



WHERE DOES YOUR WATER SHED?

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Land use data

- ◎ Iowa total acres = 36 million acres
- ◎ In 1846, 75% of Iowa was prairie (27 million acres)
- ◎ About 19% (6.7 million acres)was savanna / woodland
- ◎ About 6 % was water (wetlands, rivers, streams, lakes)

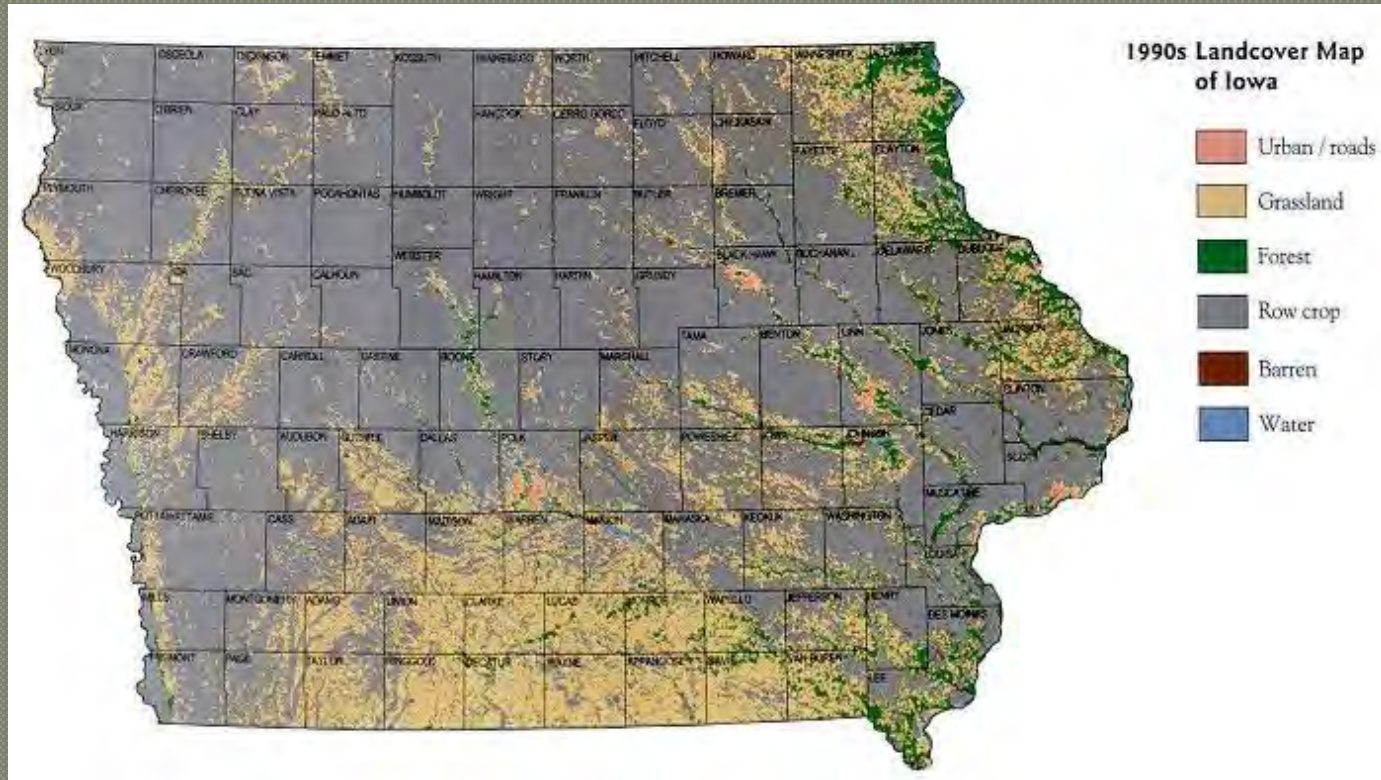
Iowa Vegetative History 1850's

- Dominated by the Tallgrass Prairie
- Woodlands along rivers, streams and hills
- Wetlands in the lower areas



