Olson Ecological Solutions, LLC

tallgrass RESTORATION, LLC

ROCKFORD PARK DISTRICT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Olson Ecological Solutions

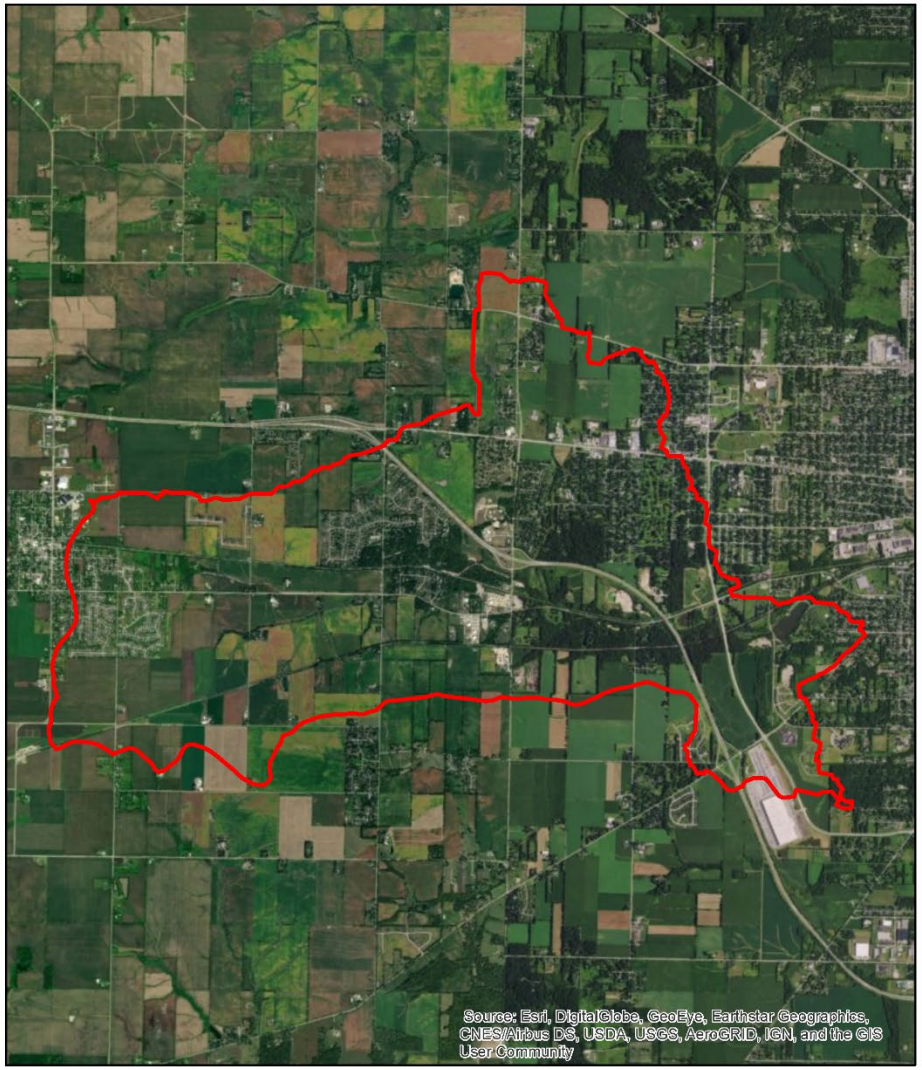
January 30, 2020

South Fork Kent Creek Watershed Stakeholder Meeting 5

AGENDA

- Pollutant Reduction Targets
- Objectives
- Best Management Practices Review
- 2020 meeting dates

South Fork Kent Creek Watershed
Watershed Boundary



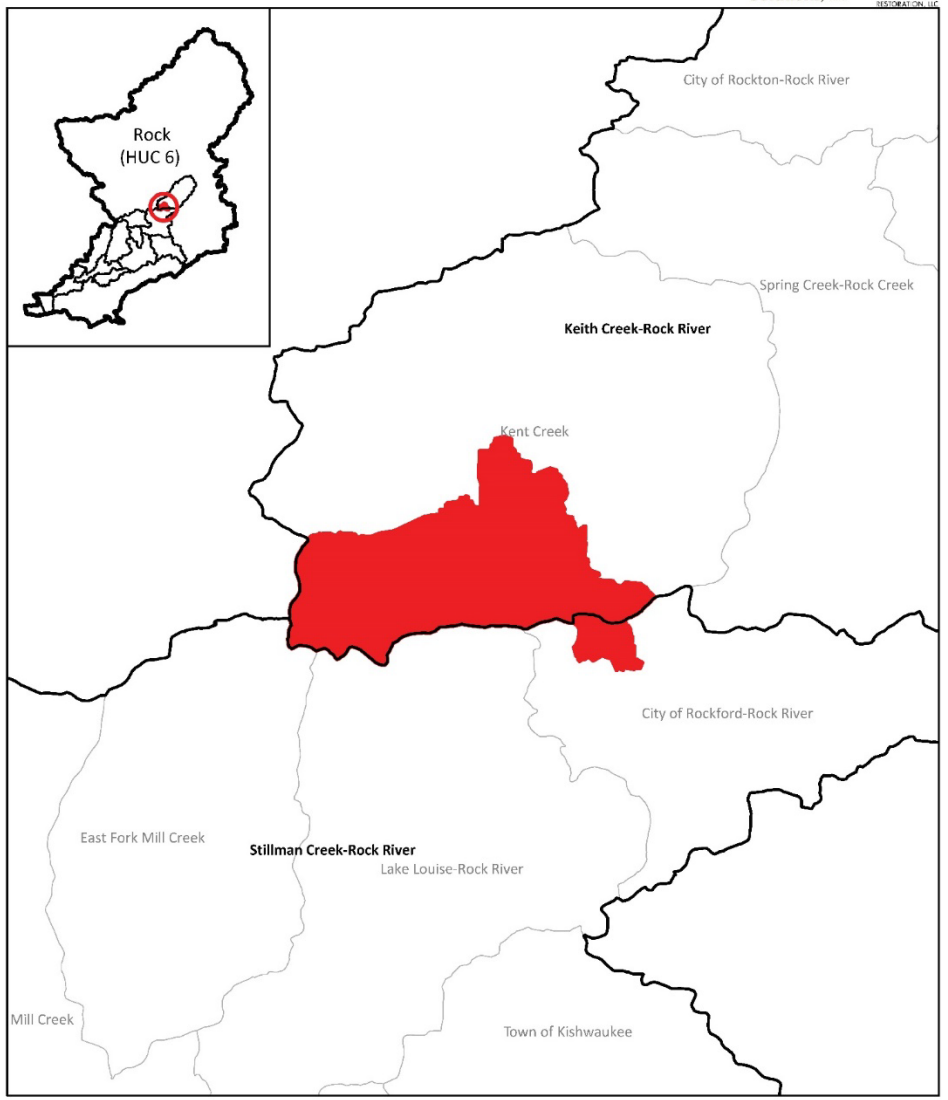
Final SFKC Watershed

0 0.4 0.8 1.2 1.6 Miles

N

Map created by Kristin Adams with Tallgrass Restoration, LLC
Data Sources: ESRI
Aerial Date: July 30, 2017
Edited: 3/6/2019

South Fork Kent Creek Watershed
Watershed Locations



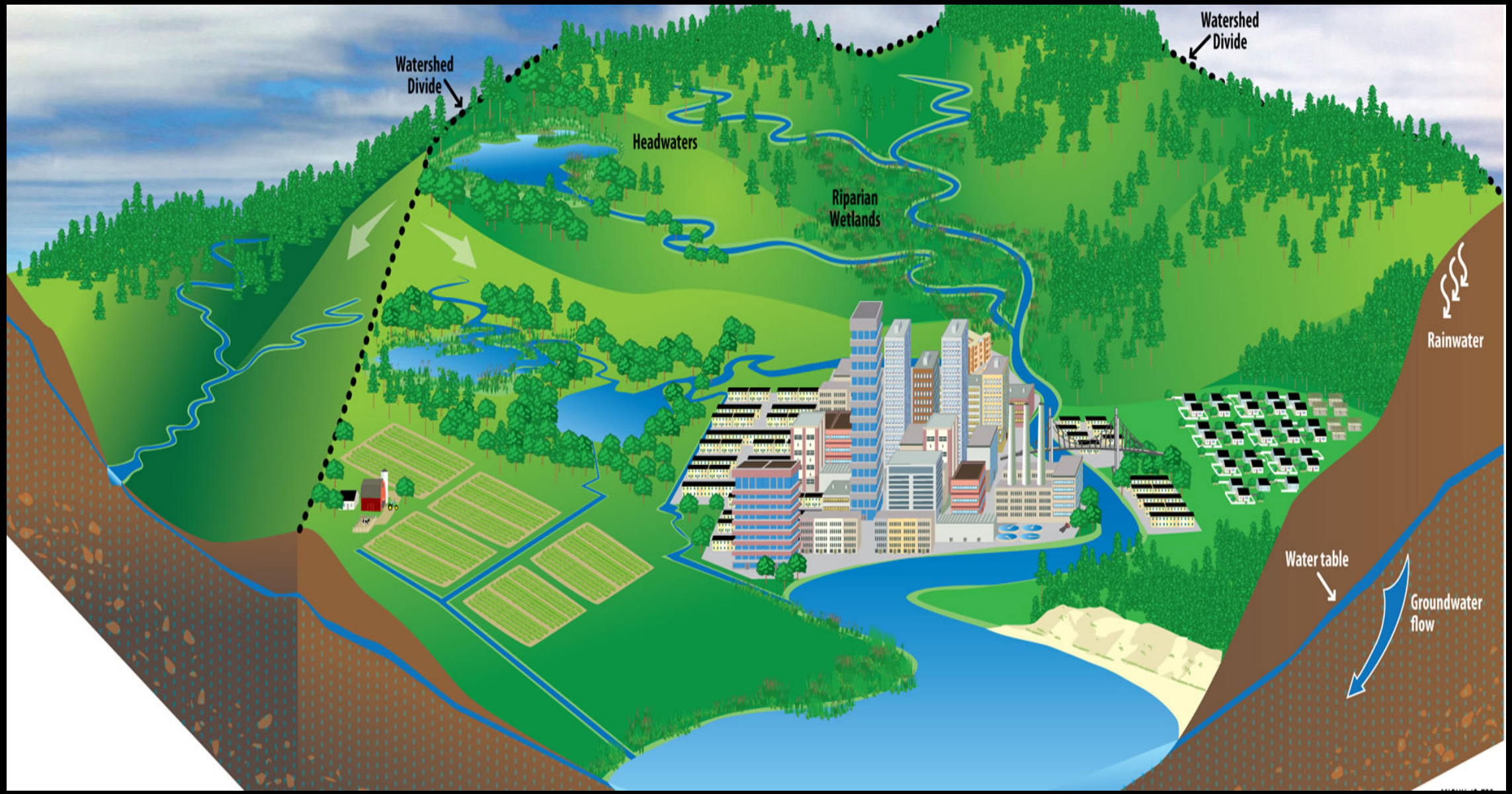
HUC10
HUC12
SFKC Watershed

0 0.9 1.8 2.7 3.6 Miles

N

Data Sources: USGS
Edited: February 7, 2019
Map created by Kristin Adams with Tallgrass Restoration, LLC

What is a Watershed?



Mississippi Watershed Management Organization

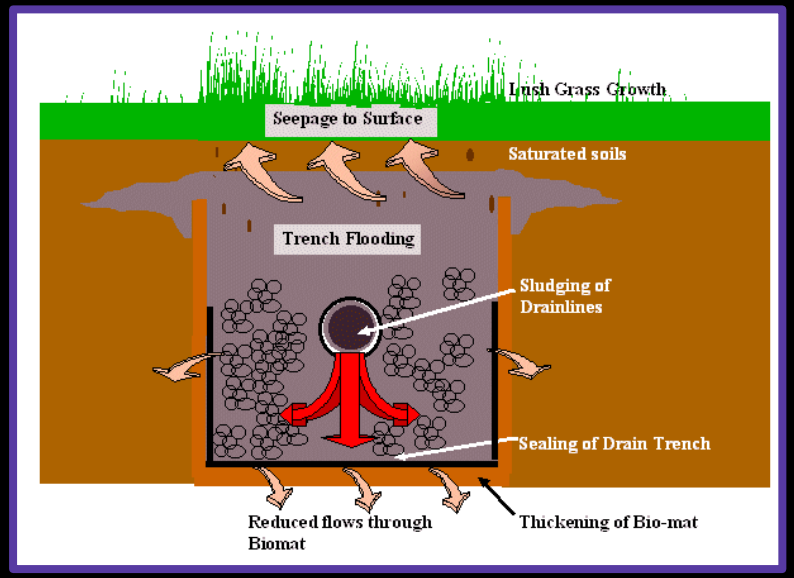
What is a Watershed Based Plan?

