



Rain Gardens 101

A presentation to members of the Oak Park Conservatory and FOPCON by University of IL Extension Conservation@Home Program

January 23, 2020

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[Photo](#) by BrianAsh at English Wikipedia(Uploads) / Public domain

Conservation@Home

- Yard Certification Program
- Sustainable Gardening
- Ecological Approach
- Educate
- Support
- Recognize



Who is involved in Cook County's C@H?

I ILLINOIS

Extension

COLLEGE OF AGRICULTURAL, CONSUMER
& ENVIRONMENTAL SCIENCES

Illinois
Master
Naturalist



feel free





Rain Gardens:

Benefits of Rain Gardens

Steps Creating a Rain Garden

Planning a Rain Garden

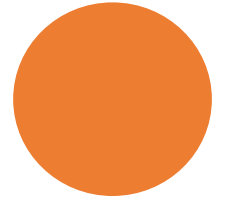
Assessing your Property

Rain Garden Installation

Right Plant, Right Place & Space

Runoff Affects Everyone Downstream

- washes debris and pollutants into our streams, rivers and lakes
- erodes soil and carries it into our surface waters
- affects aquatic life



A photograph of a well-maintained rain garden. The garden is filled with a variety of plants, including tall purple flowers, yellow daisy-like flowers, and green foliage. In the background, a house with light-colored stucco walls and red window frames is visible. A set of stairs with a red railing leads up to the house. A large, semi-transparent circular graphic is overlaid on the right side of the image, containing the text "Prevent runoff by building a Rain Garden".

Prevent runoff by
building a
Rain Garden

Rain Gardens Can...

Conserve Water

- Collect snow, rain, & stormwater on site and out of sewers
- Absorb more water than a traditional lawn
- Recharge groundwater
- Protect streams, rivers, & lakes by filtering pollutants & debris

