Raingarden Training

Nassau County Soil & Water Conservation District

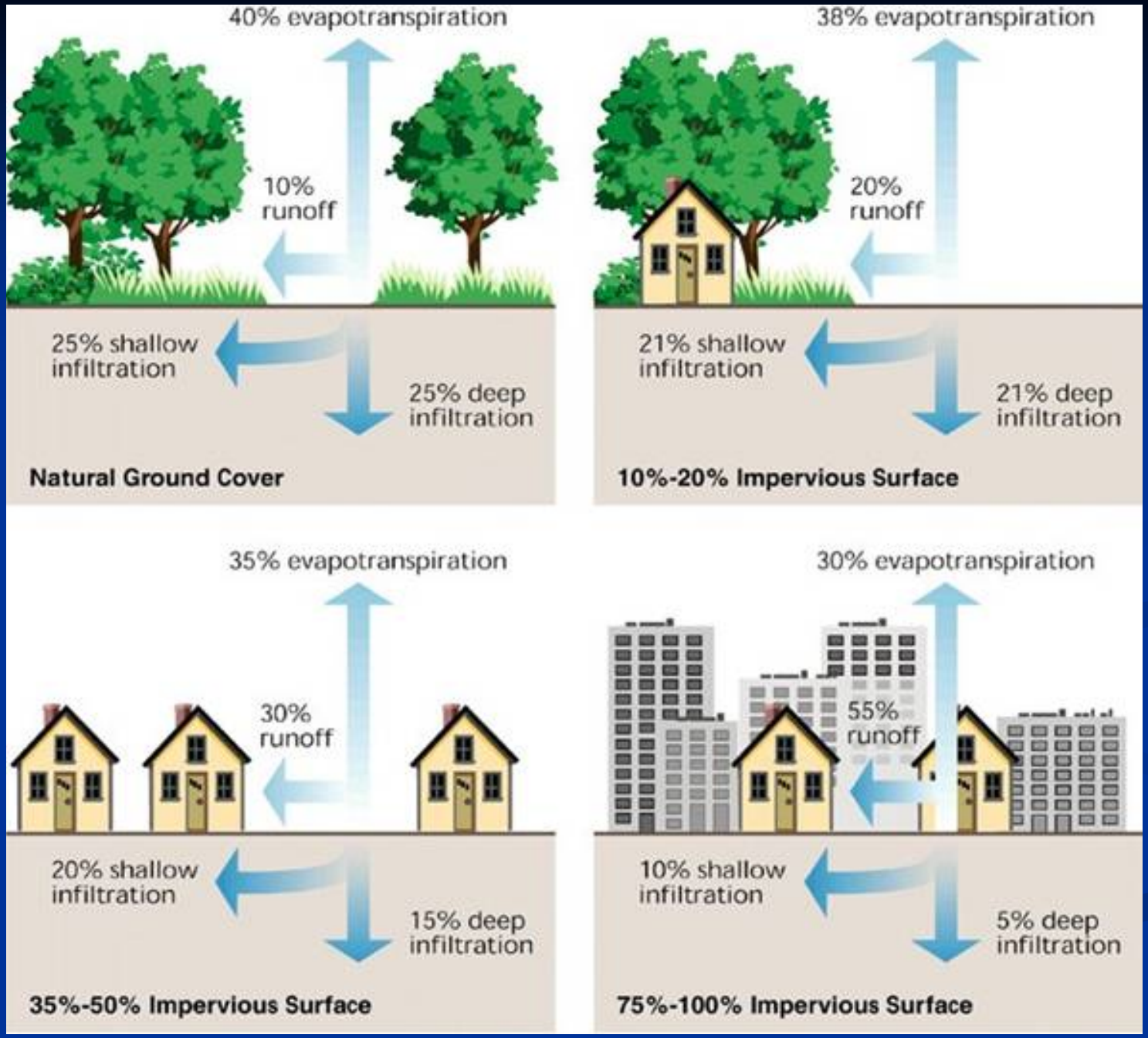
Nassau County Soil & Water Conservation District

"Working together for healthy soil and clean water"

- Is one of 58 county districts in NY State that provides “on the ground” assistance for soil, water & wildlife resources, and promotes the health, safety, and welfare of our communities
- Our purpose is to protect, preserve, restore, and enhance natural resources through education and technical assistance.

Clean water is what we want

Clean water is what we want


40% evapotranspiration
10% runoff
25% shallow infiltration
25% deep infiltration
Natural Ground Cover
38% evapotranspiration
20% runoff
21% shallow infiltration
21% deep infiltration
10%-20% Impervious Surface
35% evapotranspiration
30% runoff
20% shallow infiltration
15% deep infiltration
35%-50% Impervious Surface
30% evapotranspiration
55% runoff
10% shallow infiltration
5% deep infiltration
75%-100% Impervious Surface

NRCS

. . . connection between land and water . . .

Storm sewers carry pollutants directly to our water resources

Either to the Bay or to the Groundwater

. . . connection between land and water.

BEACH CLOSED

NO SWIMMING OR WADING

A blue-green algae bloom that can make you sick is in the beach area.

Keep people and animals out of the water.

Don't drink the water.

Rinse with clean water if exposed

Consider medical attention if you have symptoms such as nausea, vomiting or diarrhea; skin, eye or throat irritation, allergic reactions or breathing difficulties.

Report symptoms to the local health department and to harmfulalgae@health.ny.gov.

Learn more *health.ny.gov/environmental/water/drinking/bluegreenalgae.htm*

BLUE-GREEN ALGAE BLOOM ADVISORY

Blue-green algae bloom(s) have been spotted in this waterbody.

- Don't swim, wade or fish near blooms or surface scum
- Don't drink the water
- Keep children and animals away from any blooms or scums
- Rinse with clean water if exposed
- Consider medical attention if you have symptoms of nausea, vomiting, or diarrhea; skin, eye or throat irritation, allergic reactions or breathing difficulties. Report symptoms to the local health department and harmfulalgae@health.ny.gov

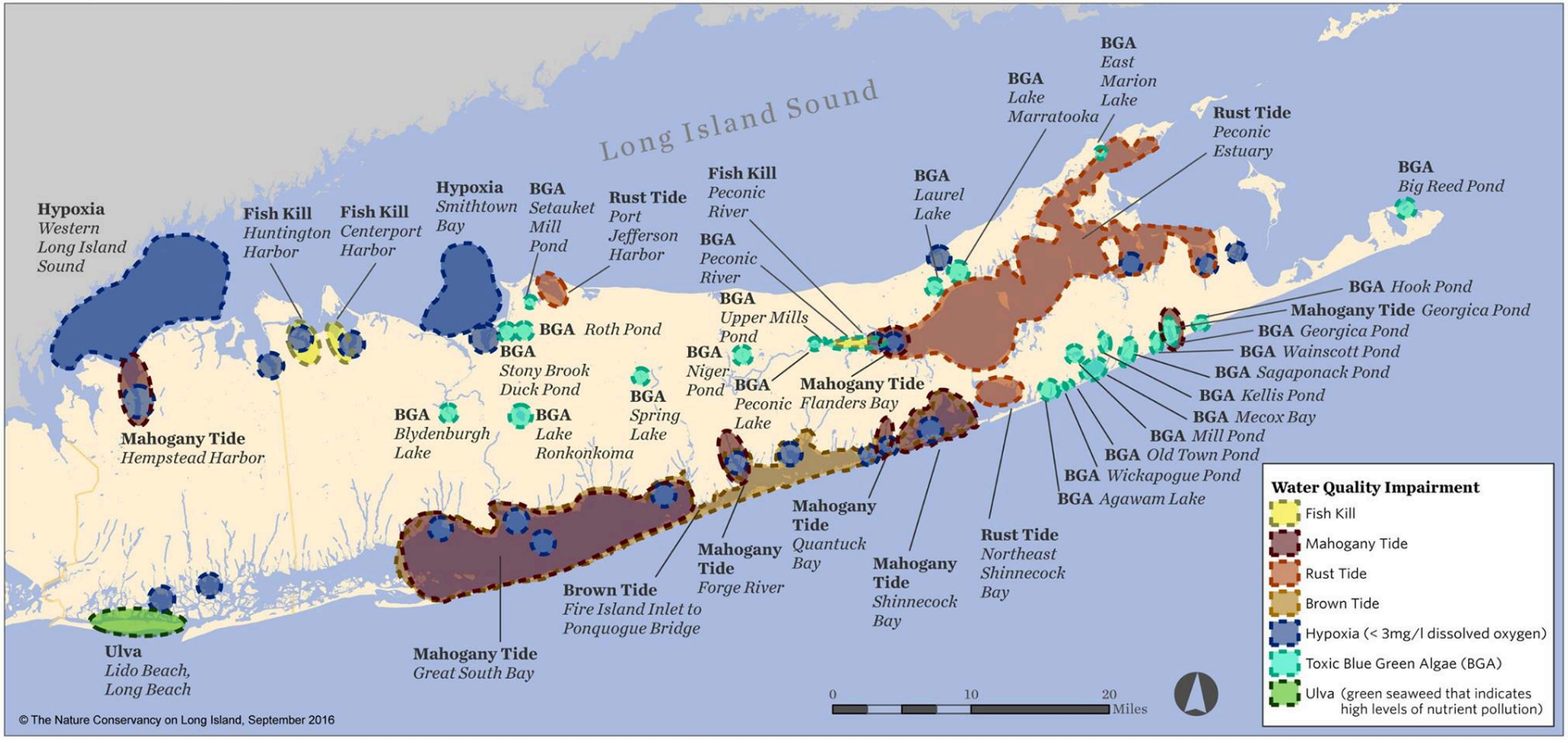
Learn more *health.ny.gov/environmental/water/drinking/bluegreenalgae.htm*

Stony Brook University
School of Marine and Atmospheric Sciences

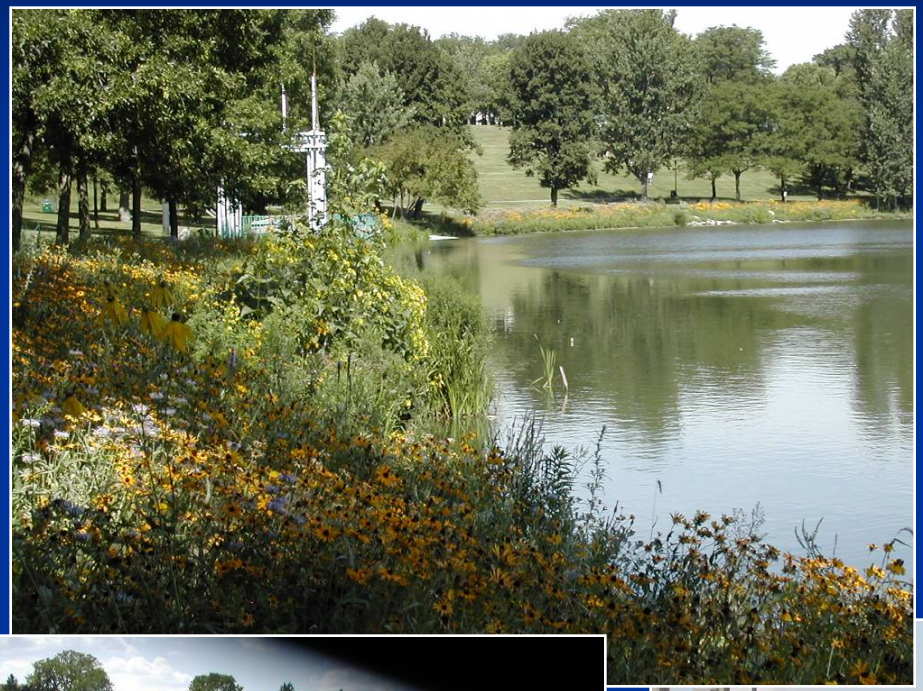
LICCRA

Long Island Water Quality Impairments, Summer 2016

The Nature Conservancy
Protecting nature. Preserving life.



