



Olson Ecological
Solutions, LLC



Olson Ecological Solutions

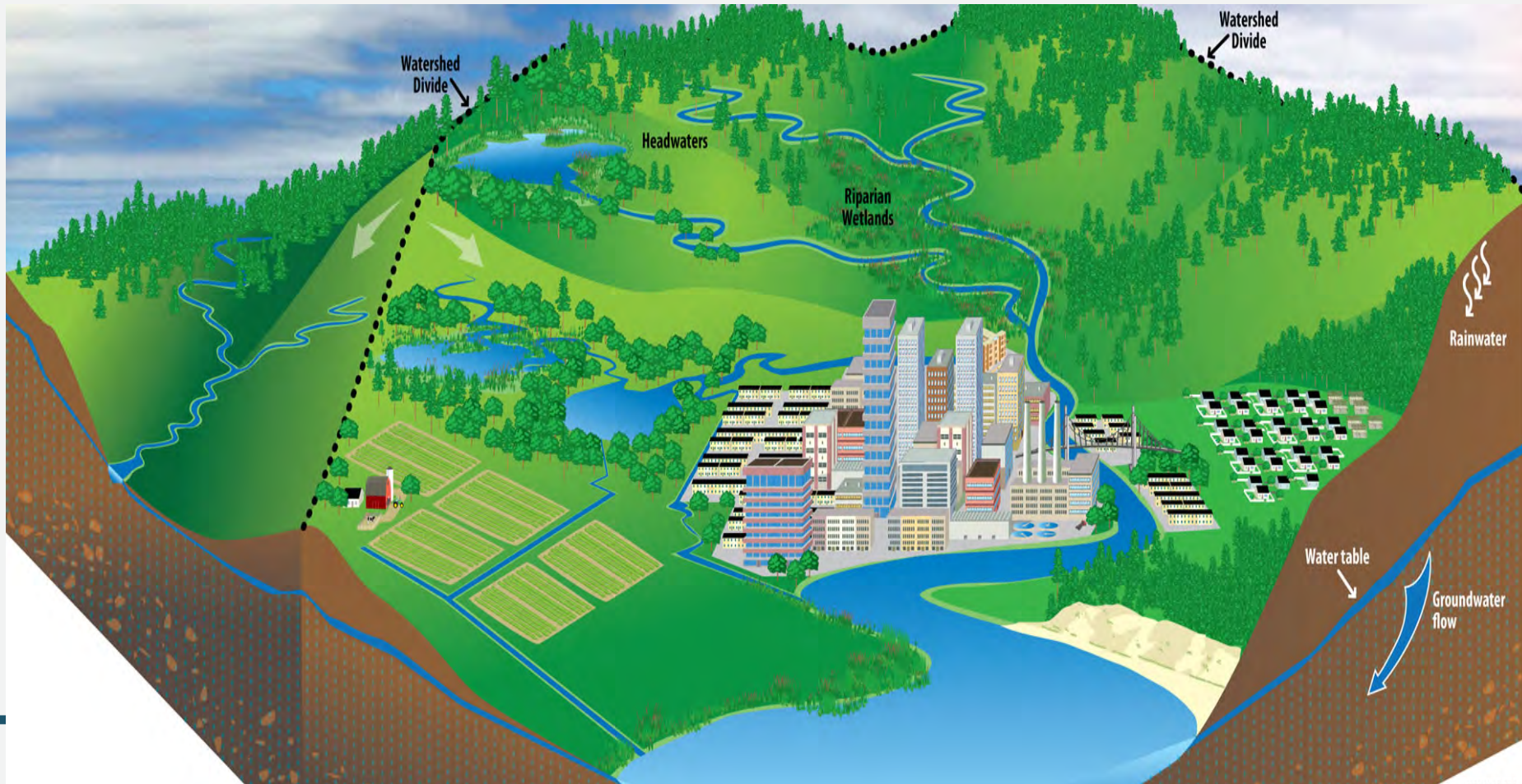
December 12, 2019

SOUTH FORK KENT CREEK WATERSHED

STAKEHOLDER MEETING 4

What is a Watershed?

- A geologic area within the boundary of a drainage divide
- Watershed health=a reflection of land use and land management within the watershed



What is a Watershed Based Plan?

100% voluntary
participation and action

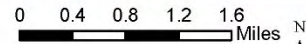
- Natural Resource Inventory
 - Assessment of historical and current conditions, features, and land uses
- Stakeholder Involvement
- Technical Guidance
- Identification of Problems and Concerns
- Recommendations
- Implementation Schedule
- Financial and Technical Resources
- Monitoring Strategy

South Fork Kent Creek Watershed Watershed Boundary



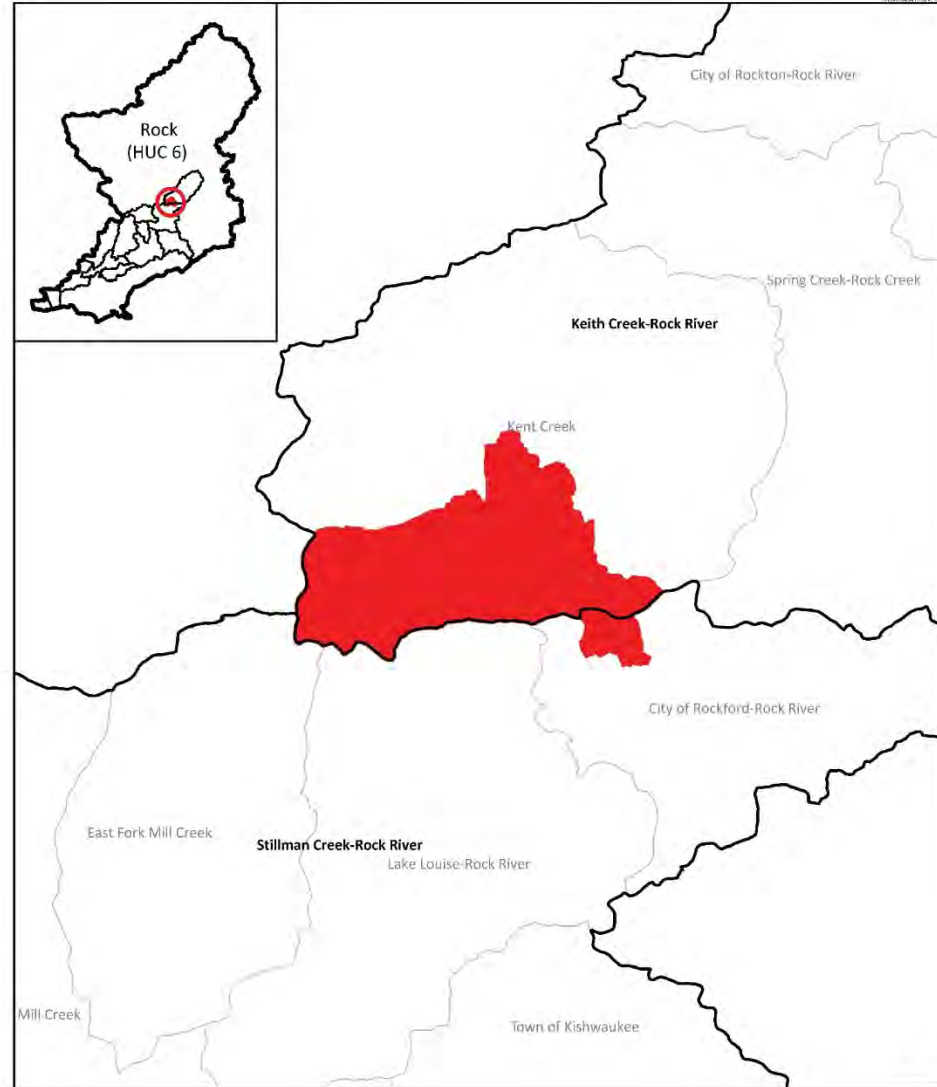
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Final SFKC Watershed

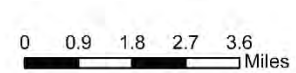


Map created by Kristin Adams with Tallgrass Restoration, LLC
Data Sources: ESRI
Aerial Date: July 30, 2017
Edited: 3/6/2019

