

# Rain Gardens and Pollinator Habitat=WIN/WIN

By: Darrick Wotachek

Why rain gardens are important?

Why we should all have a blue  
(and green) thumb?

How to start a simply rain garden?

Who benefits from rain gardens?

How can we all help?



# Summary of Certifications and Continuing Education Seminars.

- MN Landscape and Nursery Association Certified Professional.
- Live Roof LLC Certified Installer
- Attended 5-10 Rain Garden/Lakeshore Restoration/Blue Thumb Seminars(2007-Present)
- Effective Grant Writing Seminar (February 2015)
- Borgert Paver/Permeable Installation Certification
- Heberg Education Days—Aquascape Seminar
- Wetland Delineation Training-2018

# Why RG's are important?

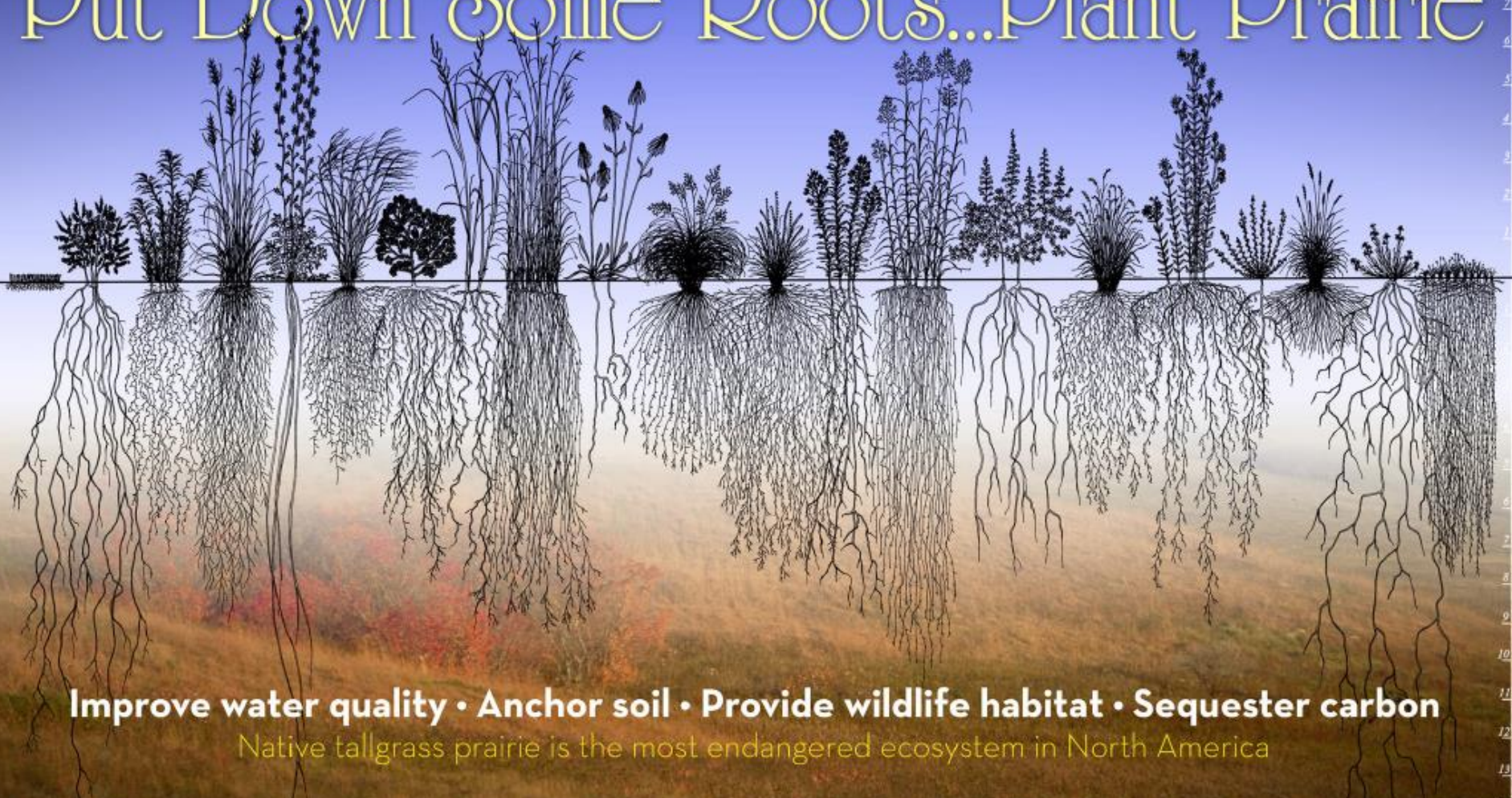
- Recharge Ground Water Aquifers
- Clean storm water/Filter Pollution
- Provide Pollinator Habitat
- Stress Relief from Gardening/Wildlife Watching
- Monarch butterflies hatcheries (declining in Midwest)
  - pesticides are threatening populations.
- Food/Nectar source for hummingbirds, bees, other species.
- Low Maintenance or No Fertilizers needed to maintain.
- SAVE water, native plants adapt to conditions.
- Hold soil in place-reduce erosion.
- Conservation of tall grass prairie species
- Cost effective solution to lawn problems