- Natural Resource Inventory
- Stakeholder Involvement
- Technical Guidance
- Identification of Problems and Concerns
- Recommendations
- Implementation Schedule
- Financial and Technical Resources
- Monitoring Strategy

100% voluntary participation and action

EPA Water Quality Assessment

South Fork Kent Creek is an impaired stream due to fecal coliform caused by unknown sources (RMMS 2016).

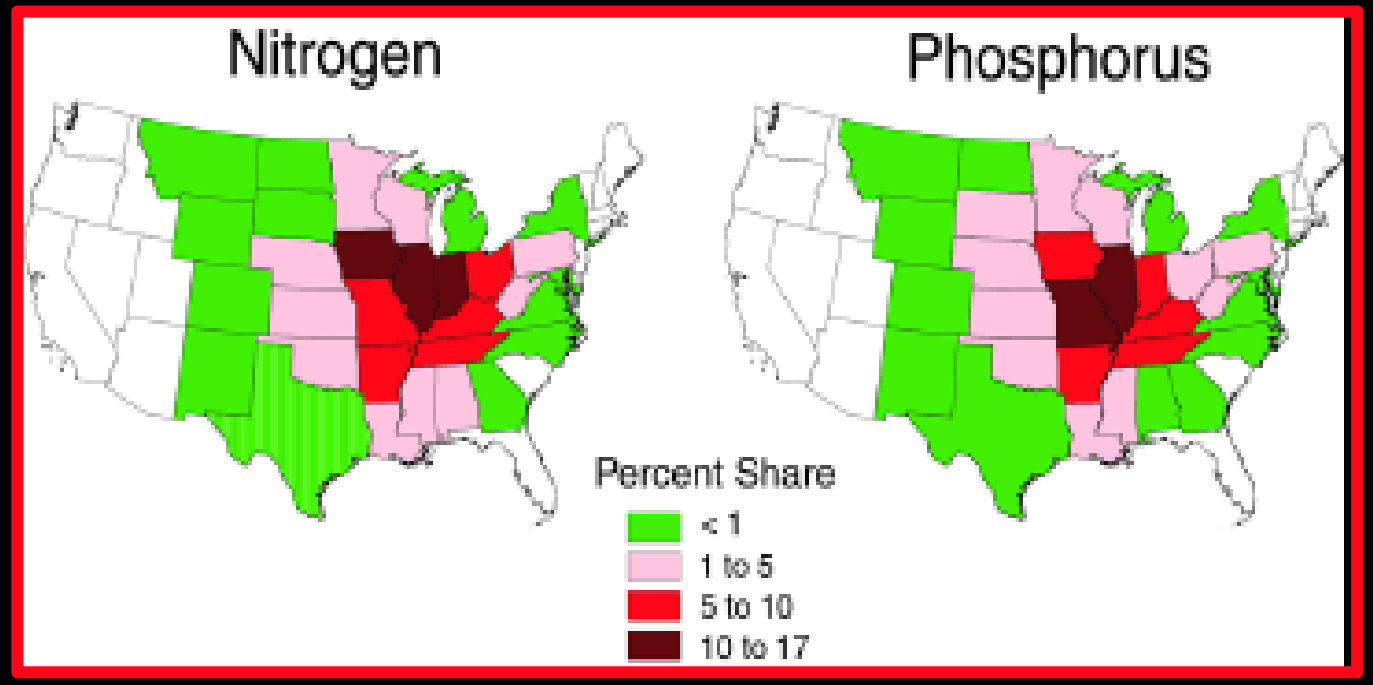


Pollutant Reduction Targets

- Total Nitrogen (TN)
- Total Phosphorous (TP)
- Total Suspended Solids (TSS)/Sediment
- Bacteria (fecal coliform)

Illinois Nutrient Reduction Strategy

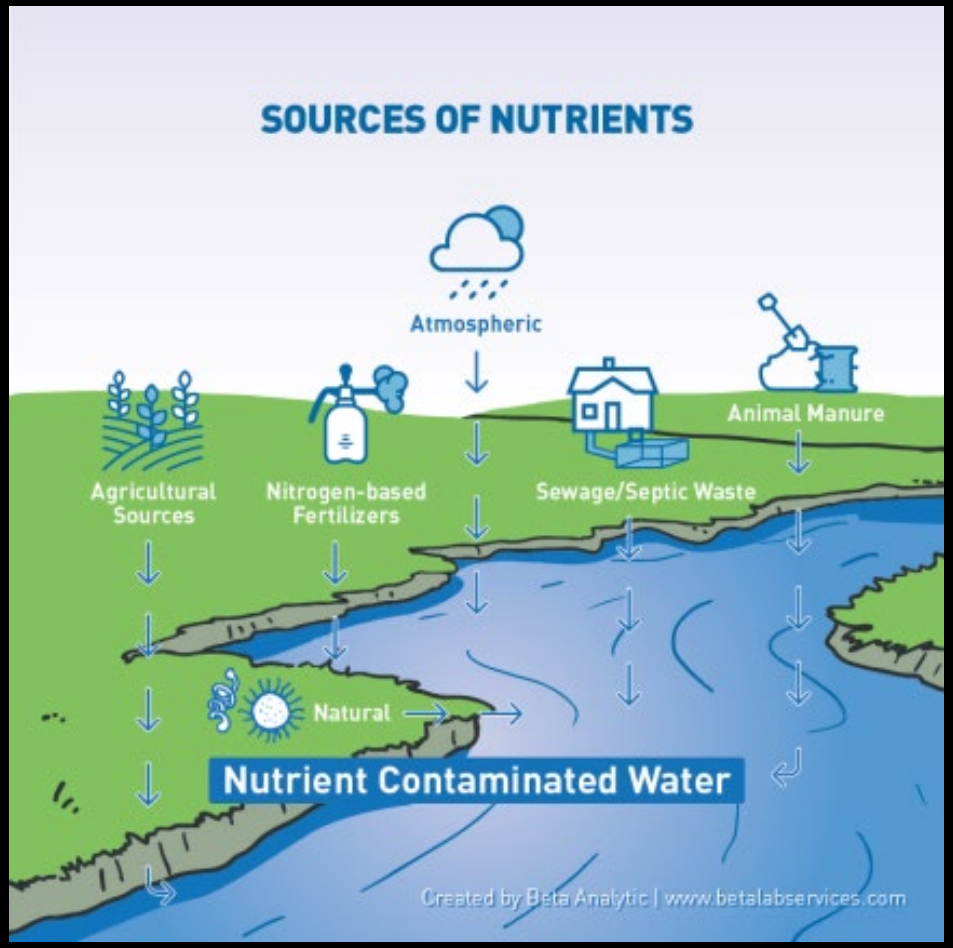
- IL = one of primary contributors of N & P to the Gulf of Mexico
- 2nd largest dead zone in world
- Calls on IL to reduce N & P
- Established in 2015
- 2025 interim goals (10-yr)
  - Reduce N by 15%
  - Reduce P by 25%



Gulf of Mexico Hypoxic Zone (NOAA)

Nitrogen: Reduction Target of 7.5%

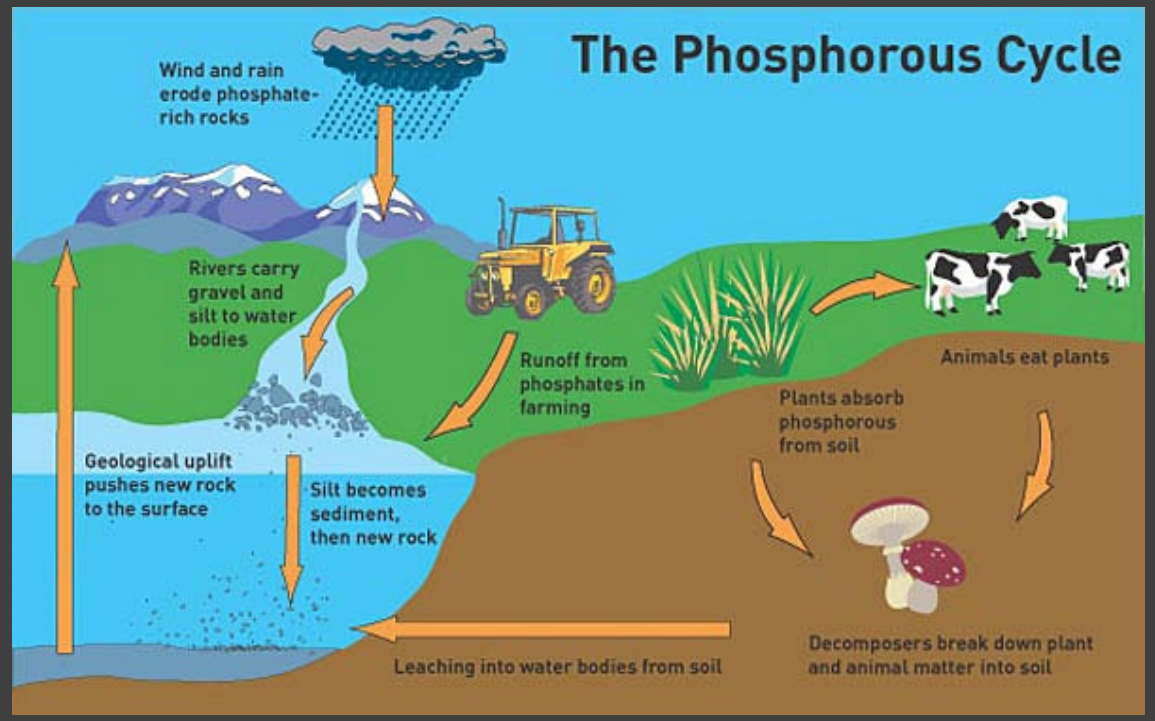
- Essential nutrient for plant and animal growth
- Excess→dead zones with no O2 or nitrates in drinking water
- Surplus sources
  - Agricultural-fertilizer, animal waste
  - Urban-sewage, water treatment plants



Source: BETA Analytic, 2019

Phosphorous: Reduction Target of 12.5%

- Essential to plant growth and animal nourishment
- Excess→ overtake oxygen levels, algae
- Surplus sources
  - Agricultural-fertilizer, animal waste
  - Urban-sewage, lawn fertilizer, domestic animal waste, water treatment plants



Source: Socratic, 2016

Total Suspended Solids Reduction Target of 13-15%

Source: Fondriest Environmental Inc., 2014

- Sediment in water
- Block sunlight for photosynthesis, clog fish gills, reduce flood storage capacity, clog drainage pipes and ditches
- Harmful bacteria and excess nutrients attach themselves to sediment
- Sources: silt, soil erosion, decaying organic material, sewage, waste

Coliform bacteria colonies in petri dish (Source: Oram, 2014)

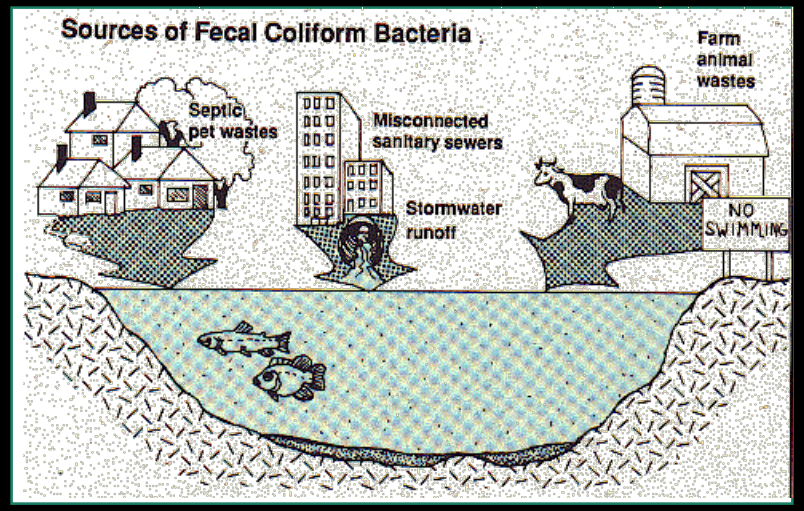


Diagram of fecal bacteria entering water supply (Source: OSU Environmental Health Sciences Center)

Bacteria Reduction Target of 32.5%-65%

- Found in warm-blooded mammals' intestines and waste
- Typically not pathogenic unless in high concentrations
- Can cause fever, nausea, stomach cramps, ear infections, Dysentery, Typhoid, Hep A
- Sources: faulty septic systems, livestock, wildlife

Bacteria

How much do we need to reduce to get off the impaired streams list?

- Reduce fecal coliform by 380 cfu
- OR by **65%**

More reasonable target of **32.5%**

- Dry detention basins totaling 10 acres
- Wet detention basins total 10 acres
- Multiple stormwater wetlands totaling 16.6 acres
- Conversion to natural areas on 875 acres

Example Objectives
Spring Br. Watershed, Stephenson Co.

