

## THE PROBLEM WITH PAVEMENT

As our city grows, nature is replaced by hard surfaces like roofs, roads, and parking lots. While these non-porous surfaces are great for protecting property and reducing erosion or inconvenient mud, they block the natural water cycle because water no longer soaks into the soil.

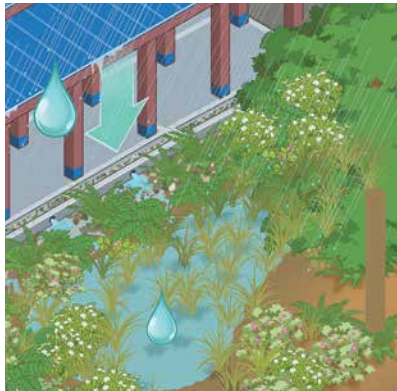
Instead, rain flows over hard surfaces, increasing the need for public stormwater systems to prevent flooding. As it flows, it picks up pollutants like motor oil, pet waste, fertilizers, and pesticides and washes them directly into local rivers and streams. Nationwide, stormwater runoff is one of the biggest threats to water quality.



*When it rains, the water washes over hard surfaces, collecting pollution along the way. Springfield's stormwater system gathers that water and releases it directly into local rivers and streams without cleaning it first. Rain gardens improve this system in several ways.*

## RAIN GARDENS TO THE RESCUE

*A rain garden is a sunken garden bed that collects water from hard surfaces like roofs and walkways and uses plants and soil organisms to remove harmful nutrients and pathogens from the water. This helps restore the natural water cycle and recharges groundwater supplies all while reducing strain on the public stormwater system.*



Water from your home's downspouts or paved areas can be directed to a rain garden. This reduces strain on the public stormwater system and helps remove pollution from the water. As water soaks into the ground, plants and bacteria in the soil help absorb and break down pollutants and harmful nutrients.

Building a rain garden on your property does take planning and work, but it's a lasting way to give back to the water cycle and reduce water pollution in and around Springfield.



## HOW-TO GUIDE

### DETERMINE SLOPE OF YOUR YARD (PERCENTAGE)

**Tools required:** two stakes, string, level, measuring tape, hammer

- Drive one stake into the ground on the uphill side and the other into the ground on the downhill side.
- Tie a string between the stakes making sure the string is completely level.
- Measure the distance between the two stakes (length) as well as from the string, on the downhill side, to the ground (rise).
- Divide rise by the length and multiply by 100:

$$\text{Percent Slope} = (\text{Rise of slope} \div \text{Length of slope}) \times 100$$

### DETERMINE SOIL DRAINAGE RATE

**Tools required:** shovel, water, clock

- Dig a hole 12" deep and 24" wide.
- Fill the entire hole with water and let it drain.
- Fill with water again and monitor how fast the water fully dissipates from hole.
- If the 2nd fill drains in 24-hours, you're good to go!
- If the 2nd fill doesn't drain in 24-hours, find a new spot.

### SIZE YOUR RAIN GARDEN

**Tools required:** calculator

Rain gardens must be at least 10% of the area it drains to. Examples for how to calculate that:

$$\text{Roof area} = 500 \text{ ft}^2 \times 0.10 = 50 \text{ ft}^2 \text{ rain garden}$$

$$\text{Driveway area} = 1000 \text{ ft}^2 \times 0.10 = 100 \text{ ft}^2 \text{ rain garden}$$

### NEED MORE HELP?

Many websites and online calculators can walk you through the calculations for your rain garden. You can also contact Springfield's Stormwater Team for assistance on your calculations.

## CONTACT US

We're here to help keep Springfield's rivers clean, so we're here to help you do that too!



