Rouge Growing Green

A Series of Green Infrastructure Workshops

Rouge Friendly Landscaping: Native Plants for Better Water Quality

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FIREFIGHTER'S PARK

Streambank Stabilization Project

Jennifer Lawson
Environmental Specialist
City of Troy - Engineering Department

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What

- The Sprague Drain, headwaters of the Main branch of the Rouge River, flows through Firefighter's Park in the City of Troy. Typical of many streams in an urbanized setting, the Sprague Drain is exposed to flashy flows and extreme erosion forces.

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Why

- Firefighter's Park is heavily used by residents that picnic, play soccer, play disc golf and enjoy nature. The popularity of this park and the easy access to trails adjacent to the stream made this an ideal location for a demonstration project.

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How

- 650-linear feet of stream bank was regraded, and then stabilized using geotextiles and native plants. Signage was also added in Fall 2003

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Plant List

Trees/Shrubs

- Black Alder
- Red Osier Dogwood
- Ninebark
- Fragrant Sumac
- Viburnum

Grasses

- June Grass
- Big Bluestem
- Virginia Wild Rye
- Indian Grass
- Riverbank Wildrye
- Tussock sedge

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Seed Mixes Included:

- Annual Rye
- Perennial Rye
- Bachelors Button
- Annual Baby's Breath
- Wild Blue Lupine
- Rocket Larkspur
- Dame's Rocket
- Lance-leaved Coreopsis
- Siberian Wallflower
- Shasta Daisy
- Biannual Evening Primrose
- Perennial Blue Flax
- Annual Phlox
- Marsh Blazing Star
- Spurred Snapdragon
- Corn Poppy
- Blanketflower
- Purple Coneflower
- Black-eyed Susan
- Deer Tongue Tioga
- Fox Sedge
- Ox-eye Sunflower
- Nodding Bur Marigold
- Common Milkweed
- Showy Tick Trefoil
- Blue Vervain
- Flat Topped Aster
- Shelter Switch Grass
- Wild Bergamot
- Giant Ironweed
- Spotted Joe Pye Weed
- Wingstem
- New England Aster

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Wildflowers and grasses add color and movement to the riverbank, making it a special place to enjoy.

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Volunteers played a huge part in the planting and improvement of the streambank in Firefighter's Park.

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Before

The wooded stream bank along the Rouge River

After

Before

Severe bank erosion fixed with grading and plantings

After

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RAIN GARDENS FOR THE ROUGE

A beautiful solution to water pollution!

Presented by:
Lillian Dean, FAICP
Coordinator, SOCWA Healthy Lawns and Gardens
In cooperation with SOCWA Master Composter Volunteers

See also: www.socwa.org
-- lawn and garden section

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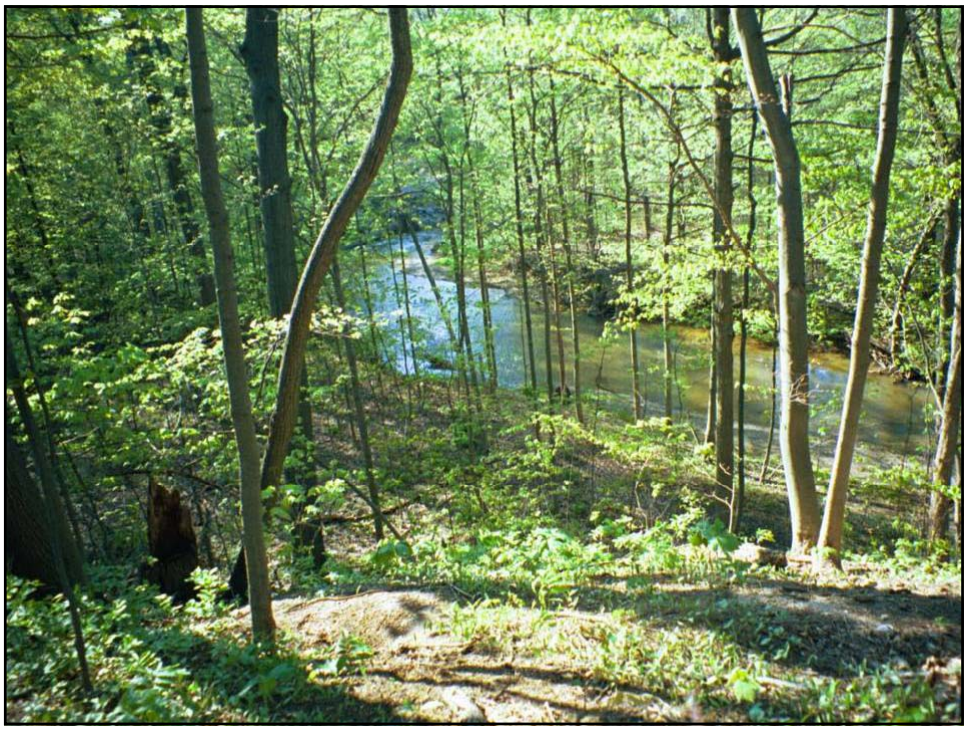
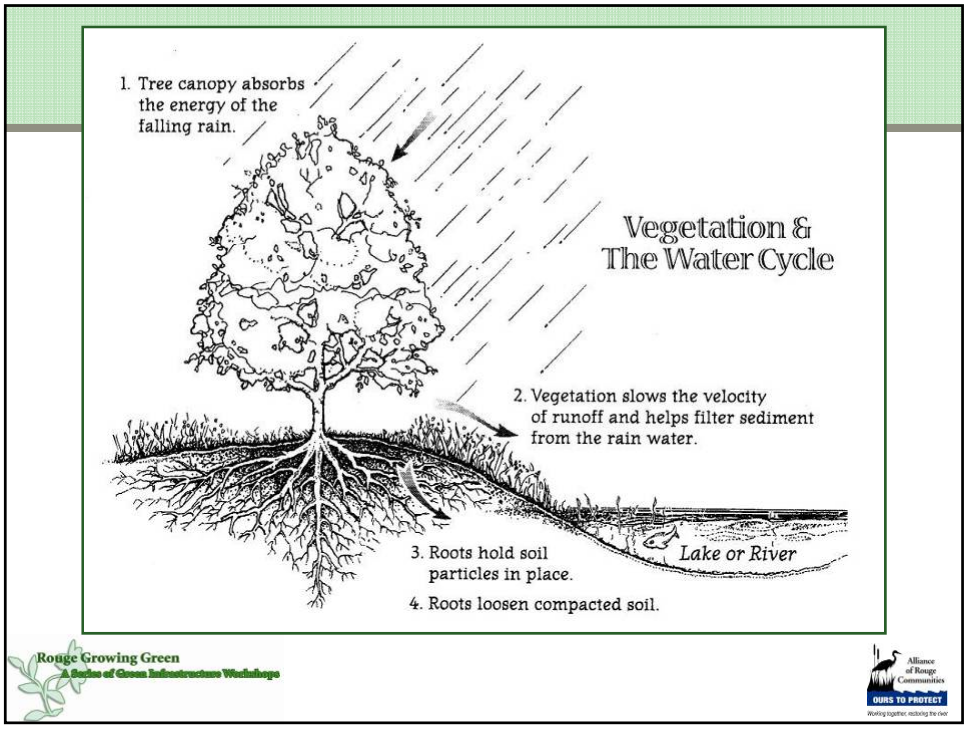
Rouge River
Main
Branch
OURS TO PROTECT