Protect Soil

- Prevent Erosion
- Reduce flooding and drainage problems

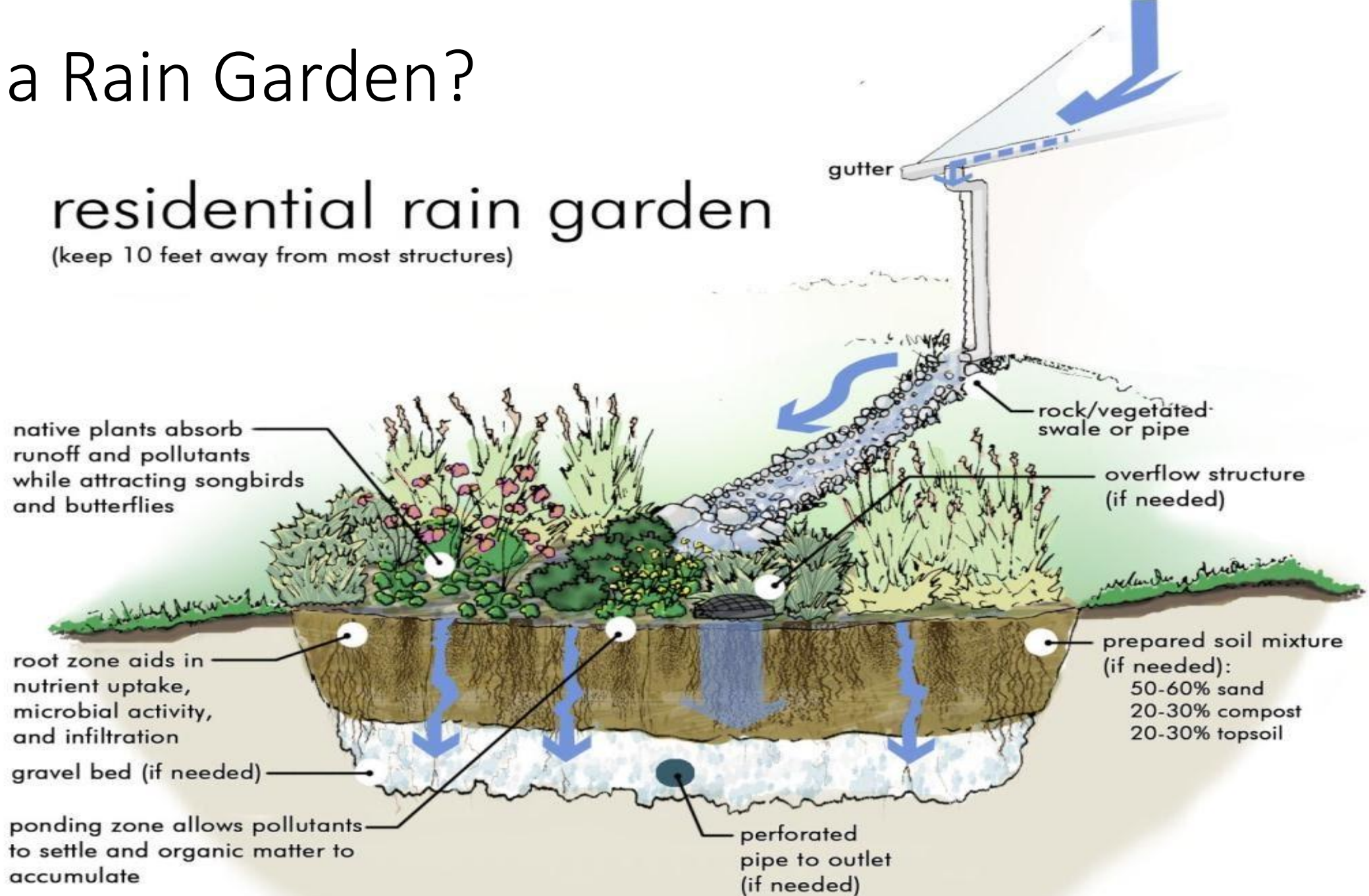
Create Beautiful Landscapes

- Attract birds, butterflies, and beneficial insects to your property
- Drain in 24-48 hours (too short for mosquito breeding!)

What is a Rain Garden?

residential rain garden

(keep 10 feet away from most structures)



Benefits of Rain Gardens



- Effective in removing up to 90% of nutrients and chemicals from rainwater and snowmelt runoff
- Effective in removing up to 80% of sediment from rainwater and snowmelt runoff
- Allow for 30% more water to soak into the ground when compared to a conventional lawn

Data from the Groundwater Foundation

Steps to creating a Rain Garden

Plan

- Choose a location

Assess

- Complete a drainage test
- Determine what type of soil you have
- Determine size of garden based on runoff

Call JULIE at 811 or
(800)892-0123
BEFORE YOU DIG!

Install

- Dig and grade the area or areas you have selected
- Install rain barrels, stream beds, French drains, other inflow conveyances
- Plant and mulch the Rain Garden

Maintain

- Water and weed regularly

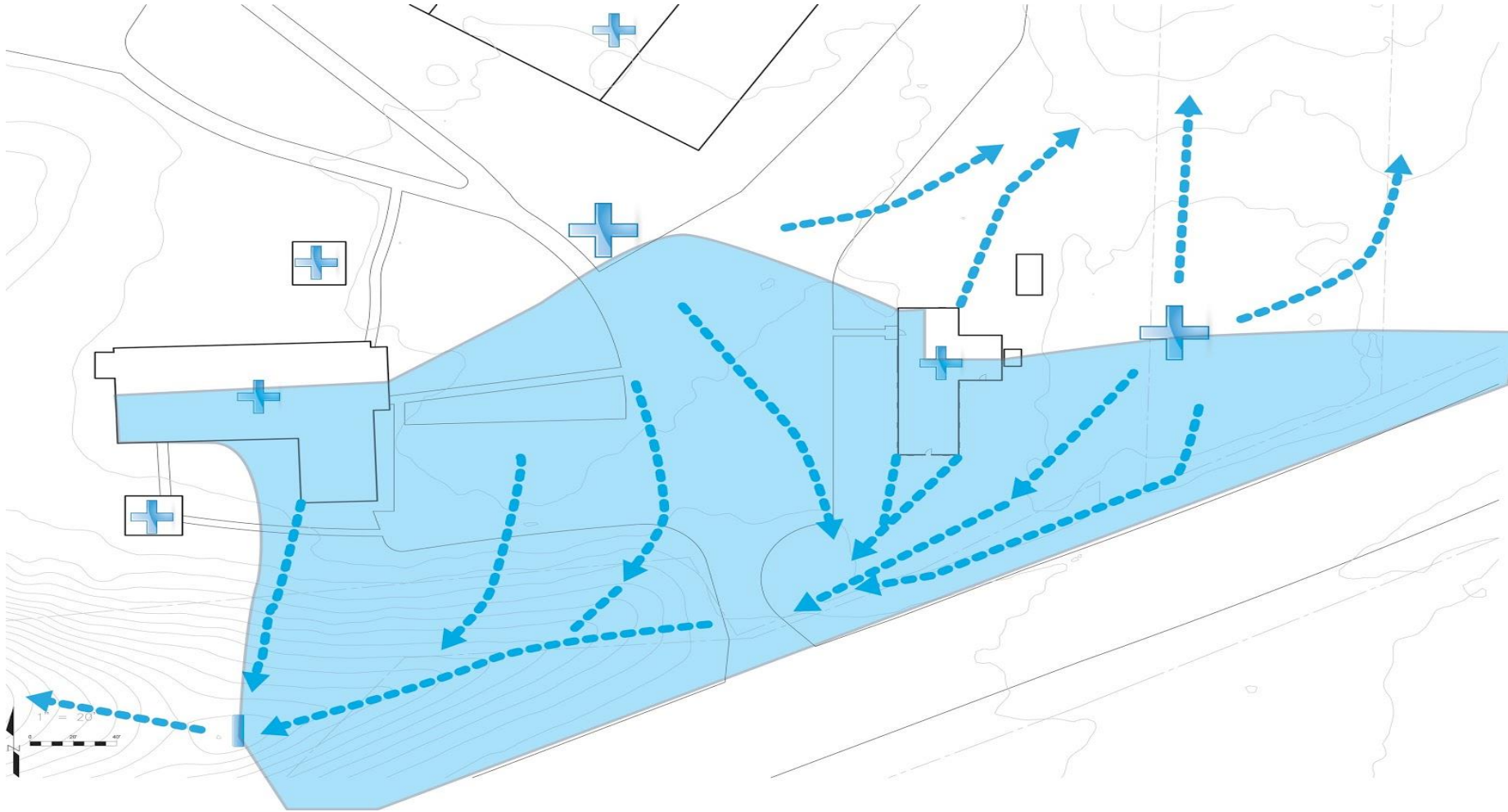
Selecting the
right spot





Rain Gardens can be designed to fit your landscape requirements.

