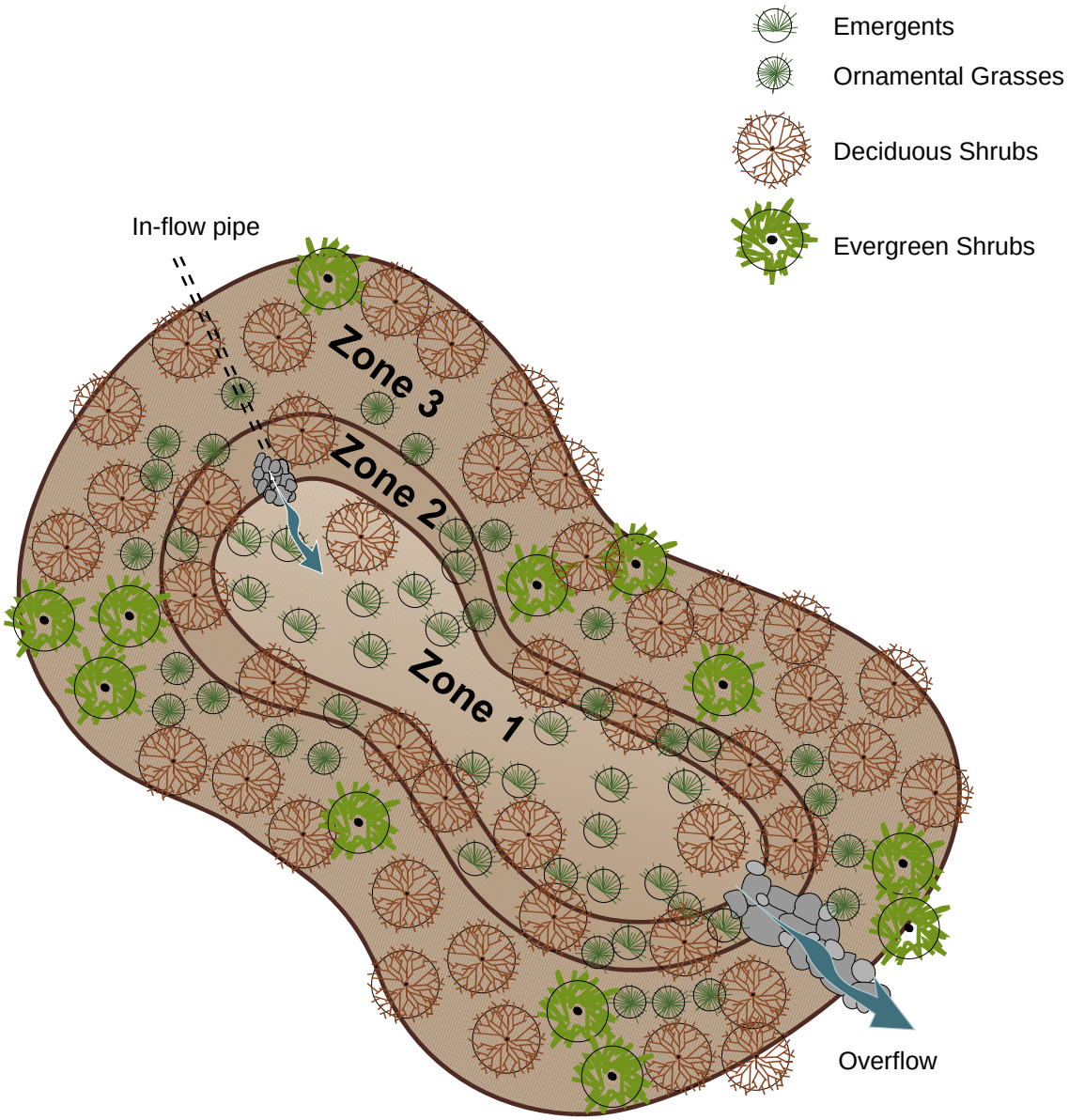


Garden 2: **Sunny and Wilder**

ZONE 1 **Emergents**: Slough sedge (*Carex obnupta*), dagger-leaf rush (*Juncus ensifolius*), and taper-tipped rush (*Juncus acuminatus*).
Deciduous shrubs: Dwarf red-twig dogwood (*Cornus sericea* 'Kelseyi'), Pacific ninebark (*Physocarpus capitatus*), and *Cornus* 'Midwinter Fire'.

