

# A Rain Garden How to Manual for Homeowners

2024



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*This project was undertaken in connection with the settlement of an enforcement action by the United States and the State of Indiana concerning Combined Sewer Overflows.*

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## 1.0 Introduction

The “Catching Rain Fort Wayne” Green Infrastructure Initiative is intended to help members of the Fort Wayne community learn about the impact that each one of us has on water quality, and how we can improve it by implementing natural processes or techniques that mimic nature.

Our landscape has changed significantly over the past hundred years. Urban and suburban development continues to alter the natural landscape that historically defined our region. Increasing amounts of rooftop, roadway and other paved surfaces, and the introduction of non-native plants have led to an increased amount of stormwater runoff. More runoff means more pollution is carried into our waterways because we have reduced nature’s ability to infiltrate – or soak – rain water runoff into the ground.



Source: Cuyahoga SWCD

Rain gardens can be an important way to reduce water pollution caused by increased stormwater runoff that carries surface pollutants into storm sewers and then into streams and other water bodies. Rain gardens can also help to reduce the amount of stormwater that enters storm sewers and the combined sewer system, causing sewage to be discharged to our rivers during wet weather. Finally, rain gardens may help to address some drainage issues on public and private property.

Rain gardens are man-made landscape features where stormwater runoff is allowed to collect and pond for a short period of time. Native perennial plants are typically used in a rain garden because they are hardy, they come back from year to year and they can actually help filter some pollutants out of rain water runoff while their roots help water soak into the ground naturally. Planting a rain garden is like returning a little bit of your property to its natural state.

### 1.1 Purpose

This manual is intended to provide basic information about rain garden planning, planting and maintenance. It is meant to be used as a workbook for and supplement to the homeowner how to workshops and Fort Wayne’s Development Criteria Standards Manual Supplement: General Guidance for Rain Garden Design.

In addition to helping you decide on a location and size for your garden, this manual has tips for plant selection and discusses how to maintain the garden after it is planted.

## 1.2 Why Rain Gardens Matter

As Fort Wayne grows, new development continues to replace green space with impervious surfaces such as rooftops, paved streets and parking lots. Impervious areas don't allow water to soak – or infiltrate – into the ground, so they contribute to stormwater runoff. Even the construction activity on developing sites can compact the ground, limiting its capacity to absorb water.



Stormwater runoff coming from developed areas is a significant source of pollution. The runoff from rain, and even melting snow, can carry contaminants into streams, lakes and rivers. Water pollution can be traced to our own homes and yards. One inch of rain falling on a modest home on a small lot may generate over 1,000 gallons of runoff. As water runs off the roof, driveway, patio and even the lawn, it picks up contaminants such as fertilizer, pesticides, bacteria from pet waste, grass clippings and other

yard debris. One of the ways you can help to keep these pollutants out of our rivers and streams is by planting a rain garden to reduce runoff.

Stormwater runoff has another significant impact in parts of the City of Fort Wayne. The amount of stormwater that goes into some of our sewers can cause sanitary sewage to be discharged into the St. Joseph, St. Mary's and Maumee Rivers. The oldest third of Fort Wayne has a combined sewer system. When it is not raining, these sewer pipes carry sanitary sewage to the Water Pollution Control Plant for treatment. But when it rains these same pipes must carry stormwater runoff, too. The combined sewer system can become overloaded when it rains resulting in sewer overflows to the rivers. Rain gardens can help reduce the amount of stormwater going into these combined sewers so that less sewage is likely to be discharged to the rivers when it rains.

## 1.3 What is a Rain Garden?

A rain garden is an attractive, landscaped area that is built at a level slightly below the level of your yard. This depression is designed to capture rain water runoff from impervious (hard surface) areas such as rooftops, roads, sidewalks, driveways and even lawns. Rain gardens are planted with perennial native plants that are selected to tolerate the cycles of rainfall and dry weather that we have here in Northeastern Indiana. The roots of the plants help the soil soak



White Coneflower and Purple Coneflower

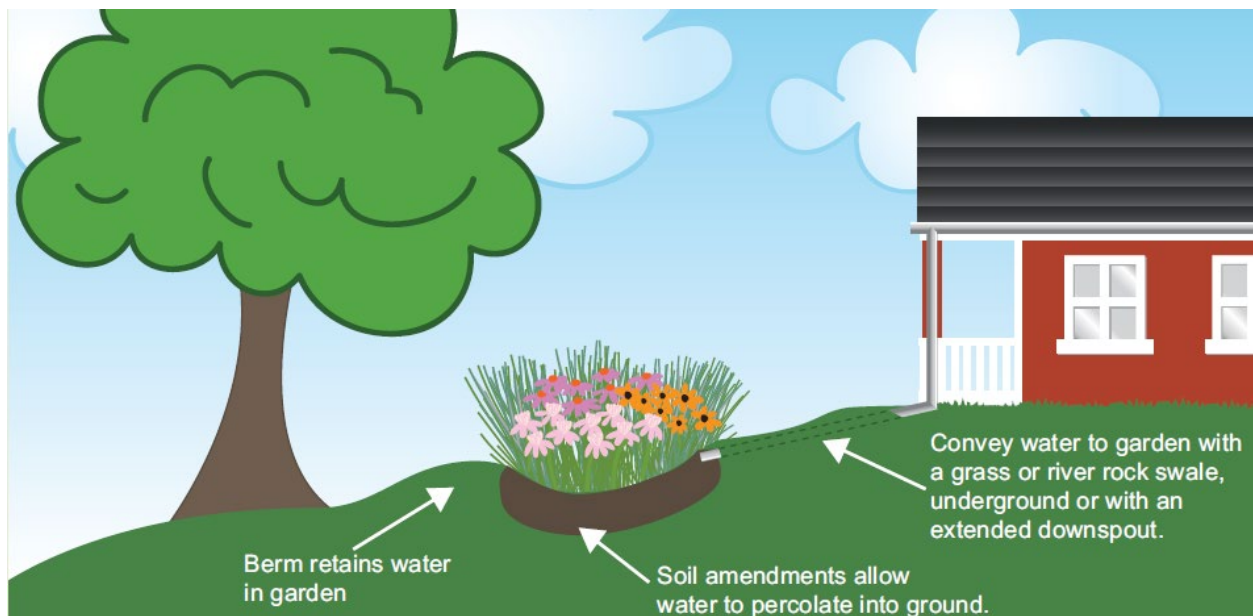
up more water when it does rain, so the amount of stormwater runoff is reduced. The runoff leaving your lot flows more slowly. This helps to prevent soil from eroding. The plants in the rain garden also help to clean the water by filtering out some chemical pollutants from stormwater before it goes into local streams and rivers. Rain gardens may sometimes be used to address yard drainage problems and may help recharge supplies of ground water.

In addition to helping control rain water runoff and the pollutants it can carry, rain gardens are also an attractive addition to a landscaping plan for a yard or community. Rain gardens provide habitat and food for birds and butterflies. Plants may be selected so that the rain garden has a variety of colors, textures and heights. Plants can be chosen to bloom throughout the spring, summer and fall. Your rain garden can also provide you with a connection to nature in your own yard and a serene escape from a hectic world.



Designing and installing a rain garden is not difficult. However, there are some basic design principles that can help ensure a successful and attractive rain garden. A rain garden is typically situated at a lower elevation than your home. If your rain garden is constructed on a slope, it is important to guide the water using a feature like a swale or downspout. Additionally, a berm should be incorporated to retain the water that is directed towards your rain garden. The figure below gives a visual representation of the profile of a typical rain garden (Figure 1). Within this booklet you will find sample rain garden plans, lists of suggested plants and guidelines for maintenance. Consider this manual to be your step-by-step guide through the process of building an attractive and functional rain garden on your property.

**Figure 1: Profile of a Typical Rain Garden**



## 2.0 Technical Training

### 2.1 Location and Placement Guidelines



A rain garden can work virtually anywhere. The location, size and effectiveness depends on the amount of runoff going into the garden, the soil type and the plants that are used. Areas along driveways or sidewalks and areas that receive runoff from a downspout may be ideal spots for a rain garden, but you can also consider using a corner of your yard as a rain garden location.

A sandy soil or soil high in organic matter is best suited for a rain garden, BUT rain gardens will work in clay soils, too. Much of Northeastern Indiana is comprised of clay soil -- soil that has very tiny particles and is easily compacted. There are ways to accommodate areas with clay soils to make them suitable as rain gardens.

When selecting a location, keep the following in mind:

- Locate the rain garden where it will collect the largest possible amount of rain water runoff from a downspout or hard surface area.
- Look for a natural depression (low spot) in the yard by finding where water already collects on the property or where the runoff flows. Locate the rain garden up the slope from the low spot to interrupt the flow path and divert water. This will help reduce flow to that area and reduce ponding of water in your yard.
- Don't place the rain garden where water already stands. It is best to capture the runoff before it gets to the low spot.
- Place the rain garden a minimum of 10 feet from your house or building to prevent water from being drawn to the foundation or basement.
- Rain gardens should not be placed over or near the drain field of a septic system or within existing drainage ways, such as a ditch or swale.
- Rain gardens should not be installed near large trees. Trees have extensive root systems that could be damaged as you dig the rain garden. Also, some trees may not be able to tolerate the extra moisture being held by the rain garden.
- If downspouts don't naturally flow to the area where you plan to locate the rain garden, consider creating a swale or using a buried plastic pipe as a way to route the water to the rain garden location (see Section 2.2.5).
- Place the rain garden downhill from the driveway in order to collect rain water runoff





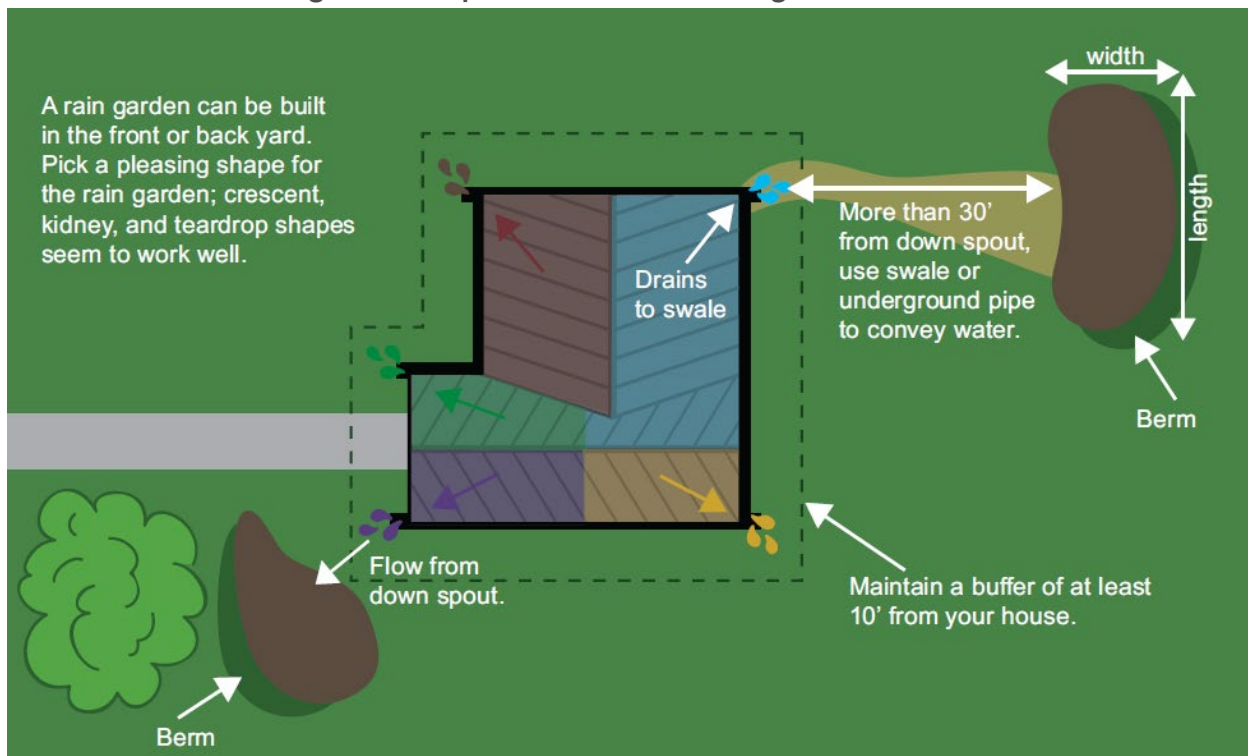
from it.

- If you live in a subdivision with an active neighborhood association, it may be a good idea to check with the association president or board before you install a rain garden to be sure that your plan does not conflict with the neighborhood covenants or zoning regulations. You may find that your neighborhood association will want to get involved in the rain garden program, too.
- Don't locate your garden in an area that may be part of the public right-of-way or in a utility easement without getting permission first.
- Think about where the water will go when your rain garden fills up and overflows. Be sure the overflow does not go toward your foundation or onto a neighbor's property.
- At least 48 hours before you dig, find out where underground service lines or utilities are located. "Call Before You Dig" – (800) 382-5544 or just 811. Learn more at [www.call811.com](http://www.call811.com).