Know your property's hydrology



**Where
does the
water
come
from
and go
to?**

Diagram above adapted from the University of Illinois Extension, Four Seasons Gardening

Location, Location, Location

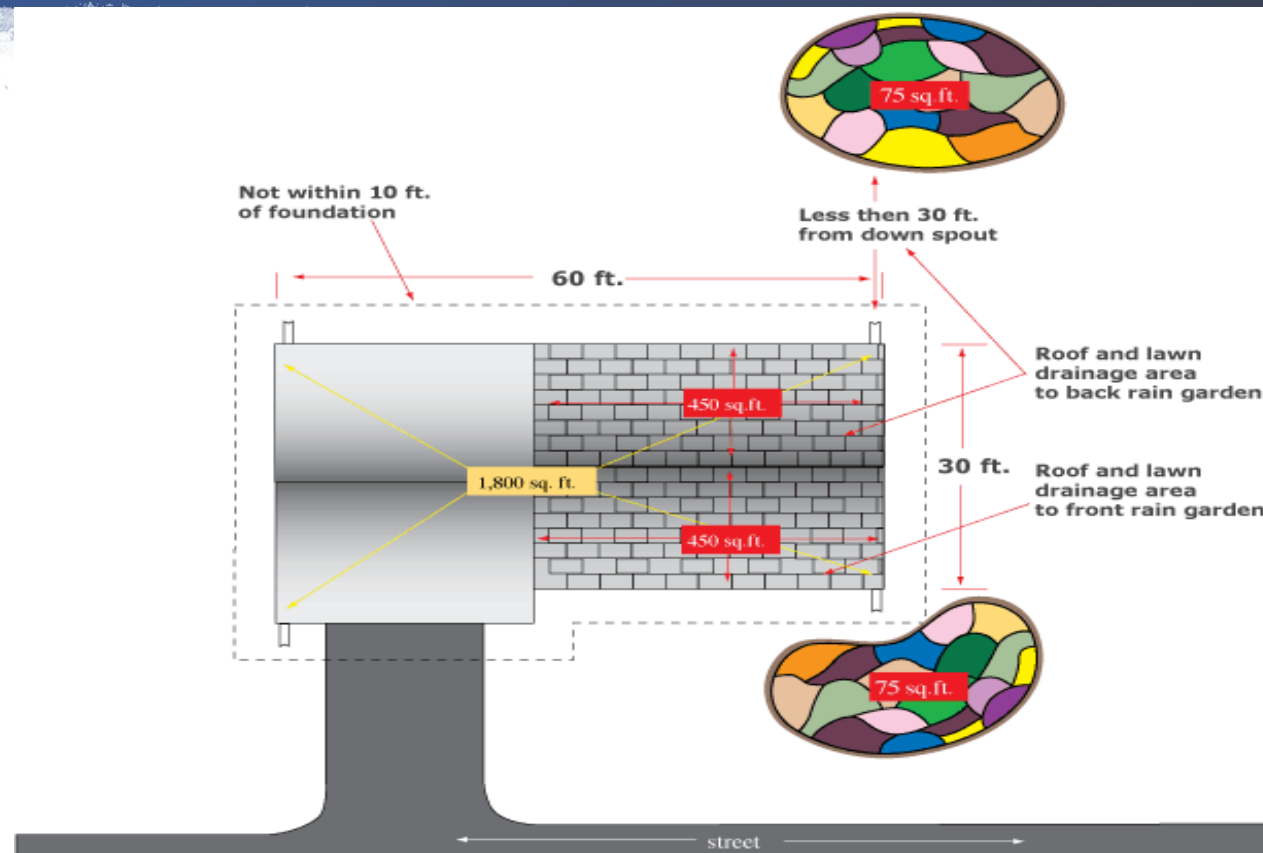


Diagram above adapted from the University of Wisconsin-Extension, [Rain Gardens: A How-to Manual for Homeowners](#).