ZONE 2 **Deciduous shrubs**: Dwarf red-twig dogwoods, snowberry (*Symphoricarpos albus*), tall Oregon-grape (*Mahonia aquifolium*).

ZONE 3 **Deciduous shrubs**: Western serviceberry (*Amelanchier alnifolia*), oceanspray *(Holodiscus discolor*), red-flowering currants (*Ribes sanguineum*), and snowberries to fill in (set back from the grasses).
Evergreen shrubs: Tall Oregon-grape.
Ornamental grasses: At the top add taller grasses, such as *Miscanthus* 'Morning Light', *Pennisetum alopecuroides*, and switch grasses (*Panicum virgatum* 'Heavy Metal,' and 'Shenandoah').



Garden 3: **Sunny rain garden with a swale in partial-shade**

Rain garden

ZONE 1 **Deciduous shrubs**: Dwarf red-twig dogwood (*Cornus sericea* 'Kelseyi') and one Douglas spirea (*Spiraea douglasii*).
Emergents: Slough sedge (*Carex obnupta*), small-fruited bulrush (*Scirpus microcarpus*), dagger-leaf rush (*Juncus ensifolius*), and taper-tipped rush (*Juncus acuminatus*).

ZONE 2 **Deciduous shrubs**: Snowberries (*Symphoricarpos albus*) and more dwarf red-twig dogwoods.

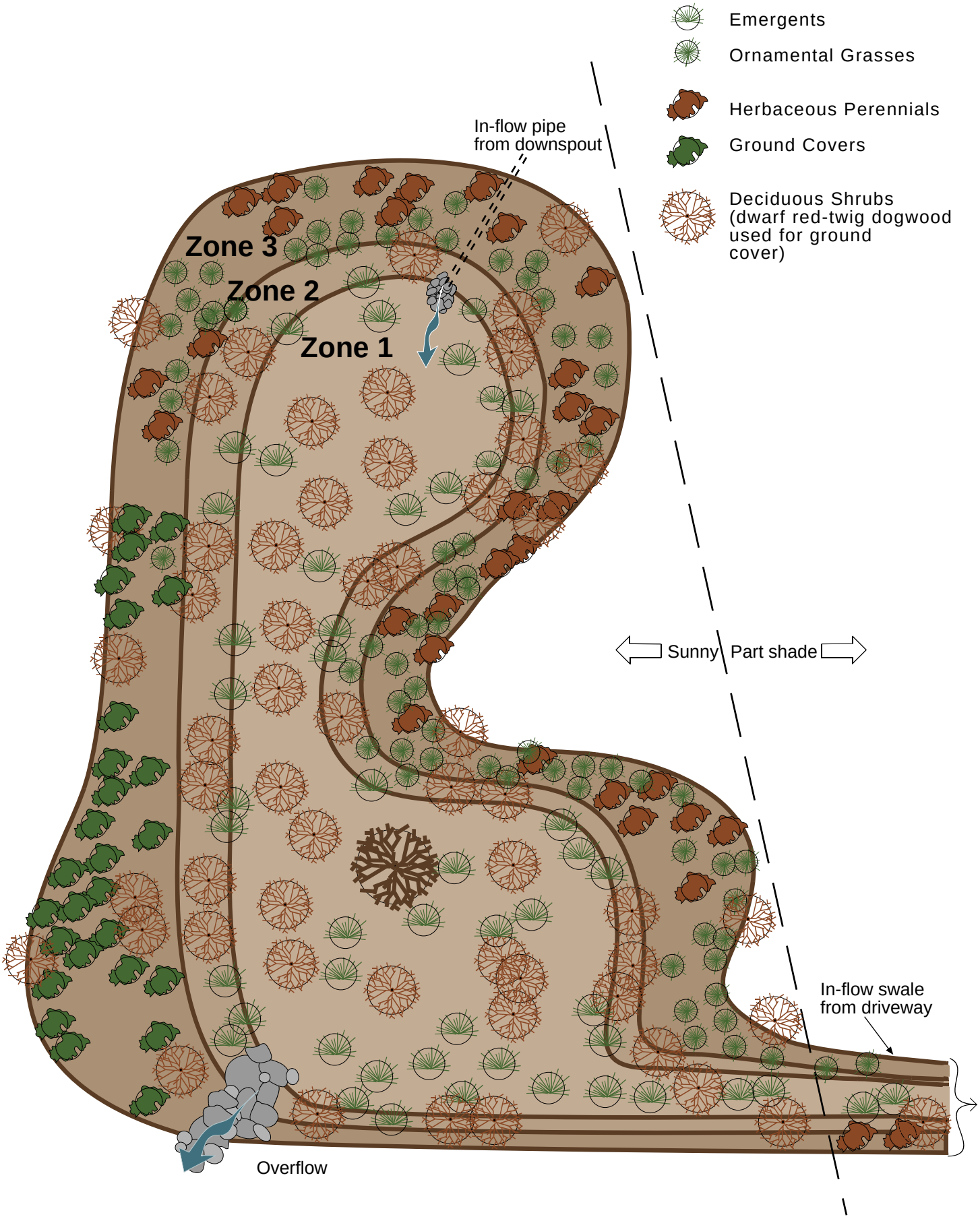
ZONE 3 Around the main edge and merging into the existing landscape use ornamental grasses grouped and intermixed with some perennials, as well as deciduous shrubs.
Deciduous shrubs: Snowberries and coralberries (*Symphoricarpos orbiculatis*).
Ornamental grasses: *Pennisetum* 'Hameln', *Pennisetum* 'Little Bunny', *Pennisetum* 'Little Honey'. Mix in a few blue oat grass (*Helictotrichon sempervirens)* and *Miscanthus* 'Little Kitten.' Arrange above mix in small clusters to mimic a natural pond.
Herbaceous perennials: *Gaura* 'Siskiyou Pink', *Echinacea* 'White Swan', gayfeather (*Liatris spicata*), *Coreopsis* 'Zagreb' and *Coreopsis* 'Creme Brulee.'
Ground cover: Coast strawberry (*Fragaria chiloensis*).