Objectives for Goal 1: Reduce sediment and nutrient loading from creek banks.

A. Stabilize 2210 feet of bank along the most severely eroded sections of creek along Loran Road.
B. Stabilize 5814 feet of the most severely eroded creek banks throughout the watershed.
C. Execute the maintenance plan for long-term creek bank stabilization.

Example Objectives
Spring Br. Watershed, Stephenson Co.

Objectives for Goal 2: Reduce sediment and nutrient loading from livestock and row crop operations.

Apply appropriate Best Management Practices (BMPs) to accomplish the following.

A. Address end-row erosion on 3.4 acres (20% of the total 17 acres of end rows).
B. Buffer 7,140 feet of stream from sediment and nutrient loading (20% of 35,700 feet without existing buffer).
C. Target erosion in crop fields on 590 acres (20% of the 2,944 acres of tilled crop land).
D. Address nutrients and pathogens originating from 1 of 6 existing livestock operations.
E. Improve vegetative cover in 16 acres of existing, forested riparian areas (20% of the total 79 acres).

Example Objectives
Spring Br. Watershed, Stephenson Co.

Objectives for Goal 3: Address volume and velocity of water runoff to enhance water quality.

A. Design whole-farm management systems for 10-year and/or 25-year storm events to be proactive in reducing flooding utilizing BMPs.
B. Incorporate a good water management system that will measurably improve downstream impacts.
C. Slow/manage water flow using BMPs, especially through channelized section along Loran Road.

Example Objectives
Spring Br. Watershed, Stephenson Co.

Objectives for Goal 4: Utilize practices that protect and/or enhance wildlife habitat.

For each BMP focused on water quality, protect and/or enhance habitat for:

A. Pollinators (e.g. monarch butterflies and honeybees),
B. Fish,
C. Macroinvertebrates,
D. Waterfowl,
E. Turtles,
F. Amphibians,
G. Species in Greatest Need of Conservation, and
H. Threatened and Endangered Species.

Example Objectives
Spring Br. Watershed, Stephenson Co.

Objectives for Goal 5: Consider landowner needs with each project and practice.

A. Utilize cost share opportunities when available for each BMP.
B. Provide technical assistance to landowners to plan and implement BMPs.
C. Utilize market-value crops in conservation buffer practices when practicable.

Example Objectives
Spring Br. Watershed, Stephenson Co.

Objectives for Goal 6: Maintain and support a sustainable farming community.

A. Review and propose revisions to state and federal regulations related to farming practices that affect water quality, runoff volume, and economic viability.
B. Put ordinances into place to protect the rural farming community from the negative effects of urbanization in relation to water quality, runoff volume, and ability to continue farming.
C. Review and propose revisions to local stormwater ordinances if farmland conversion occurs.
D. Utilize water quality BMPs that keep properties within the County tax base.

South Fork Kent Creek

Objectives

South Fork Kent Creek

Goals

SFKC Goals

1. Address water volume and velocity to improve water quality and prevent flooding.
2. Minimize erosion, sediment, and nutrient loading into surface waters.
3. Decrease contaminants in the water, including fecal coliform bacteria.
4. Protect, enhance, and manage wildlife habitat.
5. Sustain and enhance the recreational opportunities of the watershed.
6. Educate the community about water quality and this plan.
7. Work with governing and policy-making bodies to protect water quality currently and in future land use planning.
8. Preserve prime farmland during future land use changes.

Goal 1: Address water volume and velocity to improve water quality and prevent flooding.

- Best Management Practices
  - Constructed wetland
  - Conversion to natural areas
  - Bioretention & rain gardens
  - Roadway swales
  - Wet/dry detention ponds
  - Remeander stream
  - Infiltration basin

- Objectives:
  1. Construct ____ acres of wetlands on hydric soils.
  2. Create ____ acres of riparian buffers.
  3. Convert ___acres of turf, ___acres of residential, and ___ acres of agricultural to natural areas.
  4. Improve ____acres of roadway swales, especially along _____ Rd (367 total acres of roads).
  5. Install ___ acres of basins, bioretention, rain gardens, or detention ponds.
  6. Remeander ___% of **25,717 ft** of highly channelized stream.

Wetland Restoration/Creation

Current representation

58 acres of wetlands

Current opportunity

3,803 acres of hydric soils

Construct ____ acres of wetlands on hydric soils.

BMP & Efficiency	Bacteria	N	P	Sediment
Constructed Wetland	78%	35%	43%	80%

- Current representation
  - **281 acres** of stream bank buffers in entire watershed
- Current opportunity
  - **160 acres** of stream bank with buffers in poor condition
- Create ____ acres of riparian buffers.

Streambank Riparian Buffers

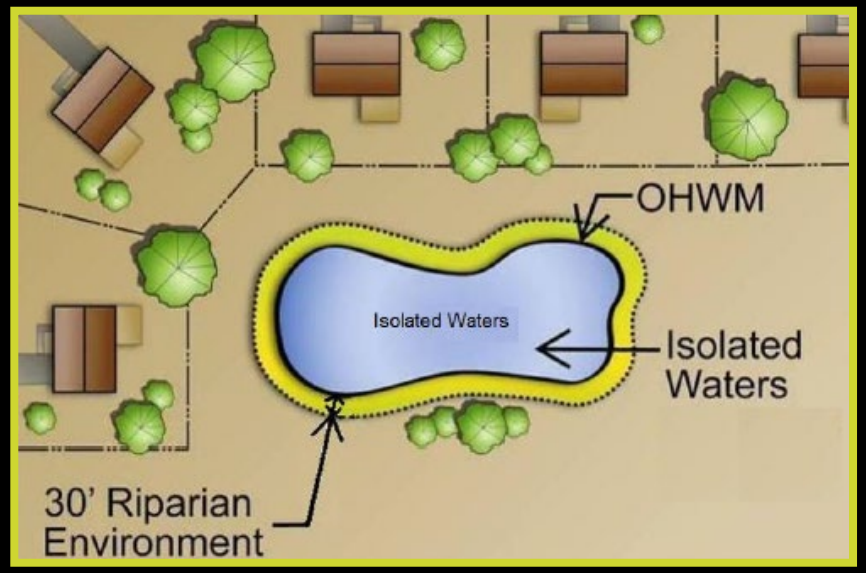
BMP & Efficiency	Bacteria	N	P	Sediment
Streambank Stabilization	30%	40%	45%	53%

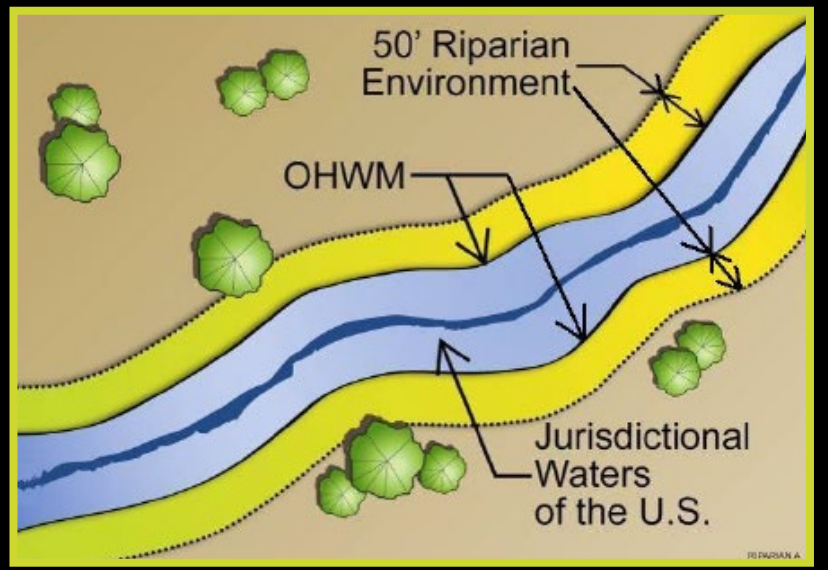
Riparian buffers

✓Reduce flood flow rates, velocities, and volumes

✓Minimize erosion and promotes bank stability of streams, lakes, ponds, or wetland shorelines

Figure 6.13. Examples of Riparian and Non-riparian Environments

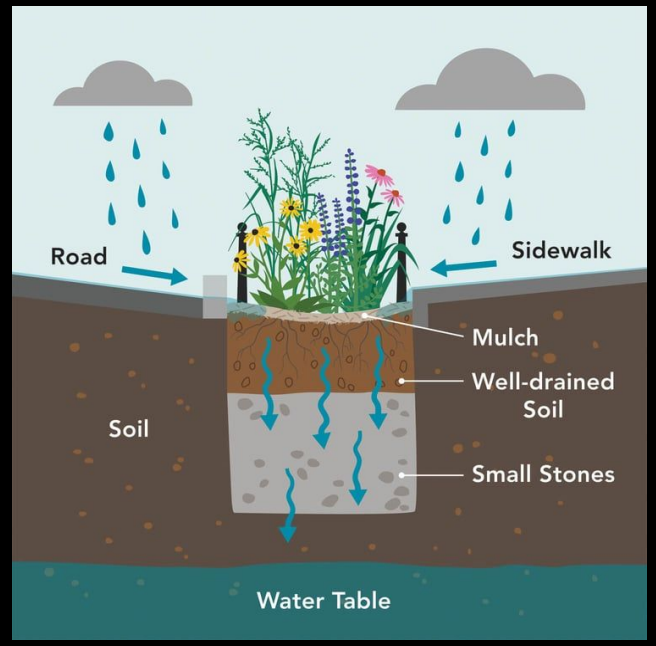




Vegetated Swales

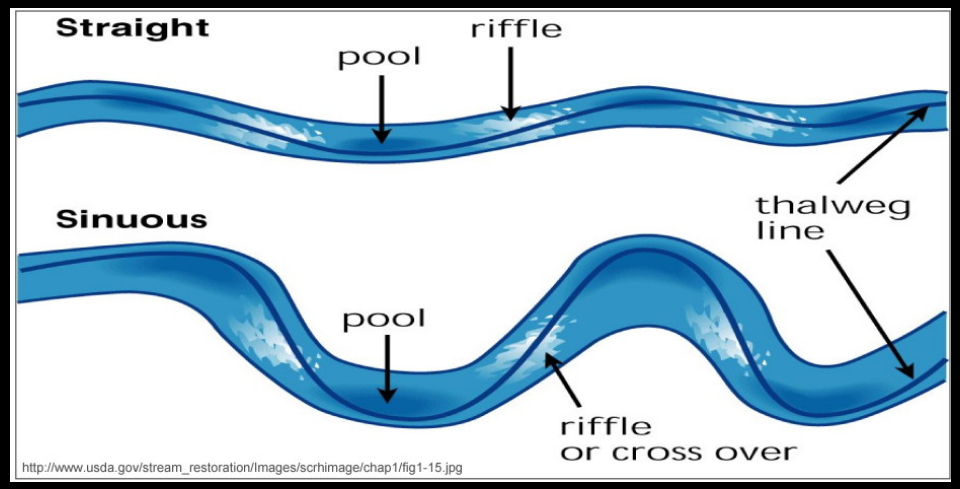
Vegetated swales are shallow channels or swales vegetated with deep rooted plants, which filter out pollutants and slow stormwater. They intercept stormwater runoff from nearby impervious areas. Their primary function is to filter pollutants and sediment from stormwater runoff.

Improve ____acres of roadway swales, especially along _____ Rd (367 total acres of roads).



Connecticut Fund for the Environment

Stream Channel Restoration (e.g. meanders)



- Current representation
  - **122,462 ft** of streams in the entire watershed
  - **73,477 ft** of stream channels are in a **natural state** with no channelization (~60%)

- Current opportunity
  - **25,717 ft** of highly channelized stream(21%)
  - **23,268 ft** of moderately channelized streams (19%)

Remeander ___% of **25,717 ft** of highly channelized stream.