1. Tree canopy absorbs the energy of the falling rain.
Vegetation & The Water Cycle
2. Vegetation slows the velocity of runoff and helps filter sediment from the rain water.
3. Roots hold soil particles in place.
Lake or River
4. Roots loosen compacted soil.
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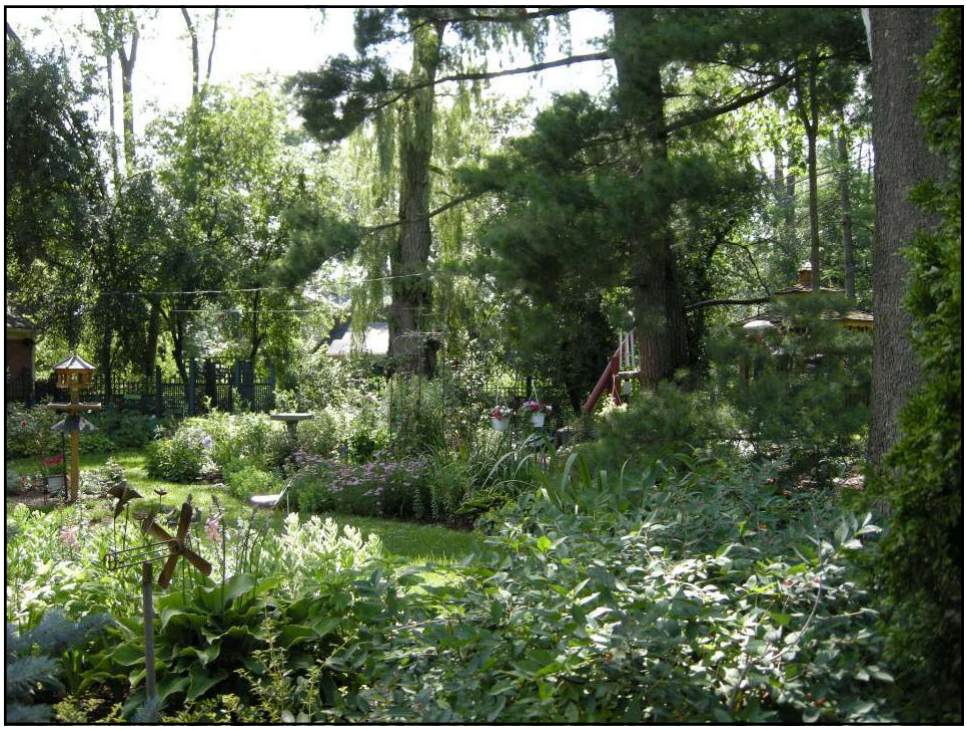