South Fork Kent Creek Watershed Watershed Locations



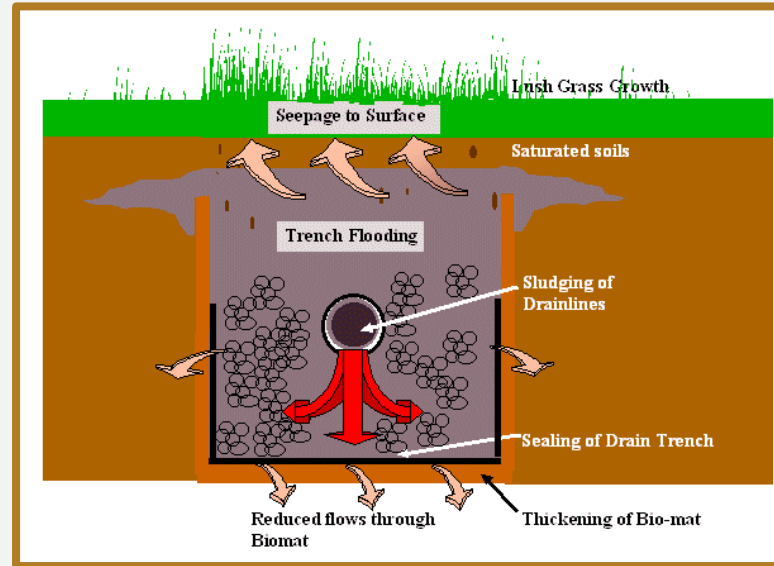
HUC10
 HUC12
 SFKC Watershed



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

EPA Water Quality Assessment

According to the Illinois Environmental Protection Agency, South Fork Kent Creek is an **impaired stream**, as it does not support primary contact due to **fecal coliform** caused by unknown sources (RMMS 2016).



Illinois EPA Water Quality Assessment Data

- Assessed in 2012
- @ Tay and Corbin St.
- Fecal coliform geometric mean= 581
- IEPA guidelines:
 - FC geometric mean ≤ 200 cfu/100ml
 - $\leq 10\%$ of samples exceed 400 cfu/100ml


Year Reported	Years Retrieved	Location	Fecal Coliform Geometric Mean (cfu/100ml)	% of samples > 400 cfu/100ml	Retrieved by:
2006	5/2003-10/2004	Tay & Corbin St.	1577	28	Rock River Water Reclamation District
2008	1/2005-7/2007	Tay & Corbin St.	703	61.5	Sinissippi Colation for Resoring the Environment (SCORE)
2010	1/2006-11/2009	Station Trib 2	802	65	Sinissippi Colation for Resoring the Environment (SCORE)
2012	2008-2010	Tay & Corbin St.	581	60	Rock River Study Group

AGENDA

- Review vision statement
 - Review & revise goals
 - Evaluate Inventory Phase II
 - Best Management Practices
 - 2020 meeting dates
-

South Fork Kent Creek Watershed Vision Statement

We envision improving the water quality in South Fork Kent Creek Watershed in order to preserve and enhance the natural beauty, wildlife habitat, recreational attractions, and agricultural use of this natural resource for future generations to come.





*SOUTH FORK
KENT CREEK*

GOALS

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.
-

Review of

*NATURAL
RESOURCE
INVENTORY*

Phase II

Land Use

Top 3

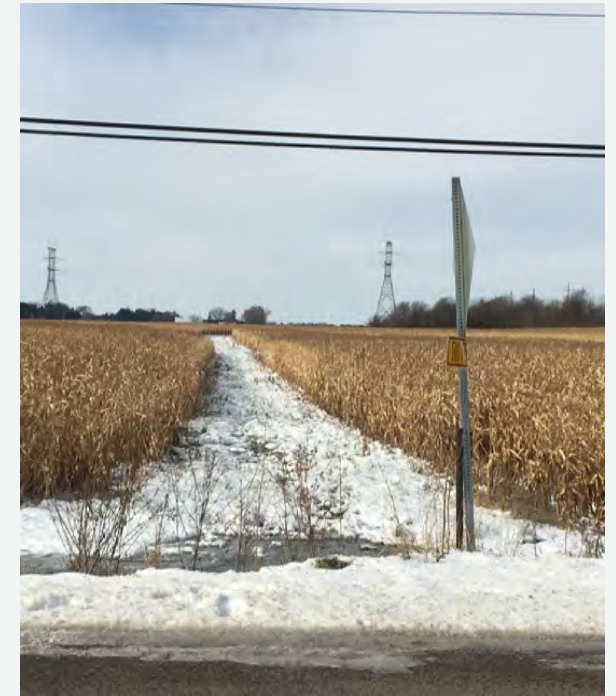
- Agricultural: High Residue Till (35.1%)
- Residential: Low Intensity, Developed (19.5%)
 - Forest (14%)

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%

Agricultural/Production

Land Use

- High Residue Till (35.1%, **2,726 acres**)
- Low Residue Till (9.2%, **717 acres**)
- Orchard (0.02%, **2 acres**)
- Pasture (0.5%, **37 acres**)



Agricultural / Production




- Addressing Goals

- Goal 2: ↓ erosion, sediment, & nutrient loading
- Goal 3: ↓ contaminants (FC)
- Goal 8: Prime Farmland (59.7%, **4,629 acres**)

- BMP Ideas

- Tillage/Residue
- Cover Crops
- Buffer strips between fields and streams/waterbodies
- Grassed waterways (KA?)
- Drain Tiles: basins, constructed wetlands, bioreactors
- Fencing
- Stream crossings

Cropland Practices

- No-till/Reduced Till Farming
 - Cover Crop
 - Nutrient Management Plans
 - Grassed Waterways
 - Permanent Vegetation Systems (especially on HEL)
 - Terrace or Contour Farming w/ Contour Buffer Strips
 - Tree Planting in Floodplains
 - Wetland Restoration
 - Filter Strips
- 

No-till Farming

What is the current representation?

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

What is the opportunity?

There's opportunity to **convert 717 acres** of low-residue or conventional till to no-till.



BMP & Efficiency	N	P	Sediment
Conservation Tillage 1 (30-59% Residue)	15%	36%	40%
Conservation Tillage 2 (equal or more than 60% residue)	25%	69%	77%

Cover Crop



What is the current representation?

What is the opportunity on 3,443 acres of cropland?

BMP & Efficiency	N	P	Sediment
Cover Crop 1 (Group A Commodity) (High Till only for sediment)	1%		
Cover Crop 2 (Group A Traditional Normal Planting Time) (High Till for TP and sediment)	20%	7%	10%
Cover Crop 3 (Group A Traditional Early Planting Time) (High Till only for TP and Sediment)	20%	15%	20%

Nutrient Management Plans

- What is the current representation?
- What is the opportunity on 3,443 acres of cropland?

BMP & Efficiency	N	P	Sediment
Nutrient Management 1 (Determined Rate)	15%	45%	
Nutrient Management 2 (Determined Rate plus Additional Considerations)	25%	56%	

Grassed Waterways



NRCS Wisconsin

BMP & Efficiency	N	P	Sediment
Controlled Drainage	39%	35%	

What is the current representation?