South Fork Kent Creek Watershed
Stream Channelization

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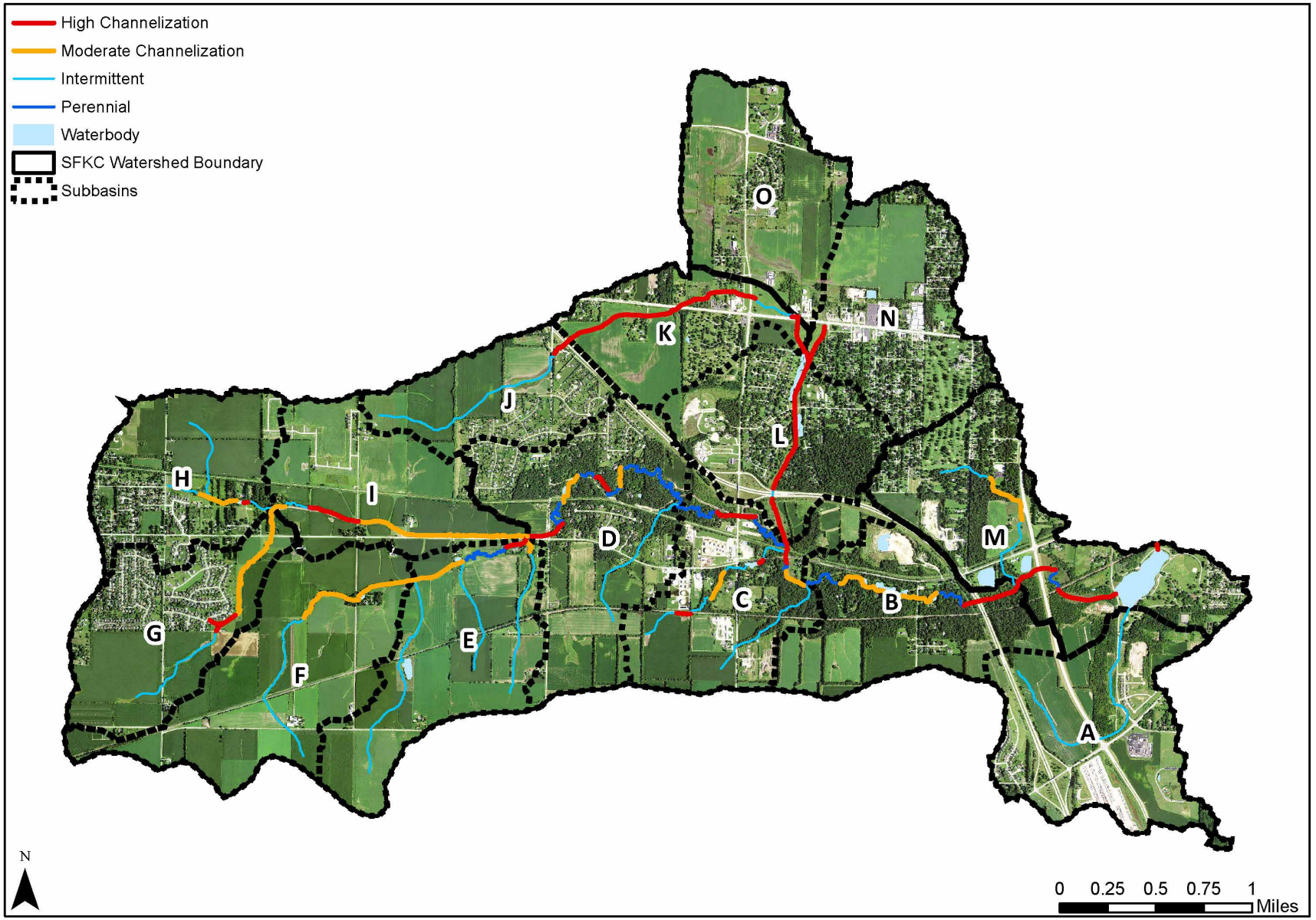


Data Sources: USGS
Aerial Date: July 30, 2017
Edited: November 19, 2019
Map created by Kristin Adams with Tallgrass Restoration, LLC

Rain Gardens

A rain garden is a depressed, landscaped garden planted with native plant species that is designed to retain and infiltrate stormwater runoff from individual residential or commercial lots, sump pumps, and roofs. Rain gardens are versatile features that can be installed in almost any unpaved space. Rain gardens have also been used successfully along streets to reduce and filter street runoff.

Install ___ acres of basins, bioretention, rain gardens, or detention ponds.

BMP & Efficiency	Bacteria	N	P	Sediment
Rain Garden & Bioretention	37%	56%	75%	81%
Wet Detention Pond	70%	32%	49%	80%
Dry Detention Pond	78%	25%	19%	47%

Goal 2: Minimize erosion, sediment, and nutrient loading into surface waters.

- Best Management Practices
  - Stream stabilization
  - Porous pavement
  - No till
  - Forest Stand Improvement
  - Infiltration basin
  - Conversion to natural areas
  - Bioretention
  - Vegetated Swales and filter strips

- Objectives:
  1. Stabilize ____ feet of most severely eroded streambank.
  2. Install porous pavement on ___% of parking lots or driveways.
  3. Convert ___% of the 717 acres of tilled farmland to no till.
  4. Improve vegetative cover in ____acres of forested riparian areas.

Streambank Stabilization

Current representation

- 244,924 ft of streambanks within the entire watershed
- 93,071 ft (38%) of streambanks are stabilized or have slight erosion

Current opportunity

- 22,043 ft (9%) of streambanks are very severely eroded
- 66,129 ft (27%) of streambanks are severely eroded
- 63,680 ft (26%) of streambanks are moderately eroded

Stabilize _____ feet of very severely eroded streambank.

BMP & Efficiency	N	P	Sediment
Streambank Stabilization	95%	95%	95%

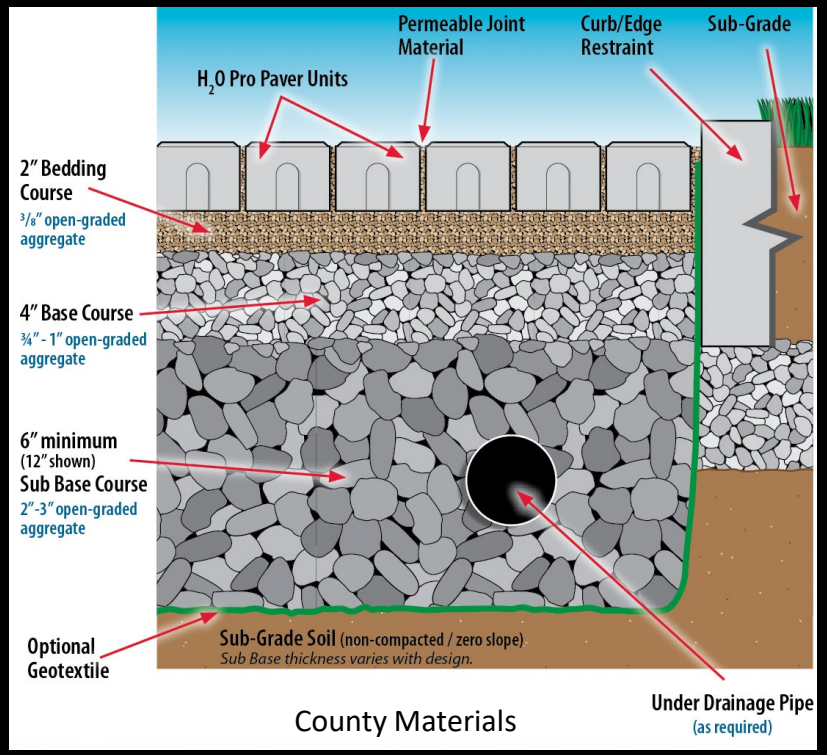
Porous Pavement

Porous pavement is pavement designs with various percolating layers that filter stormwater. They are especially important in filtering out the first flush pollutants, like car oil, gasoline, heavy metals, litter, suspended solids, and road salt, at the beginning of a storm event.

Install porous pavement on ___% of parking lots or driveways.

BMP & Efficiency	Bacteria	**N**	**P**	**Sediment**
Porous Pavement	40%	**85%**	**65%**	**90%**

Morton Arboretum, Lisle. Permeable pavers



County Materials

No-till Farming

Current representation

High-residue till **is practiced on 2,726 acres** (79% of cropland) out of 3,443 acres of cropland

Opportunity to **convert 717 acres** of low-residue or conventional till to no-till.

Convert ___% of the 717 acres of tilled farmland to no till.

BMP & Efficiency	Bacteria	N	P	Sediment
No Till/Strip Till	20%	**10%**	**50%**	**70%**

Forest Erosion Control

- 1,090 acres of forest in the watershed
  - Very low quality- **44 acres**
  - Low quality- **316 acres**
  - Medium quality- **523 acres**

Improve vegetative cover in ____acres of forested *riparian* areas.

Remove Invasive Brush

Tall Bellflower, native woodland plant

Lake County Forest Preserves

Land use in 100-yr floodzone

Land Use Type	Acreage	%
Forest	134.5	24.91%
High Residue	119.2	22.08%
Wetland	53	9.82%
Water	45.1	8.35%
Grassland	42.9	7.95%
Developed, Low Intensity	42.1	7.80%
Low Residue	34.8	6.45%
Turf	32.9	6.09%
Roads	20.1	3.72%
Pasture	6.8	1.26%
Developed, High Intensity	3.2	0.59%
Developed, Medium Intensity	2.6	0.48%
Trail	2.5	0.46%
Railroad	0.2	0.04%
Total	539.9	100.00%

10 Year, 50 Year, and 100 Year Flood Terminology

	"10 Year" Flood	"50 Year" Flood	"100 Year" Flood
	• 10% probability of flooding in any given year	• 2% probability of flooding in any given year	• 1% chance of flooding in any given year
EXAMPLE: Clark Fork River above Missoula	27,000 Cubic feet per second (cfs)	38,200 Cubic feet per second (cfs)	42,500 Cubic feet per second (cfs)

Photo courtesy NWS Missoula Employee

Goal 3: Decrease contaminants in the water, including fecal coliform bacteria.

- Best Management Practices
  - Septic maintenance education
  - Livestock exclusion fence
  - Grassed waterways
  - Infiltration trench
  - Dry detention
  - Constructed wetlands
  - Conversion to natural areas

- Objectives:
  - Create education materials and plan outreach efforts for septic maintenance, targeting areas on septic.
    - Who would take this lead?
    - How to reach landowners?
  - Ensure 100% of pasture acres along streams install livestock exclusion fencing.
  - Install ____ acres of filter strips on residential areas, other developed areas, trails, and pasture.
  - Widen undersized grassed waterways and install ____ acres of new grassed waterways.
  - Install ____ square ft of small infiltration trenches to treat ___% of residential areas serviced by septic systems.

Septic System Maintenance

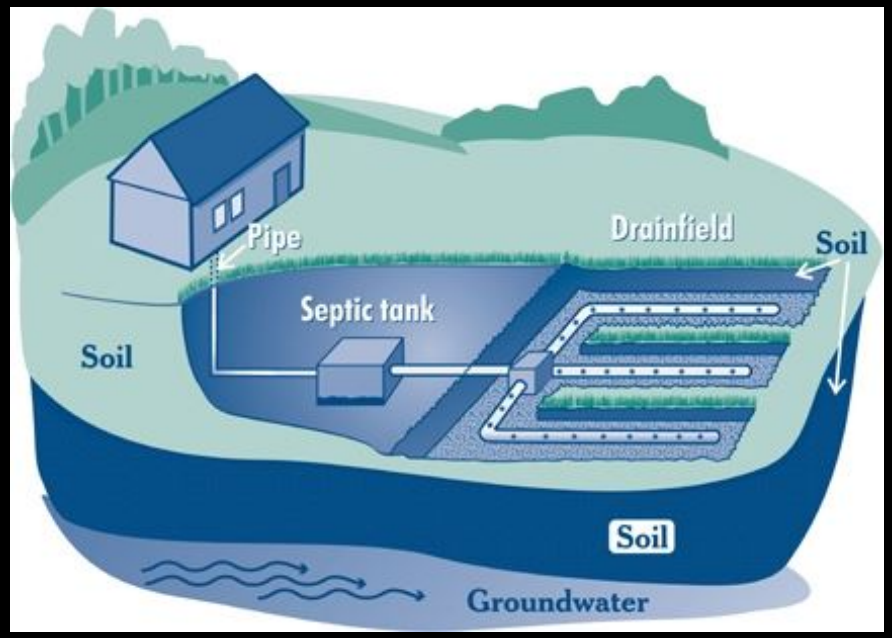
Proper use and maintenance of your septic system is necessary to prevent it from malfunctioning and leaking pollutants into local waterways.

Approximately **326 acres** of residential areas serviced by septic.

Create education materials and plan outreach efforts for septic maintenance, targeting areas on septic.

Who would take this lead?

How to reach landowners?



Livestock Exclusion Fence

Ensure 100% (or 37 acres) of pasture acres along streams install livestock exclusion fencing.

Filter Strip

BMP & Efficiency	**Bacteria**	N	P	Sediment
Filter Strip-Agricultural	**30%**	40%	45%	53%

Install ____ acres of filter strips on residential areas (1,514 acres), _____ acres on other developed areas (246 acres), ____acres on trails (29 acres), and ____ acres on pasture (37 acres).

