



# RAIN GARDENS for the ROUGE RIVER

## A Citizen's Guide to Planning, Design, & Maintenance for Small Site Rain Gardens

Bulletin prepared by SOCWA, Southeastern Oakland County Water Authority, 3910 W., Webster Rd., Royal Oak, MI 48073, 248-288-5150

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Rain garden registry for Southeast Oakland County, [www.socwa.org](http://www.socwa.org)  
Funded through a grant from the Rouge River National Wet Weather Demonstration Project.

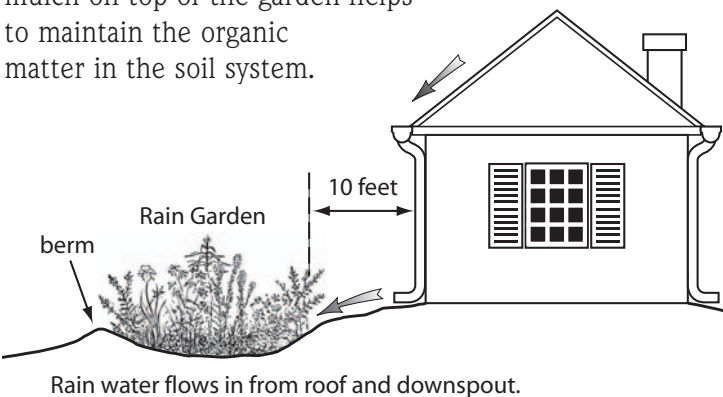
### What is a Rain Garden?

A rain garden is a depression in the landscape, designed and planted to trap, absorb, and filter storm water runoff and improve water quality. The rain garden creates a "bioretention area" which collects water runoff, filters out pollutants, and slowly absorbs water. Rain gardens are designed to be "dry gardens" within 48 hours after a major rainfall.

Rain gardens recreate a natural system of water recycling, similar to a mature forest with its spongy layer of leaves and organic litter. In a forest, rainwater slowly percolates into and through the soil, where it replenishes ground water – and where water is taken up by plant roots and recycled into the atmosphere.

Rain gardens in sandy soils can be designed to encourage infiltration through the garden soil. In contrast, rain gardens in clay soil areas are often designed to absorb and recycle all of the water within the garden itself.

The rain garden bed is usually excavated to a depth of 2 to 3 feet. A mixture of compost and sharp sand is then added to create a fertile planting mix. Compost (decomposed organic matter; made from yard clippings) holds 130% of its weight in water, helps break down and filter pollutants, and provides a source of slow-release nutrients for plants. The layer of natural mulch on top of the garden helps to maintain the organic matter in the soil system.



**Rain Garden Locations**

### Why Use Native Plants?

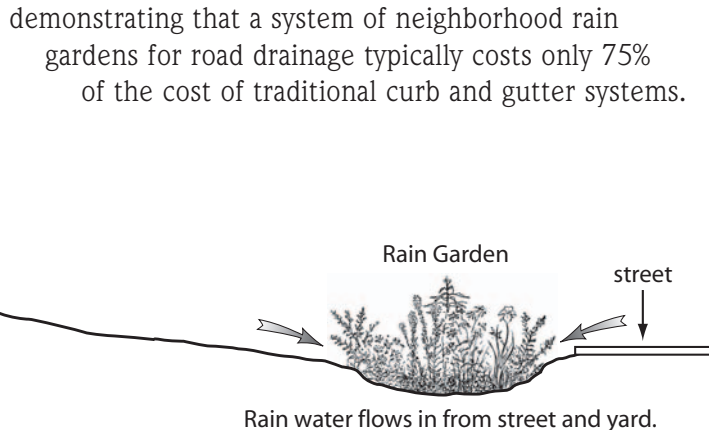
Native wildflowers, groundcovers, and shrubs which are adapted to damp or wet conditions are recommended for rain gardens (see page 4). Native plants are hardy, attract beneficial butterflies and other insects, soak up rain water, and filter pollutants. Native plants help restore local ecological character and community identity.

### Keeping the Rain Out of the Storm Drain

Rain gardens provide a way for individual property owners to be part of the solution to water pollution. Home gardeners in Southeast Oakland County are demonstrating rain garden plant combinations that add beauty and biodiversity to their communities. For photographs and examples of rain garden designs, see the SOCWA Rain Garden Registry at [www.socwa.org](http://www.socwa.org) (Lawn and Garden Section).

Typically in urban areas, storm water runoff flows into storm drains which in turn discharge to rivers and lakes. Rain water picks up pollutants such as oil, grease, de-icing salts, fertilizers, pesticides, heavy metals, bacteria from animal wastes, debris, and sediment as it flows over streets, parking lots, driveways and lawns.

