Where there’s water....
Rain Gardens for Water Conservation

Presentation by Stephen Brueggerhoff
Native Plant Society of Texas
What is a Rain Garden?

Shallow, vegetated depression designed to absorb and filter runoff from impervious surfaces; roofs, sidewalks and driveways.
Benefits of Rain Garden

- Provides water infiltration
- Lowers risk of flooding and soil erosion
- Helps filter out pollutants (secondary)
- Provides aesthetic & ecological benefits

Dry Creek Bed feature at the Lady Bird Johnson Wildflower Center
Garden Design: Is this a rain garden? Can you guess where it is located?
First Steps
Things to Keep in Mind

✧ If possible, pick a spot with full sun
✧ Ensure overflow will not disrupt neighbors yard
✧ Place rain garden at least 10-foot away from your house
✧ Test for utility lines; www.texas811.org
First Steps

Additional….

✧ NOT located over septic field
✧ Rain garden in a flatter part of your yard will make digging much easier. Example: a rain garden 10-ft wide on a 10% slope must be 12 inches deep to be level.
What are your goals? Do you wish to capture ONLY rainfall from downspouts, or do you wish to capture rainfall from downspouts AND runoff from yard?
First Steps

Observe flow of water and where it collects

Image: Stephen Brueggerhoff
First Steps
Calculate Slope

**Note:** The slope of your lawn is related to the depth of your rain garden

- Sink two stakes about 10-ft apart, one uphill & one downhill at your rain garden site. Measure distance (in inches) between two stakes
- Measure height (in inches) at downhill stake between ground & string
First Steps

Calculate Slope

Divide height between the ground and string by the distance between the 2 stakes; multiply the result by 100 to find percent slope

Example: \( \frac{6}{120} \times 100 = 5\% \ slope \)
Note: The slope of your lawn is related to the depth of your rain garden

✧ If slope > 4%, easiest to build 3 to 5-inch deep rain garden
✧ If slope between 5 & 7%, easiest to build 6 to 7-inches
✧ If slope between 8 & 12%, easiest to build 8-inches
Second Steps
Soil Percolation Test

Reference stick
Yardstick

Don’t forget: send soil sample to lab!
Giant Steps
Bigger May Not Be Better: Calculating the Rain Garden Size and Shape

- Remember your goals: capture of downspout OR of landscape
- Longer side should be perpendicular to the slope & downspout
Giant Steps
Calculate Garden Size/Shape

- Measure area of impervious footprint; l x w to get square-foot
- Divide by 6 (this number relates to the ‘rule of thumb’ that your rain garden should hold 1-inch of runoff at 6-inches deep)
Giant Steps
Construct Garden

- Dig depth between 4 to 6-inches; depth is dependent on slope
- Construct small berm down slope; improve capture
- Slope sides of rain garden (less than 6%) and level top border of basin, distributes overflow evenly; may plant the edging with grasses
- Loosen soil at bottom to 3-inches; level the soil
- If water flows quickly, may construct a ‘splash pad’ to guide water
Giant Steps
Construct Garden: Special Considerations

Image: Chesapeake Bay Sea Grant - http://www.chesapeakequarterly.net/V04N4/side2/
Giant Steps
Planting In the Proper Zone

Refer to ‘(Partial) Native Plant List for Rain Gardens’ document
Where Do I Find Examples?
Location of ‘green infrastructure’

www.austintexas.gov/department/austins-small-scale-green-infrastructure
Where Do I Find Examples?
Location of ‘green infrastructure’

Traffic calming rain garden at the intersection of 10th & Rio Grande

Rain garden at the intersection of Grover & Reese

Images: www.austintexas.gov/department/austins-small-scale-green-infrastructure
Where Do I Find Examples?
Location of ‘green infrastructure’

Barbara Jordan Elementary School rain garden

Images: www.austintexas.gov/department/austins-small-scale-green-infrastructure
Where Do I Find Examples?
Location of ‘green infrastructure’

Lower Colorado River Authority Redbud Center - manages stormwater using permeable pavements, bioswales & larger bioretention systems

From: Austin Land Design- www.austinlanddesign.com/
**Plant Selection**

- Drought tolerant plants, can manage periodic standing water
- Circumstances may require professional engineering or contractor services to ensure proper design and construction, secure permits, etc
- If renting, ALWAYS get landlord permission before beginning any work
- Refer to ‘(Partial) Native Plant List for Rain Gardens’ document
Native Plant Palette

Big Muhly  
(*Muhlenbergia lindheimeri*)

Inland Sea-Oats  
(*Chasmanthium latifolium*)
Native Plant Palette

Gulf Muhly
(Muhlenbergia capillaris)

Image: Sam C. Strickland
Lady Bird Johnson Wildflower Center

Indiangrass
(Sorghastrum nutans)

Image: Sally & Andy Wasowski
Lady Bird Johnson Wildflower Center
Native Plant Palette

Cherokee Sedge
(Carex cherokeensis)

Texas Sedge
(Carex texensis)
Native Plant Palette

Turk’s Cap
(Matracusc arboreus var. drummondii)

Swamp Milkweed
(Asclepias incarnata)
Native Plant Palette

Gregg’s Mistflower
(Conoclinium greggii)

Halberdleaf Rosemallow
(Hibiscus laevis)
Gulf Coast Penstemon
(Penstemon tenuis)
# (Partial) Rain Garden Plant list

<table>
<thead>
<tr>
<th>Grasses</th>
<th>Perennials</th>
<th>Shrubs</th>
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<tbody>
<tr>
<td>Big Muhly</td>
<td>Swamp Milkweed</td>
<td>American Beautyberry</td>
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<tr>
<td>Inland Sea Oats</td>
<td>Four-nerve Daisy</td>
<td>Yaupon</td>
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<tr>
<td>Gulf Muhly</td>
<td>Mealy Blue Sage</td>
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<tr>
<td>Cherokee Sedge</td>
<td>Obedient Plant</td>
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<td>Texas Sedge</td>
<td>Pigeonberry</td>
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<td>Frogfruit</td>
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<td>Lantana</td>
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<td>Twistleaf Yucca</td>
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<td>Coreopsis</td>
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Websites:

C.o.A. Watershed Protection Department
- www.austintexas.gov/raingardens
- www.austintexas.gov/department/grow-green-resources (garden design templates, ‘Creekside’)

Rain Garden Alliance- http://raingardenalliance.org/right/calculator

Rain Garden Network – www.raingardennetwork.com

Texas A&M AgriLife Extension - http://soiltesting.tamu.edu (soil tests)

Texas Land/Water Sustainability Forum – http://texaslid.org

Low Impact Development Center, Inc - www.lowimpactdevelopment.org/raingarden_design/whatisarain garden.htm
Thanks to You!!

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https://npsot.org/wp/wilco