132.5 acres of grassed waterways

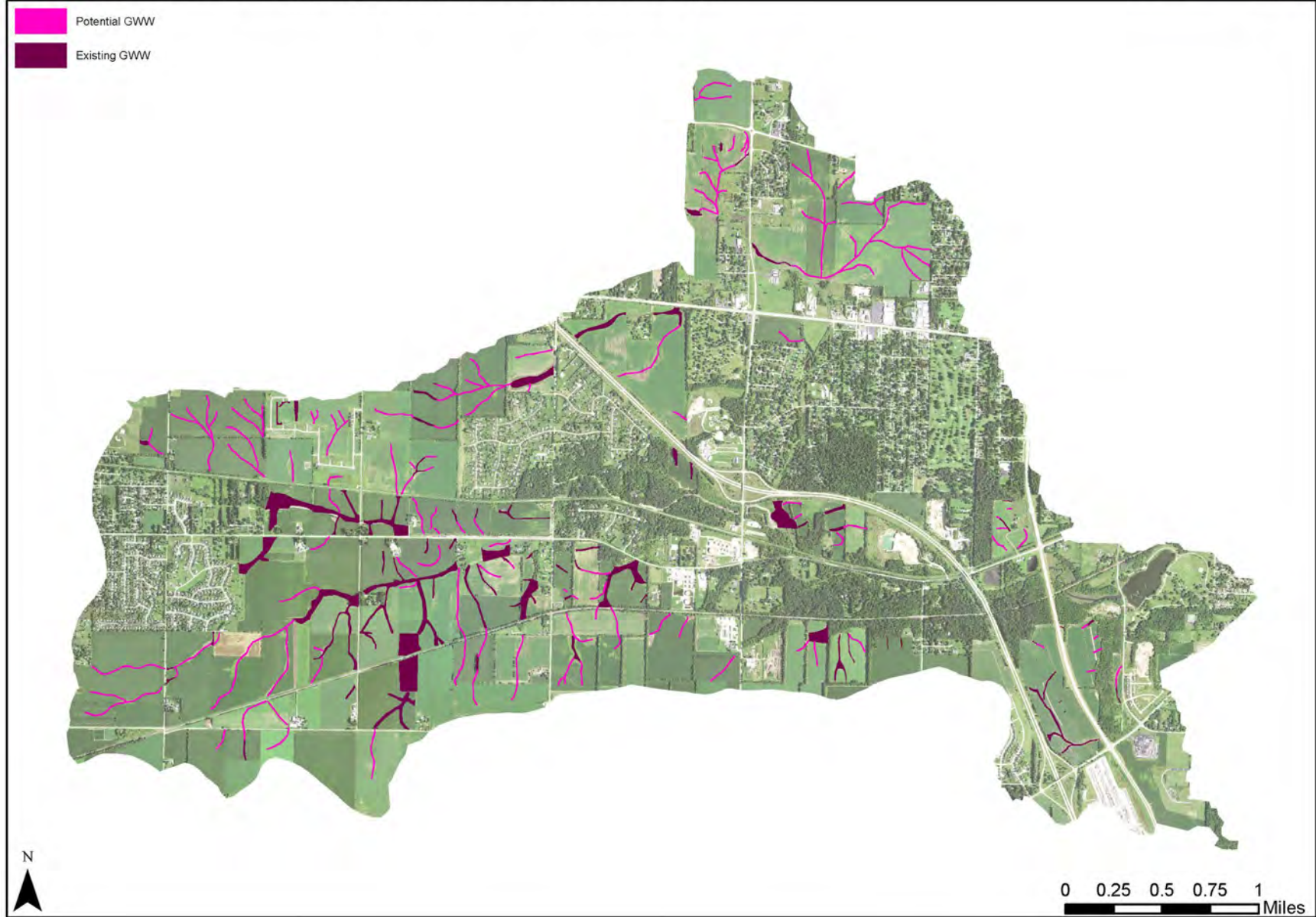
What is the opportunity?

75.4 acres of potential GWW (30 ft width)



Clean Water Iowa

South Fork Kent Creek Watershed Potential and Existing Grassed Waterways



Permanent Vegetation Systems (especially on HEL)

- Retire farmland and plant permanent vegetation
- Highly erodible land (HEL) has soils with an erodibility index greater than 8 on
 - more than 1/3rd of the field or
 - more than 50 acres
- What is the current representation?
- What is the opportunity?
 - There are **134 acres** of HEL farmland

	N	P	Sediment
BMP & Efficiency			
Land Retirement	90%	81%	95%

Terrace or Contour Farming

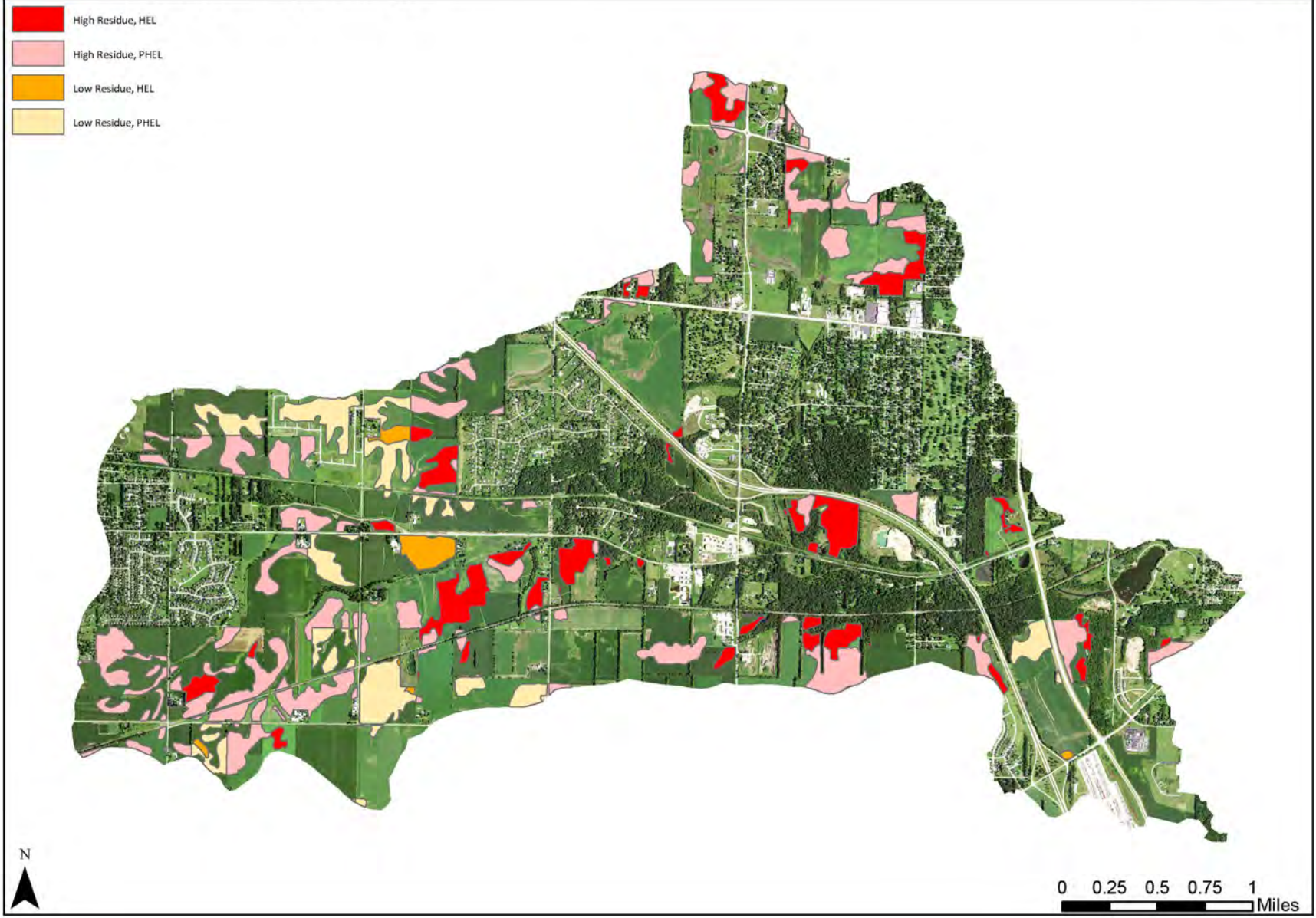


BMP & Efficiency	N	P	Sediment
Contour Farming	28%	40%	34%

BMP & Efficiency	N	P	Sediment
Terrace	25%	31%	40%


- What is the current representation?
- What is the opportunity?
 - There are 305 acres of HEL farmland
 - 265 acres HEL in high residue
 - 40 acres HEL in low residue
 - There are 786 acres of PHEL farmland
 - 554 acres PHEL in high residue
 - 232 acres PHEL in low residue

South Fork Kent Creek Watershed Erodibility Type by Tillage



Land Use Type on HEL	Acreage	%
Forest	320.4379883	27.92%
Developed, Low Intensity	280.5130005	24.44%
High Residue	264.8070068	23.08%
Turf	72.07360077	6.28%
Roads	57.78979874	5.04%
Low Residue	40.24879837	3.51%
Grassland	28.65950012	2.50%
Developed, High Intensity	26.31240082	2.29%
Quarry	14.27140045	1.24%
Developed, Medium Intensity	12.41880035	1.08%
Trail	9.982580185	0.87%
Railroad	9.100199699	0.79%
Mulch Yard	6.273489952	0.55%
Pasture	2.316760063	0.20%
Wetland	1.614979982	0.14%
Water	0.704231977	0.06%
Cemetery	0.032663301	0.00%
	1147.5572	100.00%

Tree Planting in Floodplains

- What is the current representation?
 - What is the opportunity?
 - Retire farmland that floods frequently and plant trees
 - **375 acre** of 100-yr floodplain in the watershed
- 

Land Use Type in 100 yr Floodzone	Area	%
Developed, High Intensity	12974.7258	0.59%
Developed, Low Intensity	170252.7192	7.79%
Developed, Medium Intensity	10584.05636	0.48%
Forest	544516.5512	24.91%
Grassland	173644.4256	7.94%
High Residue	482584.0789	22.08%
Low Residue	140900.8489	6.45%
Pasture	27510.22419	1.26%
Railroad	608.8662645	0.03%
Roads	81442.53861	3.73%
Trail	10199.7626	0.47%
Turf	133319.1599	6.10%
Water	182638.2182	8.36%
Wetland	214616.6866	9.82%
Total	2185792.862	100.00%

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



Filter Strip

What is the current representation?

