



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
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What Is a Rain Garden?

A rain garden is a depression in the landscape, designed and planted to trap storm water runoff. Rain gardens may be as simple as an enhanced swale in the backyard, or they may involve more extensive planning and engineering with underdrains.

In a rain garden, plants and soils filter storm water naturally, removing nutrients and other pollutants. This process is called bioretention. In clay soil environments, the rain water is absorbed by the compost and plants. In a sandy soil environment, some infiltration into the ground may take place. In either case, a functioning rain garden should be dry after 48 hours - thereby avoiding mosquito problems.

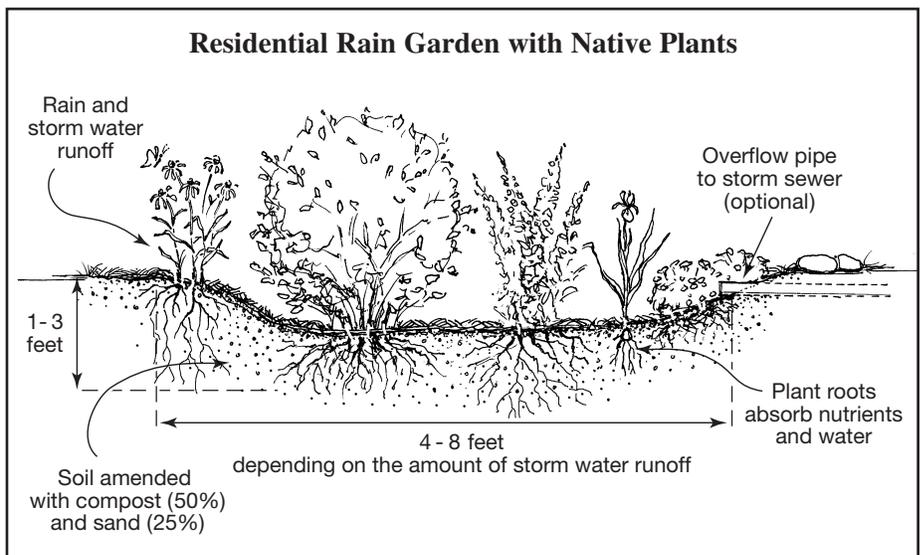
To enhance the ability of a site to handle storm water, some soil amendment is often useful. Sand, compost, and top soil are often mixed together in functioning rain gardens. The addition of compost is particularly important for pollutant breakdown and water uptake.

Native plants offer many advantages in a rain garden. Typically, native plants require less water and fertilizer than non-native species - and many are naturally resistant to pests. When selected to fit site conditions, native plants create small ecosystems, attracting birds, butterflies, and beneficial insects. A short list of recommended rain garden wildflowers and shrubs is included on page 4 of this flyer.

Rain Gardens—The Natural Solution for Small Urban Spaces

Rain gardens offer a functional and attractive option to the “pipe and pond” approach to storm water management. Because they provide an attractive landscaped garden as well as storm water retention, rain gardens are particularly useful in small urban spaces.

In 2002, the City of Lathrup Village and the SOCWA Healthy Lawn and Garden Program worked together to design and install a small rain garden located off of the north entrance driveway of the City Office building (27400 Southfield Rd., 1/4 mile north of I-696). The rain garden soil mix was 60% compost, 30% sand, and 10% top soil. An infiltration sump with pea gravel was placed at the front of the garden to help with infiltration. SOCWA volunteers selected and planted native wildflowers and shrubs suitable for a sunny location.



How-to-do-it Guidelines for Small Site Rain Gardens

You don't need to be an engineer to plan and build a rain garden - but you do need to understand storm water management principles.