The illustration below can help you determine possible locations for a rain garden on your property (Figure 2).

Figure 2: Sample Site Plan for Locating a Rain Garden



## 2.2 Sizing and Shaping the Garden

A rain garden can be almost any size and shape. A typical residential rain garden usually covers an area between 80 and 300 square feet.

To determine the optimal size for your rain garden, you'll need to consider how much water will be directed into the garden, the kind of soil you have and how deep the garden should be. In this section, you will learn to:

- Calculate the drainage area (section 2.2.1)
- Determine appropriate depth (section 2.2.2)
- Determine garden size (section 2.2.3)
- Decide rain garden shape (section 2.2.4)
- Route water to the garden (section 2.2.5)

### 2.2.1 Calculate the Drainage Area

In order to determine how much water will go into your rain garden, you will need to determine the size of the area that will drain to it (Figure 3). A rain garden design worksheet is available as [Appendix A](#) to assist in calculating the drainage area.

If the rain garden is close to a house or building, most or all of the water going into the garden may come from the rooftop. You will need to measure the rooftop area. You don't need to climb onto the roof to do this. There is an easy and accurate way to estimate the rooftop area:

1. Measure the length and width of the house or building (in feet) then multiply the numbers together to determine the approximate area that the house covers. This estimate of the footprint of the building is approximately equal to the size of the roof, in square feet.
2. Count the number of downspouts on the home or building.
3. Divide the roof area (as calculated in #1 above) by the number of downspouts. This will tell you approximately how many square feet of rooftop drain to each downspout.
4. Determine how many downspouts you will route to your garden. Multiply this number by the number of square feet calculated in step #3. This will tell you how many total square feet of roof area will drain to the garden.



If the rain garden will be located more than 30 feet away from the house or building and downhill from another hard surface (impervious) area such as a driveway, follow these steps to calculate the drainage area going to the garden:

1. Stand where the garden will be located and look around you to see what part of the lawn

or impervious area slopes toward you.

2. Use your garden hose or a string to encircle the area that appears to slope toward the garden spot. Move the hose or string to make a square or rectangle that generally covers the drainage area.
3. Measure the length and width of the square or rectangle and multiply these numbers. The result is the square footage of the contributing area of lawn and/or other impervious surface that will drain to the garden.
4. Add the square footage you just calculated to the rooftop area that will drain into the garden. This is the total drainage area. You will use this number when determining the rain garden size in Section 2.2.3.

Figure 3: Determining Drainage Area



Note: Depending on your soil type, you may need to make your rain garden larger to accommodate the water going to it. Check with City Utilities for more information.

## 2.2.2 Determine the Rain Garden Depth

A typical rain garden is between four and eight inches deep, but they can be deeper. Making the garden deeper may cause water to stand for too long. If the garden is shallower, it will need to be larger to hold the same amount of rain water runoff.

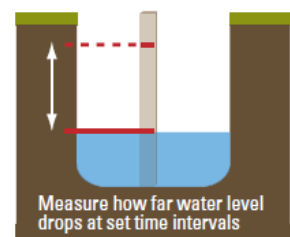
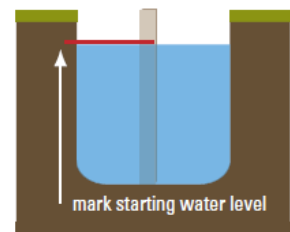
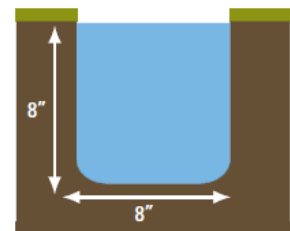


In Northeastern Indiana, you will want all of the water in the garden to be absorbed into the ground (infiltrate) within one or two days. This will reduce the chance that mosquitoes will breed in the garden and will help ensure that your plants survive. To determine how much water your rain garden can absorb and how deep it should be, you will need to conduct an infiltration test (Figure 4). The test described here will tell you the maximum depth of water that the garden will absorb in 24 hours.

1. Dig a hole about the size of a gallon jug -- approximately eight inches across and eight inches deep. Dig the hole in the area where you plan to locate the rain garden.
2. Remove any loose dirt from the hole, and then fill it to the top with water.
3. Let the water soak in for a minimum of two hours so that the soil around the hole becomes saturated. The hole does not have to drain completely.
4. Fill the hole with water again.
5. You will need to measure how much the water level drops in a given period of time. Put a stick, stake or paint stirring paddle into the bottom of the hole so that the stick is standing up and extends above the top of the hole. Mark the beginning water level on the stick.
6. Note the time that you begin the test.
7. Check the hole after 24 hours. Use a ruler to measure how much the water level dropped.
8. If the hole drains completely in 24 hours, the deepest part of your garden may be as deep as the hole was, but this depth is not required.

A quicker but slightly less accurate way to perform the infiltration test is to follow steps 1 through 6 above. Instead of waiting for 24 hours as described in step 7, check the hole after six hours. Measure how much

**Figure 4:  
Infiltration Test**



the water has dropped. If the water dropped one inch in six hours, you can expect that four inches of water will be absorbed in 24 hours. So you can make the deepest part of your garden about four inches deep. This will provide you with the most flexibility in selecting plants because they typically will not be standing in water for more than a few hours. Remember that the longer you allow the infiltration test to run, the more accurate your result will be because infiltration tends to slow after the first few hours.

You will want the water that goes to the garden to absorb in one or two days. Therefore the infiltration rate per day that you observed in the test will determine the maximum depth for your garden. On properties with very good drainage -- for example where the home used for the infiltration test drained completely in 24 hours -- the garden may be built shallower than the test would indicate. If an eight inch deep hole drains completely in 24 hours, the deepest part of the garden could be eight inches deep or it could be shallower. The garden should not be any deeper than indicated by the infiltration test. If the test shows a slower infiltration rate, you may need to make the garden more shallow, but larger.

### 2.2.3 Determine the Rain Garden Size

The size of the rain garden, also known as its area (length x width), will depend on how much space you have available and how much rain water runoff you want to capture in the rain garden. A common approach is to size the rain garden so that it will hold the water that will come from the drainage area (determined above) during a one-inch rain fall. This is not an absolute rule because the amount of space you have available may ultimately determine the size of your rain garden.

To calculate the rain garden size:

1. Divide the number of inches of rainfall that you plan to capture by the depth of the deepest part of the garden (determined in Section 2.2.2). One inch of rainfall capture is a good rule of thumb.
2. Next multiply the result by the drainage area that you calculated in Section 2.2.1. The result is the optimal square footage of the garden.

For example, if the base of your house measures approximately 60 feet across the front and is 30 feet from front to back, the square footage of the roof is approximately 1,800 square feet. If you have four downspouts and only one will be directed to the rain garden, the drainage area will be about a fourth of the roof (or about 450 square feet). If you want to capture one-inch of rain from 450 square feet of drainage area in a garden that is four inches deep, you will need to have a rain garden that is about 113 square feet.

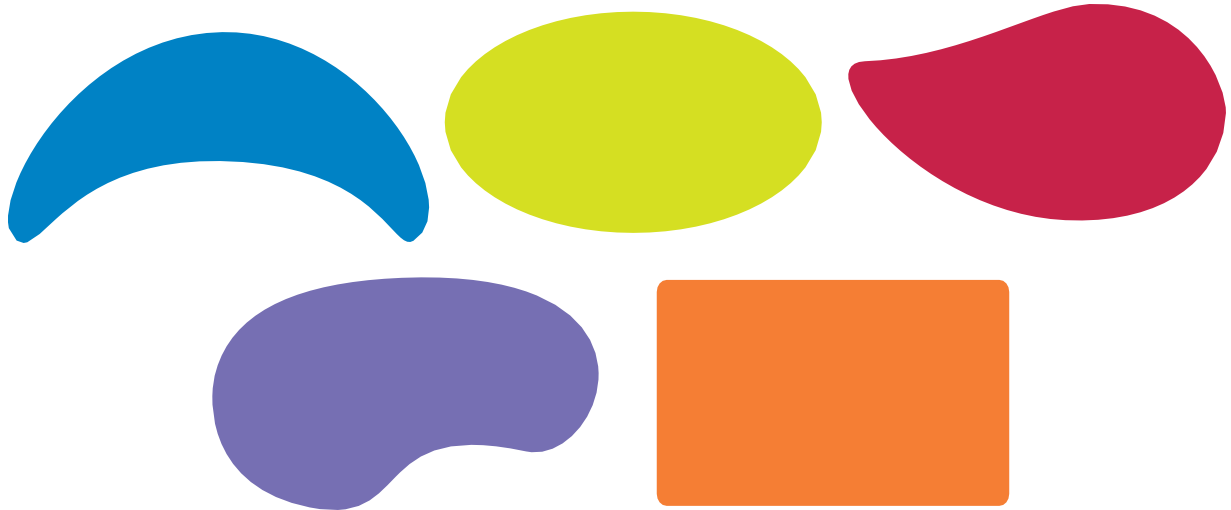
$(1'' \text{ rain} \div 4'' \text{ deep}) \times 450 \text{ sq. ft drainage area} = 112.5 \text{ sq. ft rain garden}$

*A typical rain garden size is about 80 to 300 square feet. A rain garden of that size will hold about the amount of water that comes from one residential downspout in a one inch rainfall.*

## 2.2.4 Shape

Rain gardens can take a variety of shapes like the ones shown below. Crescents, ovals, teardrops and kidney shapes are popular, but the shape of your garden will be determined primarily by the space you have available, the location and your preferences.

Once you have determined the appropriate size for your garden, you should choose a shape that best fits your yard and existing landscaping.



To help you shape the garden, mark the perimeter by placing stakes, string or even a garden hose along the edge of where you want the rain garden to be. Doing this will provide a defined area that you will dig and it will also allow you to better visualize the final size and shape of the rain garden. **This is the time to make changes, before you start digging.**



## 2.2.5 Routing Water

If your rain garden will be located more than 30 feet from the home, you may need to plan and construct an arrangement to route water from a downspout to the garden. Although it sounds elementary, remember that water flows downhill, so plan your garden downhill from the water source. Keeping this principle in mind, there are several options for routing runoff from its source to your rain garden:

- Water can be routed to your rain garden through a grassy swale (or a flat grassy channel) that will slow down the water and spread it out as it travels to the garden. This allows for some additional infiltration of the water.
- You can create a creek bed feature or a small waterfall using a rock-lined channel. This can create an attractive “babbling brook” when it rains and can slow down the water going into the garden, dissipating some of its force. A rocky channel requires little maintenance.
- Another option is to use a plastic downspout extender to connect a downspout to the rain garden. If this kind of direct connection is made, almost all of the water coming from the downspout will go directly into the garden, so the garden must be sized correctly. A 4-inch plastic downspout extender can be used effectively and can either be placed on top of the lawn or be buried. If the extender is buried, the plastic should discharge water at the lowest point in the garden.
- Regardless of how the water is routed, some kind of diffuser should be used at the point where the water enters the garden so that plants in the immediate area will not be washed out by the force of the water and to prevent erosion. River rocks make an attractive diffusion structure.



## 2.3 Plant Selection and Garden Design

### 2.3.1 Plant Selection

Native plant species are recommended for use in a rain garden. These plants have dense and deep growing root systems so they will help more water soak into the ground. Because they are native to this area, the plants recommended in this manual are adapted to growing conditions in Northeastern Indiana. Once they are well established, these rain garden plants will withstand both frequent dry conditions and periods of time when they may be standing in water. Also the

plants suggested here are perennials, which means they will come back from year to year. The flowering plants will produce blooms for many years into the future.

There are potentially more than 100 plants native to the area that can be used in a rain garden. [Appendix B](#) provides a list of several common native perennial plants that would do well in rain gardens in Fort Wayne. [Appendix C](#) and [Appendix D](#) provide more extensive plant lists in which hearty native species are listed. There may be other plants with similar names or plants that look similar, but those could be hybrids that need special care or plants that are not perennials in our climate. Consider choosing the plants that are listed in this manual, or talk with professionals at local nurseries or local master gardeners for additional plant possibilities.



We recommend that plants or plugs be used to establish and delineate your rain garden plant layout, as opposed to establishing your rain garden from seeds. If you will be planting established plants (also known as plugs) you will need one plant for every two and a half square feet. To decide how many plants you will need, divide the square footage of your rain garden by 1.5. For example, if your rain garden will be 75 square feet, you will need to purchase approximately 50 plants.

Before selecting plants for your garden, consider how you might want the garden to look at various times of the year. You may want to select plants that will bloom at different times so that you can have color in the garden from spring to fall. You may want a riot of color or you may want to limit the garden palette to just a few complementary or contrasting colors. Certain plants are known for attracting butterflies, hummingbirds or other wildlife. It may be worth doing some research before buying plants to be sure you are getting plants that will give the garden the look that you want to achieve.