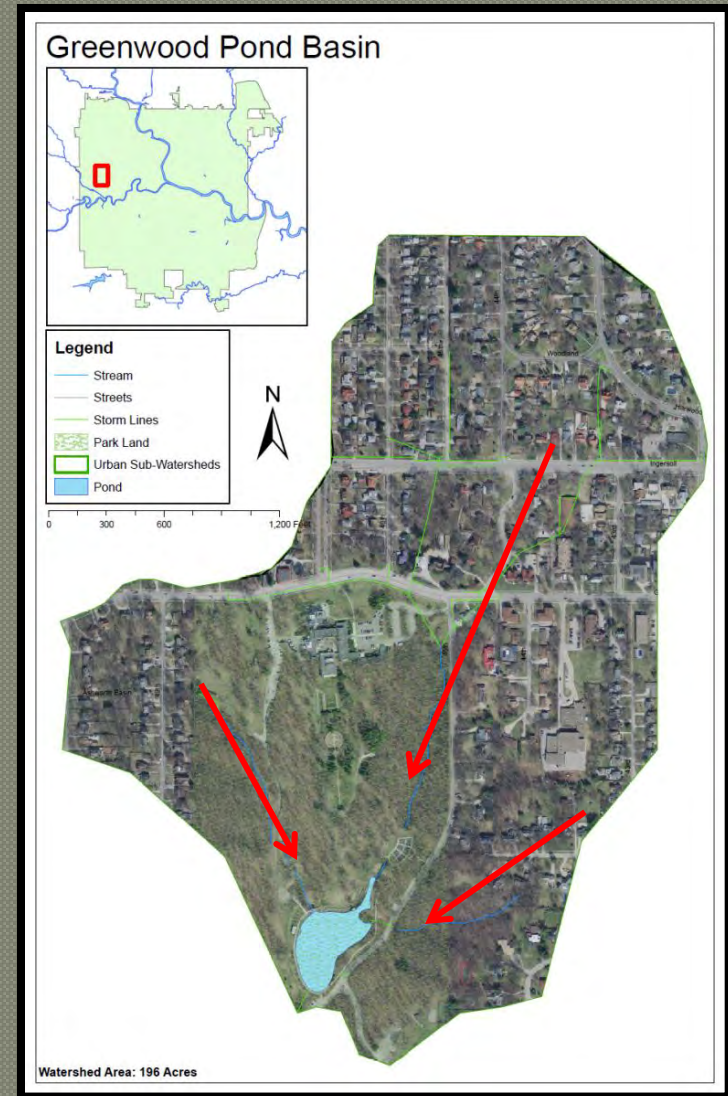
Iowa Vegetative History 1990's

- Dominated by row crop agricultural
- Grassland and degraded savanna in the southern portions is dominated by non-native species



What is Stormwater Runoff?

- Rainfall or snowmelt that cannot be absorbed into soil fast enough runs into low areas, streams or lakes.
- What is a Watershed?
 - An area of land that water flows across or through to a focal point (stream, river, lake)

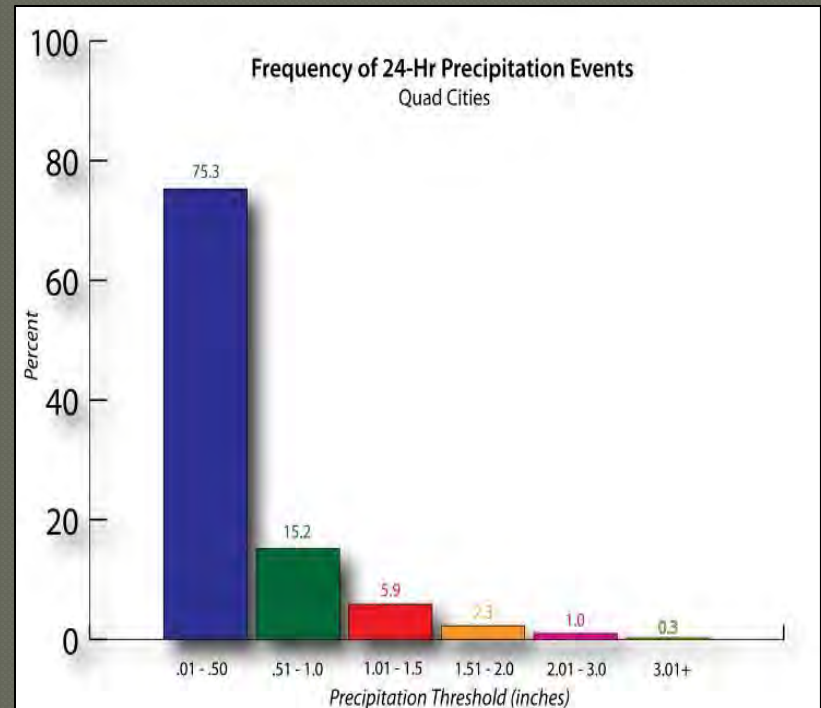


Contaminants in Storm Water Runoff

- Sediment from construction sites
- Pesticides & nutrients from lawns, etc
- Bacteria from pet wastes
- Oil & grease from car leaks, gas stations, and industrial areas
- Sand and salt from snow and ice control
- Trash such as cigarette butts, paper wrappers, bottles
- Thermal Pollution