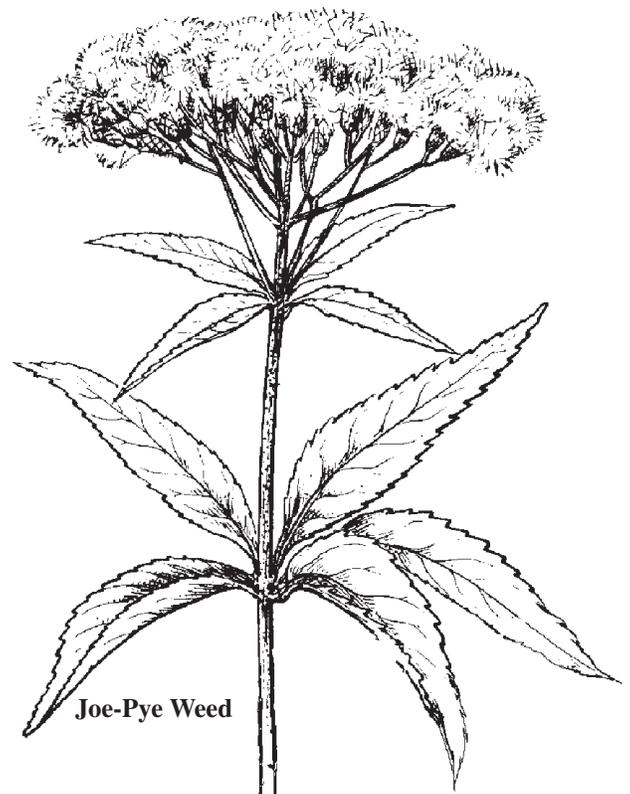
The following guidelines reflect interviews with Larry S. Coffman, Prince George's County, Maryland, Roger Bannerman, Wisconsin Department of Natural Resources, Madison, Wisconsin, and Chris Cavett, Maplewood, Minnesota.

SITE SELECTION & RAIN GARDEN DESIGN

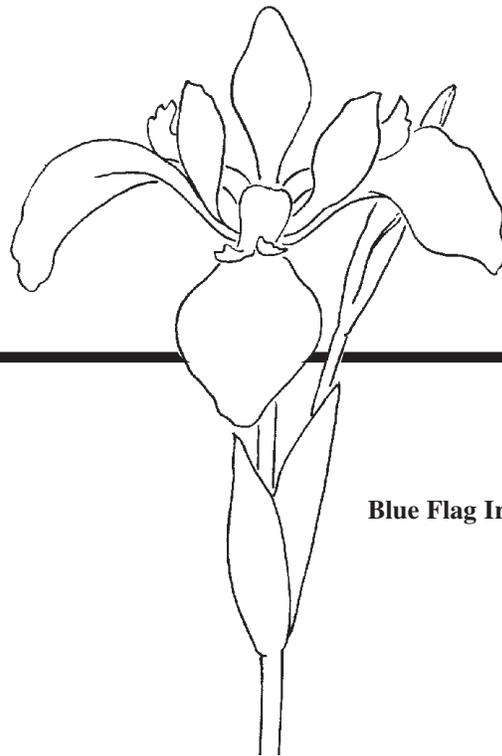
- Observe the storm water runoff patterns on the site. Does water infiltrate in the ground after a rain or does it pond? Rain gardens should be placed where they will intercept storm water flow - hopefully through diffused, overland flow. Wet areas in the yard that currently collect rainwater are ideal locations.
- If you are using rainwater from the roof, place rain gardens in the vicinity of roof downspouts. Gardens should be 20 feet away from any buildings, including your neighbor's home. If necessary, create a grassed swale to guide the downspout water to the rain garden.
- Sizing of the rain garden depends on many factors including the size of the drainage area, soil texture, slope, and the goals of the property owner. The Virginia Department of Forestry recommends a garden space that is 5% - 7% the size of the total drainage area.
- Design the garden as a "shallow bowl" to trap the first flush of storm water. The recommended ponding depth with the infiltration capability of the soils - but generally averages 3 to 6 inches. If the site has clay soils, make the depression shallow to reduce the volume of trapped water. If soils are sandy and porous, a deeper rain garden - even exceeding one foot in depth - could be considered.
- A grassed buffer (lawn) around the rain garden provides additional water quality and soil erosion control benefits.
- If a constructed rain garden holds standing water for more than two days, some modifications in the soils and design will be needed. Rain gardens need to trap storm water temporarily, but should not become a wet pond that breeds mosquitoes.

SOILS, NATURAL MULCHES, AND EROSION CONTROL

- Build the garden bed with a planting mix of sand (25-35%), compost (50% or more) and native soil (15-25%). For a small rain garden at a home site, variations of these proportions may be workable.
- Stabilize the top of the garden with a natural mulch 2 to 3 inches deep. The mulch acts as a sponge to capture heavy metals, oils, and grease. Bacteria breaks down the pollutants as the mulch decays. The mulch also reduces weeds and maintenance.
- Select a natural mulch such as aged shredded hardwood bark that will gradually decompose, adding compost (humus) to the soil. Apply the mulch to a depth of 2 - 4 inches and replenish, as needed.



