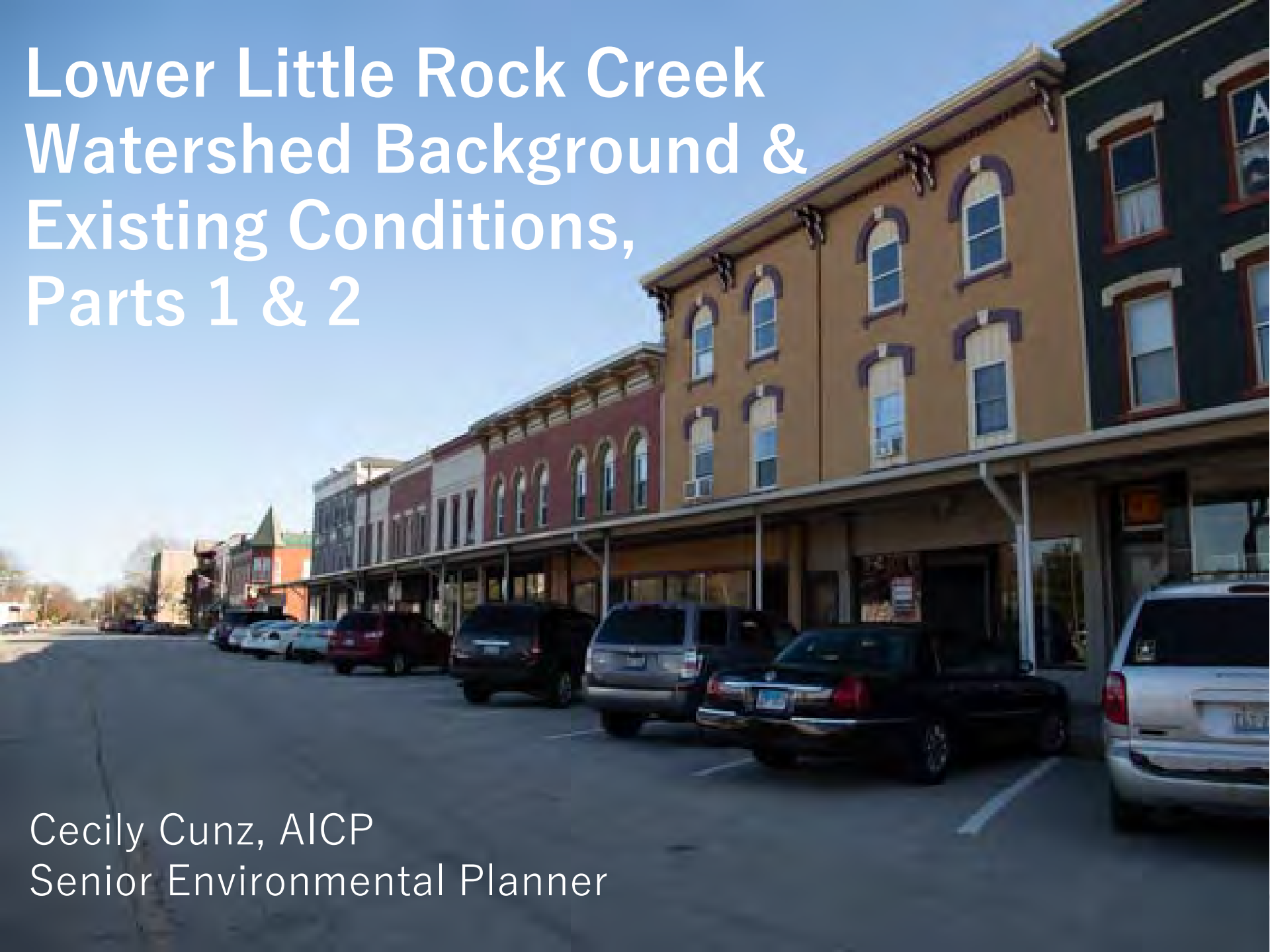
Lower Little Rock Creek Watershed Background & Existing Conditions, Parts 1 & 2



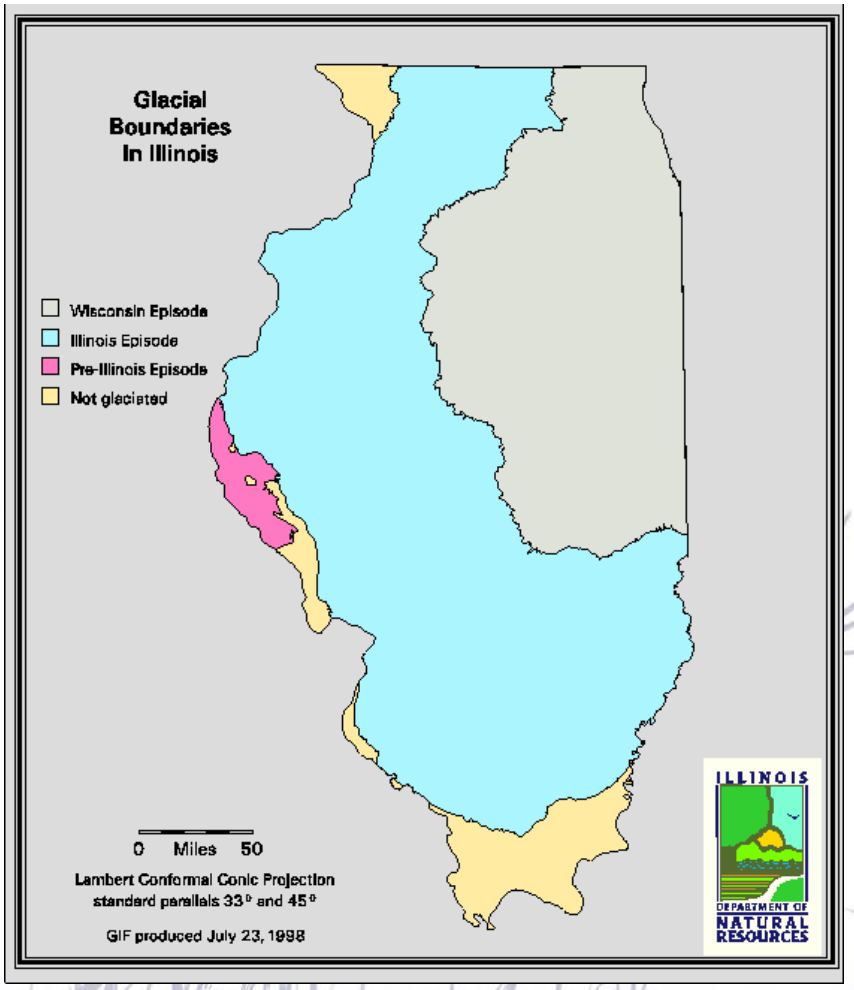
Cecily Cunz, AICP
Senior Environmental Planner

Key Discussion Topics

- Geology and Pre-Settlement Conditions
- Topography and Subwatersheds
- Pre-settlement Wetlands
- Jurisdictions & Demographics
- Existing & Future Land Use
- Impervious Cover
- Open Space Parcel Prioritization
- Important Natural Areas
- Green Infrastructure Network
- Cropland Data
- Groundwater

Geology & Soils

- Most recent “Wisconsin” glacier receded 14,000 years ago.
- Little Rock Creek watershed is located within the Sandwich Fault Zone
- Glacial drift, loess, and alluvium over dolomite, limestone, sandstone, and shale are remnants of glacial movement



Early History

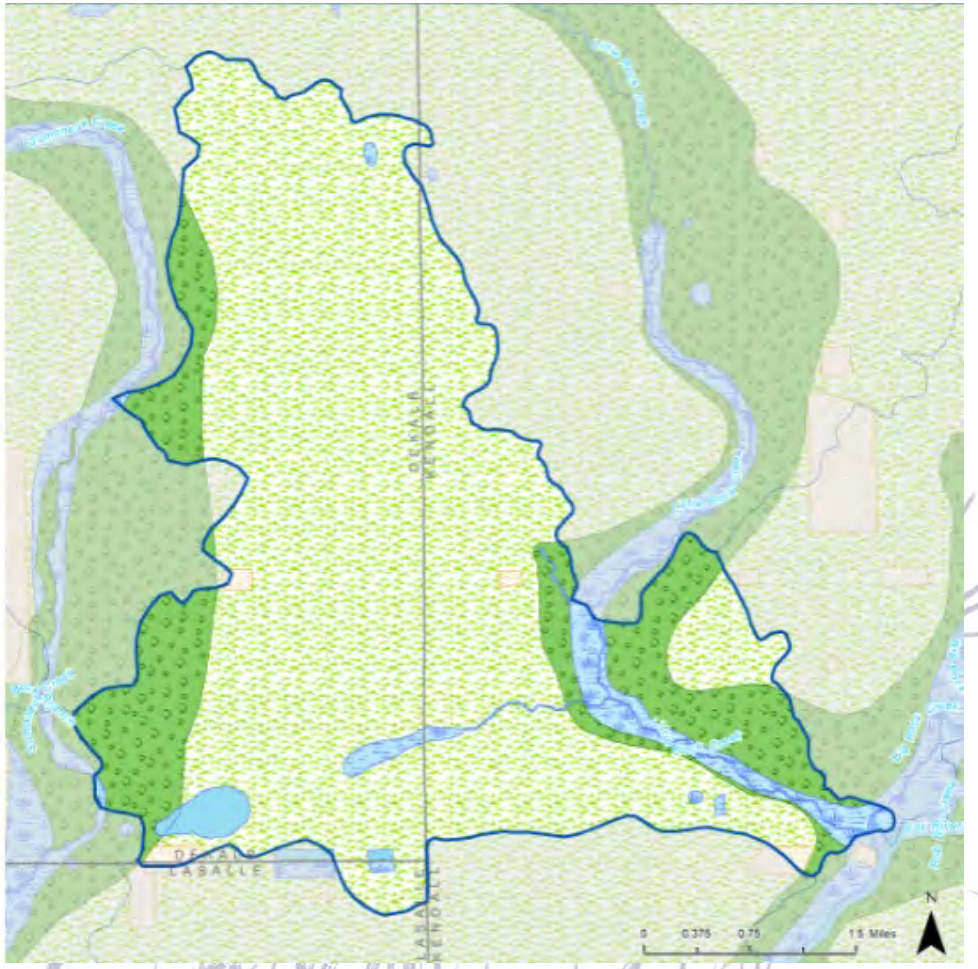
Described in *History of Dekalb County, Illinois* (1868) as:

"In the broad, billowy prairies, extending as far as the eye can reach, we have the element of vastness as in scarce any other land; we have a luxuriant sward of emerald greenness, clothing the whole land, down to the very margin of the waters; we have meandering streams, clear as crystal, now smooth, quiet and glassy, then ruffled by winds or rapids; we have clumps of trees, charming groves, disposed with an effect of beauty that might baffle a landscape gardener; now crowning the grassy height, now clothing the green slope with their pleasing shade. From the gentle heights of the rolling prairies, the country, even before the hand of man had broken its surface, wore the aspect of cultivated meadows and rich pasture grounds, irrigated by frequent rivulets."

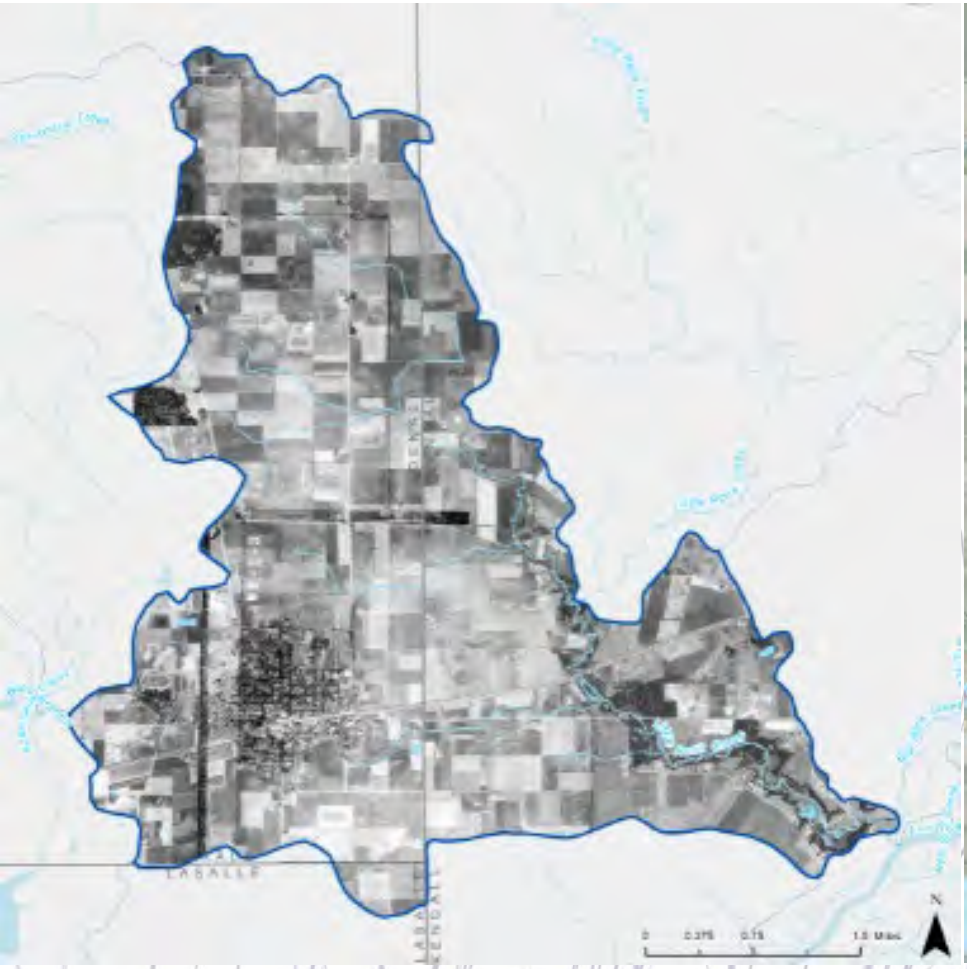
(Boies, 1868)

Pre-Settlement Landscape

Over 75% of the watershed was prairie, with less than 20% forest, and the remainder split between wetlands, water, and agricultural fields.