Rainfall Patterns and Water Quality

- The 'first flush' of rainfall moves pollutant loads to surface waters
- Use practices that retain water from the small storms on-site
- Strategies include:
 - soil quality enhancement
 - reducing soil compaction
 - vegetation selection



75% of storms < 0.5 inch
90% of storms < 1 inch

A Changed Landscape



Addition of Impervious Surfaces

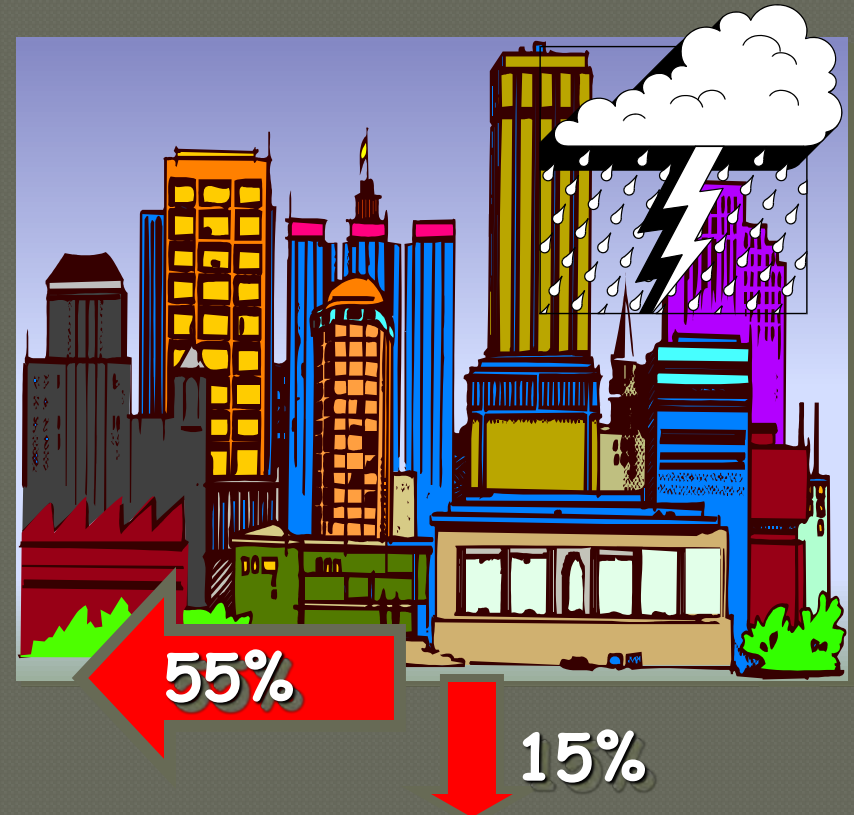
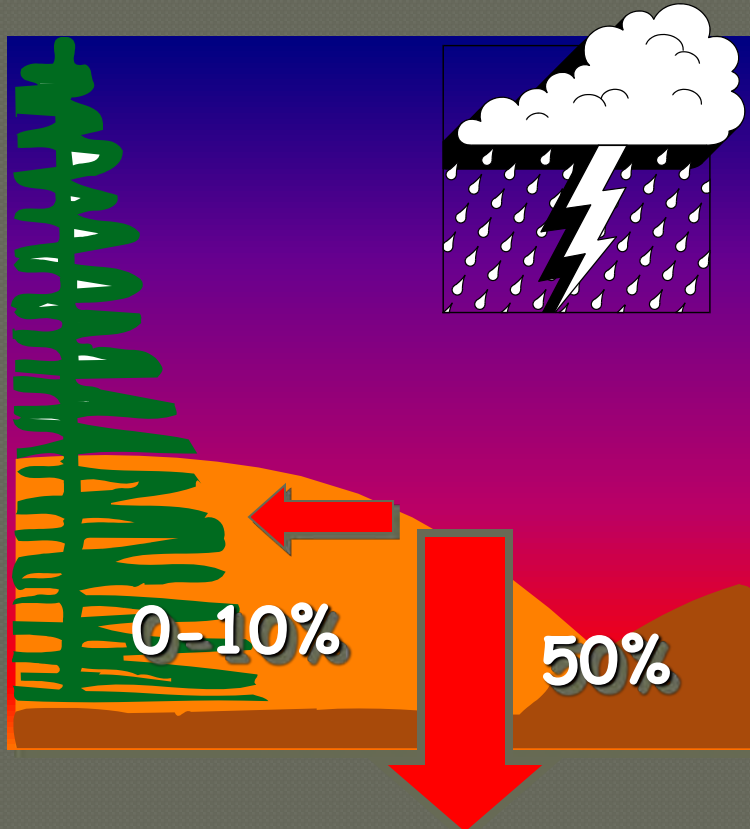
Concrete, asphalt, roofing, and compacted soil prevent rainfall from infiltrating into the ground.