What is the opportunity?



BMP & Efficiency	N	P	Sediment
Filter Strip-Agricultural	53%	61%	65%

Livestock Practices

*37 acres of
pasture in the
watershed*

- Livestock exclusion fencing
 - Pasture and hay land management
 - Winter Feeding Facility
 - Waste Management Systems
 - Waste Utilization
-

Livestock Exclusion Fence

BMP & Efficiency	N	P	Sediment
Streambank Protection without Fencing	15%	22%	58%
Streambank Protection and Fencing	75%	75%	75%
Use Exclusion	39%	4%	59%

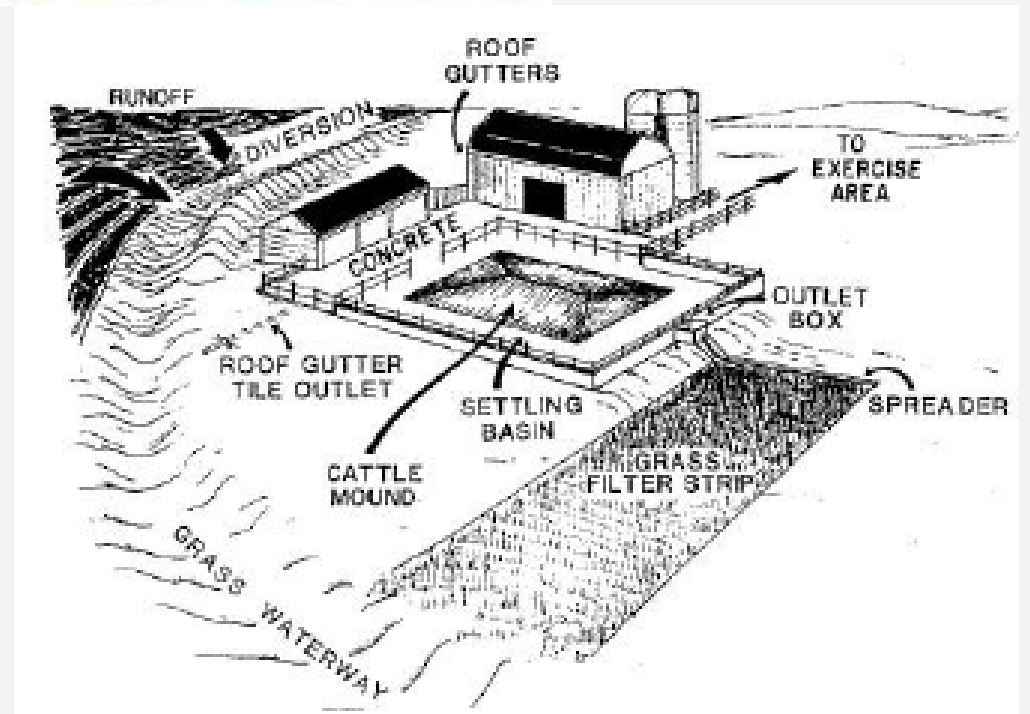
BMP & Efficiency	N	P	Sediment
Alternative Water Supply	13%	12%	19%
Livestock Exclusion Fencing	20%	30%	62%



Waste Management Systems

Examples:

- Waste Storage Structure
- Waste Treatment Lagoon
- Vegetated Treatment Area



BMP & Efficiency	N	P	Sediment
Litter Storage and Management	14%	14%	

Buffers and Critical Area Plantings

What is the current representation?
What is the opportunity?

BMP & Efficiency	N	P	Sediment
Pasture and Hayland Planting (Forage Planting)	18%	15%	

BMP & Efficiency	N	P	Sediment
Critical Area Planting	18%	20%	42%
Heavy Use Area Protection	18%	19%	33%

BMP & Efficiency	N	P	Sediment
30m Buffer with Optimal Grazing	36%	65%	
Forest Buffer (minimum 35 ft wide)	45%	40%	53%
Grass Buffer (minimum 35 ft wide)	87%	77%	65%



Residential

- Land Use
 - High Intensity, Developed (1.1%, 85 acres)
 - Medium Intensity, Developed (2.1%, 161 acres)
 - Low Intensity, Developed (19.5%, 1,514 acres)



Residential

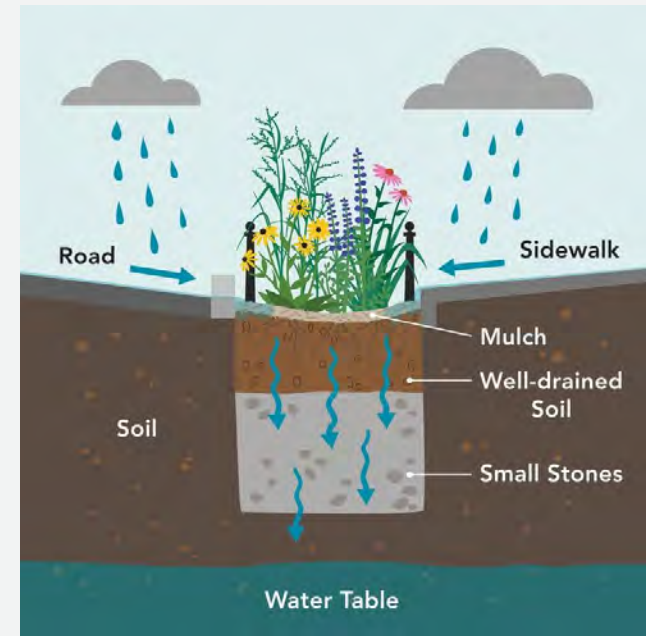
- BMP Ideas
 - Constructed wetlands
 - Vegetated swales & filter strips
 - Rain gardens
 - Proper septic maintenance



- Addressing Goals
 - Goal 1: water volume and velocity
 - Goal 2: ↓ erosion, sediment, & nutrient loading
 - Goal 3: ↓ contaminants (FC)

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.



Connecticut Fund for the Environment



City of Columbus, columbus.gov

Rain Gardens

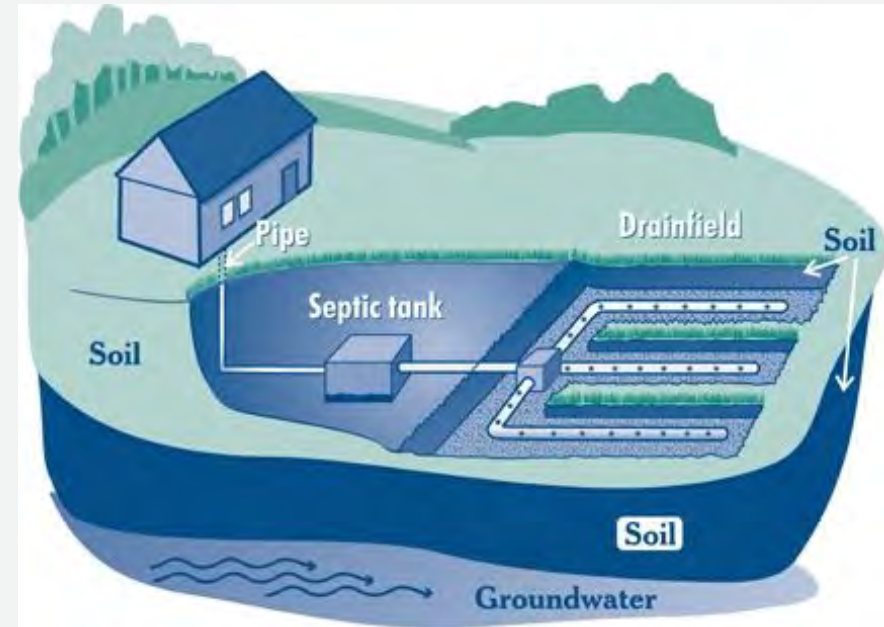
A rain garden is a depressed, landscaped garden planted with native plant species that is designed to retain and infiltrate stormwater runoff from individual residential or commercial lots, sump pumps, and roofs. Rain gardens are versatile features that can be installed in almost any unpaved space. Rain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

<http://www.lakecountyil.gov/2232/Rain-Gardens-On-Your-Campus>



Septic System Maintenance

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





Natural Areas

- Land Use
 - Forest (14%, 1,090 acres)
 - Grassland (2.7%, 212 acres)
 - Wetland (0.69%, 54 acres)
 - Water (0.81%, 63 acres)

Forest Erosion Control



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

Woodland Quality Criteria

Quality Category	Description
Very High	Little to no invasive woody species present.
High	Occasional invasive woody species present.
Medium	Thick density of invasive young growth woody species present. Able to walk through area.
Low	Thick density of invasive old growth woody species present.
Very Low	Area impassable due to invasive woody species growth.