Land Use in Watershed

Land Use		
Land Use Type	**Acres**	**%**
High Intensity, Developed	85	1.1%
Medium Intensity, Developed	161	2.1%
Low Intensity, Developed	1,514	19.5%
Roads	367	4.7%
Railroad	42	0.54%
Trail	29	0.37%
Golf Course	123	1.6%
Cemetery	69	0.89%
Turf	373	4.8%
High Residue Till	2,726	35.1%
Low Residue Till	717	9.2%
Orchard	2	0.02%
Pasture	37	0.5%
Quarry	74	1.0%
Mulch Yard	23	0.30%
Forest	1,090	14.0%
Grassland	212	2.7%
Wetland	54	0.69%
Water	63	0.81%
Total:	**7,760**	**100%**

Grassed Waterways

NRCS Wisconsin

BMP & Efficiency	**Bacteria**	N	P	Sediment
Grassed Waterway	**50%**	30%	25%	45%

Current representation

132.5 acres of grassed waterways

Opportunity

75.4 acres of potential GWW (30 ft width)

Widen undersized grassed waterways and install ____ acres of new grassed waterways.

Clean Water Iowa

South Fork Kent Creek Watershed
Potential and Existing Grassed Waterways

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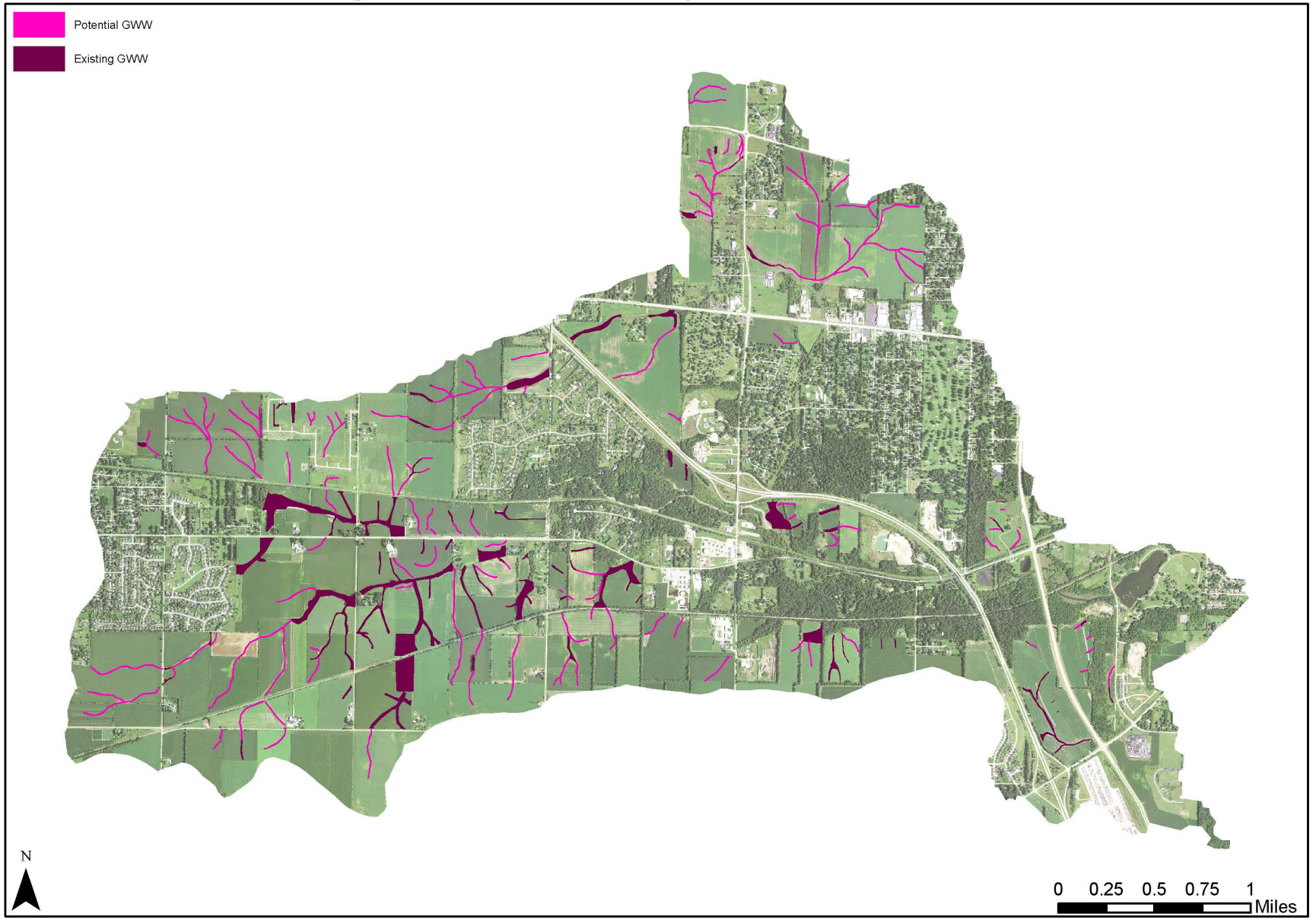

Data Sources: USGS
Aerial Date: July 30, 2017
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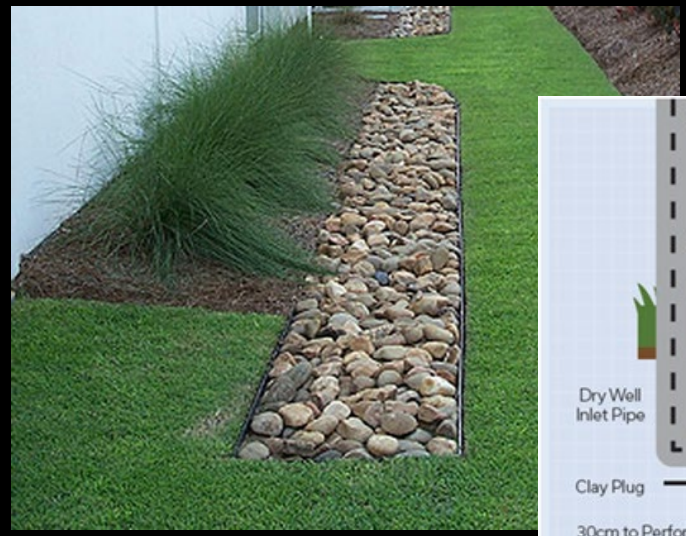
Map created by Kristin Adams with Tallgrass Restoration, LLC

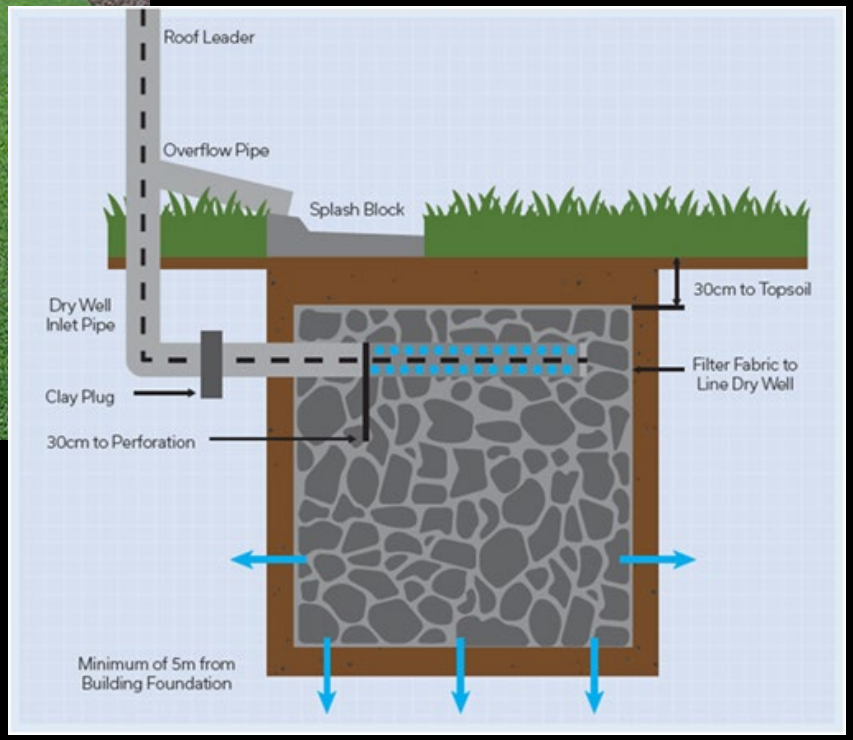
Infiltration Trench

In developed areas, overflow of sewers is a common occurrence during a heavy rainfall, contributing organic pollutants to the fresh storm water. Flooding and faulty septic systems threaten local watersheds with increased exposure to contaminants.

The trenches are excavated near infrastructure where running water could be captured, like the end of a sloped driveway, and temporarily held beneath ground. They are lined with a geotextile material and then filled with granular stone. This facilitates the infiltration of water into the ground to recharge the water table with uncontaminated water.

Install ____ square ft of small infiltration trenches to treat ___% of residential areas serviced by septic systems.
Approximately 326 acres of residential area serviced by septic.





BMP & Efficiency	**Bacteria**	N	P	Sediment
Infiltration Trench	**85%**	55%	60%	75%

Goal 4: Protect, enhance, and manage wildlife habitat.

- Best Management Practices
  - Constructed Wetlands
  - Wetland creation/enhancement/restoration
  - Herbaceous weed treatment
  - Restoration of rare or declining communities
  - Riparian herbaceous cover
- Objectives:
  - Utilize native plants with deep roots whenever possible for installation of swales, buffer, bioretention, etc.
  - Identify and create a wildlife corridor following main stem of SFKC.
  - Connect & protect existing natural areas.

Native Plantings

Utilize native plants with deep roots whenever possible for installation of swales, buffer strips, bioretention, etc.