**Impervious
Surfaces**



Historic Hydrology vs. Modern Hydrology



Water as a nuisance / waste product



One Problem: Conventional Site Design

Collect
Concentrate
Convey
Centralized
Control



Engineered Drainage



Traditionally...

Detention for Flood Control



Waverly hospital rain water detention pond.
Pond built 2003. Picture taken 1-13-04.

Regional Wet Detention Ponds are Becoming Popular







Sod over an altered, compacted subsoil sheds runoff much like roofs and other impervious surfaces, after the sod turf becomes saturated.



Properties threatened by stream erosion in Des Moines

You live on waterfront property!



- You have waterfront property if there are storm drain inlets in the street.
- Storm drains are connected to streams, ponds, and lakes.
- Water is not treated before it flows to the stream.



Storm water and pollutants flow directly from street into this Iowa lake

How much rain water really flows off my yard?

- Average rainfall in Iowa: 28-36 inches per year
- Acre of land in Iowa receives anywhere from 760,000 to 977,500 gallons of water per year
- A row of rain barrels 6 – 7 miles long to hold all that water.
- $\frac{1}{4}$ acre (~11,000 S.F.) urban lot receives ~217,188 gallons per year
- To calculate the amount of water run off on your yard, do a Rain Water Audit at www.jcswcd.org

A man in a red shirt and cap is using a hose to clean a driveway in front of a house. The house has a white roof and a stone-textured wall. A silver car and a blue pickup truck are parked in the driveway. The scene is outdoors with trees and a clear sky.

Rooftop & Patio- 900 gallons

Driveway- 500 gallons

Compacted Yard- 2,600 gallons

Yearly Stormwater Runoff- 128,000 gallons

This small urban lot could shed 4,000 gallons of water into the street as stormwater runoff in a 1" rainfall event.