BMP & Efficiency	N	P	Sediment
Site Prep/steep slope seeder/transplant			81%
Site prep/straw/crimp seed/fertilizer/transplant			95%

Remove Invasive Brush

Tall Bellflower, native woodland plant

Lake County Forest Preserves





Wetland Restoration / Creation

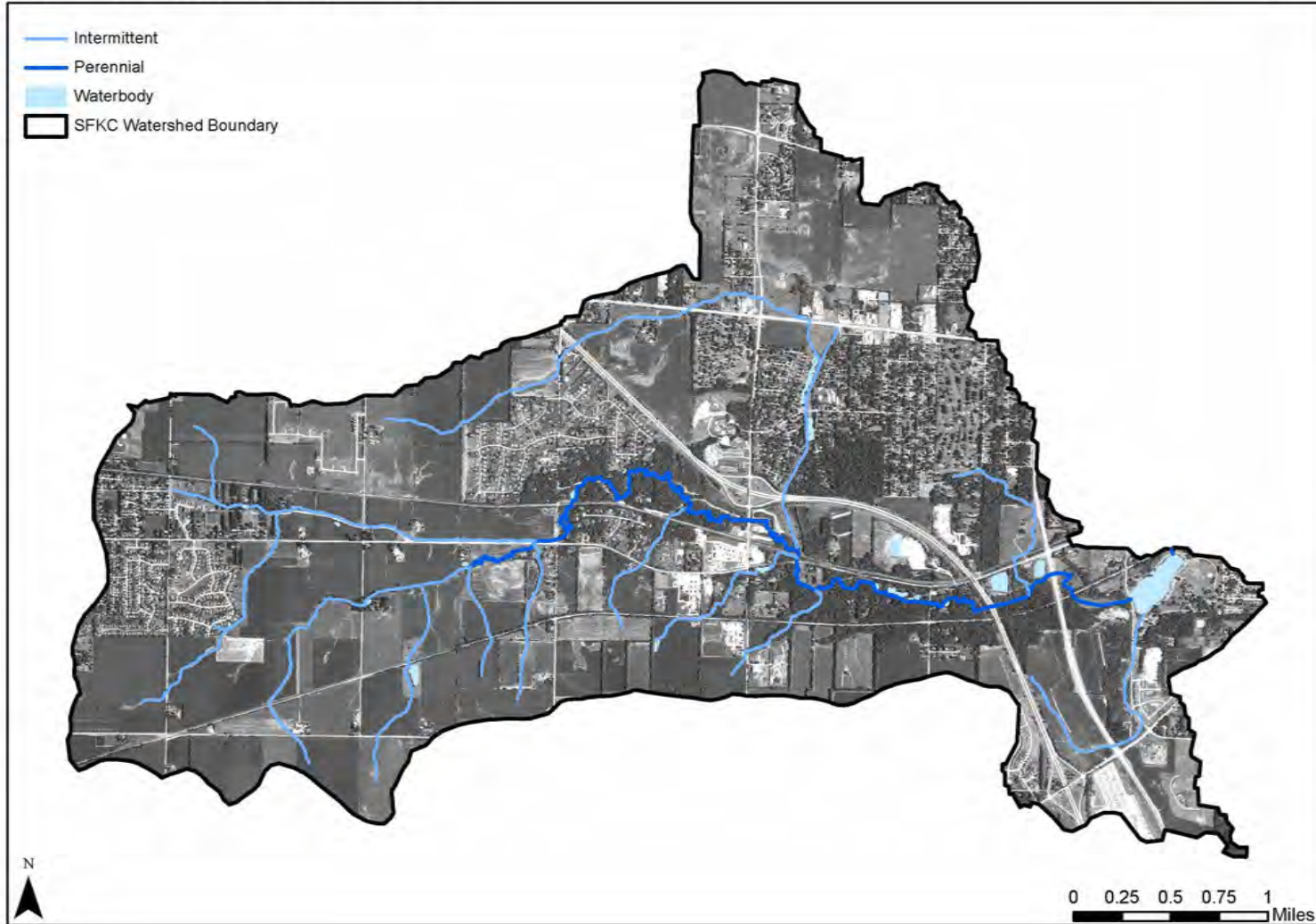
What is the current representation?

– 58 acres of wetlands

What is the opportunity?

– 3,803 acres of hydric soils

South Fork Kent Creek Watershed Streams and Waterbodies




Streams & Waterbodies

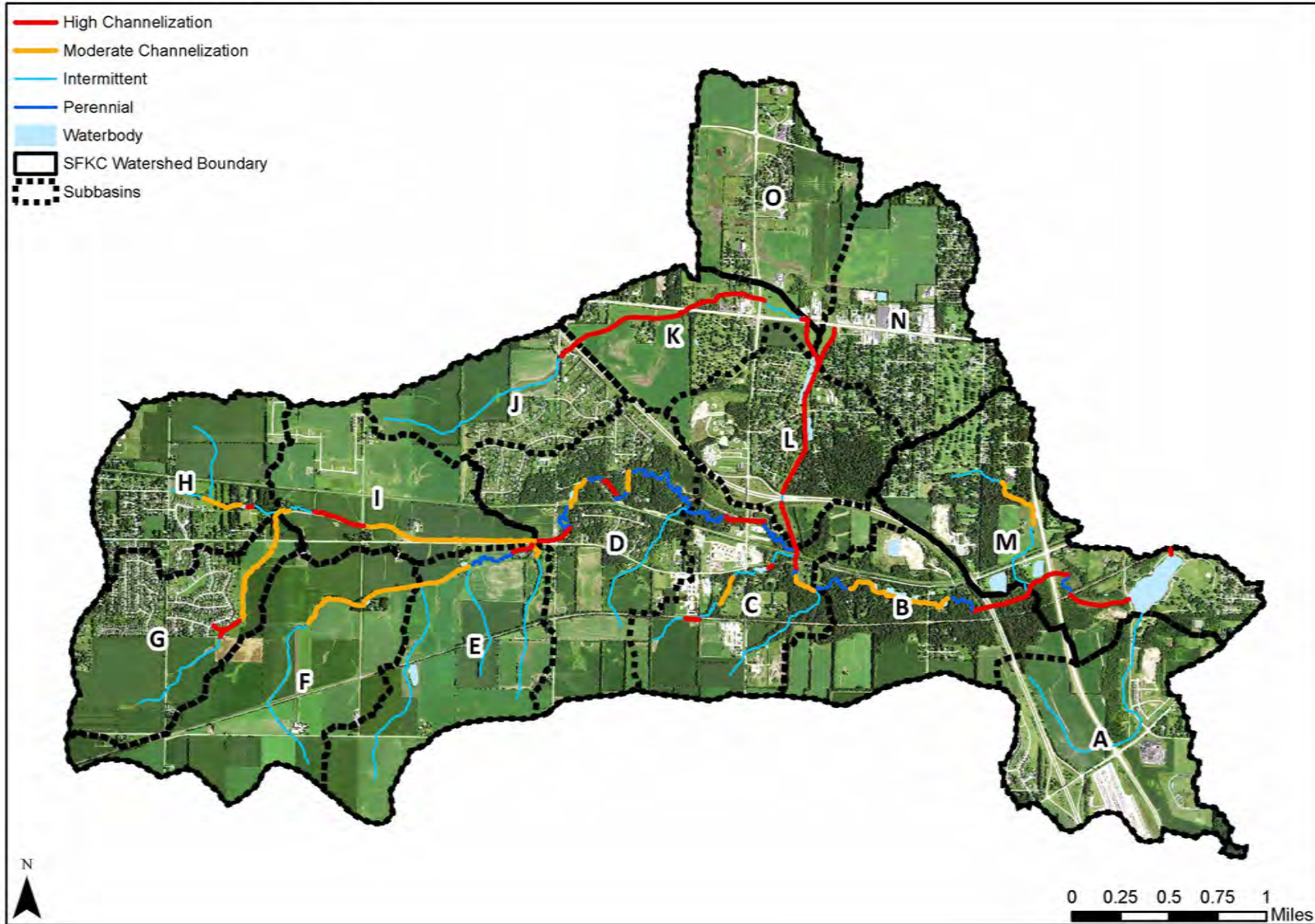
- 24 waterbodies, 46.3 acres
- 92,712 ft intermittent stream
- 29,751 ft perennial stream

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

Stream Channel Restoration (e.g. meanders)

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

South Fork Kent Creek Watershed Stream Channelization



Streambank Stabilization

- What is the current representation?
 - 244,924 ft of streambanks within the entire watershed
 - **93,071 ft** of streambanks are **stabilized** or have slight erosion (38%)

- What is the opportunity?
 - **22,043 ft** of streambanks are **very severely eroded** (9%)
 - **66,129 ft** of streambanks are **severely eroded** (27%)
 - **63,680 ft** of streambanks are **moderately eroded** (26%)

BMP & Efficiency	N	P	Sediment
Streambank Stabilization and Fencing	75%	75%	75%

Streambank Stabilization

How to stabilize?