Clean-up is costly and our waters remain impaired



Typical Residential Property

+ “Green Concrete” Compacted Lawn

8,390 s.f. “impervious” x 1” rain
(if infiltrates first ¼” of rain)

= 3,880 gallons of runoff

1,500 s.f. house (& patio) x 1” rain
= 925 gallons of runoff

1,000 s.f. driveway x 1” rain
= 617 gallons of runoff

In a 1” rainfall

Potential Runoff:

5,422 gallons

with 30” yearly precipitation

Potential Runoff:

171,532 gallons/yr

Stormdrain

Gregg Thompson, MASWCD

One Problem: Conventional Site Design

What is a Rain Garden?

Photograph Courtesy of Rice Creek Watershed District.

- A garden in a low spot
- Catching runoff from downspouts, driveways, parking lots, roads
- With deep-rooted plants that like water

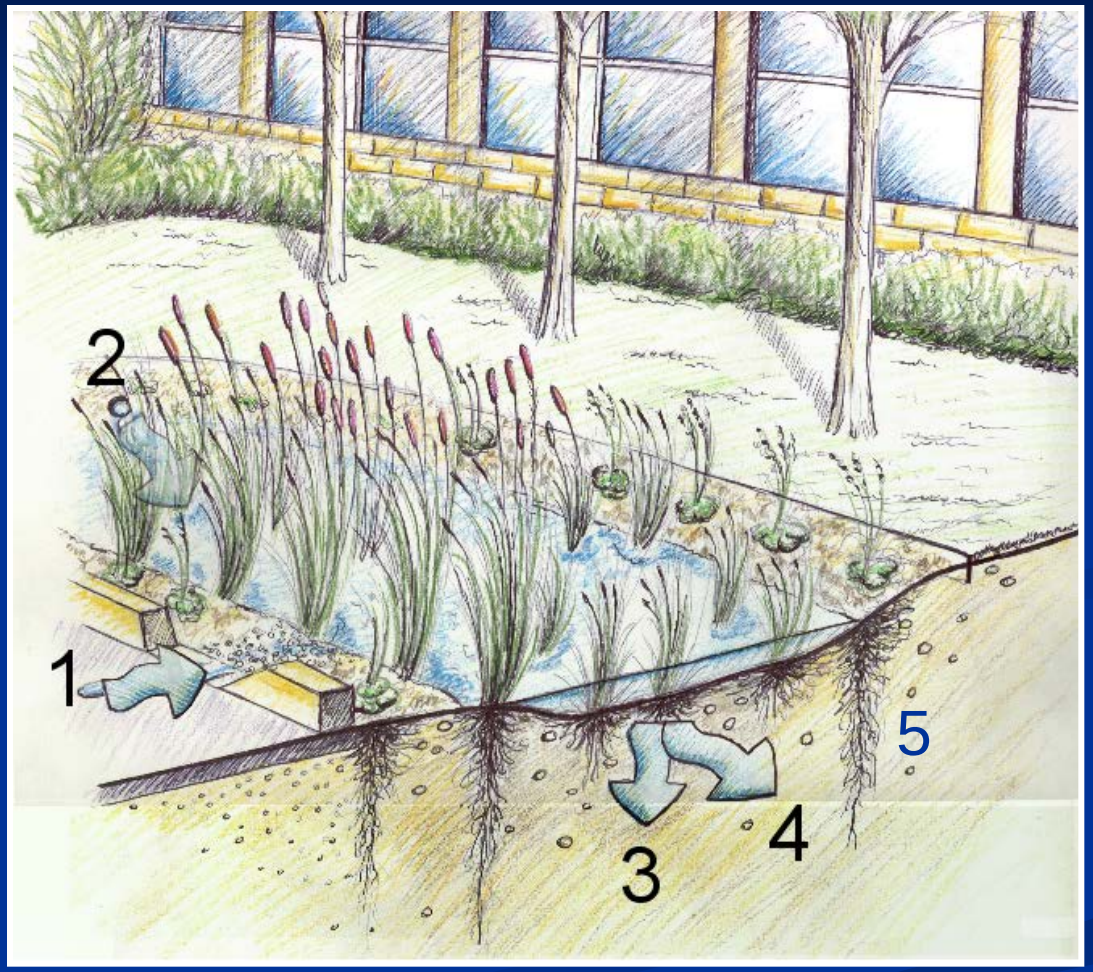
Why Raingardens?

Raingardens help protect our

wetlands, rivers, streams, bays, and LI Sound.

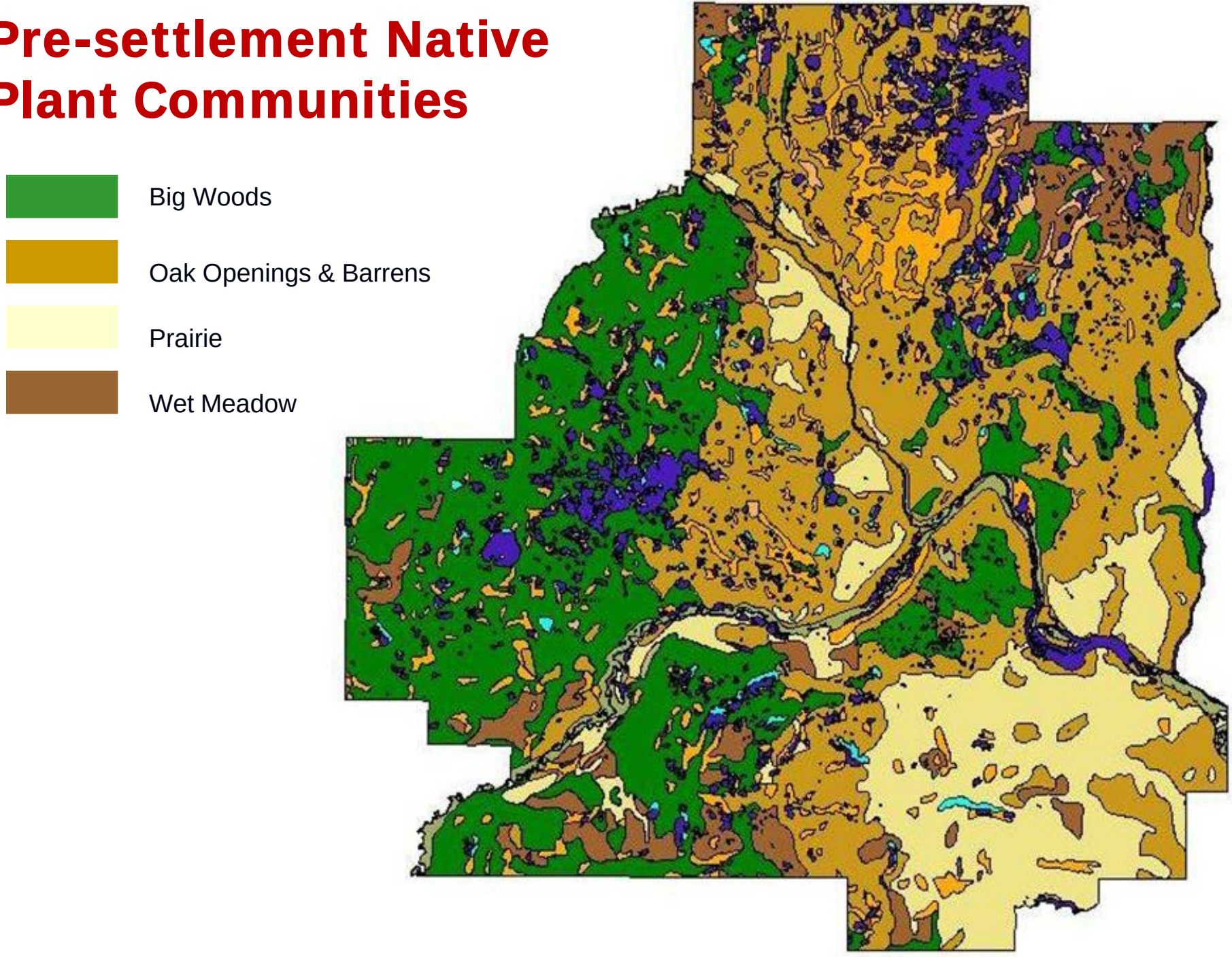
How do Raingardens Work?

1. Capture runoff from rooftop, downspout, sidewalks, driveway or road
2. Slow & reduce runoff
3. Infiltration to recharge acquifer
4. Infiltration to watershed
5. Native plants deep roots loosen soil and carry water down

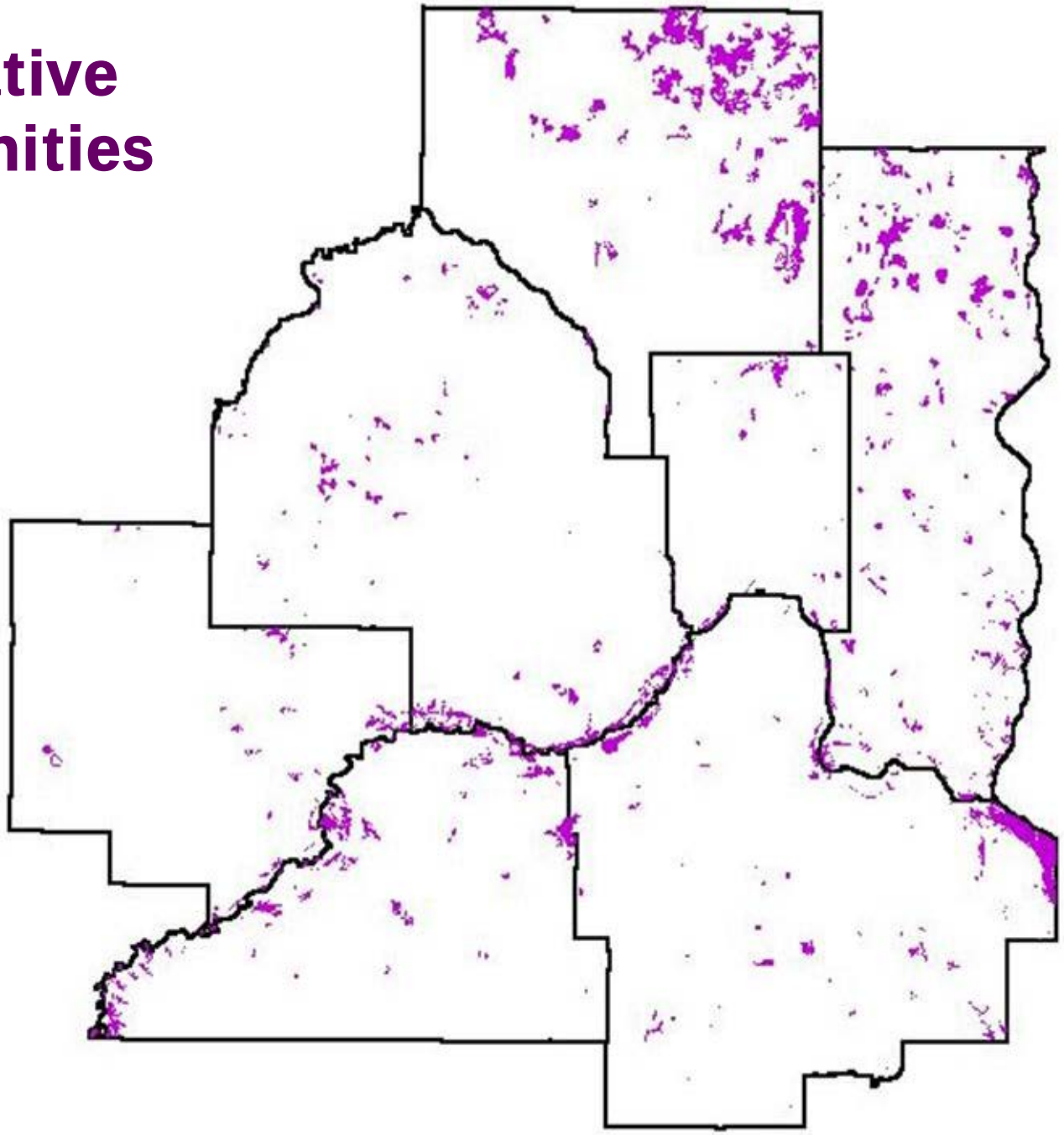


Why Natives?