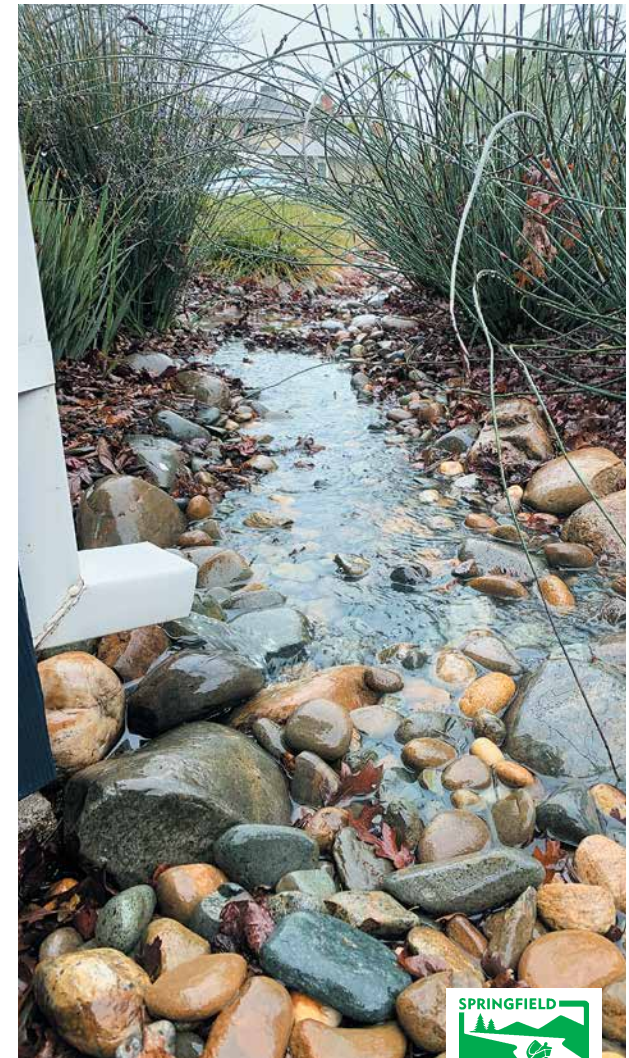
Find more Clean Water Garden info at [bit.ly/cleanwatergarden](http://bit.ly/cleanwatergarden), 541.726.3694  
[WaterResources@springfield-or.gov](mailto:WaterResources@springfield-or.gov)

CITY OF SPRINGFIELD, OREGON

Clean Water  
GARDEN

# RAIN GARDENS

Support nature's water cycle





# Rain Gardens

## WELCOME THE RAIN



### STEP 1 PICK THE LOCATION

**WHERE'S THE WATER SOURCE?** Determine what areas of your property could drain to a rain garden. Rooftops, driveways, and patios all produce runoff that a rain garden can collect and filter.

**CONSIDER PROPERTY REQUIREMENTS.** Rain gardens must be at least 10 ft. from building foundations (5 ft. if down slope), 5 ft. from property lines, and 2 ft. from sidewalks. Make sure the rain garden is placed downhill from structures.

**CONSIDER THE SLOPE.** Locating a rain garden on slopes greater than 10% can cause instability and erosion. If the slope of area is greater than 10%, seek technical assistance from a qualified engineer. If there is only slight slope, add a berm on the downhill side of the garden to hold rainwater. *Flip over this page for a "How-To Guide."*

**ALWAYS CALL 811 BEFORE YOU DIG.** **Call 811** to locate all underground utilities. Do not install rain gardens over underground utilities such as gas, power, phone, or water lines. Also locate rain gardens away from septic tanks, septic drainage fields, and underground oil tanks.

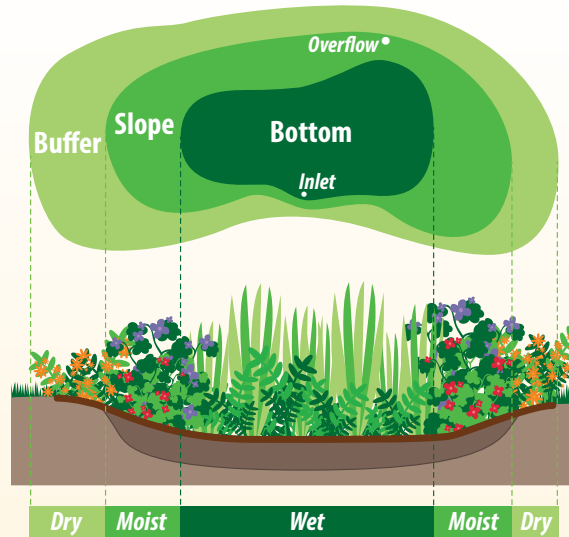
**DRAINAGE MATTERS.** Do not build a rain garden in an area where water ponds. Make sure there is at least 3 ft. between the bottom of the rain garden and the top of the groundwater table. Conduct a soil drainage test to make sure there is adequate drainage. *Flip over this page for details in the "How-To Guide."*

**MAP IT.** Draw where the rain garden could go, choosing spots that are downhill of downspouts or paved areas. Depending on your site, you could capture all or part of the runoff from your property. You can also consider installing multiple rain gardens.