Swale

ZONE 1 **Deciduous shrubs**: Dwarf red-twig dogwood.
Emergents: Slough sedge, small-fruited bulrush.

ZONE 2/3 **Deciduous shrubs**: Creeping Oregon-grape (*Mahonia nervosa*).
Herbaceous perennials: Foamflower (*Tiarella grandiflora*), fringecup (*Tellima grandiflora*), moor grass (*Molinia caerulea*).

Garden 3: **Sunny rain garden with a swale in partial shade**



Selected Plants for Residential Rain Gardens in Western Washington

The following table includes both native and non-native plant species that are suitable for rain gardens and are commonly available in western Washington. Rain gardens generally have three planting zones characterized by soil moisture.

Zone 1: Area of periodic or frequent standing or flowing water. Zone 1 plants should also tolerate the seasonally dry summers in the Northwest without extra watering and may also be planted in Zones 2 or 3.

Zone 2: Periodically moist or saturated during larger storms. Plants listed under Zone 2 can also be planted in Zone 3.

Zone 3: Dry soils, infrequently subject to inundation or saturation. This is an area where the rain garden planting can blend to the existing landscape if desired.

These lists, for a **sunny to partly sunny rain garden** and for a **shady to partly shady rain garden**, contain just a few of the many beautiful plants you could include, especially for Zone 3. For additional ideas, please check other lists of drought-tolerant perennials, shrubs, and trees provided by local government agencies and sustainable gardening advocates. Remember that depending on your garden's layout, it may have some sections that are partly shady and others that are sunny.

Special Considerations:

Drought tolerance – Plants included on the list are tolerant of dry conditions when planted and sited appropriately. Nonetheless, summer irrigation will be necessary for one or two seasons to establish these plants, and may be necessary during particularly stressful periods in subsequent years.