Pre-settlement Native Plant Communities



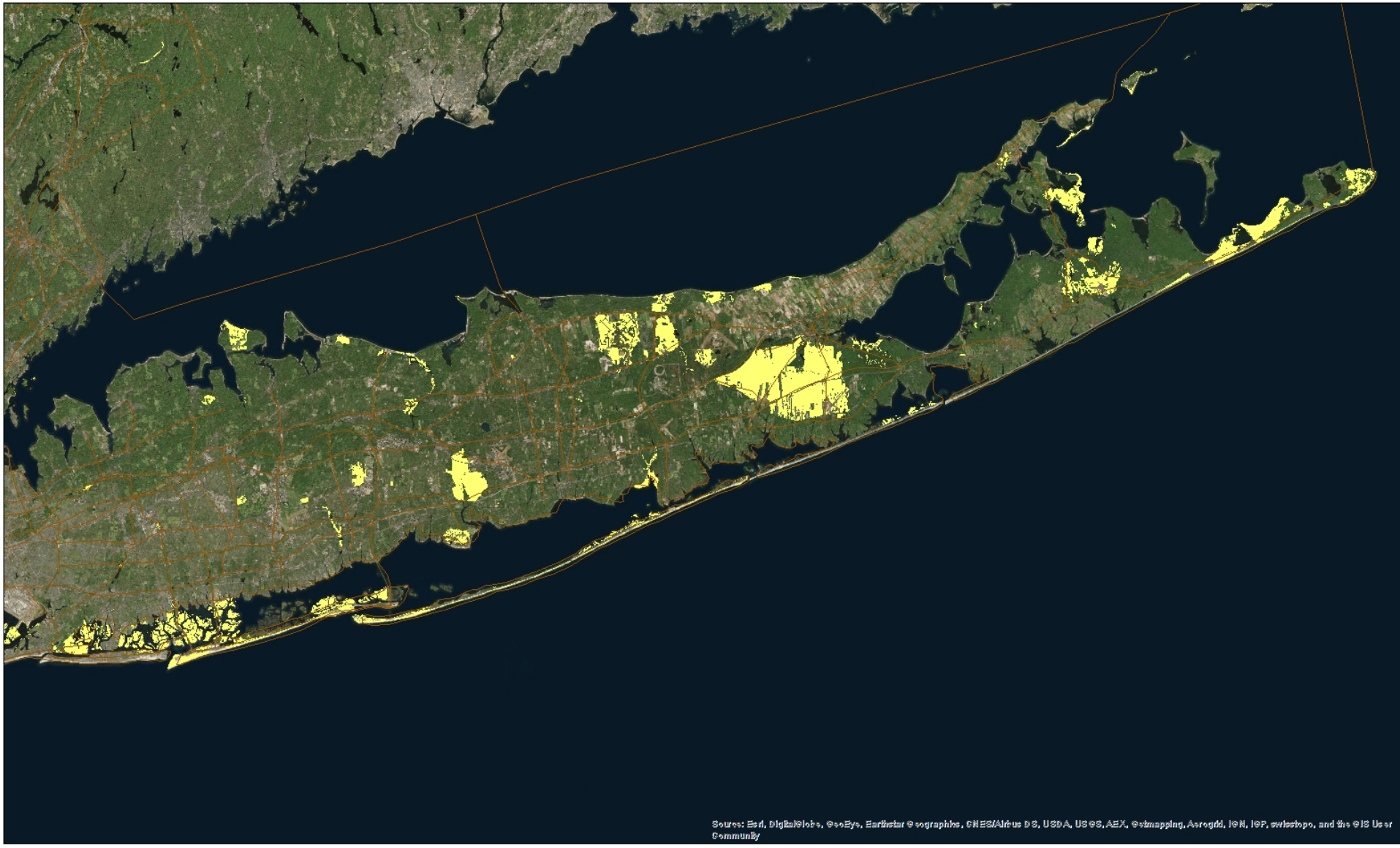
Remaining Native Plant Communities



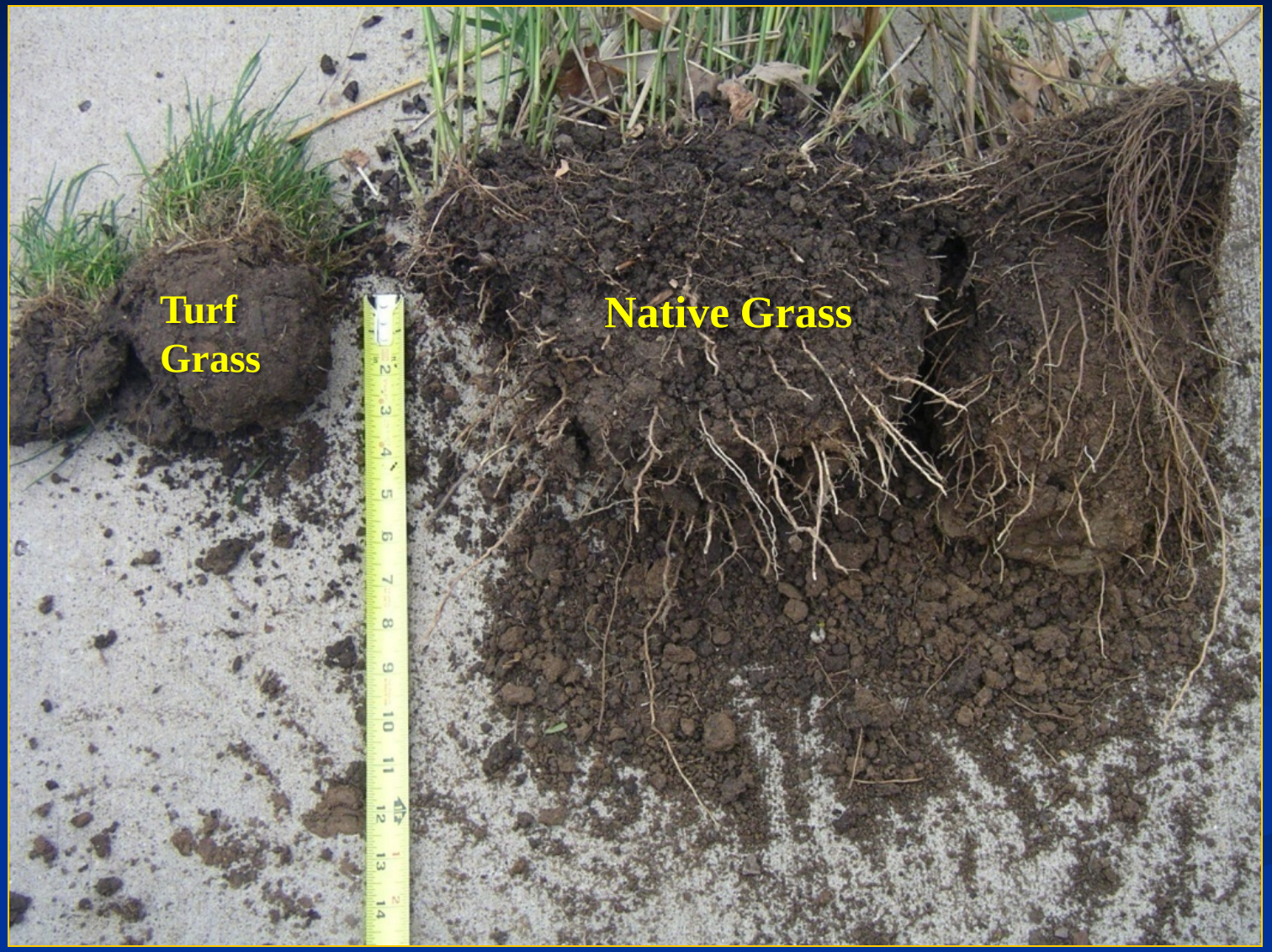
Plants of North Hempstead

- The dominant tree species include tulip tree, black and red oak, beech, black birch, and red maple, with an understory dominated by eastern dogwood. Sweet gum and pin oak occur in moist areas near kettle ponds. Little of the original forest remains on western Long Island as much of the ecoregion is highly urbanized. Small acreages exist in parks and preserves, but species diversity is much reduced.

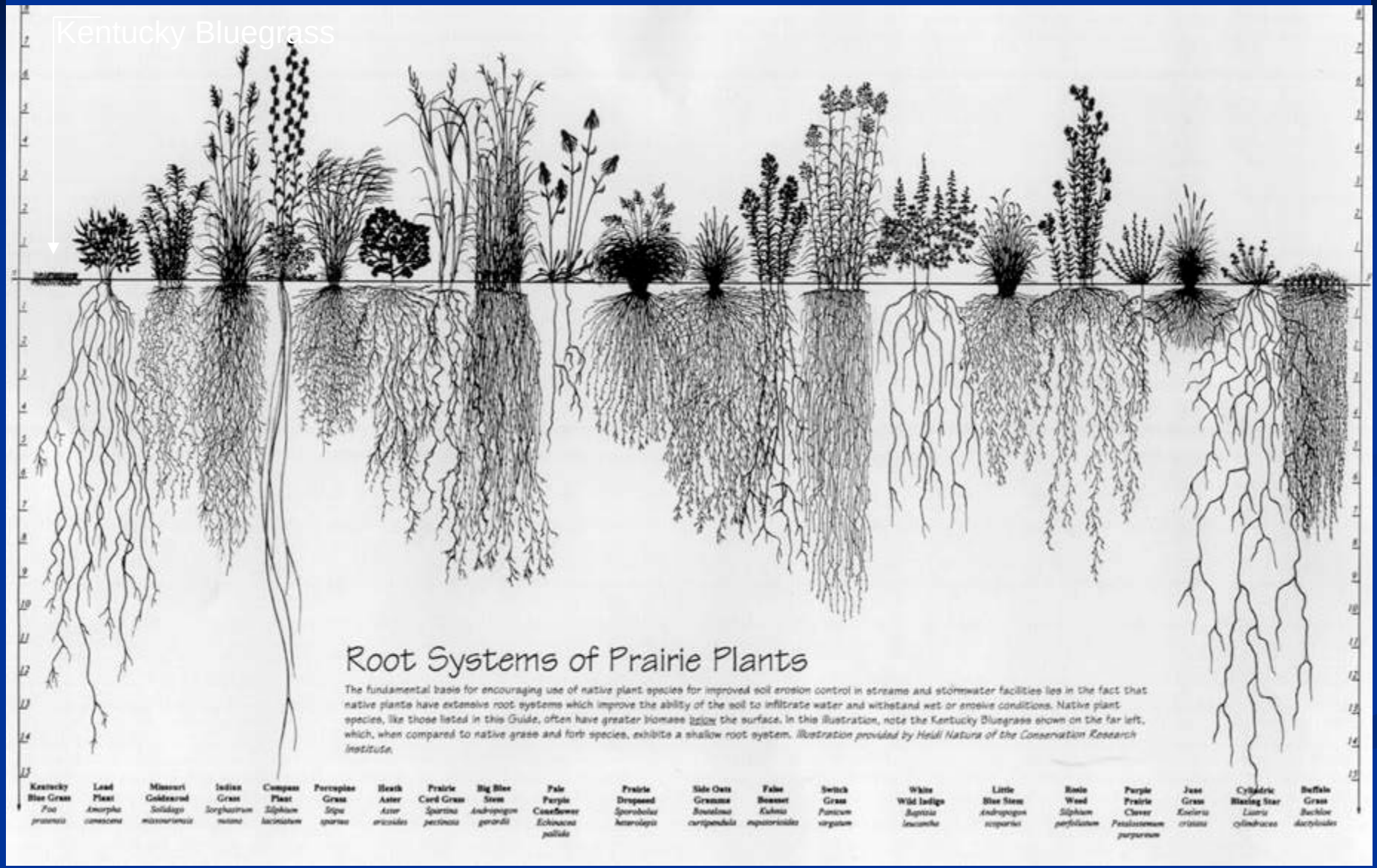
Pine Barrens, Shrublands and Grasslands of Long Island (potential natural vegetation)


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Native Plants – The Root of the Solution



Roots of Native Prairie Plants



Conservation Research Institute and Heidi Natura

WHAT DO YOU THINK IS THE BIGGEST CROP IN THE US?