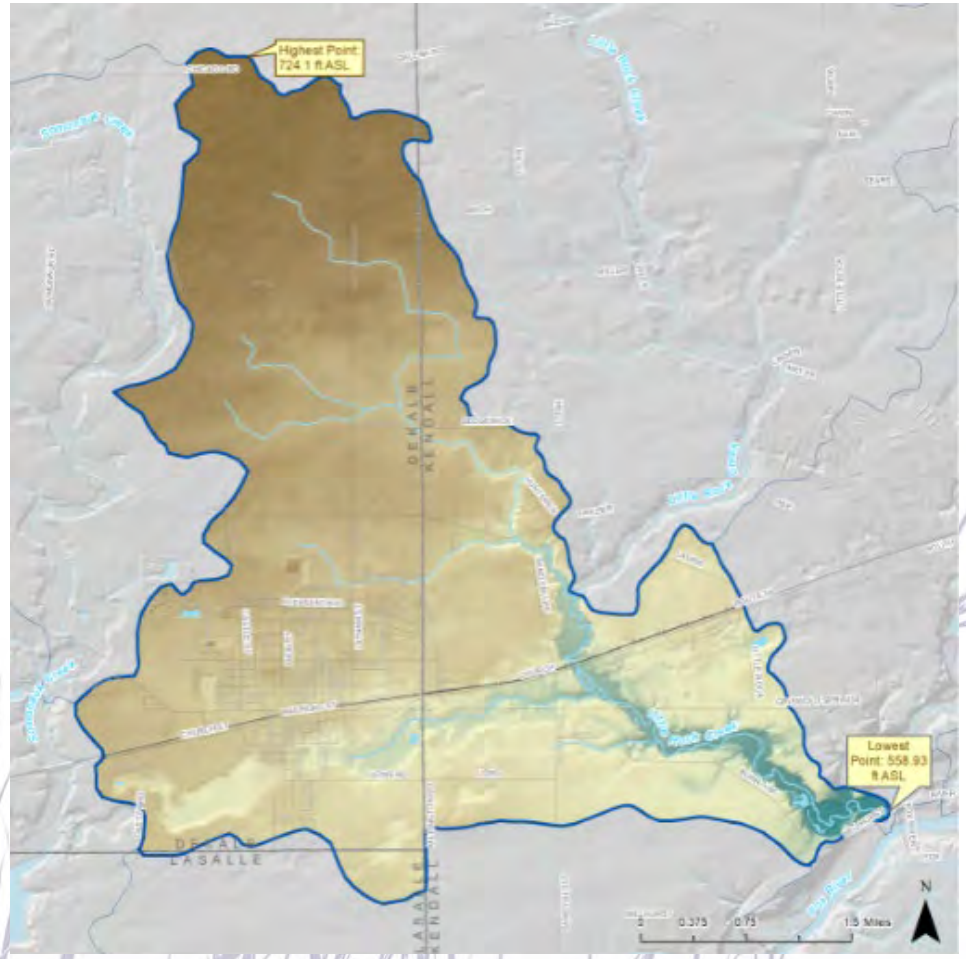
Historic (1939) & Current (2017) Aerial



Source: Google

Digital Elevation Model

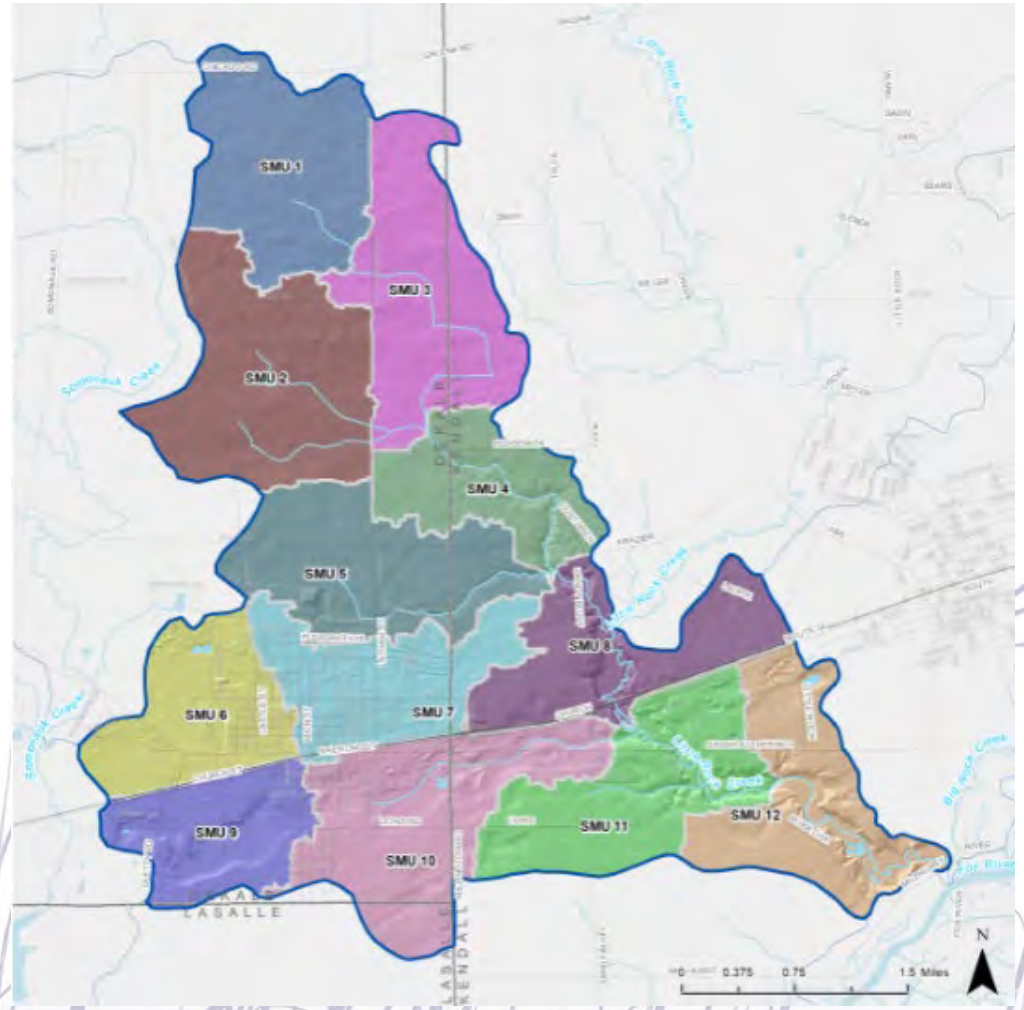
- Highest elevation is 724 ft ASL (north end)
- Lowest is 559 ft ASL (outlet at south)
- Flows northwest to southeast
- Difference of 165 ft
- Depicts steep valleys in the southern portion of watershed along Little Rock Creek



Subwatershed Management Units (SMU)

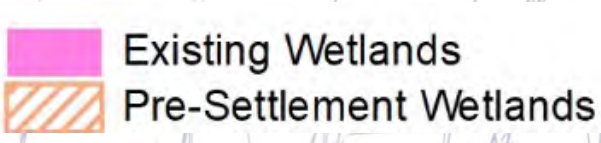
Subwatersheds allow for a detailed look at watershed characteristics and problem areas

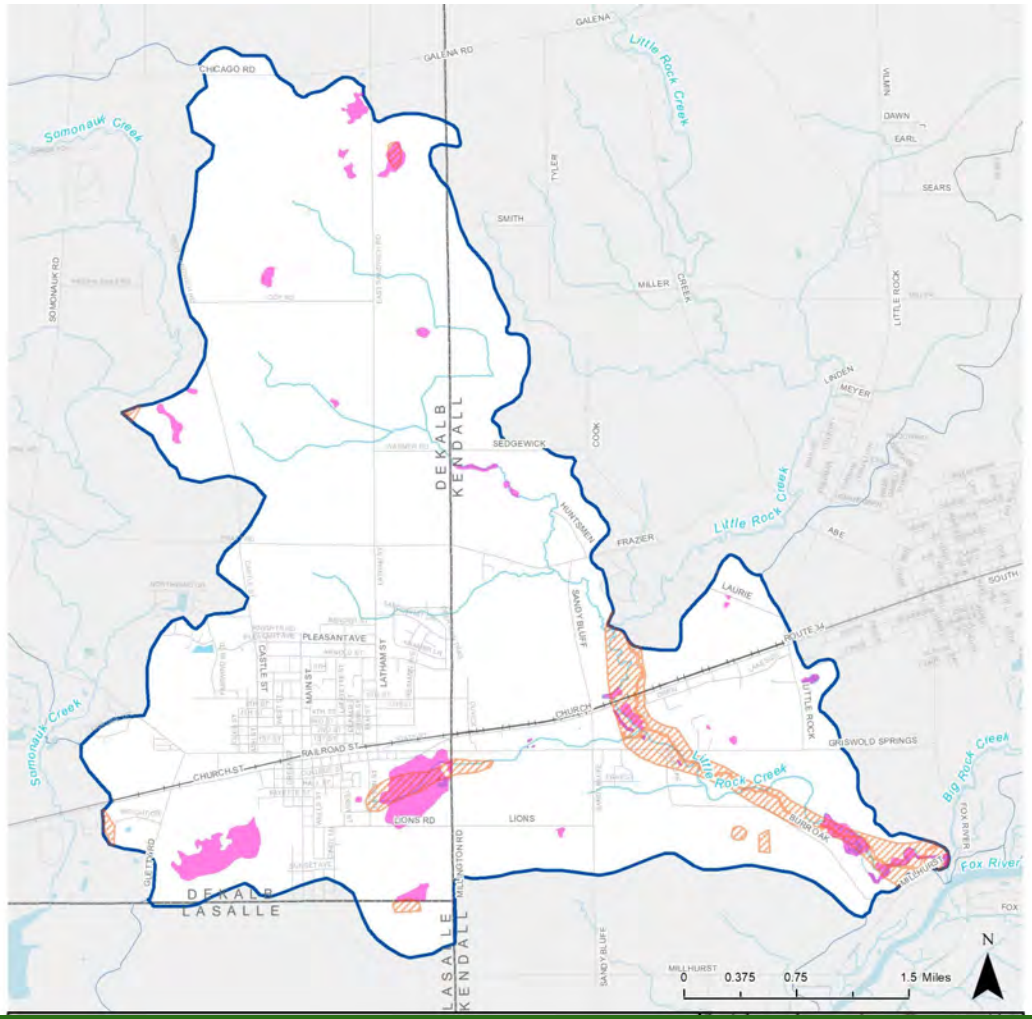
- 12 SMUs
- Range in size from 606.8 to 1,188.3 acres



