Homeowner Rain Gardens
from the ground up

Sprague Avenue Enhancement Project
Presentation Overview

Introduction
- What is a Rain Garden?
- Benefits of Rain Gardens
- City of Tacoma Incentives

Plan
Build
Plant
Maintain

Visscher Street
What is a Rain Garden?

*Rain Garden Handbook pg 3
Rain Garden Benefits

- Stormwater
  - Onsite Management
  - Recharge Groundwater
  - Reduces Flooding
  - Filters Pollutants
- Improve air quality
- Attractive landscape feature and habitat
- Reduced yard maintenance

Sprague Avenue bioretention/rain garden

*Rain Garden Handbook pg 5
Other Incentives

- Per TMC 12.08.560
- Rate reduction for Low Impact Development / Green Infrastructure
  - One basic category of development lower

September 2010
Four Stages of a Rain Garden

**PLAN**
- Check Drainage
- Location
- Test Soil
- Size and shape of rain garden

**BUILD**
- Lay Out
- Excavate
- Flat bottom
- Install inlets and overflow
- Bioretention soil mix

**PLANT**
- Select plants for the appropriate planting zones
- Suggestions
- Mulch

**MAINTAIN**
- Keep the path of water clear
- Maintain soil and plant health
- Mulch

*Rain Garden Handbook pg 7*
Recommended Timelines

- Perform soils and perc. testing during the wet season, when the soil is saturated.
- Do soils work during the dry period, when the soils are less likely to become compacted.
- Plant during the late fall/early winter, so the plant roots can benefit from fall and winter rains and softer soil.

Do not use heavy machinery in rain garden

*Rain Garden Handbook pg 8
Check Site Drainage

- What areas will drain to your rain garden?
- Check for seeps and springs
- How will water get there?
- Remember, you can have more than one rain garden.

*Rain Garden Handbook pg 11
Water Inflow

- Consider velocity of water entering
- Do you need some stone?

Gravel “Creek Bed”

Piped

*Rain Garden Handbook pg 29
Always Provide an Overflow

Emergency Overflow

Rock Lined Overflow

Underdrain

*Rain Garden Handbook pg 29
Yard Drain
Where NOT to Locate

- Within 10 ft of a building
- Near steep slopes
- Near septic tank
- Poor draining areas
- Over existing mature vegetation
- High Groundwater
- Near wells

• Over utilities
• Call for Locates 811

*Rain Garden Handbook pg 13
Infiltration / “Perc” Test

- Needs to be done in the proposed rain garden location
- Permit Required for Rate Break (per the SWMM)
- No Permit Requirements (per the WSU or other resource)

*Rain Garden Handbook pg 15
SWMM Method

- Volume 3, Chapter 2, p 352
- Provide soils information, prepared by a soils professional
- Professional’s scope
WSU Method

- Dig a test hole
- Evaluate soil texture
- Fill the hole with water and observe drainage
- Dry season (pre-saturate)
- Wet season (only 1 test needed)

*Rain Garden Handbook pg 15
How big does it need to be?

Using the available area

Determine the area needed

Rain Garden for Two Homes

*Rain Garden Handbook pg 18
Rain Garden Sizing for Best
(Most All the Water)

Region 3 (Tacoma), 12-inch ponding

<table>
<thead>
<tr>
<th>Soil Drainage Rate</th>
<th>Rain Garden Top of Ponded Surface (sq. ft.)</th>
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<tbody>
<tr>
<td></td>
<td>1,000 sft Impervious</td>
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<tr>
<td>2.5+ (good)</td>
<td>170</td>
</tr>
<tr>
<td>1-2.49 (moderate)</td>
<td>220</td>
</tr>
<tr>
<td>0.5-0.99 (moderate)</td>
<td>260</td>
</tr>
<tr>
<td>0.25-0.49 (poor)</td>
<td>310</td>
</tr>
</tbody>
</table>

*Rain Garden Handbook pg 21*
Prepare for Construction

- Layout, pg 31
- Excavate, pg 32
- Bottom should be flat, pg 40
- Removed dirt needs to be disposed of properly or reused on site