Design Principles



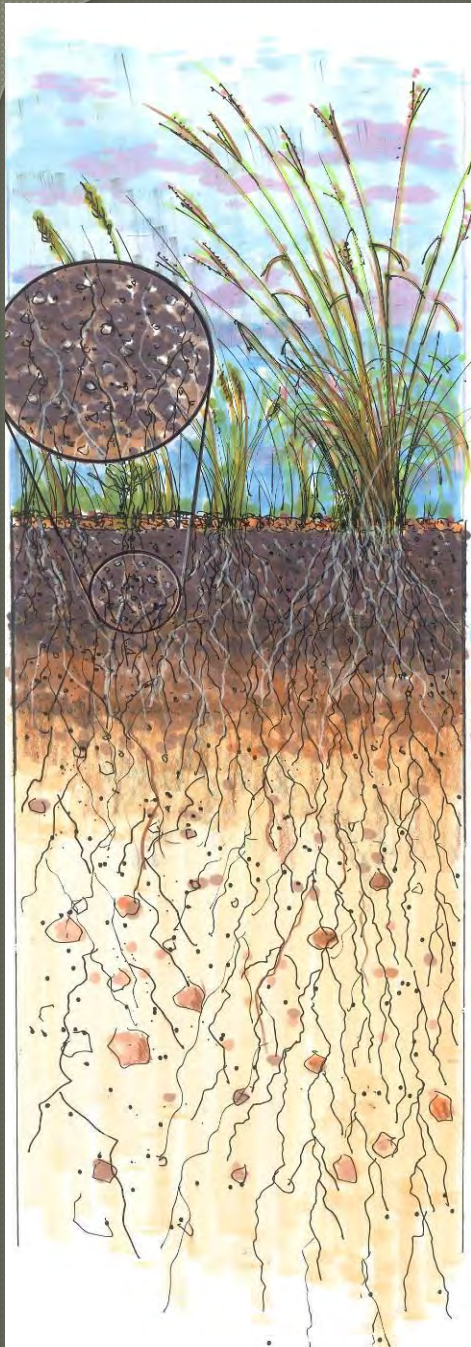
**Retain rain
on site.**

**Mimic the
hydrology
of the native
ecosystems.**

**Infiltrate more.
Shed less.**

Historic Landscapes

- Prairie soils had 8-10% organic matter content and 45% pore space
- Now soils have < 4% OM
- Even less organic matter on construction sites
- Bulk density has increased – less pore space
- Soils have lost 60-80% of their ability to absorb and infiltrate rainfall events
- Ag lands generate runoff after about 1.25 inches of rain.





PRACTICES

RAINSCAPERS

CASE STUDIES

RESOURCES

CONTACT

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Practices

- ▶ Rain Gardens
- ▶ Bioretention Cells
- ▶ Bioswales
- ▶ Soil Quality Restoration
- ▶ Native Landscaping
- ▶ Native Turf
- ▶ Roadside Native Plantings
- ▶ Green Roofs
- ▶ Permeable Pavement Systems