Joe-Pye Weed



Blue Flag Iris

PLANTING THE RAIN GARDEN

In most rain gardens, plants are inundated from time-to-time and left dry at other times. Choose hardy plants that grow in either saturated soils or organic soils. Native wildflowers and shrubs are ideal. Some non-aggressive native grasses may also be useful. Native plant nurseries in Michigan and the Midwest will also have useful information. Consider hiring a consultant familiar with the growth habits of native plants, or requesting help from ecological gardening volunteers.

- Plant selection and placement should reflect various zones of the rain garden. Some sections of the garden will typically have saturated soils, while other areas (along the side of the rain garden) may have organic soils but may not be saturated with water.
- Use plants native to Michigan and the Upper Great Lakes whenever possible. Native plants are adapted to local climate and site conditions. Native plants offer many advantages for water quality and biodiversity. Perhaps most importantly, the deep roots of some native wildflowers and shrubs help absorb storm water, and help to decompose storm water pollutants.
- Wet prairie wildflowers are excellent candidates for sunny rain gardens. Diverse plantings can often be selected to provide continuous bloom and nectar for butterflies throughout the growing season.
- In partial shade locations, consider a rain garden with trees, shrubs, woodland wildflowers, and sedges - recreating a woodland edge. Trees and shrubs have important storm water enhancement benefits and add to habitats for birds and beneficial insects.

- Start your garden with a wide variety of plant species planted in a style to replicate a “natural” look. Plants suited to the site will thrive, while those that aren’t suitable for drainage and site conditions will die out. Avoid monocultures which can be susceptible to disease.
- Involve community groups and children in the planting of the garden whenever possible. Community plantings are ideal opportunities for education outreach and help build community pride in water quality projects. If community residents participate in the planting of the rain garden, they will be more willing to help maintain it.

MAINTAINING THE RAIN GARDEN

- Consider garden maintenance responsibilities before planting.
- Inspect the rain garden after rainstorms. Rain gardens, like other native plant gardens, need attention to maintenance.
- Weed when necessary. Replace mulch and plants when necessary.
- If volunteers are involved, be sure to thank them in an appropriate way.



NATIVE WILDFLOWERS, GROUNDCOVERS, AND SHRUBS FOR RAIN GARDENS IN SOUTHEAST MICHIGAN (partial list)

A “starter” list of rain garden plants for Southeast Michigan is listed below. Always check sun/shade conditions before planning your garden. The plants listed are excellent for moist organic gardens that are “dry” within 48 hours of a rain.

SHRUBS:

- American Cranberrybush
Viburnum trilobum
- Black Chokeberry
Aronia prunifolia
- Common Buttonbush
Cephalanthus occidentalis
- Meadowsweet
Spiraea alba
- 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 Sweetpire
Itea virginica

WILDFLOWERS, SEDGES, and GRASSES:

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| Beardtongue
<i>Penstemon digitalis</i> | Indian Grass
<i>Sorghastrum nutans</i> |
| Bergamot (Bee-Balm)
<i>Monarda fistulosa</i> | Joe-Pye Weed
<i>Eupatorium fistulosum</i> |
| Black-Eyed Susan
<i>Rudbeckia hirta</i> | Marsh Blazing Star
<i>Liatris spicata</i> |
| Blue Flag Iris
<i>Iris versicolor</i> | Missouri Ironweed
<i>Vernonia missurica</i> |
| Blue Vervain
<i>Verbena hostata</i> | New England Aster
<i>Aster novae angliae</i> |
| Boneset
<i>Eupatorium perfoliatum</i> | Old-Field Cinquefoil
<i>Potentilla simplex</i> |
| Canada Anemone
<i>Anemone canadensis</i> | Porcupine Sedge
<i>Carex hystericina</i> |
| Cardinal Flower
<i>Lobelia cardinalis</i> | Queen-of-the-Prairie
<i>Filipendula rubra</i> |
| Columbine
<i>Aquilegia canadensis</i> | Sneezeweed
<i>Helenium autumnale</i> |
| Culver’s Root
<i>Veronicastrum virginicum</i> | Spiderwort
<i>Tradescantia virginiana</i> |
| Horsemint
<i>Monarda punctata</i> | Swamp Goldenrod
<i>Solidago patula</i> |
| | Swamp Milkweed
<i>Asclepias incarnata</i> |
| | Tall or Green-Headed
Coneflower
<i>Rudbeckia trilobum</i> |
| | Threadleaf Coreopsis
<i>Coreopsis verticillata</i> |
| | White Turtlehead
<i>Chelone glabra</i> |
| | White Vervain
<i>Verbena urticifolia</i> |
| | Wild Strawberry
<i>Fragaria virginiana</i> |