The streets and driveways from a typical city block generate nine times more runoff than a woodland area of the same size. Community experiences are demonstrating that a system of neighborhood rain gardens for road drainage typically costs only 75% of the cost of traditional curb and gutter systems.



Rain water flows in from street and yard.

# How-to-do-it Guidelines for Home Rain Gardens

Guidelines based on publications written by Larry Coffman, Prince George's County, Maryland; Roger Bannerman, Wisconsin Department of Natural Resources, Madison, Wisconsin; Sherri Buss, Consultant to Maplewood, Minnesota; and Donald Carpenter, P.E., Lawrence Technological University, Southfield, Michigan.

## Step #1: Select a Rain Garden Location

Consider the source of storm water for the garden. Choices include street runoff, driveway runoff, and roof runoff. Locate the garden where it can trap small amounts of rain water and add beauty to your landscape. If you have a front yard ditch or swale, it may be possible to divert some water into an "off line" rain garden adjacent to the ditch.

Observe your home landscape after several heavy rainstorms. Where does the water collect? Naturally-occurring depressions are excellent locations for rain gardens – provided that the amount of water reaching the site is not excessive.

If rain water from a roof flows through gutters and a drain spout, place the rain garden at least 10 feet away from the building foundation. Roof water can be directed to the garden via a gravel path, a grassed swale, or an underground pipe (like a French drain system).

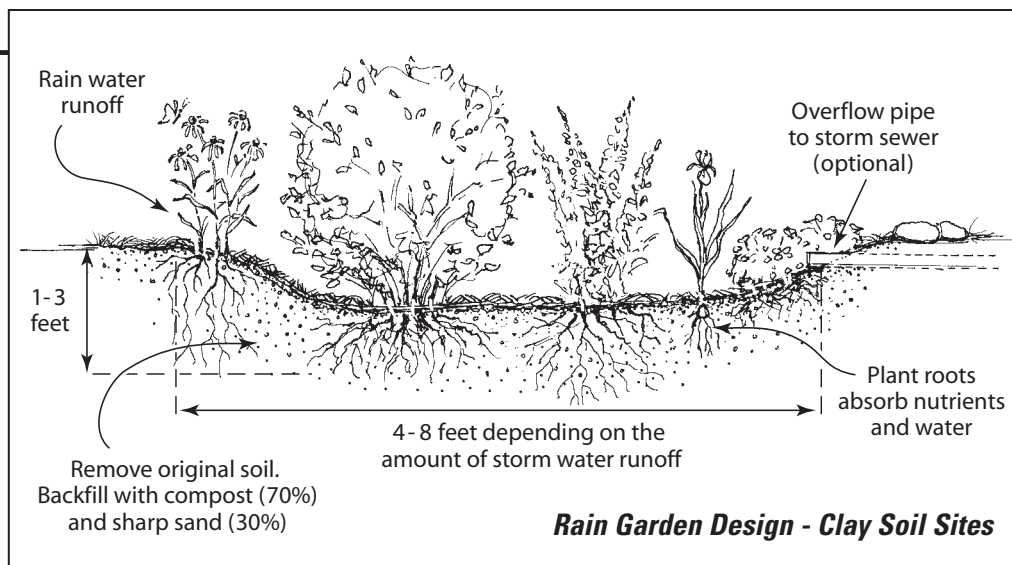
Another excellent location is the right-of-way between the street and sidewalk – provided that the area receives runoff from the street or driveway. Check with your city public works department concerning Miss Dig (underground utilities) and city requirements.

## Step #2: Check Your Soils for Drainage

Sandy soil drains quickly...while clay soil keeps water ponding on the surface. Most home soils, however, fall somewhere between these two extremes.

To measure the drainage rate of your rain garden site, follow these steps:

1. Dig a hole 18 inches deep.
2. Fill the hole with water and let it drain. (This wets the soil along the sides of the hole).
3. Then fill the hole again. Check and record the level of water in the hole after 24 hours and after 48 hours.



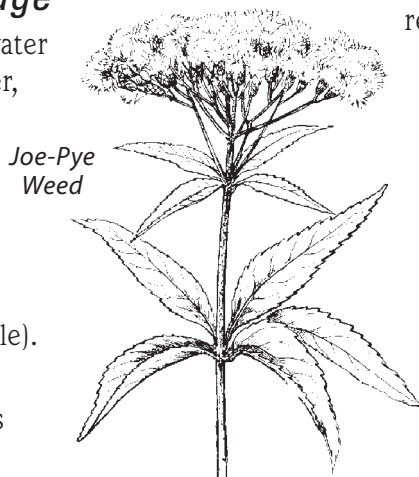
If the water has drained within 48 hours, you have moderately well-drained (or well-drained) soils and can use some top soil or even native soil as part of the planting mix. However, if your soil is poorly drained, you will need to add substantial amounts of compost to the soil mix.

