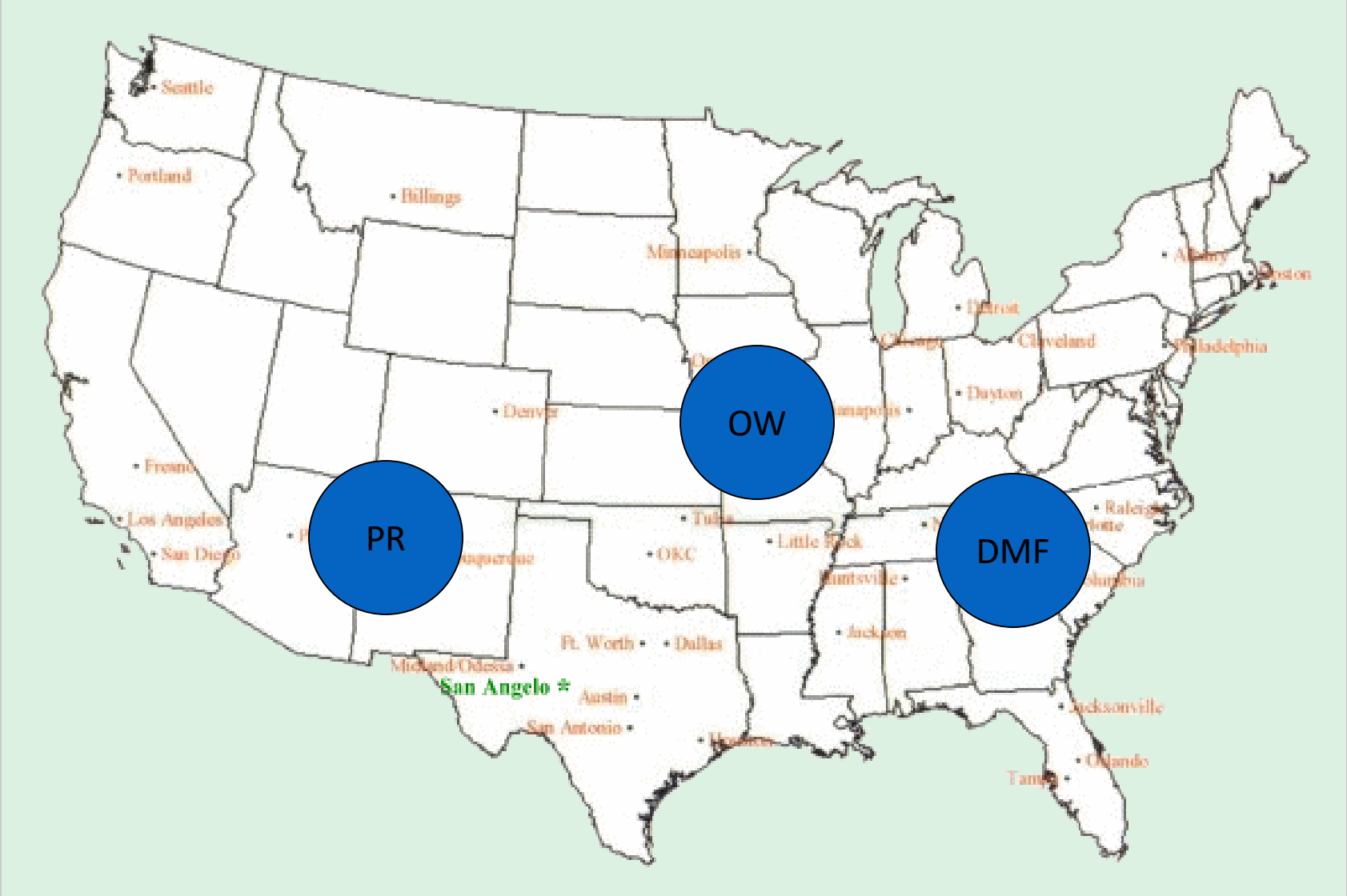
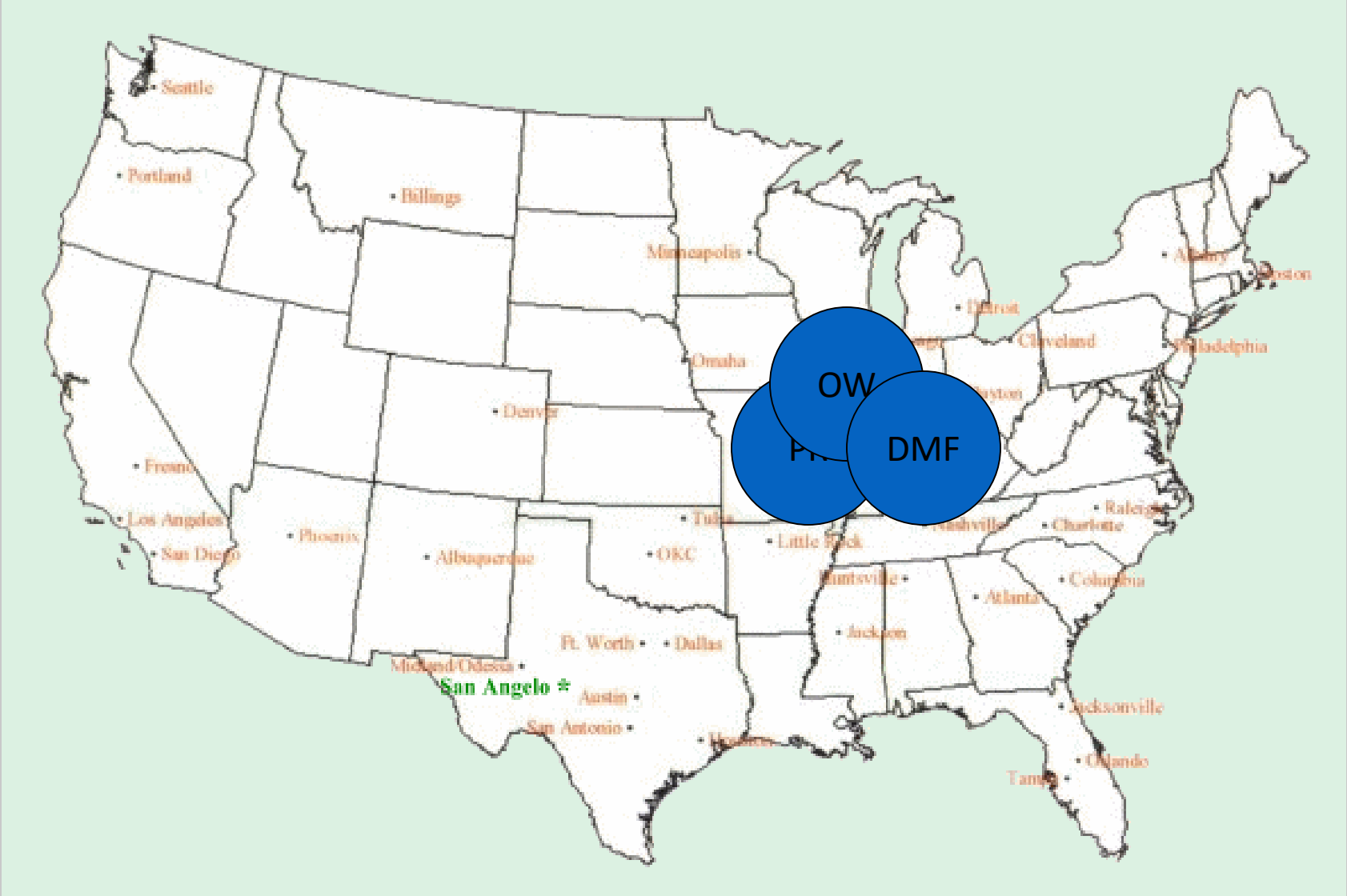
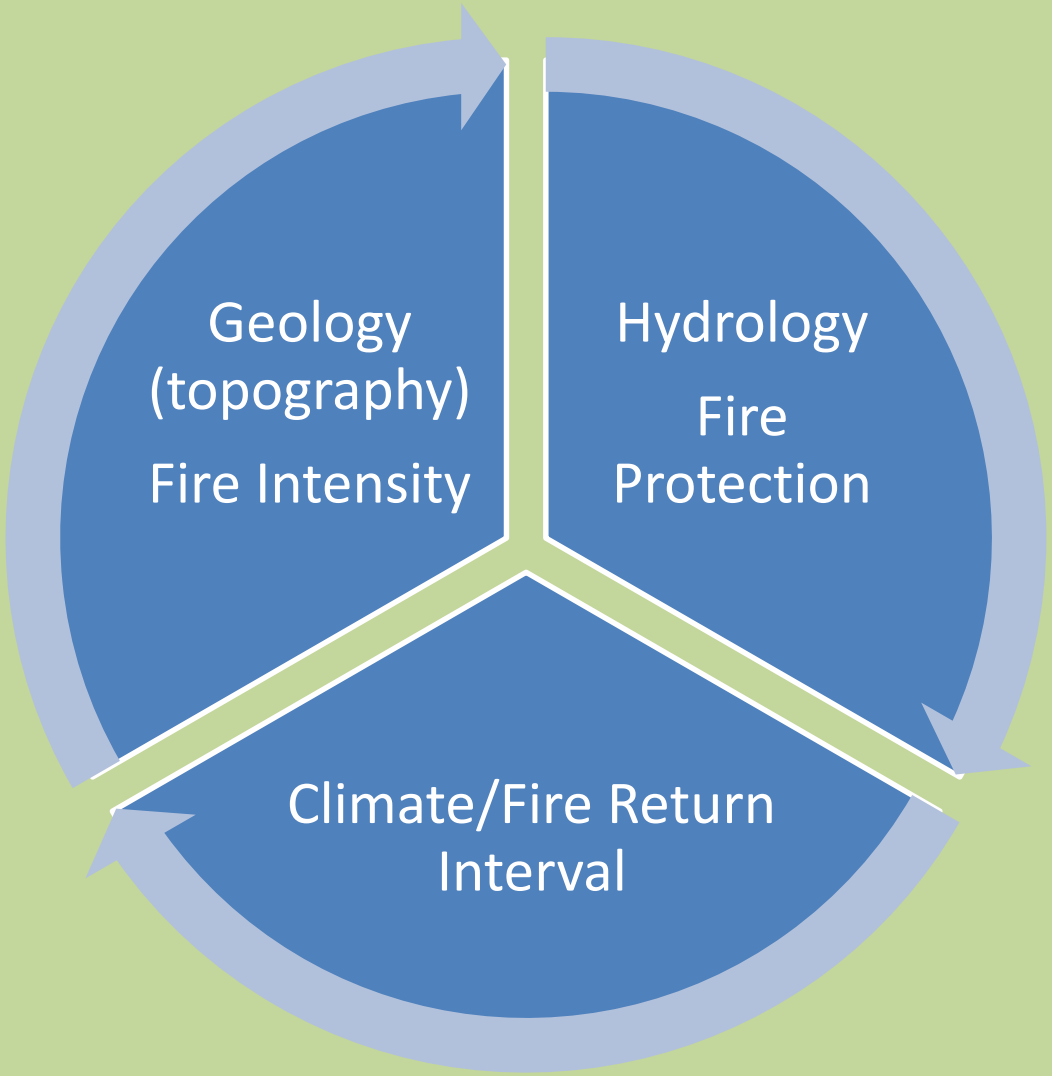
Natural Communities of McHenry County