Pre-Settlement & Existing Wetlands

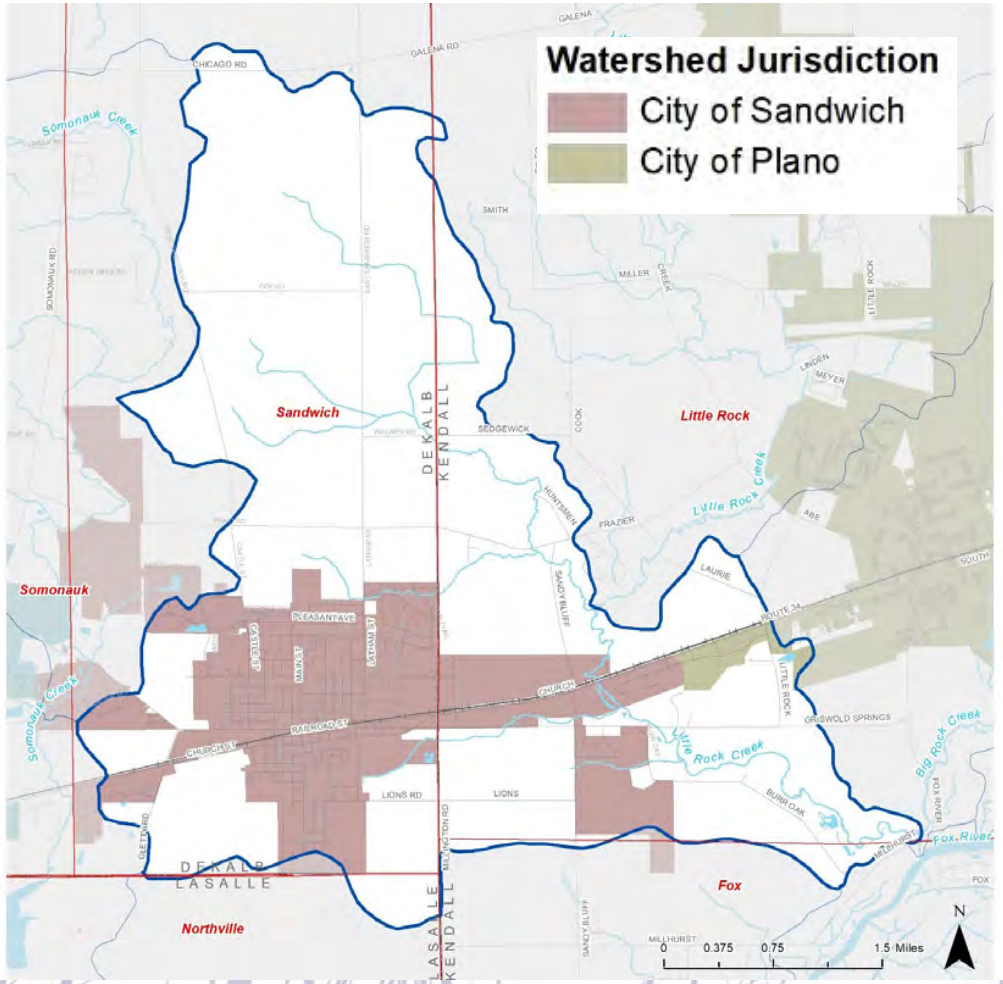
Historically about 1,776 acres of wetlands. According to current wetland inventories only 309 acres remain, or a loss of 83%.





Jurisdictions

Jurisdiction	Area (Acres)	% of Watershed
County		
DeKalb County	6,353.7	60.3%
Kendall County	4,058.6	38.5%
LaSalle County	128.8	1.2%
Total	**10,541.1**	**100.0%**
Unincorporated Township Areas		
Unincorporated Fox Township	126.8	1.2%
Unincorporated Little Rock Township	3,132.4	29.7%
Unincorporated Northville Township	125.4	1.2%
Unincorporated Sandwich Township	4,647.1	44.1%
Total	**8,031.7**	**76.2%**
Municipalities		
City of Sandwich	2,392.5	22.7%
City of Plano	116.9	1.1%
Total	**2,509.4**	**23.8%**



Levels of Jurisdictions

Level of Jurisdiction	Entities
Federal	US Environmental Protection Agency (USEPA)
	- Office of Water
	US Army Corps of Engineers (USACE)
	US Department of Agriculture (USDA)
	- Natural Resources Conservation Service (NRCS)
	- Farm Service Agency (FSA)
	- Agricultural Research Service (ARS)
	- Forest Service (FS)
	- National Institute of Food and Agriculture (NIFA)
	- Rural Utilities Service (RUS)
	US Fish and Wildlife Service (USFWS)
	US Department of Transportation (USDOT)
	- Federal Aviation Administration (FAA)
State	Illinois Environmental Protection Agency (IEPA)
	- Bureau of Land
	- Bureau of Water
	Illinois Department of Natural Resources (IDNR)
	- Office of Water Resources (OWR)
	- Illinois Nature Preserves Commission (INPC)
	Illinois Department of Agriculture (IDOA)
	Illinois Department of Transportation (IDOT)

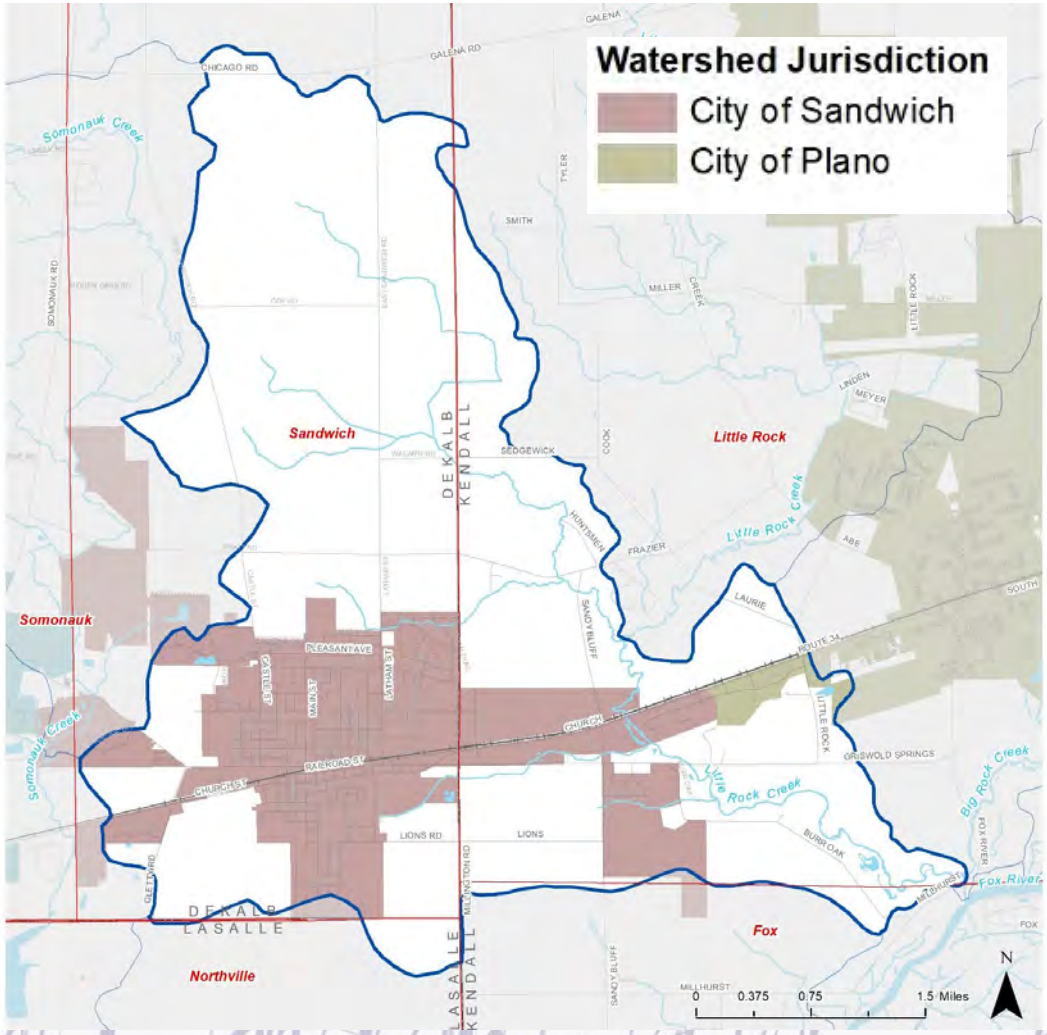
Level of Jurisdiction	Entities
County	DeKalb County Board
	DeKalb County Community Development Department
	DeKalb County Health Department
	DeKalb County Highway Department
	DeKalb County Soil and Water Conservation District
	DeKalb County Forest Preserve
	Kendall County Board
	Kendall County Planning, Building, and Zoning Department
	Kendall County Highway Department
	Kendall County Forest Preserve District
	LaSalle County Board
	LaSalle County Environmental Services and Land Use Department
	LaSalle County Highway Department
	LaSalle County Parks Department
Local	City of Sandwich
	City of Plano
	Unincorporated Fox Township
	Unincorporated Little Rock Township
	Unincorporated Northville Township
	Unincorporated Sandwich Township
Special	Drainage Districts
	DeKalb County Regional Office of Education
	Regional Office of Education #35
	Kendall County Regional Office of Education

Ordinance Review

Conducting Ordinance Review

- DeKalb County
- Kendall County
- LaSalle County
- Sandwich
- Plano

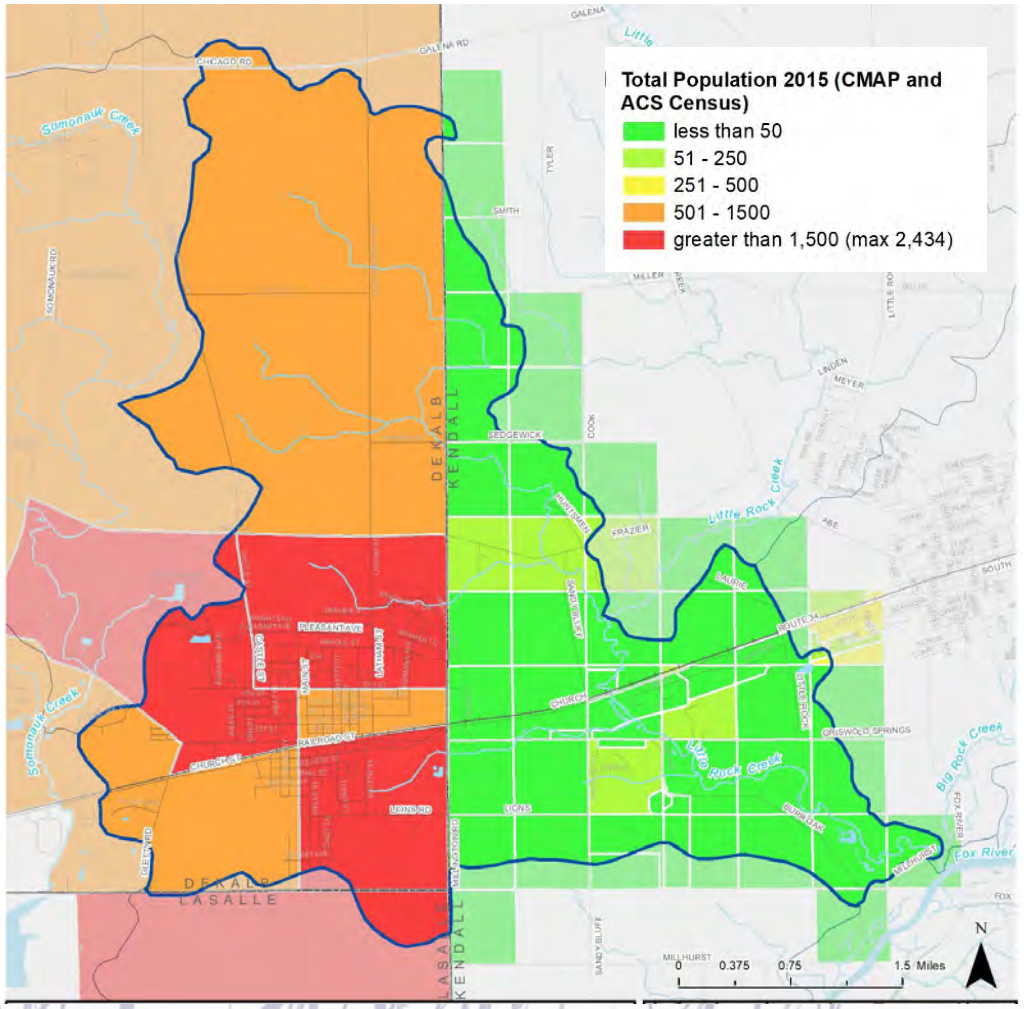
Dekalb and Kendall County have already returned results