10 Points to Consider

1. Build it more than 10-feet from a foundation, 20-feet if soil is heavy clay
2. Not in an area with a shallow water table
3. Not in areas where water ponds (ground may be too compacted)
4. Not near or over utilities
5. At least 35 feet or more away from septic system drain field
6. At least 50 feet or more away from drinking water wells
7. Not in areas near large trees where you may be damaging existing roots
8. Not on slopes greater than 15%
9. Not in locations that are higher than the downspout outlet
10. Not behind retaining walls

Take a look at your property's sun/shade patterns

Individual sites can offer significant environmental differences from the surrounding area

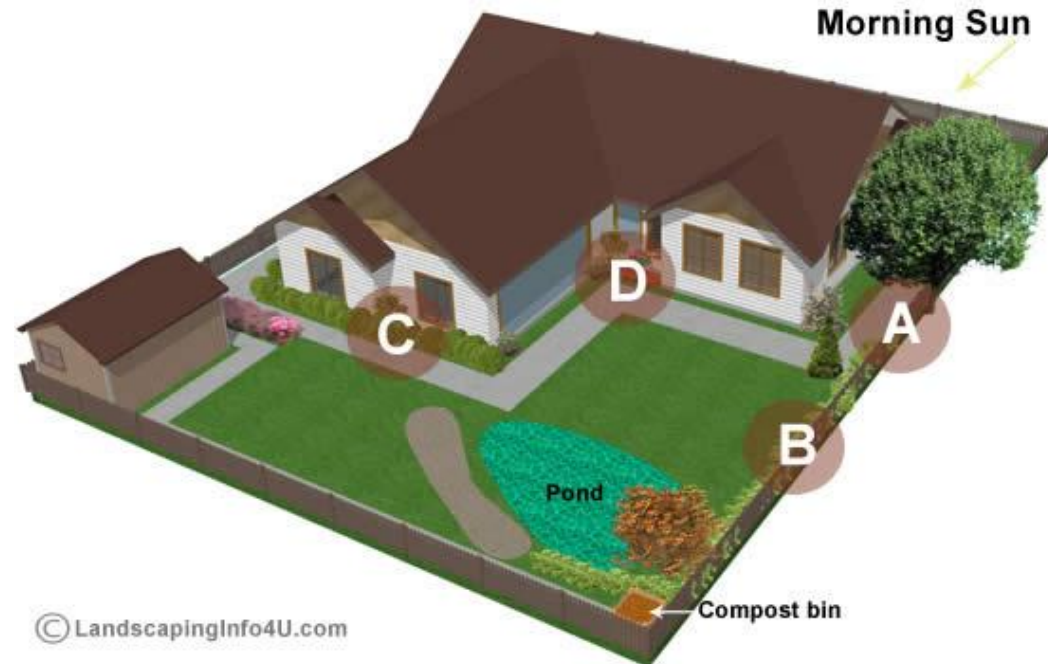


Diagram above adapted from the University of Illinois Extension, Four Seasons Gardening

It is best to position your rain garden as close as possible to drainage sources to avoid high concentrations and high velocities of water runoff



Fig. 4.4. Shows options for placing retrofits on the lot

Soil and Drainage Tests



Photo courtesy of Professor Lee Skabelund

What type of soil do you have?

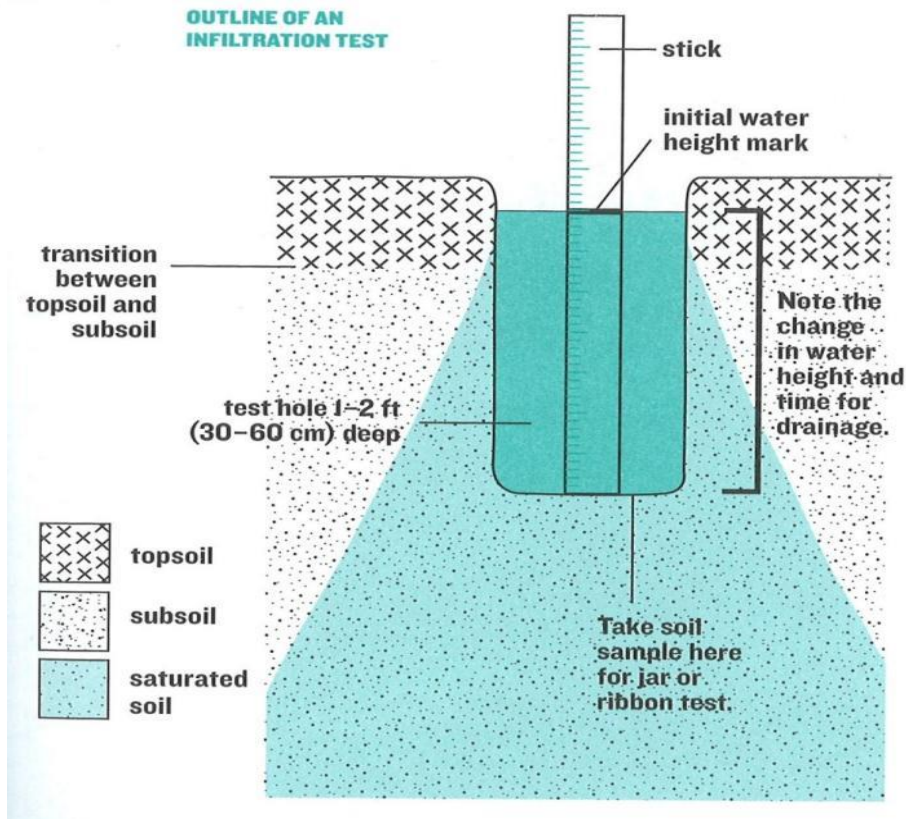
You can do these tests at home by yourself