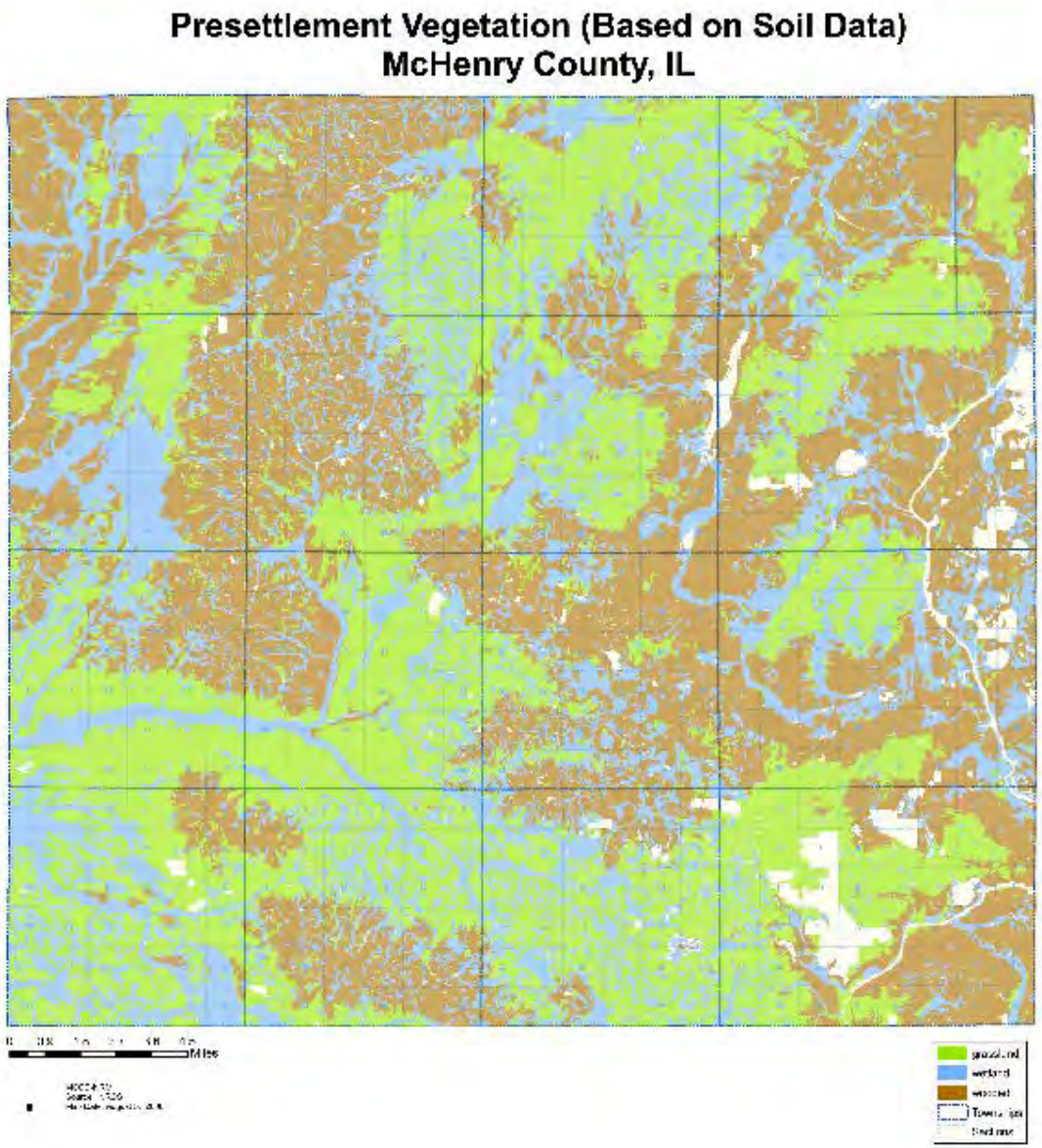
18 Decades of Change

McHenry County in 1837
A Wilderness on the Eve of Settlement

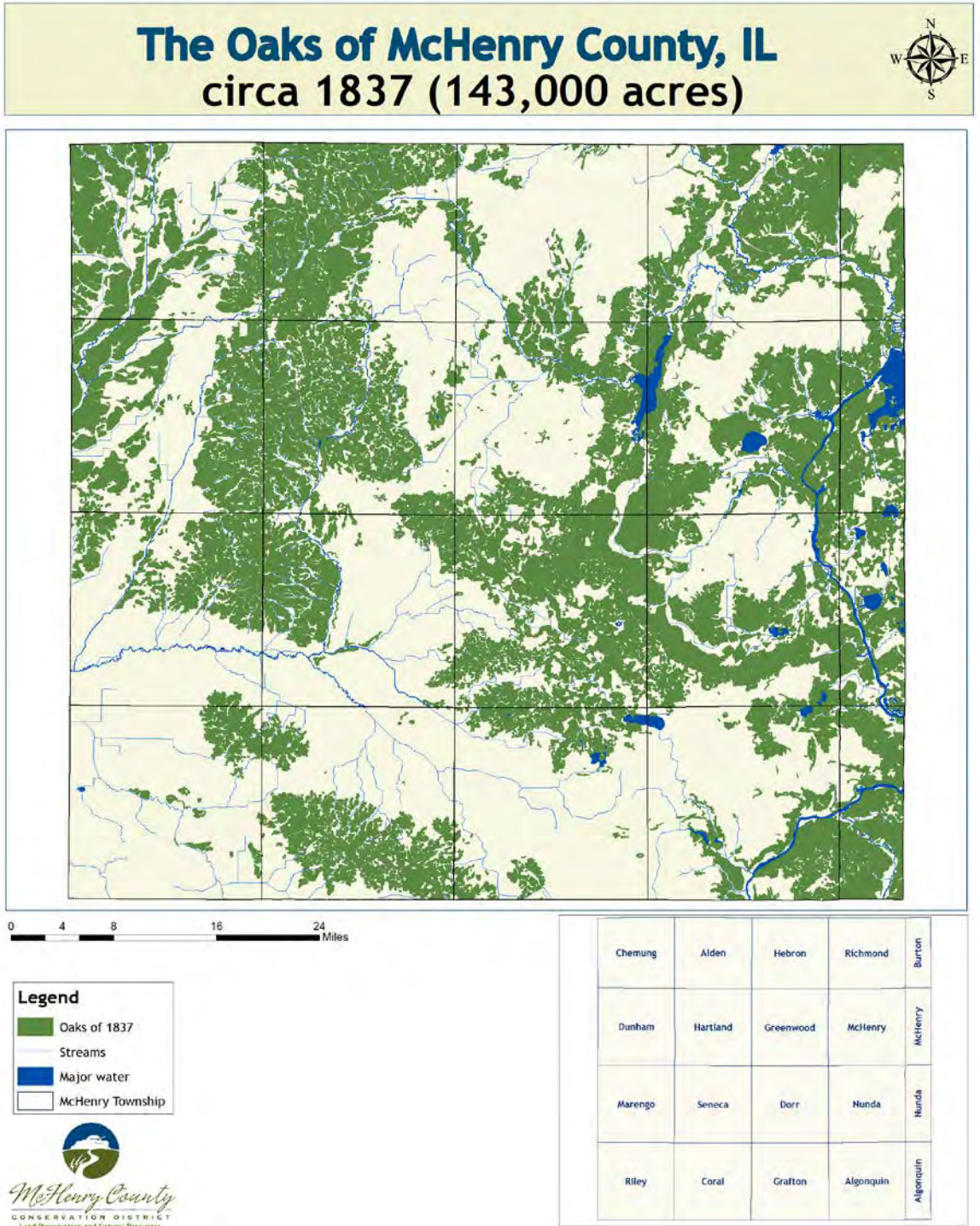

Seattle
Portland
Billings
Minneapolis
Detroit
Cleveland
Philadelphia
Dayton
Denver
OW
Fresno
Los Angeles
San Diego
PR
Tulsa
OKC
Little Rock
DMF
Raleigh
Huntsville
Jackson
Ft. Worth
Dallas
Midland/Odessa
San Angelo *
Austin
San Antonio
Jacksonville
Orlando
Tampa


Seattle
Portland
Billings
Minneapolis
Omaha
Denver
Fresno
Los Angeles
San Diego
Phoenix
Albuquerque
Tulsa
OKC
Little Rock
Ft. Worth
Dallas
Midland/Odessa
San Angelo *
Austin
San Antonio
Houston
Jackson
Huntsville
Nashville
Atlanta
Charlotte
Raleigh
Columbia
Jacksonville
Orlando
Tampa
Detroit
Cleveland
Boston
Philadelphia
Albany
OW
DMF


Geology
(topography)
Fire Intensity
Hydrology
Fire
Protection
Climate/Fire Return
Interval



Pre-Euro American Settlement Vegetation Patterns McHenry County



Distribution of Oak Ecosystems in McHenry County 1837

Oak Ecosystem Variety

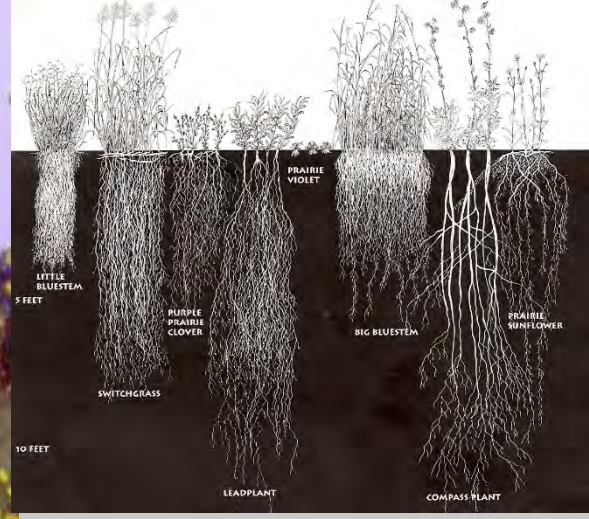
Emigrant's Guide to the Western States of America or Backwoods and Prairies, John Regan 1852

"A description of country called barrens or oak openings prevails to some extent in Illinois. This term is used to designate a species of land which partakes of the nature of both forest and prairie. The surface is generally dry, and more uneven than the prairie, and is covered with scattered oaks, interspersed at times with pine and hickory, mostly of a stunted and dwarfish size, but which springs from a rich vegetable soil, admirably adapted for the purposes of agriculture.

Among the oak openings you find some of the most lovely landscapes of the west and travel for miles and miles through varied park scenery of natural growth with all the diversity of gently swelling hill and dale."

The Jesuit Relations

The appearance of the country is the most pleasing since we left Canada, being covered with grasses and flowers of a rich and gay hue. The groves are extensive and filled with great herds of conies and stags…by their appearance look as if apple orchards planted by the hand of god for the pleasure of man’s viewing



1. Xeric Prairie
2. Dry Prairie
3. Mesic Prairie
4. Wet Prairie

McHenry County's topography and hydrology lent itself to dairy farming

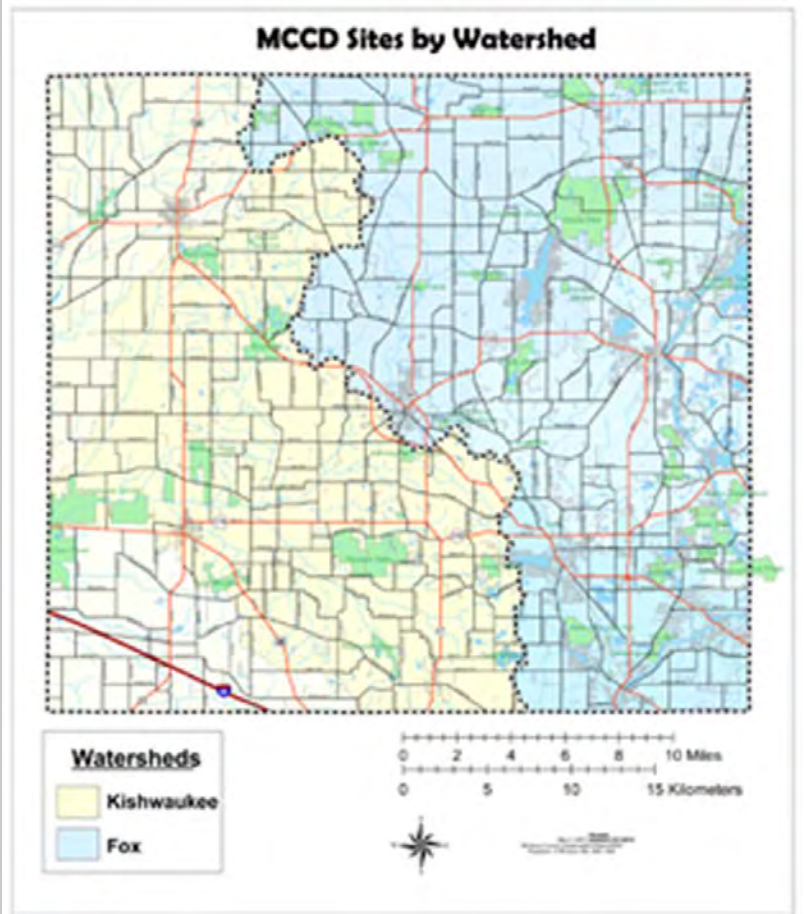
1/100th of 1% of original Illinois Prairie Remains Today

Wetlands

Why Understanding the County's Original Natural Heritage and Hydrology is Important

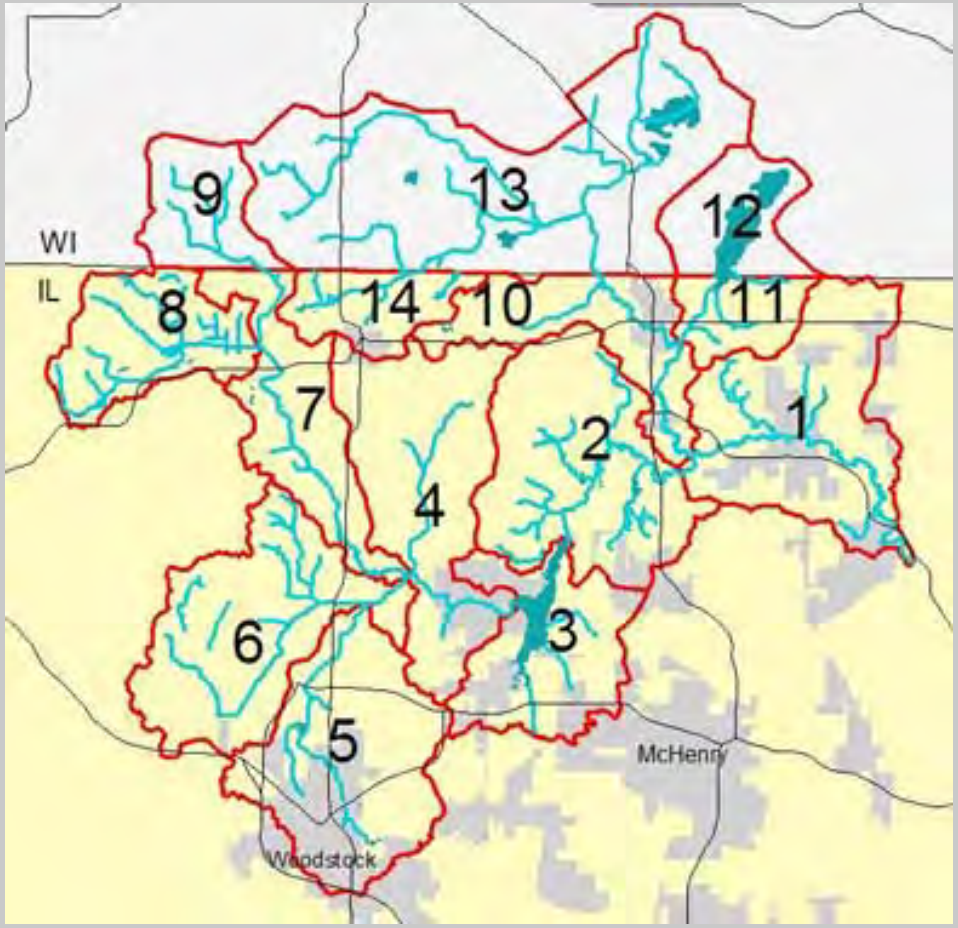
- Understand the role of water, soils and topography that underpin the county's natural heritage
- Conservation purposes (What is left and what can be restored)
- Understanding the complexities of how the land handled water in 1837 and how it handles it today
- Anticipate future impacts from changes in water events (storms, floods, droughts etc.)
- Determine how best to honor water's role in the County's landscape