- Reduce water force against the bank
- Increase the resistance of a bank to erosive forces
- Examples: native plantings, soil bioengineering, structural systems, stormwater reduction, rip rap, coir fiber logs with vegetative slope.



Streambank

Riparian Buffers

- What is the current representation?
 - **281 acres** of stream bank buffers in entire watershed
- What is the current opportunity?
 - **160 acres** of stream bank with buffers in poor condition



Riparian buffers for waterbodies and streams

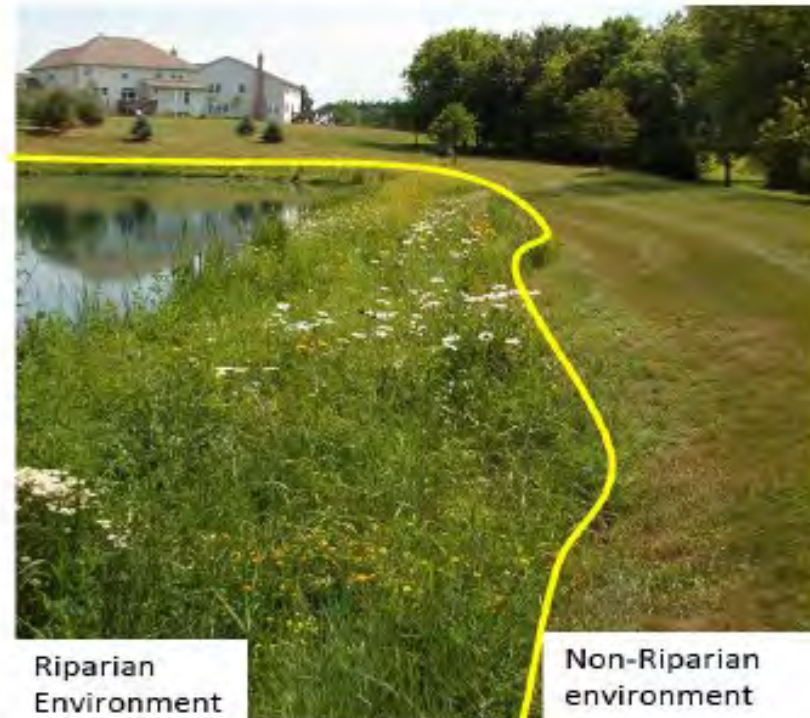
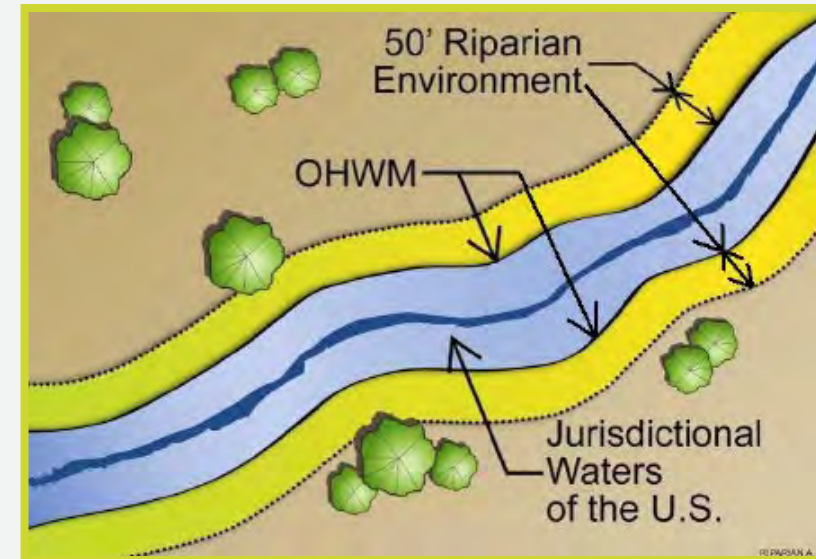
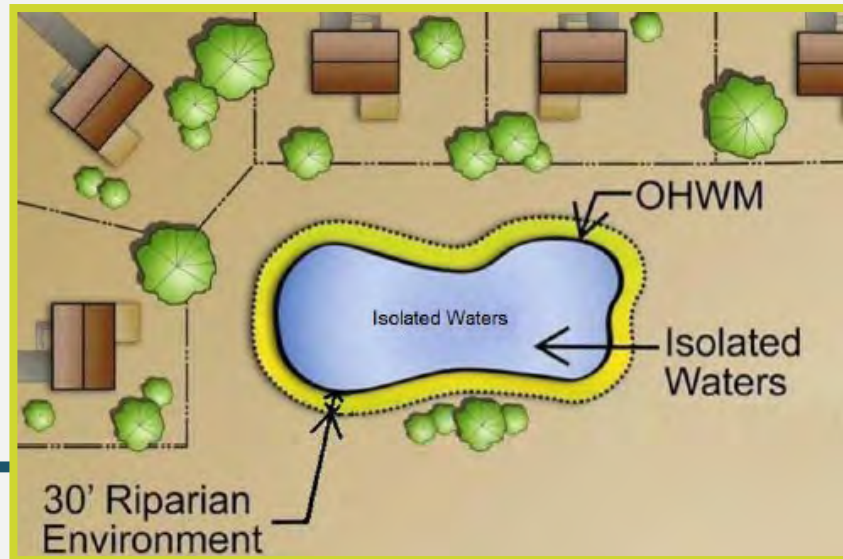


Figure 6.13. Examples of Riparian and Non-riparian Environments



Waterbodies

Riparian Buffers

- What is the current representation?
 - **30 acres** of shoreline 50 ft buffers in entire watershed
 - What is the current opportunity?
 - **20 acres** of shoreline with buffers in poor condition (66%)
-





Waterbodies

Shoreline Erosion

- What is the current representation?
 - **26,191 ft** of shoreline in entire watershed
 - **12,834 ft** of the shorelines are **stabilized** or have slight erosion (49%)
 - What is the opportunity?
 - **0 ft** of shoreline are **very severely eroded** (0%)
 - **3,143 ft** of shoreline are **severely eroded** (12%)
 - **10,214 ft** of shoreline are **moderately eroded** (39%)
-



Impervious Surfaces

- Land Use
 - Roads (4.7%, 367 acres)
- BMP Ideas
 - Vegetated swales
 - Buffer strips
 - Rock check dams
 - Rock outlet diversion
- Addressing Goals
 - Goal 1: water volume and velocity
 - Goal 2: ↓ erosion, sediment, & nutrient loading
 - Goal 3: ↓ contaminants (FC)



Best Management Practices

Programs/Behavior


- Maintain septic systems
 - Education
 - Policy to protect water quality efforts
 - Change habits and culture
-

Practices on-the-ground

- Cover crops, no till
 - Grassed waterways, wetland restoration
 - Filter strips, buffer strips
 - Fence livestock out of stream
 - Filter water downstream of wildlife congregation areas and residential areas on septic
 - Improve woodland filtration capacity
 - Stabilize streambanks
 - Slow the water down and give it a place to settle out
 - Reduce flooding
- 