**•WE ALL HAVE INPUT IN THE WATER  
CYCLE!!!!!! LET'S KEEP IT CLEAN.**





# Put Down Some Roots...Plant Prairie



**Improve water quality • Anchor soil • Provide wildlife habitat • Sequester carbon**

Native tallgrass prairie is the most endangered ecosystem in North America

- |   |   |  |  |   |  |  |   |  |   |  |  |   |  |   |  |  |  |   |  |  |
|---|---|--|--|---|--|--|---|--|---|--|--|---|--|---|--|--|--|---|--|--|
| <b>Kentucky Blue Grass</b><br><i>Poa pratensis</i><br>(Nonnative) | <b>Lead Plant</b><br><i>Amorpha canescens</i> | <b>Missouri Goldenrod</b><br><i>Solidago missouriensis</i> | <b>Indian Grass</b><br><i>Sorghastrum nutans</i> | <b>Compass Plant</b><br><i>Siphium laciniatum</i> | <b>Porcupine Grass</b><br><i>Silpho spaldingii</i> | <b>Heath Aster</b><br><i>Aster verticillatus</i> | <b>Prairie Cord Grass</b><br><i>Sporobolus pectinatus</i> | <b>Big Blue Stem</b><br><i>Andropogon gerardii</i> | <b>Pale Purple Coneflower</b><br><i>Echinacea pallida</i> | <b>Prairie Dropseed</b><br><i>Sporobolus heterolepis</i> | <b>Side Oats Gramma</b><br><i>Bouteloua curtipendula</i> | <b>False Bonaset</b><br><i>Nolina missouriensis</i> | <b>Switch Grass</b><br><i>Panicum virgatum</i> | <b>White Wild Indigo</b><br><i>Baptisia leucantha</i> | <b>Little Blue Stem</b><br><i>Andropogon scoparius</i> | <b>Road Weed</b><br><i>Silybum integrifolium</i> | <b>Purple Prairie</b><br><i>Petalostemum purpureum</i> | <b>June Grass</b><br><i>Koeleria cristata</i> | <b>Cylindric Blazing Star</b><br><i>Liatris cylindrica</i> | <b>Buffalo Grass</b><br><i>Buchloe dactyloides</i> |
|---|---|--|--|---|--|--|---|--|---|--|--|---|--|---|--|--|--|---|--|--|