Two Large Watersheds



- Nippersink/Fox
- Kishwaukee/Rock

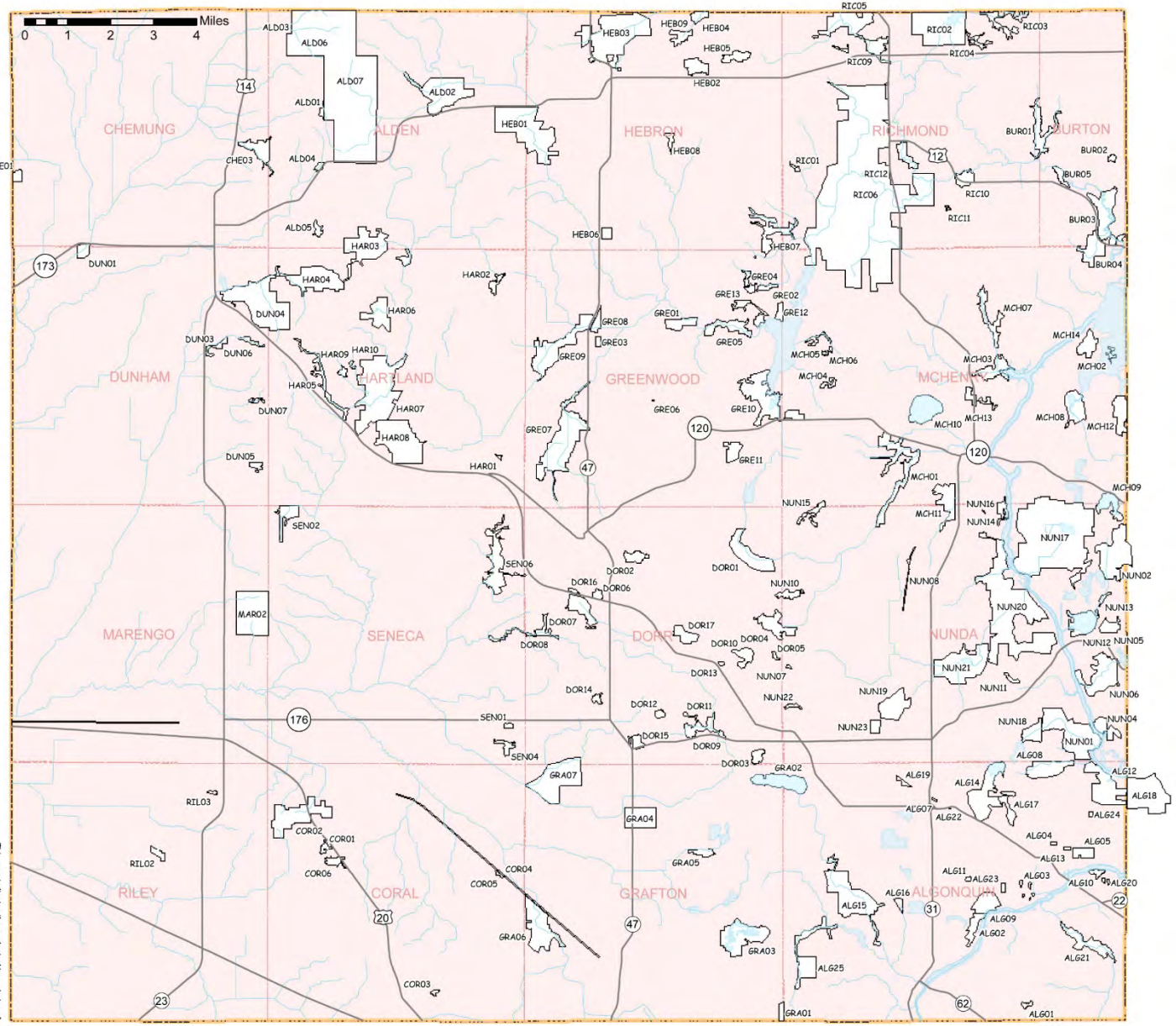
Sub Watersheds of the Nippersink



- Lower Nippersink Creek
- 2 Glacial Park / Tamarack Farms
- 3 Wonder Lake
- 4 Vander Karr Creek
- 5 Silver Creek
- 6 Slough Creek
- 7 Nippersink Creek Bailey Woods
- 8 Nippersink Creek Headwaters
- 9 Zenda Headwaters
- 10 North Branch Nippersink Creek
- 11 Lower Elizabeth Lake Drain
- 12 Elizabeth Lake
- 13 Upper North Branch Nippersink Creek
- 14 Hebron Peatlands

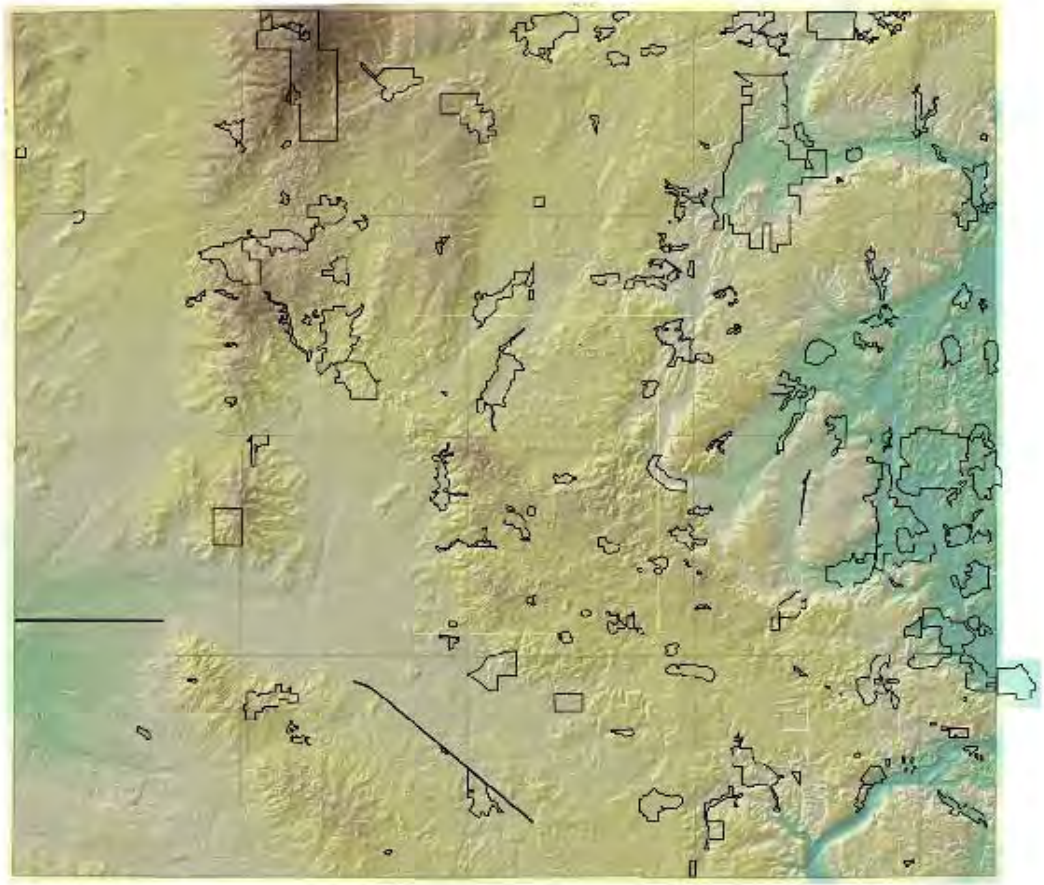
M.C.N.A.I. 2005

McHenry County Natural Areas Inventory
All Sites



This map indicates the ecological boundaries of the natural areas only and is not intended to identify public or private property.

McHenry County Natural Areas Inventory
Overlain on a shaded relief map, Illinois State Geological Survey



