Landscaping for Rain, Butterflies and Pollinators
With Raingardens and Native Plants
Johnson County Residential Raingarden Workshop
May 17, 2017
Agenda:

1. The Importance of Back Yard Landscaping
2. How to Build a Raingarden
3. Choosing Plants

Presented by: David Dods
Environmental Scientist & Co-author of “The Blue Thumb Guide to Raingardens”

Sponsored by: Johnson County Stormwater Management Program
http://www.jocogov.org/stormwater
Nature Treasures
Water
Professional Work: Restoration of Industrial Contamination
Urban Stormwater Management
1. The Importance of Back Yard Landscaping

Images: David Dods, Scott County, MN Soil and Water Conservation District, Rice Creek Watershed District
This is Angela and Marsha

They are Amazing Geoscience Teachers at Olathe North High School (and good landscapers)
This is the Raingarden the Geoscience Students Created

We are going to find out why
To Do So, Let’s Look at What Happens When We Turn Prairie and Forest ...

Into Suburbs
The Native Prairie Acts Like a Flower-Filled Sponge:
Soaks Up Water,
Soaks Up Carbon,
Habitat for Pollinators and Wildlife

Prairie photo: Carla Dods
Prairie Root Display,
National Botanical Conservatory, Washington D.C.

Photo by Rusty Schmidt,
Waterdrop Design NY
Forests are the Same:
Teaming With Life Above and Below Ground,
Soaking up Water and Carbon
Our Urban Landscape:
an Ode to Asphalt

Lots of Runoff When it Rains

Little Infiltration, Habitat, Carbon Storage, or Shade
Suburban Soil Care:
Step 1: Strip topsoil, Compact, Let bake in the sun
Step 2: Add rock and debris,
Step 3: Cover with sod
Step 4: Water and fertilize (repeat forever...)

Hard as the road, No topsoil, No organic matter, Little life left in it
And We Alter the Landscape on a Grand Scale
Consequences:
Backyard and Neighborhood Drainage Problems,
(Does this look familiar?)

Photos: Angela Epps
Consequences: Erosion
Consequences:
Neighborhood Flooding
Consequences:
Stream Erosion
Consequences:
Pollution in our Lakes and Streams
Consequences: 
Loss of Habitat and Native Plants

- We have altered 95% of the natural landscape in the Lower 48
- 2,000,000 ac/year are developed (the size of Yellowstone NP)

Sources: Monarch Watch; *Bringing Nature Home*, by Doug Tallamy; The Nature Conservancy
The Importance of Native Plants
(Besides Beauty, Habitat, Soaking up Rainwater, and Holding Carbon?)

Insects evolved adapted to these plants; When we lose the plants, we lose the insects
Declining Monarch Butterfly Population

Total Area Occupied by Monarch Colonies at Overwintering Sites in Mexico

- 1994-2016 average = 5.91 ha
- 2004-2016 average = 3.36 ha

Monarch Photo: Mary Nemecek,
Chart and Map: Monarch Watch
Mariposa, Mexico
Monarch Reserve

Photos Courtesy of Scott and Lynn Horsley
~ 1/3 of Commercial honeybee colonies die each year

Wild bee abundance declined 23% between 2008 and 2013. Over 100 U.S. crop plants depend on pollinators, most of them native.

Source: National Academy of Sciences and University of Vermont
The Importance of Native Plants and Insects

Everybody eats plants...
or eats something that eats plants

Example:
96% of all terrestrial birds feed their young on insects
Native flowering dogwood supports 117 species of moths and butterflies
Non-native Kousa dogwood imported from China supports none.

Personal Observations
My native flowers are covered with insects
Personal Observations
Curiously, one flower has very few visitors....

“A plant that has fed nothing has not done its job.”
- Doug Tallamy

‘Goldsturm’ cultivar
Conclusion: The plants we choose for our landscapes have far reaching impacts.
That is Why ONHS Geoscience Students Turned a Compacted, Muddy Space into a Raingarden:

We can do the same at home!
2. How to Build a Raingarden

Images: David Dods, Scott County, MN Soil and Water Conservation District, Rice Creek Watershed District
Raingarden

- Garden with a shallow depression
- Made to catch rainwater runoff
- With deep-rooted plants
- Infiltrates water
- Filters pollutants
- Creates Habitat
- Attractive landscaping

Photo: City of Maplewood, MN
Locating the Garden
Locating the Garden

Catch and slow water near the source of runoff before it flows downhill and picks up speed

By downspouts, driveways, patios, sump pump outlets

Stay 10 – 20 ft away from buildings +/-

Farther if you have an old, wet basement
Rain Garden Location
Collects Drainage from Driveway
Raingarden Location: Downspout to Garden Bed

Photos courtesy of Rusty Schmidt
Raingarden Location: Downspout to Garden Bed

Photo courtesy of Rusty Schmidt
Raingarden Location: Side Yard Downspout Drain Point
Raingarden Location:
Low Point in Back Yard Where Downspouts Drain
Raingarden Location: Sump Pump Drain Point
Raingarden Location: Downspout and Sidewalk Runoff
Ruiz Library, Kansas City
Raingarden Location: Parking Lot Edge
Places to Avoid

Utility Lines - Call Before You Dig
Kansas One Call: 811
Missouri: 1-800-DIG-RITE

Septic Systems

Uphill of Buildings: Don’t soak water into ground uphill of house

Behind Retaining Walls if Not Designed for Water
Sizing the Garden
Inspect & Test Your Soil

Dig a hole

Look for soil type, fill material, compaction

Conduct a percolation test:
Measure how much water soaks in over 24 hours
Select Garden Depth so That Water Soaks Away in About One Day

- Large plant selection: Many plants can tolerate being wet for a day. If water stays for days, that limits choices.
- No mosquitoes.