Two million acres, an area the size of Yellowstone National Park, are lost to development each year Nature Conservancy NRDC

We have converted 62,500 sq miles (40 million acres) to suburban lawn in the U.S. (45.6 million acres). This is over 8 times the size of New Jersey dedicated to an alien plant.

THE IMPACT:

100 million acres have been invaded by alien plants. This is expected to double in the next five years.

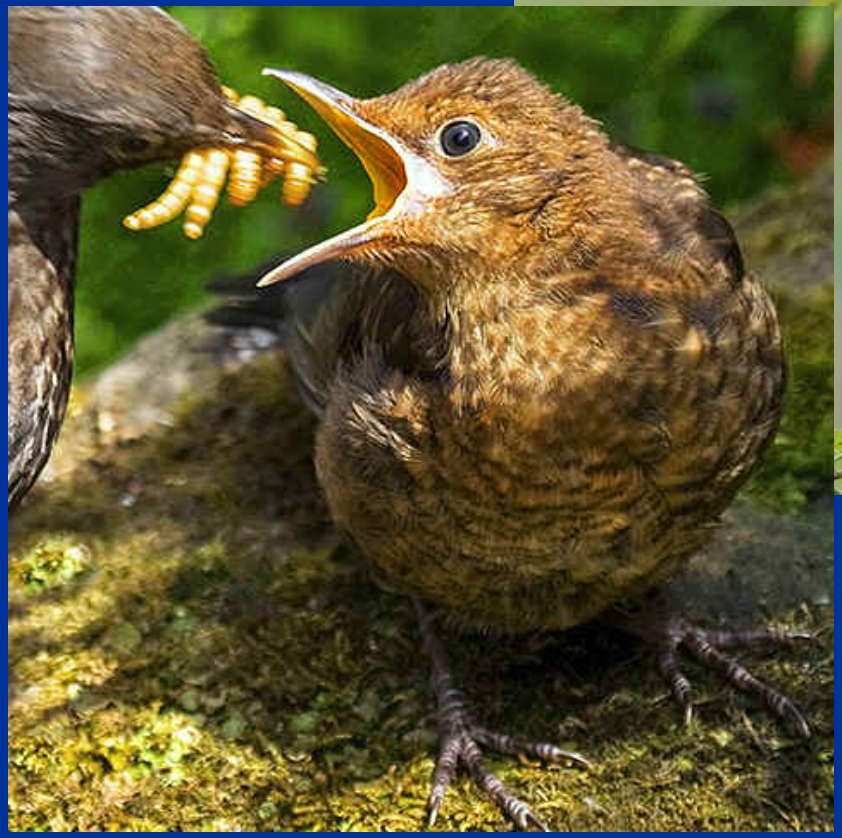
Over 800 plant and animal species are rare, threatened, or endangered in Pennsylvania. 150 have already disappeared entirely.

Because 54% of the U.S. is now in cities or suburbs, and 41% is in agriculture, biodiversity will have to survive in those areas if it is going to survive at all. Truly natural areas are gone nearly everywhere.

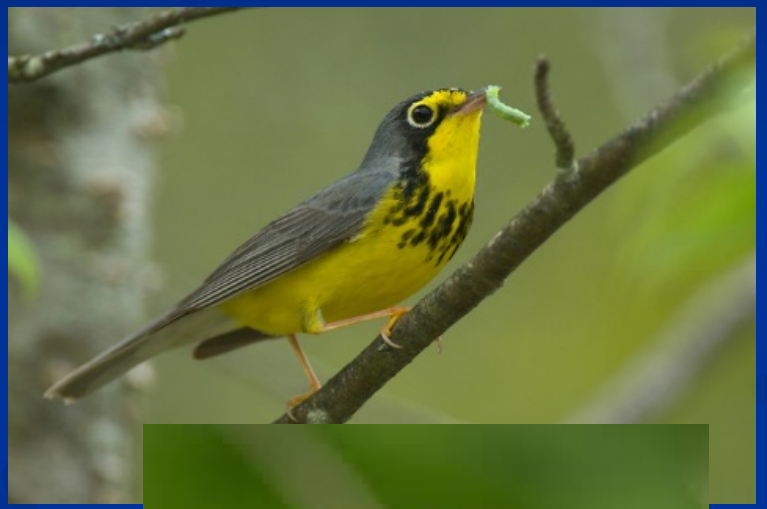
Today, suburbia supports very little biodiversity. Our challenge is to redesign suburbia so that it becomes a healthy, functioning ecosystem.

Insects are the most important group of animals that transfer energy captured by plants to other animals.

96% of all terrestrial birds rear their young on insects



They bring insects, mostly caterpillars, at an average rate of 1 every 3 minutes = 6,000 caterpillars per brood of birds.



90% of all insects that eat plants require native plants to complete their development.

And they need to hide:

Every time we plant an alien plant, we are reducing the local insect population.

Studies have shown that areas overrun with alien plants produce 35 times less caterpillar biomass, the most popular insect food with birds.

Some native species are better at producing caterpillars more than others:

TREES:

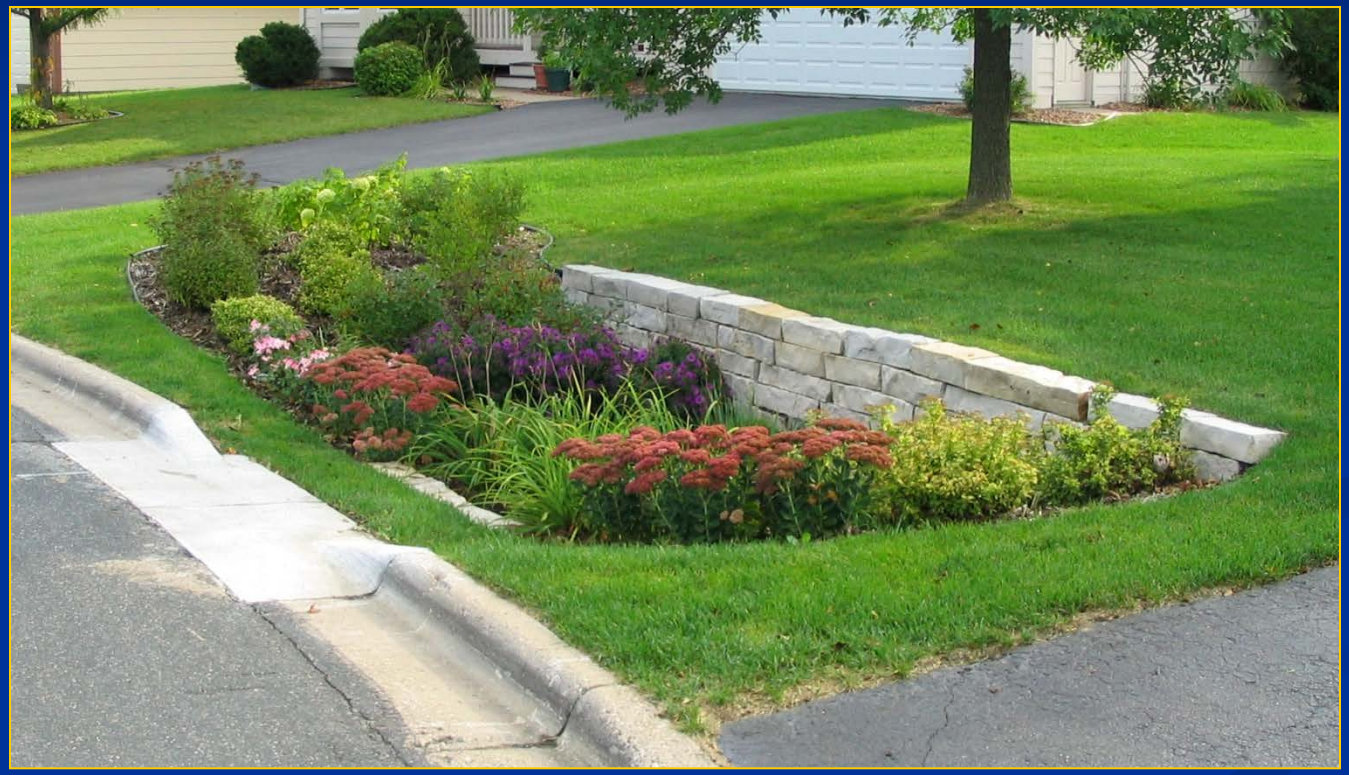
Oak	Quercus	534
Black cherry	Prunus	456
Willow	Salix	455
Birch	Betula	413
Poplar	Populus	368
Crabapple	Malus	311
Blueberry	Vaccinium	288
Maple	Acer	285
Elm	Ulmus	213
Pine	Pinus	203
Hickory	Carya	200
Hawthorn	Crataegus	159

Some native species are better at producing caterpillars more than others:

Perennials:

Goldenrod	Solidago	115
Asters	Aster	112
Sunflower	Helianthus	73
Joe pye, Boneset	Eupatorium	42
Morning glory	Ipomoea	39
Sedges	Carex	36
Honeysuckle	Lonicera	36
Lupine	Lupinus	33
Violets	Viola	29
Geraniums	Geranium	23
Black-eyed susan	Rudbeckia	17