Elevation (m)
High : 300
Low : 220

MCNAI sites

1:180,000
Kilometers 0 2 4 6 8 10
Miles 0 1 2 3 4 5 6 7

MCCD-NRM
Map Date: 4/1/06

Features of the County's Original Hydrology Wetlands

Wetlands

Ephemeral Wetlands

1. Prairie Vernal Pools
2. Floodplain Marshes
3. Wet Woodland Pockets

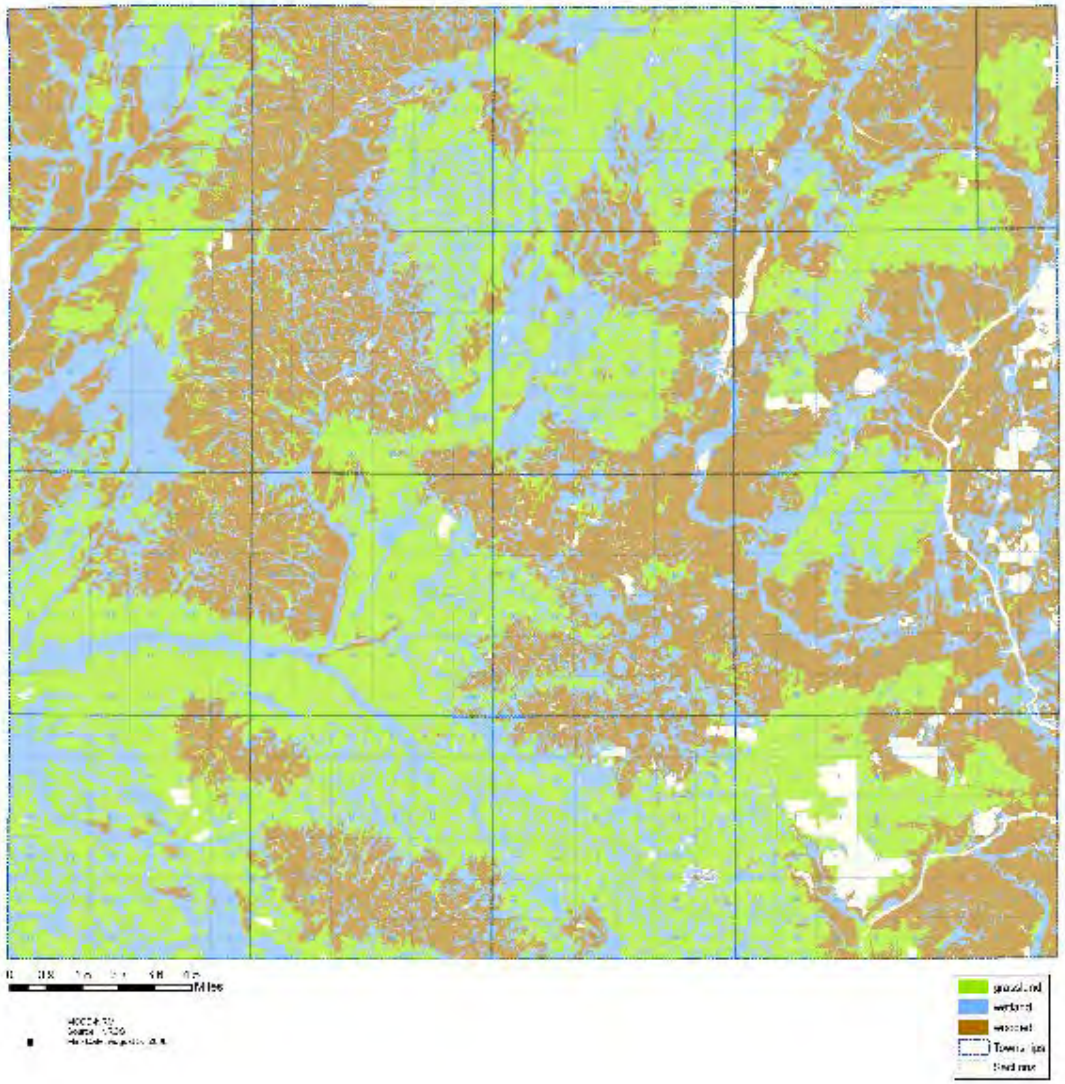
Permanent Wetlands

1. Wet Prairies
2. Sedge Meadows
3. Marshes
4. Bogs
5. Fens

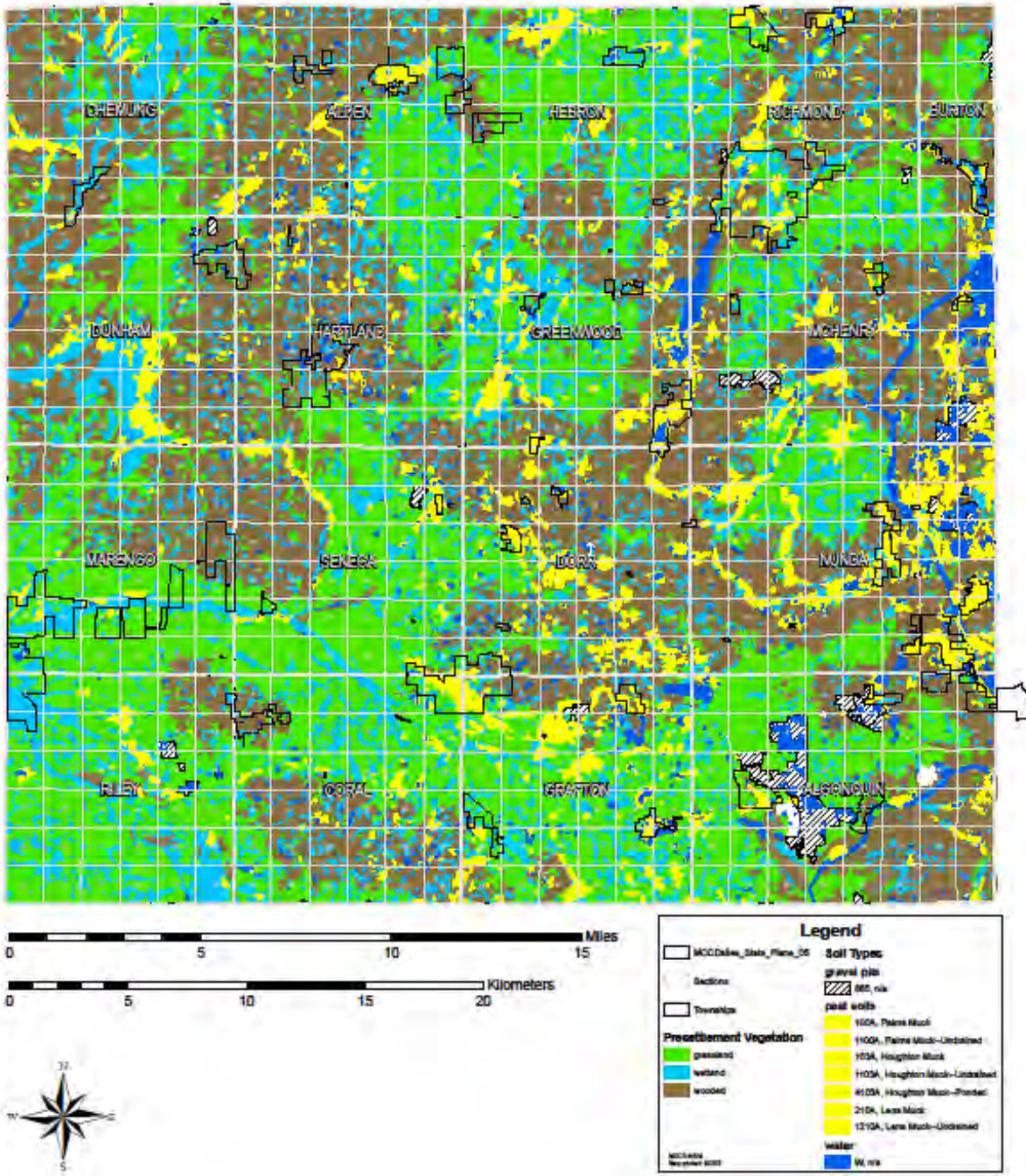
Open Water Communities

- Natural Ponds
- Lakes
- Riparian Systems

Presettlement Vegetation (Based on Soil Data)
McHenry County, IL

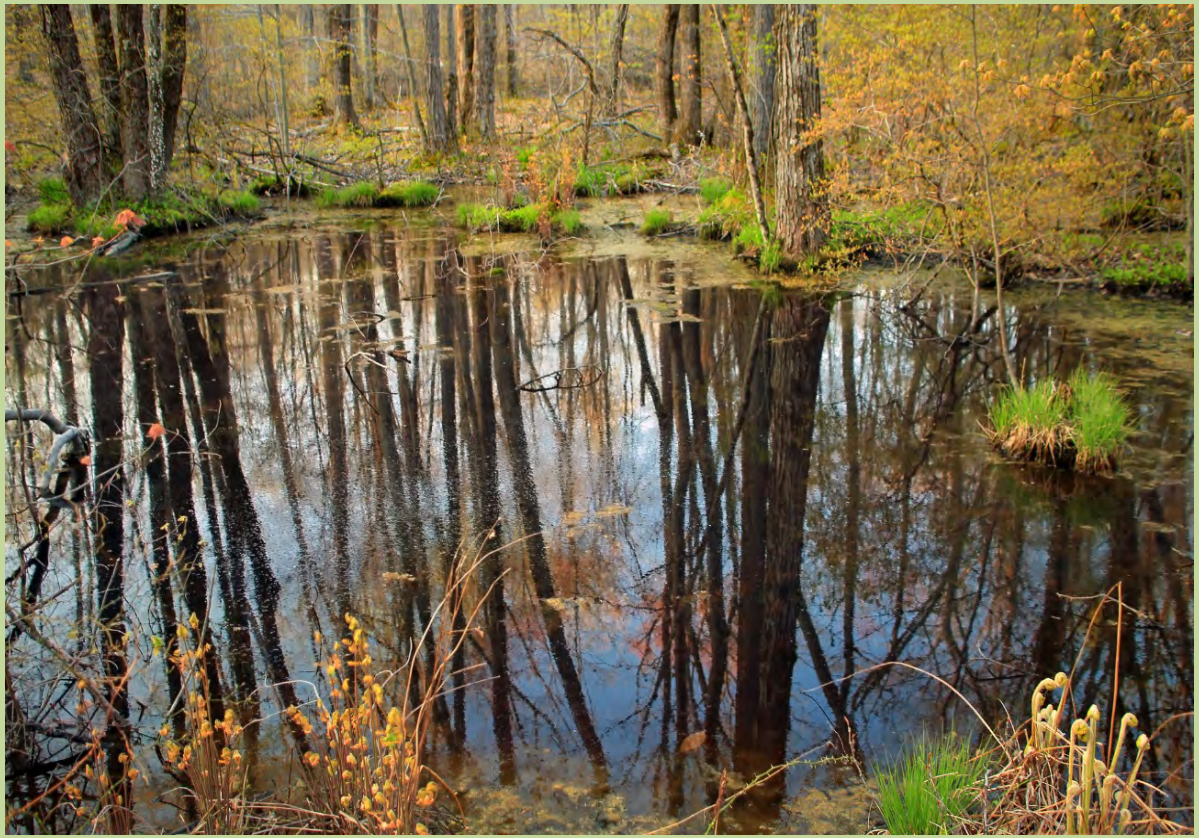


Distribution of Organic Soils in McHenry County



Ephemeral Wetlands

Woodland Wet Pocket



Prairie Vernal Pool

Wet Prairie

Sedge Meadow

Marsh

Leatherleaf Bog

Oakwood Hills Fen

McHenry County's Original Riparian Systems

Ground Water Discharge Areas

Seeps

Springs

Head Water Streams

Coyote Creek

Carver Creek

Tamarack Creek

Main Tributaries

Boone Creek

Tryon Creek

Piscasaw Creek

Silver Creek

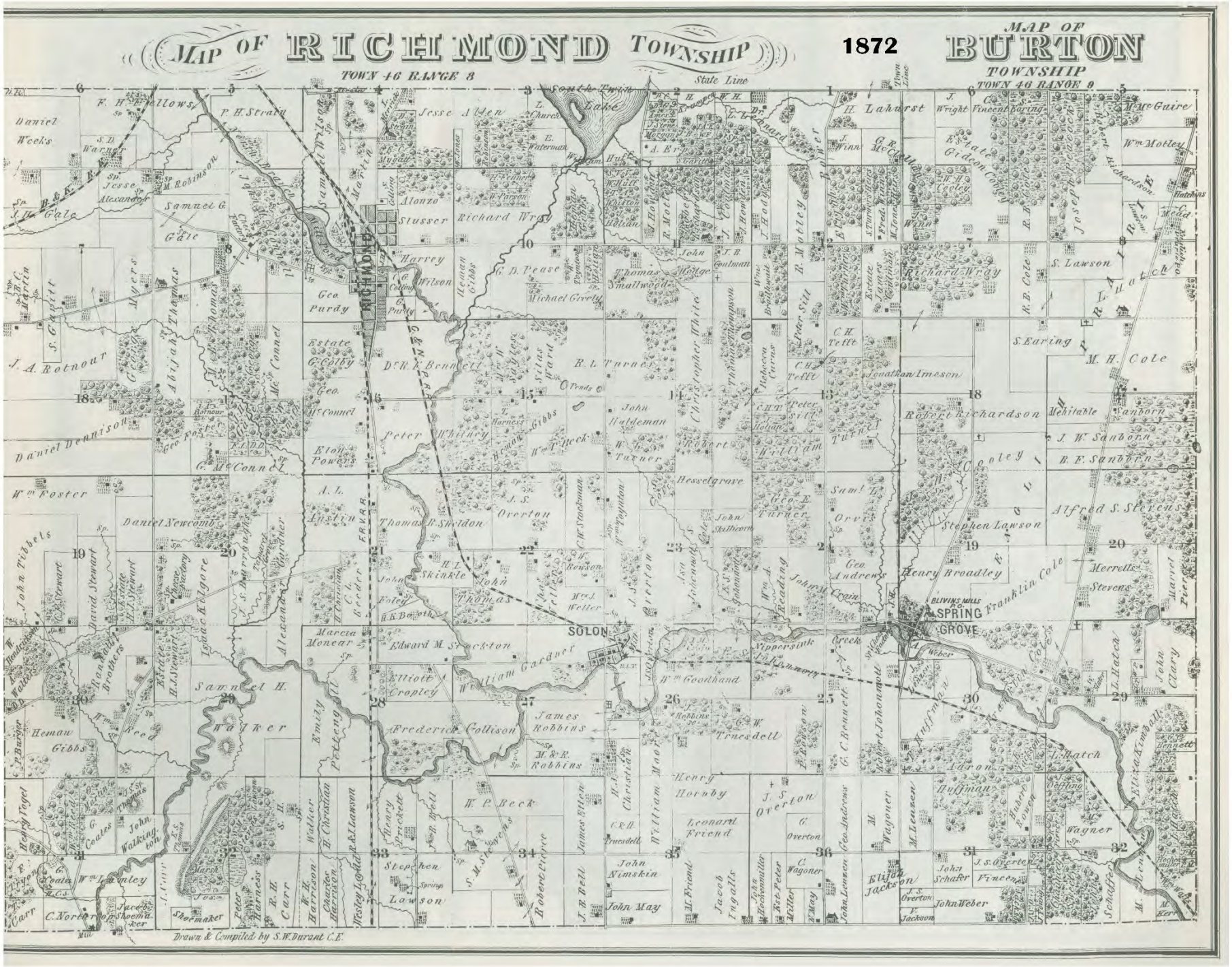
Major Streams

Kishwaukee River

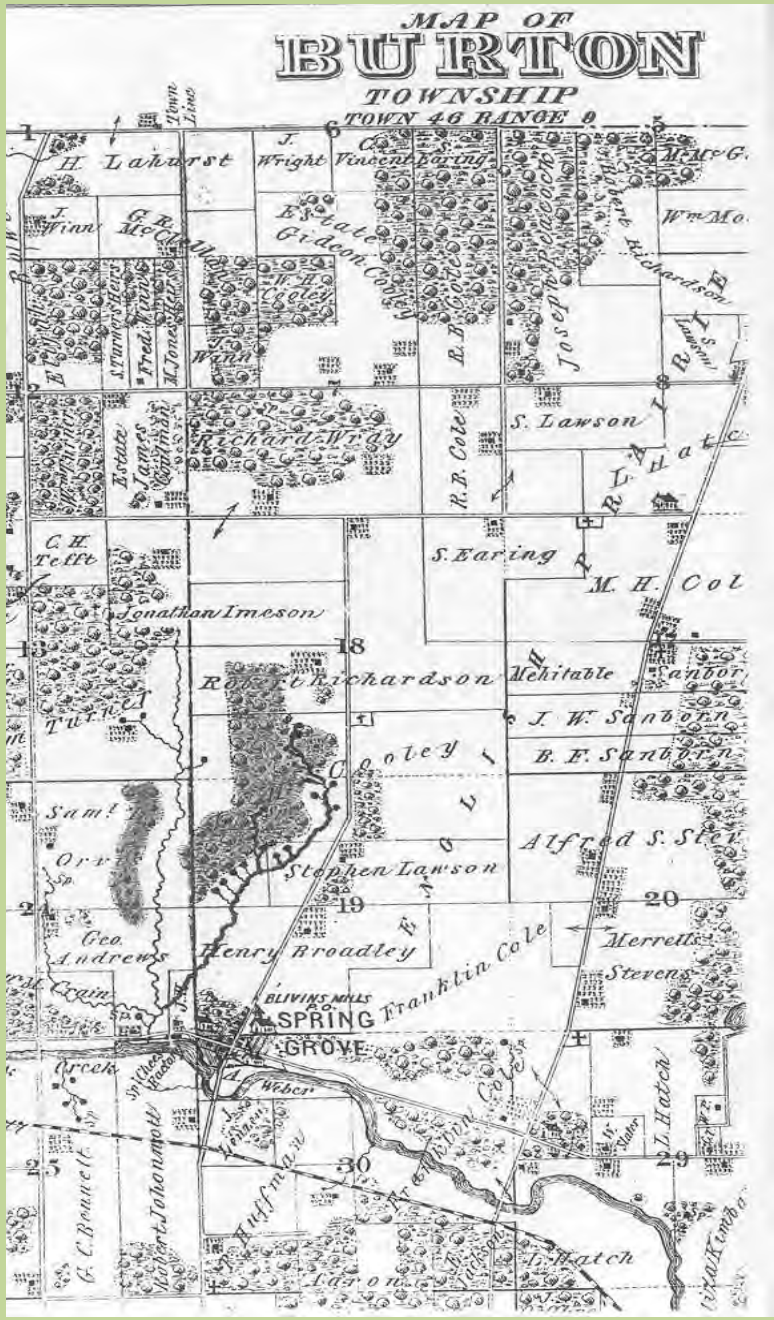
Nippersink Creek

Fox River

Headwaters and Main Tributaries

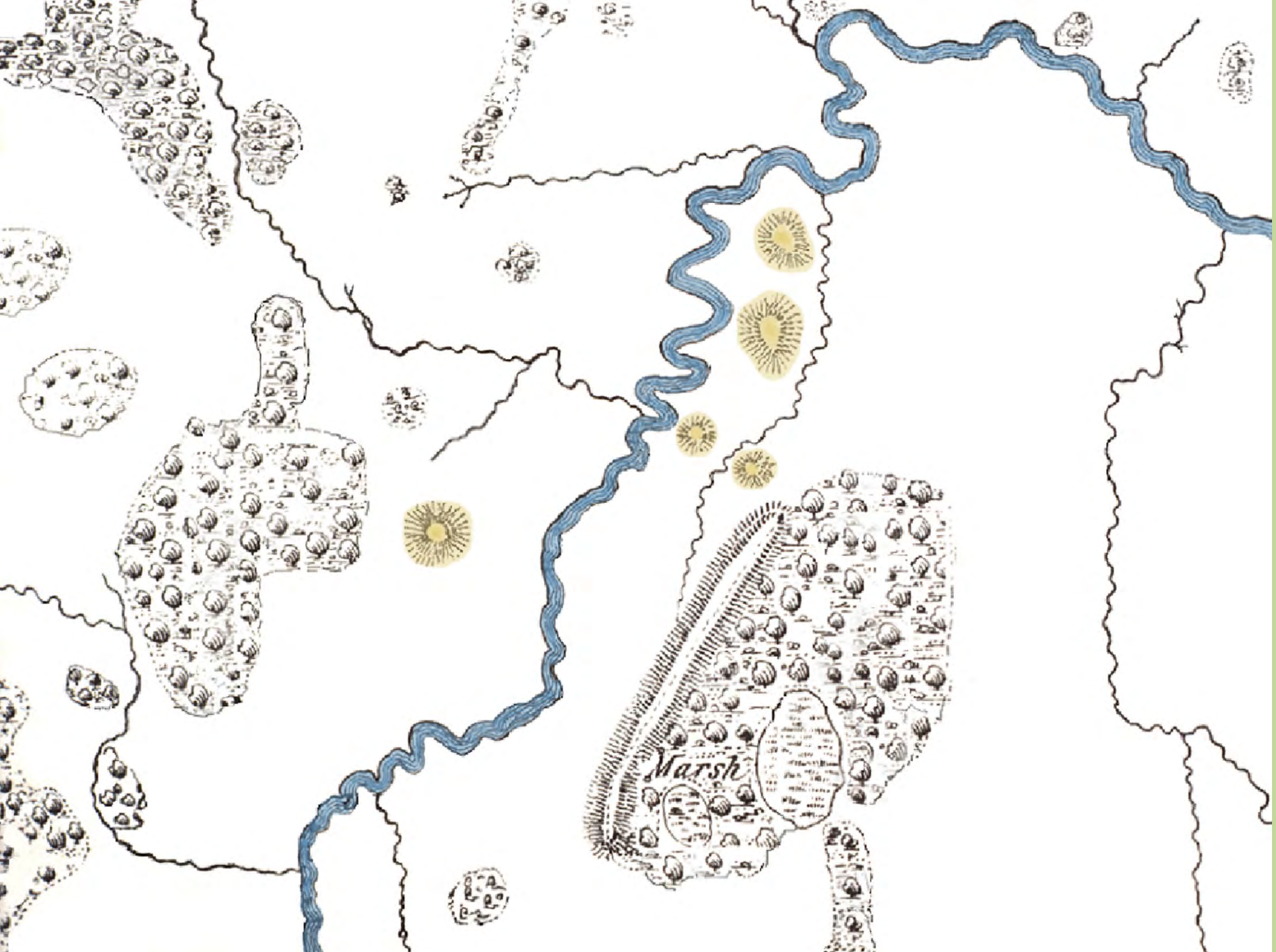


1872 Combination Atlas



Ecological/Cultural Information on Early Plats

- Springs, Ponds & Mill Races
- Unchannelized Stream Courses
- Timber Resources
- Orchards
- Schools, Churches, Cemeteries & Mills
- Roadways
- Remarkable Features


Marsh

Major Hydrology Change Engines
1837-2019

Farm Drainage 1877-2019

- Tile Drainage
- Ditching
- Channelization
- Tunneling
- Water Quality

Development /Road Construction

1940-2019

- Impermeable Surfaces
- Tunneling
- Ditching
- Water Quality
- Storm Water Detention

1791-1880

John Johnstone – The Father of American Tile Drainage

FARM DRAINAGE.

It would be hardly fitting to close this work without referring to the above subject, for, out of the 384,400 acres of land comprising McHenry County, nine per cent., or 34,956 acres, are wet land and totally unfit for cultivation, as shown by the report of the Secretary of the State Board of Agriculture. On this land the farmers of this county are paying taxes and yet receive from it no income, while the wet spots stand, a menace to the health of the family and a blotch on the appearance of the farm.