*Early
2020
Meeting
Dates*

Thursday, January 30
Thursday, February 27
Tuesday, March 31



*THANK YOU FOR YOUR
TIME!
QUESTIONS?*

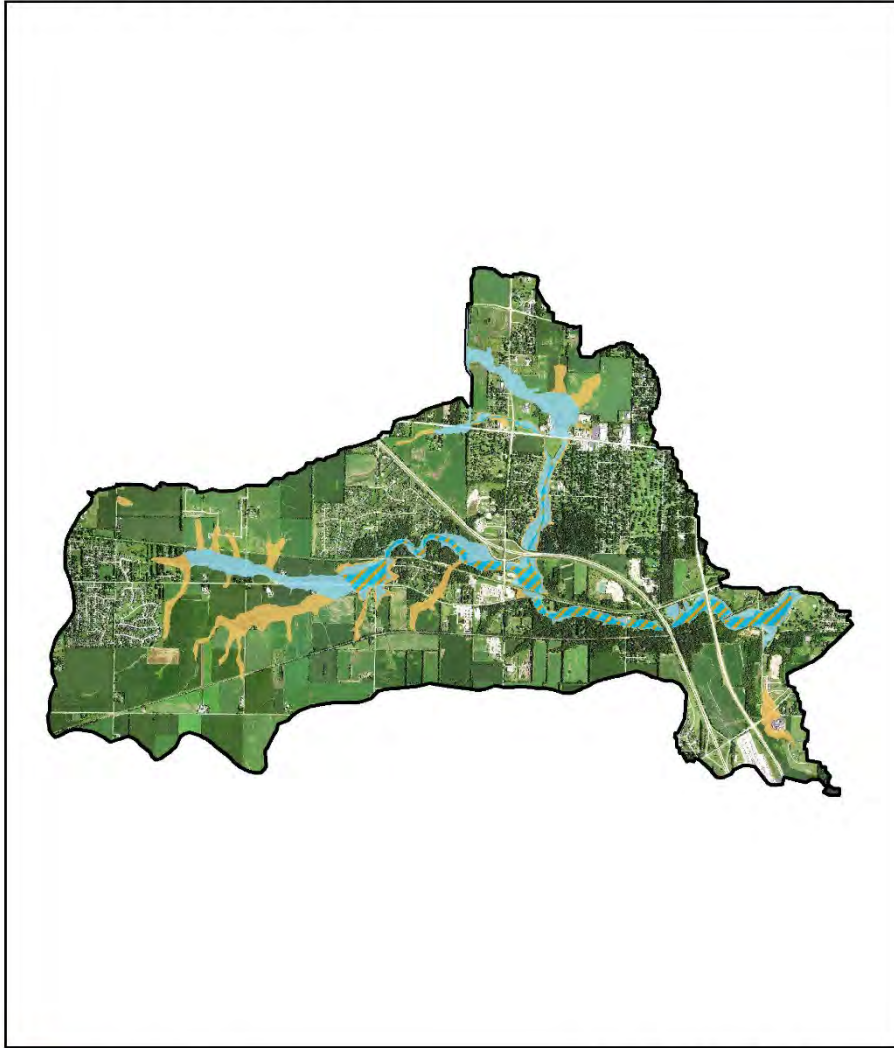
Alyssa Robinson

alyssa@olsonecosolutions.com

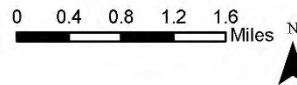
Rebecca Olson

rebecca@olsonecosolutions.com

South Fork Kent Creek Watershed FEMA Flood Hazard



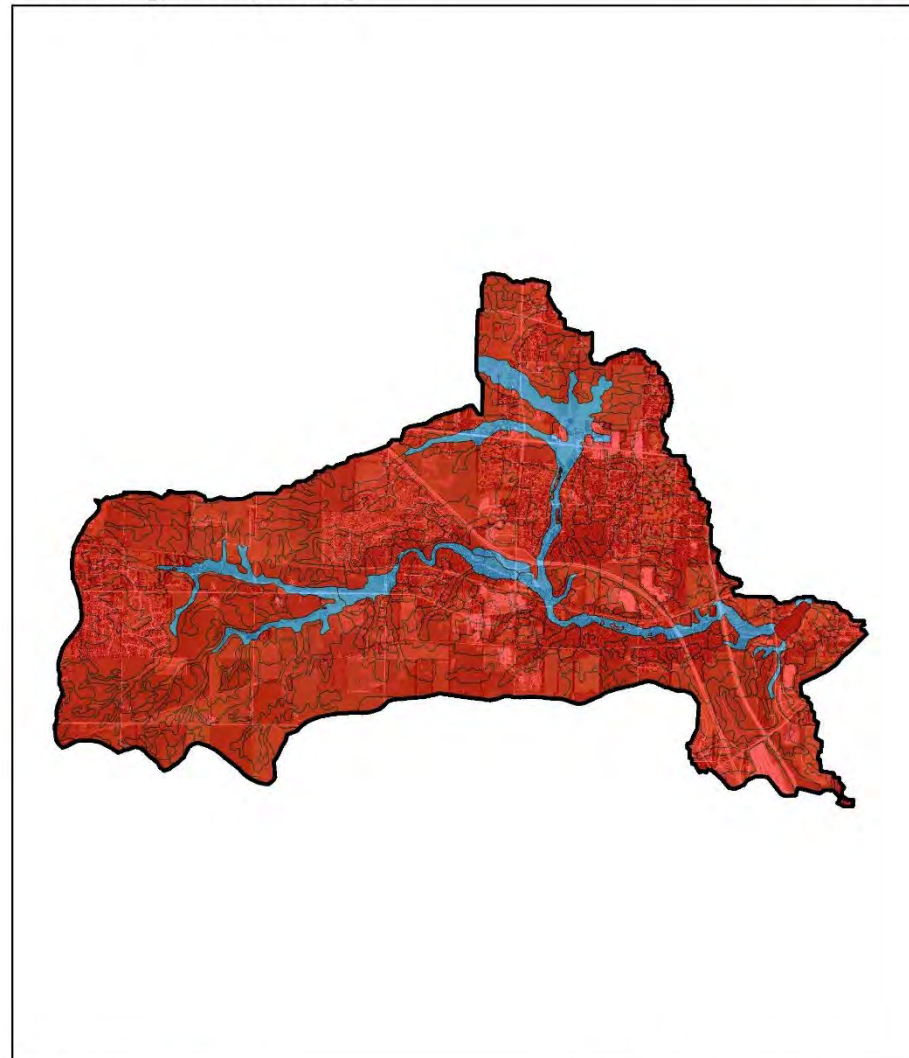
- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Floodway
- SFKC Watershed



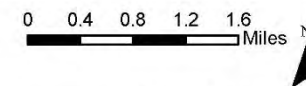
Data Sources: FEMA, USGS
Aerial Date: July 30, 2017
Edited: July 9, 2019

Map created by Kristin Adams with Tallgrass Restoration, LLC

South Fork Kent Creek Watershed Flooding Frequency



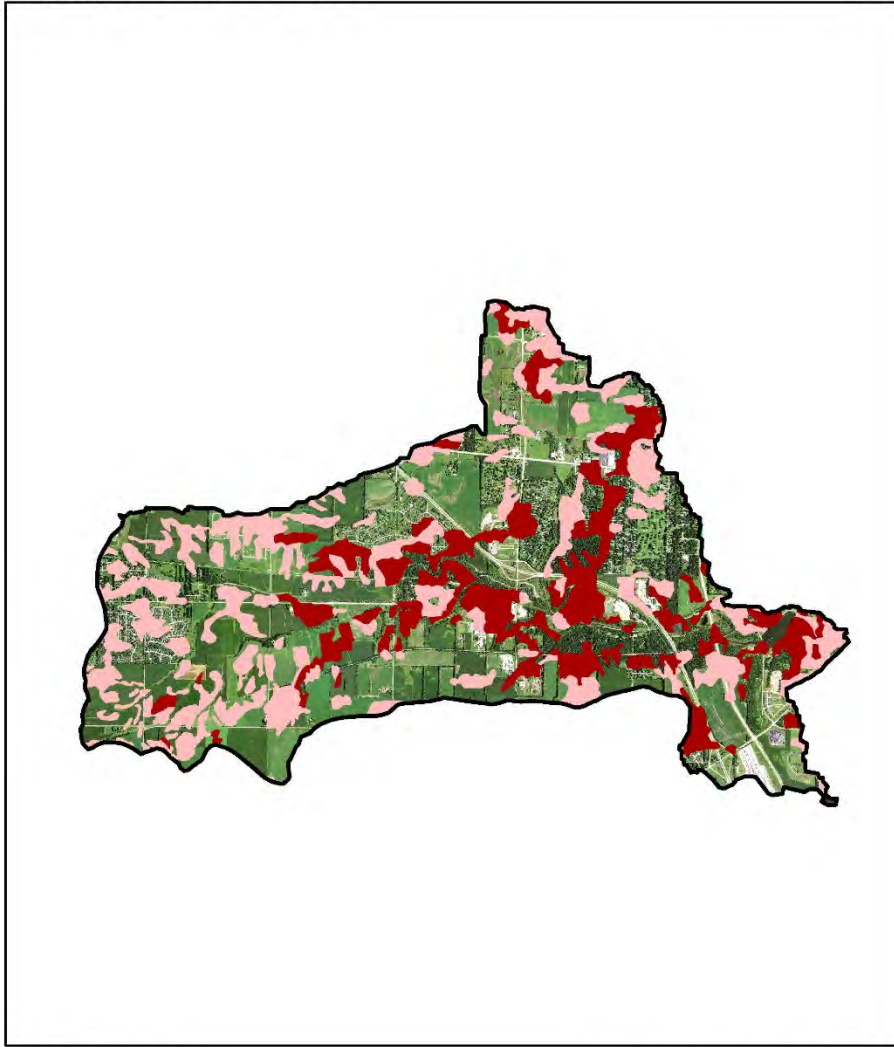
- SFKC Watershed
- None
- Very Rare
- Rare
- Occasional
- Frequent
- Very Frequent