Demographics - Population

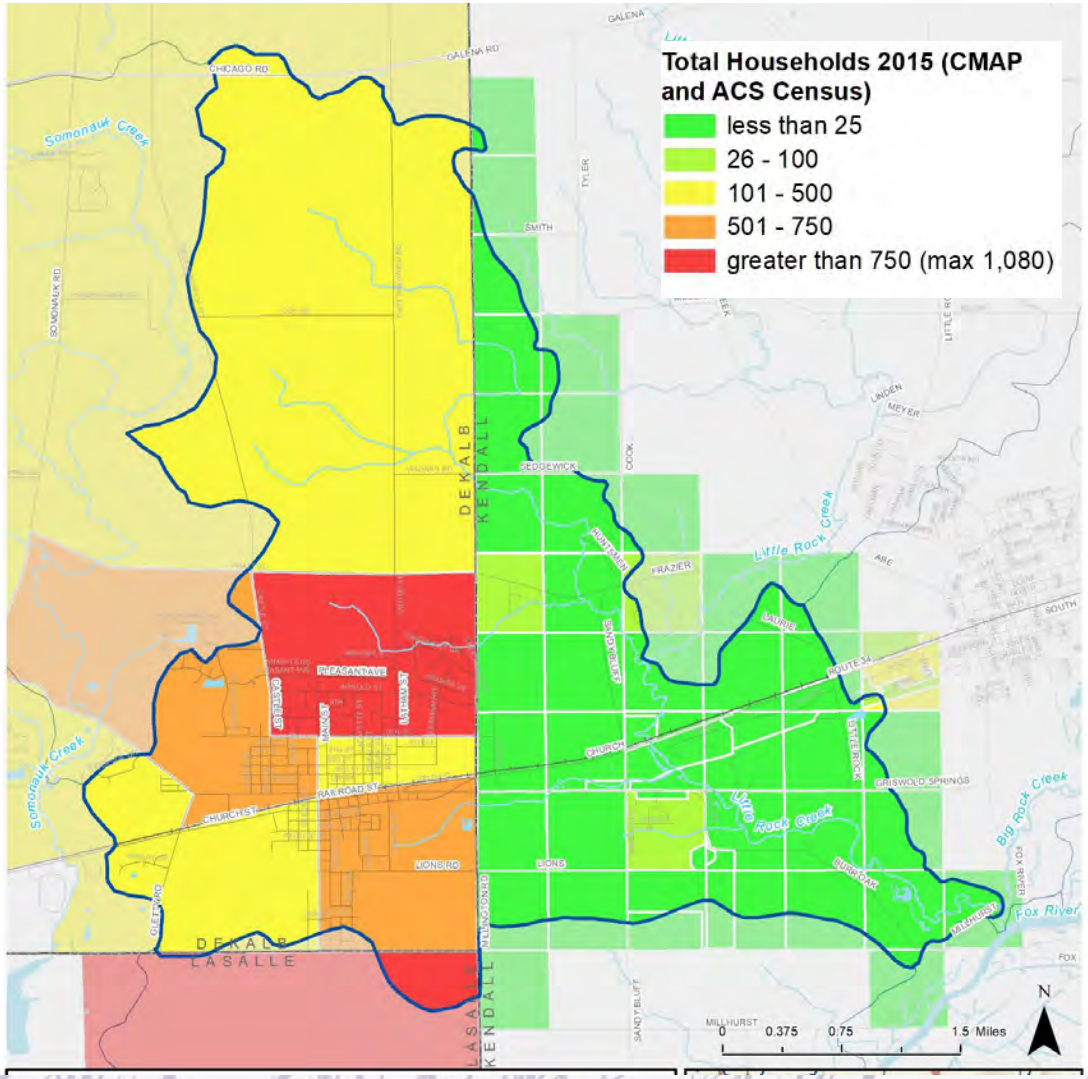
Demographics data based on CMAP data (Kendall) and the American Community Survey 2015 data (Dekalb and Lasalle)

Total population in 2015 is 13,222 (slight over estimation)



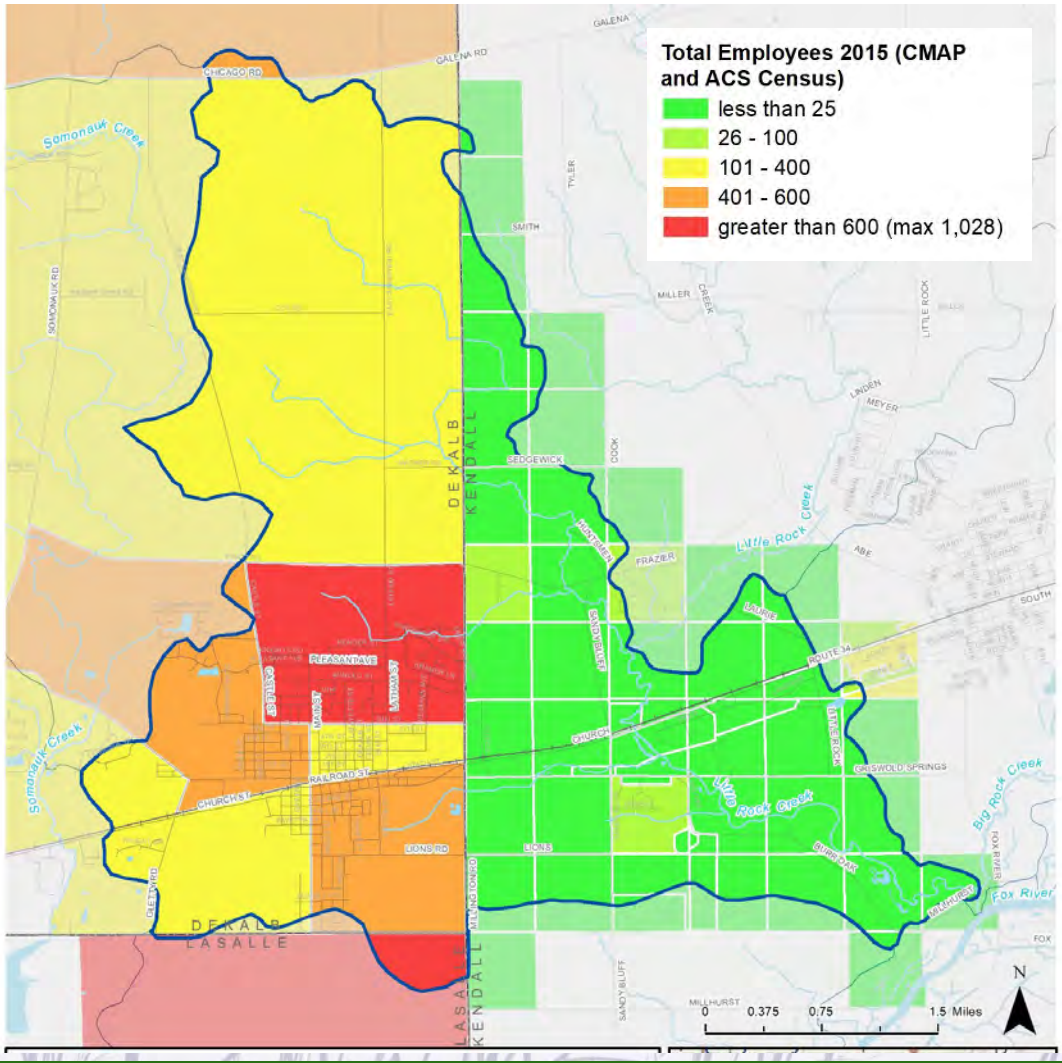
Demographics - Households

4,867 total households in 2015 (slight over estimation)



Demographics –Employed Population

Employed population of 7,143 in 2015 (slight over estimation)

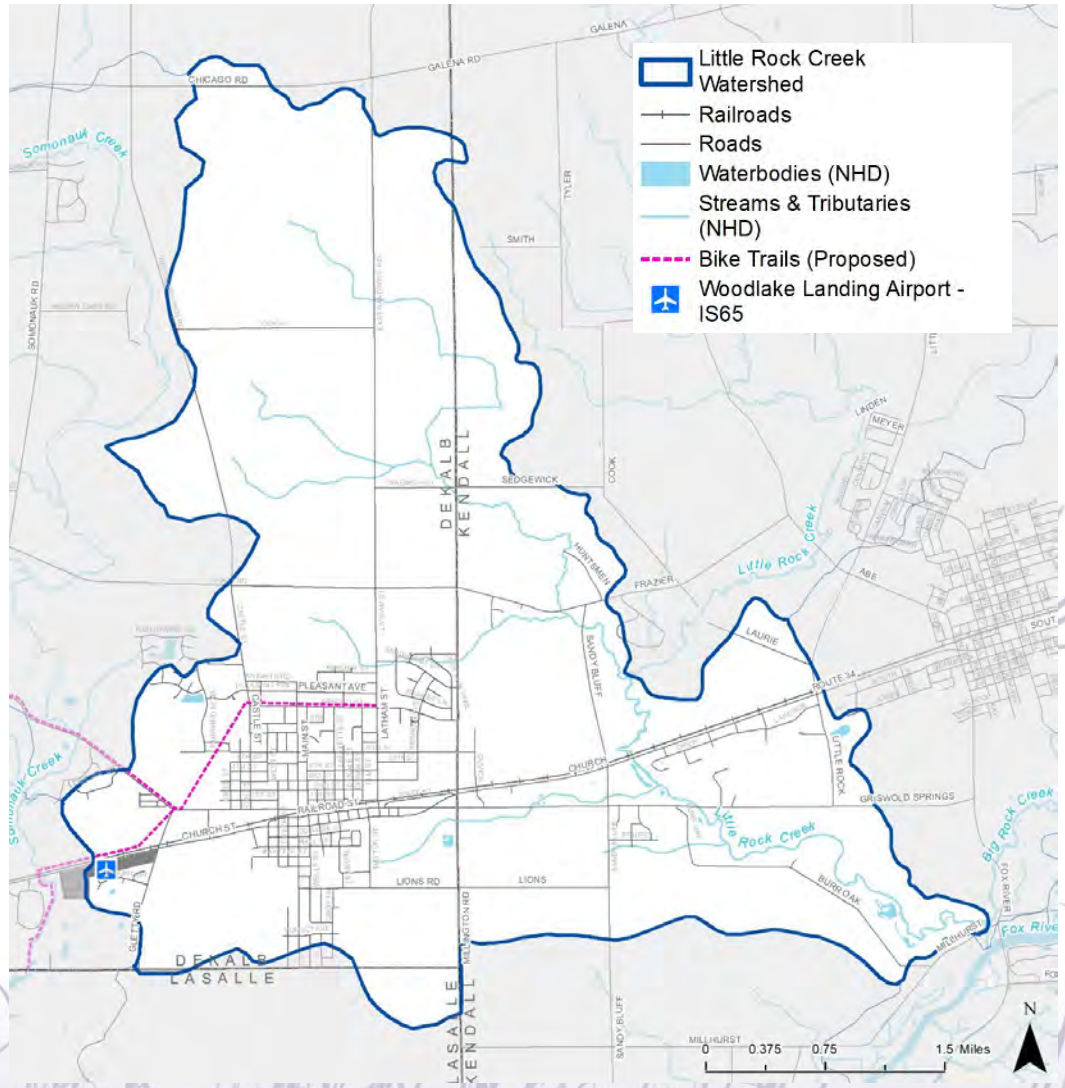


Transportation Network

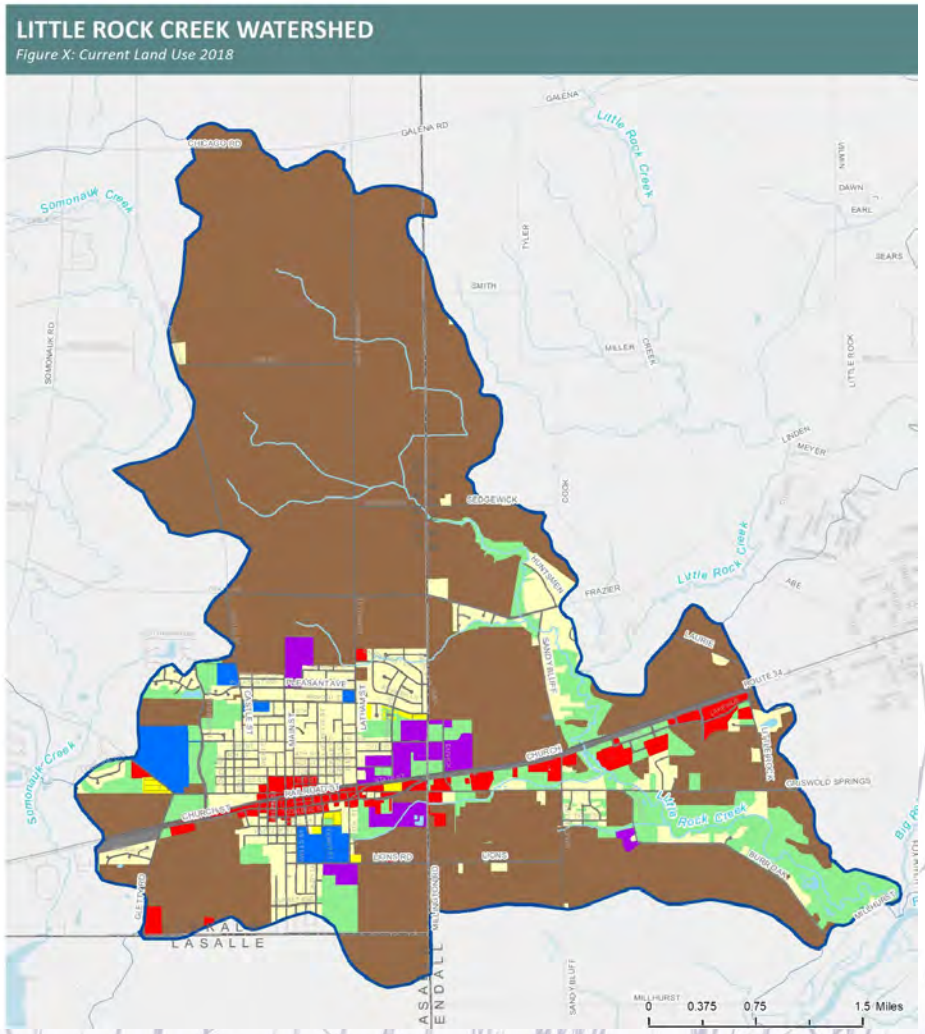
Roads
- 69 miles of roads

Railroad
- Runs east-west
- Primarily used to transport freight

Walking/Bike Trails
- Not an extensive trail network
- 2.6 miles of proposed trails