Every plant has its own optimal growing conditions. The following sections can help you select plants and lay out a garden design that will maximize growing conditions to create a vibrant and beautiful mixture of looks for your rain garden.

**Aggressive Plants:** None of the native plants listed in this manual are “invasive species” but some will spread aggressively. An unofficial definition of an invasive species is a species that does not naturally occur in a specific area and whose introduction does or is likely to cause economic or environmental harm or harm to human health. Because they are not native to the area, invasive species do not have natural predators to keep their growth in check. Also, they spread very rapidly, so they crowd out native species.



The plants recommended in this manual are all native to the upper Midwest, but some of the plants may grow more aggressively than others by reseeding themselves or extending their roots. In our area New England Aster is a very aggressive plant and may push out other plants. Some plants are aggressive but will just fill in empty spaces in the garden. When selecting plants for your rain garden, ask at a nursery or check the web sites listed in the Resources section to learn more about plants that may spread aggressively.



### 2.3.2 Rain Garden Layout

The options for rain garden designs are unlimited. As a starting point for your own rain garden design, [Appendix A](#) shows detailed local rain garden plans for a variety of gardens using the recommended plant list. These plans divide the garden into zones based on plant size and water tolerance and provide a good starting point if you have a bit of gardening experience. The zones are described below. If you are an experienced gardener, or as your knowledge grows, you may want to create your own rain garden designs. You can be adventurous with your plant selections while keeping in mind that different plants have differing needs for sunshine and soil drainage. Don't be afraid to try out ideas until you find the right mix for your individual rain garden. Like most gardens, a rain garden may always be a work in progress.

The sample rain garden layouts provided in this manual group plants with height, color and bloom in mind. Native plants are a natural choice for rain gardens because their deep roots make it easy for water to move down into the soil. These plants are low maintenance, reduce runoff and enhance air and water quality. Many native plants tolerate short periods of standing water and are also drought tolerant so they can withstand pooling during a rain storm and don't need to be watered as often. These plants live longer than non- native species because they are winter hardy and are less prone to insect damage and disease. Additionally, fertilizer should not be necessary in a rain garden planted with native plants.

When selecting plants and choosing a layout for a rain garden it is important to pay close attention to the following factors:

- The water tolerance and requirements of the plants. Plants that like saturated or moist soil conditions should be placed in the deepest section of the rain garden (typically the center). Plants that prefer average conditions may be planted around the sides of the rain

garden. Plants that prefer dry soil conditions should be located around the top edges or front of the rain garden.

- The amount of sun exposure the rain garden will receive and sun preferences of plants. Most plant books or catalogues will provide sun/shade guides for plants.
- The blooming period, bloom color and non-bloom color of the plants. Choose a mix of plants that will bloom in spring, summer and fall to provide flowers throughout the growing season. Choose plants with varying colored blooms and distribute colors evenly to create interest. Remember that plant foliage and stems can provide color interest even when the plants are not in bloom.
- The height/size of each plant. Plants that are very tall or wide may cover or shade smaller plants. Stair-step plant heights with the tallest in the back and shorter plants toward the front.
- By providing nectar, berries, seeds and shelter, certain plants may attract wildlife such as birds, rabbits, squirrels, deer, butterflies and other insects to the rain garden. When choosing plants, consider what wildlife you want to attract.



### **“DON’T OVERCROWD ME”**

Be careful not to space plants too close. The gaps between plants will fill in over time.

**Plants and salt:** Salt used to melt ice causes the most damage to plants if it is splashed on them or clings to the leaves and stems while the plants are growing. The perennial plants in your garden will be mostly dormant during the winter, so salt damage to the plants themselves is not very likely. Also, if most of the rain water going to your garden comes from your roof, you won’t need to worry about the salt tolerance of plants.

If your garden will receive runoff from a driveway, sidewalk or roadway that is heavily salted in winter, you can choose a garden location and select plants to reduce the chance of salt damage. Heavy clay soil may retain salt. If you have clay soil, consider choosing plants with a higher salt tolerance. Your nursery or garden center can advise you on plant selection. Another option is to locate and design your garden to minimize the salt that gets into it in the first place. Consider leaving a grass strip between your garden and the driveway or roadway that drains into it. This will allow the grassy area to filter out some of salt before the rain water runoff or snow melt gets to your garden. If you have very sandy soil most of the salt will be flushed through the garden before plants start growing in the spring.

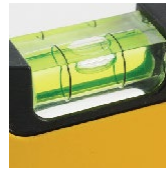
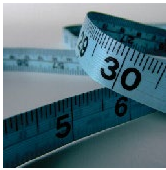
## 2.4 Building the Rain Garden

Once the size and location of the garden has been determined, it’s time to start building the rain garden. The following sections describe the needed tools, rain garden shapes, routing water to the rain garden, how to remove existing lawn turf, digging and leveling the rain garden, setting the slope and constructing a berm.

### 2.4.1 Tools

These tools may be useful when constructing the rain garden. Power tools can make the work easier, but are not essential.

- Tape measure
- Shovel
- Trowel
- Rake
- Carpenter's Level
- Stakes or marking flags
- String
- Downspout Extender (optional)
- Power Tiller (optional)
- Landscape Rock (optional)



Before you do any digging, remember to call 811 at least 48 hours in advance to have underground utilities located. It's the law!

### 2.4.2 Removing Lawn Turf

Many rain gardens are constructed in existing lawns. The time and effort it takes to dig out the garden can be reduced by removing the sod first. Sod removal machines are available for rent at some nurseries and tool rental facilities, but a shovel and some hard work can be just as effective. If removed carefully, the turf grass could be reused for patching bare spots around the lawn.

As an alternative, you can cover the lawn where the rain garden will be located with black plastic, several layers of newspaper or any disposable material that will block sunlight. Over a period of about a week, the grass will die and it can then be tilled to create the rain garden soil. This can even be done in the fall so that the area is ready for garden preparation in the spring. Using this method, it is not necessary to remove the lawn turf.

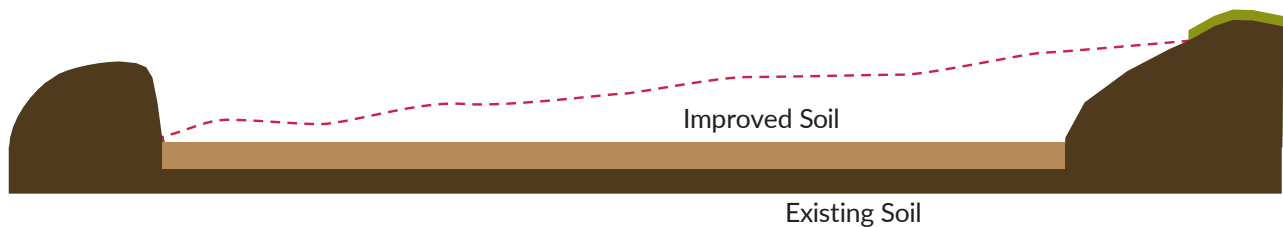
### 2.4.3 Excavating the Garden

Begin by digging into the ground and removing the existing soil from the area where the garden will be located. You will need to dig down to at least the depth calculated in Section 2.2.2. The garden area should be uniformly deep and have a flat, level bottom.

Now is the time to decide if you want to add some organic material such as compost, biosolids or sand to the garden area. Adding organic material can help plants get a strong start by giving them some additional nutrients. It will also help to add more air to the soil and more spaces between soil particles. If existing soil is to be amended or replaced with a higher quality soil mixture (soil

amendment), it will be necessary to over-excavate the rain garden and backfill with the new soil. First, determine how many inches of soil you would like to add to your garden. A minimum of two to three inches of soil is recommended in order to allow for improved root growth. Next, dig the rain garden area to the depth you calculated in Section 2.2.2 then dig down an additional two to three inches to loosen the soil in the bottom of the garden. Remove about half of this loosened soil so that the garden is about an inch to an inch and a half deeper than it will ultimately be. Incorporate organic material by mixing it with the loosened soil in the bottom of the garden area or fill the garden area with the new soil so that the surface of the soil is at the depth calculated in Section 2.2.2. An example is shown in Figure 5.

**Figure 5: Over-digging to add Organic Material**



Once you have dug out the entire garden area and added any soil amendments, use a tiller, shovel or hoe to loosen the soil that may have become compacted as you walked over it. This will help to promote deep root growth and infiltration of water.

You can check to see if the bottom is level by laying a board across the garden floor and moving the board around to find high and low spots. You can add back soil to fill in low spots and remove additional soil to level out high spots. The excess soil can be used to make a berm around the garden area to help contain rain water runoff. Excess soil can be placed along the downhill edge and sides of the rain garden.

You may contact Fort Wayne City Utilities for more information about soil amendments.

#### 2.4.4 Developing Rain Garden Slopes

You have just dug out the footprint of your rain garden. Within this footprint, you will need to develop the side slopes of the garden. The sides of the garden should gently slope downward toward the interior of the garden. If the ultimate desired depth for the garden is four inches, the side slopes should be about three times the depth or about 12 inches long (Figure 6). You may need to add some soil to build up these slopes. Because different plants may be more or less tolerant of very wet conditions, you can place plants that like drier soil higher up on the slopes and plants that like more water in the deeper part of the garden.

**Figure 6: Sloping the sides of a Rain Garden**

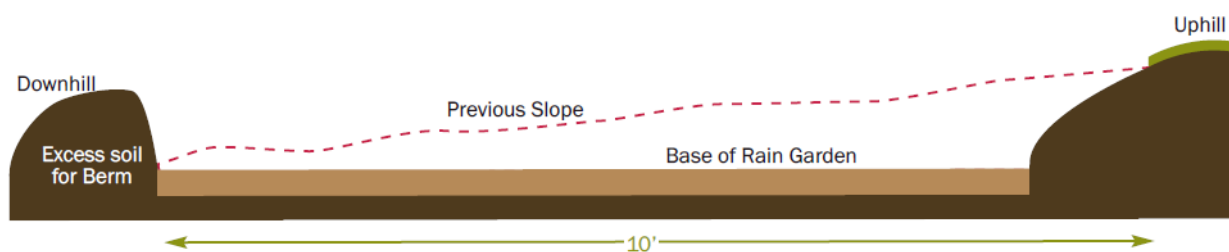


### 2.4.5 Building the Berm

If you are creating a rain garden on a slope, the soil that is removed from the garden location can be used to create a berm on the downhill side. This will create a shallow mound that will hold water in the garden (Figure 7). Extend the berm out and allow it to gradually taper around the sides of the garden. In a flatter yard, you may need to create a berm around the entire garden to help contain water inside.

The berm must be compacted so that it will support the weight of water in the garden. This will also help prevent the berm from eroding if water in the garden overflows. Use a hand tamp to compact the soil for the berm. Grass seed should be planted, or leftover turf grass from the original excavation should be planted on the berm as soon as possible to limit the amount of erosion from the slopes. The berm can also be covered with mulch to help hold it in place.

Figure 7: Building the Berm



### 2.4.6 Testing the Garden

Before you begin planting the garden, it is important to test the area that you have prepared to ensure that it will absorb water as required. Take the time to fill the garden completely with water. Fill the garden with water using a hose, and let the water entering the garden run across rocks or some other material that will diffuse the water to avoid causing erosion. Fill the garden to the point where it is about to overflow. Wait 24 hours and check the garden to see how much water has been absorbed.

After 24 hours, there should be very little standing water. However, the garden will be very wet. If you find standing water puddles, these probably indicate low spots in the garden. Check the depth and add soil back to fill the low spots so that they are no deeper than the maximum garden depth that you calculated in Section 2.2.2.

If the garden has not emptied, call City Utilities for suggestions before you begin planting.

### 2.4.7 Plant Installation

Plant materials are available in a variety of forms. Grasses and flowers come in seeds, pots and plugs. Seeds are not recommended for rain gardens because they take several growing seasons to fully establish and they may be washed away in a heavy rain event. Potted plants come in various sizes and are more expensive, but will bloom sooner and give a more established look to the garden. If deep cell plugs are available, they are recommended for use in a rain garden. Plugs are small cone-shaped pots that usually come in packs of six to twelve. Plugs often establish more

successfully and are more economical when purchased in bulk.



When you are ready to plant, set out all the plants for your rain garden in the desired location. Check the spacing, and don't be afraid to move things around if necessary. Remember that even though the plants are small right now, they will grow and eventually fill out their space. Do not overcrowd the plants because their root systems will compete and more aggressive plants could overtake smaller plants. You should have purchased one plant for every 1.5 feet of rain garden area. Each plant

should be given the recommended spacing indicated on its tag. If not, a good rule of thumb is to allow one foot of space around smaller plants and four feet of space around larger plants. Appendix D shows plant growth over time in photographs from planting in April through August. As seen in the photographs, plants will grow very quickly. Make sure to stick the pot tags in the soil next to each plant. Consider planting flowers in groups so that similar plants are located near each other, rather than scattering them around the rain garden individually. This helps when weeding, making it easier to know which plants are weeds and which are “keepers”.