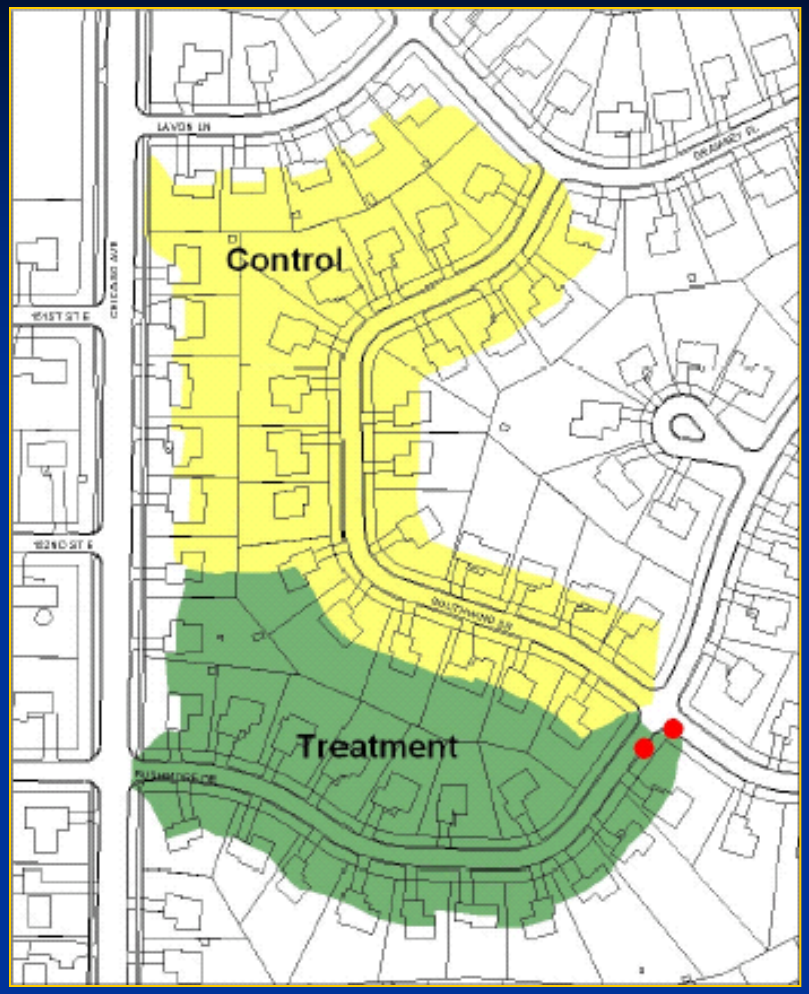
Burnsville, MN
A Municipal Success Story

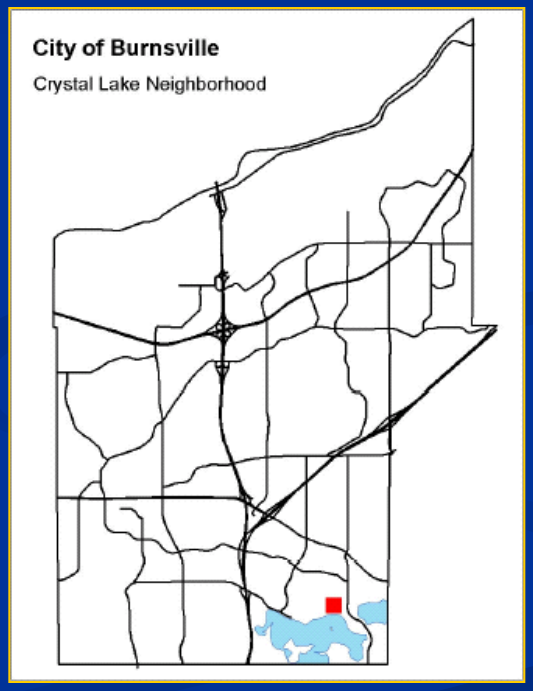


Barr Engineering Study; Presented By Rusty Schmidt, URS

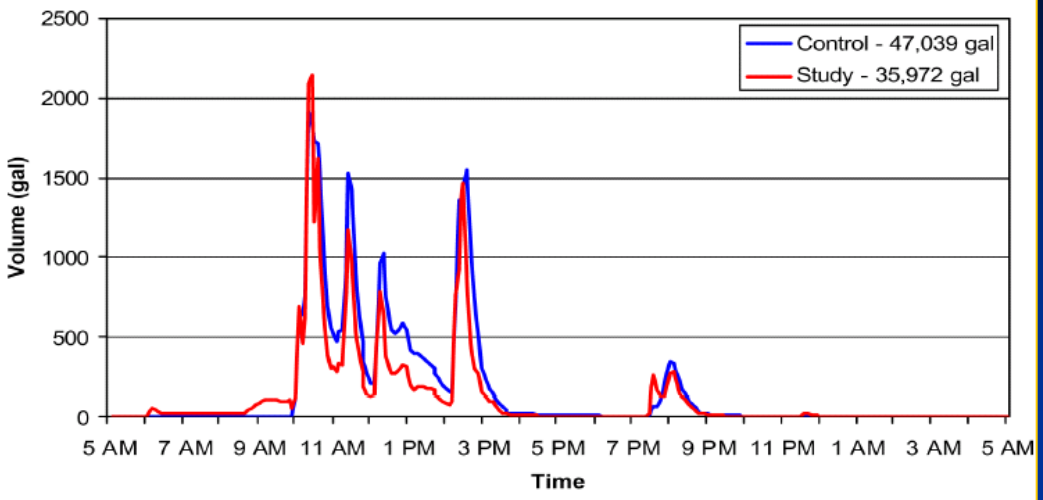
Burnsville, MN

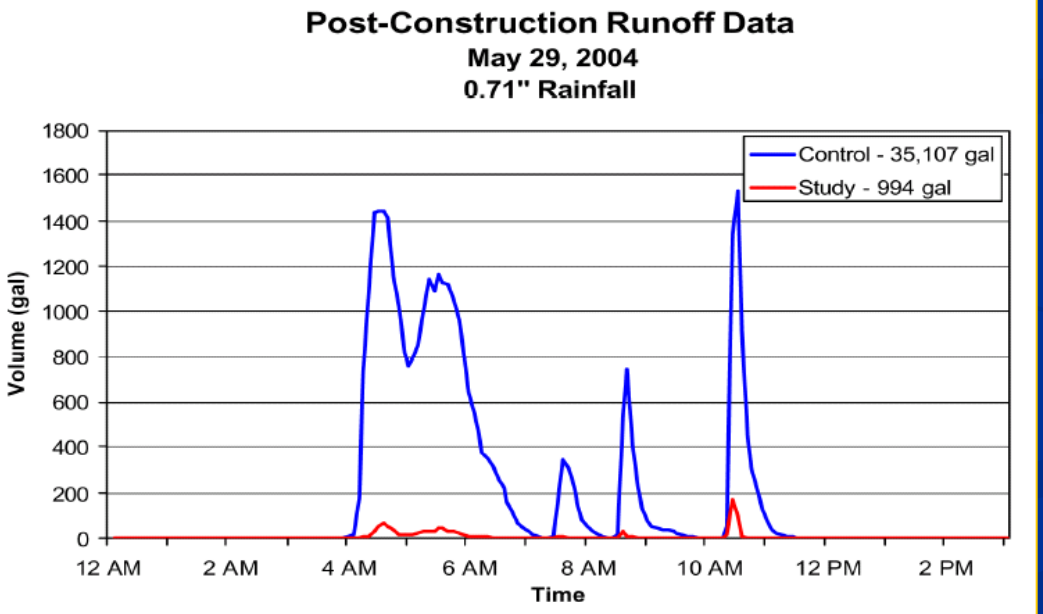
Paired Study of Residential Street Runoff Control





Burnsville, MN





Burnsville, MN

Blue: Control

Red: With Rain Gardens

City of Burnsville
Designed by: Barr Engineering

City of Burnsville
Designed by: Barr Engineering

Locating the Garden

- Near downspouts, driveways, sump pump outlets (where is the water flowing?)

- minimum 10ft. Away from a basement however further is better. (where is the slope from foundation?)
- 4’ away from roads and slabs.

- Avoid utility lines & septic tanks

Photographs: Dakota County Soil and Water Conservation District

Sizing the Garden

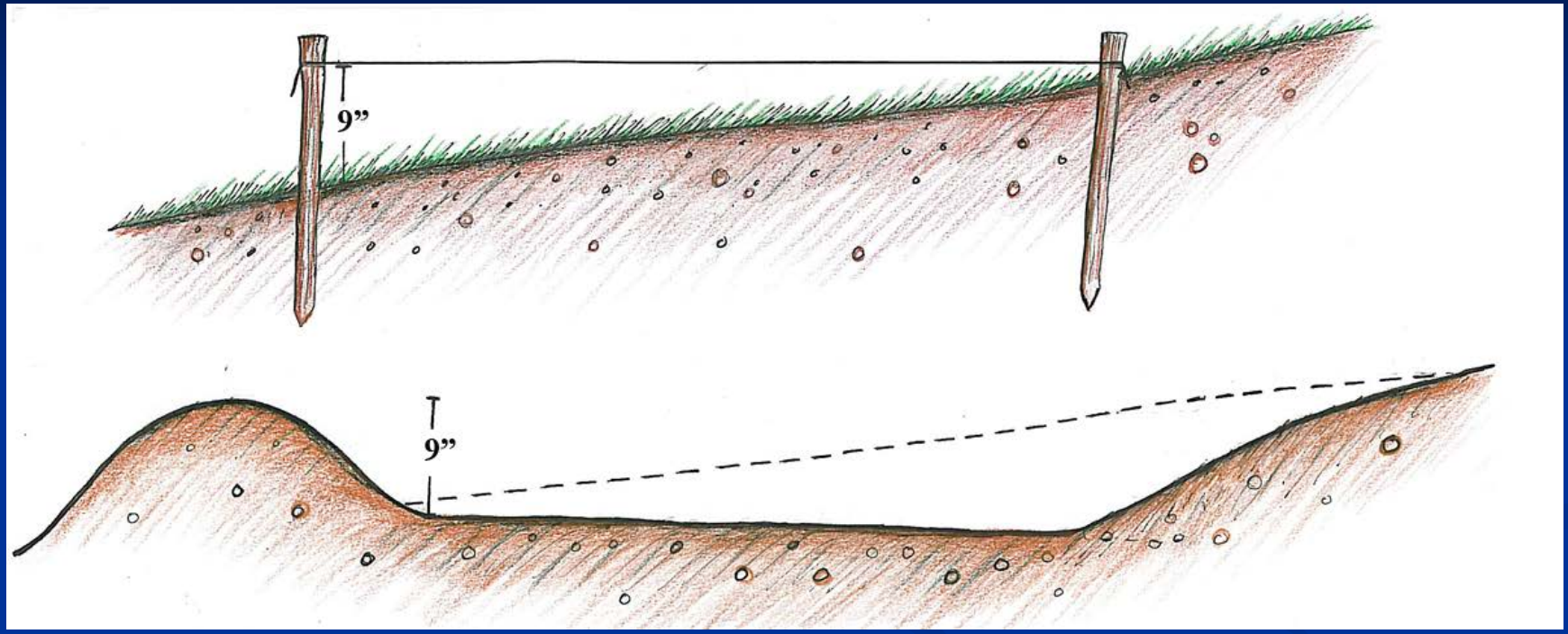
- For residential yards, the bed depth is more important than the area

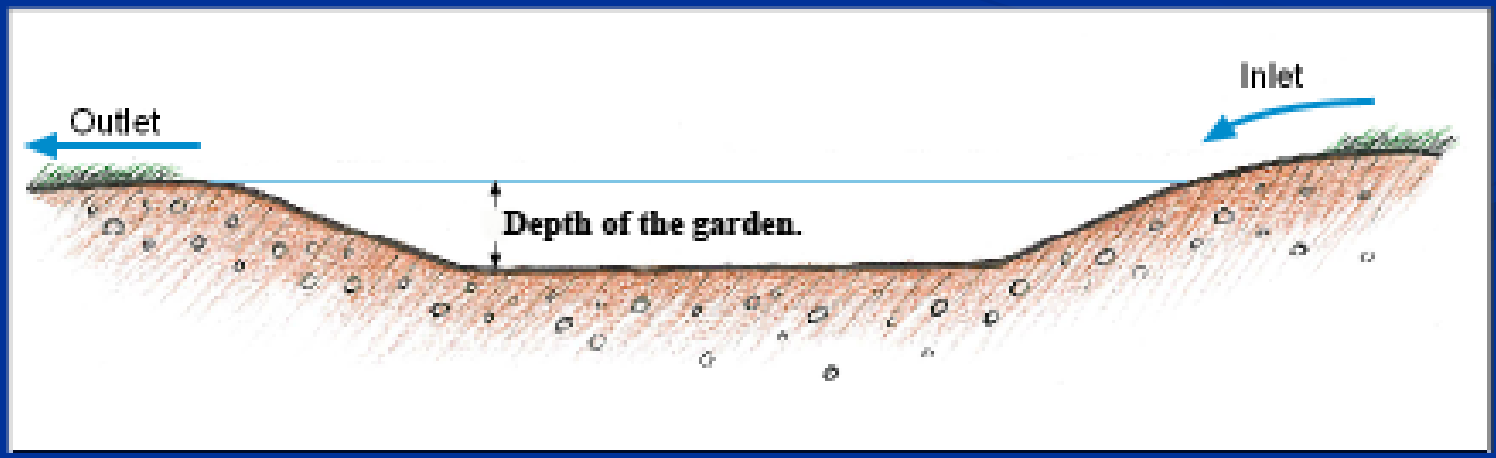
- An average size might be about 6’ x 8’ near one downspout