Placement of large trees – Consider height, spread and extent of roots at maturity. Use caution in plant selection for areas with buried pipes or other structures. If placed close to a road or driveway, consider the potential for lower limbs to cause visibility or safety problems.

* denotes native species

Plants for a Sunny to Partly Sunny Rain Garden

Zone 1 Deciduous Shrubs Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Cornus sericea** Red-osier dogwood Red-twig dogwood	Sun/partial sun	To 15 feet	May - June	Prefers wet to moist organically rich soils, but is adaptable; tolerates seasonal flooding; small white flowers in clusters; berrylike bluish-white fruits
Cornus sericea 'Kelseyi' Dwarf red-twig dogwood	Sun/partial sun	To 1.5 feet	June - August	Prefers wet to moist organically rich soils, but is adaptable; small white flowers; berrylike fruit; low-growing, compact form; good ground cover
Cornus sericea 'Flaviramea' Yellow dogwood	Sun/partial sun	6 - 8 feet	May - June	Prefers wet to moist organically rich soils, but is adaptable; easily transplanted and grown; small, white flowers; yellow stems and reddish/purple fall color
Cornus 'Midwinter Fire' Blood-twig dogwood	Sun/partial sun	5 - 6 feet	May - June	Prefers wet to moist organically rich soils, but is adaptable; tiny white flowers clusters; bright red stems in winter
*Physocarpus capitatus** Pacific ninebark	Sun/partial shade	6 - 13 feet	May - June	Moist or dry soils; drought-tolerant; "snowball" shaped shrub; white flowers; seeds persist into winter
*Rosa pisocarpa** Clustered wild rose	Sun/partial shade	6 - 8 feet	May - July	Moist soils, tolerates seasonal flooding but also tolerant of dry conditions; pink clustered flowers; fruits persist; spreads aggressively
*Spiraea douglasii** Douglas spirea Steeplebush	Sun/partial shade	4 - 7 feet		Moist or dry, to seasonally inundated soils; spikes of small, pink flower clusters; may spread in wet soils
Salix purpurea 'Nana' Dwarf Arctic willow	Sun/partial shade	3 - 5 feet		Grows well in poor soils; moderately drought-tolerant; small yellow flowers in the fall

Zone 1 Evergreen Shrubs Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Myrica californica** Pacific wax myrtle	Sun/partial shade	To 30 feet	May - June	Evergreen shrub preferring moist soils; inconspicuous spring flowers

Plants for a Sunny to Partly Sunny Rain Garden, continued

Zone 1 Emergents ** Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Carex obnupta** Slough sedge	Sun/partial shade	1 - 5 feet		Moist to seasonally saturated soils; shiny foliage; excellent soil binder
*Juncus acuminatus** Taper-tipped rush	Sun/partial shade	1 - 2 feet	Summer	Handles shallow inundation in winter, and summer drought
*Juncus ensifolius** Dagger-leaf rush	Sun	12 - 18 inches		Stems resemble irises; small, rounded “pom-pon”-like flowers
*Juncus tenuis** Slender rush	Sun	6” – 2.5 feet		Delicate flowers
*Scirpus microcarpus** Small-fruited bulrush	Sun/shade	2 - 4 feet		Wet soils; tolerates prolonged inundation; good soil binder; spreads aggressively

Zone 1 Deciduous trees/ Large Shrubs Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Amelanchier alnifolia** Western serviceberry	Sun/partial shade	10 - 20 feet/ 25 ft. spread	April - May	Moist to dry, well-drained soils; drought-tolerant; large white flower clusters; purple to blue-black berries
*Corylus cornuta** Beaked hazelnut	Sun/partial shade	20 - 30 feet/ 15 ft. spread	April - May	Moist, well-drained soils; edible nuts; intolerant of saturated soils; male catkins throughout winter add interest
*Rhamnus purshiana** Cascara	Sun/shade	20 - 30 feet/ 20 ft. spread	April - May	Moist to fairly dry soils; small greenish-yellow flowers; shiny black fruits; yellow fall color
*Acer circinatum** Vine maple	Filtered sun/shade	To 25 feet	Spring	Dry to moist soils; tolerant of shade and clay soils; excellent soil binder; beautiful fall color