- ▶ Rainwater Harvesting
- ▶ Stream Corridor Stabilization
- ▶ Vegetated Box Filters

Rainscaping practices infiltrate or capture urban storm water which reduces runoff and improves water quality in Iowa streams and lakes. Use the menu at the left to explore each practice with design details and photo examples or select a thumbnail from below to get started.



Soil Quality Restoration



**Aerate soils prior to
compost application**

**Turf grass after application of
compost**



Early Spring

Yard with fall applied compost

Traditional turf management



Rain Garden Definition

- A shallow depression to capture, temporarily pond, and absorbs run-off water from impervious surfaces (roofs, pavement)



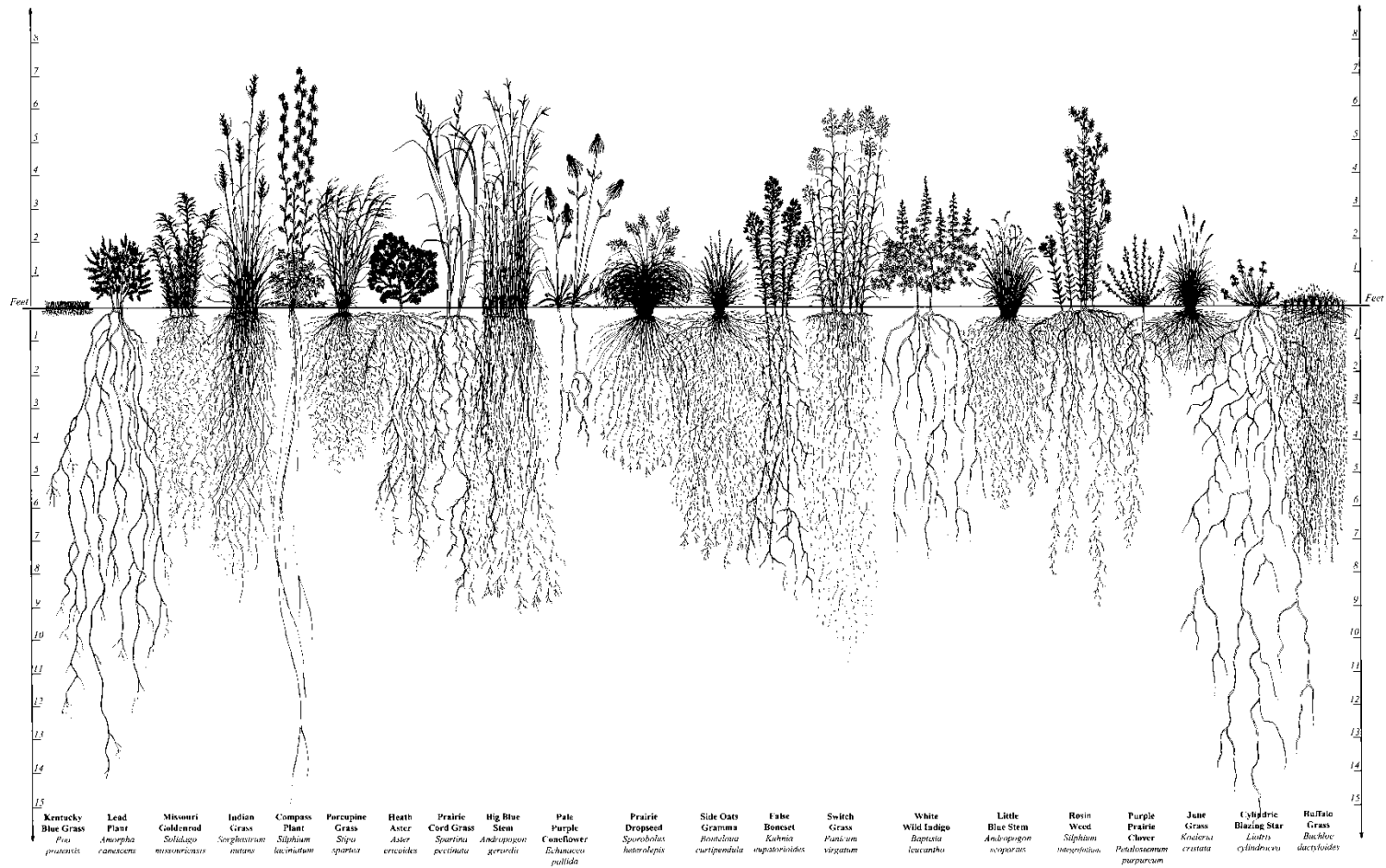
Rain gardens slow down rainfall run-off on the way to surface water