Sizing your rain garden

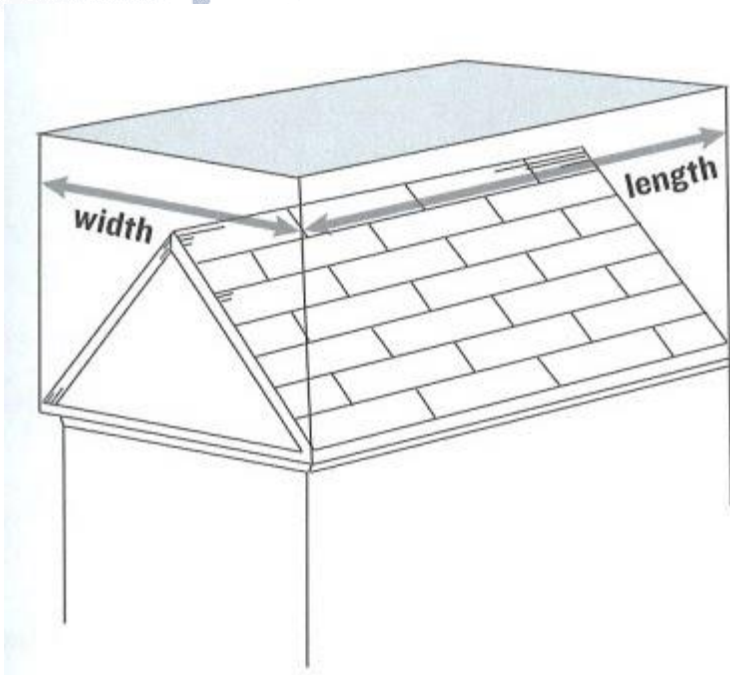


Drainage Test



1. Dig a 1-foot (30-cm) test hole in well-draining soil or a 2-foot (60-cm) hole in slowly draining soil. If you're doing the infiltration test when the soil is dry, fill the test hole with water, let it drain, then repeat three times.
2. Jab the stake or stick into the middle of the test hole.
3. Fill the hole with water.
4. Mark the filled water level on the stake with the marker.
5. Note the time.
6. Wait for the hole to drain completely, then note the time again.
7. Measure the distance from the mark on the stick to the bottom of the hole (in inches or cm). This is the water depth.
8. Calculate how long (in hours) the water took to drain. This is the drainage time.
9. Divide the water depth by the drainage time. The result is the drainage rate (inches /hour or cm/hour).

Calculating Runoff



First, determine the width X length of the area that will be draining into your rain garden. This can apply to roofs, driveways, lawns and patios.

Let's calculate this roof at 12' x 20'

$$12' \times 20' = 240 \text{ sq. ft.}$$

Calculating with Runoff Co-Efficients

SURFACE	RANGE	RECOMMENDED VALUE
Concrete	0.80-0.95	0.90
Brick	0.70-0.85	0.80
Roofs	0.75-0.90	0.85
Paving Stones	0.10-0.70	0.40
Landscaped Beds	0.15-0.30	0.20
Crushed Aggregate	0.15-0.30	0.20

Second: Multiply the width X length of the roof in this example by the co-efficient value from this LEEDS chart to determine the amount of runoff.

$$240' \times .85 = 204 \text{ sq. ft.}$$

Determining Size of Rain Garden

Third: You can
do more
mathematical
calculations

OR

$$\text{Maximum pooling depth} = \left[\frac{1 \text{ inch}}{6 \text{ hours}} \times \frac{24 \text{ hours}}{1 \text{ day}} \right] = 4 \text{ inches/day}$$

$$\text{Runoff volume} = 1000 \text{ square feet} \times \left[\frac{1 \text{ inch}}{1 \text{ hour}} \times \frac{1 \text{ foot}}{12 \text{ inches}} \right] \times 1 \text{ hour} = 83.3 \text{ cubic feet}$$

In this calculation, first do the multiplication within the brackets and then multiply that value by the square footage.