There are places scattered about in McHenry, Lake and adjoining counties where the results of their use may be seen. The writer had shown him, adjoining Crystal Lake, on the extensive farm of C. S. Dole, Esq., a large tract of beautiful land, as productive as a garden, upon which his informant assured him that he himself had a few years since speared fish.

Another instance is on the farm of Geo. S. Young, Esq., near Harvard, where a pond in which there were fish was drained in 1883 and a fine crop of corn was raised thereon in 1884, despite the idea of many that the soil would be too light to raise anything if it were drained. Other instances might be mentioned but you have doubtlessly noted some in your neighborhood.

1877 History of McHenry County

1874, Heafer Tile Plant,, Bloomington , Il.,,

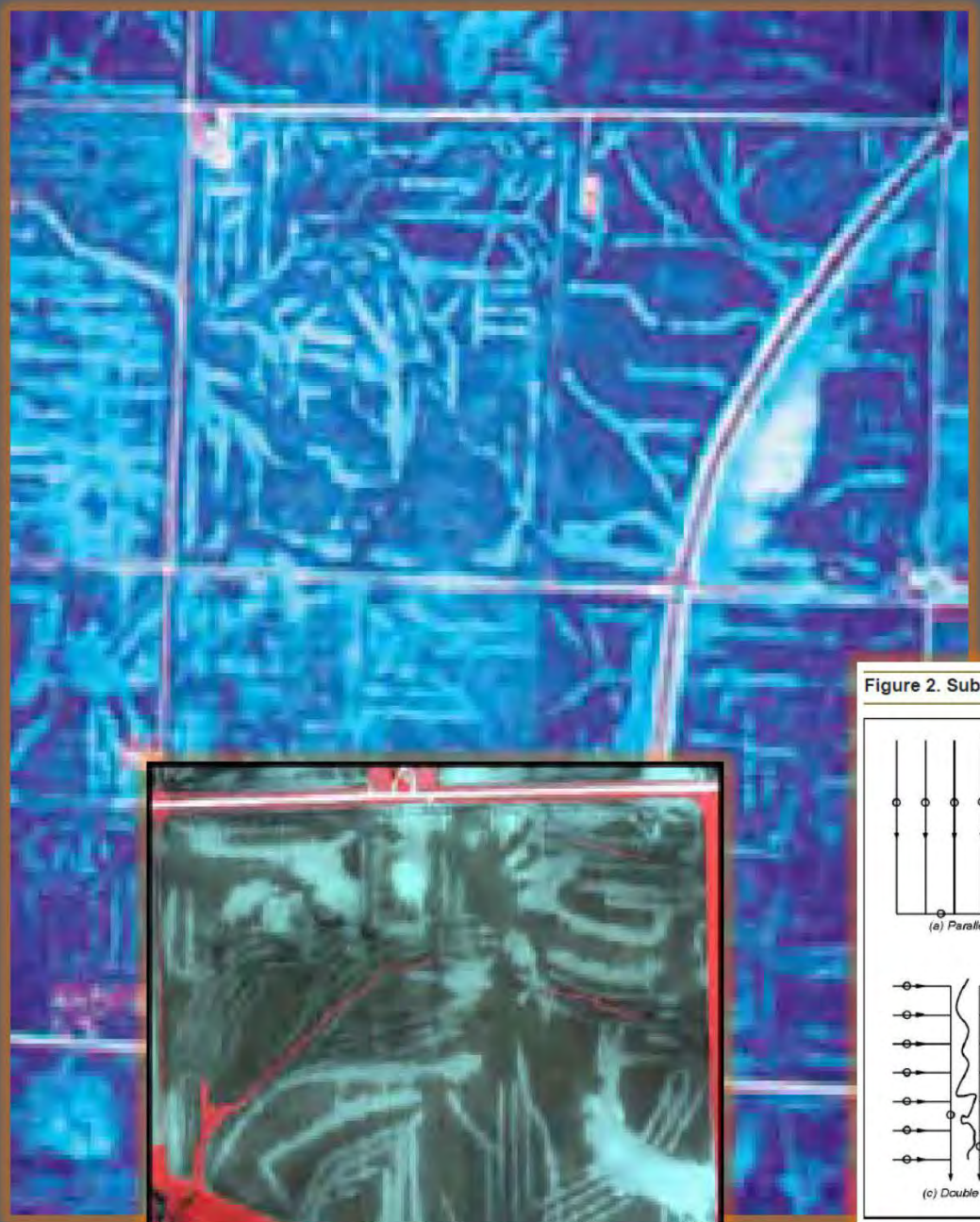
1850

1891

1650

1873

Standard Clay Drain Tile, 1850 through 1970



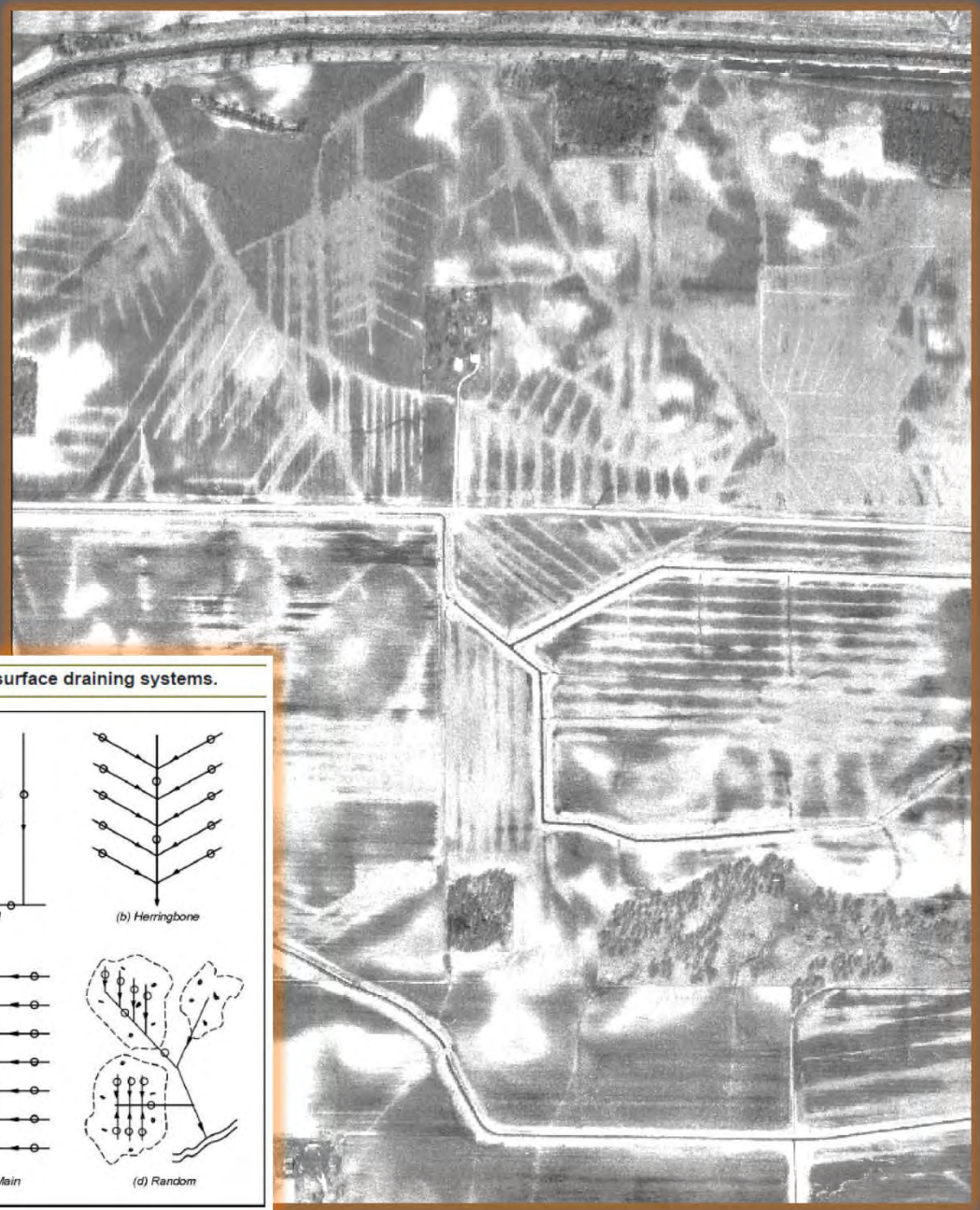
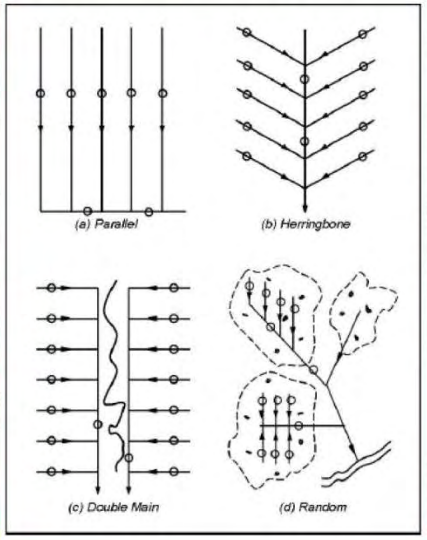
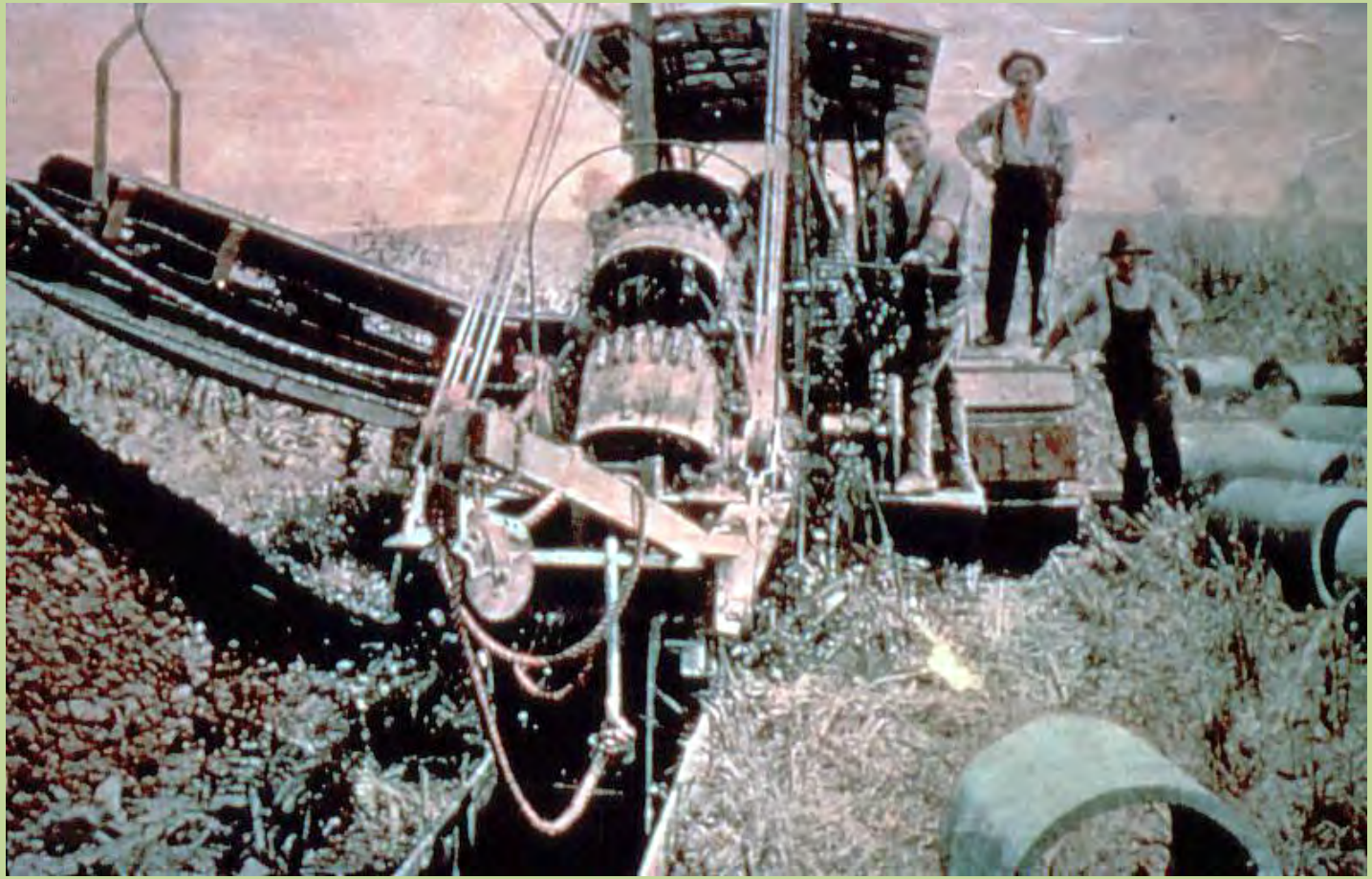
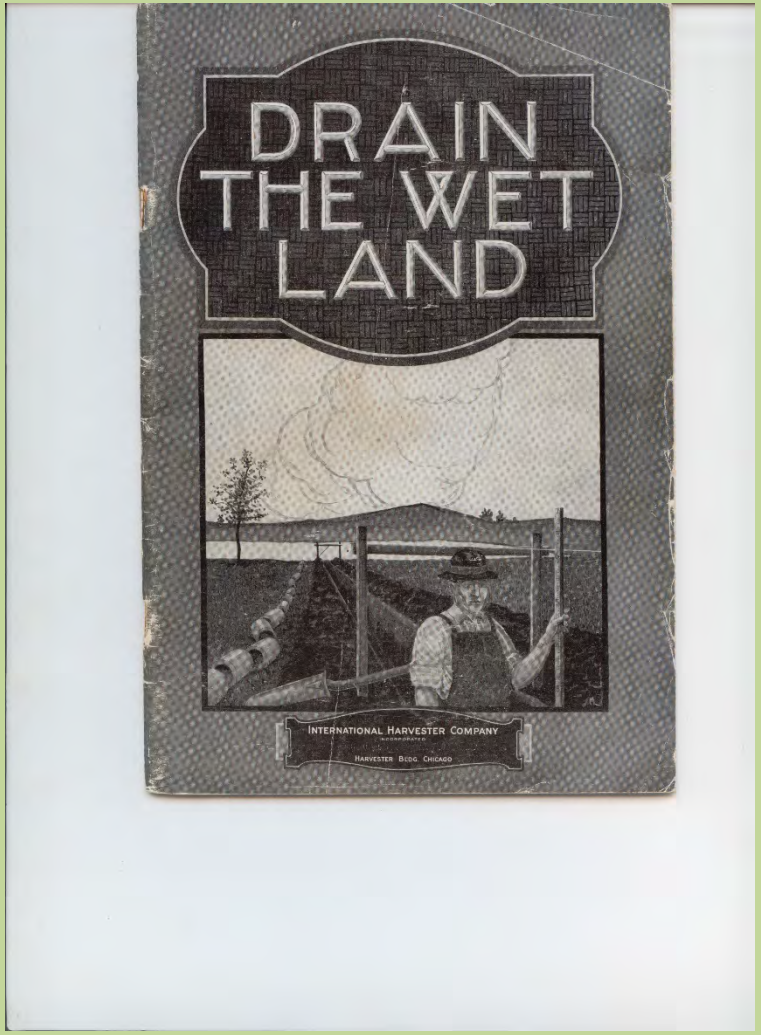


Figure 2. Subsurface draining systems.