## Step #3: Determine Your Goals for Water Retention

Using the information from the drainage test and your site observations, determine your goal for storm water retention and/or infiltration.

Rain gardens in poorly drained sites will need to be sized to hold more water, and/or to have an overflow outlet to a nearby ditch or storm drain. A soil mix of 70% compost and 30% sharp sand is recommended (not beach sand).

However, if the native soil is moderately well-drained, some water infiltration through the rain garden is possible. A soil mix of 50% compost, 30% sharp sand, and 20% top soil or native soil is useful. Make sure that any purchased top soil does not have any clay in it.



## Step #4: Determine Rain Garden Size and Shape

Home rain gardens vary in size, reflecting site conditions, aesthetics, and the ability of the owner to handle garden maintenance.

However, rain gardens must be large enough to hold the water within the contributing drainage area. As you plan your rain garden, visualize how the water will be directed to the garden and how it will be stored. If possible, distribute the water evenly throughout the garden surface. To alleviate the potential for excess ponding, place the rain garden length perpendicular to the runoff flow so that the garden can catch as much water as possible.

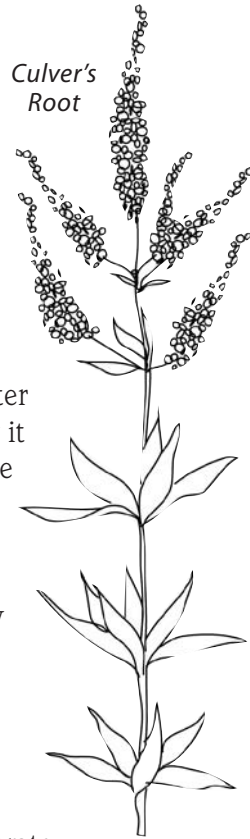
## Step #5: Plant the Rain Garden

Select hardy, native plants that will tolerate some amount of water for up to 48 hours. It is not necessary, however, to select only plants suited for a wetland. Like other gardens, rain gardens are dry for much of the season and need to be watered during dry weeks.

In selecting your plants, remember the goal of biodiversity and habitat for song birds and butterflies. Choose plants that have aesthetic landscape value such as flowers, berries, and interesting leaves or bark.

Each rain garden site is unique. Microclimates (light, temperature and wind), as well as the size of the drainage area, will influence plant selection. Check reference books and websites to learn about native plants and their site requirements. Most importantly, visit native plant gardens and speak to experienced gardeners.

Assess your site for the desired height of plantings. Some native wildflowers and shrubs will grow a 7 – 8 feet or more in height, obstructing the view of drivers if planted near the street. On the other hand, the tall native species can add beauty and interest to rain garden sites in other areas of the home landscape.



## Step #6: Mulch the Rain Garden

A natural organic mulch, such as shredded hardwood mulch, is ideal for rain gardens. Mulch maintains moisture, prevents erosion, provides natural weed control, and improves soil structure over time as the mulch decomposes.

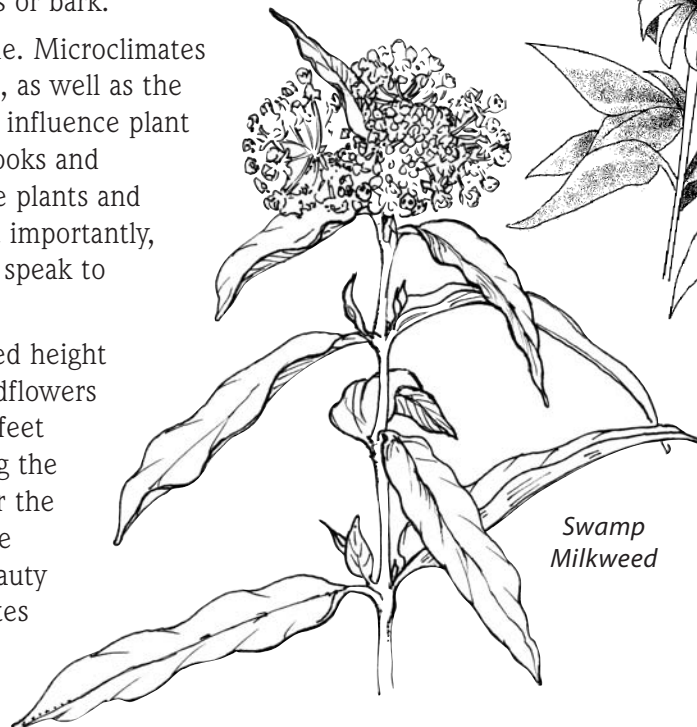
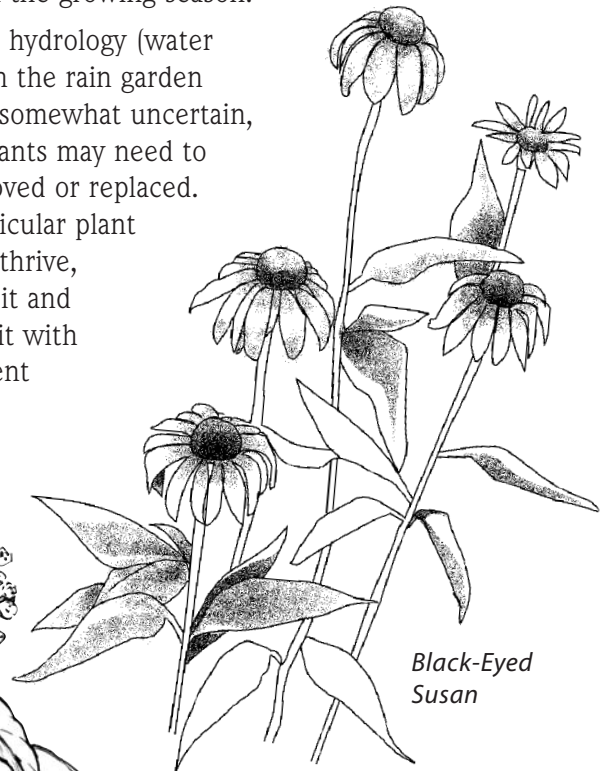
Apply a 3 inch layer of mulch after planting. Be careful not to smother small plants. Replenish the blanket of mulch every 6 months. Avoid landscape fabric or other synthetic matting that does not decompose naturally.