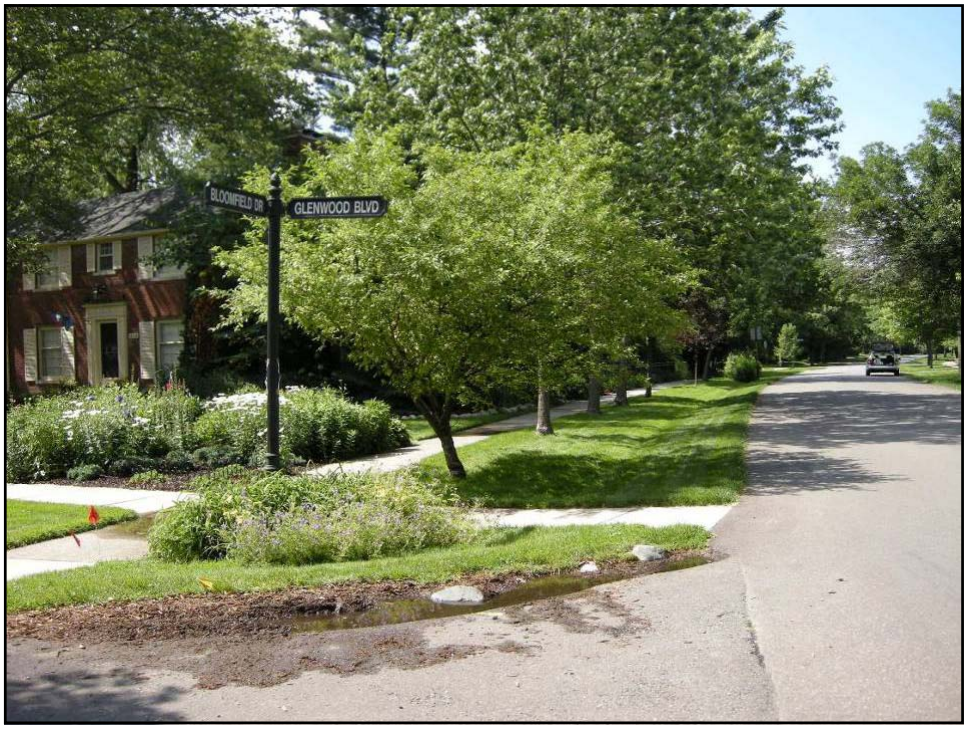

Tall native wildflower with deep roots soak up rain water

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Native wildflowers for rain gardens

Blue lobelia (left) Nodding wild onion (right)

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Monarch butterfly nectaring on Joe-Pye Weed
(Eupatorium maculatum)

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SOCRRA/SOCWA Gardens:

3910 W. Webster, Royal Oak (between Coolidge & Greenfield)

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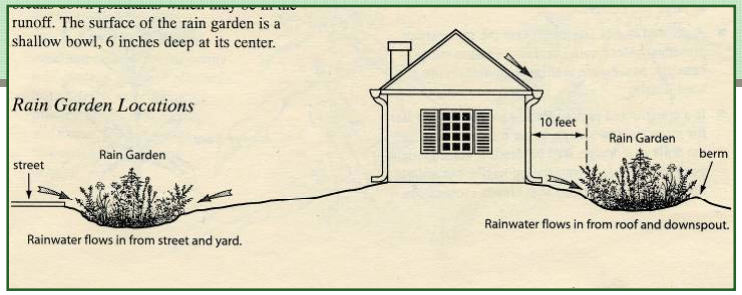

What is a rain garden?

A rain garden is a depression in the landscape designed and planted to capture storm water runoff. In a rain garden, plants and the soil system filter storm water naturally, removing nutrients and other pollutants. A rain garden should be dry after 48 hours or less.

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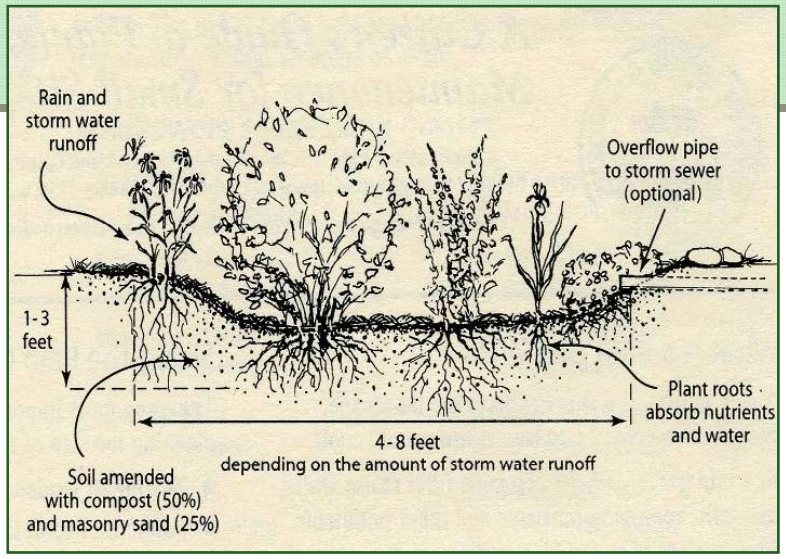

Typical Rain Garden Profile - Clay Soil Site

Useful soil mix: 70%- 80% compost; 20% -30% sharp sand; NO top soil

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Lathrup Village Community Rain Garden - June 2004

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Rain Garden
for the
Rouge River

Adler Elementary School Rain Garden: Fall Maintenance

- Thin native plants
- Weed out aggressive plants
- Divide ornamental grasses
- Mulch with shredded leaves

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Home Drainage Test

Steps:

1. Dig a hole 18 inches deep and 6 inches in diameter
2. (use shovel or post hole digger)
3. Fill the hole to the top with water and let it drain.
4. (this will saturate the surrounding soil).
5. Re-fill the hole with water and measure how fast it drains
6. (use a yard stick). If the hole drains 3 inches in a
7. 6 hour period, your infiltration rate is 0.5 inches per hour.
8. If the hole doesn't drain completely in 48 hours, this
9. location has poor drainage (clay soil site).

