



Rain gardens and bioswales are landscape features that collect, absorb and filter stormwater runoff. Rain gardens are shallow depressions that hold runoff until it can soak into the soil. Bioswales are broad, shallow drainages that convey and filter runoff by slowing the flow and directing it through planted permeable surfaces. Bioswales and rain gardens can be used together or separately. Be sure to check with your local building department before building a bioswales or rain garden.

Step 1: Site assessment

Sketch your site and calculate the impervious surface area. For example, calculate the roof area (L x W) for each downspout on your house, for a rain garden designed to absorb the roof runoff. Observe and sketch water flow over your site surface from the discharge area. Note areas of ponding, where runoff flows onto a neighbor's property

or into a storm drain. Assess soil percolation rates—contact your local Conservation District for help. Soils that drain slower than .5 inch per hour are not suited for bioretention. Calculate percent slope of site, (slope = rise/run x 100%). Generally, sites steeper than 12% are too steep for biofiltration. For help estimating slope see our information sheet at www.soundnativeplants.com/sites/default/files/uploads/PDF/Estimating_slope.pdf.

Step 2: Determine location and size

Ideally, place bioretention features where they will collect the most runoff—usually close to the discharge points—and keep rain gardens away from permanent structures. Locate your feature 3' from a sidewalk, 6' from a basement, 2' from a crawl space or slab and 10' from a retaining wall. Make the rain garden surface area at least 10% of the contributing impervious surface. For example, a 450 square foot roof needs a rain garden of at least 45 square feet. Rain gardens should be at least 5' wide to accommodate side slopes and planting. The soil percolation rates determine the depth of the feature. Generally, 6–12" depth works for percolation rates greater than 1" per hour. Soils that percolate at 0.5–1" per hour need a ponding depth of 12–24". Soil amendment can increase percolation rates. For example, 4" of additional amendment may reduce your ponding depth by 4".

Step 3: Delineate area, conveyance and re-grade

Use a rope, garden hose or stakes to delineate the edge of your feature. Figure out how water will be conveyed into the system., such as by gutter extenders, buried pipe, rock lined drain tiles, or a bioswale. The inlets and outlets of the features should be armored with rock to minimize erosion. Before digging, either by hand or with a machine, call your local utilities for a locate service to ensure safe digging. Grade the bottom of the rain garden level and slope the sides at a ratio of 3:1 if possible. Exterior berms should rise at least 2" above the outflow. Now is the time to introduce soil amendments, such as compost, which will improve plant and microbial health. A typical soil mixture contains 20–40 percent organic material.

Step 4: Choose appropriate plants—Right plant for right place

Each bioretention feature has different elevation zones with corresponding moisture conditions. The lowest part of the feature will be wettest and the highest point will be driest. Choose a variety of native plants with specific tolerances regarding sun and shade, soil moisture levels and aesthetics. Use tough plants like sedges or bunch grasses around areas of inflow and outflow, and groundcovers like coastal strawberry to minimize erosion on the berms. During layout, consider the mature size of each plant. Plants do the important work of filtration and should be grouped together to provide an attractive and beneficial finished bioretention feature. Additional summer irrigation, weeding and mulching may be necessary to help native plants become well established.

A rain garden design manual may be found at <https://fortress.wa.gov/ecy/publications/publications/1310027.pdf>