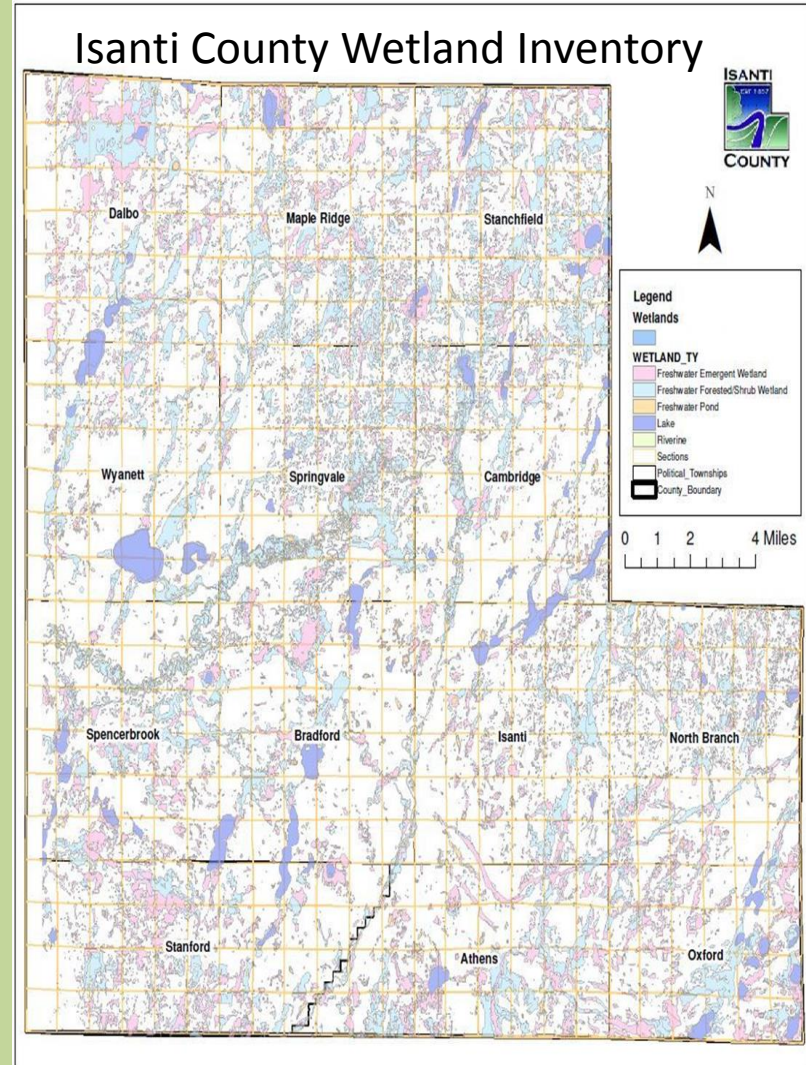


# Why should Isanti County &

## residents care?

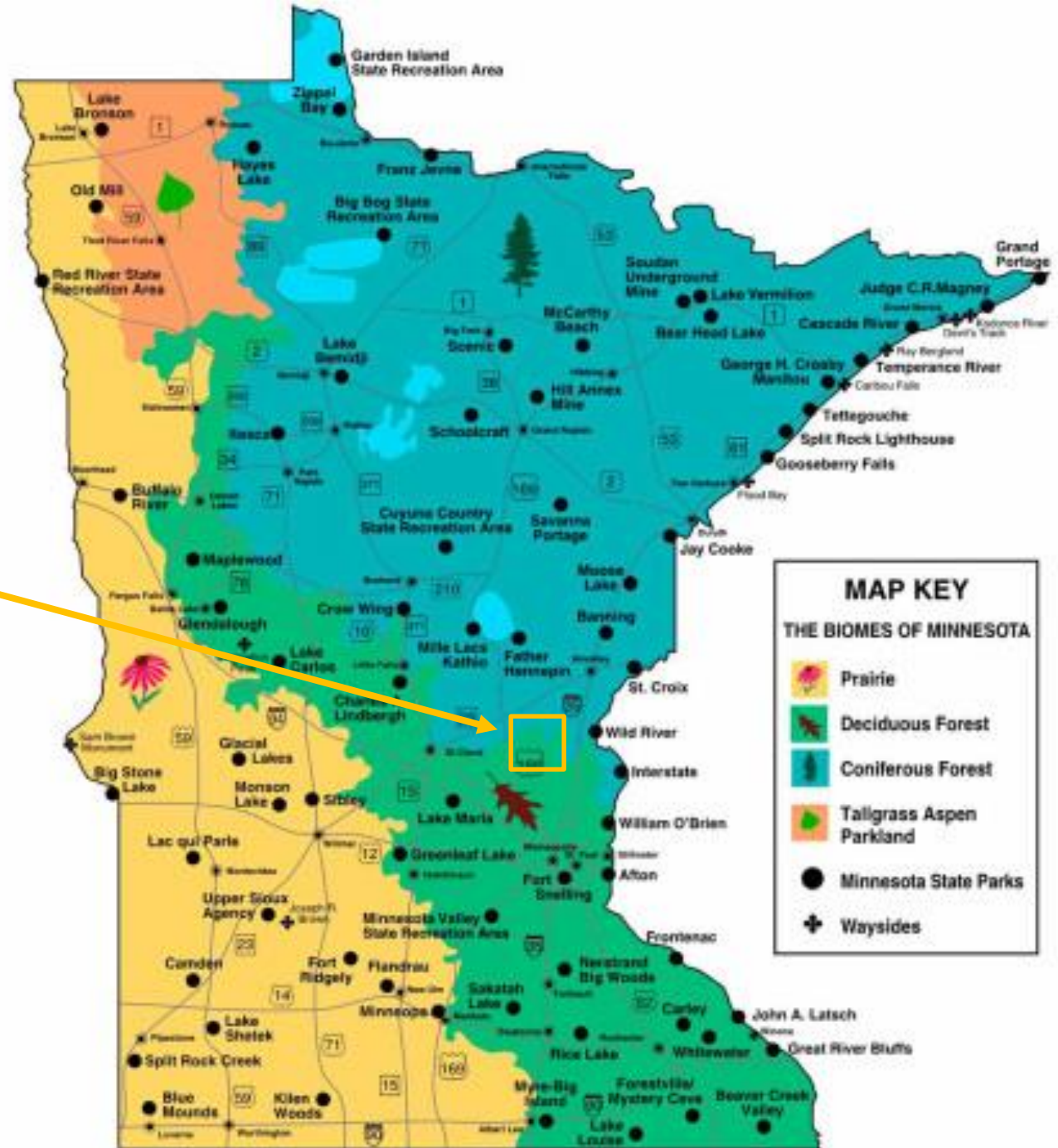
- 11 Lakes Impaired
- 5 Streams
- Rum River=2% from Impaired Status!!

- 32-33% of IC is a WATER RESOURCE!
- Shallow Ground water Aquifers on Anoka Sand Plain
- MAJOR RECHARGE AREA FOR MT. SIMON AQUIFER



# IC-MN Biome Transitional Area

Multiple ecosystems exist from pine forests to oak savannah to scattered tall grass prairies.





# Rain Gardens

- Perc. Test-in/hr
- Calculate Imperv. Surf
- Size the basin for 1-1.5 inch rain fall event.
- Digout basin for 6-12” ponding depth.
- Rotor till compaction
- Plant Selection
- Add Compost&Mulch
- Enjoy Butterflies!!