### STEP 2 RAIN GARDEN SIZE & DESIGN

**SIZE YOUR RAIN GARDEN.** The size of the rain garden should be at least 10% of the area that drains to it. *Flip over this page to see the "How-To Guide" for details.* Even if you can't collect all the rain on your property, treating part of it still helps improve water quality and restore hydrology.

**PICK A SHAPE.** The shape of the rain garden is a personal choice – round, square or kidney shaped are all popular choices. Before starting, make sure the rain garden will have enough space for plants and water to settle together.



### PLANT TYPES IN A RAIN GARDEN

*Design your rain garden to help rain absorb into the soil. Select plants for drier soil in the buffer area, moist soil along the slope, and wet-to-saturated soil in the bottom.*

**MARK IT OUT.** Outline the area of your garden with stakes and string.

**PLAN FOR OVERFLOW.** In the event of a large storm, make sure any overflow is directed away from buildings and neighboring property. You can prevent erosion by lining the overflow with rock.

### STEP 3 BUILD THE FOUNDATION

**PLAN TO DIRECT WATER IN.** Water can be transported from your downspout or driveway through a swale lined with plants, decorative rocks, or through a pipe.\* If you choose to do a swale and it's within 5 ft. of any structure, it must have a waterproof liner.

**EXCAVATE.** Prior to digging, moisten soil with water to make digging easier. Excavate the entire area with a shovel. Gently slope the sides while keeping the bottom relatively flat.

**DEPTH.** The finished rain garden should be 6-12 in. deep.

**SOIL AMENDMENTS.** A mix of soil, sand, and compost can be added to the bottom to improve drainage and soil quality.

**EROSION PROTECTION.** Minimize erosion at the garden inlet and outlet by adding rocks. These help slow the flow of rushing water.

### STEP 4 CHOOSE & INSTALL PLANTS

**WATER NEEDS.** When selecting plants, be sure to consider their water needs and placement. Plants at the bottom will need to tolerate lots of water. Plants on the slopes and buffer will have less standing water. *(See diagram to left: "Plant types.")*

**LIGHT NEEDS.** Think about how shade and sun will impact the area for your rain garden and select plants that thrive with that light.

**PURCHASE YOUR PLANTS.** Rain gardens provide habitat for birds and other species. For this reason, native plant species are an ideal choice, though ornamentals also work.

**LAYOUT.** Prior to planting, set out all the plants in their chosen location. Confirm the placement looks good and they are in areas where the amount of moisture and sunlight will work. Rain garden plants are important because they filter pollutants and soak up harmful nutrients. They also prevent erosion, improve drainage, increases infiltration and retention, and are aesthetically beautiful!

**PLANT.** Once the locations of plants have been settled upon, fill your garden with all the beautiful plants you have selected!

**FINISH.** Finally, add 2-4 in. of mulch. This will help feed your garden and discourage weeds. Avoid using anything that could float away, such as grass clippings or leaves.

### STEP 5 MAINTENANCE

**FIRST 2 YEARS.** Rain garden plants will need watering during the dry season for at least the first 1-2 years. It's best to do deep, infrequent watering (once a week) to encourage healthy root growth.

**DOWNSPOUTS.** If your water source will be a redirected downspout, wait until rain garden plants have a strong root system before redirecting and allowing water to flow in.

**WEED.** Regularly pull weeds by hand. Avoid using herbicides and fertilizers in the rain garden since these pollute the water.

**CHECK FLOWS.** Flowing water can move things around so periodically check that the rain garden is properly receiving and draining water. Remove sediment and debris as needed and check for erosion.

**RESURFACE.** Add compost or mulch 2-4 in. deep as needed. Pea gravel or other rock are also good added stabilizers as they will not float away or decompose.

*\*Underground pipe installation must meet Oregon Plumbing Specialty Code, which requires a permit and inspection. For information, contact the City of Springfield's Development Center at 541.726.3753.*