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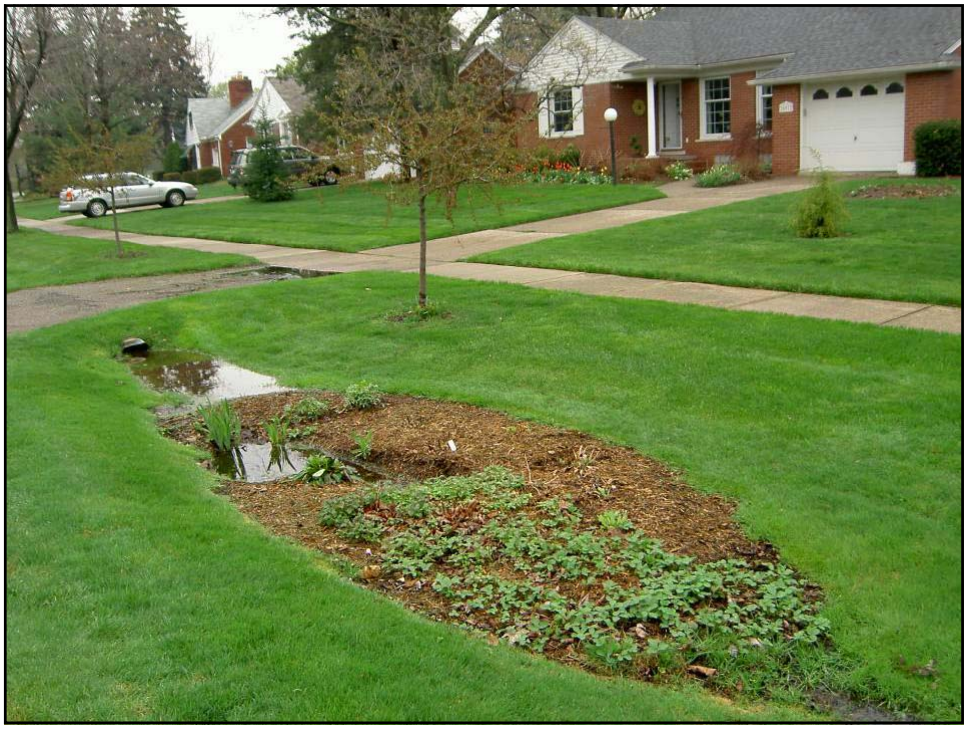
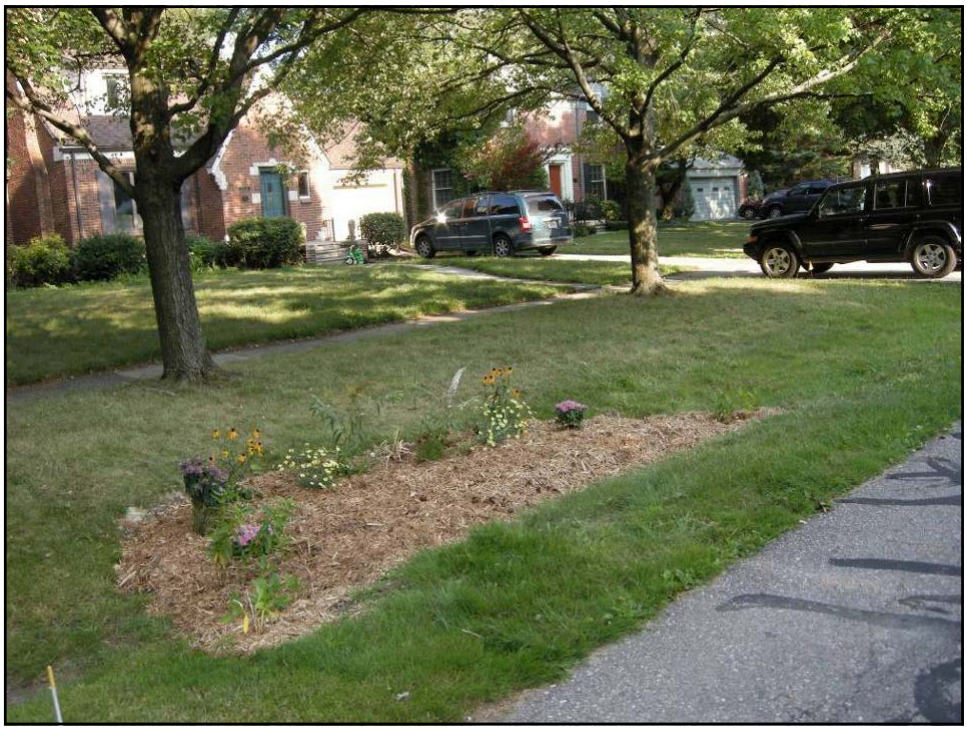



JCB



Investigation Of Rain Garden Planting Mixtures

By Donald Carpenter, Ph.D. - Lawrence Technological University -- June 2005 Data

% WATER RETAINED BY WEIGHT

100% compost	**132%**
80% compost; 20% sharp sand	**76%**
80% compost; 10% sharp sand; 10% top soil	**69%**
60% compost; 40% sharp sand	**35%**
35% compost; 35% sharp sand; 30% top soil	**27%**
100% sharp sand	**16%**