By 1934 there was enough tile installed in Illinois to circle the world six times and enough drainage ditches that placed end to end they would stretch from Chicago to Outer Mongolia





Drainage statistics for highly drained states in the North Central Region of the United States. Taken directly from "Farm drainage in the United States: history, status and prospects" by the USDA (Misc. Pub. No. 1455. Washington, D.C., 1987).

Percent Total of All Land Drained & Corresponding Number of Acres

Illinois	30%	9,795,000
Wisconsin	6 %	2,245,000
Indiana	30%	8,085,000
Iowa	20%	7,790,000
Minnesota	15%	6,370,000
Michigan	15%	5,515,000
Ohio	20%	7,400,000
Total		47,200,000

Impervious Surface

Stormwater Detention

Altered Drainage Patterns

Mapping Altered Hydrology in McHenry County

<u>Methods:</u>

- Evaluate the current hydrology in McHenry section by section with the latest aerial imagery layer (2013)
- Compare current hydrology with historic hydrology by using 1872 plat maps, 1939 aerial photography, and IDNR's 1994 stream layer.
- Digitize a layer for each type of disturbance
- Analyze the altered water feature layers to quantify the changes

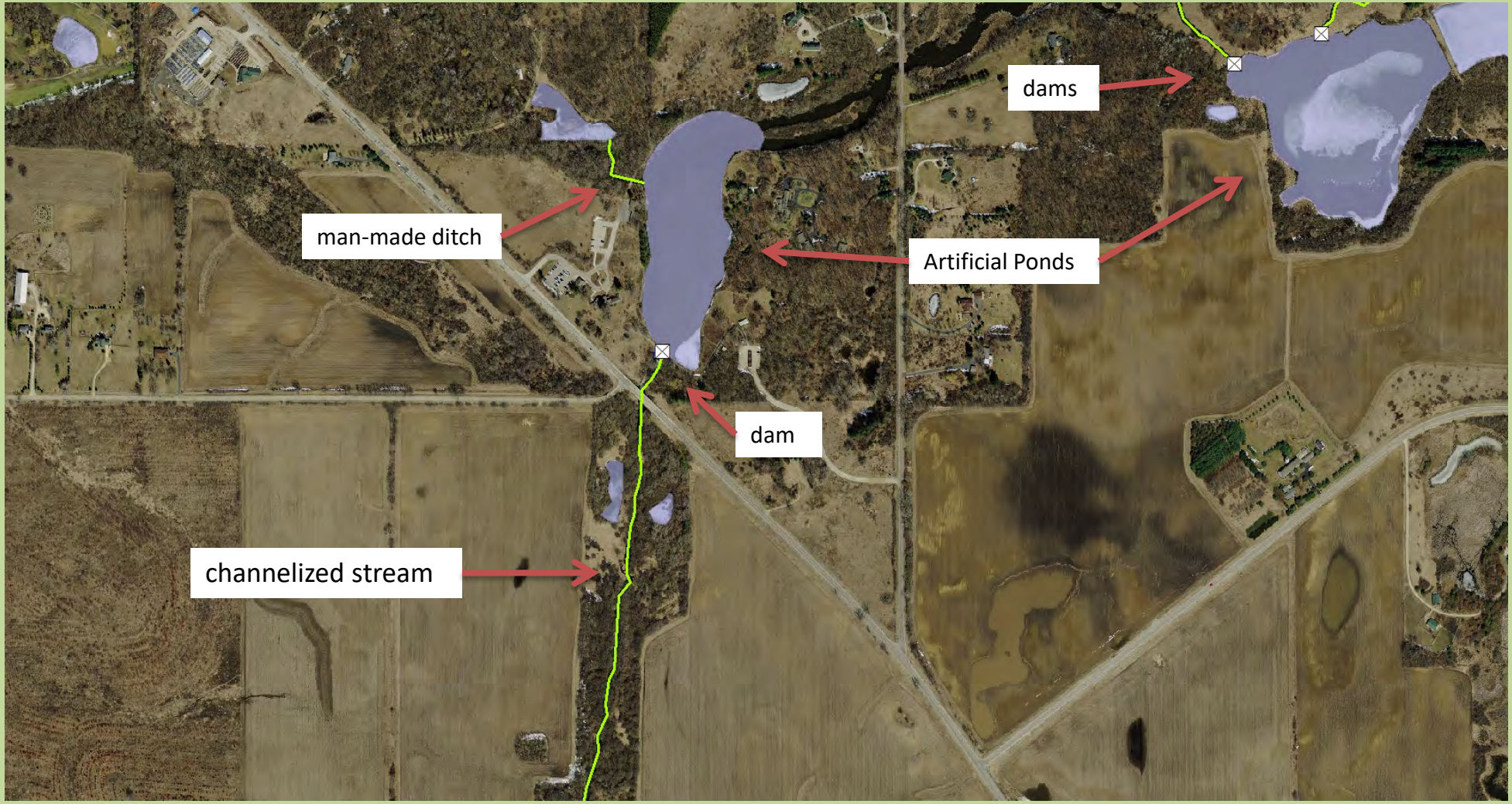
1872 Plat Map

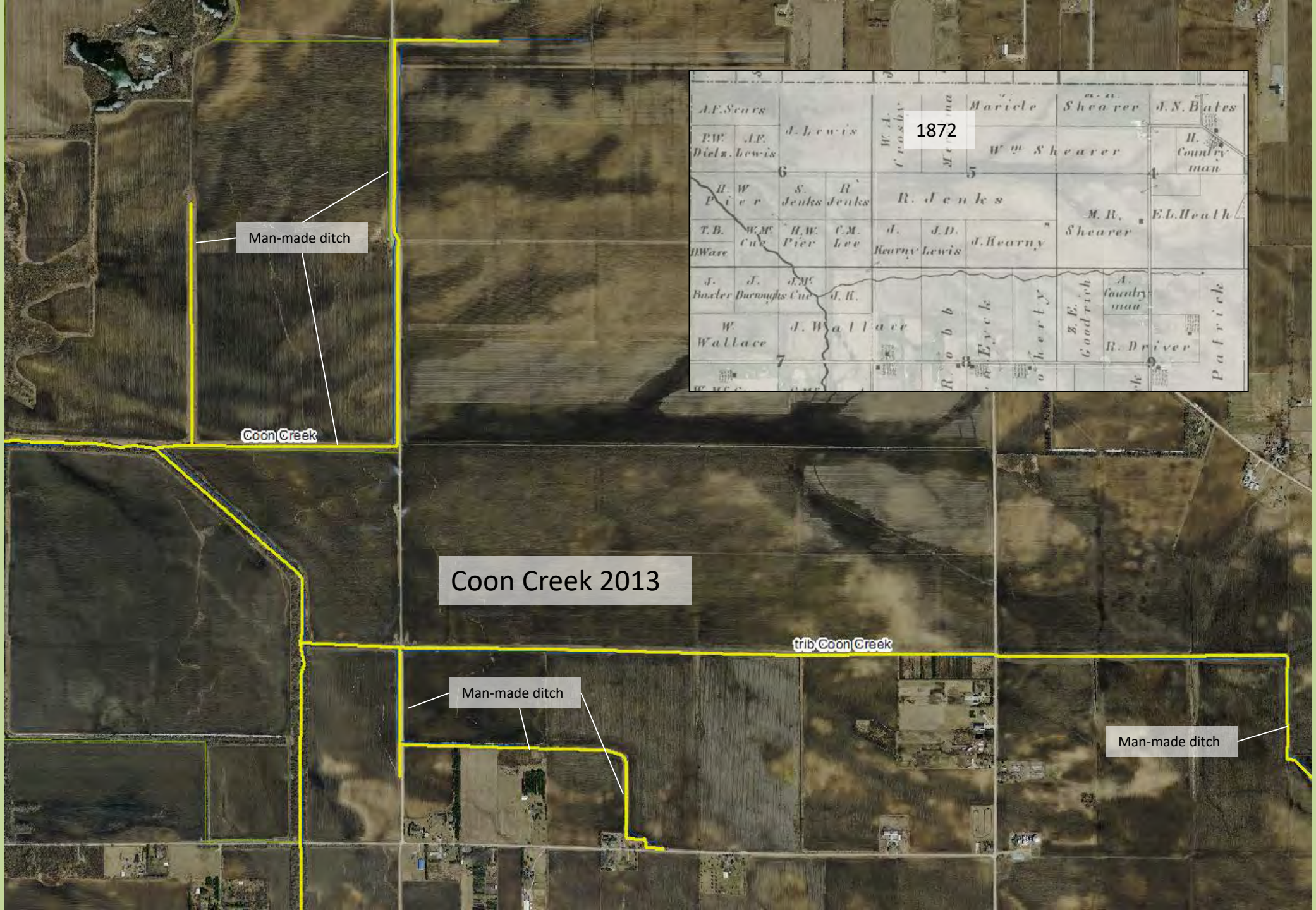
Brookdale

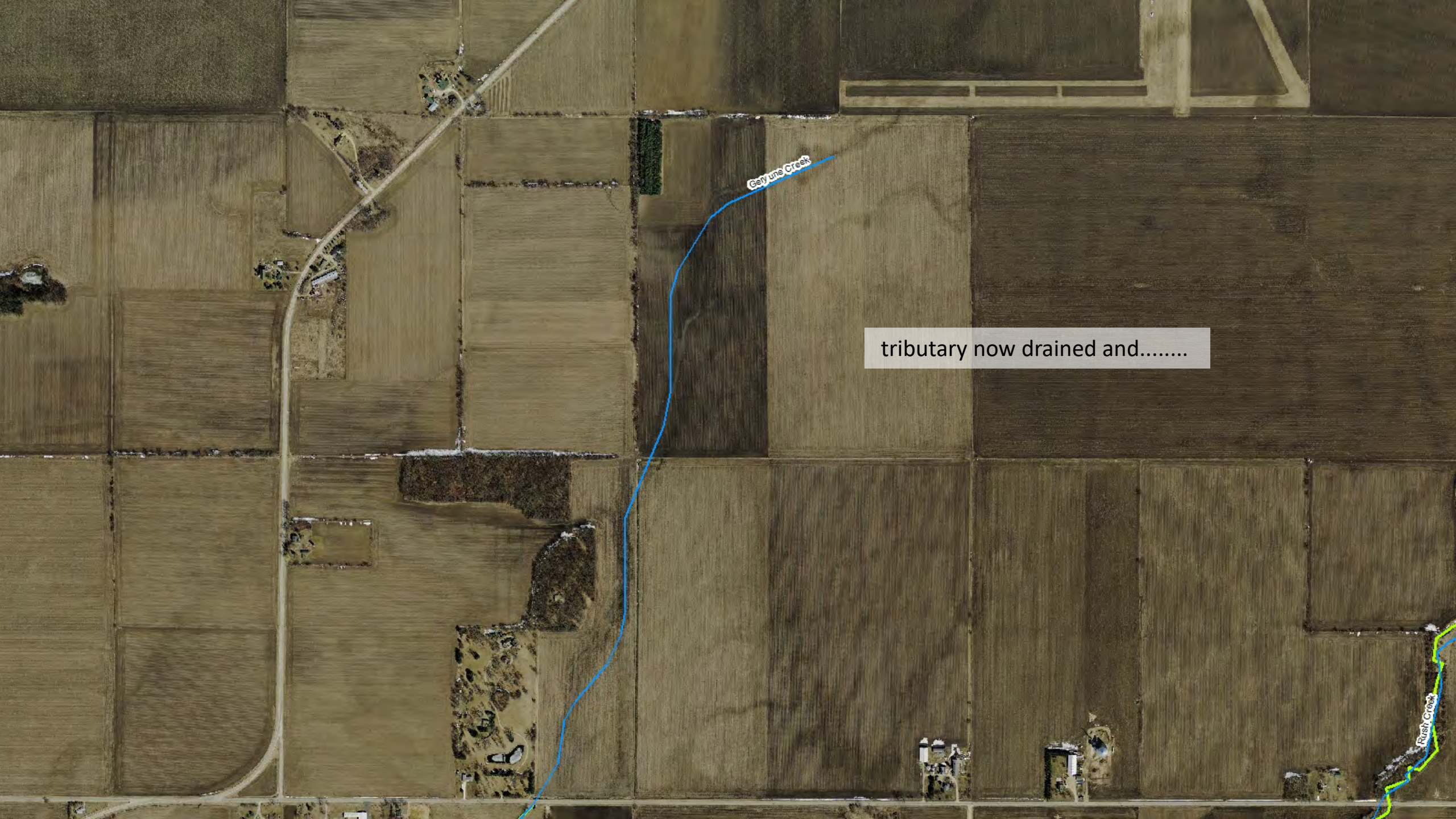
2013 Satellite Imagery

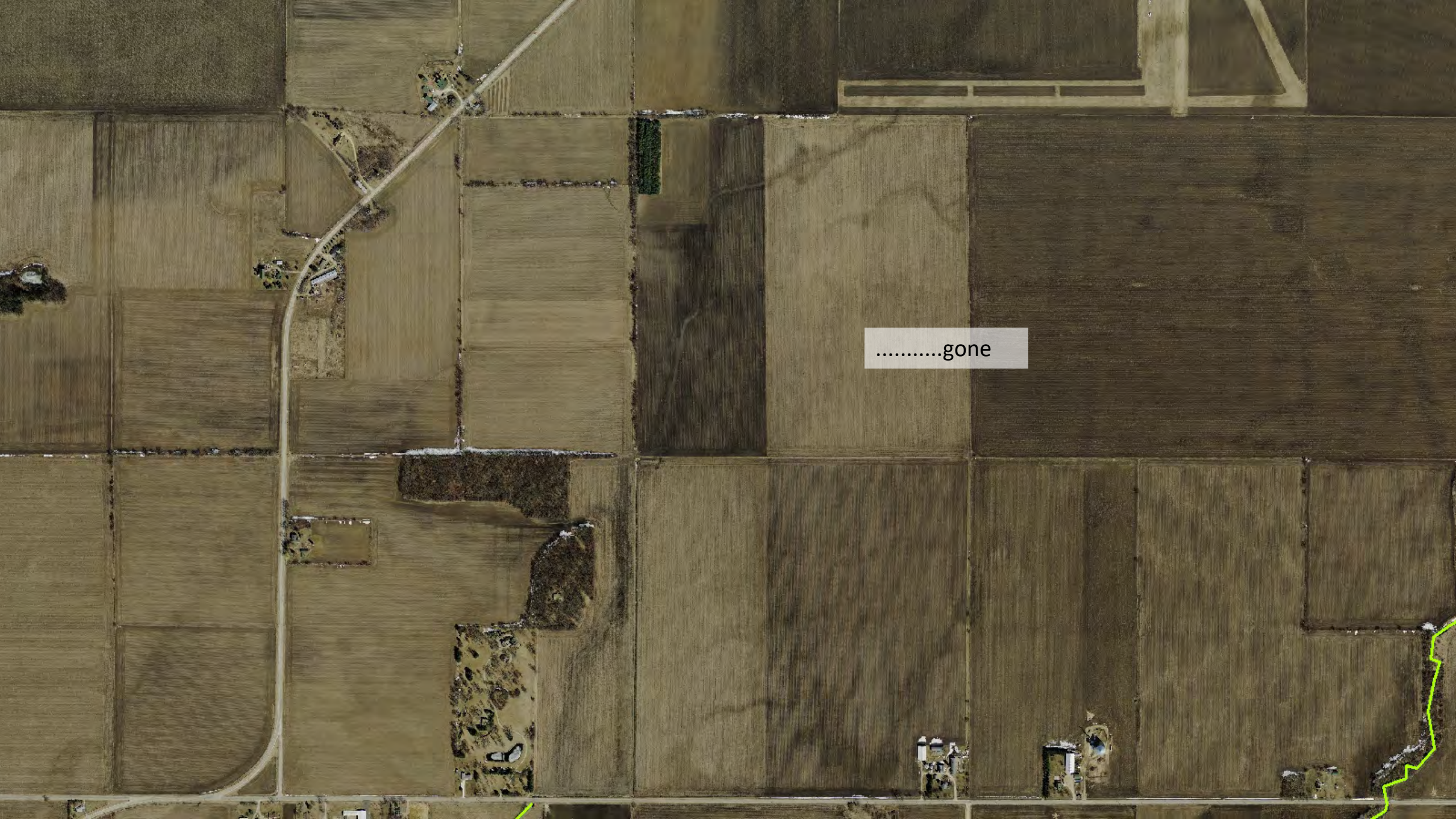
1939 Aerial Photo of Brookdale Area

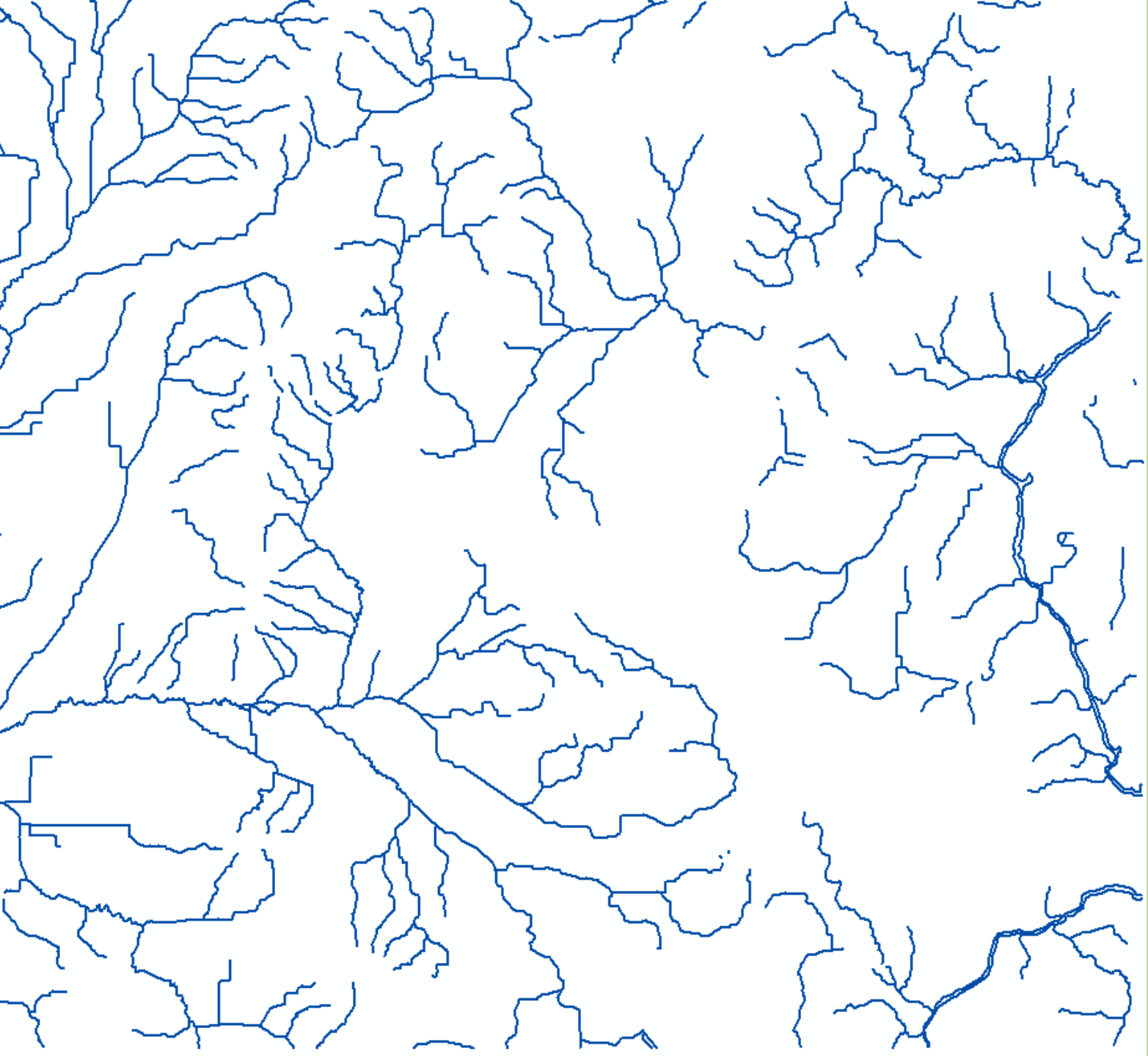
2013 Aerial Imagery



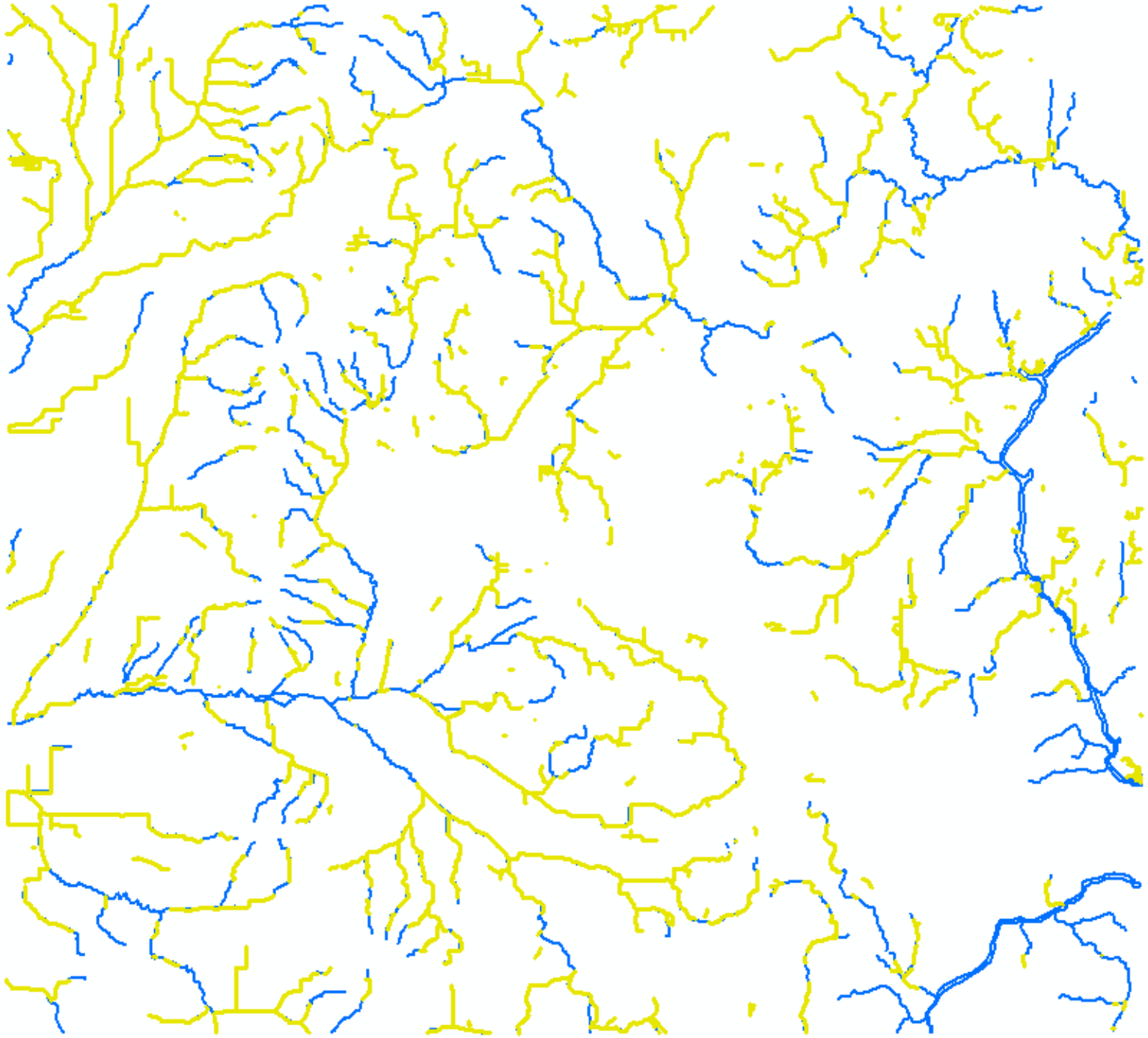