**Rain garden at Forever Green
Landscape and Nursery in Coralville**



March Madness



Root Systems of Prairie Plants

Conservation Research Institute

Heidi Nansen 1995

©

Native Landscaping



Rainwater Harvesting

○ Rain Barrels:

- A 55 gallon barrel will fill when 1 inch of rain falls on an 8x10 foot area of roof!
- Provide water for gardening
- Save money on water bills
- Use the water to wash your car
- Reduce Stormwater runoff

- When it rains it drains...every little bit helps!



A single rain barrel is used in this yard to water vegetables and flowers.



6,000 gal tank capturing roof water for greenhouse use at Kirkwood Community College in Cedar Rapids

Green Roofs





Creating Demand for Local Businesses



**Sedums growing at Roof Top Sedums
in Davenport, IA**



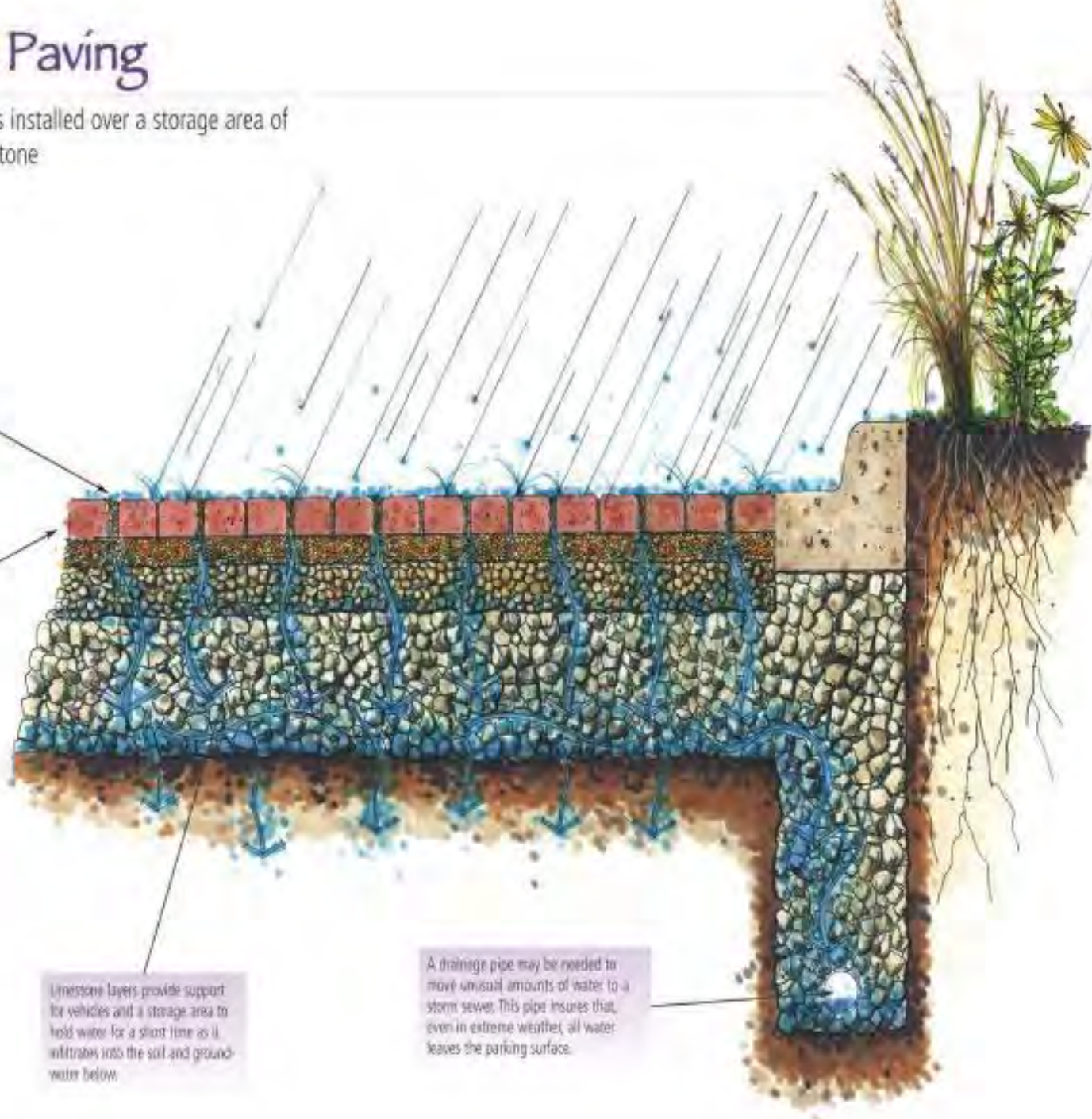
Pervious Paving

Modular paver blocks installed over a storage area of uniformly-sized limestone

This system prevents car-related pollutants on parking areas from reaching our rivers and streams.



Spaces between modular pavers funnel storm water into an 18-inch layer of limestone below. Here, water is temporarily stored as it infiltrates into the soil and groundwater below.



Limestone layers provide support for vehicles and a storage area to hold water for a short time as it infiltrates into the soil and groundwater below.

A drainage pipe may be needed to move unusual amounts of water to a storm sewer. This pipe insures that, even in extreme weather, all water leaves the parking surface.



Dubuque green alley

- The pilot project in Dubuque will provide \$9 million to implement their green alley program over the next three years.





Permeable pavers in West Union's business district

Manville Heights Area





Funding Opportunities

- City of Coralville, Iowa City, and North Liberty
- REAP storm water management funds
(contact Johnson SWCD)
- Iowa Storm Water Loan Program
(contact Johnson SWCD)



Watershed Group Exercise

1. What is the name of your watershed?
(Lake Macbride, Muddy Creek, Ralston Creek, and Willow Creek)
2. What communities are located in your watershed?
3. What are the major land uses?
4. What are the primary pollutants?
sediment from construction sites, agriculture, and/or streambanks
pesticides and nutrients from urban and agricultural areas
bacteria from pet waste, livestock, septic systems
thermal pollution
trash
5. How do you expect the land use to change over the next 10-20 years?