Existing (2018) Land Use

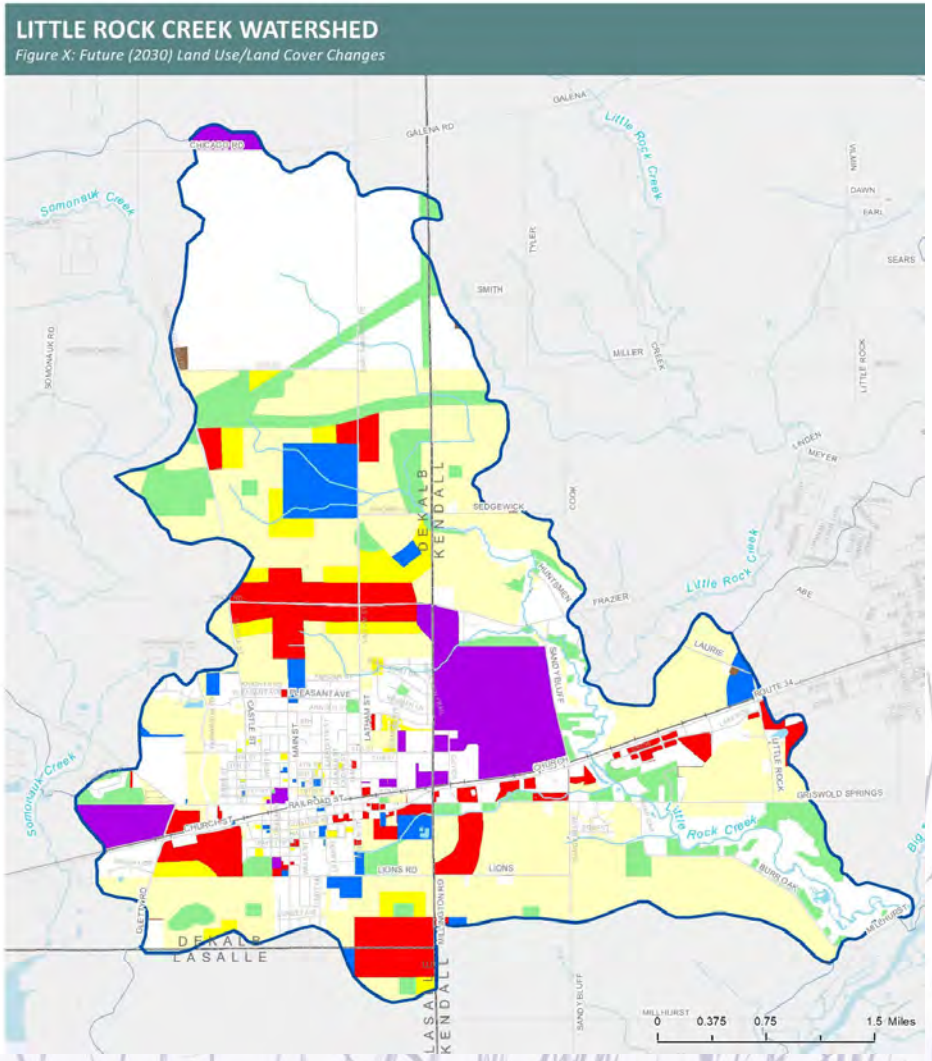


- 68% Agriculture
- 10% Single Family Residential
- 9% Open Space
- 6% Transportation
- 2% each Commercial/ Retail, Industrial, Municipal/Institutional
- Remaining Multi-Family, Water & Utility

Current Land Use

- Agriculture
- Single Family Residential
- Multi-Family Residential
- Res/Commercial Mixed
- Commercial/Retail
- Industrial/Business Pk
- Industrial
- Municipal/Institutional
- Open Space
- Wetlands
- Transportation/Utility

Future (2030) Land Use Changes



- Only loss is in Agricultural land (-5,665 ac. or -54%)
- Biggest gain is in Single Family Residential (+3,255 ac. or +31%)
- +7% (+701 acres) of Commercial/Retail
- +5% each of Industrial & Open Space

Future Land Use

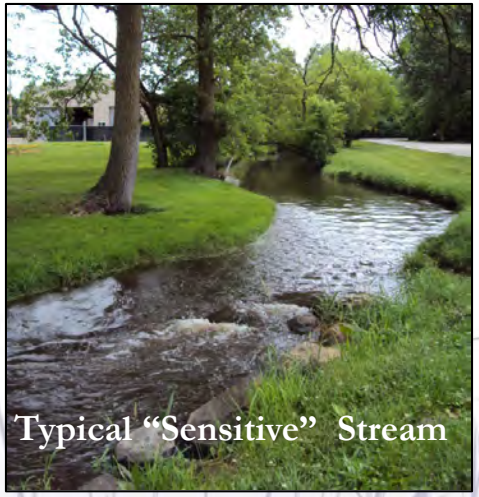
- Agriculture
- Single Family Residential
- Multi-Family Residential
- Res/Commercial Mixed
- Commercial/Retail
- Industrial/Business Pk
- Industrial
- Municipal/Institutional
- Open Space
- Wetlands
- Transportation/Utility

Impervious Cover Impacts on Streams

As impervious cover increases stream morphology degrades, pollutants & temperatures increase, flow/volume increases, and habitat degrades.

Category	% Impervious	Stream Condition within Subwatershed
Sensitive	<10%	Stable stream channels, excellent habitat, good water quality, and diverse biological communities
Impacted	>10% but <25%	Somewhat degraded stream channels, altered habitat, decreasing water quality, and fair-quality biological communities.
Non-Supporting	>25%	Highly degraded stream channels, degraded habitat, poor water quality, and poor-quality biological communities.

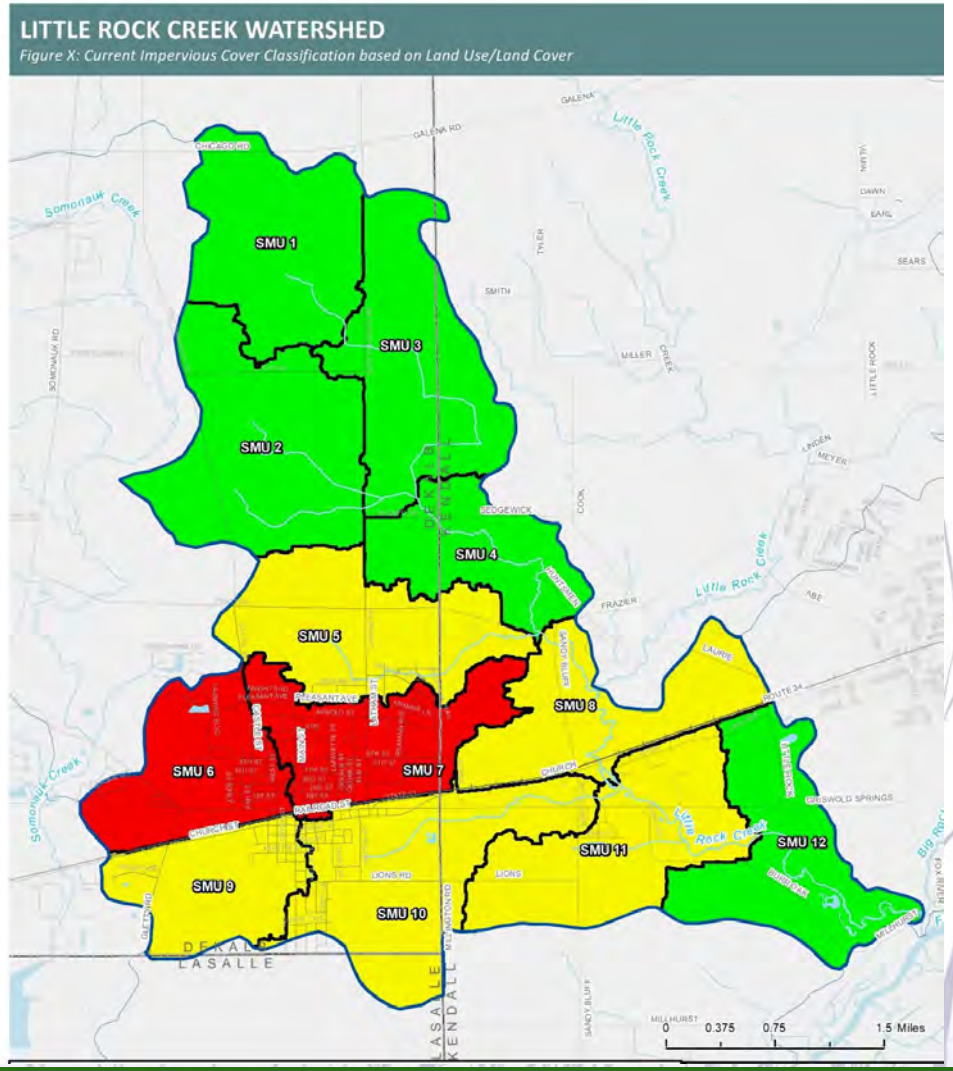
Source: Center for Watershed Protection


Typical "Sensitive" Stream


Typical "Impacted" Stream


Typical "Non-Supporting" Stream

Existing Impervious Cover

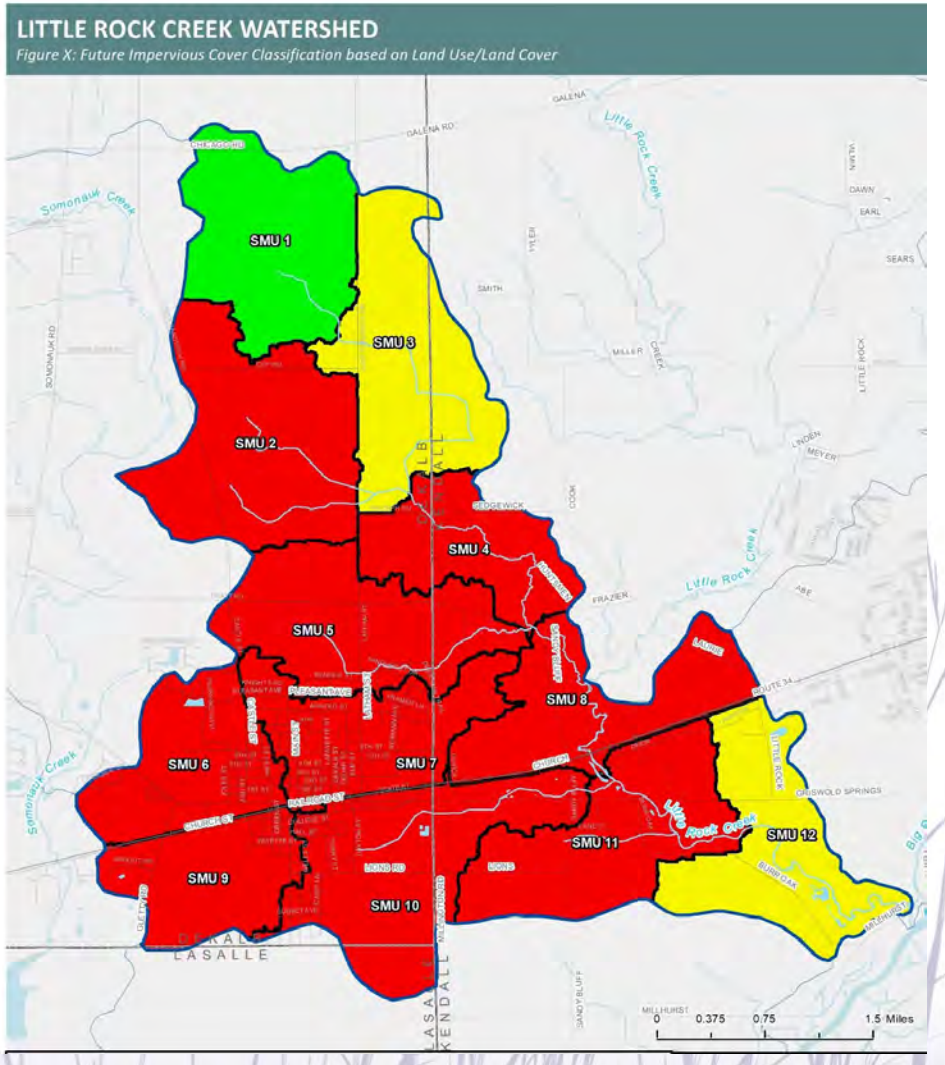


Based on existing land use/land cover (2018)