Determining Size of Rain Garden

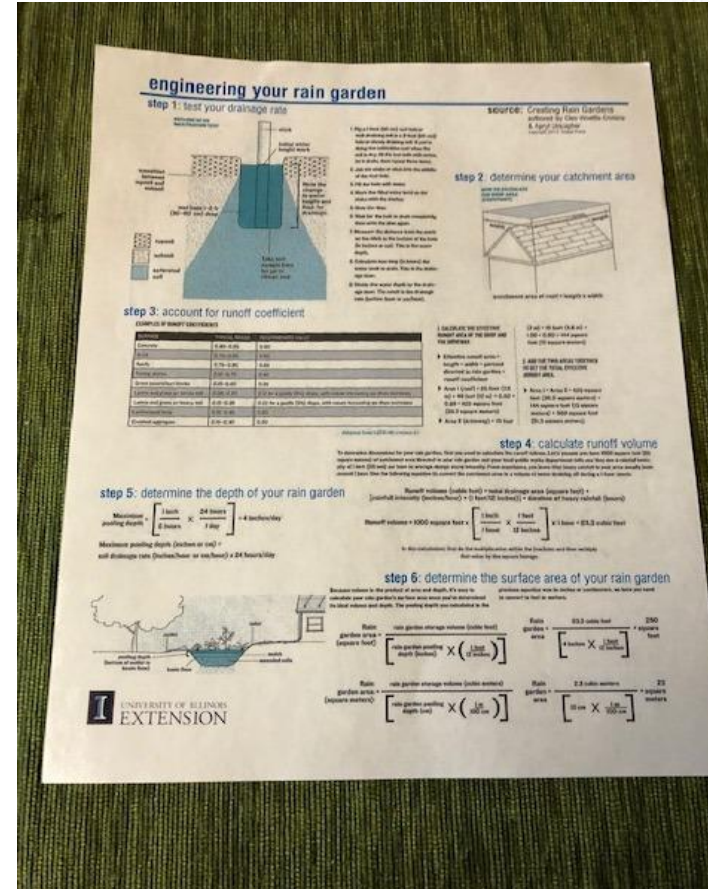
You can use this easy method.....

1/3 the size of the area you are draining

$$240 \text{ sq. ft.} \times 1/3 = 80 \text{ sq. ft.}$$

Determining Size of Rain Garden

If you want the technical formulas there is a handout that you can take home today.



Creating the Rain Garden



Getting Started

Use a hose, a rope, or
paint to create a shape.
Be creative!



Prep the Area

Take out sod or any other vegetation.

If you start in the Fall, you can lay down corrugated or black landscape fabric to help.

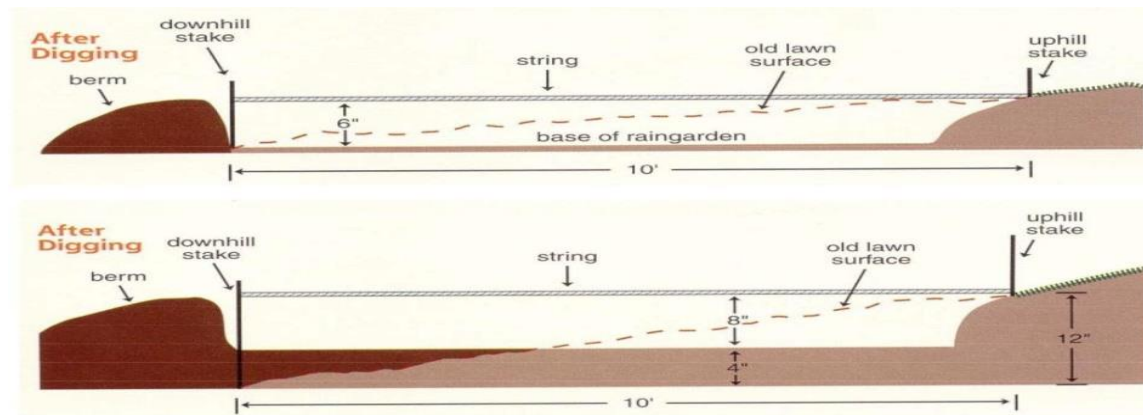




CALL JULIE
Before You DIG!
811 or (800)892-0123

Dig Your Rain Garden

Dig to a depth of 3" to 8" keeping the bottom as level as possible. Use soil and removed sod to build a berm if your garden is on a slope.

