



Essex Region
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How to Create a Rain Garden: A Guide for Homeowners!





Bebb's Sedge
(Carex Bebbii)

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Welcome to Your Guide to Creating a Rain Garden!

This guide is intended to provide homeowners and landscape professionals with the information needed to design and build a rain garden. Rain gardens can be created in four easy steps:

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How to Create a Rain Garden: A Guide for Homeowners!

As urbanized areas grew and replaced forests and wetlands, so did impervious surfaces like asphalt. Water cannot be absorbed through these types of surfaces, so the resultant runoff enters storm sewers and can carry pollutants from streets, parking lots and even lawns into our local streams and rivers, and ultimately, our lakes. Rain gardens are a sustainable, easy way that homeowners can help to manage rainfall and snow-melt, and improve water quality. They are landscaped areas planted with wildflowers and other native vegetation that temporarily retain stormwater runoff from our roofs, roads and lawns. This process is known as bioretention and reduces the volume of water entering our storm sewers and can decrease flooding. Rain gardens are inexpensive, and are easy to create and maintain. In addition to retaining stormwater, they prevent pollution like fertilizers, pesticides, oil and grease from entering our natural watercourses by filtering water through the ground slowly instead of running directly into storm drains.

What is a Rain Garden?

Rain gardens are typically bowl shaped and shallow, with native, hardy, low-maintenance plants. These gardens are created in lower lying areas where water otherwise drains to storm sewers. A rain garden is not a pond or wetland. They are dry most of the time, holding water for brief periods during and after a rainfall and can be an important part of improving a community's water quality.



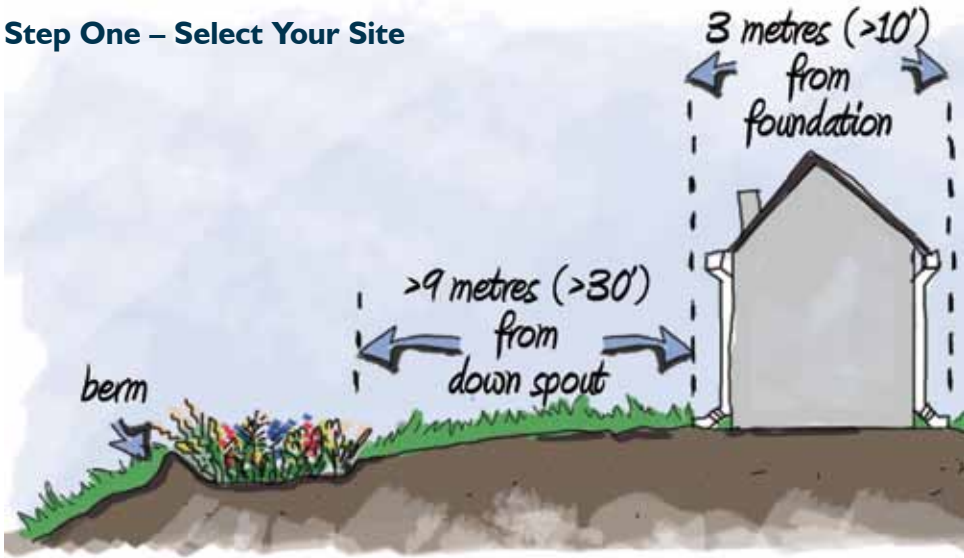
Why Rain Gardens?

- Help protect streams, rivers and lakes from pollutants carried by stormwater runoff
- Help protect communities from flooding
- Increase the amount of water entering the ground, which re-charges aquifers
- Provide habitat for wildlife, such as birds and butterflies
- Beautify your yards and neighbourhood



Rain gardens can protect our water courses from pollutants.