- 5 SMUs classified as Sensitive
- 5 SMUs classified as Impacted
- 2 SMUs classified as Non-Supporting

Sensitive (<10%)
Impacted (>10% but <25%)
Non-Supporting (>25%)

Future Impervious Cover

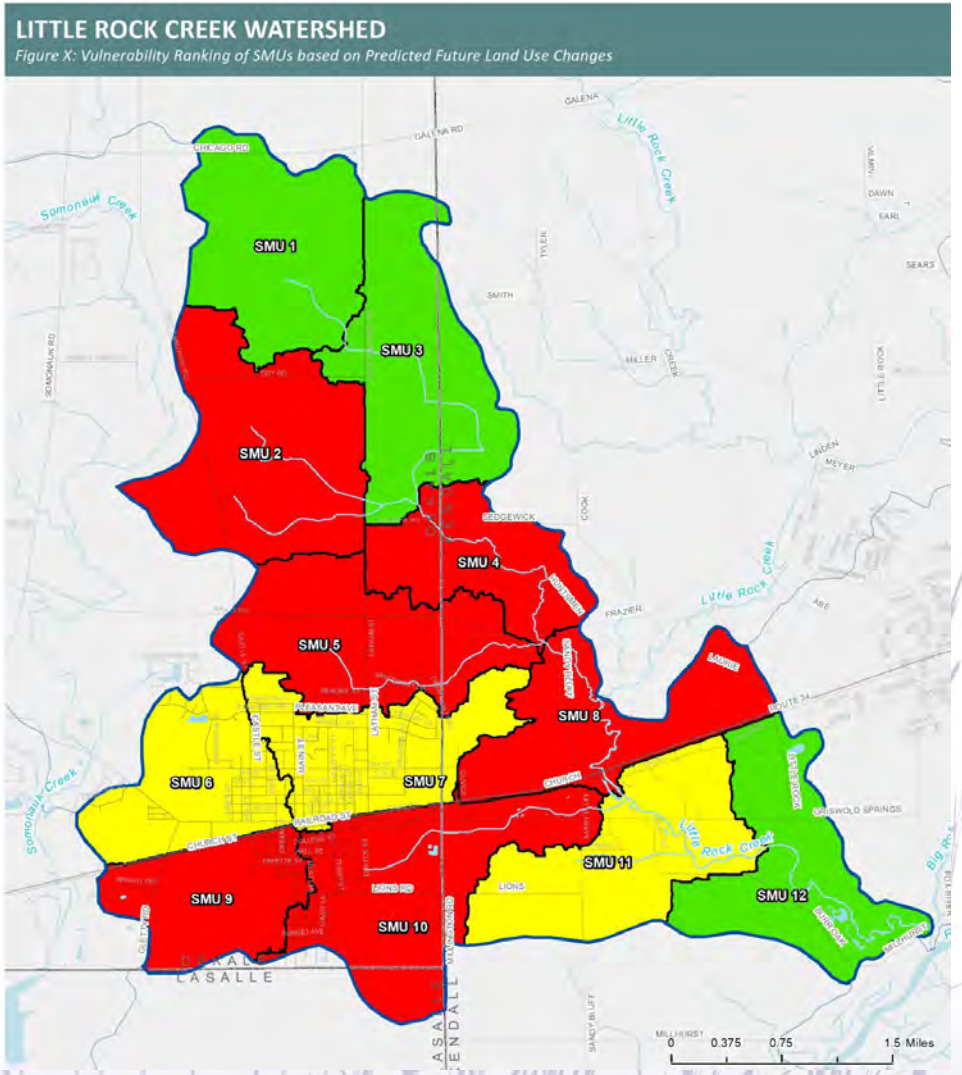


Based on 2030 land use predictions

- 1 SMU classified as Sensitive
- 2 SMUs classified as Impacted
- 9 SMUs classified as Non-Supporting

Sensitive (<10%)
Impacted (>10% but <25%)
Non-Supporting (>25%)

Future Vulnerability to Development



Vulnerability Ranking

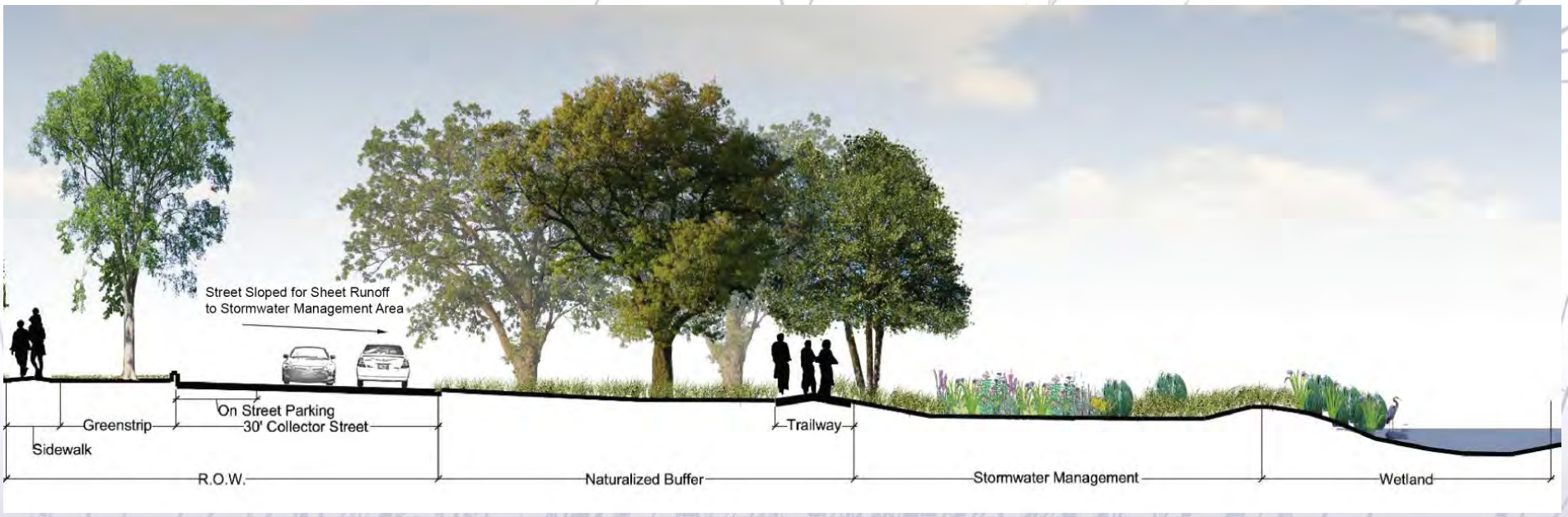
- 6 High
- 3 Medium
- 3 Low

Vulnerability Ranking

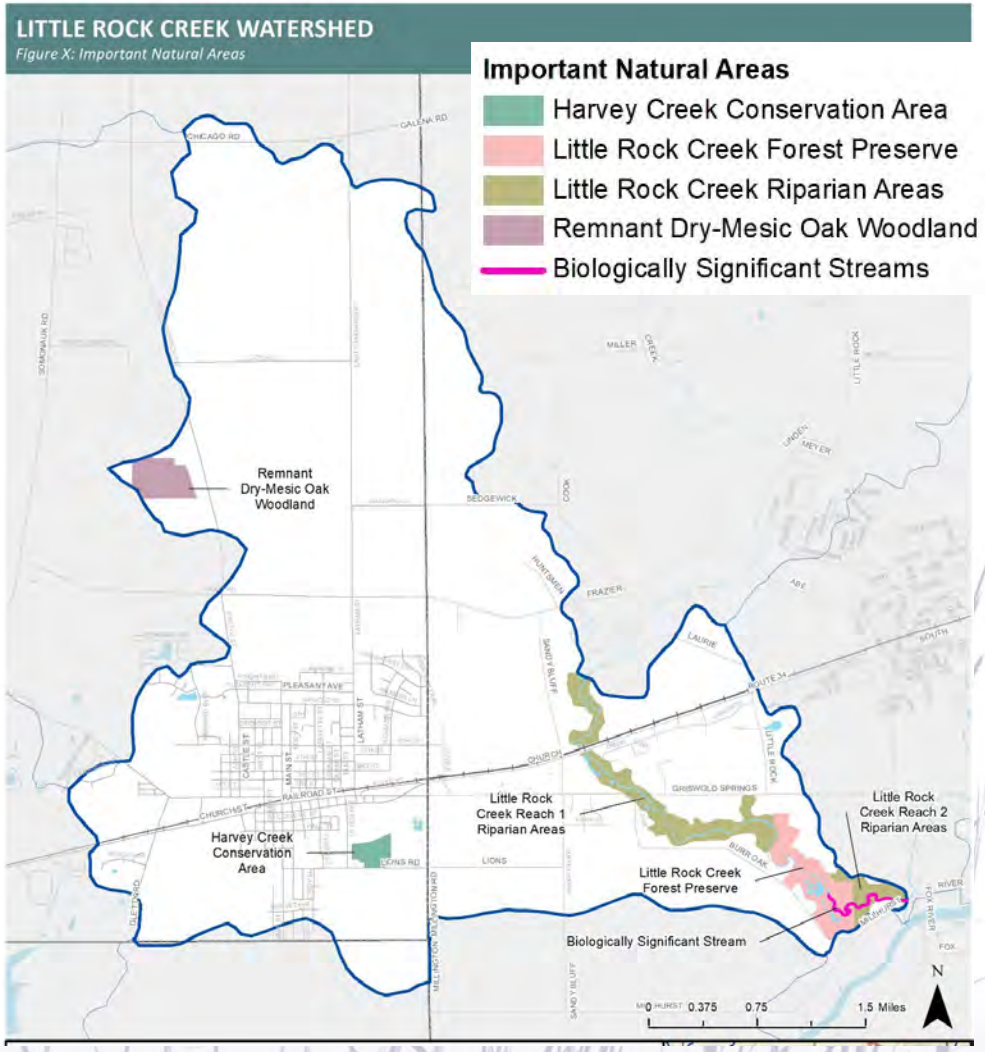
- High
- Medium
- Low

Conservation Design or Low Impact Development

- Also known as cluster or open space design
- Preserves natural areas and features
- Maintains density by allowing smaller lots clustered around larger areas of open space



Important Natural Areas



- Harvey Creek Conservation Area
- Little Rock Creek Forest Preserve
- Little Rock Creek Reach 1 & 2 Riparian Areas
- Dry-Mesic Oak Woodland
- Biologically Significant Stream

Harvey Creek Conservation Area

30-acre park owned by Sandwich Park District including restored wetlands and prairies. A paved circular walking path with interpretive signs and picnic area provides recreational opportunities for visitors.

Little Rock Creek Forest Preserve

Preserve is a 133-acre mesic and floodplain oak woodland owned by Kendall County FPD. It sits within a steep valley along 1.3 miles of Little Rock Creek Reach 2.

Little Rock Creek

237 acres along LRC Reaches 1 & 2 including high quality trees such as sycamore, oak, maple, basswood, and hackberry, but degrading over time.

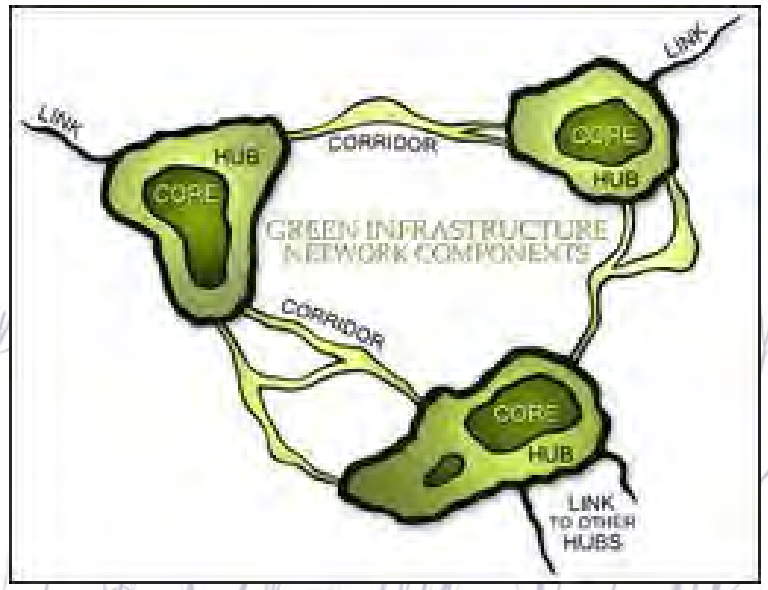
4,600 LF of Little Rock Creek classified as Biologically Significant by IDNR.