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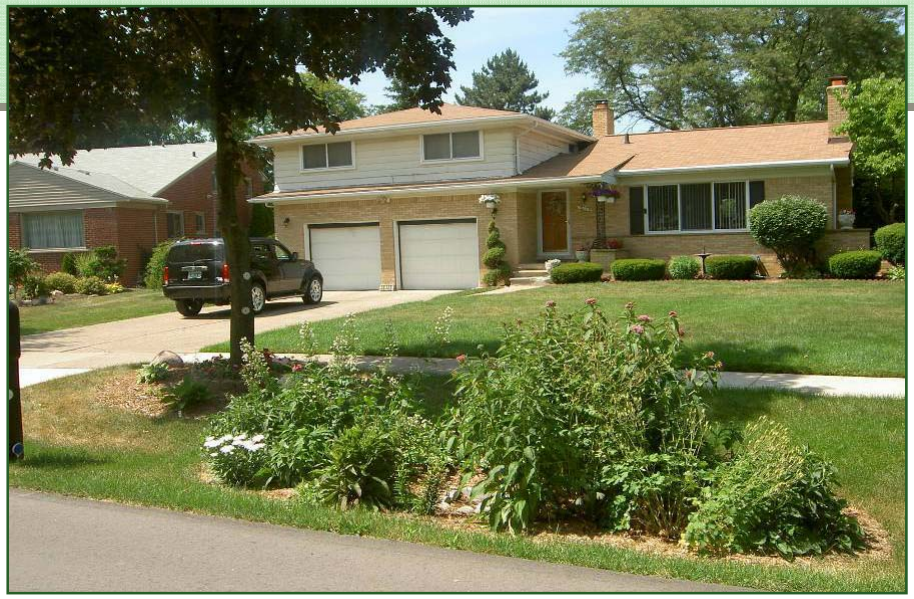

Alfred Sander's Rain Garden, Lathrup Village

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San Rosa Neighborhood Rain Gardens
West of Southfield Rd., Lathrup Village

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The Piotrowski rain garden is a family project

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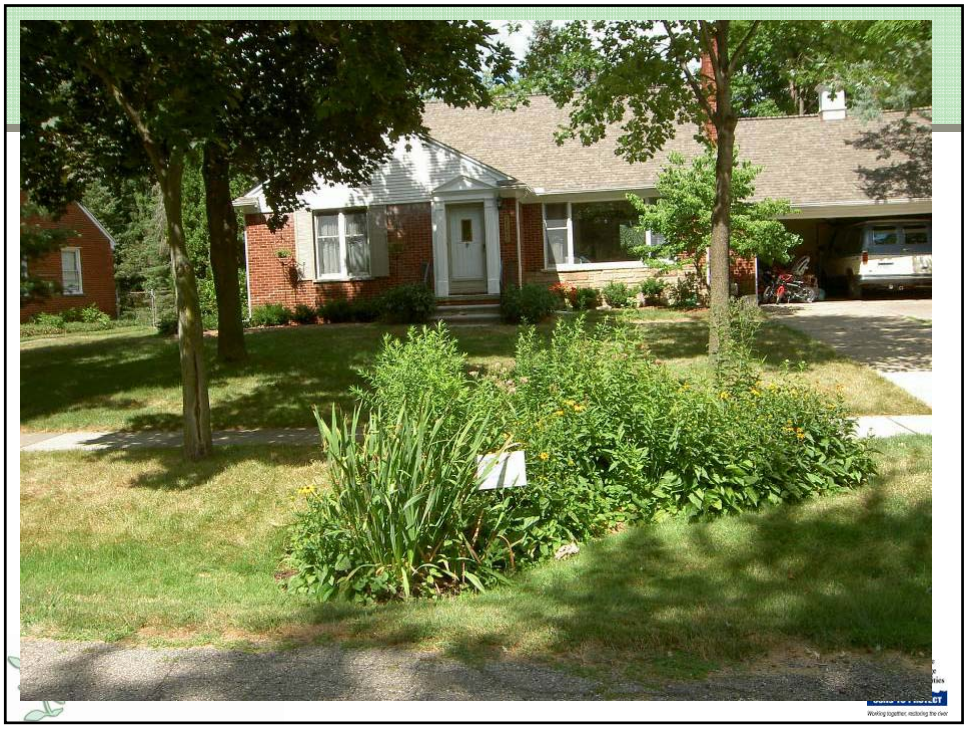