- Fit into landscaping – yours and neighbors

Photographs: Dakota County Soil and Water Conservation District

Depth of the Garden






Minnetonka
near Shady Oak Lake


Minnetonka
near Shady Oak Lake

First Growing Season

- Limit standing water while plants are small
- Water during dry periods
- Pull weeds

Photograph: Dakota County Soil and Water Conservation District

Raingarden
Basic Keys to Success:

Hydrology

Soil Prep

Plant Selection

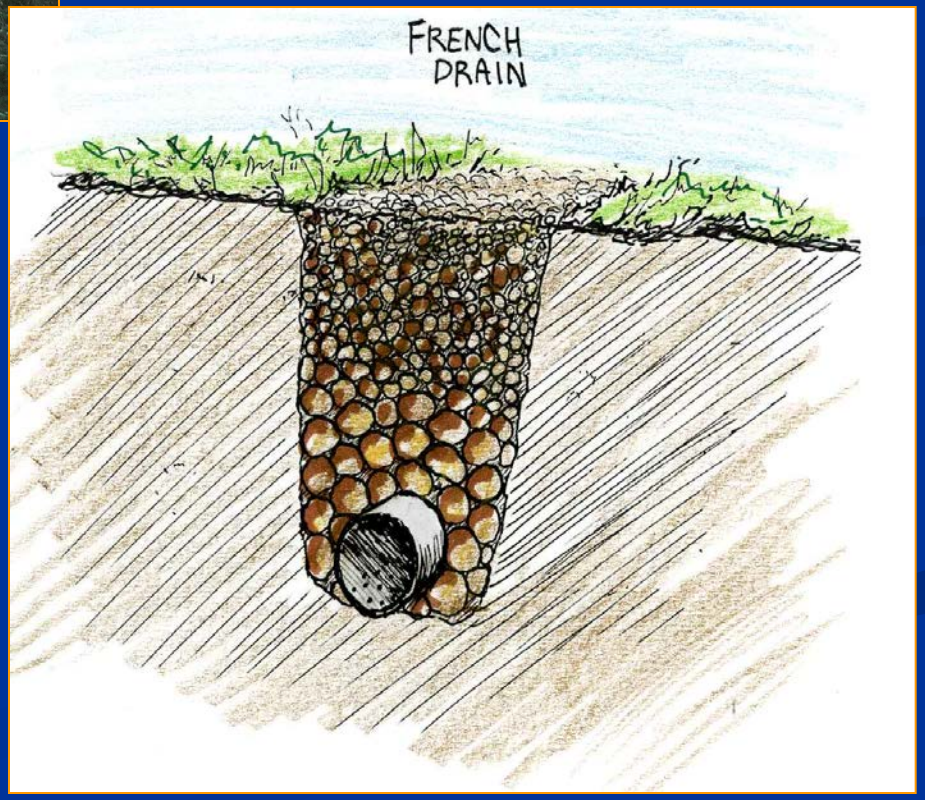
Percolation Test

Select flower bed depth that drains in 24 hours

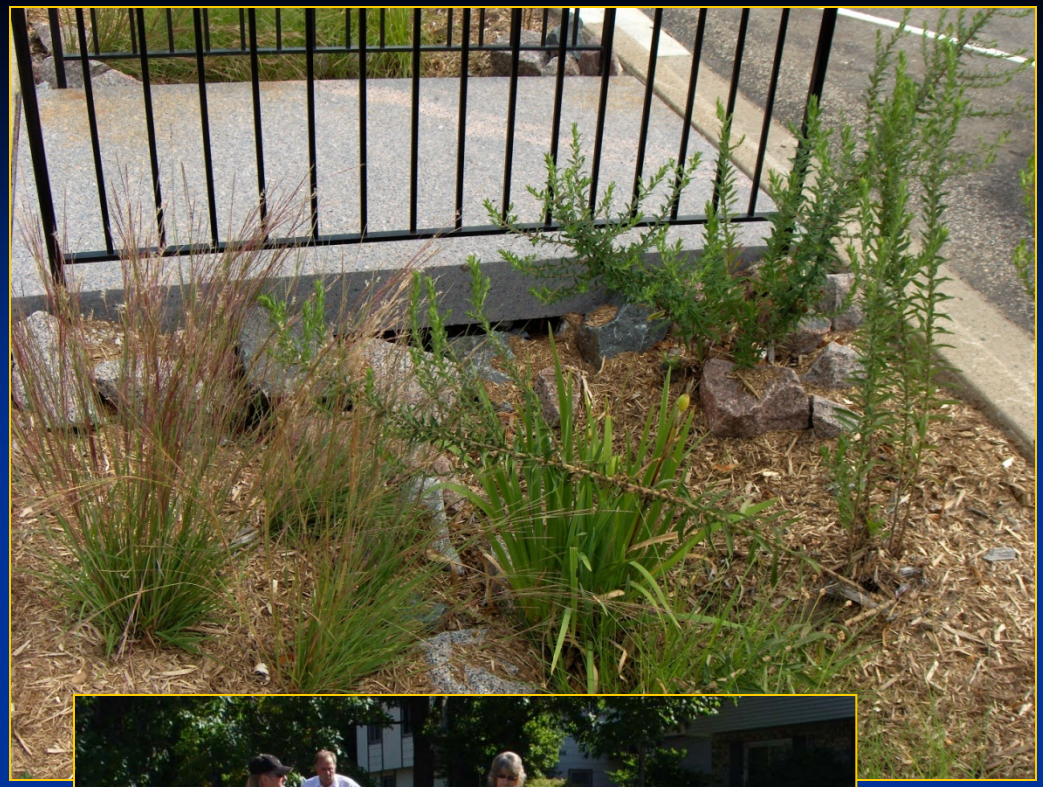
The Math: measure x hours = depth

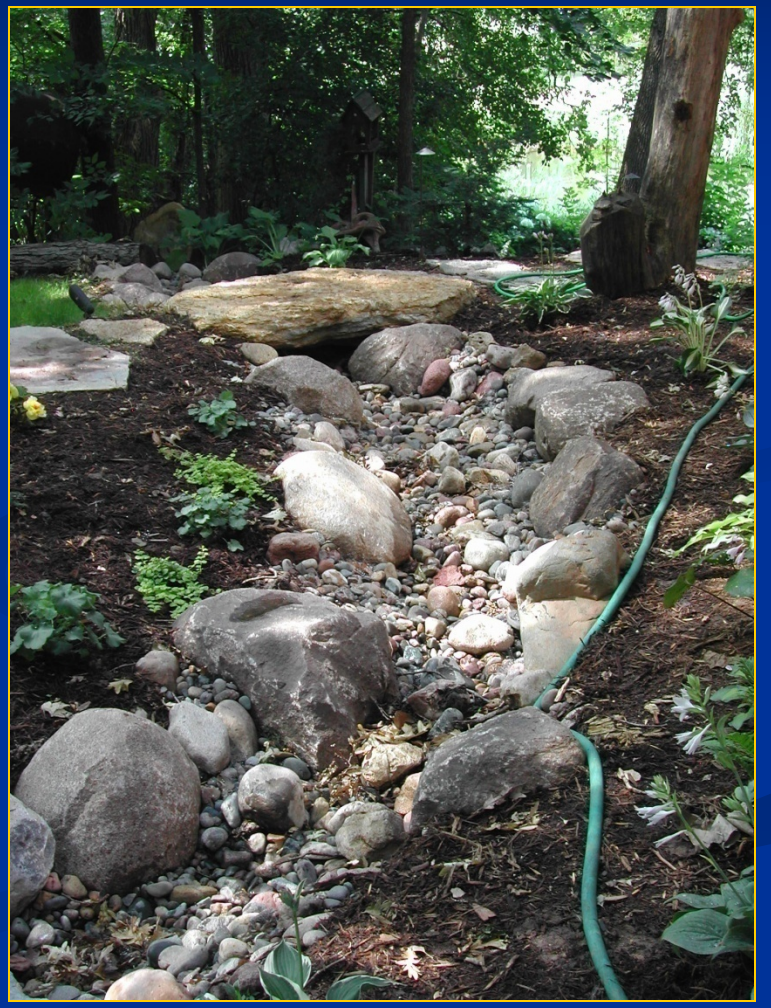
So ¼” per hour times 24 hours = 6” deep!

Pipe/Stream Systems



Pipe/Stream Systems





Example Design and Installation

Example Design and Installation

Example Design and Installation

Example Design and Installation

Garden Soil Prep

Size and site

Remove sod

Till or double-dig: over-dig clay soils

Amend with compost or peat moss

Depth of garden is not more than 12” deep


CHEVR


CHEVROLET


908-902


300 gallons in
1” rainfall

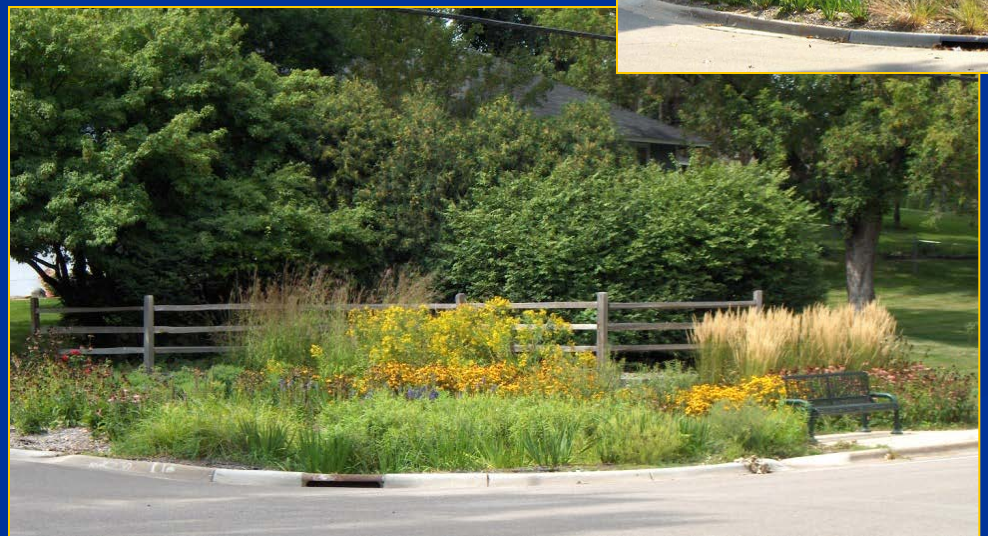

Overflow
(overland)
depression
berm

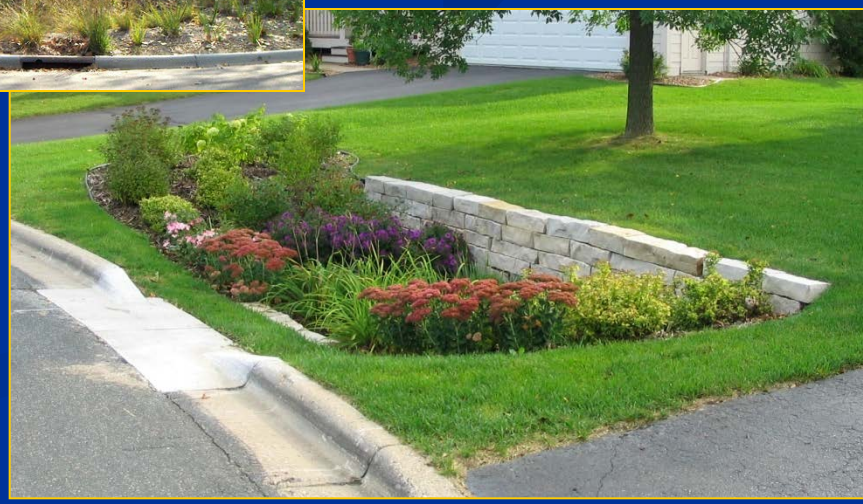

Depression
(w/ compost)
Berm (w/ erosion-
control blanket)