**Emergents are plants that “emerge” from standing water and can be partially covered with water during the wet season.

Plants for a Sunny to Partly Sunny Rain Garden, continued

Zone 2 **Deciduous Shrubs** Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Rubus parviflorus** Thimbleberry	Sun/partial shade	4 - 10 feet	May - June	Moist to dry soils; white flowers; red berries; makes thickets and spreads easily
*Symphoricarpos albus** Snowberry	Sun/shade	2 - 6 feet	April - June	Wet to dry soils, clay to sand; excellent soil binder; provides good erosion control; spreads well in sun; white berries; flowers attract hummingbirds
*Symphoricarpos orbiculatis** Coralberry	Sun/shade	3 feet tall/5 ft. spread	April - June	Similar to snowberry, but produces purple fruits; species has wide, mounding/spreading habit; some cultivars are more upright, have brighter, larger berries

Zone 2 **Evergreen Shrubs** Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Mahonia aquifolium** (*Berberis aquifolium**) *Tall Oregon-grape*	Sun/partial shade	6 - 10 feet (or 2 - 3 ft. for 'Compacta')	March - April	Dry to moist soils; evergreen; blue-black fruit; bright yellow flowers; 'Compacta' form averages 2 feet tall; great low screening barrier

Zone 2 **Herbaceous Perennials** Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Aquilegia formosa** Western columbine	Sun/partial shade	1 - 3 feet	Spring	Tolerates soils of varying quality; tolerant of seasonal flooding; red and yellow flowers attract hummingbirds and butterflies
*Aster chilensis** Common California aster	Sun	1.5 – 3 feet	June -September	Moist soils; white to purple flowers
*Aster subspicatus** Douglas' aster	Sun	6" – 2.5 feet	June - September	Moist soils; blue to purple flowers
*Camassia quamash** Common camas	Sun/partial shade	To 1.5 feet	May - June	Moist to dry soils; loose clusters of deep blue flowers

Plants for a Sunny to Partly Sunny Rain Garden, continued

Zone 3 Evergreen Shrubs and Groundcovers Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
Arbutus unedo 'Compacta'	Sun/partial shade	To 10 feet	Fall	Prefers well drained soils; tolerant of poor soils; good in climate extremes; white to greenish-white flowers; striking red-orange fruit
*Fragaria chiloensis** Wild/Coastal strawberry	Sun/partial shade	10 inches	Spring	Sandy well-drained soils; flowers white; small hairy strawberries; evergreen; aggressive spreader
Helianthemum nummularium Sunrose	Sun	6" - 2 feet/ 2 ft. spread	May - July	Will tolerate various soils; low-growing, sub-shrub; many varieties are available with flowers in salmon, pink, red, yellow and golden colors; great evergreen ground cover
Lavandula angustifolia Lavender	Sun/partial shade	To 2.5 feet	June - August	Does best in well-drained soils without amendments; blue, lavender, pink to white flowers, semi-evergreen aromatic perennial

Zone 3 Deciduous Shrubs Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Holodiscus discolor** Oceanspray	Sun/partial shade	To 15 feet	June - July	Dry to moist soils; drought-tolerant; white to cream flowers; good soil binder
*Philadelphus lewisii** Mock-orange	Sun/partial shade	5 -10 feet	June - July	Adapts to rich moist soils or dry rocky soils; drought-tolerant; fragrant flowers
*Ribes sanguineum** Red-flowering currant	Sun/partial shade	8 -12 feet	March - April	Prefers well-drained soils, but will accept clay; drought-tolerant; rosy-red flowers attract hummingbirds; dark-blue to black berries; thornless