# Rain Gardens

## 1. Perc. Test-in/hr or day.

- Dig holes 8" wide X 12" deep
- Fill with water
- Mark starting level
- Record time
- Measure water drop at set time intervals
  - Sandy soils after 15, 30, 60 minutes
  - Clay/Loam Soils: 1,2 & 4 hours
- Set rain garden depths to desired infiltration
  - MAX=12" for rain garden
  - Deeper=Bioretention Gardens on Commercial Scale
  - $1"/4\text{hrs} \times 24\text{hrs}/\text{day} = 6 \text{ inches}/\text{day}$  of infiltration.

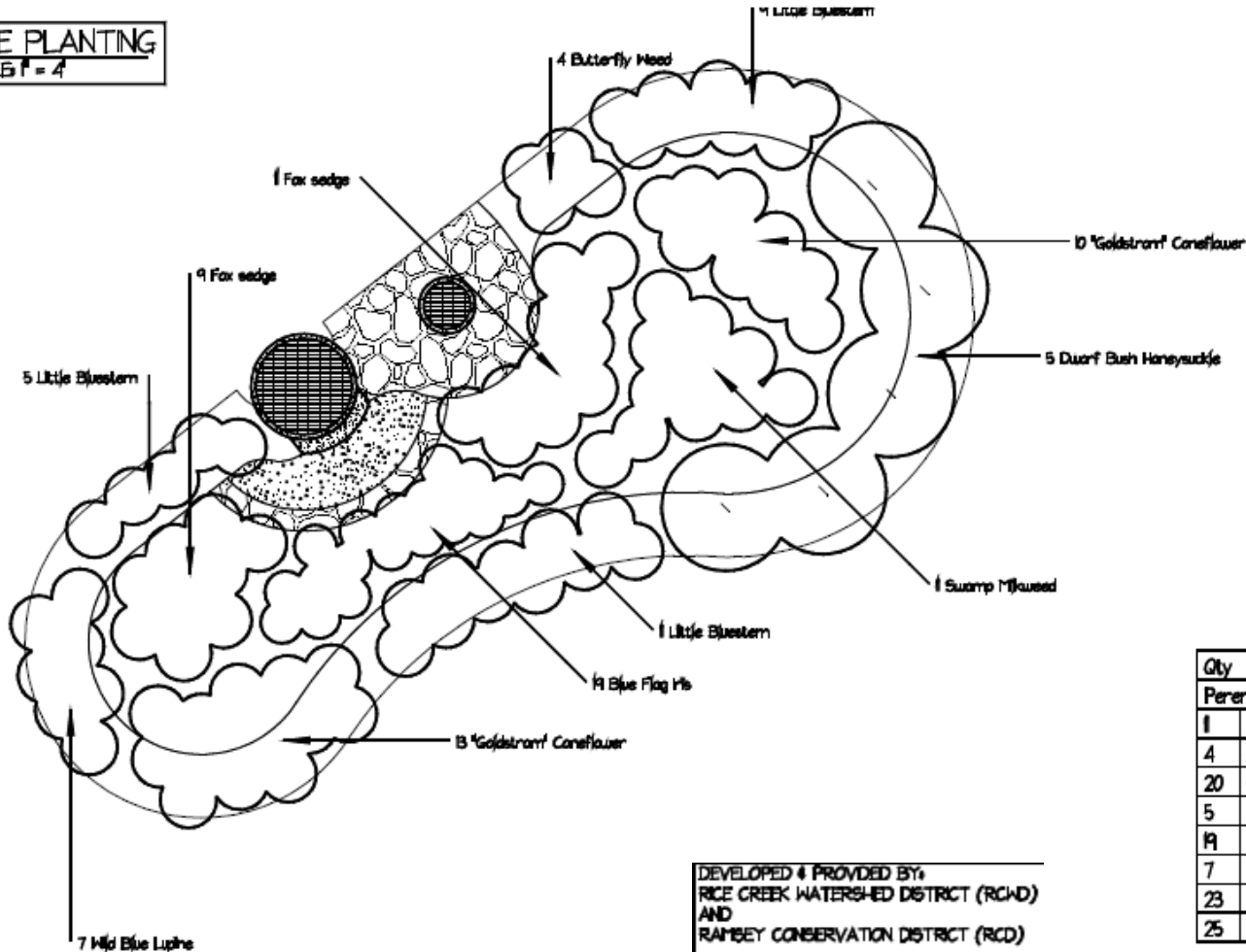


# Rain Gardens

2. Calc. Impervious Surface draining to Garden
  - Measure Sq Ft. of hard surfaces
  - 400 sq ft
3. Size the garden
  - Ex:  $400/6'' = 67$  sq ft of garden needed.
4. Layout & Excavate, divert water to garden
  - Drain tiles with surface drains, dry creek beds, grass swales.
5. Rip any compacted soils 12-18" deep
6. Install sand/compost (70/30) mix if in heavy soils
7. Install overflow if heavy soils
8. Plant, Mulch, Enjoy!!!