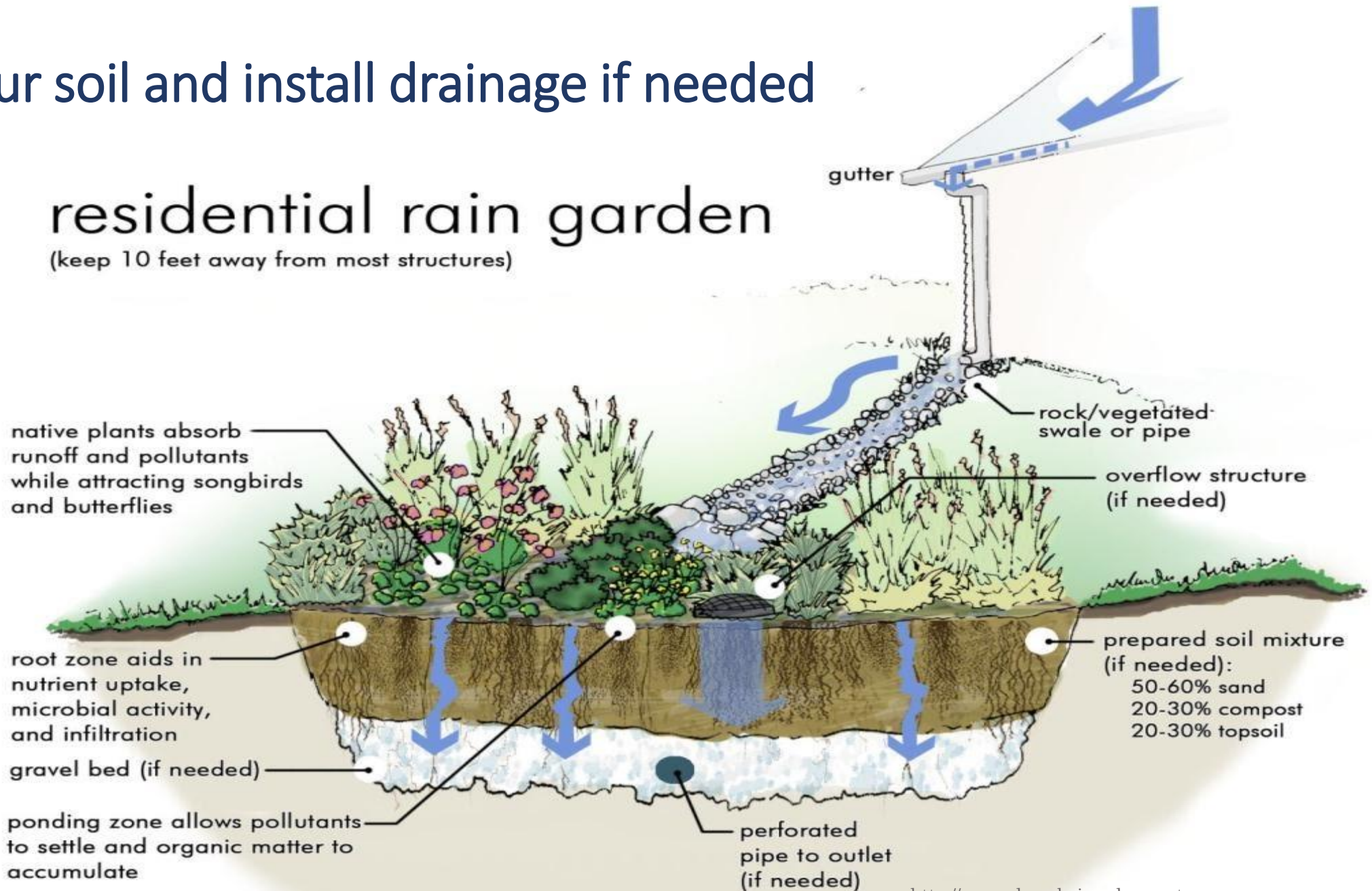


images courtesy WI DNR

Prepare your soil and install drainage if needed

residential rain garden

(keep 10 feet away from most structures)



Add Inflow and Outflow Features

- Stream bed
- Gutter extensions
- Splash stones
- French drain
- Special grading
- Swales
- Rain barrels with a standard garden or soaker hose
- Corrugated gutter hose



Install paths to prevent compacting soil

Use raised landscape stone or pavers to create a path through your new rain garden.



Photo from Four Seasons Gardening

Prevent erosion in your rain garden

Use stones or crushed gravel to stop erosion at inlets and outlets when extreme water flow happens



Photo by Chris Enroth, U of IL Extension Educator

Selecting the
right plants:
NATIVES preferred



Photo from Four Seasons Gardening

Know your zones

1. WET Zone- center and lowest spot of your garden where water pools as it drains

2. MOIST Zone- the border and slope areas where some flooding may occur in extreme downpours

3. DRY Zone- edge of your garden and the driest area, it includes any berm that you might add



Native plants/sedges that do well in the WET zone



Blue Vervaine
(*Verbena hostata*)



Cardinal Flower
(*Lobelia cardinalis*)



Sensitive Fern
(*Onoclea sensibilis*)



Swamp Milkweed
(*Asclepias incarnata*)



Sneezeweed
(*Helenium autumnale*)



Chinese Astilbe
(*Astilbe chinensis*)



Tussock Sedge (*Carex stricta*)

Native plants that do well in the MOIST zone



**Joe-Pye
Weed (*Eutrochium
purpureum*)**



**Royal Fern (*Osmunda
regalis*)**



**Great Blue
Lobelia (*Lobelia
siphilitica*)**



**New England
Aster (*Aster novae-
angliae*)**



**Black Eyed Susan
(*Rudbeckia herta*)**



**Blazing Star (*Liatris
spicata*)**

Native plants that do well in the DRY zone



Mountain
Mint (*Pycnanthemum
virginianum*)



Spiderwort
(*Tradescantia ohiensis*)



Prairie
Dropseed (*Sporobolus
heterolepis*)



Rattlesnake
Master (*Eryngium
yuccifolium*)



Wild Bergamot
(*Monarda fistulosa*)



Culver's
Root (*Veronicastrum
virginicum*)

Shrubs for your garden



Wet

- Buttonbush (*Cephalanthus occidentalis*) 3' – 10'



Wet or Moist

- Black Chokeberry (*Aronia melanocarpa*) 3' – 6'
- Red Osier Dogwood (*Cornus sericea*) 8' – 10'
- Elderberry (*Sambucus canadensis*) 10'
- False Indigo (*Amorpha fruticosa*) 12'
- Winterberry (*Ilex verticillata*) 6' – 12'