Illustration: Dan Shaw, Waterdrop Innovations
I try to hold the runoff volume from a 1” storm from the drainage area leading to the garden

Average size: about 8’ x 10’ near one downspout

Fit it to the scale of the landscaping

Remember to get the bed depth right to make sure it drains in a day
Preparing the Soil and Garden Bed
Garden Bed Shape: Shallow, Flat-Bottom Bowl

Preparing the Garden Bed
Put as much effort into preparing the soil as you do in selecting plants

• Dig out bowl shape.
• Break up compacted clay; Double dig.
• Mix in 3 - 4” compost.
• Rake to shape.
Test Infiltration Before Planting
It is much easier to rework the soil before the plants go in

Garden shape:
• Flat-bottomed, shallow bowl
• Berm on downhill edge
Plant Materials
For Larger Applications, Plugs are an Economical Choice
Planting:
Include Cute Kids for Photos

[Image of a man and child planting in a garden]
Inlets, Outlets, Mulch, and Finishing Touches
Inlets and Outlets
Direct water in and out of garden without erosion

Creek Bed Inlet

Notch in Garden Wall for Overflow Point

Photos: Rusty Schmidt and David Dods
Mulch

Use Coarse, Shredded Hardwood

Pinebark Nuggets & Cedar Chips Float
Just After Planting
Olathe North HS Garden Plan – Rain/Butterfly Garden

Photo by Kerry Hyre
Finishing Touches
Make the Garden Look Deliberate

Inlet splash blocks prevent erosion
Edging
Outlet
Accents
Rain Garden Construction
Blair Mill Elementary School, NJ
By Tony Federici

Photos by Tony Federici
Rain Garden Construction

Inlet

Bed of Pool

Berm Around Edge

Overflow: Creek Bed to Drain

Photos by Tony Federici
Rain Garden Construction
Filling With Water

Photos by Tony Federici
Maintenance

- Water during dry periods first year
- Should rarely need watering after 2\textsuperscript{nd} year
- Pull weeds 3-4x/yr
- Cut back grasses in late winter
- Clean inlet and mulch in Spring

Photo: Rusty Schmidt
3. Choosing Plants

Images: David Dods, Scott County, MN Soil and Water Conservation District, Rice Creek Watershed District
Deep Roots
Improve infiltration each year,
Help plants survive drought

Mailbox Art by Melissa Dods

Photo by Rusty Schmidt, Waterdrop Design NY
Putting the Right Plant in the Right Place

Considerations:

- Sun-Shade
- Plant Size
- Aggressiveness
- Moisture Tolerances

Photo: Andy Dandino, Mid-America Regional Council (MARC)
Center Bottom is Wettest Zone
Center Bottom: Wettest Zone
Foundation Plants are Typically Sedges, With Some Rushes and Grasses

Palm Sedge
Soft Rush
Switchgrass, ‘Shenandoah’
Center Bottom: Selected Flowers Tolerate Moist to Wet, and Periodic Drying

Joe pye weed

Marsh milkweed

Southern blue flag iris

Cardinal flower
Garden Sides: Average Moisture
Many Favorite Flowers Go Here

Purple coneflower, Black-eyed Susan, Blazingstars
Top Edges: Dry and Well-Drained
You can include dry favorites even though it is a “rain” garden

Butterfly milkweed  Prairie dropseed  Purple poppy mallow
Include Grasses for Garden Structure and Four Season Color

Little Bluestem and Switchgrass

Little Bluestem
Trees & Shrubs
Summer shade is a wonderful thing

Witch hazel
Black gum
Bald cypress
Shady Areas:
Many woodland wildflowers and shrubs like moist conditions

Colors tend to be more muted and bloom in Spring

Celandine poppy, Wild ginger
Red buckeye
Wild sweet William
Squaw weed
Milkweeds for Monarchs

- Marsh milkweed
- Common milkweed (back)
- Butterfly weed (front)
- Green antelopehorn milkweed
- Whorled milkweed
Fall Nectar Sources

Showy goldenrod (Don’t plant Common goldenrod)

All Blazingstars (Liatris)

Asters (Silky)

Sedum, “Autumn Joy”
Non-native, but good late season nectar
Rain Garden Planting Zones - ONHS

Dry flowers & grasses on the high points

Sedges in low points
Raingarden Construction: Start to Finish
Olathe North High School, Olathe, KS
Marking out the Garden
Dig, Rototill in Compost, Rake to Shape
Mark Plant Locations

High Point, Dry

Low Point, Wet

Edge of Concrete, Dry
After Two Years

Dry:
- Little bluestem
- Coneflowers

Wet:
- Palm sedge

Dry:
- Prairie dropseed
Resource and Contact Info

Available From:
TerraceHorticulturalBooks.com

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David Dods
david6dods18@earthlink.net