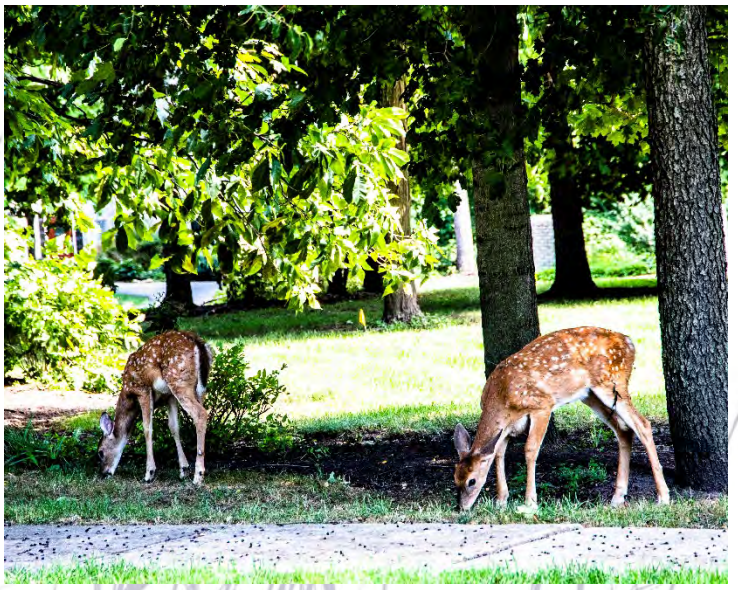
Dry-Mesic Oak Woodland

Remnant dry-mesic oak woodland is located west of West Sandwich Rd and north of Pratt Rd. It is located on private land and consists of old growth oaks.

Importance of Green Infrastructure

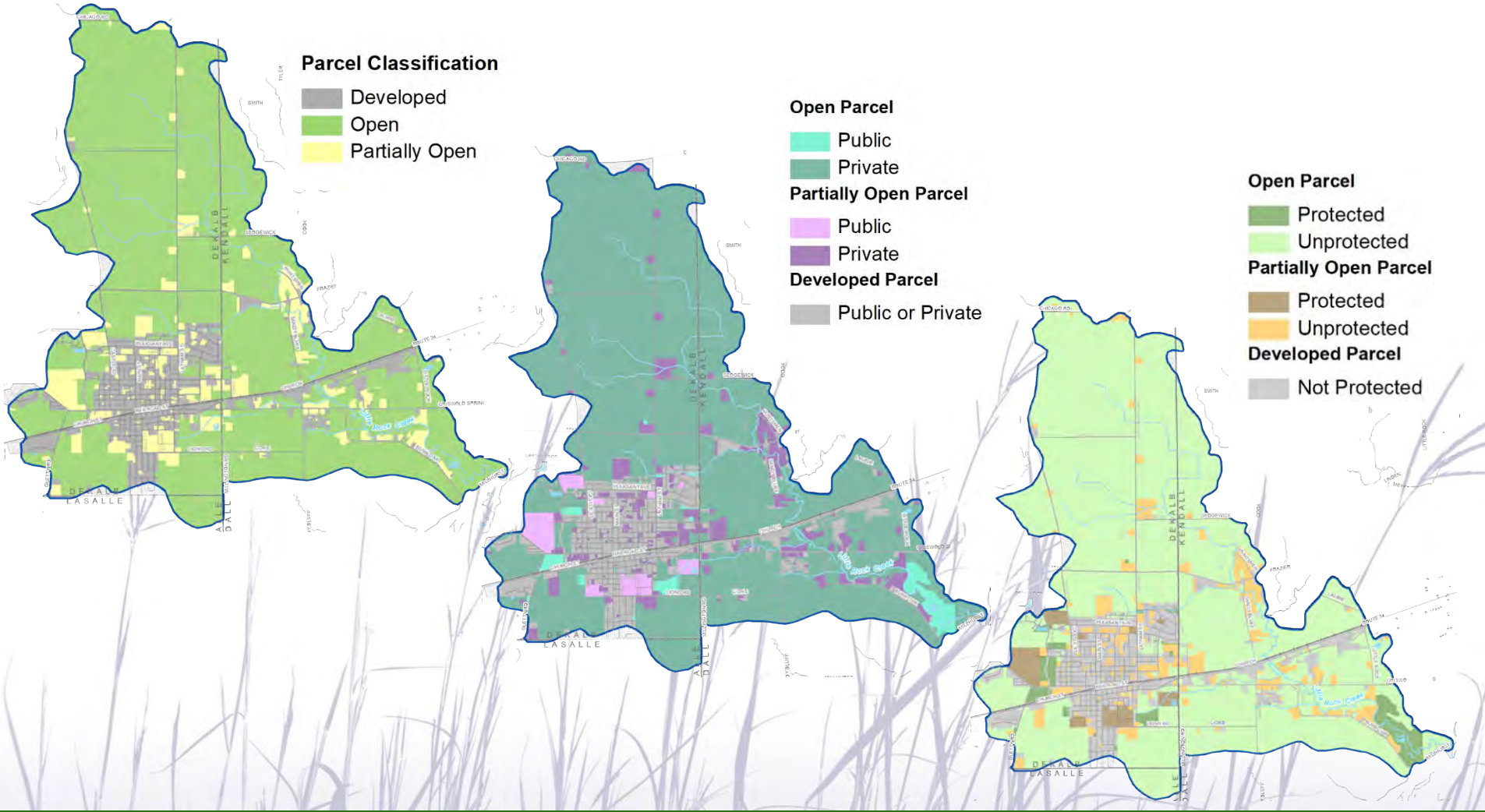
Green Infrastructure is a connected system of *Hubs* and linking *Corridors* that conserves open space for ecological function, cleans water, benefits a range of species, and reduces flooding.





Developing a Green Infrastructure Network

Parcel-Based Open Space Inventory & Analysis



Developing a Green Infrastructure Network

Open and partially open parcels are prioritized based on criteria important to green infrastructure.

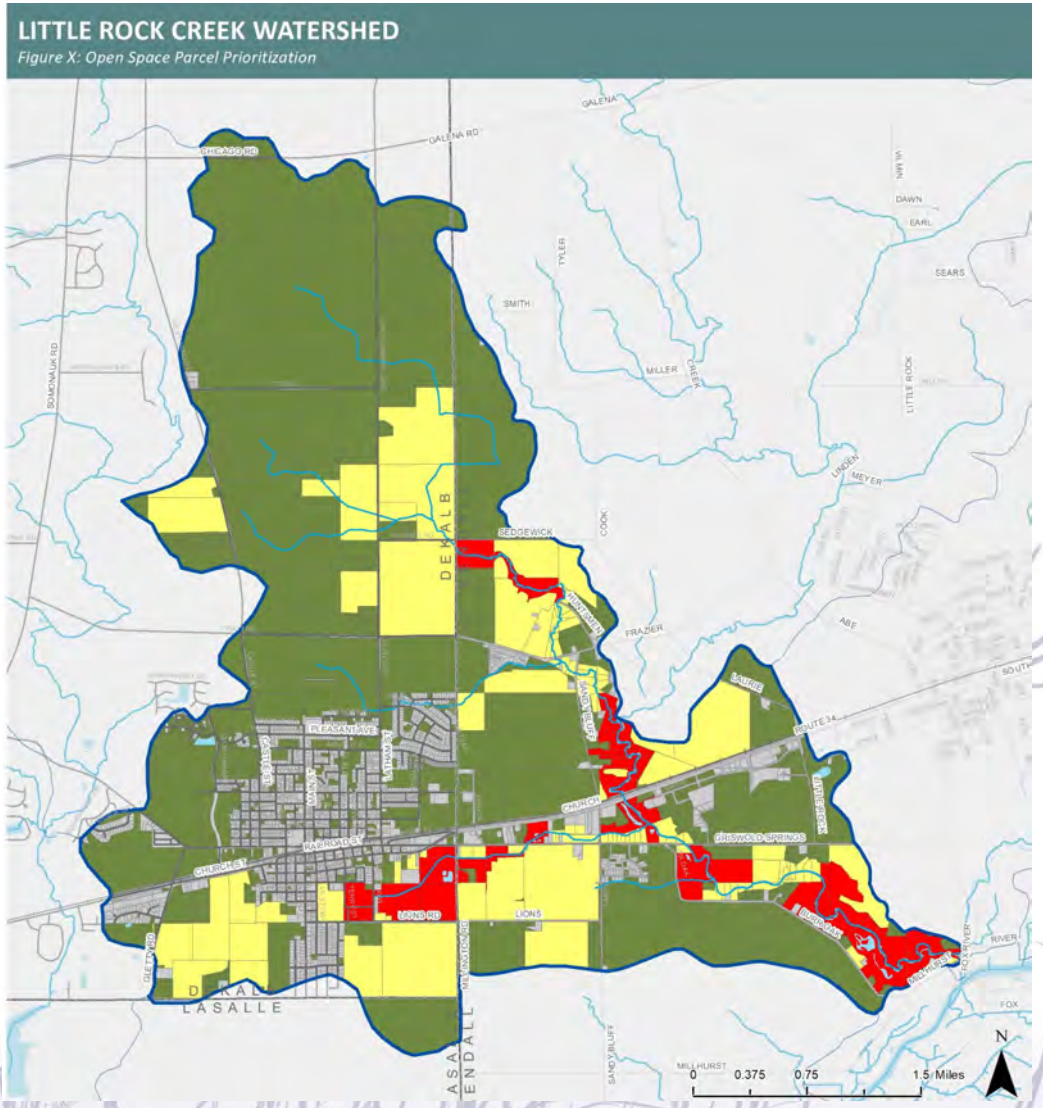
Green Infrastructure Criteria
1. Open or partially open parcels that intersect FEMA 100-year floodplain
2. Open or partially open parcels within 0.5-miles of any headwater stream
3. Open or partially open parcels that intersect a wetland
4. Open or partially open parcels that include a potentially restorable wetland
5. Open or partially open parcels equal to or greater than 10 acres
6. Open or partially open parcels that are within 100 feet of a stream or significant open water
7. Open or partially open parcels in a "Highly Vulnerable" Land Use/Land Cover SMU
8. Open or partially open parcels adjacent to or including private or public protected open space
9. Open or partially open parcels managed by the DeKalb or Kendall County Forest Preserve District or a local park district.
10. Open or partially open parcels that intersect existing trails
11. Open or partially open parcels that include or intersect an "Important Natural Area"

Open Space Parcel Prioritization

Results of prioritization process

Parcel Prioritization Points

- 0 - 3 Low Priority
- 4 - 5 Medium Priority
- 6 - 8 High Priority
- Developed Parcel

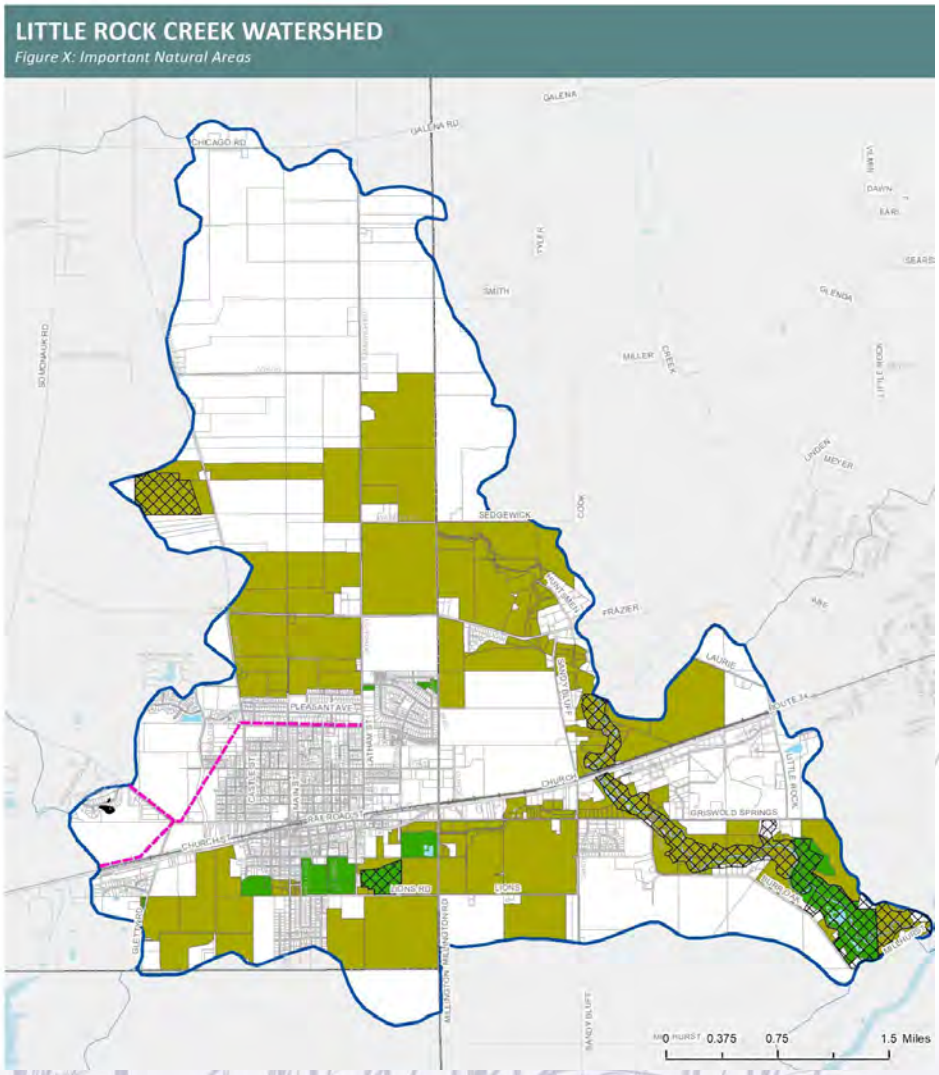


Green Infrastructure Network

GIN includes 239 parcels, totaling 3,501 acres,

291 acres (8%) of which are protected

- Important Natural Areas
- Protected Green Infrastructure
- Unprotected Green Infrastructure
- Proposed Trails



Green Infrastructure Planning

- Protect specific unprotected green infrastructure parcels through acquisition, ordinance changes, and/or incentives.
- Incorporate conservation or low impact design standards on green infrastructure parcels where development is planned.
- Limit future subdivision of green infrastructure parcels.
- Implement long term management of green infrastructure.