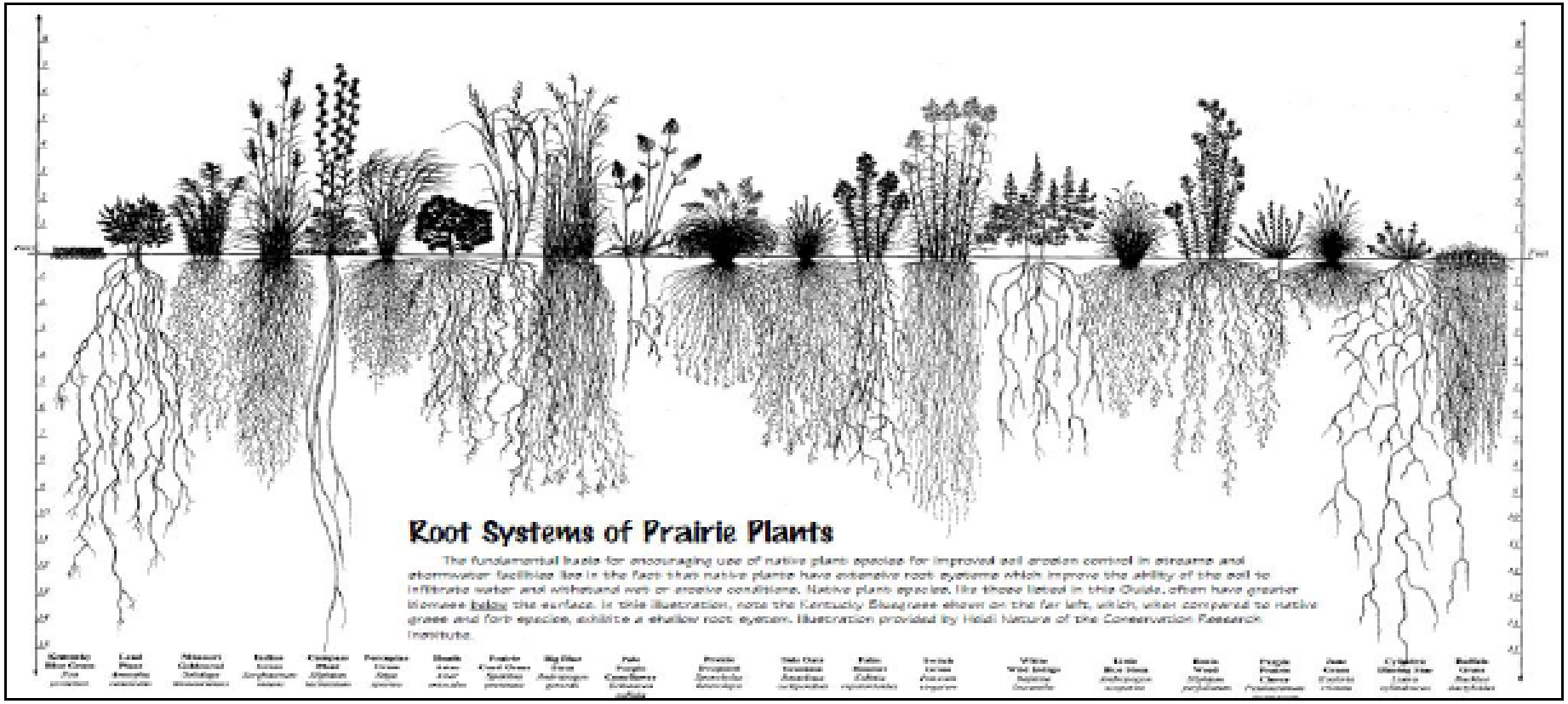
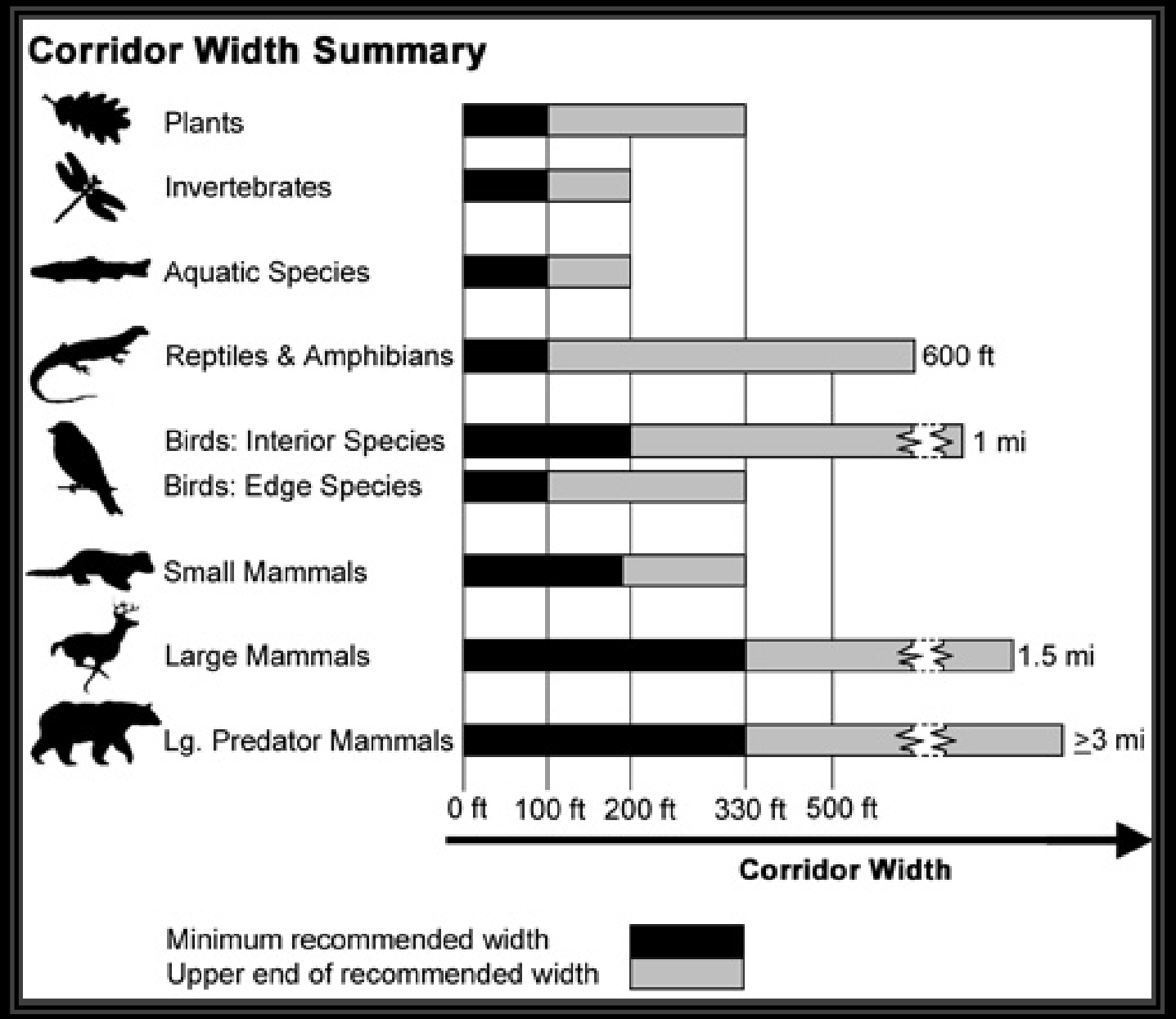


Figure 5.16. Root Systems of Grass and Prairie Plants (Source: Heidi Natura, CRI, 1995).

Wildlife Corridor

Identify and create a wildlife corridor following main stem of SFKC.

Connect & protect existing natural areas.



Goal 5: Sustain and enhance the recreational opportunities of the watershed.

- Best Management Practices
  - Wetlands
  - Riparian buffer
  - Streambank stabilization
- Objectives:
  - Consider access when installing riparian filter strips.
    - 75% filter strips coverage along shoreline
    - Mowed zig zag trail through filter strips

Goal 6: Educate the community about water quality and this plan.

- Best Management Practices

- Objectives:
  - Appoint leadership group to educate community about water quality and this plan.

Goal 7: Work with governing and policy-making bodies to protect water quality currently and in future land use planning.

- Best Management Practices

- Objectives:
  - Ensure the watershed-based plan complies with the Winnebago County Surface Water Management Ordinance.
  - Form inter-governmental agency group (technical advisors)

Goal 8: Preserve prime farmland during future land use changes.

- Best Management Practices
  - Critical area planting
  - Grassed waterways
  - No till
- Objectives:
  - Retire marginal and less productive land and plant permanent vegetation in its place.
  - Improve ineffective grassed waterways and install grassed waterways on flooded agricultural land.
  - Convert ___% of the 717 acres of tilled farmland to no till.

Retire Land in Floodplains

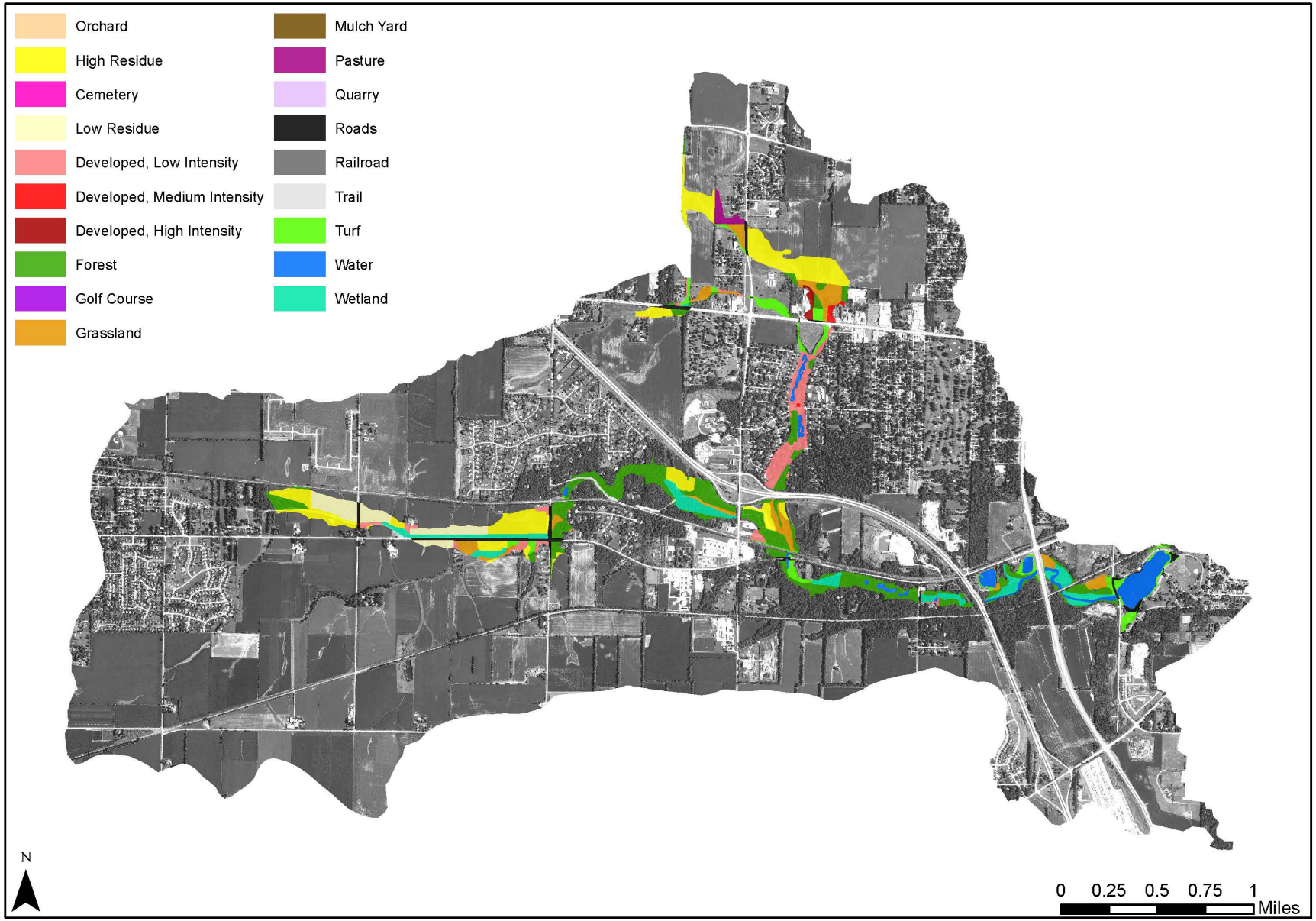
Retire marginal and less productive land and plant permanent vegetation in its place.

119 acres of high residue till ag. land in 100-yr floodplain (22% of land in floodzone) .
35 acres of low residue till ag. land in 100-yr floodplain (6%) .

South Fork Kent Creek Watershed
Land Use within the 100 Year Floodzone

Olson Ecological Solutions, LLC

tallgrass RESTORATION, LLC



Data Sources: USGS
Aerial Date: July 30, 2017
Edited: December 12, 2019
Map created by Kristin Adams with Tallgrass Restoration, LLC

Grassed Waterways

Clean Water Iowa

Current representation

132.5 acres of grassed waterways

Opportunity

75.4 acres of potential GWW (30 ft width)

Improve ineffective grassed waterways and install grassed waterways on agricultural land in 100 yr floodzone.

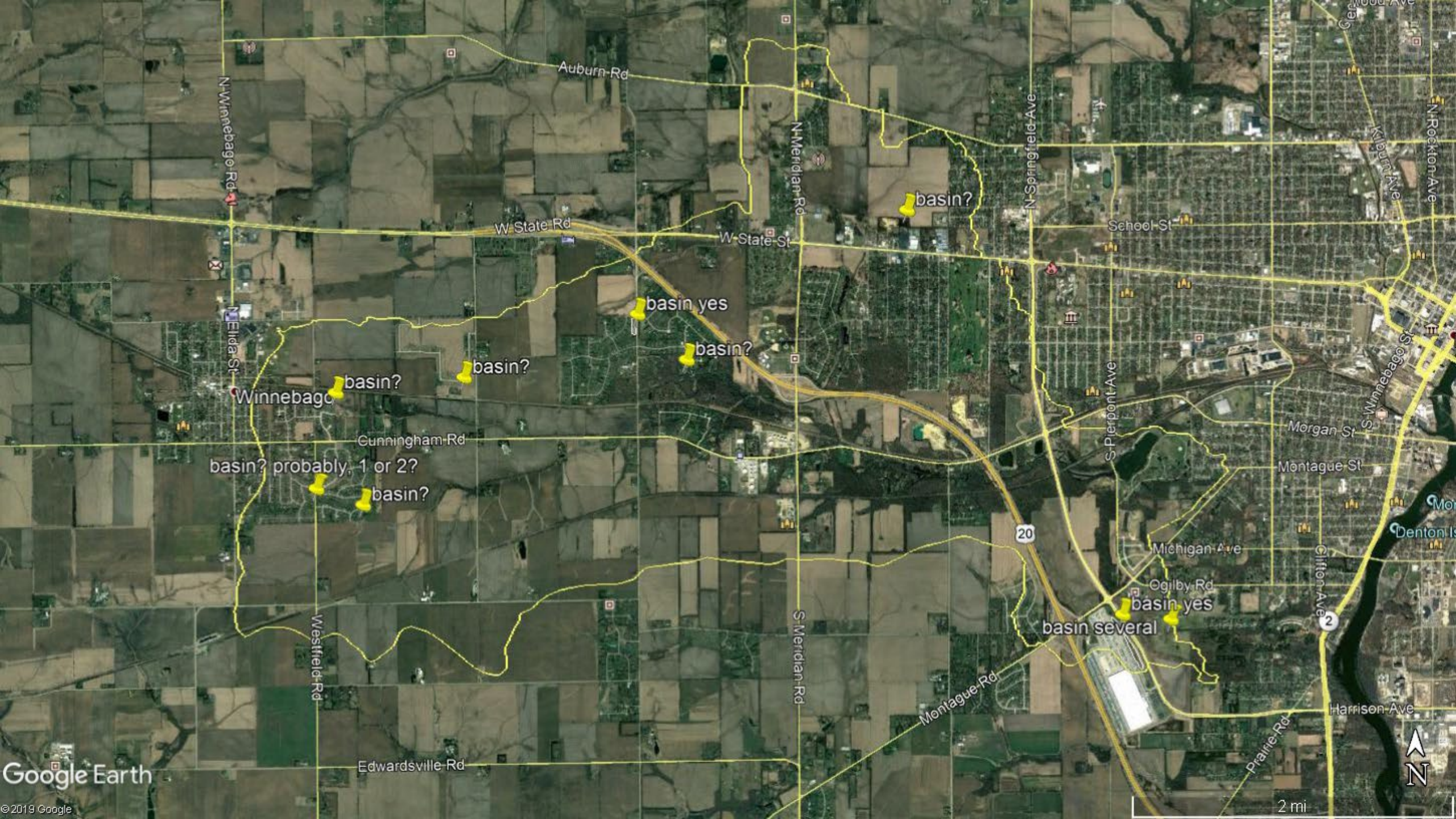
BMP Type	Bacteria	TN	TP	TSS/ Sediment
Infiltration Trench	85%	55%	60%	75%
Infiltration Basin	85%	60%	65%	75%
Porous Pavement	40%	85%	65%	90%
Forested Filter Strip	30%	45%	40%	53%
Grass Filter Strip	30%	40%	45%	53%
Vegetated Swale	30%	10%	45%	60%
Grassed Waterway	50%	30%	25%	45%
Grade Control Structure	25%	10%	20%	30%
Bioretention Area	37%	56%	75%	81%
Rain Garden	37%	56%	75%	81%
Dry Detention	78%	25%	19%	47%
Wet Detention or Pond	70%	32%	49%	80%
WASCOB	35%	20%	60%	70%
Stormwater Wetlands	78%	35%	43%	70%
Extended Wet Detention	UNK	55%	68%	86%
Bioreactor	UNK	45%	UNK	UNK
Conservation Tillage	UNK	15%	36%	40%
No Till / Strip Till	20%	10%	50%	70%
Cover Crop	35%	30%	30%	40%
Conversion to Natural Area	60%	90%	80%	90%
Nutrient Management Plan	0%	15%	7%	0%
Streambank Stabilization	N/A	95%	95%	95%
Livestock Exclusion Fencing	N/A	20%	30%	62%
Terrace	UNK	25%	31%	40%
Critical Area Planting	UNK	18%	20%	42%
Prescribed Grazing	UNK	41%	23%	33%
Heavy Use Area Protection	UNK	18%	19%	33%
Feed Area Management	80%	85%	83%	79%