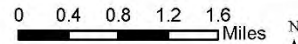
Data Sources: USGS, USDA NRCS
Aerial Date: July 30, 2017
Edited: July 18, 2019

Map created by Kristin Adams with Tallgrass Restoration, LLC

South Fork Kent Creek Watershed Highly Erodible Land

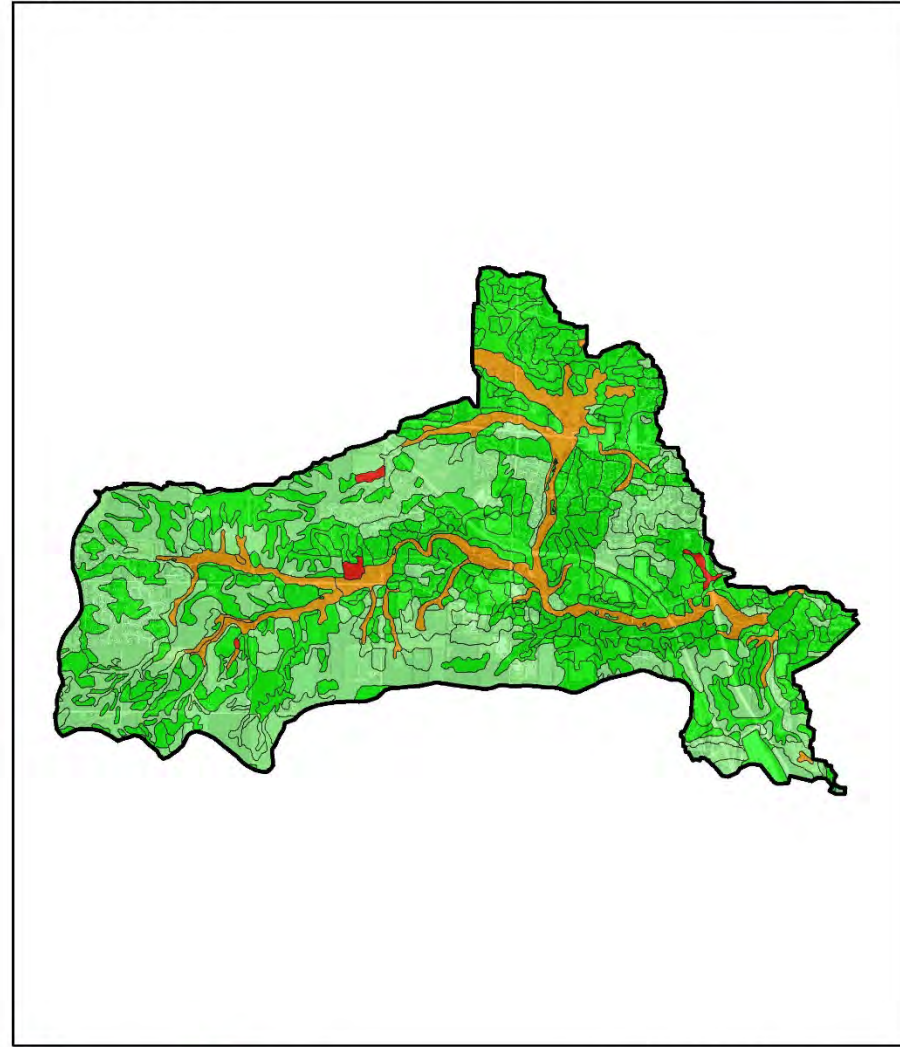


- SFKC Watershed
- Highly Erodible Land
- Potentially Highly Erodible Land

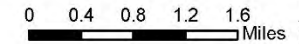


Data Sources: USGS, USDA NRCS
 Aerial Date: July 30, 2017
 Edited: July 18, 2019
 Map created by Kristin Adams with Tallgrass Restoration, LLC

South Fork Kent Creek Watershed Hydric Soils

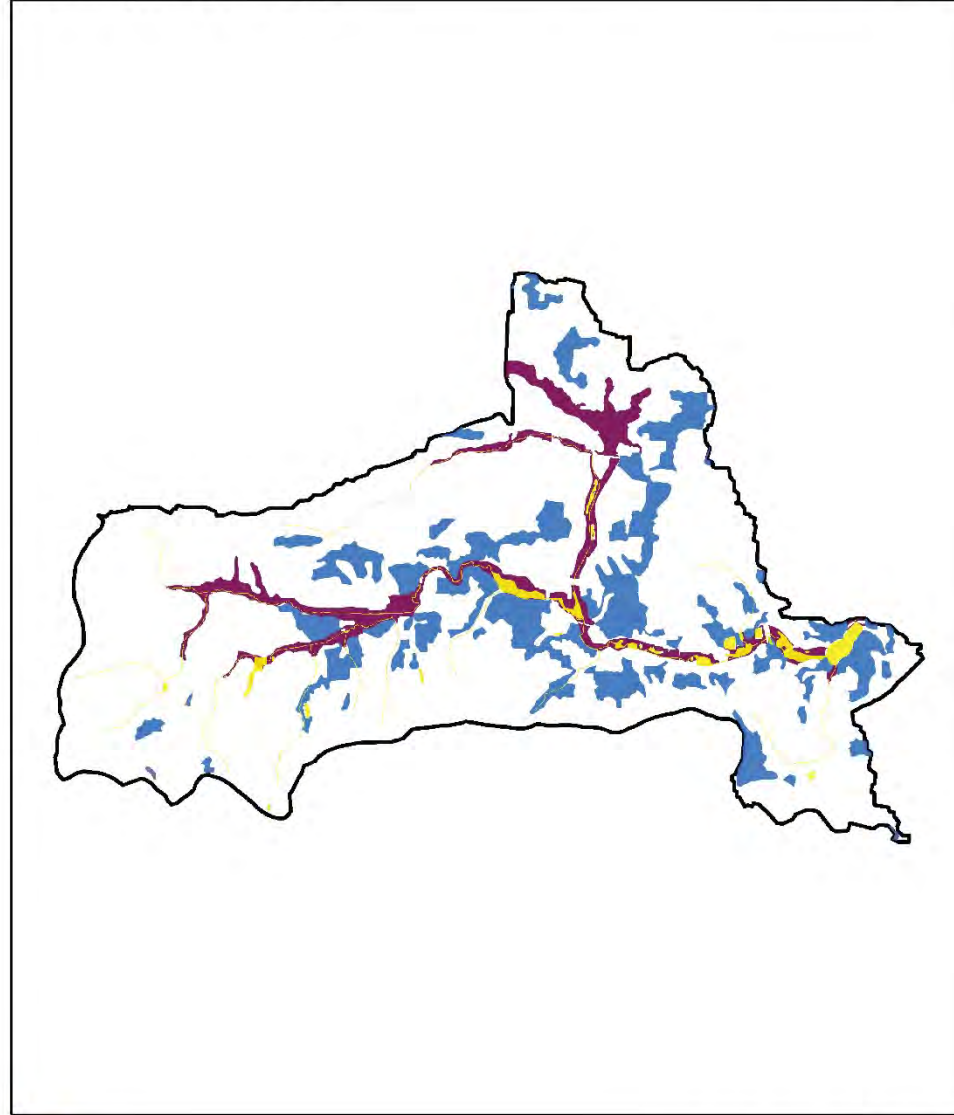


- SFKC Watershed
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

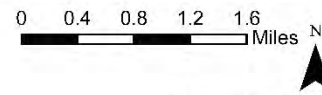


Data Sources: USGS, USDA NRCS
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 Map created by Kristin Adams with Tallgrass Restoration, LLC

South Fork Kent Creek Watershed Priority Area Map



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



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