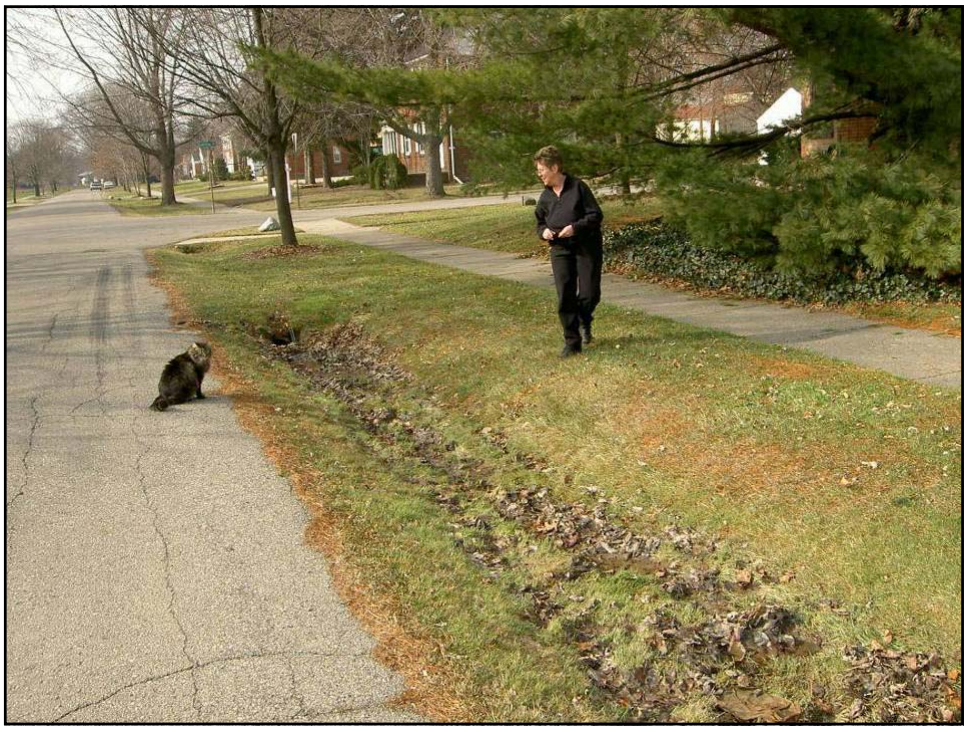

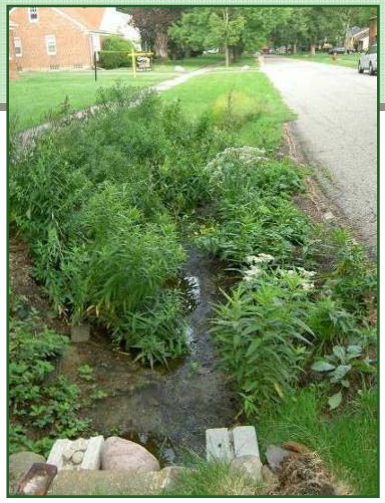

Peggy Collins, Master Composter
Magnolia Nieghborhood, Southfield
Streetside rain garden receives water from storm drain ditch along the entire block

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Peggy Collins' Rain Garden
Magnolia Subdivison, Southfield 7/24/07

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Barbara Burke, Master Composter
Farmington Hills
Rain water from roof - diverted to rain garden via underground french drain system

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How-to-do-it Guidelines For Home Rain Gardens

Step #1:	Select a rain garden location.
Step #2:	Check your soils for drainage ("dig a hole" test).
Step #3:	Determine your goals for water retention.
Step #4:	Determine rain garden size and shape.
Step #5:	Plant the rain garden.
Step #6:	Mulch the rain garden.
Step #7:	Maintain the rain garden.
	Make changes, as needed!

ENJOY YOUR LOVELY GARDEN!

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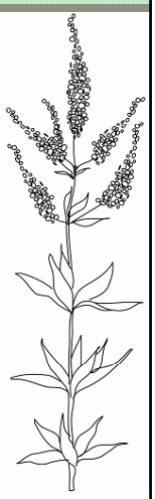
Rain Garden Plant Selection

- Check your site conditions. Sun vs. shade; various degrees of shade; soil texture and drainage, etc.
- Choose hardy plants that grow in either saturated soils or organic soils. (moist-to-wet tolerance).
- Use plants native to Michigan whenever possible. Native plants are adapted to local climate and site conditions.
- Wet prairie wildflowers are excellent for sunny locations. To attract butterflies, select for continuous bloom and nectar throughout the growing season.
- In partial shade, consider a "woodland" garden. Low-maintenance trees and shrubs can be selected for storm water benefits, bird habitat and more.
- Use a pesticide-free grassed buffer around the rain garden to provide additional water quality benefits.



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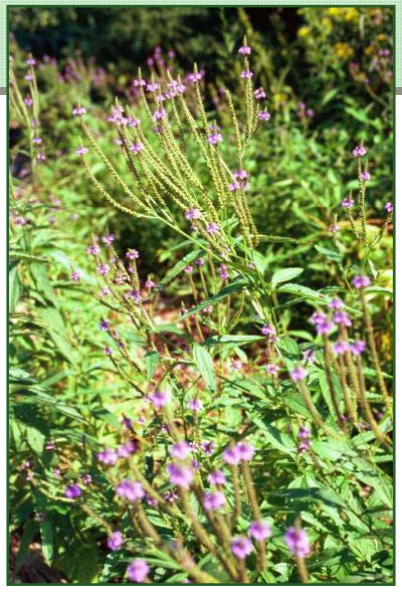

SOCRRA NATIVE LANDSCAPE EDUCATION SITE

Blue vervain *(Verbena hastata)*
Boneset *(Eupatorium perfoliatum)*

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Native Wildflowers and Shrubs for Rain Gardens:

- "Right plant…right place" - check sun/shade; soil pH; drainage; organic matter content of soil.
- Consider biodiversity; butterfly plants; berries for birds.
- Plants available from Michigan Native Plant Producers Association and sometimes local retailers.
- What does "native" mean? Would have been found here before European settlement

Shown here: Joe-pye Weed

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Blue Flag Iris
Iris versicolor

Penstemon
Penstemon digitalis

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Spiderwort - *Tradescatia spp.*

Tallgrass Prairie native wildflower…
and easy-care garden perennial

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Bee Balm - *Monarda didyma*

Old fashioned garden plant - great for butterflies! (non-native)

Spacing: 18 - 24" **Tip:** Cut in 1/2 in May for compact growth

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American Cranberrybush Viburnum - *Viburnum trilobum*
(spring flowers; fall color; red berries for the birds)

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How To "Build" The Rain Garden On Clay Soil Sites

1. Observe the flow of rain water over the ground during a heavy rain storm. Use the "natural holding areas" on the site as your rain garden location.
2. Dig out and remove clay soil - 1-to-3 feet deep.
3. Replace soil with compost (70% - 80%) and sharp sand (20% - 30%) mix.

   Note: Avoid top soil due to clay component.

4. Let the soil mix settle. Check the water flow and infiltration following major rain storms. If necessary, expand the size of the rain garden.
5. Plant the garden - native wildflowers recommended.
6. Top-dress with shredded organic mulch (3" deep).