Step One – Select Your Site

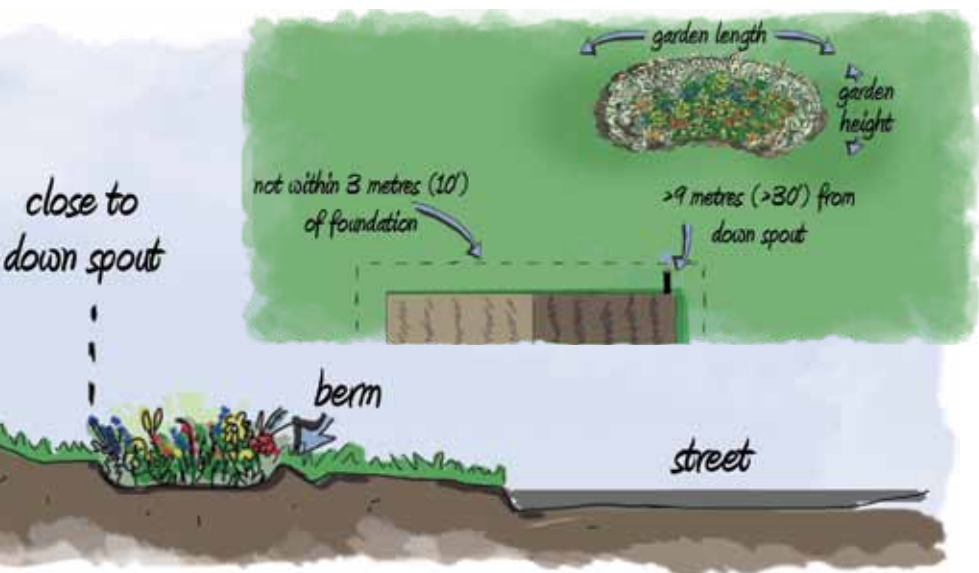


When selecting the location of your rain garden, keep in mind that:

- Your garden should be in a lower lying area
- The size and depth of the garden are based on the drainage area, land use, soil type and how fast water can seep through the soil
- It's generally ideal to create your rain garden near a drainage area
- Drainage areas can often include your roof, lawn, driveway and some times the sidewalk
- Rain gardens should not be placed directly over a septic system or in an area where water already ponds
- Rain gardens should receive full or partial sunlight
- Digging will be easier if the garden is created where the yard is flat
- Rain gardens should be located at least 3 metres (10 feet) from the house

Step Two – Test Soil

When designing your garden it is important to remember that the type of soil influences the rate at which water can seep through the soil. For example, water filters faster through sandy soils than clay soils. This means that gardens with clay type soils need to be larger to be as effective, and may require augmentation with sand for faster infiltration.



The following tests can ensure your soil is suitable for a rain garden:

Test 1:

Dig a 15 centimetre (6 inch) deep hole where you plan to build your rain garden and fill it with water. The water should soak in (in less than 24 hours), otherwise, the soil is not suitable.

Test 2:

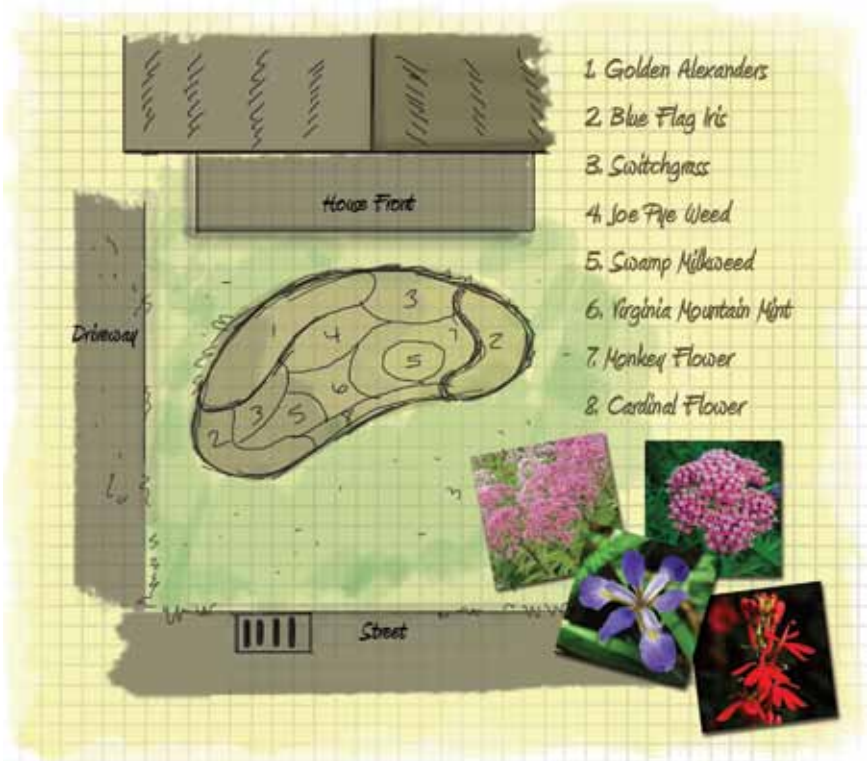
Dampen a handful of soil with a few drops of water, knead the soil in your fingers and squeeze it into a ball. If it remains in a ball, work the soil between your forefinger and thumb, squeezing it upward creating a ribbon of uniform thickness, allowing the ribbon to emerge and extend over your forefinger. The soil is not suitable if it forms a ribbon more than 2.5 centimetres long (1 inch) before breaking. Also, the soil should feel gritty rather than smooth.

If your site is mostly clay, you should look elsewhere on your property to build. However, if your options are limited, you can augment the rate of filtration by mixing in sand. The degree to how much is fairly subjective and differs on a site to site basis. However, once you mix in some sand, you should conduct the soil test again to ensure that water soaks in within 24 hours. Continue to mix sand with your soil until this infiltration rate is achieved.