2019 USDA Cropland Data

Cropland as % of Watershed:

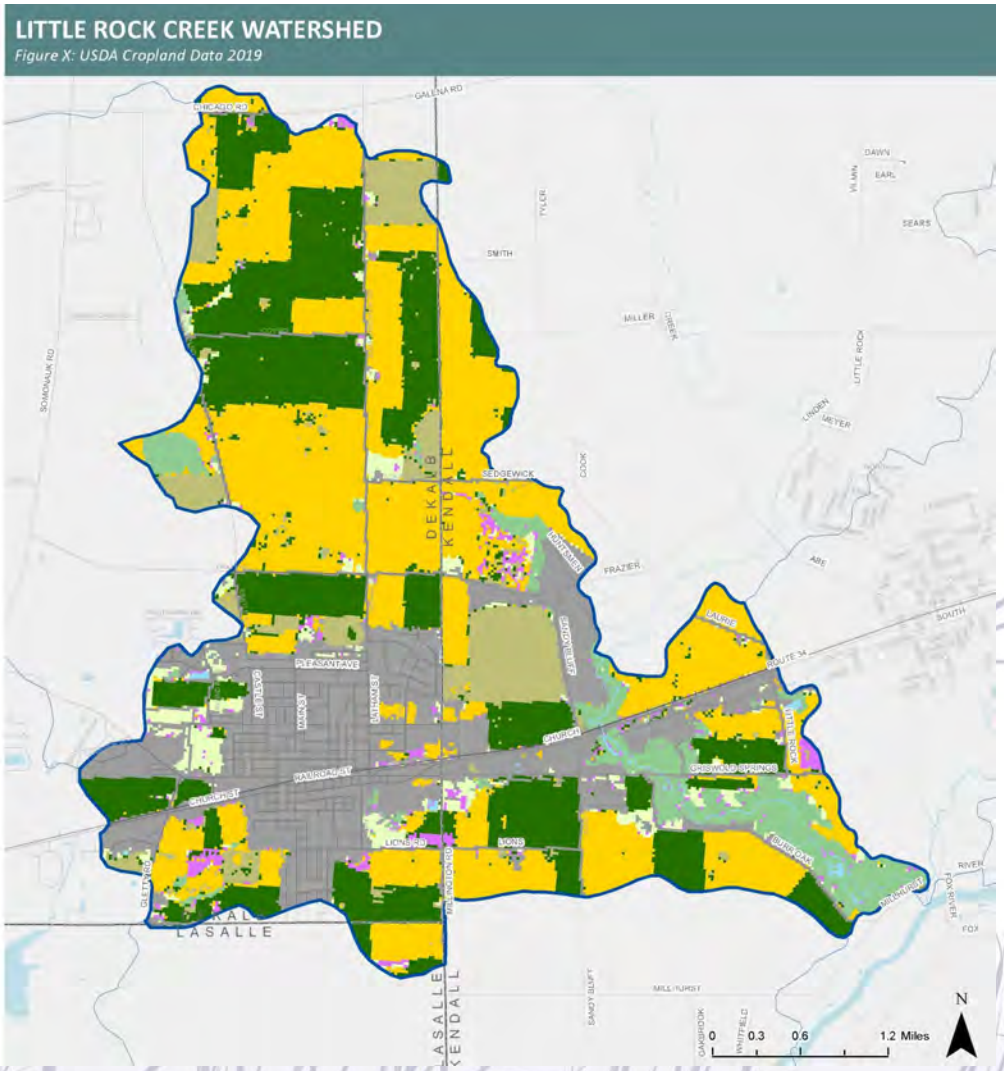
34% corn

24% soybeans

8% fallow/idle cropland

3% grassland/pasture

All others 2%



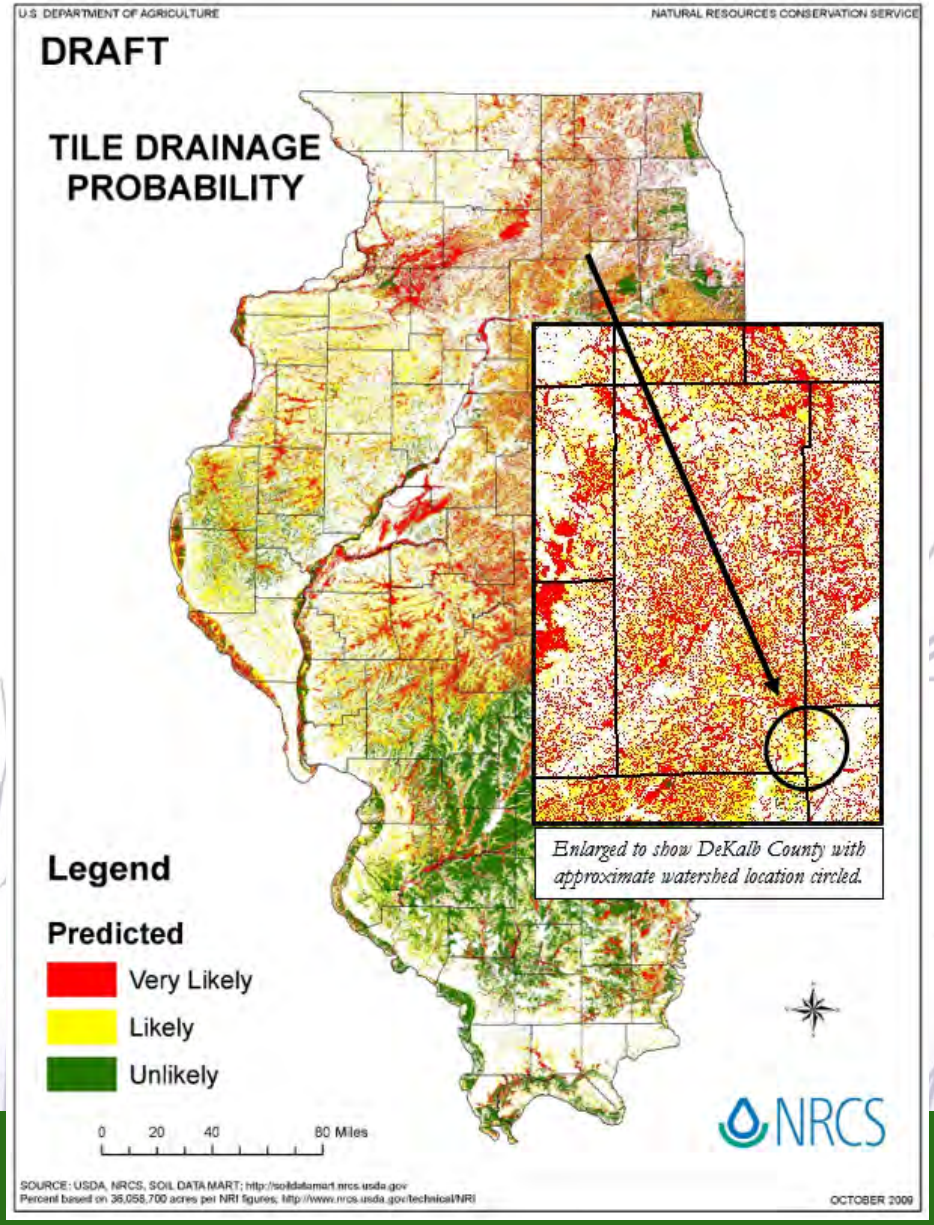
USDA Cropland Data 2019

- Other (1.9%)
- Corn (33.7%)
- Deciduous Forest (6.1%)
- Developed (23.9%)
- Fallow/Idle Cropland (7.5%)
- Grassland/Pasture (3.4%)
- Soybeans (23.5%)

Tillage & Drainage

Based on field inventory, conventional tillage is the dominant tillage practice.

Based on NRCS mapping, much of the watershed is likely or very likely to be tile drained.

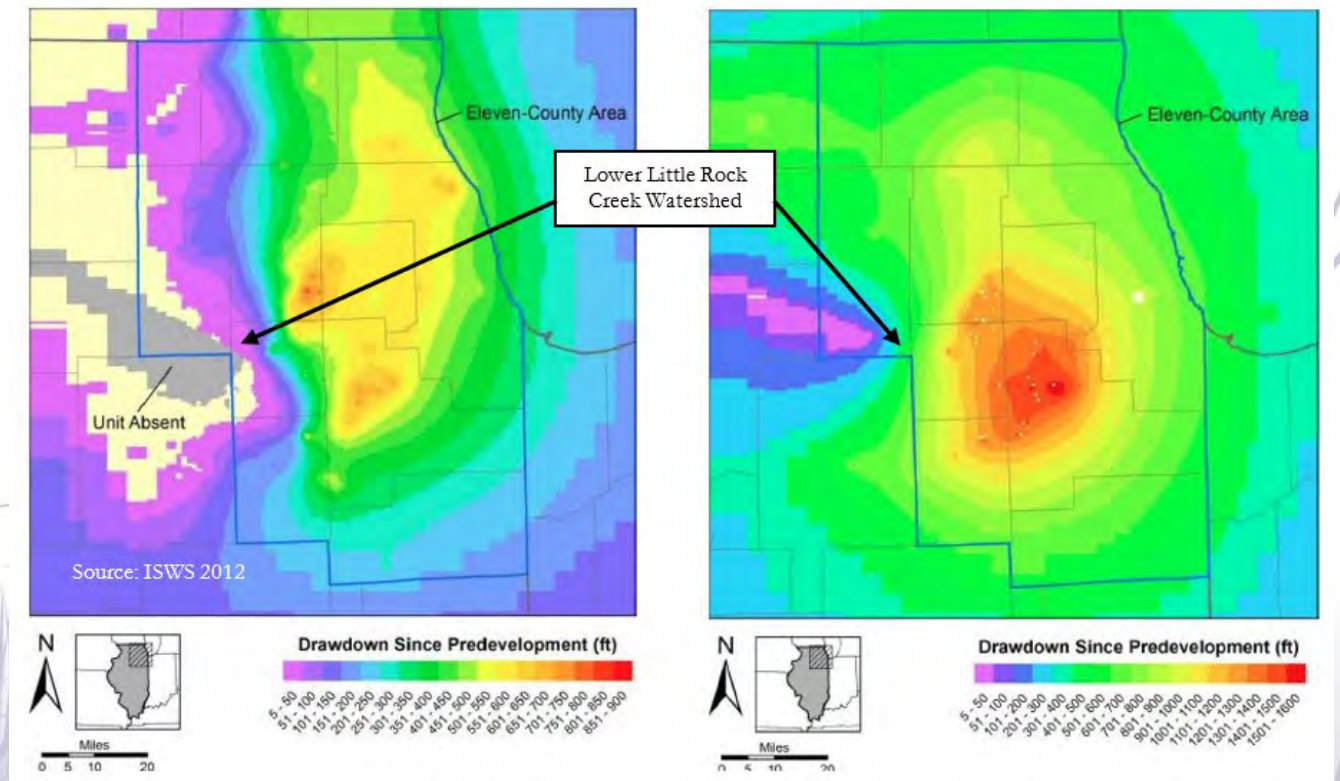


Groundwater

An Illinois State Water Survey (ISWS) Study from 2012 suggests that drawdown since predevelopment could reach 150 feet in the Ancell Unit and up to 700 feet in the Galesville Unit by 2050.

Ancell Unit

Ironton-Galesville Unit



Source: ISWS 2012

Watershed Planning Schedule

Updated as follows:

November '20 – Water Quality, Initial Modeling Results

January '21 – Watershed Goals & Prioritization

March '21 – Critical Areas and Action Plan

May '21 – Outreach Plan, Monitoring Plan, & Milestones

Draft of plan submitted in April 2021

Then review and finalized in July 2021


Questions?