## Step #7: Maintain the Rain Garden

There is no such thing as a “no maintenance” garden. Good gardening practices, however, can minimize maintenance tasks.

Maintenance activities in a rain garden are similar to a perennial garden. Weeding, watering, edge “cleanup”, pruning, dividing, and mulching are needed at various times in the growing season.

Because hydrology (water flows) in the rain garden may be somewhat uncertain, some plants may need to be removed or replaced. If a particular plant doesn't thrive, remove it and replant it with a different species.





## *Native Wildflowers and Shrubs For Rain Gardens in Southeast Michigan (partial list)*

Check sun/shade conditions before planning and planting your rain garden. The plants listed here are excellent for moist gardens that are dry within 48 hours of a rain.

Some native wildflowers and shrubs grow over 5 feet tall and are not suited to a streetside rain garden. Take time to visit native plant gardens and learn about plant growth habits before making purchases.

### **Shrubs**

American Cranberrybush

*Viburnum*

*Viburnum trilobum*

Black Chokeberry

*Aronia prunifolia*

Buttonbush

*Cephalanthus occidentalis*

Fragrant Sumac

*Rhus aromatica*

Meadowsweet

*Spiraea alba*

Nannyberry Viburnum

*Viburnum lentago*

Ninebark

*Physocarpus opulifolius*

Redosier Dogwood

*Cornus stolonifera*

Shrubby Cinquefoil

*Potentilla fruticosa*

Shrubby St. John's-Wort

*Hypericum prolificum*

Spicebush

*Lindera benzoin*

Steeplebush

*Spiraea tomentosa*

Virginia Sweetspire

*Itea virginica*

### **Wildflowers**

Beardtongue

*Penstemon digitalis*

Bergamot (Bee-Balm)

*Monarda fistulosa*

Black-Eyed Susan

*Rudbeckia hirta*

Blue Flag Iris

*Iris versicolor*

Blue Vervain

*Verbena hastata*

Boneset

*Eupatorium*

*perfoliatum*

Cardinal Flower

*Lobelia cardinalis*

Columbine

*Aquilegia*

*canadensis*

Culver's Root

*Veronicastrum*

*virginicum*

Golden Alexanders

*Zizia aurea*

Great Blue Lobelia

*Lobelia*

*siphilitica*

Heath Aster

*Aster ericoides*

Ironweed

*Vernonia missurica*

Joe-Pye Weed

*Eupatorium*

*fistulosum*

Marsh Blazing Star

*Liatris spicata*

Mountain-Mint

*Pycnanthemum*

*virginianum*

New England Aster

*Aster novae-angliae*

Queen-of-the-Prairie

*Filipendula rubra*

Sneezeweed

*Helenium*

*autumnale*

Spiderwort

*Tradescantia*

*ohiensis*

Swamp Goldenrod

*Solidago patula*

Three-Lobed

Coneflower

*Rudbeckia triloba*

White Turtlehead

*Chelone glabra*

Wild Strawberry

*Fragaria virginiana*



### **Native Plant Data Bases For Plant Descriptions**

[www.wildflower.org](http://www.wildflower.org)

[www.plants.usda.gov](http://www.plants.usda.gov)

[www.nps.gov/plants](http://www.nps.gov/plants)