

ECO-FRIENDLY LANDSCAPING WITH RAIN GARDENS: Reducing Your Impervious Footprint

The Problem

Every time it rains, the Norwalk River picks up speed and swells within its banks as pollutant-laden water rushes into it from parking lots, roadways, and discharge pipes. As more impervious pavement fills the landscape, the resulting problems of water quality, and flooding become more pronounced. The Norwalk River has reached a threshold where pollutants from paved areas, fertilizers from lawns, and impacts from sewage treatment systems and septic tanks have caused problems with water quality. But there are still many ways that each of us can reduce our impervious footprint and improve the health of the river by minimizing stormwater runoff.

The Solution

We can be cautious about the types of pollutants that land on our driveways, prevent chemicals from washing into our storm drains, and keep hazardous substances (e.g., paint thinners, pesticides, medicines) out of our sewer pipes. We can also limit the amount of stormwater runoff from our own yards that ends up in the river after a rainstorm. One way to do this is by diverting roof runoff away from paved surfaces, which often funnel water onto driveways and roads, and instead direct gutters into a shallow planted area (generally 6" deep) known as a rain garden.

Rain gardens are relatively inexpensive and simple to install. They can be quite diverse and planted with a variety of native perennials, grasses, shrubs, and even trees. These landscape features are an easy way to add diversity to your yard while also helping to protect the river from harmful pollutants. Sized according to your dwelling's footprint, a strategically located rain garden will collect roof runoff and allow the water to seep into the ground, where it is filtered and cleaned. The roots of the plants in your rain garden also absorb water and some of the contaminants. Additionally, native plants provide food and habitat for a variety of wildlife, including birds, butterflies, and beneficial insects.

To construct your own rain garden, follow these six steps (summarized from UConn's "Rain Gardens: A Design Guide for Homeowners in Connecticut").

Step 1: Placement of the Rain Garden

- Locate the garden where it will collect the most runoff, such as downhill from paved surfaces where water would naturally flow.
 - Avoid placing it closer than 10' from your house foundation.
 - Do not place the rain garden over a septic system or near the well.
 - Avoid placing the rain garden in a low spot that always seems wet.
- To avoid unwanted long-term ponding, choose an area that will drain after several hours.

Shrubs

Red Chokeberry (*Aronia arbutifolia*)
Highbush Blueberry (*Vaccinium corymbosum*)
Lowbush blueberry (*Vaccinium angustifolium*)
Inkberry (*Ilex glabra*)
Pussy Willow (*Salix discolor*)
Silky Dogwood (*Cornus amomum*)
Red-osier Dogwood (*Cornus sericea*)
Gray dogwood (*Cornus racemosum*)
Elderberry (*Sambucus canadensis*)
Winterberry (*Ilex verticillata*)
Spicebush (*Lindera benzoin*)
Buttonbush (*Cephalanthus occidentalis*)
Sweet Pepperbush (*Clethra alnifolia*)
Swamp azalea (*Rhododendron viscosum*)
Pinxterbloom azalea (*R. periclymenoides*)
Witherod (*Viburnum cassinoides*)
Arrowwood (*Viburnum dentatum*)
Nannyberry (*Viburnum lentago*)
Black haw (*Viburnum prunifolium*)
American cranberry (*Viburnum trilobum*)

Perennials

Joe-Pye Weed (*Eupatorium dubium*)
Swamp milkweed (*Asclepias incarnata*)
New York Aster (*Symphiotricum novi-belgii*)
Hop Sedge (*Carex lupulina*)
Soft Rush (*Juncus effusus*)
Rose mallow (*Hibiscus moscheutos*)
Marsh Marigold (*Caltha palustris*)
Tickseed sunflower (*Bidens aristosa*)
Lanceleaf coreopsis (*Coreopsis lanceolata*)
Iris (*Iris versicolor*)
Cardinal Flower (*Lobelia cardinalis*)
Monkey Flower (*Mimulus ringens*)
Scarlet Bee-balm (*Monarda didyma*)
False goat's beard (*Astilbe spp.*)
Spiderwort (*Tradescantia virginiana*)
Spiked gay feather (*Liatris spicata*)
Sensitive fern (*Onclea sensibilis*)
Cinnamon fern (*Osmunda cinnamomea*)
Royal fern (*Onclea regalis*)
Marsh fern (*Thelypteris palustris*)

Grasses

Switch grass (*Panicum virgatum*)
Creeping bentgrass (*Agrostis stolonifera*)
Meadow foxtail (*Alopecurus pratensis*)
Blue joint (*Calamagrostis canadensis*)
Tussock sedge (*Carex stricta*)
Tufted hair grass
(*Deschampsia caespitosa*)

Trees

River birch (*Betula nigra*)
Red maple (*Acer rubrum*)
Sweetgum (*Liquidambar styracifolia*)
Swamp white oak (*Quercus bicolor*)
Pin oak (*Quercus palustris*)
Larch (*Larix laricina*)
Cottonwood (*Populus deltoides*)
Shadblow (*Amelanchier spp.*)
Green ash (*Fraxinus pennsylvanica*)

Step 2: Soils

•Determine the suitability of soils at your desired rain garden location by performing a percolation test.

1. Dig a hole about 6" deep and fill it with water.
2. If water is in the hole after 24 hours, the site is not suitable.

Step 3: Sizing

- To capture the majority of roof runoff, follow these basic steps.
 1. Measure the impervious footprint of your house (total area of paved or hardened surfaces - roofs, driveways - as seen from above).
 2. Count your gutters and determine what portion of the roof area would be contributing water to the gutter downspout that would empty into your desired rain garden location.
 3. Divide your roof contributing area by 6 to determine the area rain garden will need to hold 1" of roof runoff in an area 6" deep.
 4. From Step 2, if there was some infiltration but it was slow, you can increase the size of your garden to make up for poor drainage.
 5. For silty soils, increase garden size by 50%. For clayey soils, increase size up to 100%.

Step 4: Installation

- Before digging, call the "Call Before You Dig" (800-922-4455) hotline to locate any underground utilities.
- Lay out your desired shape for the garden with a string.
- Smaller gardens can be dug by hand with a shovel, or equipment can be rented for larger gardens.
- If the yard is fairly level, just dig out the bowl to a depth of 6" or 8" if mulch will be used.
- If the yard is sloped, use removed soil to create a small berm at the downslope side to prevent the soil from washing away after a storm.
- To maintain water storage, make the bottom of the garden fairly level. To avoid erosion, don't slope the edges too steeply.
- Apply mulch or a groundcover to help stabilize the soils.

Step 5: Planting

Once the shallow depression is dug, customize your rain garden by selecting plants according to their look and level of maintenance. The best plants for a rain garden are natives that can tolerate wet, as well as drought, conditions. Refer to the suggested plant list below to create your own unique rain garden. Maintained established plants as any other plants in your yard.

Step 6: Maintenance

- Water newly installed plants until established; weed as necessary.
- In the years following installation, remove dead plant material, prune shrubs, and replace mulch as desired.

For more details on how to design your own rain garden, visit <http://www.sustainability.uconn.edu/> to download the design guide.