BMP Efficiency for Pollutant Load Reduction

Early 2020 Meeting Dates

Thursday, February 27

Tuesday, March 31


Auburn Rd
N Winnebago Rd
N Elida St
W State Rd
W State St
N Meridian Rd
N Springfield Ave
School St
S Pierpont Ave
S Winnebago St
Morgan St
Montague St
Cunningham Rd
Westfield Rd
S Meridian Rd
Montague Rd
Edwardsville Rd
Michigan Ave
Ogilby Rd
Clifton Ave
Harrison Ave
Prairie Rd
20
2
basin?
basin yes
basin?
basin?
basin?
Winnebago
basin? probably, 1 or 2?
basin?
basin yes
basin several
Google Earth
© 2019 Google
2 mi
N

Thank you for your time!
Questions?

Alyssa Robinson | alyssa@olsonecosolutions.com

Rebecca Olson | rebecca@olsonecosolutions.com

Example Objectives
Candlewick Lake, Boone Co.

Goal 1: Reduce the amount of soil entering our streams and lakes.

Objectives for Goal 1

1. Reduce the amount of sediment entering streams and lakes by 417 tons/yr (36%).

Example Objectives
Candlewick Lake, Boone Co.

Goal 2: Reduce the amount of nutrients entering our streams, lakes, and groundwater.

Objectives for Goal 2

1. Reduce the amount of phosphorous entering streams and lakes by 620 lbs/yr (23%).
2. Reduce the amount of nitrogen entering streams and lakes by 2,600 lbs/yr (22%).

Example Objectives
Candlewick Lake, Boone Co.

Goal 3: Maintain a healthy volume of water feeding Candlewick Lake with a consistent flow.

Objectives for Goal 3

1. Determine the water budget baseline for Candlewick Lake.
2. Determine the water volume requirements of Candlewick Lake.
3. Reduce flashy hydrology during storms for each stream reach feeding Candlewick Lake, Boone Lake, and Beaver Creek.
4. When designing recommended projects, determine how the project will affect the water budget and design projects to ensure a sufficient water supply to Candlewick Lake with a steady, gradual flow.

Example Objectives
Candlewick Lake, Boone Co.

Goal 4: Treat pollution from future development before it enters our streams and lakes.

Objectives for Goal 4

1. Review plans for development and recognize the opportunities to improve water quality coming from the development.
2. Determine the pollution projected to come from the development before and after opportunities to improve water quality are implemented to estimate the pollution reduction possible.
3. Implement water quality projects to lessen the amount of pollution entering our streams and lakes from each planned development.

Example Objectives
Candlewick Lake, Boone Co.

Goal 5: Coordinate with local municipalities to create policies that adhere to these goals.

Objectives for Goal 5

1. Adopt a common, updated ordinance or intergovernmental agreement for Timberlane, Poplar Grove, Caledonia, and Boone County to protect water quality under the guidance of the most current Boone County Regional Stormwater Management Plan.
2. Provide recommendations to protect water quality from this plan to all municipalities to be included in the ordinances or intergovernmental agreement.
3. Create a relationship with all local municipalities to promote cooperation in land and water conservation efforts.

Example Objectives
Candlewick Lake, Boone Co.

Goal 6: Educate the community about land and water conservation and this plan.

Objectives for Goal 6

1. Increase awareness of nutrient runoff from lawns, driveways, rooftops, and farm fields and encourage behaviors that will reduce nutrient pollution in local streams and lakes.
2. Increase awareness of the connection between protecting our streams and lakes and improving people's quality of life, recreational opportunities, scenic amenities, community value, property value, and public health.
3. Promote partnerships with community groups that can assist in creating public awareness.
4. Enroll homeowners and landowners in a recognition program for implementing conservation projects and participating in land and water protection programs.
5. Deliver Urban Campaign education materials and invitations to events to all households within urban areas of the watershed.
6. Deliver Rural Campaign education materials and invitations to events to all households within the rural areas of the watershed.
7. Provide all municipalities and developers within the watershed with Future Development Campaign education materials and invitations to events and meetings.

*Objectives 1-4 are adopted from the EPA's "Developing an Outreach Strategy" website.

Most Prominent Land Uses

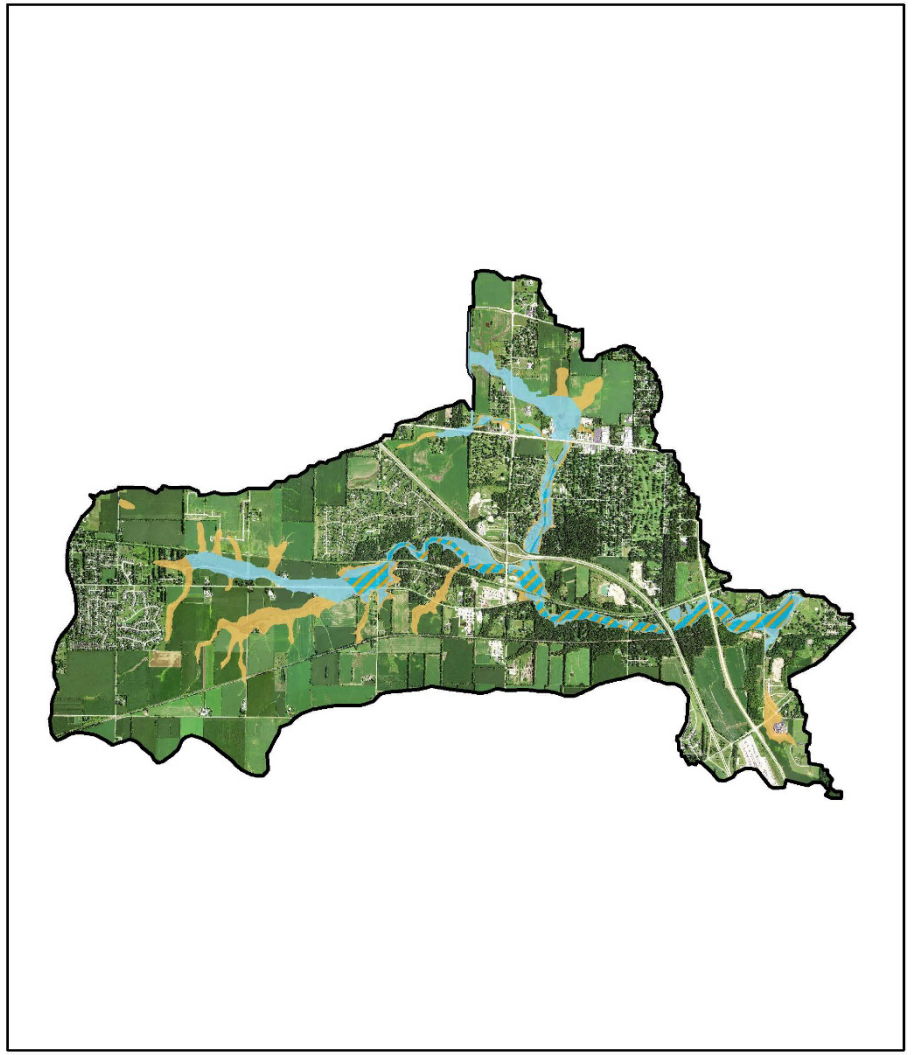
- Agricultural: High Residue Till (35.1%)
- Residential: Low Intensity, Developed (19.5%)
- Forest (14%)

Land Use		
Land Use Type	**Acres**	**%**
High Intensity, Developed	85	1.1%
Medium Intensity, Developed	161	2.1%
Low Intensity, Developed	1,514	19.5%
Roads	367	4.7%
Railroad	42	0.54%
Trail	29	0.37%
Golf Course	123	1.6%
Cemetery	69	0.89%
Turf	373	4.8%
High Residue Till	2,726	35.1%
Low Residue Till	717	9.2%
Orchard	2	0.02%
Pasture	37	0.5%
Quarry	74	1.0%
Mulch Yard	23	0.30%
Forest	1,090	14.0%
Grassland	212	2.7%
Wetland	54	0.69%
Water	63	0.81%
Total:	**7,760**	**100%**

South Fork Kent Creek Watershed
FEMA Flood Hazard

Olson Ecological Solutions, LLC

tallgrass RESTORATION, LLC



1% Annual Chance Flood Hazard
0.2% Annual Chance Flood Hazard
Floodway
SFKC Watershed

0 0.4 0.8 1.2 1.6 Miles

N

Data Sources: FEMA, USGS
Aerial Date: July 30, 2017
Edited: July 9, 2019
Map created by Kristin Adams with Tallgrass Restoration, LLC

South Fork Kent Creek Watershed
Flooding Frequency

Olson Ecological Solutions, LLC

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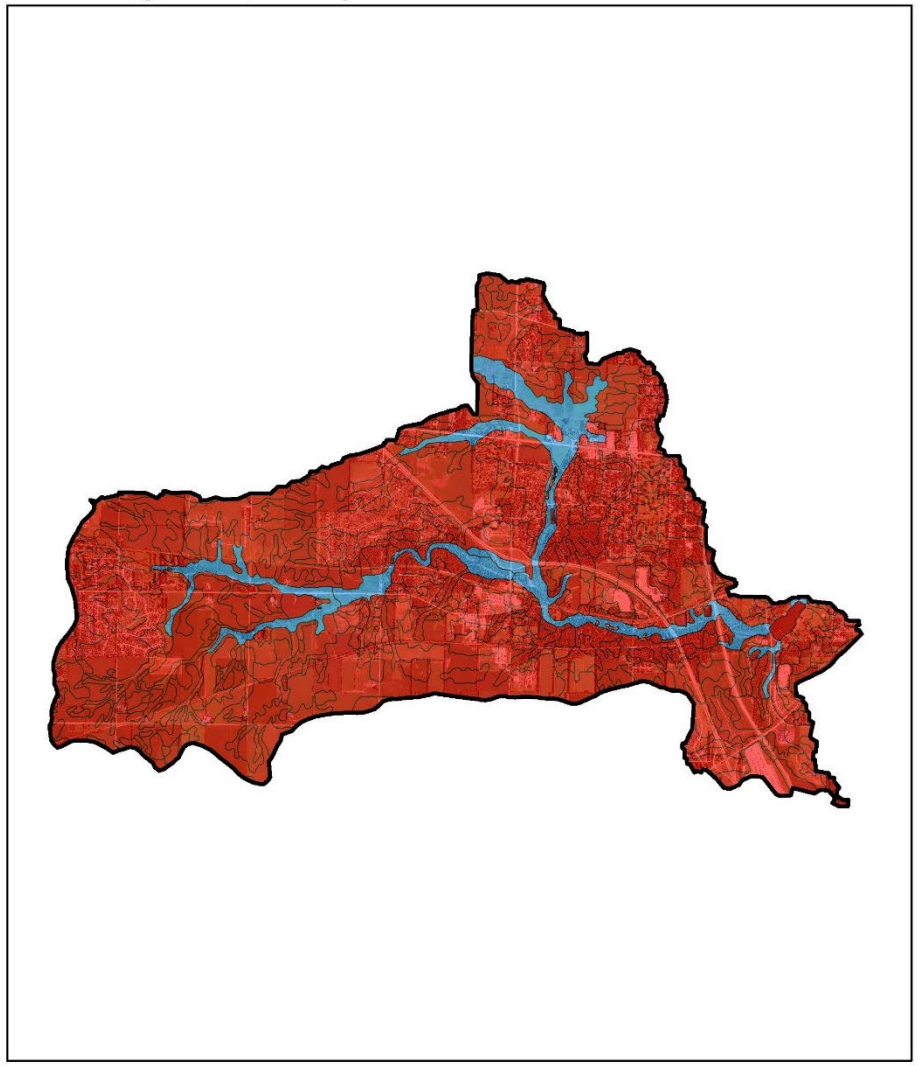