Step Three – Design Your Garden

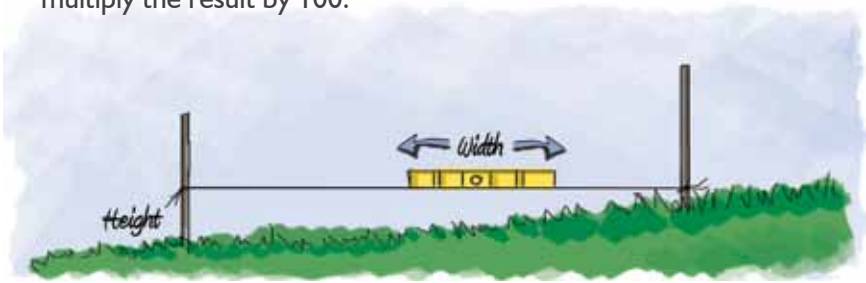
The size of your rain garden is entirely up to you. However, the effectiveness of your garden may depend on its size. Large rain gardens will take more time to maintain and money to complete, but will be more effective for capturing runoff. However, relatively small rain gardens can still capture stormwater and improve water quality. Here are a few general guidelines to consider when designing your rain garden:

- Typically, residential rain gardens are between 10 to 30 square metres (100 to 300 square feet) and 10 to 20 centimetres (4 to 8 inches) deep
- More roof and lawn surface area will typically result in more runoff
- It is important to keep the garden level for optimal filtration
- The slope of your lawn should determine the depth of your rain garden



The slope of your lawn can be determined by following these steps:

1. Place one stake at the uphill end of the rain garden site and place the other stake at the downhill end. The stakes should be approximately 4.5 metres (15 feet) apart.
2. Tie a string to the bottom of the uphill stake and run it to the downhill stake.
3. Using a carpenter's level, make the string horizontal and tie it to the downhill stake at that height.
4. Measure the width between the two stakes.
5. Measure the height on the downhill stake from the ground to the string.
6. To find the lawn's percent slope, divide the height by the width and multiply the result by 100.



- If the slope is less than 4%, build a rain garden that is approximately 7 to 14 centimetres (3-6 inches) deep.
- If the slope is 5-7%, build a rain garden that is approximately 15 to 18 centimetres (6-7 inches) deep.
- If the slope is 8-12%, build a rain garden that is approximately 20 centimetres (8 inches) deep.

Next, determine the approximate area that will drain to the rain garden; the size of the rain garden should be proportional to the size of the drainage area. For gardens 'close' to the house (<9 metres (30 feet) from a downspout), most water will come from the roof downspout. Estimate the percentage of the roof that feeds that downspout. Then multiply your home's footprint (the area of the first floor) by that percentage to determine the drainage area.

Terry's house is 18 metres by 12 metres (60 feet by 40 feet), so the roof area is 216 square metres (2400 feet²). He estimates that the downspout collects water from 25% of the roof, so he multiplies 216 by 0.25 to get a downspout drainage area of 54 square metres (600 feet²).

Roof Area: $18\text{m} \times 12\text{m} = 216\text{m}^2$ (2400 feet²)

Drainage Area: $216\text{m}^2 \times 0.25 = 54\text{m}^2$ (600 feet²)

Conversely, for a rain garden that is 'far' from the house (>9 metres (30 feet) from a downspout), the lawn will also drain into the garden. To calculate the cumulative draining area, the lawn area must be added to the roof area. Generally, the surface area of your garden should be about 15% of the cumulative drainage area.

Terry's lawn is 9 metres by 9 metres (30 feet by 30 feet), or 180 square metres (900 feet²). This means that the total drainage area for his garden is 234 square metres ($180\text{m}^2 + 54\text{m}^2$) or 1500 feet² ($900\text{ft}^2 + 600\text{ft}^2$). To calculate the approximate surface area that his rain garden should be (about 15% of drainage area), he multiplies by 0.15.

Approximate Rain Garden Surface Area: $234\text{m}^2 \times 0.15 = 35\text{m}^2$

Finally, you must determine the dimensions of your rain garden. To do this, simply choose a garden width that best suits your property and landscaping. Next, divide the surface area of your garden by the garden width to determine the garden's length. As for shape, crescent, kidney and teardrop shaped gardens are effective.

Step Four - Dig & Plant

Call before you dig!

Ensure that you utilize the services of Ontario One Call before you dig. Think about what services might be buried in the ground, such as gas pipelines, electrical services, telephone and cable TV as well as water and sewer connections. In addition to these types of buried services to your home, there could be distribution networks for utilities that serve your neighborhood and community. In some cases, such as pipelines and fiber optic cables, they may even be part of a national feeder route.