# Design & Construction Examples

**SITE PLANTING**  
SCALE 1" = 4'

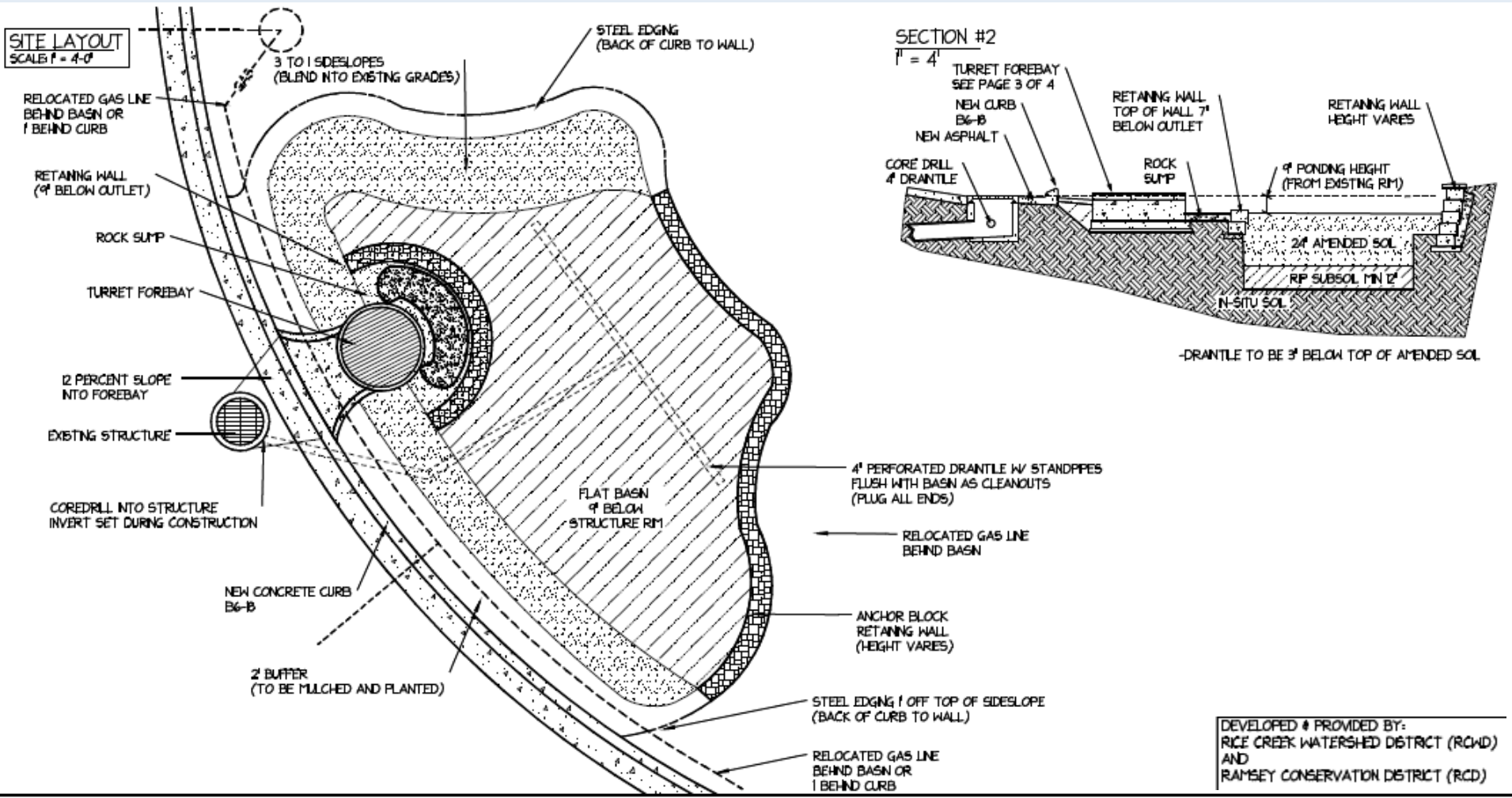


DEVELOPED & PROVIDED BY:  
RICE CREEK WATERSHED DISTRICT (RCWD)  
AND  
RAMSEY CONSERVATION DISTRICT (RCD)

Qty	Botanical Name	Common Name	Site/Condition
<b>Perennials and Annuals</b>			
1	<i>Asclepias incarnata</i>	Swamp Milkweed	Plug 2'
4	<i>Asclepias tuberosa</i>	Butterfly Weed	Plug 2'
20	<i>Carex vulpinoidea</i>	Fox sedge	Plug 2'
5	<i>Diervilla lonicera</i>	Dwarf Bush Honeysuckle	1 Gal
19	<i>Iris versicolor</i>	Blue Flag Iris	Plug 2'
7	<i>Lupinus perennis</i>	Wild Blue Lupine	Plug 2'
23	<i>Rudbeckia fulgida</i>	'Goldstronf' Coneflower	1 Gal
25	<i>Schizachyrium scapanum</i>	Little Bluestem	Plug 2'