When planting, minimize how much you walk through the rain garden in order to avoid compacting the soil. Start at one end of the rain garden and work your way to the other end. Put down some mulch to walk on if necessary and move the mulch when you are ready to plant there. Keep these tips in mind when planting:

- Keep the plants moist before planting.
- Gently loosen the root ball of the plant before planting.
- Dig a hole twice as wide as the root ball and deep enough so that the root ball is completely covered by soil when the hole is re-filled.
- Loosen the dirt in the hole so the sides and bottom are not compacted. Compacted soil will restrict root growth.
- Refill the space around the plant and gently press the soil around the roots to minimize air spaces.
- Water the plants well after planting.



Once the plants are in the ground, mulching keeps them cool and moist and reduces weeds. Keep in mind that the rain garden will periodically be submerged and that many varieties of wood mulch will float. Use a three-inch thick layer of coarse, double shredded hardwood mulch to reduce this potential.

A few finishing touches will help to create order and beauty and set the rain garden apart from its surroundings:

- When registering your rain garden it is required that you create a clear and defined border. This can be done with a berm, landscape edging, or a row of plants can be used to set the garden off from the yard and provide an edge create a distinct border.
- You may want to add items such as a bench, garden gnome, gazing ball, bird bath, sculpture or decorative rock to make your garden reflect your personality and create a sanctuary that you will enjoy.



## 2.5 Maintenance

While rain gardens are generally low maintenance compared to traditional grass lawns, they still require some level of care. Particularly in the initial years of establishment, rain gardens demand more attention. However, as the rain garden becomes more established, the maintenance time gradually decreases. When registering a rain garden, it is mandatory to annually monitor its condition to prevent overgrowth and ensure compliance with Fort Wayne ordinance 99 and 100.

### 2.5.1 Watering



The rain garden is intended to receive and absorb rain water runoff. But because young plants are especially susceptible to stressors such as dry soil, you will need to water the rain garden plants regularly until the plants are established. This usually takes one or two growing seasons. About one inch of water per week is needed, so a slow trickle of water from the hose for 30 minutes each week is usually sufficient. After the plants are established, you should not have to water them except during prolonged dry periods.

Mature plants can tolerate standing water better than young, small plants. During the first couple of years after the garden is planted you may need to allow some rain water to escape from the rain garden, especially during extended rainy periods. To do this, some of the water that has been directed to the garden may be temporarily routed in a different direction. Another option is to cut a notch in the berm on the downstream end of the rain garden so less water is held in the garden. Once the plants are larger and better established, you can re-route the water back into the rain garden or fill in the notch cut.

## 2.5.2 Spring

Spring is the best time to plant your rain garden. Once established, spring is also the time to clean up by pruning dead vegetation and plants that have grown too large. You will also need to weed the rain garden and add mulch, if necessary. You should maintain a three-inch mulch layer in the rain garden. During the first one or two growing seasons, you may need to weed more often. As the plants mature and fill in the rain garden you will need to weed less. Remove excess sediment, leaves or debris that may have collected in the rain garden. This is also the best time for planting new or different plants and replacing plants that may have died over the winter. Water wisely as described above and add compost, if needed.



## 2.5.3 Summertime

In the summertime, the primary maintenance needs will be to remove summer weeds such as crabgrass and dandelions and to water wisely during dry periods. Be sure to monitor the berm around the edge of the rain garden for erosion.



Any damaged areas will need to be repaired by replacing lost soil and adding mulch or reseeding if the berm is planted with grass.

## 2.5.4 Fall and Winter

Autumn presents another opportunity to plant. Look for and remove weeds and water as needed. Do not remove leaves that may have fallen in the rain garden. The leaves will provide compost material for the following spring growth.



The stems and seed heads may be left in the rain garden for winter interest, wildlife cover and bird food. No maintenance is needed during the winter months. You may cut back your rain garden to clean up for spring, if desired.

## 2.6 Frequently Asked Questions

### Is a rain garden a pond?

A rain garden is not a pond so water should not stand in the garden for an extended period of time. If properly designed, a rain garden should only hold water for about 24 hours.

### Will a rain garden be a breeding ground for mosquitoes?

No! Properly designed rain gardens are, in fact, mosquito death traps! Mosquitoes lay eggs in standing water. The eggs hatch into larva and then grow to become flying insects. This life cycle needs to take place in standing water and lasts seven to 12 days. So, if a mosquito lays its eggs in a rain garden with standing water and the water infiltrates within a couple of days or less, the eggs will not have an opportunity to develop and will die.





### Are rain gardens hard to maintain?

As described in the Maintenance section, a rain garden will need little maintenance once it is well established. Native plants are suggested for rain gardens because they are well adapted to the local climate and will not need significant maintenance, fertilizers or pesticides. The bulk of rain garden maintenance involves periodic watering and weeding.

### Will I need to water my rain garden?

You will need to water the rain garden during the first one or two growing seasons until the plants become established. About an inch of water a week is a good rule of thumb. In subsequent years, watering should only be necessary during prolonged dry periods.

### How much does it cost to build a rain garden?

Rain gardens do not have to be expensive. If you build the rain garden yourself, the major cost elements are typically plants, soil amendments and mulch. Choosing smaller plants like plugs and buying plants, soil and mulch in bulk will reduce these costs. The average rain garden costs about \$2 to \$5 per square foot if you do the work yourself. You may be able to reduce the cost even more if you share plants with friends or receive free plant starts or cuttings. If you hire a landscape consultant to design, construct, select and install plants, the cost could increase to about \$10 to \$20 per square foot.



### Will a rain garden cause water to seep into my basement?

A rain garden should be placed at least ten feet away from the house to help ensure that water soaked into the ground through the garden does not seep into the basement. Wet basements may be caused by improper grading and drainage around a house foundation. For example, a downspout may empty right onto the ground next to the house or the surface of the yard may slope toward the house. A rain garden allows rain water from downspouts to be directed away from a house foundation and toward the rain garden.

### Rain gardens filter pollutants. Will pollutants build up in my rain garden and kill my plants?

Many of the common pollutants that enter rain gardens such as fertilizers, pesticides, oils and sediments are filtered through the mulch and soil in the rain garden. The pollutants do not have a chance to build up in the rain garden because they are constantly being broken down (biodegraded) by microorganisms in the soil. Rarely do the pollutants have an opportunity to affect the plants in the rain garden. Some plants actually absorb pollutants and use them as food.

# Appendix A: Rain Garden Design Worksheet

Date: \_\_\_\_\_

Designer: \_\_\_\_\_

Location: \_\_\_\_\_

## **STEP 1. Sketch the Site**

Be sure to include permanent fixtures including the house, garage, sheds, large trees, driveway, sidewalks, and fences. Indicate which direction is north, downspout locations, low-lying areas in the yard, the general direction stormwater flows across the yard and the sun exposure in different areas of the yard. Highlight or hatch the areas where you plan to divert rainfall runoff to your rain garden.

**STEP 2. Determine the Roof Drainage Area of the House, Garage or Other Buildings that will Drain to the Rain Garden**

$$\begin{array}{rclcl} \text{Length of House} & \times & \text{Width of House} & = & \text{Total Square Feet of Drainage} \\ \text{\_\_\_\_\_\_ ft} & \times & \text{\_\_\_\_\_\_ ft} & = & \text{\_\_\_\_\_\_ sq ft} \end{array}$$

**STEP 3. Determine the Drainage Area for Each Downspout by Dividing the Total Square Feet of House Drainage by the Number of Downspouts**

$$\begin{array}{rclcl} \text{Total Square Feet of House} & \div & \text{Number of Downspouts} & = & \text{Drainage Area per Downspout} \\ \text{\_\_\_\_\_\_ sq ft} & \div & \text{\_\_\_\_\_\_ downspouts} & = & \text{\_\_\_\_\_\_ sq ft/downspout} \end{array}$$

**STEP 4. Determine how many Downspouts will be Directed to the Rain Garden and Multiply by the Result from STEP 3**

$$\begin{array}{rclcl} \# \text{ of Downspouts to Garden} & \times & \text{Drainage Area/Downspout} & = & \text{Drainage Area to Rain Garden} \\ \text{\_\_\_\_\_\_ downspouts} & \times & \text{\_\_\_\_\_\_ sq ft} & = & \text{\_\_\_\_\_\_ sq ft} \end{array}$$

**STEP 5. Add Drainage Areas of Other Locations that will Flow to the Rain Garden (Driveways, Sidewalks, etc.)**

$$\begin{array}{rclcl} \text{Square Footage of Other Areas} & + & \text{Roof Drainage Area to Garden} & = & \text{Total Drainage Area} \\ \text{\_\_\_\_\_\_ sq ft} & + & \text{\_\_\_\_\_\_ sq ft} & = & \text{\_\_\_\_\_\_ sq ft} \end{array}$$

**STEP 6. Divide the Result of STEP 5 by the Infiltration Rate of the Soil**

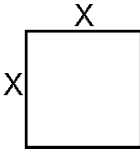
*Assume for this example that the water level dropped 1 inch in 6 hours during the infiltration test*

$$\frac{1 \text{ inch}}{6 \text{ hours}} = \frac{X \text{ inches}}{24 \text{ hours}} \quad \rightarrow \quad X = 4 \text{ inches} = \text{Recommended Rain Garden Depth (for this example only)}$$

**STEP 7. Divide STEP 5 Result by the Recommended Depth from STEP 6 to Determine the Rain Garden Size**

$$\begin{array}{rclcl} \text{Total Drainage Area} & \times & (1 \text{ (inch)} \div \text{Depth of Garden (inches)}) & = & \text{Rain Garden Size} \\ \text{\_\_\_\_\_\_ sq ft} & \times & (1 \text{ inch} \div \text{\_\_\_\_\_\_ inches}) & = & \text{\_\_\_\_\_\_ sq ft} \end{array}$$

**STEP 8. Determine the Length of the Sides by Taking the Square Root of the Rain Garden Size from STEP 7**

$$\sqrt{\text{Rain Garden Size}} = X \text{ ft}$$


**STEP 9. Determine the Number of Plants Needed by Dividing Rain Garden Size from STEP 7 by 2.5**

$$\begin{array}{rclcl} \text{Rain Garden Size} & \div & 2.5 \text{ sq ft} & = & \text{Number of Plants Needed} \\ \text{\_\_\_\_\_\_ sq ft} & \div & 2.5 \text{ sq ft} & = & \text{\_\_\_\_\_\_ Plants} \end{array}$$

# Appendix B: Rain Garden Layout Examples

Source: Earth Source Incorporated, 2008

	Symbol	Name	Sunlight	Water Tolerance	Color	Height	Arrange the Plants	Bloom Time
FLOWERS		Cardinal Flower <i>Lobelia cardinalis</i>				24-54 in.	1 ft. apart	September
		Black Eyed Susan* <i>Rudbeckia subtomentosa</i>				12-36 in.	1 ft. apart	May – Frost
		Marsh Blazing Star <i>Liatris spicata</i>				24-48 in.	1 ft. apart	July – August
		Southern Blue Flag <i>Iris virginica shrevei</i>				15-40 in.	1 ft. apart	May – June
		Ironweed <i>Vernonia fasciculata</i>				36-48 in.	3 ft. apart	July – Sept.
		Great Blue Lobelia* <i>Lobelia siphilitica</i>				24-36 in.	1 ft. apart	July – Frost
		Ohio Spiderwort <i>Tradescantia ohioensis</i>				24-36 in.	1 ft. apart	May – July
		Yellow Coneflower <i>Ratibida pinnata</i>				36-72 in.	1.5 ft. apart	June – August
		Purple Coneflower <i>Echinacea purpurea</i>				24-36 in.	1 ft. apart	May – Frost
		Queen of the Prairie <i>Filipendula rubra</i>				18-36 in.	2 ft. apart	July – Frost
		Rattlesnake Master <i>Eryngium yuccifolium</i>				48-60 in.	1 ft. apart	May – Frost
		Rose Turtlehead <i>Chelone obliqua</i>				30-48 in.	1 ft. apart	July – Frost
		Marsh Milkweed <i>Asclepias incarnata</i>				36-48 in.	1 ft. apart	May – Frost
		Wild Bergamot <i>Monarda fistulosa</i>				24-48 in.	1 ft. apart	July – Frost
GRASSES		Little Bluestem <i>Schizachyrium scoparium</i>				24-36 in.	8 in. apart	May – March
		Crested Sedge* <i>Carex cristatella</i>				36 in.	1 ft. apart	May – July
		Fox Sedge <i>Carex vulpinoidea</i>				12-36 in.	1 ft. apart	May – July
SHRUBS		Blackhaw virburnum <i>Virburnum prunifolium</i>				12-15 ft.	3 ft. apart	Feb. – April / July – Frost
		Spicebush* <i>Lindera benzoin</i>				6-12 ft.	2 ft. apart	Feb. – Frost

Full Sun  
 Part Shade  
 Low  
 Moderate  
 Moderate/High  
 High

\*Plant is on the City Utilities 2024 Plant List and is native to Allen County per the USDA Plants Database (<https://plants.usda.gov/home>)  
 Note: This is a short list of recommended, local plants. More plant choices are provided in [Appendix C](#) and [Appendix D](#).

