

# Tips for Green Leaders

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Frederick County



## Design and Construction of a Rain Garden

### Rain, Rain - Soak In!



*Like our roofs and driveways, turf often prevents rainwater from soaking into the ground.*

Where does the rainwater go that runs off of your roof, driveway, lawn, and sidewalk? This “stormwater runoff” is often conveyed to curbs, gutters, drains, or sewers, then piped to a stormwater detention pond and gradually released into the nearest stream or lake.

However, stormwater was not regulated until the mid-1980’s, which means that roads and buildings constructed before stormwater regulations might not have any treatment before water reaches a stream.

A novel alternative to the conventional ‘pipe and pond’ approach is the use of a rain garden to store and treat runoff and recharge groundwater. Rain gardens are suitable for any land use—residential, commercial, or industrial. In a rain garden, rainwater from paved surfaces, downspouts, and lawns is collected in shallow, low-lying areas planted with native vegetation to be stored temporarily, absorbed by plants, and percolated into the ground. Pollutants such as fertilizer, pesticide residue, oil, and heavy metals can be trapped by the rich soil and root systems in the rain garden, permitting cleaner water to slowly soak down through the soil and rocky subsoil until it recharges groundwater supplies.

Native plant species that can tolerate the extremes of wet soils and dry periods are preferred for use in a rain garden. They are deep-rooted, adapted to the local climate, and attractive to pollinators, nectar-feeders, and other wildlife. Many of these native plants are sold by local nurseries, where experienced horticultural staff can help match suitable plants with your rain garden needs. You will need to consider sun exposure, soil type, soil moisture retention, and drought resistance when selecting plants.

### Rain Garden Benefits

A rain garden can be your personal contribution to cleaner water, healthier wildlife, and an improved environment for you and your community. Each rain garden may seem small, but collectively they produce substantial environmental benefits.

#### Rain gardens benefit us by:

- Increasing the amount of water filtering into the ground. This recharges groundwater and helps reduce the amount of pollutants washing off into lakes and streams;
- Helping to sustain adequate flows in streams during dry spells;
- Providing valuable wildlife habitat;
- Enhancing the beauty of your yard and the neighborhood;
- Protecting communities from flooding and drainage problems;
- Protecting streams and lakes from damaging flows that cause bank erosion;
- Reducing the need for costly stormwater treatment structures.

## Resources:

### Rain Garden Design:

- Chesapeake Ecology Center  
[tinyurl.com/39u6gml](http://tinyurl.com/39u6gml)
- RainScaping.org  
[www.rainscaping.org/](http://www.rainscaping.org/)
- Low Impact Development Center  
[www.lowimpactdevelopment.org/raingarden\\_design/index.htm](http://www.lowimpactdevelopment.org/raingarden_design/index.htm)
- Wisconsin Department of Natural Resources  
[tinyurl.com/y8m6r2n](http://tinyurl.com/y8m6r2n)
- Iowa Stormwater Partnership  
[tinyurl.com/7f4o79c](http://tinyurl.com/7f4o79c)

### Native Plant Guides:

- U.S. Fish & Wildlife Services  
[www.nativeplantcenter.net/guides/chesapeakenatives.pdf](http://www.nativeplantcenter.net/guides/chesapeakenatives.pdf)
- Mountain Region Guide:  
[tinyurl.com/c7pf2h2](http://tinyurl.com/c7pf2h2)
- Piedmont Region Guide:  
[tinyurl.com/cml7zdj](http://tinyurl.com/cml7zdj)
- BayScapes Program  
[tinyurl.com/ctw7g2e](http://tinyurl.com/ctw7g2e)

## Constructing a Rain Garden

Key steps in the process include choosing a location, sizing, designing the garden, checking for utility lines, installing the garden, and maintenance. You might decide to do all or some of the steps yourself, or you might select a professional landscaper to help.

**1. Choose a location.** There are several ways to choose a rain garden location. Low-lying areas that collect water or areas that stormwater usually travels across can become rain gardens. Other options include constructing a garden that collects runoff from a parking lot or redirecting flow from gutter downspouts to a garden. Keep the rain garden about 10-15 feet from buildings.

**2. Determine soil type, size, and depth.** Determine whether your soil is clay, silt, or sand based on its texture. For clay soils in particular, you will probably want to use an amended soil in your garden consisting of 50-60% sand, 20-30% topsoil, and 20-30% compost. If you use amended soil, your garden should be 20-30% of the size of the drainage area. To determine drainage area, multiply the length by the width of your roof, driveway, or other surface draining into your rain garden. Rain gardens can range from 3-12" in depth, depending on the size of the garden. A deeper depth can allow for a smaller area garden. The most important factor to consider is making your garden deep enough to hold rainwater while it soaks into the ground. If your garden is on a slope, make sure to create a berm, or raised section of ground, on the downhill side of the garden. For a more detailed guide to determining soil type, garden area, and garden depth, see p. 11 of Rain Gardens Across Maryland: <https://extension.umd.edu/learn/rain-gardens-across-maryland>.

**3. Creating a site design.** Your rain garden can be any shape that you want. Use native plant guides to select plants appropriate for your garden, based on its exposure to the sun, moisture level, and soil type. Rain gardens installed in Frederick County will need to be adapted to either the Piedmont or Mountain region of the Chesapeake Bay Watershed. For a guide to plant selection by region, see the U.S. Fish & Wildlife Service's guide: [www.nativeplantcenter.net/guides/chesapeakenatives.pdf](http://www.nativeplantcenter.net/guides/chesapeakenatives.pdf).



*This rain garden has an attractive curved shape and brightly colored flowering plants.*

*Image used under Creative Commons from Jim\_Holmes\_OH.*

**4. Check for utility lines and pipes.** Call Miss Utility at 1-800-257-7777 at least one week prior to digging.

**5. Install the garden.** Use a hose or rope to create an outline of your rain garden. Excavate by hand or machine to your pre-determined depth and build a berm using excavated soil if necessary. Fill the area with soil amendment, leaving a few inches for mulch. Remove plants from containers, loosen their roots, and plant them in the amended soil. Follow with a layer of mulch and watering.

**6. Maintenance.** Maintenance for rain gardens is essentially the same as that for other landscaping. Water your garden about one inch per week during dry spells. Replace soil or mulch if it gets washed out by heavy rains. Trim plants, remove dead vegetation, and remove weeds if needed.



*Your rain garden can be as beautiful as you decide to make it. This garden directs downspout water to a simulated stream bed.*

*Image used under Creative Commons from Field\_Outdoor\_Spaces.*



"Tips for Green Leaders in Frederick County" is a publication of the Frederick County Office of Sustainability and Environmental Resources, Office of the County Executive. For more information on this topic and about our programs, visit [www.frederickcountymd/sustainability](http://www.frederickcountymd/sustainability), email us at [sustainability@frederickcountymd.gov](mailto:sustainability@frederickcountymd.gov), or call at 301.600.1416. Sustainable Frederick County is on Instagram, Twitter, and Facebook.