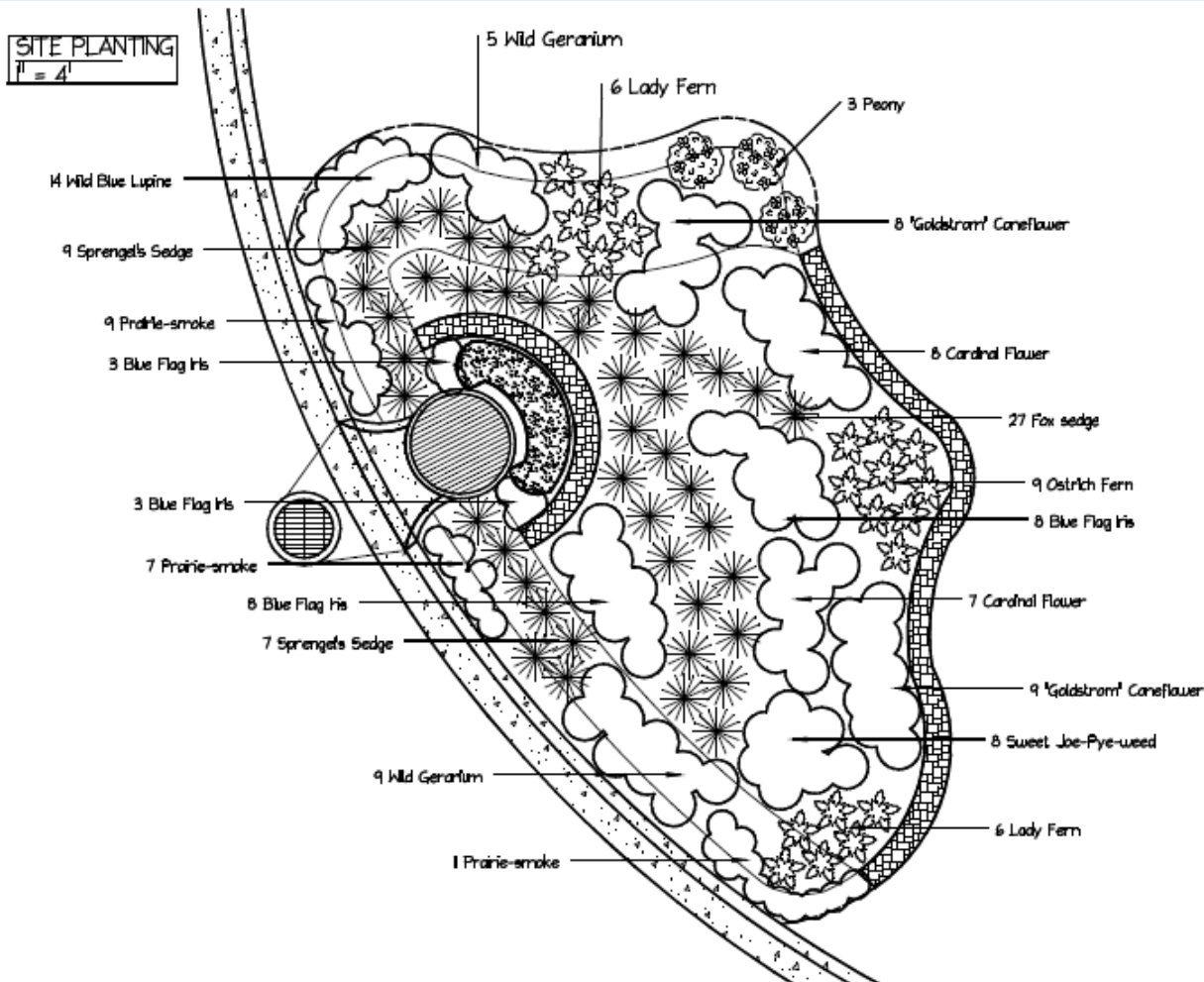


# Design & Construction Examples



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# Design & Construction Examples



Qty	Botanical Name	Common Name	Size/Condition
<b>Perennials and Annuals</b>			
12	<i>Athyrium angustum</i>	Lady Fern	4" Pot
16	<i>Carex sprengelii</i>	Sprengel's Sedge	Plug 2"
27	<i>Carex vulpinoidea</i>	Fox sedge	Plug 2"
8	<i>Eupatorium purpureum</i>	Sweet Joe-Pye-weed	Plug 2"
14	<i>Geranium maculatum</i>	Wild Geranium	Plug 2"
27	<i>Geum triflorum</i>	Prairie-smoke	Plug 2"
22	<i>Iris versicolor</i>	Blue Flag Iris	Plug 2"
15	<i>Lobelia cardinalis</i>	Cardinal Flower	4" Pot
14	<i>Lupinus perennis</i>	Wild Blue Lupine	Plug 2"
9	<i>Matteuccia struthiopteris</i>	Ostrich Fern	4" Pot
3	Peony spp	Peony	1 Gallon
17	<i>Rudbeckia fulgida</i>	'Goldström' Coneflower	1 Gal

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# Bald Eagle Lake Gardens

Drain tile Retrofit inlet. Residence 1 before.