## Rain Garden Example Layout – Beginner

### Zone A:

Front edge of garden where water enters. Use plants that are shorter and require less water.

### Zone B:

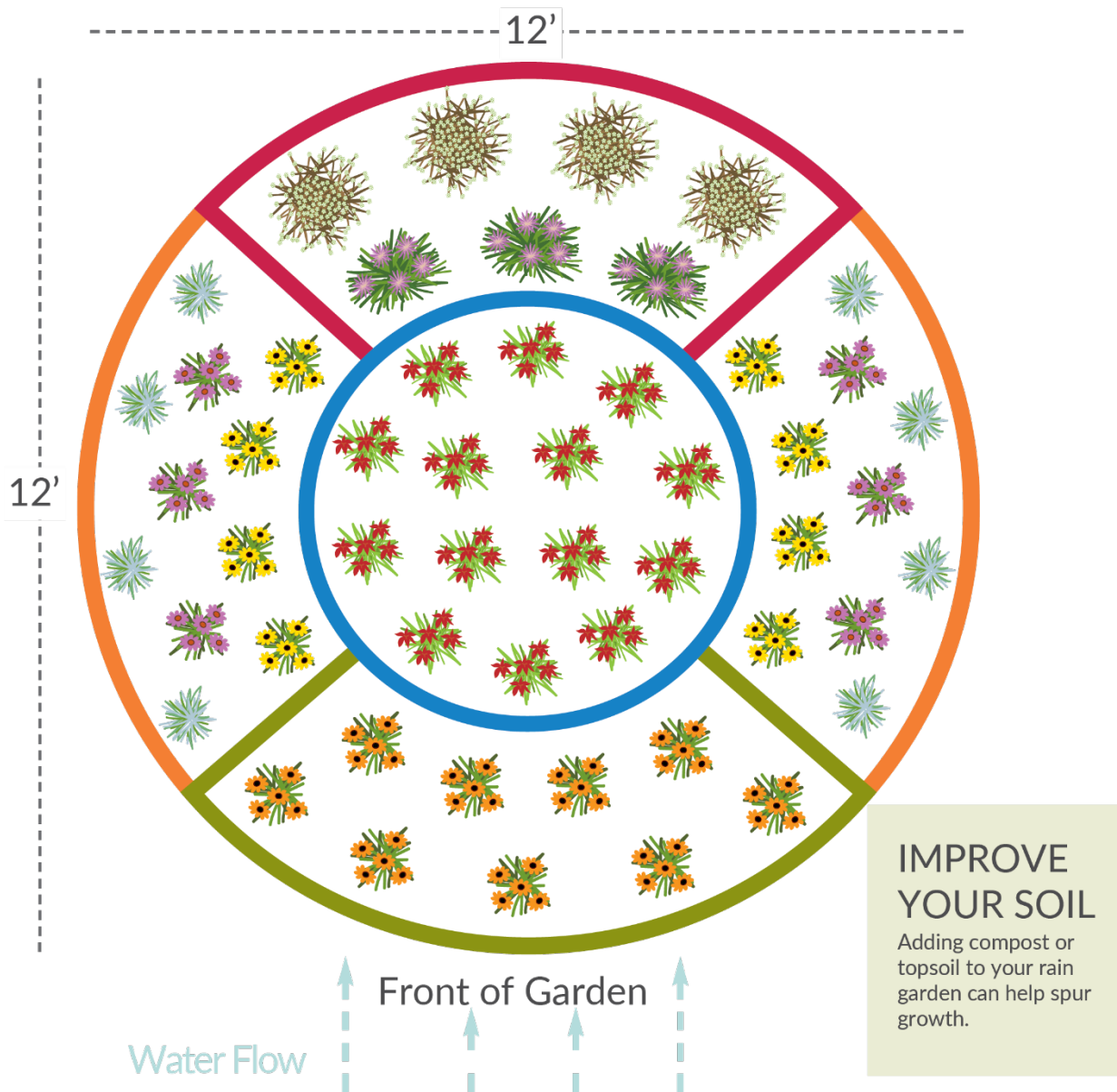
These side edges of the garden slope toward the center. Use medium height plants that prefer average soil moisture.

### Zone C:

Center of the garden and typically the wettest area. Use medium/tall plants that tolerate wet soil conditions.

### Zone D:

Tall plants should be placed at the back of the garden. These plants require average soil moisture.



## Rain Garden Example Layout - Intermediate Gardener

### Zone A:

Front edge of garden where water enters. Use plants that are shorter and require less water.

### Zone B:

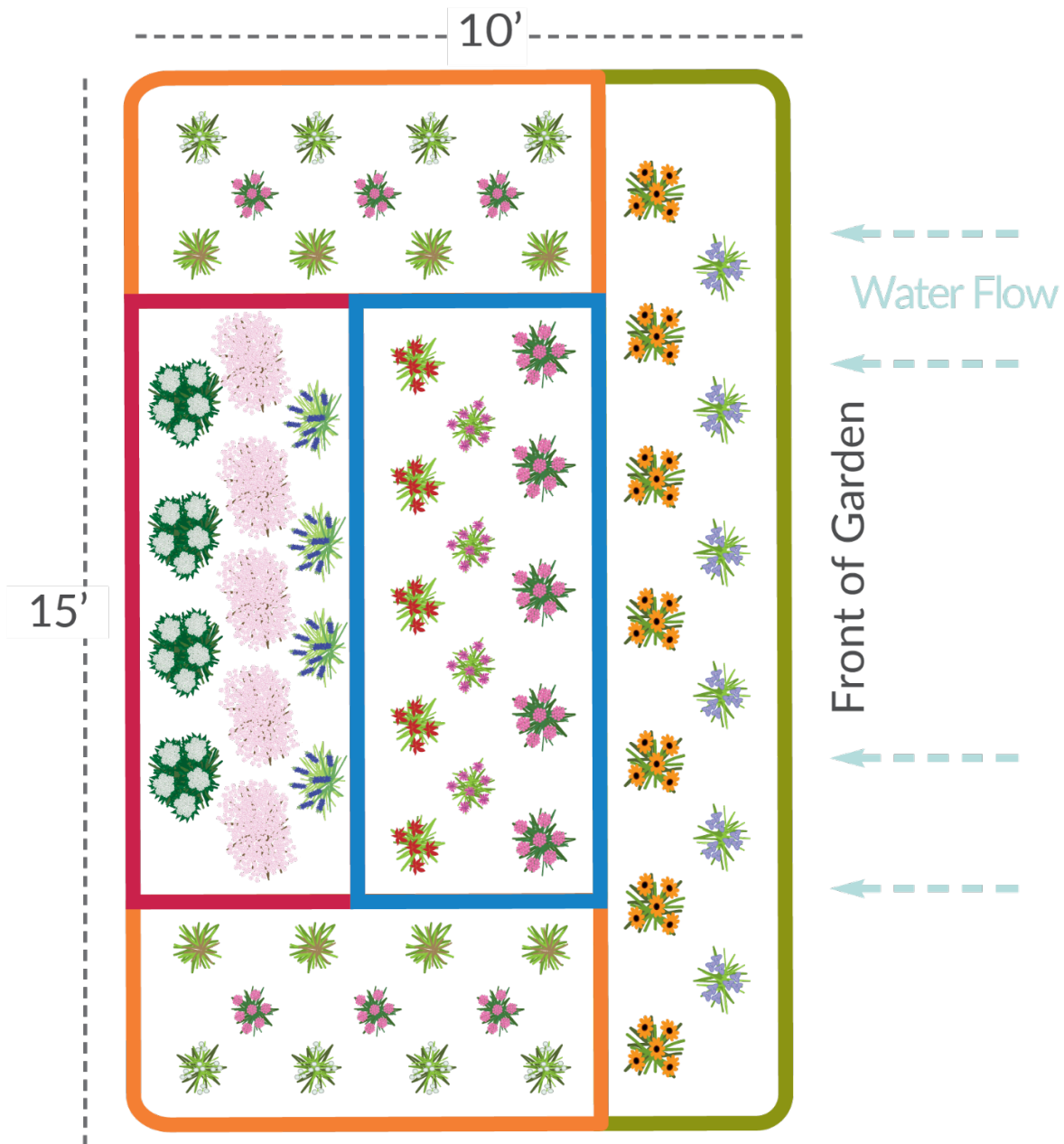
These side edges of the garden slope toward the center. Use medium height plants that prefer average soil moisture.

### Zone C:

Center of the garden and typically the wettest area. Use medium/tall plants that tolerate wet soil conditions.

### Zone D:

Tall plants should be placed at the back of the garden. These plants require average soil moisture.



## Rain Garden Example Layout – Expert

### Zone A:

Front edge of garden where water enters. Use plants that are shorter and require less water.

### Zone B:

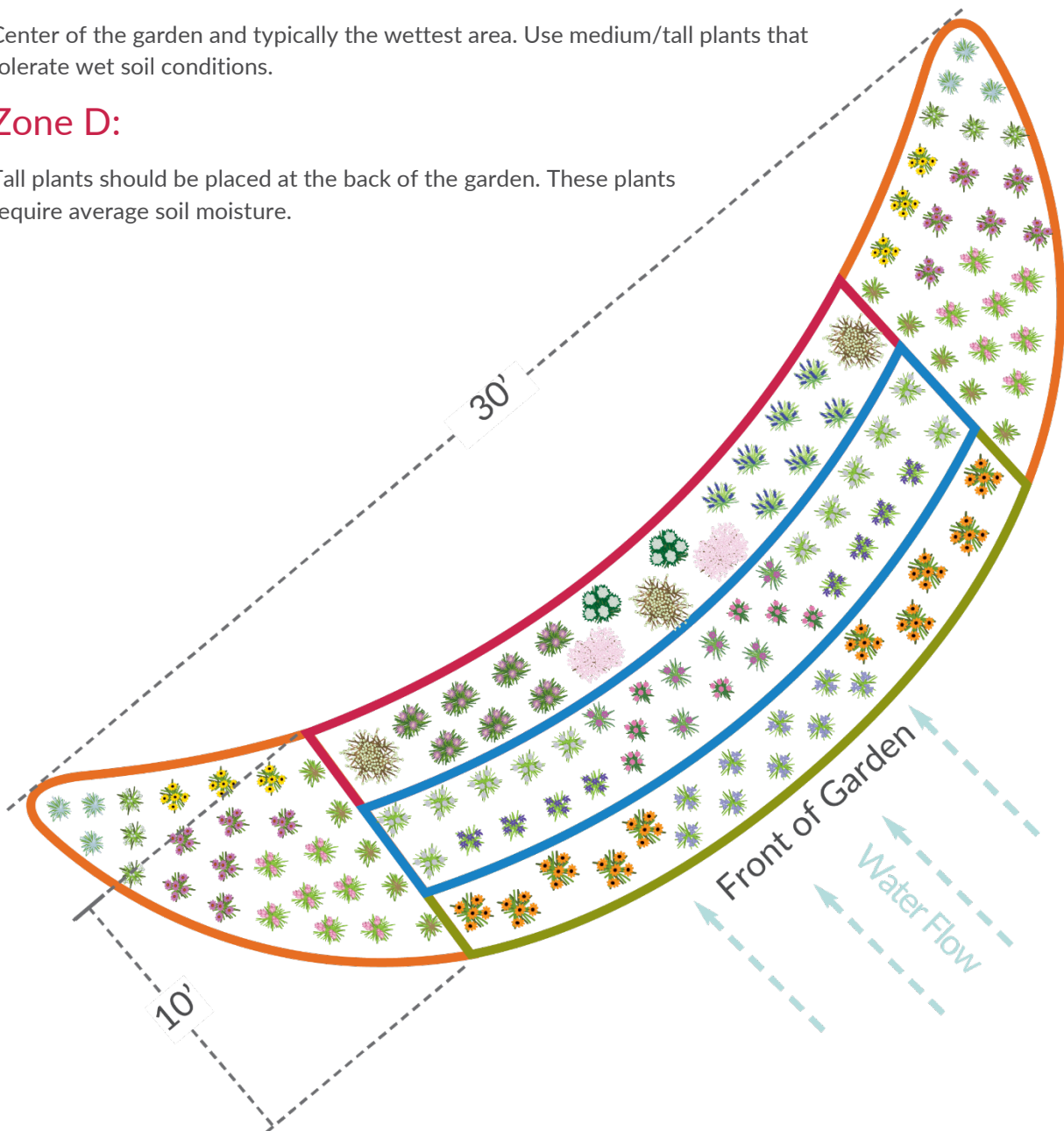
These side edges of the garden slope toward the center. Use medium height plants that prefer average soil moisture.