Moist

- Annabelle Hydrangea (*Hydrangea aborescens*) 3' – 5'



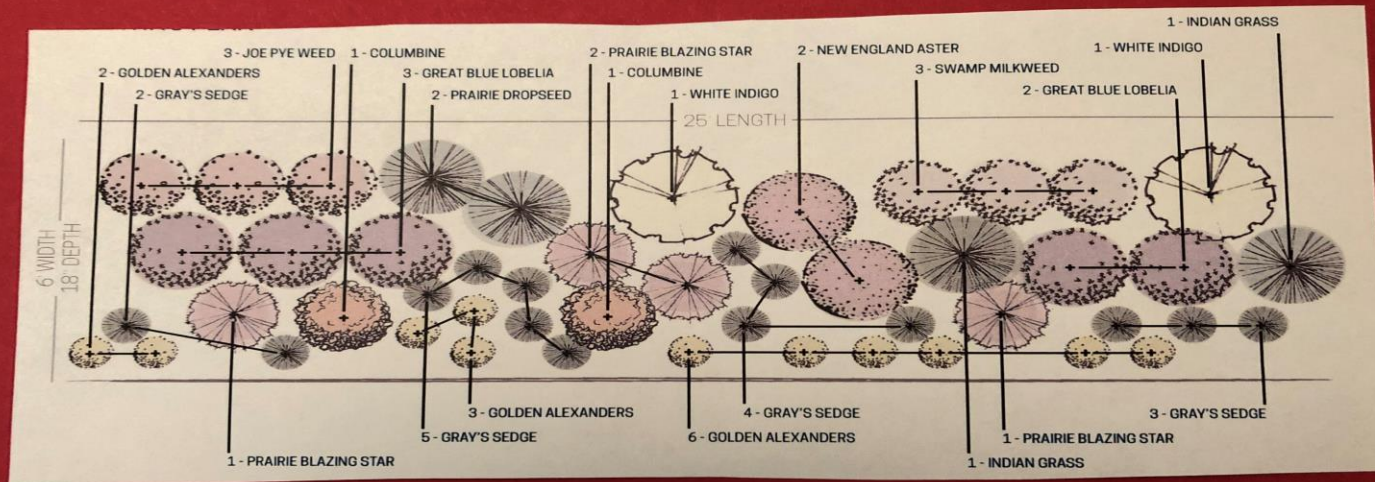
Moist to Dry

- Lead Plant (*Amorpha canescens*) 3'

Wetter

Dryer

Select your plants and design a low maintenance plan



Good Rules About Plant Spacing

Position plants 12' apart or one per sq. ft.

80 sq. ft. = 80 plants

Plant in odd numbered multiples:

3, 5, 7, 9 or 11

Start with tallest plants in the middle

Steps to creating a Rain Garden

Plan

- Check hydrology
- Look out the window
- How would it look from the sidewalk
- You might even want to cross the street if you want a front garden
- Look from your neighbor's yard
- Choose a location

Assess

- Complete a drainage test
 - Determine what type of soil you have
 - Determine size of garden based on runoff
 - Are you on a slope?
- Call JULIE at 811 or (800)892-0123
BEFORE YOU DIG!

Install

- Dig and grade the area selected
- Install rain barrels, stream beds, French drains, other inflow/outflow
- Select and purchase plants
- Plant and mulch the Rain Garden

Maintain

- Water and weed regularly
- No need for fertilizers or pesticides
- After 2 or 3 years you may have to divide the native plants

What else can I do?

- Prevent waste such as grass clippings and leaves from washing into the storm drain, rake them up and add to compost pile
- Use pans to collect oil and grease when working on a vehicle so they do not wash out into the street
- Sweep driveways and sidewalks, don't hose them down. Saves water, and debris can be added to compost pile
- Use a commercial car wash which recycles water and uses safe practices for disposing of chemicals
- Connect rain barrel to a downspout and use water to irrigate your plants
- Direct downspouts and sump outlet hoses or pipes to a French Drain

References



<https://extension.illinois.edu/cook/rain-gardens>

<https://extension.illinois.edu/cook/landscape-design>

https://iiseagrant.org/wpcontent/uploads/2019/02/RainGardenManualRevisedComplete_8_1.pdf

<http://clean-water.uwex.edu/pubs/#hy>

Upcoming Conservation@Home Workshops

Landscape Design

January 31, 2020 River Trail Nature Center, Northbrook— REGISTRATION CLOSED

February 1, 2020 Sand Ridge Nature Center, South Holland—REGISTRATION CLOSED

February 22, 2020 Little Red School House Nature Center, Willow Springs—REGISTRATION CLOSED

COMING THIS SPRING

Natural Lawn Care Program

April 4, 2020 - Sagawau Environmental Learning Center, Lemont

April 11, 2020 - Crabtree Nature Center, Barrington

April 18, 2020 - Trailside Natural History Museum, River Forest



Thank You!

For information contact:
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