St. Paul
Designed by: Barr Engineering

St. Paul
Designed by: Barr Engineering

Borders, Edging, Ornamentation





Plant Selection

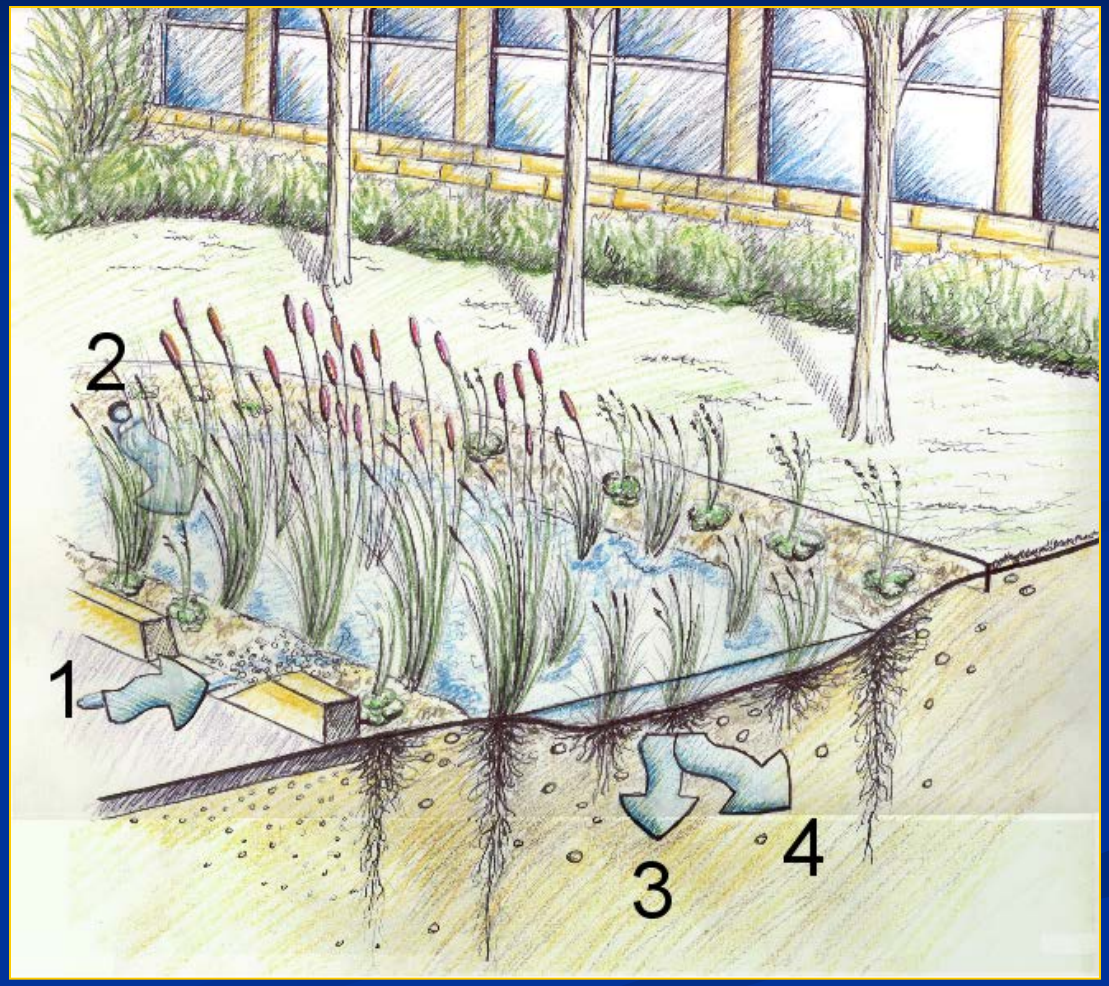
Plugs are economical choice

Howerver Seeds do not work.

Soil Moisture Tolerances

Typical:
Average to Moist
Soil Conditions

Blue Flag Iris
Iris versicolor



Sun Preferences

Full Sun, Partial Sun, Partial Shade, Shade

Blue Lobelia

Lobelia siphilitica

Culver's Root

Veronicastrum virginicum

Marsh Blazingstar

Liatris spicata

Plant Size

When is the Plant too big?

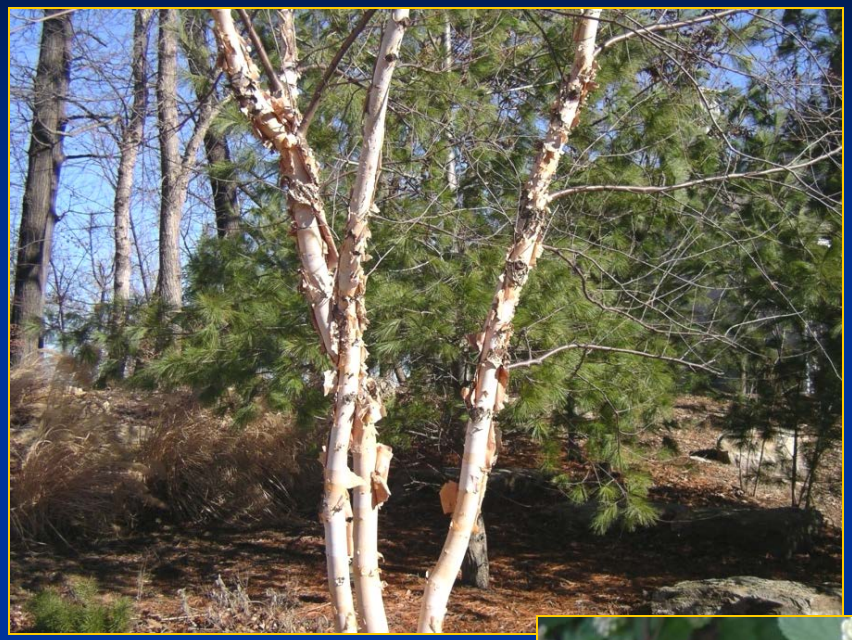
Joe-pye Weed

Eupatorium maculatum

Marsh Milkweed

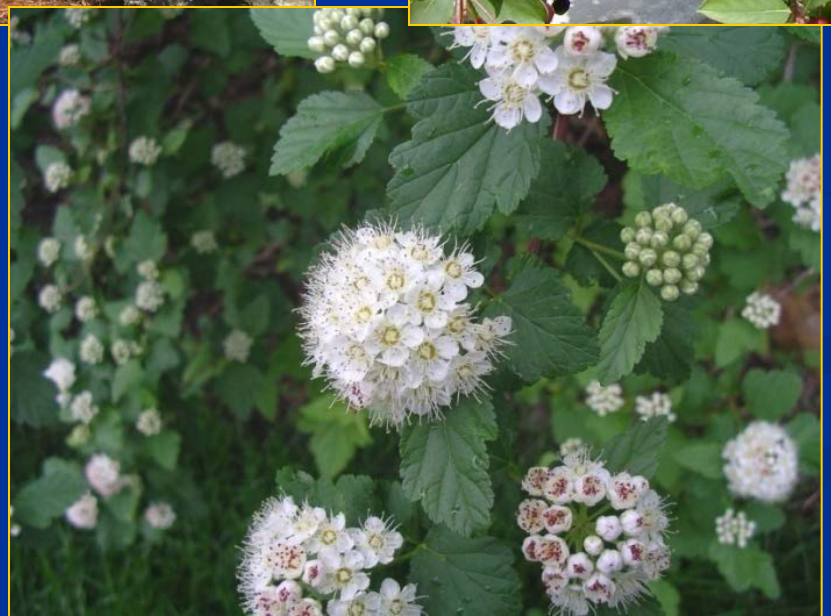
Asclepias incarnata

Trees and Shrubs



River Birch
Betula nigra

Glossy Black Chokeberry
Aronia melanocarpa



Ninebark
Physocarpus opulifolius

Plant Aggressiveness

Cup Plant

Silphium perfoliatum

Obedient Plant

Physostegia virginiana

Grasses and Sedges

Little Bluestem
Schizachyrium scoparium

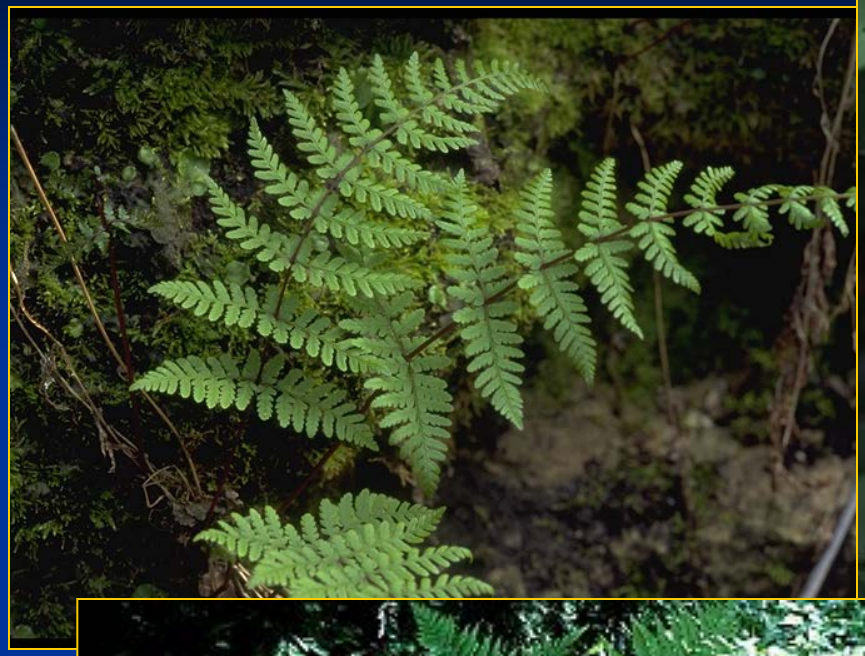
Bebb's Sedge
Carex bebbii

Tussock Sedge
Carex stricta

Fox Sedge
Carex vulpinoidea

Bristly Sedge
Carex comosa

Ferns



Favorite Horticultural Varieties

Daylillies
Hemerocallis spp.

Red Twig Dogwood
Cornus sericea

Hostas
Hosta spp.

Blueberries
Vaccinium spp.