### Zone C:

Center of the garden and typically the wettest area. Use medium/tall plants that tolerate wet soil conditions.

### Zone D:

Tall plants should be placed at the back of the garden. These plants require average soil moisture.



# Native Full or Partial Sun Garden

\*Plant is on the City Utilities 2024 Plant List and is native to Allen County per the USDA Plants Database (<https://plants.usda.gov/home>)

## Zone A:

### Flowers

- Black-eyed Susan\*  
*Rudbeckia subtomentosa*
- Ohio Spiderwort  
*Tradescantia ohioensis*
- Moonshine Yarrow  
*Achillea 'Moonshine'*
- Columbine  
*Aquilegia canadensis*
- Purple Dome Aster  
*Aster novae-angliae*
- Purple Daisy Aster  
*Aster patens*
- Scaly Blazingstar  
*Liatris squarrosa*
- Wild Petunia  
*Ruellia humilis*
- Meadow Sage  
*Salvia superba*
- Bird's Foot Violet  
*Viola pedata*
- Grasses/Sedges
- Sun Sedge  
*Carex pennsylvanica*

## Zone B:

### Flowers

- Rough Blazingstar\*  
*Liatris aspera*
- Purple Coneflower  
*Echinacea purpurea*
- Rattlesnake Master  
*Eryngium yuccifolium*
- Showy Goldenrod  
*Solidago speciosa*
- Black-eyed Susan\*  
*Rudbeckia hirta*
- Sky-Blue Aster  
*Aster oolentangiensis*
- Wild Bergamot  
*Monarda fistulosa*
- Peony  
*Paeonia*
- Autumn Joy Sedum  
*Sedum 'Autumn Joy'*
- Grasses/Sedges
- Sideoats Grama  
*Bouteloua curtipendula*
- Little Bluestem  
*Schizachyrium scoparium*
- Prairie Dropseed  
*Sporobolus heterolepis*

## Zone C:

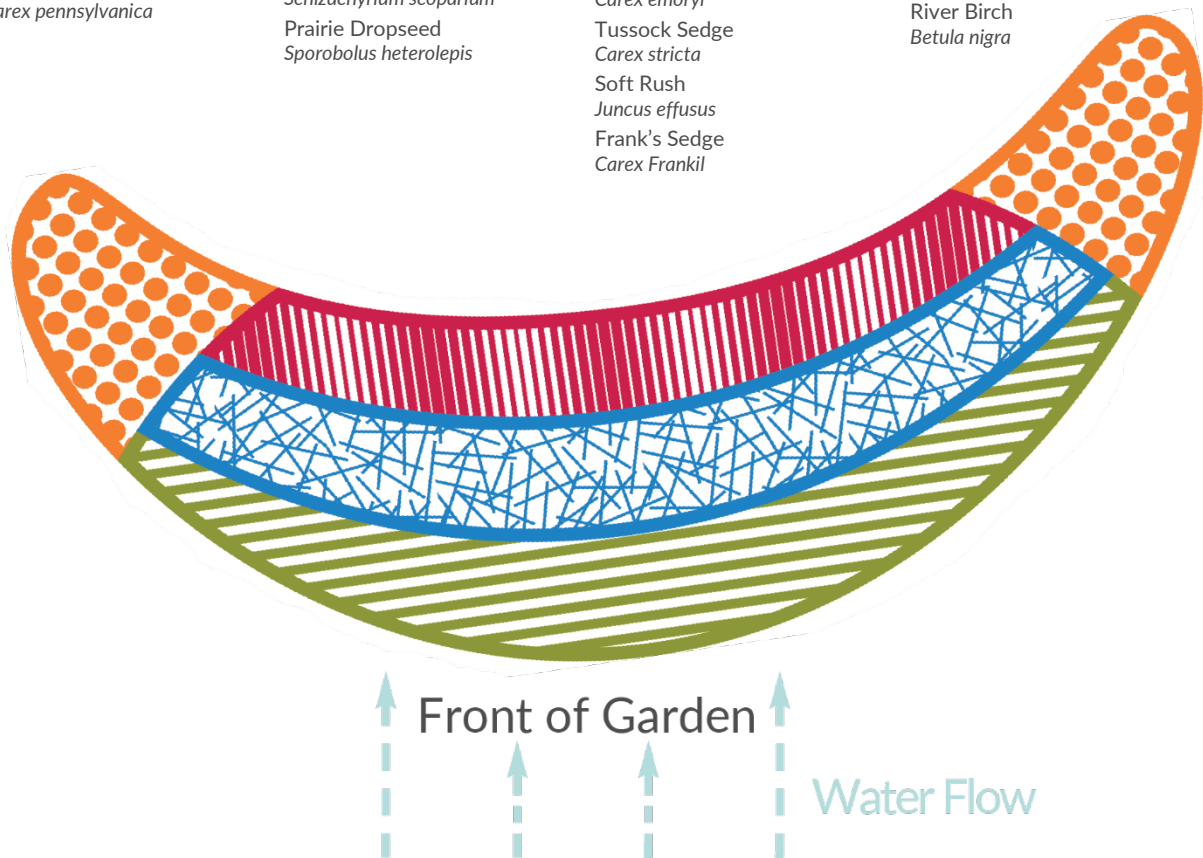
### Flowers

- Rose Turtlehead  
*Chelone obliqua*
- Marsh Milkweed  
*Asclepias incarnata*
- 'Little Joe'-Pye Weed  
*Eupatorium purpureum*
- Blue False Indigo  
*Baptista australis*
- Ohio Spiderwort  
*Tradescantia ohioensis*
- Great Blue Lobelia\*  
*Lobelia siphilitica*
- Culver's Root\*  
*Veronicastrum virginicum*
- Ironweed  
*Veronia faciculata*
- Sneezeweed  
*Helenium autumnale*
- Grasses/Sedges
- Nodding Sedge  
*Carex crinita*
- Emory's Sedge\*  
*Carex emoryi*
- Tussock Sedge  
*Carex stricta*
- Soft Rush  
*Juncus effusus*
- Frank's Sedge  
*Carex Frankil*

## Zone D:

### Flowers

- Yellow Coneflower  
*Ratibida pinnata*
- Ox-eye Sunflower  
*Heliopsis helianthoides*
- Blue False Indigo  
*Baptisia australis*
- Joe-Pye Weed  
*Eupatorium maculatum*
- Queen of the Prairie  
*Filipendula Rubra*
- Grasses/Sedges
- Big Bluestem\*  
*Andropogon gerardi*
- Indian Grass  
*Sorghastrum nutans*
- Shrubs
- American Witch Hazel\*  
*Hamamelis virginiana*
- Southern Arrowwood  
*Viburnum dentatum*
- Compact American Highbush  
*Cranberry Viburnum trilobum*
- River Birch  
*Betula nigra*





# Shady Garden

## Zone A:

### Flowers

Wild Ginger  
*Asarum canadense*  
 Astilbe  
*Astilbe cultivars*  
 Ohio Horsemint  
*Blephilia ciliata*  
 Sharp-lobed Hepatica  
*Hepatica acutiloba*  
 Hosta  
*Hosta, many cultivars*  
 Jacob's Ladder  
*Polemonium reptans*  
 Celandine Poppy  
*Stylophorum diphyllum*

## Zone B:

### Flowers

Wild Geranium  
*Geranium maculatum*  
 Columbine  
*Aquilegia canadensis*  
 False Solomon's Seal  
*Maianthemum racemosum*  
 Purple Daisy Aster  
*Aster patens*  
 Celandine Poppy  
*Stylophorum diphyllum*  
 Blue Lobelia  
*Lobelia siphilitica*  
 Rose Turtlehead  
*Chelone obliqua*  
**Shrub**  
 Dwarf Bush Honeysuckle  
*Diervilla lonicera*

## Zone C:

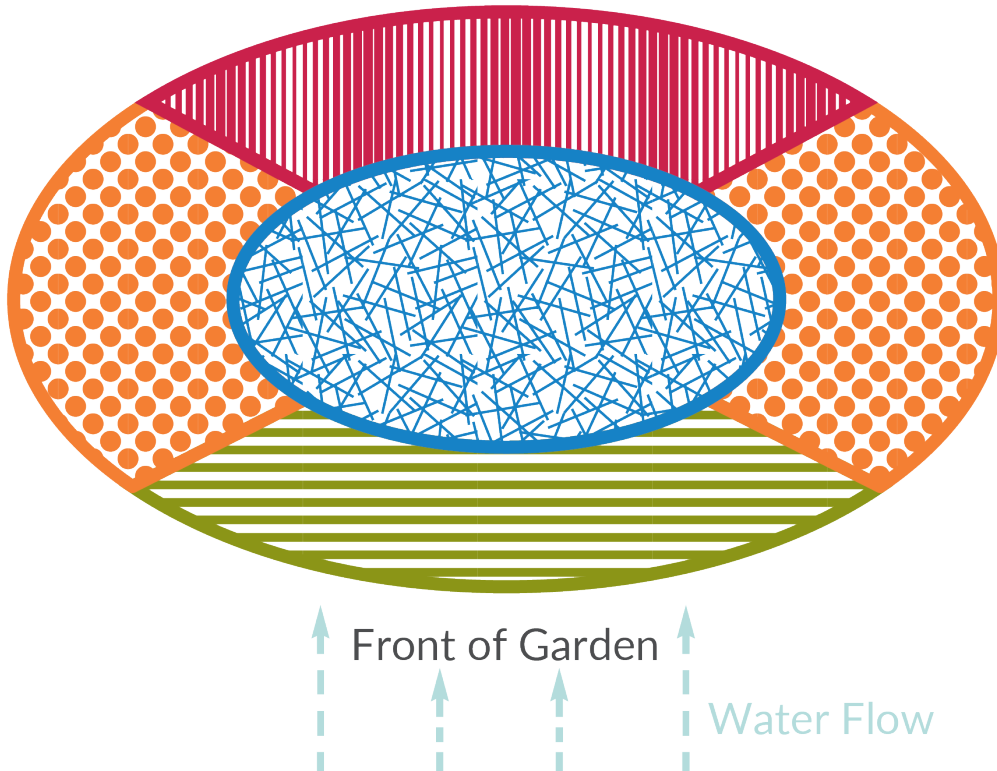
### Flowers

Southern Blue Flag Iris  
*Iris virginica*  
 Turtlehead  
*Chelone glabra*  
 Cardinal Flower  
*Lobelia cardinalis*  
**Grasses/Sedges**  
 Fox Sedge  
*Carex vulpinoidea*  
 Crested Sedge\*  
*Carex cristatella*  
 Palm Sedge  
*Carex muskingumensis*  
 Hop Sedge  
*Carex lupulina*  
**Ferns**  
 Lady Fern  
*Athyrium filix-femina*  
 Sensitive Fern  
*Onoclea sensibilis*  
 Maidenhair Fern  
*Adiantum pedatum*  
 Christmas Fern  
*Polystichum acrostichoides*  
 Cinnamon Fern  
*Osmunda cinnamomea*  
 Ostrich Fern  
*Matteuccia struthiopteris*

## Zone D:

### Flowers

Solomon's Seal  
*Polygonatum biflorum*  
 Spikenard  
*Aralia racemosa*  
 Greenheaded Coneflower\*  
*Rudbeckia laciniata*  
**Grasses/Sedges**  
 Hop Sedge  
*Carex lupulina*  
**Shrubs**  
 Hazelnut\*  
*Corylus americana*  
 Smooth Hydrangia  
*Hydrangia arborescens*  
 Spicebush\*  
*Lindera benzoin*



# Bird and Butterfly Garden

## Zone A:

### Flowers

- Butterfly Milkweed\*  
*Asclepias tuberosa*
- Autumn Joy Sedum  
*Sedum*
- Columbine  
*Aquilegia canadensis*
- Purple Dome Aster  
*Aster novae-angliae*
- Moonshine Yarrow  
*Achillea 'Moonshine'*
- Purple Daisy Aster  
*Aster patens*
- Scaly Blazingstar  
*Liatris squarrosa*
- Meadow Sage  
*Salvia superba*

## Zone B:

### Flowers

- Tall Tickseed\*  
*Coreopsis tripteris*
- Russian Sage  
*Perovskia atriplicifolia*
- Indian Blanket  
*Gaillardia x grandiflora*
- Daylily  
*Hemerocallis*
- Rattlesnake Master  
*Eryngium yuccifolium*
- Showy Goldenrod  
*Solidago speciosa*

## Zone C:

### Flowers

- Sky Blue Aster  
*Aster oolentangiensis*
- Marsh Milkweed  
*Asclepias incarnata*
- Cardinal Flower  
*Lobelia cardinalis*
- Orange Coneflower  
*Rudbeckia fulgida*
- Purple Coneflower  
*Echinacea pupurea*
- 'Little Joe'-Pye Weed  
*Eupatorium purpureum*
- Sneezeweed  
*Helenium autumnale*
- Marsh Blazingstar  
*Liatris spicata*
- Great Blue Lobelia\*  
*Lobelia siphilitica*
- Southern Blue Flag Iris  
*Iris virginica*
- Rose Turtlehead  
*Chelone obliqua*
- Culver's Root\*  
*Veronicastrum virginicum*
- Greenheaded Coneflower\*  
*Rudbeckia laciniata*