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Rain Garden Sizing

For further information: Homeowner design guidance by Donald Carpenter, Ph.D., Lawrence Technological University

- Total area flowing into rain garden - less than 1 acre
- Typical dimensions: 10 ft by 20 ft or more
- Recommended planting mix depth: 2.5 ft, average (1-4 ft)
- Ponding depth in middle of rain garden: 6" - 18"
- Drainage time: 48 hours or less (to avoid nuisances/mosquitoes)

SIZING CHALLENGES:

1. Front yard drainageway receives water from a block away (e.g., swale; ditch)
2. Large amounts of runoff from neighboring properties.

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Residential Rain Garden Locations

Site Planning Considerations

- Observe natural flow paths over time.
- Complete a drainage test to determine natural infiltration.
- Prepare a site plan.
- If the garden is proposed in the right-of-way (easement), contact your municipality for approval and/or advice.
- Direct water from downspouts & pavement into the garden.
- Slow the rapid flow of runoff, if necessary, with buffer zone (rocks; grass).
- Multiple small gardens may be more effective than one larger garden, especially in clay soils.
- Intercept rain water as close to source as possible.
- Place garden at least 10 feet away from building foundation.
- Avoid disturbing mature trees.
- Avoid underground utilities - call Miss Dig!
- Plan for an overflow outlet.

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Growing our SOCWA Rain Gardens and native plants in Southfield

By: John DeLisle

- Design
- Establishment
- Maintenance and Ecology
- Benefits of native plants

In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we learn.

- Baba Dioum, conservationist

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Site Assessment

What can I do to improve water quality and my community's ecosystems?

- Decide on a designer for the landscape plan; You?
- Dig in to native plant resources, and rain garden references. Top 3 are:
  - www.for-wild.com – Wild Ones Natural Landscapes
  - www.mnppa.org – Michigan Native Plant Producers Assoc.
  - www.raingardens.org – Rain Gardens of West MI
- Landscaping with Native Plants of Michigan by Lynn Steiner
- For professional help for the planning phase, choose a landscape contractor that has experience working with native plants. Ask if he uses an ecological/environmental consultant.

- Whether yourself, professionally or by a volunteer group, the first step in planning is assessing the site. This means identifying basic features of the land and planned Rain garden:
  - Soil and Percolation rate
  - Basin type, water source (gutter-connected, 80/20compost etc.)
  - Location and surrounding drainage patterns
  - Size, shape, slope
  - Water depth
  - Existing vegetation

When we see land as a community to which we belong, we may begin to use it with love and respect.

-Aldo Leopold

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Suggestions for locating and sizing

What has worked for us:

- **Locating rain gardens**
  - Natural water collection areas
  - Observe snow and rain drain patterns
  - Stay away from foundation (10-15')
  - Keep it shallow (1' to 2' depth), but consider soil type, backfill needed, plants utilized
  - Sunny or partly sunny location, or use forested wetland natives
  - Ditches or stormwater detention culverts
- **Size of the rain garden depends on:**
  - Your soil type
  - Area draining to the rain garden
  - Slope (flat or steep)
  - What makes sense for your yard and budget?
- **It is a balance of these elements…and the amount of mulch and compost/sand mix you install – it will settle and scour until plants establish!**

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Choosing site appropriate species

...And have fun planting!

- Choose plant material that is suitable for your soils
- Many plant lists are available online or in Wild Ones references
- Consider light levels
- Know how much your site dries out
- Aesthetic goals such as:
  - Height
  - bloom time
  - color
- Ecological goals such as:
  - Pollinator attraction
  - nutrient cycling
  - fruit for wildlife
  - deep-rooting grasses to stabilize culverts or banks

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Soil and hydrology modification

Giving the plants a chance to absorb

- What is your soil like?
  - Gritty and coarse = sandy
  - Smooth not sticky = silty
  - Sticky and clumpy = clay
- You may want to have the soil tested?
  - Or test it yourself - dig a hole, put water in it and see how long it takes to infiltrate into the ground
- What if you have poorly drained soil (clay)?
  - May have to do soil amendments (often compost and sharp sand, more sand the heavier the surrounding soil is)
  - May have to install a small "under drain" or French drain
  - For example, to process the amount of flash flow in our ditch garden within 48hrs., we installed a French drain with a sand percolation underdrain/catch basin
  - We also created 3 trench hummocks after noticing water retention in the first ditch pool was not reaching Irises and Asters

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Designing Your Rain Garden

how to arrange your plants or space blueberry bogs…

- Formal or informal?
- Choose native plants, even shrubs (we have a blueberry "bog" and a "raspberry swale")
- Appropriate for fluctuating conditions
- (sunny - shady - soils)
- Winter interest is important
- TEXTURE, COLOR, HEIGHT
- Sightlines – views and restrictions?
- Buffers/room for access
- Spacing – plant tolerances or groupings
- Any berms, contouring, or grading?

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Cost?

It's cheaper than mowing the lawn!

- **Do it yourself – purchase plants ($3 to $5 per s.f.)**
- **Cost of landscape consultants varies ($10 to $15 per s.f.)**
  - Includes design, construction, plants, and planting
- **Assuming a 300 square foot rain garden:**
  - $300 to $500 if you do it yourself
  - $3,000 or more if you hire out
  - One plant per square foot is typical

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Ordering Plants

Enjoy window shopping!

- Catalogs from nurseries provide information about the plants and preferences
- Sell plants, seeds, or seedlings (bare root, rootstock, and plugs), consider cost per plant or unit (i.e. 0 to 100 plants, 100 to 500 plants 1lb or 2lbs. Seed etc.).
- Cost for seed is listed in fractions of a pound. Seed is sold by individual species, as pre-mixed species for a particular ecosystem or as custom made mixes. Most catalogues have descriptions & pictures!!!
- Most nurseries have user-friendly websites. It is always a good idea to ask for cultural info on each species you are interested in using.
- I have personally purchased plant materials from Oakland Wildflower Farm, MI Wildflower Farm, Wildtype, Wetlands Nursery, and MaryAnn's Native Trees and have been satisfied with plant vigor from all sources. Wildtype has the widest selection of potted material.