Plants for a Sunny to Partly Sunny Rain Garden, continued

Zone 3 Ornamental Grasses Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
Miscanthus sinensis 'Morning Light', 'Little Kitten', 'Yaku Jima' Varieties of Japanese Silver Grass	Sun/partial shade	2 - 5 feet, depending on cultivar	Summer	The varieties listed, with slender leaf blades, are drought tolerant; make good accent plants around the edges to mimic natural ponds; flowers persist through winter adding year-round interest; cut back stems in late winter before new foliage begins to emerge
Pennisetum alopecuroides 'Hameln' 'Little Bunny' and other cultivars Fountain Grass	Sun	4" - 4 feet, depending on cultivar	Summer	Several cultivars offer different heights and bloom sequences; attractive, bottle-brush-like flowers persist through winter; cut dried foliage back in late winter/early spring before new foliage begins to emerge
Helictotrichon sempervirens *Blue oat grass*	Sun	2 - 4 feet tall and wide	Summer	Striking blue foliage; drought tolerant; great accent alone or in clusters
Panicum virgatum 'Heavy metal', 'Shenandoah', 'Dallas Blues'	Sun	4 - 6 feet	Summer	Drought-tolerant; several cultivars with different foliage; great fall color

Plants for a Shady to Partly Shady Rain Garden

Zone 1 Deciduous Shrubs Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Lonicera involucrata** Black twinberry	Partial shade/ shade	5 - 8 feet	April - May	Moist soils; prefers loamy soils; tolerant of shallow flooding; yellow, tubular flowers attract hummingbirds
*Rubus spectabilis** Salmonberry	Partial sun/shade	5 - 10 feet	February - April	Prefers moist, wet soils; good soil binder; magenta flowers; yellow/orange fruit; early nectar source for hummingbirds; makes thickets
*Ribes bracteosum** Stink Currant	Partial shade	5 - 7 feet	April - May	Moist soils; prefers loamy soils; tolerant of shallow flooding; big palmate leaves have pungent but pleasant aroma

Zone 1 Emergents and Ornamental Grasses Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Carex obnupta** Slough sedge	Sun/partial shade	1 - 5 feet		Moist to seasonally saturated soils; shiny foliage; excellent soil binder
*Juncus patens** Spreading rush	Part sun/partial shade	15” - 3 feet		Blue-green grass-like foliage; seed may be more easily found in Oregon
Molinia caerulea Moor Grass	Partial shade	12” - 18”	July	Many cultivars, including the creamy-yellow-white striped ‘Variegata’; an attractive border species
*Scirpus microcarpus** Small-fruited bulrush	Sun/shade	2 - 4 feet		Wet soils; tolerates prolonged inundation; good soil binder

Plants for a Shady to Partly Shady Rain Garden, continued

Zone 1 Ferns Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Athyrium filix-femina** Lady Fern	Partial shade/ shade	3 - 5 feet		Moist soils; prefers loamy soils; tolerant of shallow flooding
*Blechnum spicant** Deer Fern	Partial shade/ shade	1 - 3 feet		Moist soils; prefers loamy soils; tolerant of shallow flooding; may require occasional summer water to look its best

Zone 2 Deciduous Shrubs Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Oemleria cerasiformis** Indian plum/Osoberry	Partial shade	5 - 16 feet	February – March	Moist to dry soils; prefers shade; tolerates fluctuating water table
*Symphoricarpos albus** Snowberry	Sun/ shade	2 - 6 feet	April – June	Wet to dry soils, clay to sand; excellent soil binder; drought and urban air tolerant; provides good erosion control; spreads well in sun; white berries; flowers attract hummingbirds

Zone 2 Herbaceous Perennials and Ferns Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Asarum caudatum** Wild ginger	Partial shade/ shade	To 10 inches	Mid-spring	Moist organic soils; heart-shaped leaves; reddish-brown flowers
*Polystichum munitum** *Sword Fern*	Shade/ partial shade	3 - 4 feet		Moist to dry soils; prefers shade
*Tellima grandiflora** Fringecup	Partial sun/shade	1 - 3 feet	March - June	Perennial preferring moist soils; yellowish-green to pink flowers
*Tiarella trifoliata** Foamflower	Partial sun/shade	To 1 foot	Early - mid summer	Moist soils; perennial with some drought tolerance after established; can form dense colonies; white flowers