*Rain Garden Handbook pg 28

Profile of a Rain Garden

1. Appropriate plants; tolerant of summer drought and winter saturated soil conditions
2. Organic mulch; 3-4 inches min., chipped or shredded wood on top, sides and bottom of rain garden
3. Rain garden soil mix (pre-mixed or mixed on site); 18 inches min., 40% compost and 60% aggregate
4. Non-compacted existing native soil

*Rain Garden Handbook pg 41
Compost Should be:
- made from organic plant waste
- between 5.5 and 8.0 pH

Should not be:
- mushroom, manure or sawdust compost

Aggregate Should be:
- existing soil (if suitable)
- screened sand (commercially available) if not using existing soil

Should not be:
- clay or demolition debris

Note: Premixed rain garden soil is currently commercially available from Cedar Grove Compost
Working around existing vegetation

**Zone A; Critical Root Zone:**
Radius measures one foot per one inch of DBH from the trunk outwards and twenty-four inches in depth. 
Do not disturb, minimum volume of roots necessary for tree health and stability

**Zone B; Drip Line:**
Boundary is designated by the edge of the tree crown. 
Maintain at least 2/3 in an undisturbed condition

**Zone C; Feeder Root Zone:**
Radius measures two feet per one inch of DBH outwards and twenty-four inches in depth. 
Maintain at least 2/3 in an undisturbed condition

**Tree/Plant Protection Zone:**
Critical Root Zone or Drip Line, whichever is greater. 
Silt fencing at edge to protect area from construction activities
Planting Zones

*Rain Garden Handbook pg 45
Planting Zones

Zone 1: Plants located in the bottom (flat area) of the rain garden. Plants need to be able to tolerate wet and dry feet.

*Rain Garden Handbook pg 45
Zone 2: Plants located on the side slopes of the rain garden. Plants need to be able to tolerate occasional standing water, but are not usually inundated.
Planting Zones

Zone 3: Plants located at the top of the rain garden (above ponding area).
Plants prefer dryer conditions (similar to general landscape planting).

*Rain Garden Handbook pg 45
Develop a plant list

- Look at the site
- Typical planting priorities:
  - Save resources
  - Provide wildlife habitat
  - Promote a healthy environment
  - Rule of thumb – 1/2 evergreen, 1/4 deciduous, 1/4 ephemeral

*Rain Garden Handbook pg 51 Sample Plans
Save water

- Once established, many native plants rarely need water beyond normal rainfall – in native conditions.
- You can conserve water resources by replacing water-hungry plants (including lawns) with plants that may need no additional water at all.

Water savvy (drought tolerant) plants.

- **kinnikinnick** *(Arctostaphylos uva-ursi)*
- **Nootka rose** *(Rosa nutkana)*
- **lodgepole pine** *(Pinus contorta)*
Save time/money

- choose a plant to fit the space, not a space to fit the plant.
- When plants are chosen to fit their environment, maintenance can be reduced drastically.
- This includes pruning, watering, pest and disease control.

Low-maintenance plants

- salal (Gaultheria shallon) Zone 2-3
- Western swordfern (Polystichum munitum) Zone 2-3
- mountain hemlock (Tsuga mertensiana) Zone 3
Provide wildlife habitat

- Native plants, birds, beneficial insects and other wildlife have evolved to depend on each other, and in many cases can’t live without one other.
- Think about the landscape as a linkage to other natural areas nearby. No landscape is too small to be part of the collective efforts to protect ecosystems.

Plants for wildlife interest

- Evergreen huckleberry *(Vaccinium ovatum)*
- Beaked hazelnut *(Corylus cornuta)*
- Western buttercup *(Ranunculus occidentalis)*
Promote a healthy environment
Reduce dependence on additional resources

Pesticides:
• Native plants have developed their own defenses against many pests and diseases.

Fertilizer:
• Native plants have adapted to the nutrient levels available in our native soils. Adding fertilizers to the landscape can create non-sustainable growth and dependence on non-essential chemicals.