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What type of natives should I plant?

Seedlings or small potted plants are the easiest for rain gardens

- Seedling plants can arrive either as bare root or in flats/trays/pots like greenhouse perennials
- Prepare soil mix by raking smooth and removing clods
- Make sure to spread out the roots of rhizomatous species
- Leave at least 6" between plants – they spread/fill-in FAST in compost!
- Flowering species I find easy are: Aster spp., Blazing Stars (*Liatris* spp. and Helen's flower (*Helenium autumnale*); Blue Flag (*Iris virginica*), Swamp Milkweed (*Asclepias incarnata*)
- Good Grasses for me: Blue joint (*Calamgrostis canadensis*) and Big bluestem (*Andropogon gerardii*); Little Bluestem (*Schizyarium scoparium*, Indian Grass (*Sorghastrum nutans)*
- Sedges/Rushes: Pen sedge (*Carex pensylvanica*) or Fox sedge (*Carex vulpinoidea*) and *Juncus effusus.*
- Shrubs: Cinquefoil (*Potentilla fruticosa),* Dogwoods*(Cornus spp.)* and WIllows*(Salix spp.)*

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What type of natives should I plant?

Seeds are cost-effective and establish well with spring project timing

- Personal experience is varied, our shadier gutter garden has twice the diversity among the 3 from an identical seed mix, so far…
- Rough graded first –removed roots, clods, debris
- Wetland seed, seed mixes or plants will only be successful if planted in the proper areas. Seeds will do BEST in the wet meadow zone (drier)
- If seed is purchased as individual species they should be mixed together. Some species of native seeds are so fine that a sand filler gives the mix distribution in the mix. I broadcasted by hand, but a spreader is handy
- Broadcast the seed mix into the basin and rake it until it all has come in contact with the soil.
- Covering the seed with a light mulch of straw will help the seedlings survive
- Nurse crop: (seed oats, winter wheat, we sowed rye) Sow the native seed first, then the nurse crop on top of it and rake both into the soil.

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Seed Collecting

- It is fairly easy to grow native plants from seed…
- Collect in natural areas with permission, consult a reference, naturalist or Wild Ones member for timing
- Buy seed from a Michigan Native Plant Nursery
- Many online prairie establishment references, and textbooks
- Can start plants from seed indoors, or sow in Winter or Early Spring (stratification)
- We collected from our home in Clinton Twp.

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Eco-Functions of Natives

Nature's filters

- Hardiness - they do not need additional water, fertilizer, chemicals or winter protection to survive! (Mulching is beneficial though – minimizes compost oxidation & weeds)
- Native plants evolved locally, so they adapt to our climate
- Native plants are often resistant to common pests and pathogens that plague non-native species
- Enrich the soil and conserve water usage
- Native plants help "treat" storm water by removing/cycling nutrients and increasing infiltration (the last point is SO visible!)

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Aesthetics and Wildlife Habitat

- Use of native plants in several landscaping zones around a rain garden can provide a rich visual environment.
- The combination of wetland plants with flowering prairie plants and woody natives in upland areas provides far more visual appeal throughout the year than large areas of lawn.
- Native plants also offer food and shelter for wildlife. This benefit is particularly important as suburban growth replaces historic woodlots and fields.
- In the upland areas, for example, prairie grasses, trees and shrubs provide habitat for a variety of insects, song birds and small mammals.

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Ease of Management

It's FUN work, but it takes planning

- Native plants = less management
- Mature wetland natives require maintenance mowing and weed removal twice a year, in the spring and fall, along with mulching in high-visibility or weed-prone areas.
- Perhaps the greatest maintenance savings are achieved when grass is replaced!!!
- 5-year time frame. The early years are the busiest, involving monitoring plant success and supplementing struggling populations.

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Maintenance Hints and Details

- Watering is necessary during drought for wet meadow and prairie areas, especially in the first year. By the second year they should be able to tolerate most weather extremes. In the case of severe drought (less than 2 inches of rain per summer month) water wet meadow plants.
- If plants are growing well they should flower and produce seeds by the end of their first or second season.
- Mow or trim back wet meadows/rain gardens in the spring and fall after the first year of growth has been completed.
- Mowing twice a year will be enough to control weeds...not TOO much, or deer won't rest by your porch ☺
- Congratulations, you're saving $$$ and the environment!

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Why Rain Garden with Native Plants?

Important Lessons Learned

- Identifying vegetation that already exists on a site will raise awareness of any noxious species present, e.g., buckthorn!!!
- Some native species of plants might be saved!
- Read fervently and learn to ID plants and plant families.
- DON'T assume a seedling is a weed, ID it! if it is invasive, destroy it immediately!
- The seed bank might germinate with proper conditions of light, heat, and moisture.
- Some of these native species are Willow (*Salix*), Dogwood (*Cornus stolinifera*) Maples, and many woodland or meadow wildflowers, like violets and Prairie smoke.
- Tell as many friends and neighbors all about your plans, progress, and most importantly – how the native plant movement and rain gardening specifically will help the community!

We can each make a measurable difference almost immediately by planting a native nearby. As gardeners and stewards of our land, we have never been so empowered – and the ecological stakes have never been so high.

- Douglas Tallamy

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