## Zone D:

### Flowers

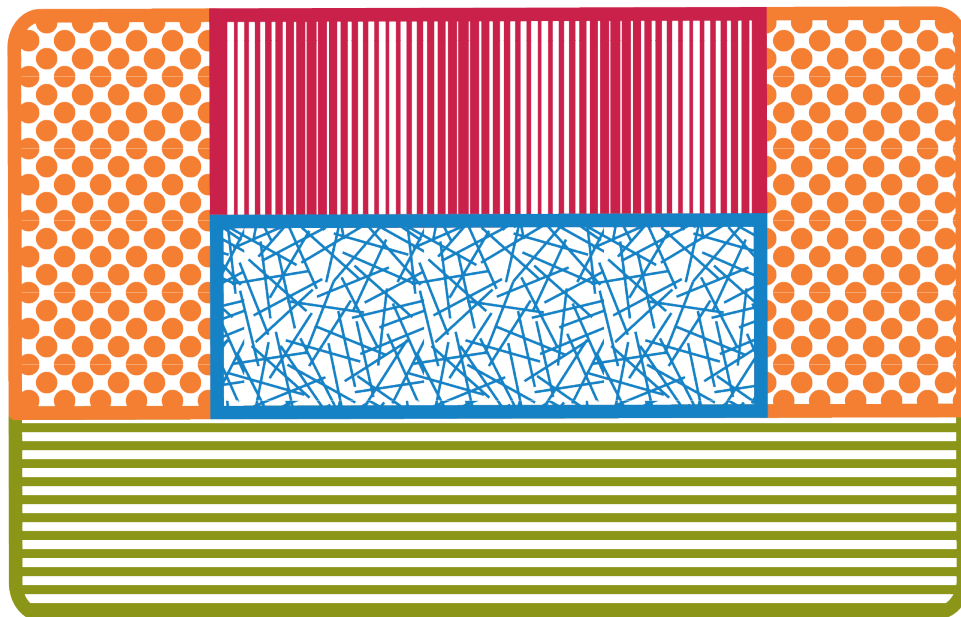
- Ironweed  
*Veronia faciculata*
- Compass Plant  
*Silphium laciniatum*
- Yellow Coneflower  
*Ratibida pinnata*
- Ox-eye Sunflower  
*Heliopsis helianthoides*

### Grasses

- Big Bluestem\*  
*Andropogon gerardi*
- Indian Grass  
*Sorghastrum nutans*

### Shrubs

- Red-osier Dogwood, 'Isanti'\*  
*Cornus sericea*



# Shrub Garden

## Zone A:

**Shrubs**

- Dwarf Bush Honeysuckle  
*Diervilla lonicera*
- Spirea  
*Spirea*
- Snowberry  
*Symphoricarpos*
- Rose  
*Rosa*

**Flower**

- Peony  
*Paeonia*

## Zone B:

**Shrubs**

- American Witch Hazel\*  
*Hamamelis virginiana*
- Southern Arrowwood  
*Viburnum dentatum*
- Compact American Highbush  
Cranberry  
*Viburnum trilobum*
- Spirea  
*Spirea*

## Zone C:

**Shrubs**

- Red-osier Dogwood, 'Isanti'\*  
*Cornus sericea*
- Dwarf-bush Honeysuckle  
*Diervilla lonicera*
- Spicebush\*  
*Lindera benzoin*
- Snowberry or Coralberry  
*Symphoricarpos*
- Southern Arrowwood  
*Viburnum dentatum*
- Compact American Highbush  
Cranberry  
*Viburnum trilobum*
- Nannyberry\*  
*Viburnum lentago*
- Black Haw Viburnum\*  
*Viburnum prunifolium*

**Tree/Shrub**

- American Arborvitae  
*Thuja occidentalis*

**Tree**

- River Birch  
*Betula nigra*

## Zone D:

**Shrubs**

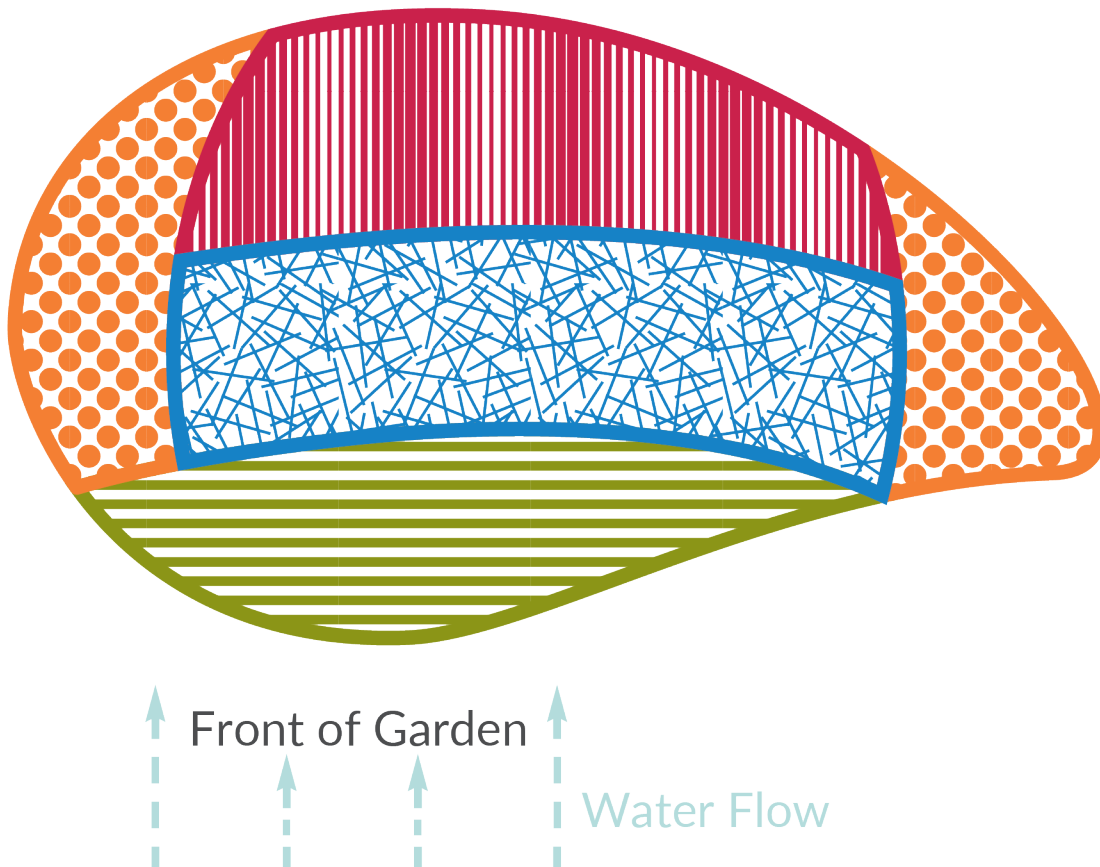
- Hazelnut\*  
*Corylus americana*
- Nannyberry\*  
*Viburnum lentago*
- Black Haw Viburnum\*  
*Viburnum prunifolium*
- Spicebush\*  
*Lindera benzoin*
- Shrub Rose Cultivars  
*Rosa x species*

**Tree/Shrub**

- American Arborvitae  
*Thuja occidentalis*

**Tree**

- River Birch  
*Betula nigra*



# Appendix C: Rain Garden Plant List Recommended for Fort Wayne, Indiana































\*Plant is on the City Utilities 2024 Plant List and is native to Allen County per the USDA Plants Database (<https://plants.usda.gov/home>)

	Name	Sunlight	Water Tolerance	Color	Height	Arrange the Plants	Bloom Time
NATIVE WILDFLOWERS	Black Eyed Susan* <i>Rudbeckia subtomentosa</i>				12"-36"	1 ft. apart	May – Frost
	Blue Vervain <i>Verbena hastata</i>				24"-72"	2 ft. apart	July – Sept.
	Brown Eyed-Susan* <i>Rudbeckia triloba</i>				12"-30"	1.5 ft. apart	June – Sept.
	Cardinal Flower <i>Lobelia cardinalis</i>				24"-54"	1 ft. apart	September
	Common Boneset* <i>Eupatorium perfoliatum</i>				24"-60"	2 ft. apart	July – Sept.
	Culver's Root* <i>Veronicastrum virginicum</i>				36"-60"	1.5 ft. apart	June – August
	Cup Plant* <i>Silphium perfoliatum</i>				4'-8'	2 ft. apart	July – Sept.
	Flat-Top White Aster <i>Aster umbellatus</i>				12"-48"	1 ft. apart	July – Sept.
	Foxglove Beardtongue* <i>Penstemon digitalis</i>				24"-48"	1.5 ft. apart	April – June
	Golden Alexander* <i>Zizia aurea</i>				12"-36"	1.5 ft. apart	May – June
	Great Blue Lobelia* <i>Lobelia siphilitica</i>				24"-36"	1 ft. apart	July – Frost
	Ironweed <i>Vernonia fasciculata</i>				36"-48"	3 ft. apart	July – Sept.
	Joe Pye Weed <i>Eupatorium maculatum</i>				48"-80"	2 ft. apart	July – Sept.
	Marsh Blazing Star <i>Liatris spicata</i>				24"-48"	1 ft. apart	July – August
	Marsh Milkweed <i>Asclepias incarnata</i>				36"-48"	1 ft. apart	July – Frost
	Monkey Flower <i>Mimulus ringens</i>				12"-36"	1 ft. apart	June – Sept.
	Mountain Mint <i>Pycnanthemum virginianum</i>				24"-36"	1 ft. apart	July – Sept.
	New England Aster* <i>Aster novae-angliae</i>				24"-48"	2 ft. apart	August – Sept.
	Nodding Onion <i>Allium cernuum</i>				12"-18"	6 in. apart	June – August
	Ohio Spiderwort <i>Tradescantia ohioensis</i>				24"-36"	1 ft. apart	May – July
	Ox-eye Sunflower <i>Heliopsis helianthoides</i>				24"-48"	2 ft. apart	June – Sept.
	Pale Purple Coneflower <i>Echinacea pallida</i>				24"-36"	1 ft. apart	June – July
	Purple Coneflower <i>Echinacea purpurea</i>				24"-36"	1 ft. apart	May – Frost
	Purple-Stem Angelica <i>Angelica atropurpurea</i>				3'-10'	2 ft. apart	June – Sept.
	Queen of the Prairie <i>Filipendula rubra</i>				18"-36"	2 ft. apart	July – Frost

Full Sun   Part Shade   Low   Moderate   Moderate/High   High

	Name	Sunlight	Water Tolerance	Color	Height	Arrange the Plants	Bloom Time	
NATIVE WILDFLOWERS	Rattlesnake Master <i>Eryngium yuccifolium</i>				48"-60"	1 ft. apart	May – Frost	
	Riddell's Goldenrod <i>Solidago riddellii</i>				30"-48"	1 ft. apart	July-Frost	
	Rose Turtlehead <i>Chelone obliqua</i>				30"-48"	1 ft. apart	July – Frost	
	Showy Black-Eyed Susan <i>Rudbeckia fulgida</i>				24"-36"	2 ft. apart	June – Oct.	
	Smooth Blue Aster* <i>Aster laevis</i>				24"-48"	1 ft. apart	Sept. – Oct.	
	Sneezeweed <i>Helenium autumnale</i>				36"-60"	1.5 ft. apart	Aug. – Oct.	
	Southern Blue Flag <i>Iris virginica shrevei</i>				15"-40"	1 ft. apart	May – June	
	Stiff Goldenrod <i>Solidago rigida</i>				36"-60"	2 ft. apart	August – Sept.	
	Swamp Rose Mallow <i>Hibiscus palustris</i>				2'-8'	2 ft. apart	July – Sept.	
	Tall Tickseed* <i>Coreopsis tripteris</i>				2'-8'	2 ft. apart	July – Sept.	
	Wild Bergamot <i>Monarda fistulosa</i>				24"-48"	1 ft. apart	July – Frost	
	Wild Senna <i>Senna hebecarpa</i>				36"-72"	2 ft. apart	July – August	
	Yellow Coneflower <i>Ratibida pinnata</i>				36"-72"	1.5 ft. apart	June – August	
	GRASSES/HEDGES	Asa Gray's Sedge <i>Carex grayi</i>				12"-36"	1.5 ft. apart	May – July
		Big Bluestem* <i>Andropogon gerardii</i>				5'-9'	2 ft. apart	July – August
Blue Joint Grass* <i>Calamagrostis canadensis</i>					24"-36"	2 ft. apart	May – July	
Canada Wild Rye <i>Elymus canadensis</i>					24"-60"	2 ft. apart	July – Sept.	
Crested Sedge* <i>Carex cristatella</i>					36"	1 ft. apart	May – July	
Dark Green Bulrush* <i>Scirpus atrovirens</i>					24"-48"	2 ft. apart	May – July	
Drooping Bulrush <i>Scirpus pendulus</i>					12"-48"	2 ft. apart	May – July	
Fox Sedge <i>Carex vulpinoidea</i>					12"-36"	1 ft. apart	May – July	
Frank's Sedge <i>Carex frankii</i>					12"-36"	1.5 ft. apart	May – July	
Giant Burreed <i>Sparganium eurycarpum</i>					12"-48"	2 ft. apart	May – July	
Hairy Fruited Lake Sedge* <i>Carex trichocarpa</i>					12"-36"	1.5 ft. apart	May – July	
Indian Grass <i>Sorghastrum nutans</i>					4'-7'	1.5 ft. apart	Sept. – Feb.	
Lakebank Sedge <i>Carex lacustris</i>					12"-36"	1.5 ft. apart	May – July	
Little Bluestem <i>Schizachyrium scoparium</i>					24"-36"	8 in. apart	May – March	
Meadow Sedge <i>Carex granularis</i>					12"-36"	1.5 ft. apart	May – July	