Plants for a Shady to Partly Shady Rain Garden, continued

Zone 2 Herbaceous Perennials and Ferns (con't) Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Tolmiea menziesii** Youth-on-age/Piggy-back plant	Partial shade/ shade	1 - 2 feet	April - August	Moist soils; brownish-purple flowers; also makes an effective ground cover in summer

Zone 3 Evergreen Shrubs and Groundcovers Species/Common Name	**Exposure**	**Mature Size**	**Time of Bloom**	**Comments**
*Gaultheria shallon** Salal	Partial shade/ shade	3 - 7 feet	March - June	Dry and moist soils; white or pinkish flowers; reddish-blue to dark-purple fruit
*Mahonia nervosa** Cascade Oregon grape/Dull Oregon grape	Partial shade/ shade	2 - 3 feet	April – June	Dry to moist soils; drought resistant; evergreen; yellow flowers; blue berries
Mahonia repens Creeping mahonia	Sun/partial shade	To 3 feet	April - June	Dry to moist soils; drought resistant; yellow flowers; blue berries; native of Eastern Washington
*Vaccinium ovatum** Evergreen huckleberry	Partial shade	3 - 15 feet	March	Moist to slightly dry soils; small pinkish-white flowers; berries in August

MAINTAINING THE RAIN GARDEN



Sunrose

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

Mulching

Mulch prevents erosion, controls weeds, replenshes the organic material in the soil, and improves infiltration. Every year check the mulch layer and, if needed, add shredded or chipped hardwood or softwood to the sides and coarse compost to the bottom 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 particularly beneficial.



Tip: Reputable tree services are a good source for free shredded or chipped wood mulch.

Watering

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 these periods watch for signs of stress, such as wilting leaves or fading evergreen needles.

Watering techniques for rain gardens include:

- Soaker hoses: Soaker hoses save water and can be covered with mulch to save even more.
- Sprinklers: Place tuna cans in a few locations around the rain garden and stop watering when there is 1 inch of water in the cans.
- Wands: See table below for the amount and frequency of watering.

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



Sunrose

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

To determine how long it takes to deliver the suggested amount of water, time how long it takes to fill a 5 gallon bucket with the hose and nozzle that you normally use.



Red-oiser dogwood (fall)

Watering Tips

- Water deeply, but infrequently, so that the top 6 to 12 inches of the root zone is moist. To know if you're applying enough water, dig down 12 to 18 inches off to the side of the plant a few hours after watering— ***don't disturb the roots***.
- Use soaker hoses or spot water with a shower type wand.
- Don't over water. Over watering can rot plant roots and soggy soil reduces oxygen needed for healthy soil and plants.
- Water in the morning or evening to reduce evaporation during warm mid-day temperatures.

Fertilizing

Do not apply fertilizers to your rain garden. The rain garden soil mix provides plenty of nutrients and if you have selected the appropriate natives or plants adapted to this region, no fertilizing is needed.

Weeding

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

Weeding Tips

- Soils in rain gardens have good structure, so weeds should be easy to pull by hand, especially in the spring when the soil is moist and the weeds are small.
- Dig or pull weeds out by the roots before they go to seed.
- Need more information on identifing and managing weeds? Go to http://gardening.wsu.edu/text/weed.htm

Pruning

Little or no pruning should be needed in your rain garden. Occasionally, some pruning may be necessary to:



Snowberry and columbine

- Keep sidewalks and sight distances on roadways clear.
- Remove broken or dead branches and suckers.
- Keep water inlets and outlets in the rain garden clear of vegetation.



Lady beetle on Snowberry

Exposed soil and erosion

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 in many ways, some of which include transporting pollutants, covering fish spawning areas, and filling in stream channels and pools. To guard against soil erosion problems:

- Check the rain garden for areas of exposed soil, particularly in the fall before the wet season begins, as well as during the winter.
- Mulch areas along the sides and bottom of the rain garden.
- Maintain a healthy cover of plants.
- Maintain a cover of decorative rock to protect the ground where concentrated water flows into the rain garden from a pipe or swale.
- If sediment is deposited from water entering the rain garden, immediately determine the source and stabilize the area.
- If erosion persists in the rain garden, 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 the amount of water may need to be reduced.