Favorite Native Varieties

Azure Aster

Monarda

Purple Coneflower

Black-eye Susan

Prairie Blazing Star

Butterflyweed

OTHER EXAMPLES

Designed by:
Savanna Designs

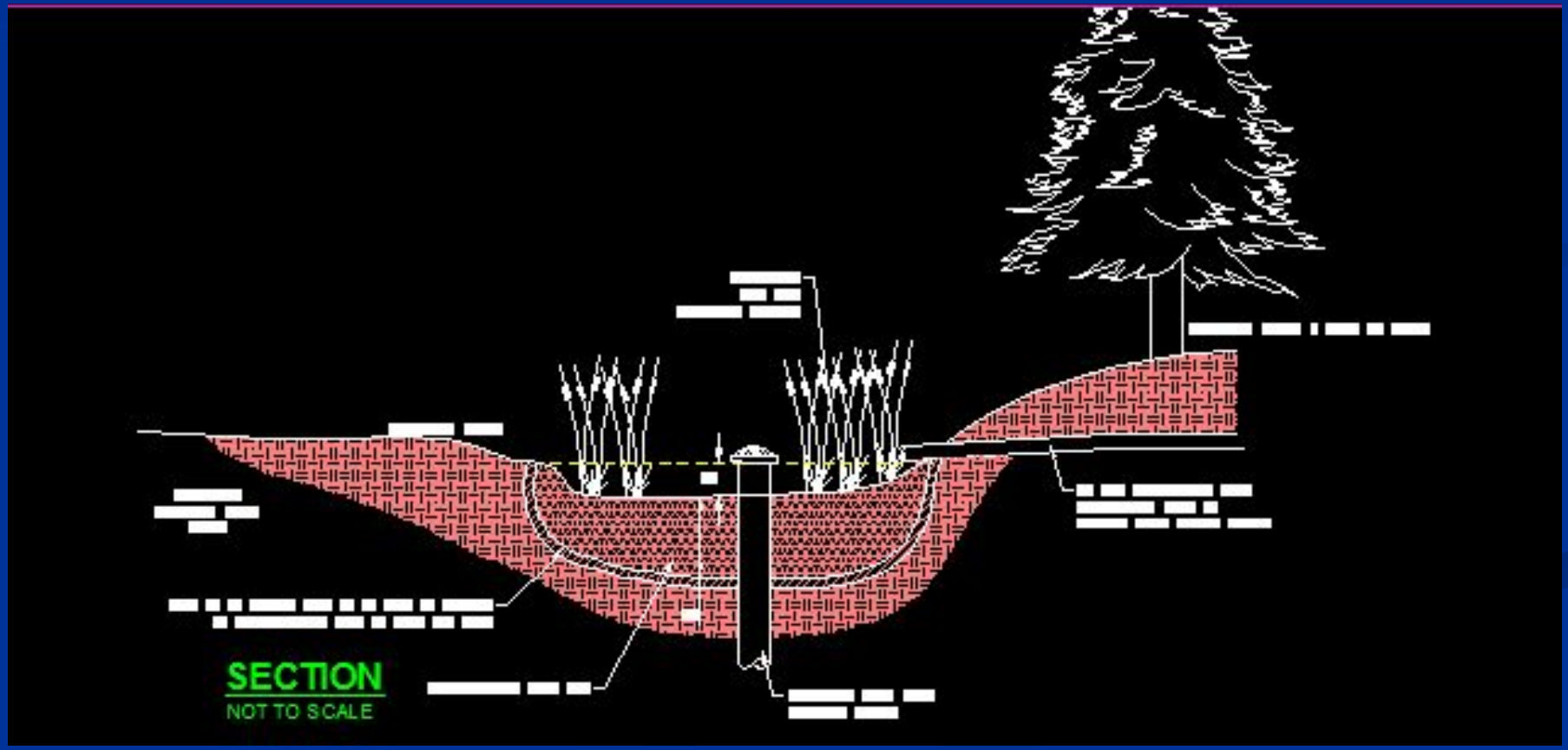
Multifunctional Landscape

Community Landscaping Features

Neighborhood Redevelopment Project

Downtown Square

Raingarden w/ Leaching Basin



Washington Conservation District

Photo: Shawn Tracy; Earth Wizards, Inc.

Photo: Shawn Tracy


Year 3, September
Photo: Shawn Tracy; Earth Wizards, Inc.

Examples of raingardens

Photo: Maplewood, MN

Examples of raingardens

Photo: Maplewood, MN

Examples of raingardens

Photo: Maplewood, MN

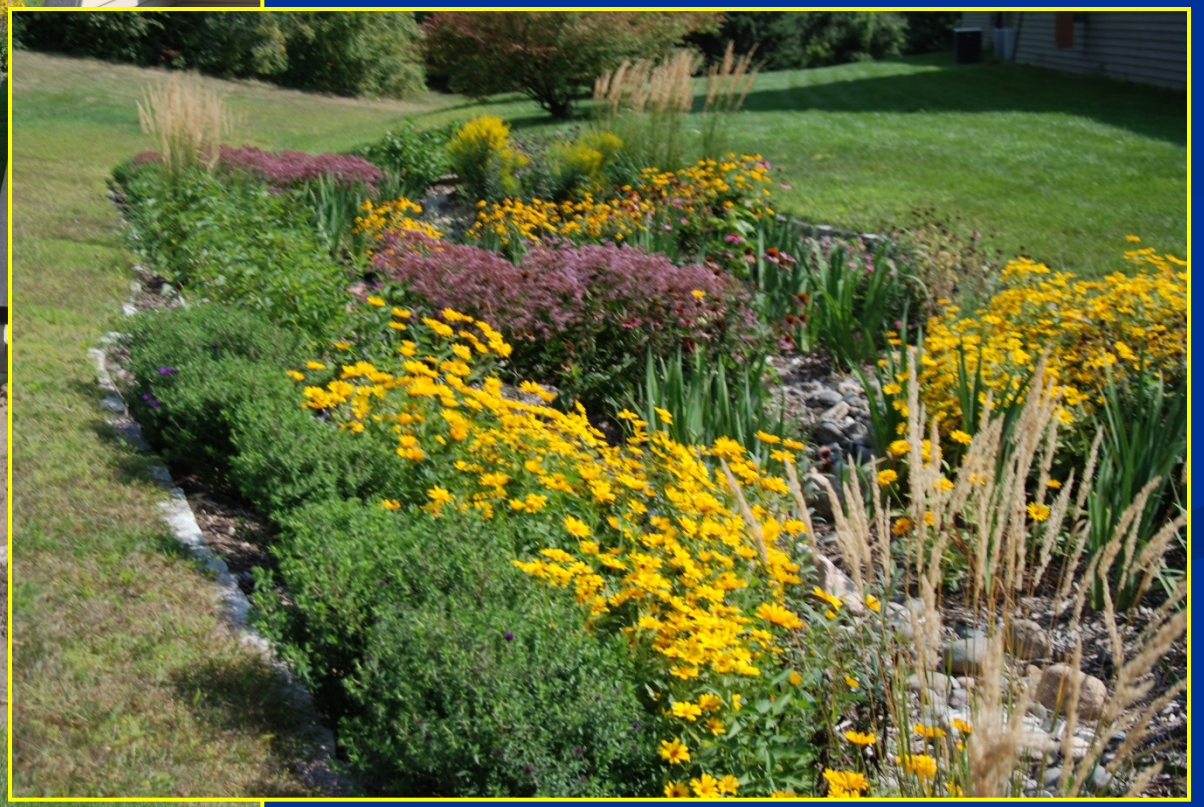
Formal


Formal
AUG 3 2007

Beautiful Gardens along the Street

Nassau SWCD - Muttontown

Trinity Church

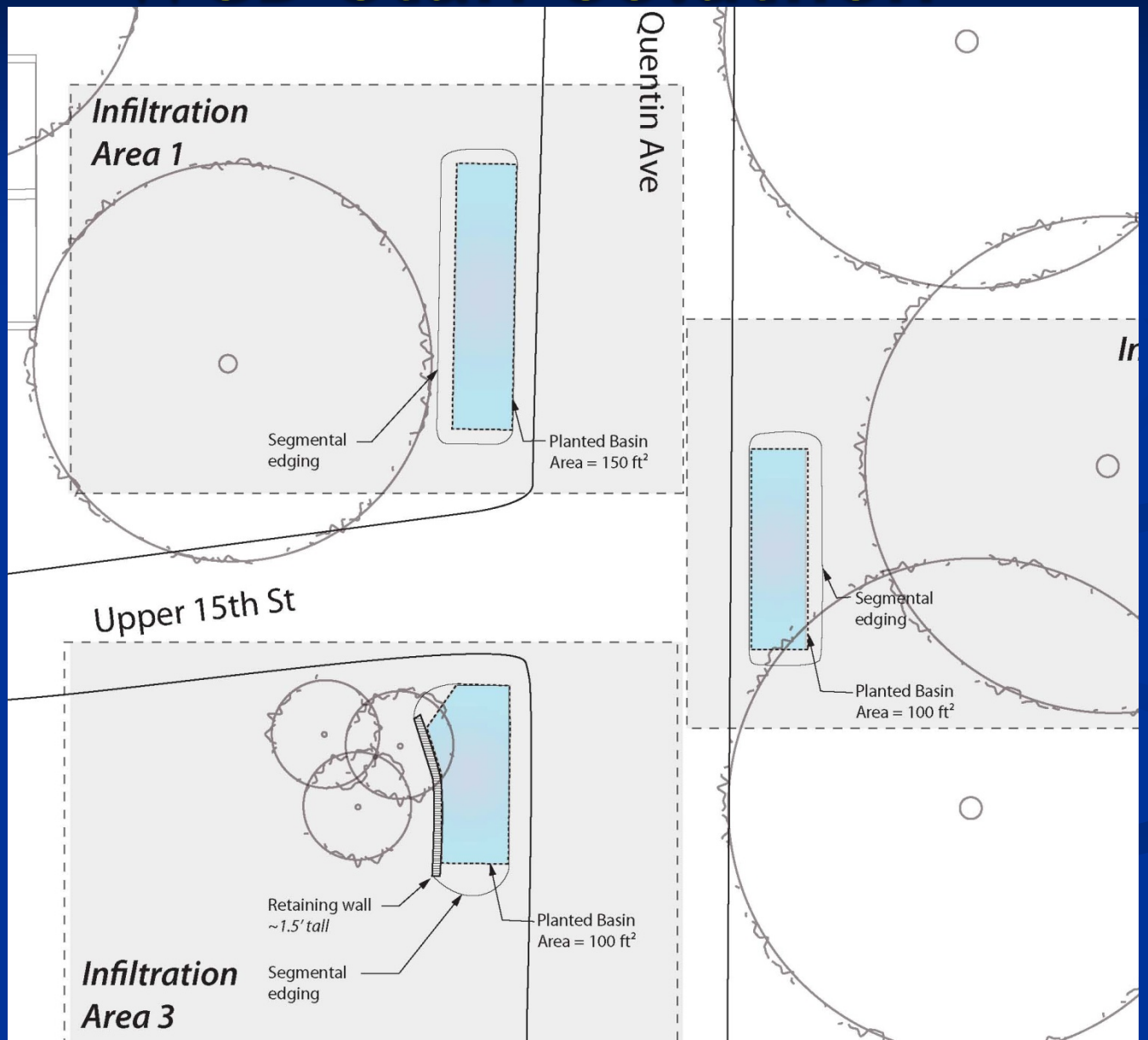


Houston We Have A Problem

Why is this a Problem? Obvious Flooding, but Water Quality?


Upper 15th St S
16600

WCD Staff Solutiion



What Do You Think?

City Council Member Out Digging and Planting

Happened More Than Once in the City Now.

Resolved Localized Flooding

Cleaned the Water Prior to the River.

Construction Group!

Proud Parents


Thank You!