Full Sun  
 Part Shade  
 Low  
 Moderate  
 Moderate/High  
 High

	Name	Sunlight	Water Tolerance	Color	Height	Arrange the Plants	Bloom Time
GRASSES/HEDGES	Porcupine Sedge <i>Carex hystericina</i>				12"-36"	1.5 ft. apart	May – July
	Prairie Cord Grass <i>Spartina pectinata</i>				4'-10'	2 ft. apart	May – July
	Prairie Dropseed <i>Sporobolus heterolepis</i>				18"-24"	2 ft. apart	Aug. – Oct.
	Short's Sedge <i>Carex shortiana</i>				12"-36"	1.5 ft. apart	May – July
	Soft Rush <i>Juncus effusus</i>				12"-24"	1.5 ft. apart	May – Sept.
	Softstem Bulrush <i>Scirpus validus</i>				2'-8'	2 ft. apart	May – July
	Stalk Grain Sedge* <i>Carex stipata</i>				12"-36"	1.5 ft. apart	May – July
	Switch Grass <i>Panicum virgatum</i>				36"-72"	2 ft. apart	July – Feb.
	Tussock Sedge <i>Carex stricta</i>				12"-36"	1.5 ft. apart	May – July
	Woolgrass <i>Scirpus cyperinus</i>				48"-60"	2 ft. apart	May – July

 Full Sun  
  Part Shade  
  Low  
  Moderate  
  Moderate/High  
  High

# Appendix D: Comprehensive Rain Garden Plant List

Recommended plants in bold

\*Plant is on the City Utilities 2024 Plant List and is native to Allen County per the USDA Plants Database (<https://plants.usda.gov/home>)

	Common Name	Latin Name		Common Name	Latin Name
	Astilbe	<i>Astilbe cultivars</i>		Marsh Milkweed	<i>Asclepias incarnata</i>
	Autumn Joy Sedum	<i>Sedum 'Autumn Joy'</i>		Meadow Sage	<i>Salvia superba</i>
	Bird's Foot Violet	<i>Viola pedata</i>		Monkey Flower	<i>Mimulus ringens</i>
	<b>Black-eyed Susan*</b>	<i>Rudbeckia hirta*</i>		Moonshine Yarrow	<i>Achillea 'Moonshine'</i>
	Blue False Indigo	<i>Baptisia australis</i>		Mountain Mint	<i>Pycnanthemum virginianum</i>
	Blue Lobelia	<i>Lobelia siphilitica</i>		New England Aster*	<i>Aster novae-angliae*</i>
	<b>Blue Vervain</b>	<i>Verbena hastata</i>		Nodding Onion	<i>Allium cernuum</i>
	Bluebells	<i>Mertensia virginica</i>		Ohio Horsemint	<i>Blephilia ciliata</i>
	<b>Brown Eyed-Susan*</b>	<i>Rudbeckia triloba*</i>		Ohio Spiderwort	<i>Tradescantia ohioensis</i>
	Butterfly Milkweed*	<i>Asclepias tuberosa</i>		Orange Coneflower	<i>Rudbeckia fulgida</i>
	<b>Cardinal Flower</b>	<i>Lobelia cardinalis</i>		Ox-eye Sunflower	<i>Heliopsis helianthoides</i>
	Celandine Poppy	<i>Stylophorum diphyllum</i>		Pale Purple Coneflower	<i>Echinacea pallida</i>
	Columbine	<i>Aquilegia canadensis</i>		Peony	<i>Paeonia</i>
FLOWERS	<b>Common Boneset*</b>	<i>Eupatorium perfoliatum*</i>	FLOWERS	Purple Coneflower	<i>Echinacea pupurea</i>
	Compass Plant	<i>Silphium laciniatum</i>		Purple Daisy Aster	<i>Aster patens</i>
	<b>Culver's Root*</b>	<i>Veronicastrum virginicum*</i>		Purple Dome Aster	<i>Aster novae-angliae</i>
	<b>Cup Plant*</b>	<i>Silphium perfoliatum*</i>		Purple-Stem Angelica	<i>Angelica atropurpurea</i>
	Daylily	<i>Hemerocallis</i>		Queen of the Prairie	<i>Filipendula rubra</i>
	False Solomon's Seal	<i>Maianthemum racemosa</i>		Rattlesnake Master	<i>Eryngium yuccifolium</i>
	<b>Flat-Top White Aster</b>	<i>Aster umbellatus</i>		Riddell's Goldenrod	<i>Solidago riddellii</i>
	<b>Foxglove Beardtongue*</b>	<i>Penstemon digitalis*</i>		Rose Turtlehead	<i>Chelone obliqua</i>
	<b>Golden Alexander*</b>	<i>Zizia aurea*</i>		Rough Blazingstar*	<i>Liatris aspera*</i>
	<b>Great Blue Lobelia*</b>	<i>Lobelia siphilitica*</i>		Russian Sage	<i>Perovskia atriplicifolia</i>
	Greenheaded Coneflower*	<i>Rudbeckia laciniata*</i>		Scaly Blazingstar	<i>Liatris squarrosa</i>
	Hosta	<i>Hosta, many cultivars</i>		Sharp-lobed Hepatica	<i>Hepatica acutiloba</i>
	Indian Blanket	<i>Gaillardia x grandiflora</i>		Showy Black-Eyed Susan	<i>Rudbeckia fulgida</i>
	<b>Ironweed</b>	<i>Veronia faciculata</i>		Showy Goldenrod	<i>Solidago speciosa</i>
	Jacob's Ladder	<i>Polemonium reptans</i>		Sky-Blue Aster	<i>Aster oolentangiensis</i>
	<b>Joe-Pye Weed</b>	<i>Eupatorium maculatum</i>		Smooth Blue Aster	<i>Aster laevis</i>
	'Little Joe'-Pye Weed	<i>Eupatorium purpureum</i>		Sneezeweed	<i>Helenium autumnale</i>
	<b>Marsh Blazingstar</b>	<i>Liatris spicata</i>		Solomon's Seal	<i>Polygonatum biflorum</i>

	Common Name	Latin Name		Common Name	Latin Name
FLOWERS	Southern Blue Flag Iris	<i>Iris virginica</i>	GRASSES & SEDGES	Prairie Cord Grass	<i>Spartina pectinata</i>
	Spikenard	<i>Aralia racemosa</i>		Prairie Dropseed	<i>Sporobolus heterolepis</i>
	Spotted Joe Pye Weed	<i>Eupatorium maculatum</i>		Short's Sedge	<i>Carex shortiana</i>
	Stiff Goldenrod	<i>Solidago rigida</i>		Sideoats Grama	<i>Bouteloua curtipendula</i>
	Swamp Rose Mallow	<i>Hibiscus palustris</i>		Soft Rush	<i>Juncus effusus</i>
	Tall Tickseed*	<i>Coreopsis tripteris*</i>		Softstem Bulrush	<i>Scirpus validus</i>
	Turtlehead	<i>Chelone glabra</i>		Stalk Grain Sedge*	<i>Carex stipata*</i>
	Wild Bergamot	<i>Monarda fistulosa</i>		Sun Sedge	<i>Carex pennsylvanica</i>
	Wild Geranium	<i>Geranium maculatum</i>		Switch Grass	<i>Panicum virgatum</i>
	Wild Ginger	<i>Asarum canadense</i>		Tussock Sedge	<i>Carex stricta</i>
	Wild Petunia	<i>Ruellia humilis</i>		Woolgrass	<i>Scirpus cyperinus</i>
	Wild Senna	<i>Senna hebecarpa</i>		Christmas Fern	<i>Polystichum acrostichoides</i>
	Yellow Coneflower	<i>Ratibida pinnata</i>		Cinnamon Fern	<i>Osmunda cinnamomea</i>
	GRASSES & SEDGES	Asa Gray's Sedge		<i>Carex grayi</i>	FERNS
Big Bluestem*		<i>Andropogon gerardi*</i>	Maidenhair Fern	<i>Adiantum pedatum</i>	
Blue Joint Grass*		<i>Calamagrostis canadensis*</i>	Ostrich Fern	<i>Matteuccia struthiopteris</i>	
Canada Wild Rye		<i>Elymus canadensis</i>	Sensitive Fern	<i>Onoclea sensibilis</i>	
Crested Sedge*		<i>Carex cristatella*</i>	American Witch Hazel*	<i>Hamamelis virginiana*</i>	
Dark Green Bulrush*		<i>Scirpus atrovirens*</i>	Black Haw Viburnum*	<i>Viburnum prunifolium*</i>	
Drooping Bulrush		<i>Scirpus pendulus</i>	Amer. Highbush Cranberry	<i>Viburnum trilobum</i>	
Emory's Sedge*		<i>Carex emoryi*</i>	Hazelnut*	<i>Corylus americana*</i>	
Fox Sedge		<i>Carex vulpinoidea</i>	Nannyberry*	<i>Viburnum lentago*</i>	
Frank's Sedge		<i>Carex frankii</i>	Red-osier Dogwood, 'Isanti'*	<i>Cornus sericea*</i>	
Giant Burreed		<i>Sparganium eurycarpum</i>	Rose	<i>Rosa</i>	
Hairy Fruited Lake Sedge*		<i>Carex trichocarpa*</i>	Shrub Rose Cultivars	<i>Rosa x species</i>	
Hop Sedge		<i>Carex lupulina</i>	Smooth Hydrangia	<i>Hydrangia arborescens</i>	
Indian Grass		<i>Sorghastrum nutans</i>	Snowberry or Coralberry	<i>Symphoricarpos</i>	
Lakebank Sedge		<i>Carex lacustris</i>	Southern Arrowwood	<i>Viburnum dentatum</i>	
Little Bluestem		<i>Schizachyrium scoparium</i>	Spicebush*	<i>Lindera benzoin*</i>	
Meadow Sedge		<i>Carex granularis</i>	Spirea	<i>Spirea</i>	
Nodding Sedge		<i>Carex crinita</i>	American Arborvitae	<i>Thuja occidentalis</i>	
Palm Sedge		<i>Carex muskingumensis</i>	River Birch	<i>Betula nigra</i>	
Porcupine Sedge		<i>Carex hystericina</i>			



# Appendix E: Time-lapse Photos of a Local Rain Garden



May 8



June 11



June 23



July 2



July 14



August 4

## Appendix F: Resources

### Fort Wayne City Utilities, Rain Garden Initiative Program

Call: 260-427-8311

Email: [catchingrain@cityoffortwayne.org](mailto:catchingrain@cityoffortwayne.org)

Website: [www.catchingrainfw.org](http://www.catchingrainfw.org)

Register Your Garden: [Catching Rain: Build a Rain Garden](#)

### Other Information Available From

Allen County Cooperative Extension Master Gardener Program  
260-481-6826

Allen County Soil & Water Conservation District  
260-484-5848 ext. 3

### Local Compost Source

Fort Wayne City Utilities Biosolids Handling Facility  
6202 Lake Avenue  
Fort Wayne, IN 46815  
260-749-8040

### Call Before You Dig

1-800-382-5544 or 811

### Helpful Web Sites

- [City Utilities Plant List](#)
- [www.indiananativeplants.org](http://www.indiananativeplants.org)
- <http://plants.usda.gov>
- [indiana.clearchoicescleanwater.org/pledges/native-plants-and-pollinators/](http://indiana.clearchoicescleanwater.org/pledges/native-plants-and-pollinators/)
- [www.ansci.cornell.edu/plants/](http://www.ansci.cornell.edu/plants/) -- information about toxic plants
- [www.asPCA.org/pet-care/poison-control/plants/plants-by-scientific-name.html](http://www.asPCA.org/pet-care/poison-control/plants/plants-by-scientific-name.html) -- information about plants that may be toxic to animals

## Appendix G: References

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