Residence 2 before excavation.



# Bald Eagle Lake Rain Gardens

Residence 1 excavation and  
Installed Hardscapes.



## Project Details

- Retrofitted overflow drain tiles to fit existing basins.
- Installed Rain Gardian Inlet.
- New curbs installed to inlet.
- “Old drain” became overflow drain to basin.
- Plants and mulch installed later.



# Bald Eagle Lake Rain Gardens

Residence 2 one year after construction.

Right side view of Resident 2.





A photograph of a concrete rain garden structure. The structure consists of a central channel with a flat top and two side channels. The central channel is currently empty, but there is a small puddle of water in the side channel on the left. The structure is surrounded by green grass and some gravel. The background shows a grassy area with some gravel and a concrete sidewalk.

# **Protecting Lakes, Filtering Runoff, and Creating Pollinator Habitat**

**Fridley Middle School  
Rain Garden**



# Side view of Fridley Rain Garden



Taken 2yrs after construction. Middle school used this garden as a source for educating youth on how to infiltrate storm water runoff.



# Christ the King Church Rain Garden 2018-2019

Before:



After: Seeding Natives/Erosion Control.





# Cambridge Bioswale Maintenance

Controlled Burn City Staff:

After: Planting additional 1000 native wildflower plugs. Cambridge Cub Scouts





Still Need Help &  
Volunteers to  
Maintain “Weeds”

Contact Todd  
Schwab @ Camb.  
Public Works!



My boys and I after plug plantings!!



# Crooked Lake Rain Gardens



Resident 3: Curb cut view, native plantings so vigorous you can't see the retaining wall behind them. 5+ years after construction.



# Well Maintained Rain Gardens

Resident 2: curb cut garden with Rain Guardian installed. 5yrs later



Resident 1: Master Gardeners rain garden 5 yrs after installation.





# Bethel University Rain Garden/Storm Water retrofit Project

- Wall 1 Construction
- Before Rain Garden Excavation
- Before Permeable Pavers





# Rain Garden

## Before

- Here is a close up of the compacted clay soils we encountered on this job.
- Located on the left is a man hole cover for an existing storm sewer.
- Basin had to be dug at a 1-1 slope in order to fit between wall and man hole cover.
- Wall was moved closer to building to save the giant white oak pictured in previous slide.





# Backside of Brushhaber Commons

Backfilling with rain garden soil.

Finished Rain Garden, Perm.  
Pavers and Wall.





# Permeable Paver Semi Turnaround

**During Wall Construction and  
Pregrade for Perm. Pavers**



**After Pavers Installed**



The entire paver turnaround was connected to an overflow drainpipe and flowed into rain garden when the soil beneath pavers reached saturation.



# Shoreview: Incarnation Church Rain Garden/Storm Water Pond Enhancements

Rip rap curb inlets, vegetated swales with native trees, shrubs and perennials.



North side of lot installed a rain garden with overflows under drive lane pictured.



Project consisted of erosion control, large scale tree and shrub plantings, rain garden drainage and grading. Pictures were taken after heavy rains hence the high water.



# Midtown Medical Rain Garden

Project consisted of installing specified soils, plantings, riprap, and mulch.

Southview of garden.





# Shoreline Rain Garden/Pollinator Habitat

During Construction: basin exc., drain tile installation, loosening compaction of clay soils.

Sand/Compost Addition





# Shoreline or other Pollinator Habitat

## Mulch Installation

## Edging & Planting.

Step 3-Installed 3" Cedar Mulch to retain moisture for plantings. Stakes mark 4" perforated drainline inlet for large rain events.