Damaging underground services can have serious consequences. Locates are conducted free of charge by contacting Ontario One Call at **www.on1call.com** or by phone at **1-800-400-2255**. Allow five full working days for locates to be completed.

Once your services are marked, use stakes and string to mark the outline of your garden. Level out the garden as much as possible by placing soil from the uphill side onto the downhill side. Use any remaining soil to create a berm on the downhill edge, which will deter water from flowing across the surface of the garden. If you're creating a garden on a fairly steep slope, additional soil may be brought in to create the berm.



Plant Selection

When selecting which plants to include in your rain garden, you should consider soil type and sunlight levels. Native plants are typically hardy and require little maintenance while being highly adaptable to a variety of soil and light conditions. Furthermore, most native plants are relatively inexpensive and perennial, which means they will come back each year. In addition to helping improve water quality, native plants are also very beautiful and provide important habitat, nectar sources, and hosts for a wide variety of pollinators, including butterflies, hummingbirds, and native bees. Avoid planting non-native species, particularly invasive exotic plants, as they out-compete native plants and threaten biodiversity. A list of plant species native to our region is included in a handy tear-out sheet on page 10.

It is important to use plants that have a well established root system, so try to purchase one or two-year-old plants. Plan where each plant will go and, before digging, lay out the plants as planned. Plants should be planted one foot apart in a grid pattern. Dig each hole twice as wide as the plant plug and deep enough to keep the crown of the young plant level with the rest of the garden. Spread double-shredded mulch evenly over the garden, approximately two inches thick, but avoid burying the crowns of the newly planted plants (mulching is not usually necessary after the second growing season). Sticking plant labels next to each grouping will help you differentiate young native plants from non-desirable species when weeding.

Generally, plants need one inch of water each week. You should water the plants immediately after planting and then continue to water twice a week (unless rain does the job) until the plugs are established. Once the plants are established, you should not have to continue watering. You can plant anytime during the growing season as long as the plugs receive adequate water.

Creating a rain garden is simple! You need only these tools:

- Tape Measure
- Rake
- Wooden Stakes
- Carpenter's
- Shovel
- Trowel
- String
- Level

Native Plants (Essex Region)



Bebb's Sedge
(*Carex bebbii*)



Black-eyed Susan
(*Rudbeckia hirta*)



Blue Flag Iris
(*Iris versicolor*)



Blue Lobelia
(*Lobelia siphilitica*)



Boneset
(*Eupatorium perfoliatum*)



Cardinal Flower
(*Lobelia cardinalis*)



Common Rush
(*Juncus effuses*)



Culver's Root
(*Veronicastrum virginicum*)



Helen's Flower
(*Helenium autumnale*)



Joe Pye Weed
(*Eupatorium
purpureum*)



Monkey Flower
(*Mimulus
aurantiacus*)



New England Aster
(*Symphyotrichum
novae-angliae*)



Path Rush
(*Juncus tenuis*)



Swamp Milkweed
(*Asclepias incarnata*)



Switch Grass
(*Panicum virgatum*)



Turtlehead
(*Chelone obliqua*)

For a complete list of native plants visit:

www.erca.org/wp-content/uploads/2013/01/native_plants_essex_region.pdf

Frequently Asked Questions

Will a rain garden form a pond?

No. If properly designed, the rain garden should hold water for a maximum of 48 hours. Rain water should soak into the ground so the garden is dry between rainfalls. However, a rain garden can be designed to contain a pond feature, if desired.

Will a rain garden encourage mosquitoes?

No. Mosquitoes need standing water for 7-12 days in order to reproduce; a rain garden should not contain water long enough for mosquitoes to complete this process. A bird bath or storm sewer is more likely to result in mosquitoes than a sunny rain garden! Rain gardens should reduce the incidence of standing water and can attract beneficial insects, such as dragonflies, which eat mosquitoes.

Are rain gardens difficult to maintain?

No. Since rain gardens use native plants, they do not require fertilizer or pesticides. Your garden might require extra water during the dry season, weeding during the first few years as it becomes established and possibly thinning as it matures.

Are rain gardens expensive?

Rain gardens can be done on any budget. The main cost of a rain garden is purchasing the plants - however, some native plants could possibly be already in your yard or donated from a neighbour. Make sure to properly identify plants before transplanting to avoid spreading invasive species. Also do not take plants from existing natural areas. The only other costs are mulch and, if necessary, additional soil.



Final Considerations

Creating a rain garden will bring beauty to your yard while controlling stormwater runoff and improving local water quality. A network of rain gardens within a community can have cumulative effects. The result is significantly lower pressure being placed on stormwater sewers and water treatment plants, which ultimately results in lower operating costs and a cleaner environment.

This manual is meant to serve as a guide, but not as a list of rules for creating rain gardens. Property owners should feel empowered to be creative when designing their rain garden. For more information on rain gardens, including sizing and plant selections, contact:

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References

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