SFKC Watershed
None
Very Rare
Rare
Occasional
Frequent
Very Frequent

0 0.4 0.8 1.2 1.6 Miles

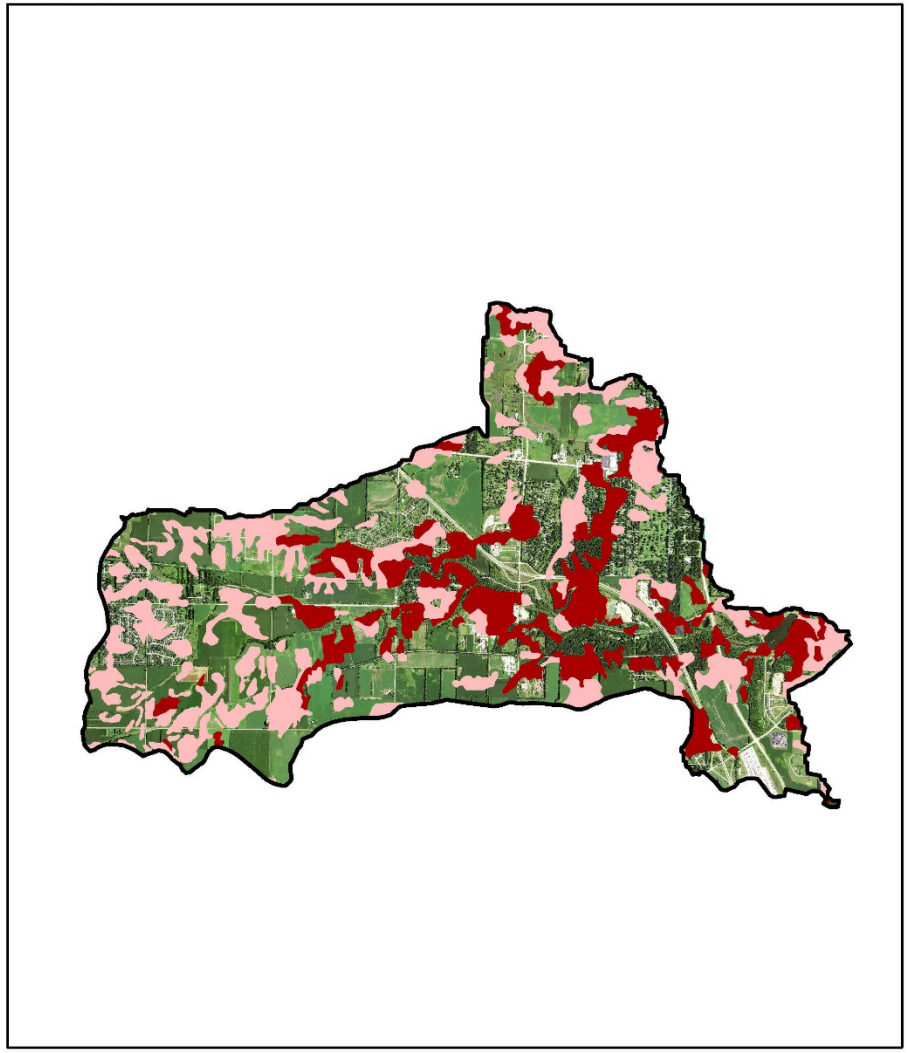
N

Data Sources: USGS, USDA NRCS
Aerial Date: July 30, 2017
Edited: July 18, 2019
Map created by Kristin Adams with Tallgrass Restoration, LLC

South Fork Kent Creek Watershed
Highly Erodible Land

Olson Ecological Solutions, LLC

tallgrass RESTORATION, LLC



SFKC Watershed
Highly Erodible Land
Potentially Highly Erodible Land

0 0.4 0.8 1.2 1.6 Miles

N

Data Sources: USGS, USDA NRCS
Aerial Date: July 30, 2017
Edited: July 18, 2019
Map created by Kristin Adams with Tallgrass Restoration, LLC

South Fork Kent Creek Watershed
Hydric Soils

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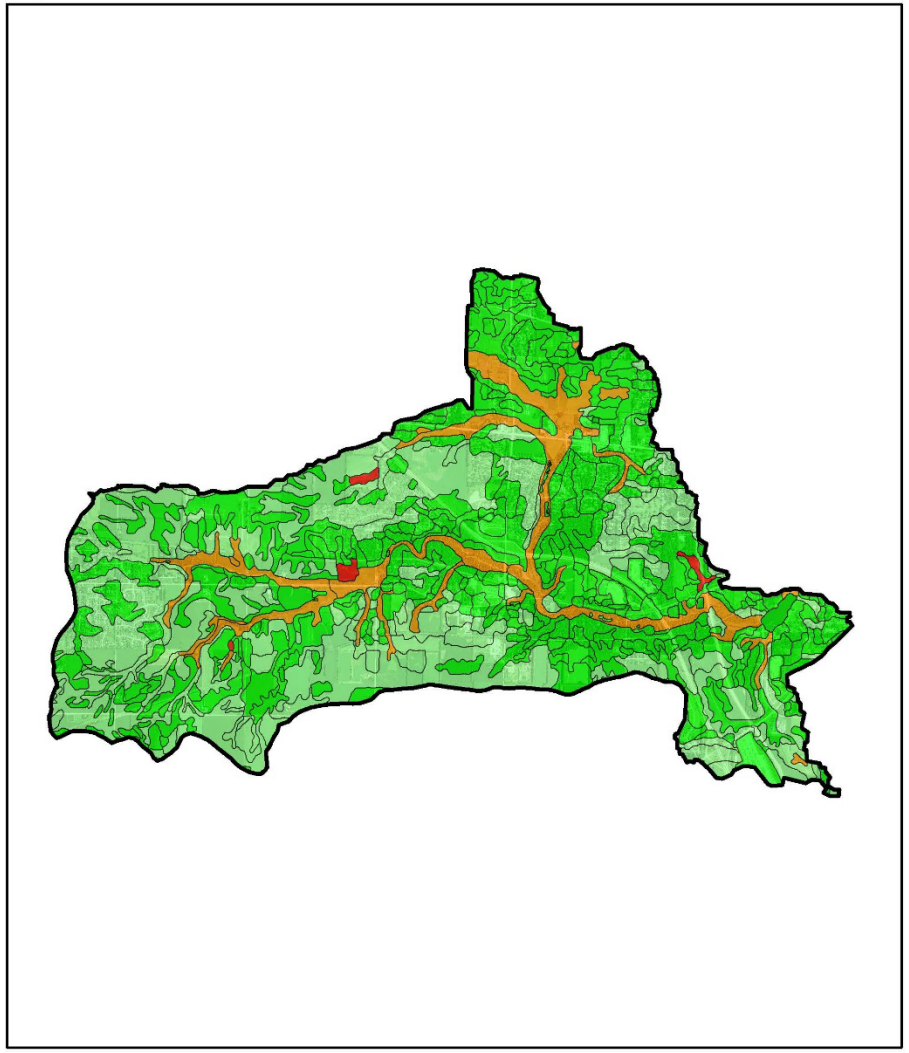


SFKC Watershed
Hydric (100%)
Hydric (66 to 99%)
Hydric (33 to 65%)
Hydric (1 to 32%)
Not Hydric (0%)
Not rated or not available

0 0.4 0.8 1.2 1.6 Miles

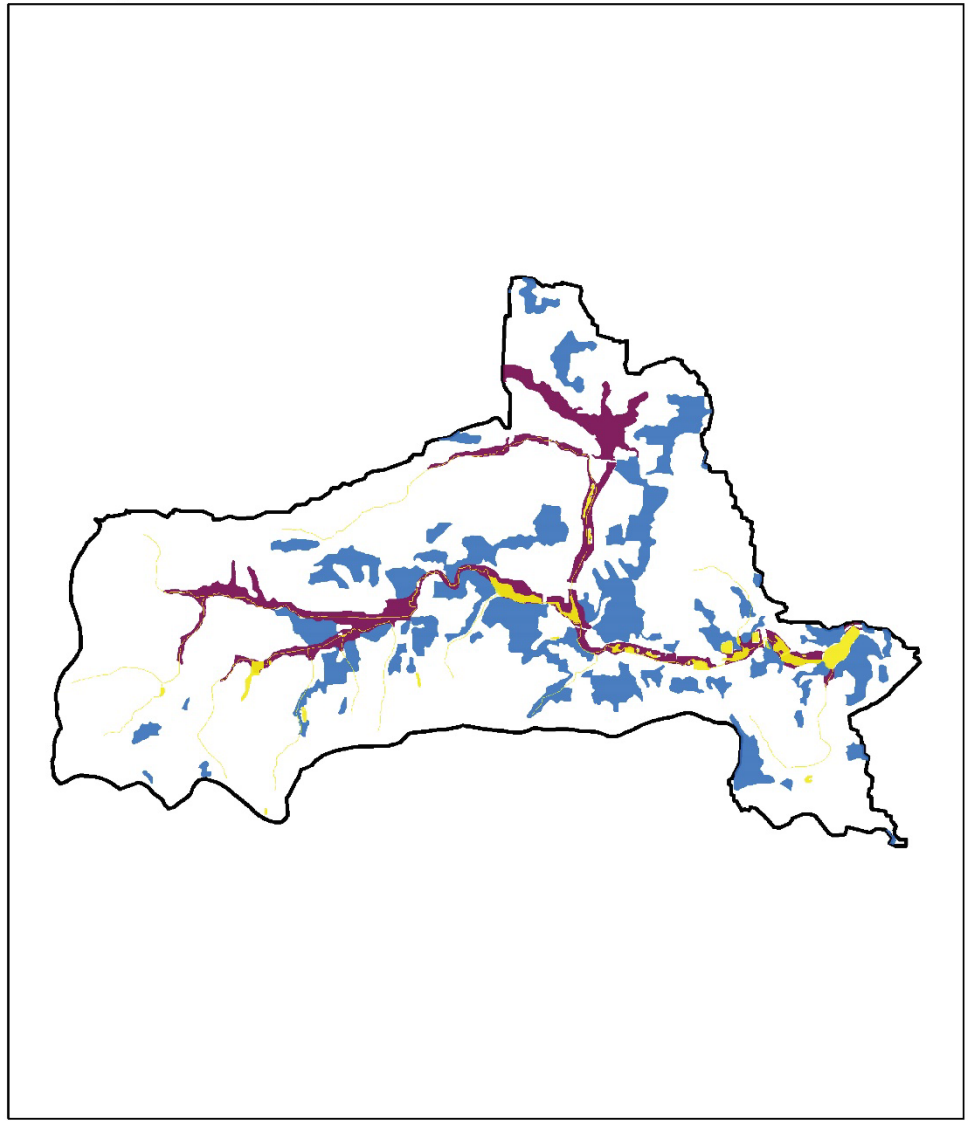
N

Data Sources: USGS, USDA NRCS
Aerial Date: July 30, 2017
Edited: July 18, 2019
Map created by Kristin Adams with Tallgrass Restoration, LLC

South Fork Kent Creek Watershed Priority Area Map

Olson Ecological Solutions, LLC

tallgrass RESTORATION, LLC



NWI
HEL
Overlap of Hydro Group, Flood Freq, Hydric, FEMA
SFKC Watershed

0 0.4 0.8 1.2 1.6 Miles

N

Data Sources: USGS, USDA
Aerial Date: July 30, 2017
Edited: August 21, 2019
Map created by Kristin Adams with Tallgrass Restoration, LLC