Eliminating pesticides and fertilizers from your landscape keeps toxic garden chemicals out of our creeks, watersheds, and the food chain through which we are connected.

To find out more information on Natural Yard Care, visit www.cityoftacoma.org/natural yards
Plant Spacing

Think in layers: Canopy (overhead), screen/buffer (shrubs), and groundcovers.

- Keep plant spacing between like layers (between trees and trees, shrubs and shrubs, etc.) consistent with the “Mature Size” of the plant (usually identified on the plant label)
- Overlap plant spacing between dissimilar layers (trees overlap shrubs, shrubs overlap groundcovers)

*Rain Garden Handbook pg 47
Woodchip Mulch

*Rain Garden Handbook pg 50
Maintain

Keep the water flowing

Maintain Mulch

Water until plants are established

Hand weed - Never use pesticides or herbicides

*Rain Garden Handbook pg 61 Checklist
Caring for your rain garden

- Water during the establishment period (first 3 years after planting). Use a soaker hose or drip irrigation to conserve water.
- If plants are “failing” try a test planting of a few plants of a different species, you can always buy more later if they are successful.
- Maintain mulch at a depth of 3-4 inches.
- Keep your inflows and overflows clean and clear of debris that may block the passage of water.

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>Fall</td>
<td>Fall</td>
</tr>
<tr>
<td>Winter</td>
<td>Winter</td>
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</tr>
<tr>
<td>Spring</td>
<td>Spring</td>
<td>Spring</td>
</tr>
<tr>
<td>Summer</td>
<td>Summer</td>
<td>Summer</td>
</tr>
</tbody>
</table>

- Plant, mulch, pull emerging weeds
- Monitor for plant mortality
- Prepare irrigation system
- Maintain mulch and irrigation
- Re-plant, mulch, pull emerging weeds
- Monitor for plant mortality
- Prepare irrigation system
- Maintain mulch and slowly reduce water
- Re-plant, mulch, pull emerging weeds
- Monitor for plant mortality
- Prepare irrigation system
- Maintain mulch and reduce water
Resources

Rain garden construction and plant lists

- City of Tacoma Rain Garden Rebate Program; [www.cityoftacoma.org/raingarden](http://www.cityoftacoma.org/raingarden)
- Rain Garden Handbook for Western Washington Homeowners; [www.raingarden.wsu.edu](http://www.raingarden.wsu.edu)
- Seattle Department of Planning and Development Green Factor; [www.seattle.gov/dpd/greenfactor/](http://www.seattle.gov/dpd/greenfactor/)
- Saving Water Partnership; [http://www.savingwater.org/outside_garden.htm](http://www.savingwater.org/outside_garden.htm)

Stormwater Management Manual

- Tacoma; [www.cityoftacoma.org/stormwatermanual](http://www.cityoftacoma.org/stormwatermanual)
Do I need a permit for my rain garden?

- Typically – No
- Yes, if your project does any of the following:
  - add or replace 2,000 square feet of impervious surface or more
  - clear or disturb 7,000 square feet or more of land
  - grade/fill 50 or more cubic yards of material
  - Rain Garden is located in the right of way
Items Required for a Permit Application

- Grading Permit Application
- Stormwater Site Plan
- Construction Stormwater Pollution Prevention (SWPPP) Plan
- Plan and details showing proposed action
- Storm connection permit required for underdrains

June 2010

For additional information – Permit Intake Center

747 Market Street – 3rd Floor

(253) 591-5218
Thank You for Coming!

Please contact us if you have questions or concerns:
Jessica Knickerbocker, (253) 502-2119
Mike Carey, (253) 404-6989

City of Tacoma Surface Water
326 East D Street
Tacoma, WA  98421

Permit Intake Center (253) 591-5218
Residential Rain Garden Rebate (253) 591-5588

Information is available on the City’s Surface Water website:
www.cityoftacoma.org/raingarden
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from the ground up

mountain hemlock (Tsuga mertensiana)