1 year later

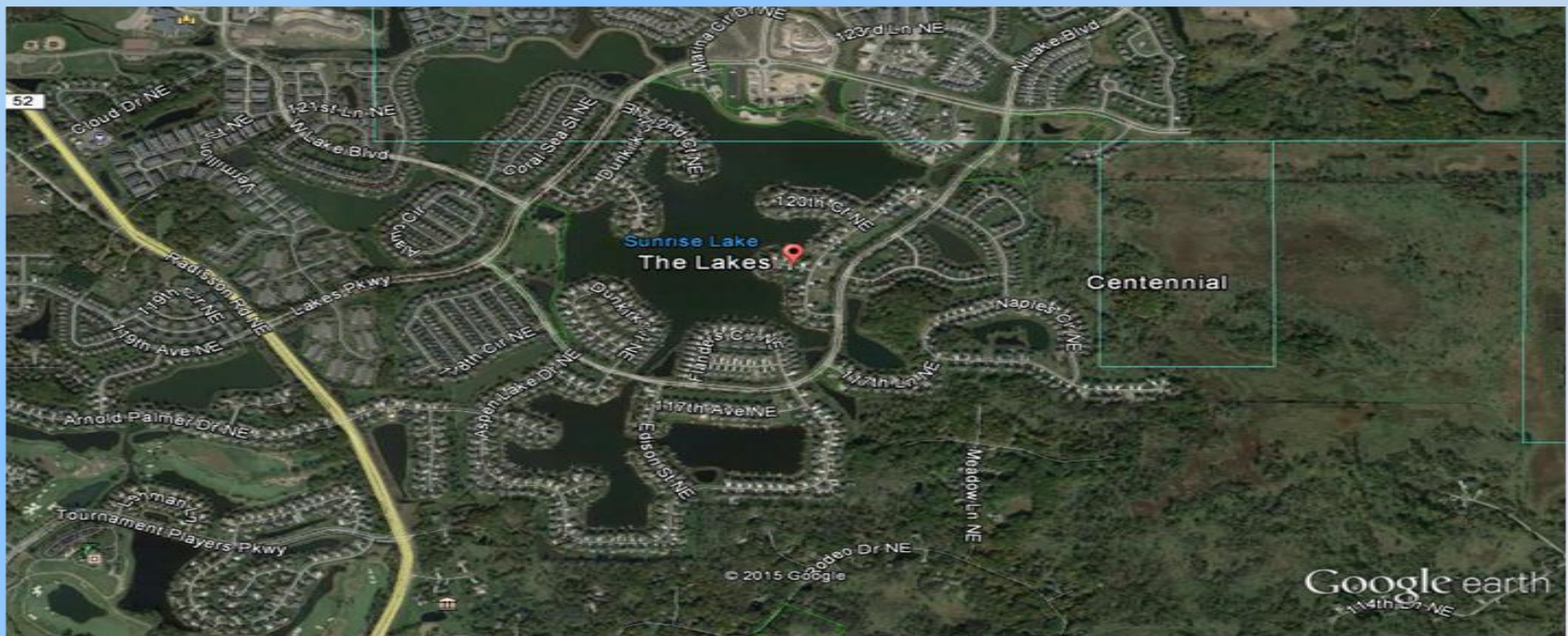
6" Ponding during rain July 4<sup>th</sup> event.





# The Lakes Development on Sunset Lake in Blaine, MN

- Supervised construction and inspected multiple buffer strips & lakeshore restorations.





# Residence 1 in “The Lakes” in Blaine, MN



This Project consisted of removing invasive reed canary grass with heavy excavation to remove majority of root system, following up with herbicide application, and revegetating with a design layout of native and cultivated shrubs and perennials to act as a buffer. Also involved in the regrading, swales had to be developed for the runoff to filter through the native plants and **not** run directly down the slope.



# Side view of Residence 1





# Residence 2 in “The Lakes” in Blaine, MN



This Job also had to be re-graded to drain to the native buffer strips on the sides of yard. Invasive Canadian thistle and canary grass, which took a course of 2-3 years of maintenance pulling, weed whipping (biological control to reduce seed heads), and follow up spot sprays with herbicide. We then mass planted plugs on the sides and areas where the invasives were to try to revive the root zone to reduce erosion and then we mulched heavily around new plants.



# Residence 3



A curving walkway and steps were installed to disrupt water flow directly to the lake. Two swales were cut in the sod to redirect water flow to native plantings on both sides of the walk way.



# What we can do to help?

Before Photo: Good  
Quality Native  
Vegetation=10' from  
waters edge.



Red=approximate wetland boundary. Currently has great wetland vegetation present and a good working buffer. No erosion. Inspection was for purple loosestrife and Canadian thistle noxious weeds. Some spiratic plants were found with some reed canary grass which could be removed by the swipe method if approved by DNR, but remainder of vegetation should stay to protect the lake. 15' Buffer should stay.

09.19.2018



**HELP EDUCATE  
PEOPLE TO PRESERVE  
NATIVE VEGETATION!!**

**NO LAWNS UP TO  
WATERS EDGE.**

**EDUCATE, EDUCATE,  
EDUCATE!!!**



10.24.2018



**PLANTING A SEED TAKES FAITH, GROWING IT TAKES  
COMMITMENT!!!**





# What we can do to help?

## 1. VIEW RESTORE YOUR SHORE

1. <https://www.dnr.state.mn.us/rys/index.html>

## 2. VIEW MN DNR SHORELAND MANAGEMENT ORDINANCE @https://files.dnr.state.mn.us/waters/watermgmt\_section/shoreland/model-with-comm.pdf

3. Go to [Blue Thumb.org](http://BlueThumb.org) and spread the word.

4. Talk to County Commissioners/City Administrators about stricter Shoreland Ordinance and native buffers on water

5. Volunteer to maintain current rain gardens, get involved!

6. Collaborate with schools to educate our youth!

7. Reduce pesticide/fertilizer use.



# References

- Pictures in this presentation were provided from personal files as well as from the following websites and personal references:
  - <http://www.blue-thumb.org>
  - Kyle Axtell, Water Resource Specialist Rice Creek Watershed District.
  - Chris and Diana Gagnon-Owners of Northland Landscaping.