Red-flowering currant



Snowberry



The rocks and plants lining this swale prevent erosion and provide a decorative way to deliver water to your rain garden.

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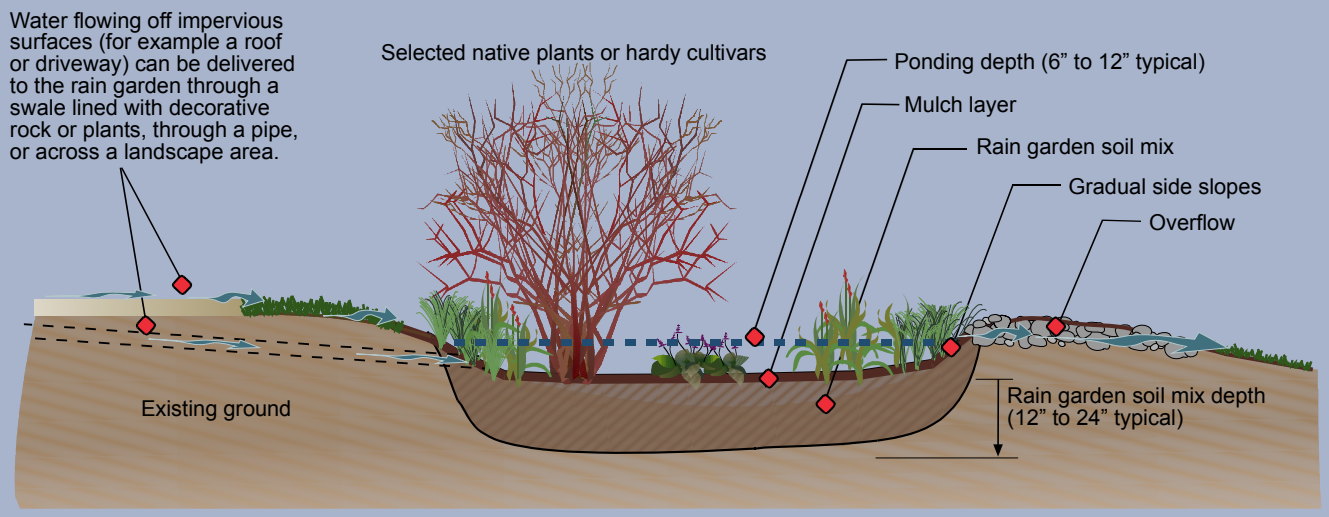
Let the rain soak in...

Rain Gardens are simply shallow depressions that allow storm runoff from roofs, driveways, patios, etc. to slowly soak into the soil. Rain gardens:

- Are landscaped with plants that fit your yard.
- Have deep, compost-amended soils to soak up and clean runoff before it reaches streets and storm drains.
- Help reduce pollution and erosion in our streams, lakes, and Puget Sound.

The Rain Garden Handbook shows homeowners and contractors how to design, build, plant, and maintain beautiful rain gardens. The Rain Garden Hanbook is available online at:
http://www.pierce.wsu.edu/Water_Quality/LID


Rain garden, City of Maplewood MN





Other ways to slow and clean stormwater at home

- **Build your soil with compost** – dig or till in compost when planting gardens, beds, or lawns.
- **Mulch** beds annually with wood chips, leaves, or compost.
- **Plant trees** to slow and clean rainfall – especially native trees.
- **Don's use pesticides** like "weed & feed" or other weed and bug killers.
- **Fertilize moderately** – more is not better, and fertilizer can pollute waterways.
- **Redirect downspouts** to spread roof runoff out into the landscape to soak in.
- **Use porous paving**, gravel, or open pavers for decks, walkways, and driveways to let the rain soak through into the soil.
- **Maintain septic systems** and sewer lines – they can be big polluters if unmaintained.
- **Fix oil leaks** in cars and equipment.

Want to learn more about home improvements that protect our streams, wetlands, lakes, and Puget Sound? See page 20 for web sites linking to natural yard care, building healthy soil, low impact development and more.