Drainage Area = ~3400 acres

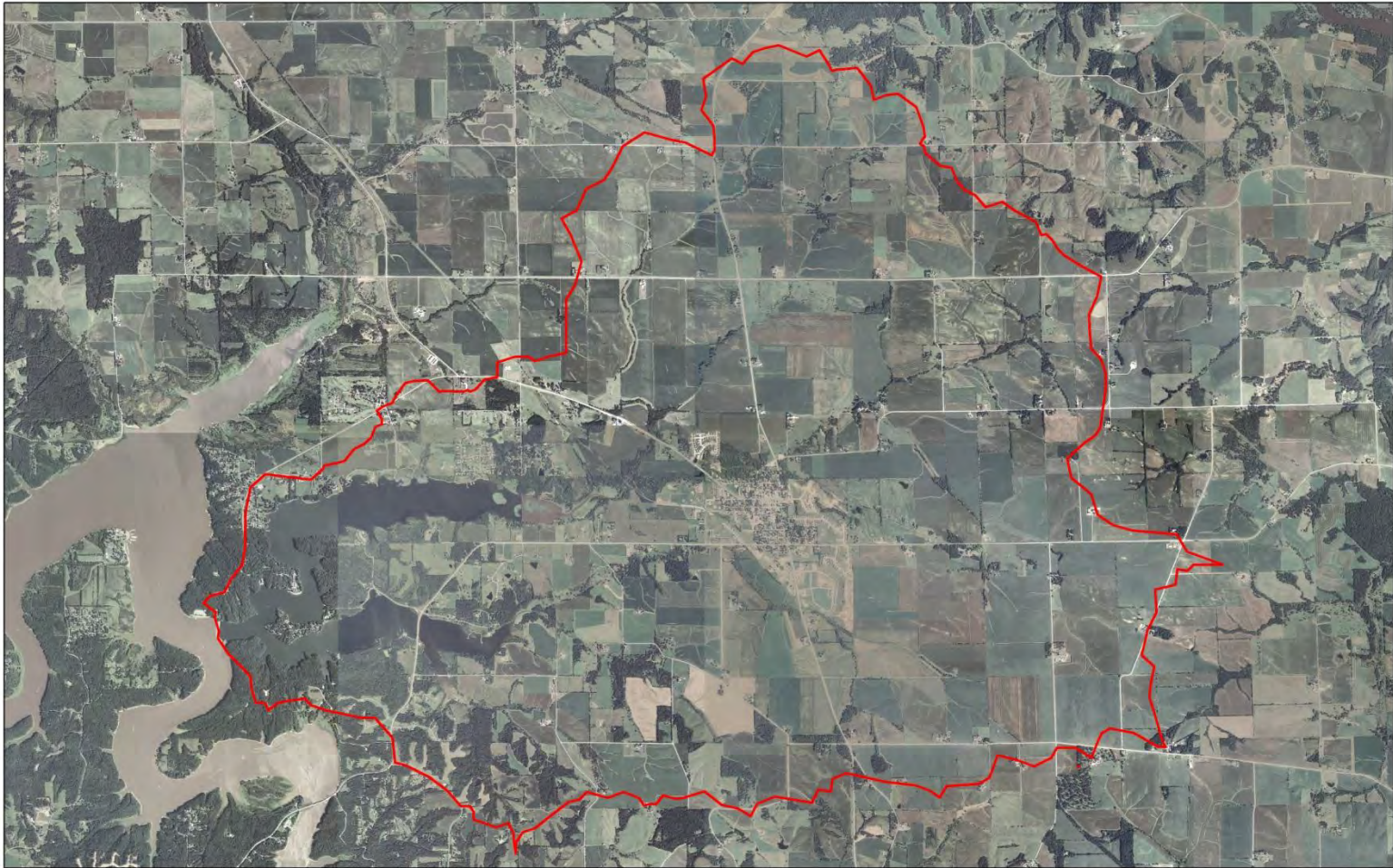


0 0.1 0.2 0.4 0.6 0.8 Miles

1 inch equals 0.300675 miles



Drainage Area = ~ 17,000 acres



0 0.5 1 2 3 4 Miles
1 inch equals 0.690129 miles



Drainage Area = 10 square miles



0 0.35 0.7 1.4 2.1 2.8 Miles

Drainage Area = 5850 acres



0 0.35 0.7 1.4 2.1 2.8 Miles

1 inch equals 0.516976 miles



How can you get involved?

● Volunteer

- City of Iowa City
- DNR-IOWATER
- River Clean-ups
- County Conservation
- Johnson County SWCD

● Install a Rainscaping Practice

● Attend Events

- Eco Iowa City
- Johnson County Green Team Events
- Johnson County SWCD
- Backyard Abundance

● Join an Environmental Group

- Iowa River Friends
- Friends of Hickory Hill
- Johnson County Heritage Trust
- Local Watershed Board or Start a Watershed Committee
- Pheasants Forever
- Environmental Advocates
- Sierra Club
- Project Green
- Iowa City Bird Club
- Trees Forever

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