1872
Man-made ditch
Coon Creek
Coon Creek 2013
trib Coon Creek
Man-made ditch
Man-made ditch


Geryune Creek
tributary now drained and.....
Rush Creek

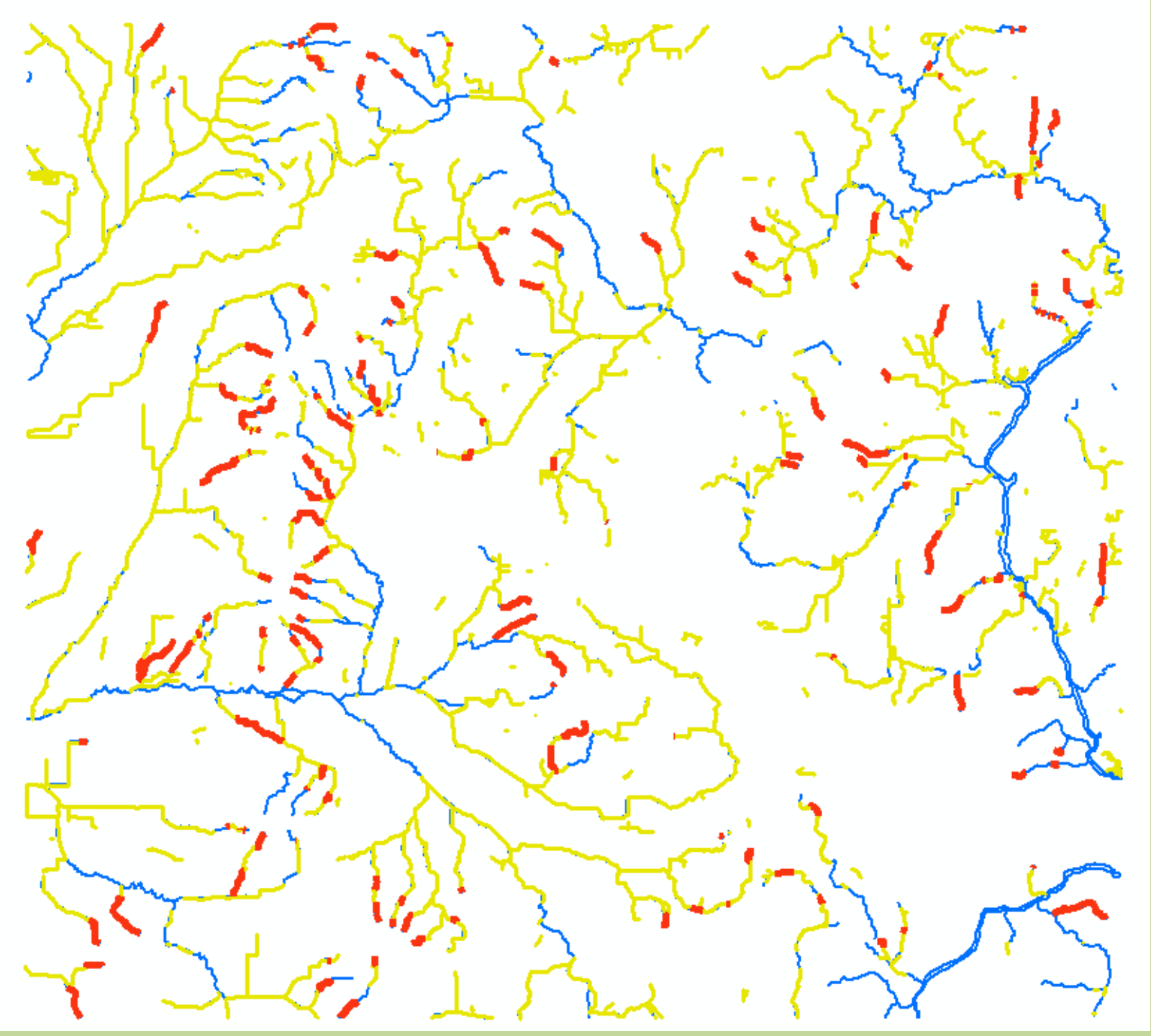

.....gone



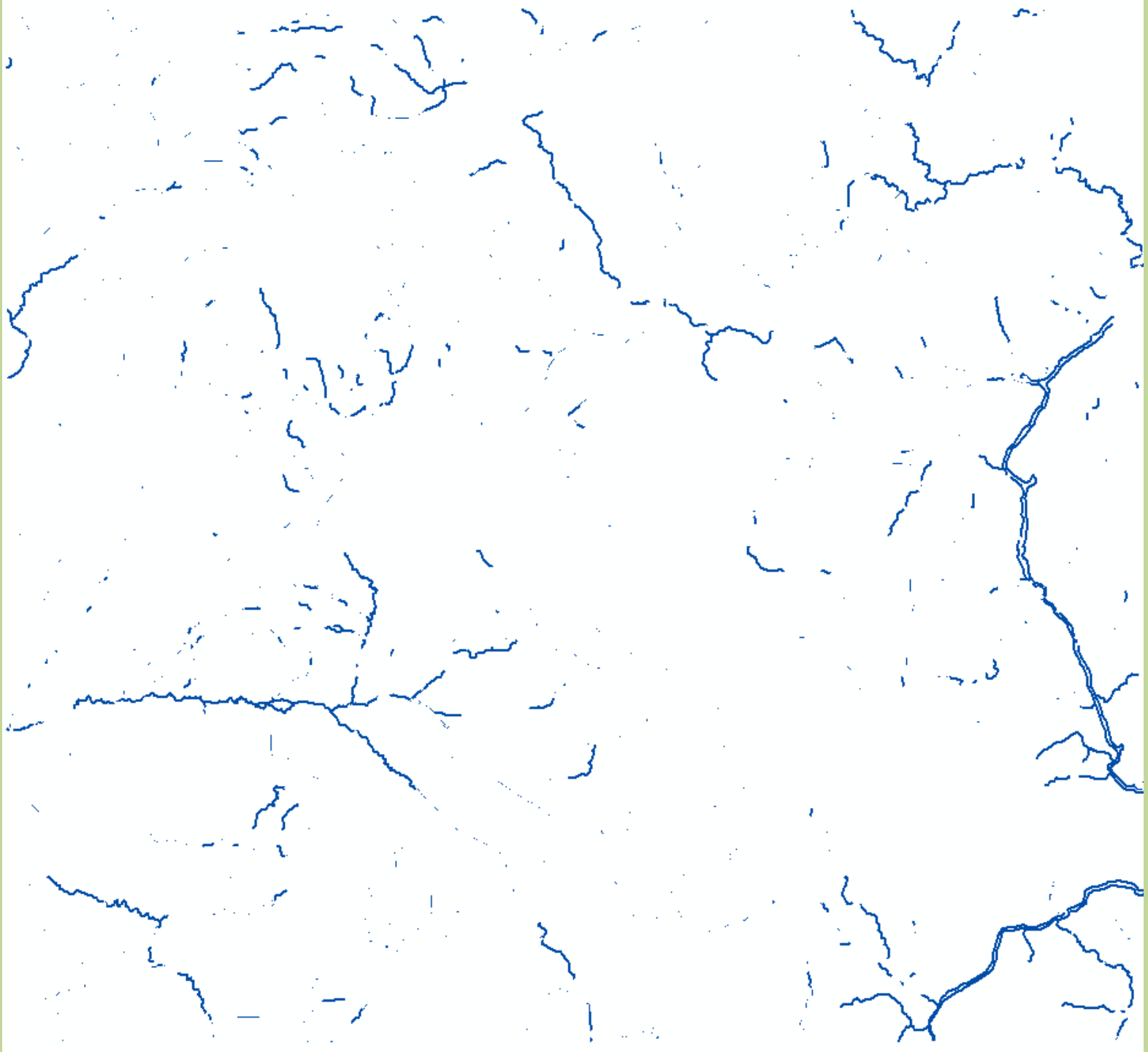
All Streams mapped in 1994



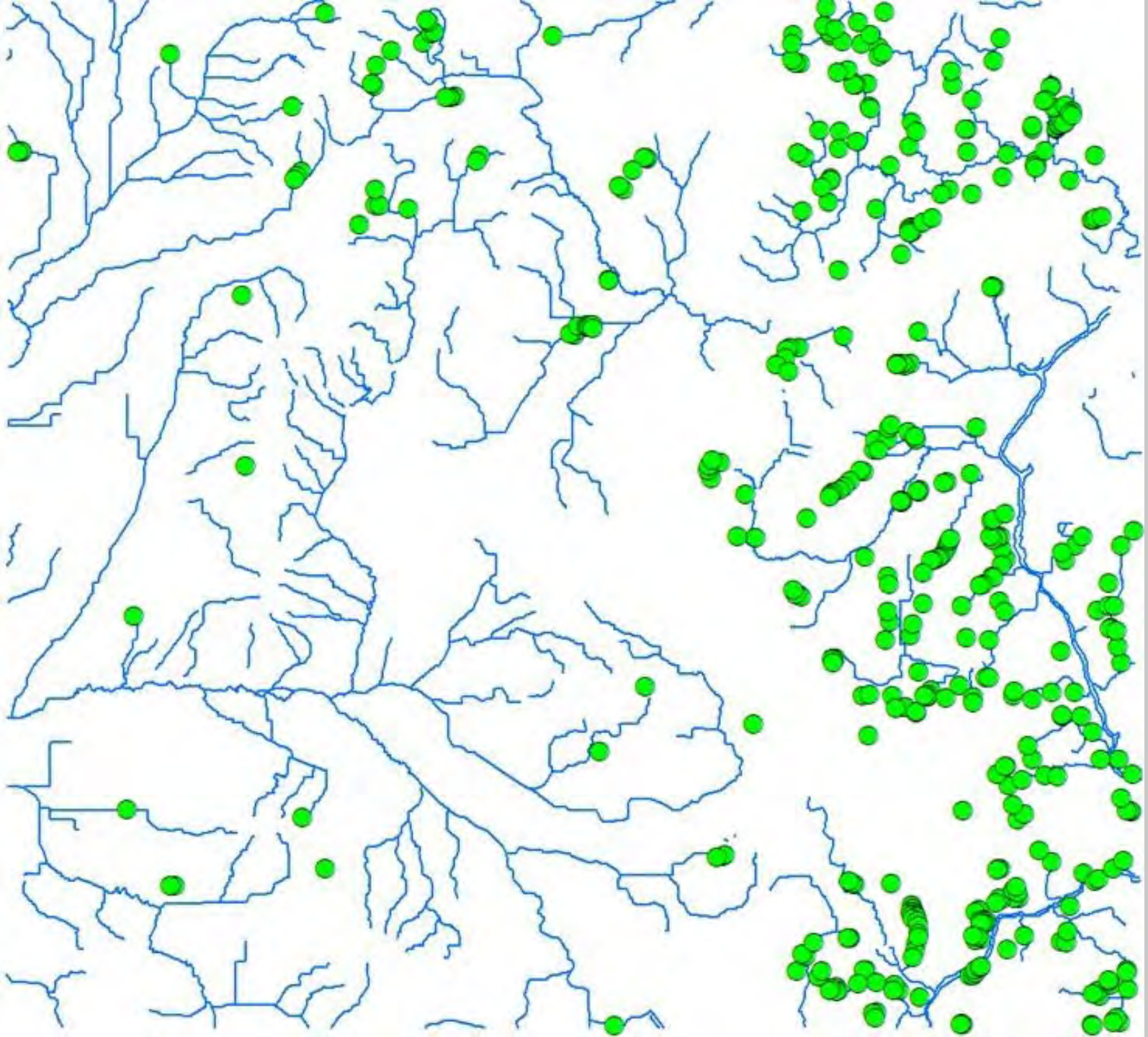
Sections of Stream that have been channelized



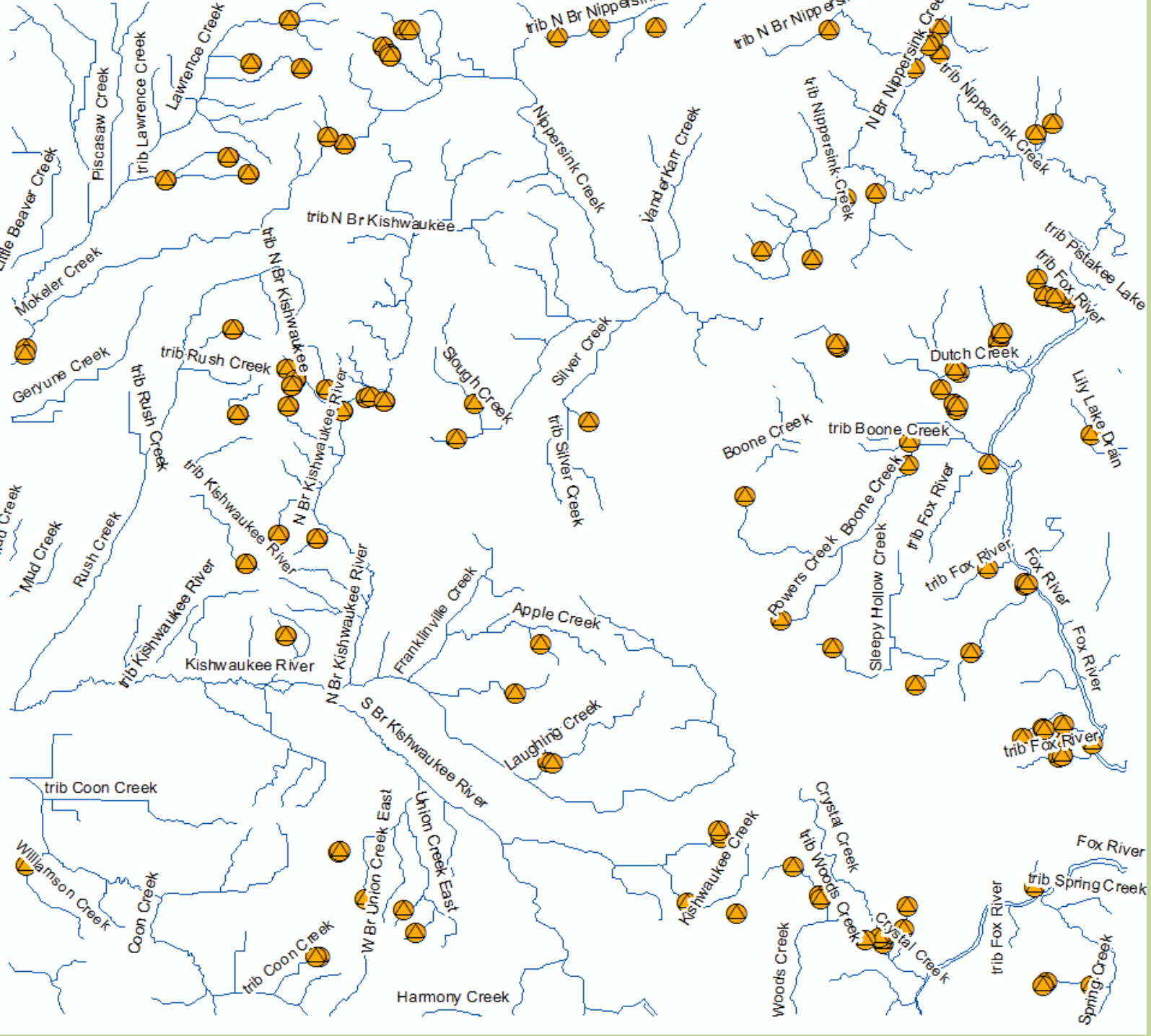
Channelized Streams (yellow) and Drained tributaries (red)



Remaining streams that haven’t been altered.



Mapped Springs
1872

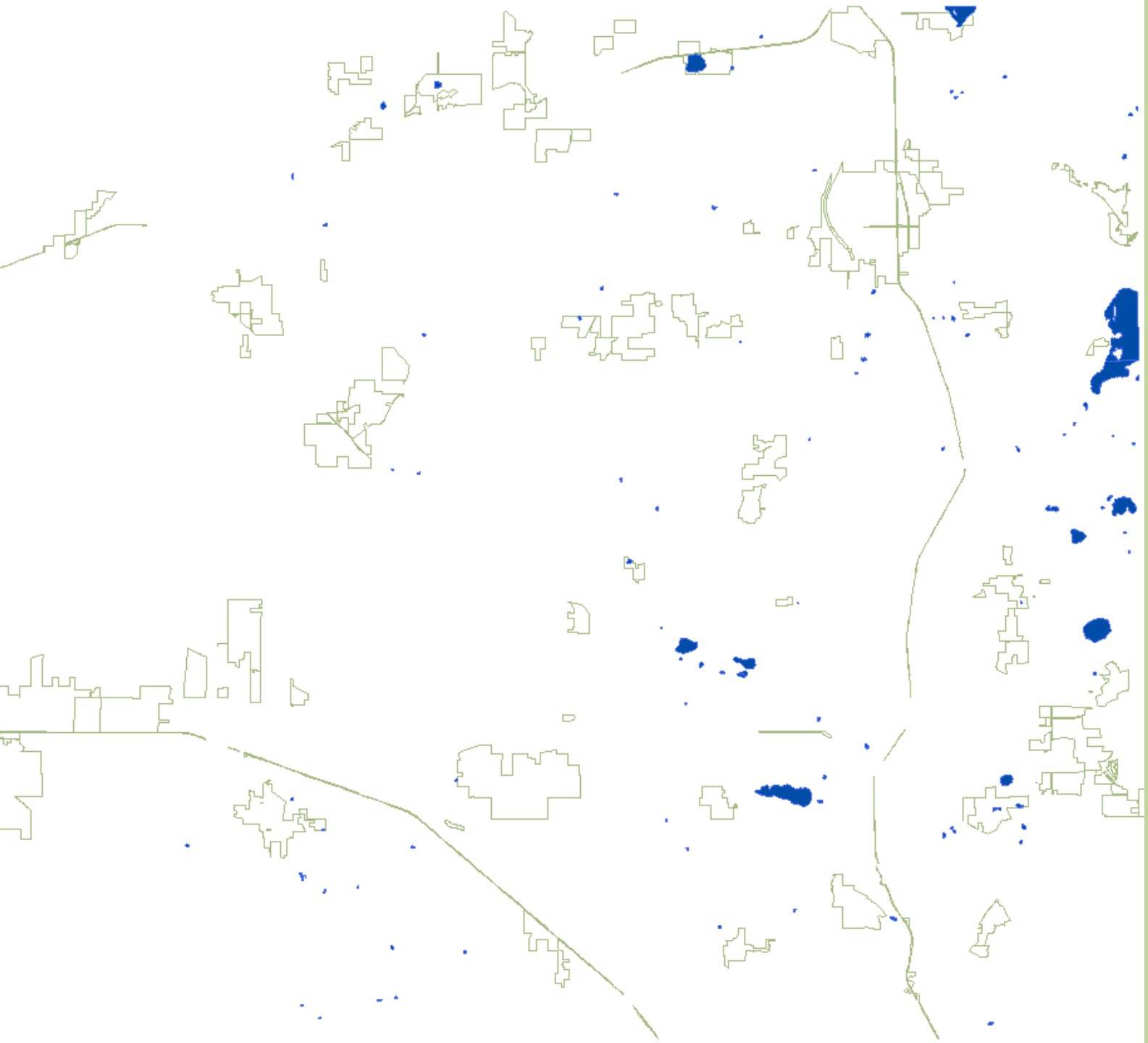


Man-made Dams in McHenry County

….as of 2013…..

…120 Dams..

~1 Dam for every 4 miles of stream



103 natural ponds (1,893 acres) existed in 1872

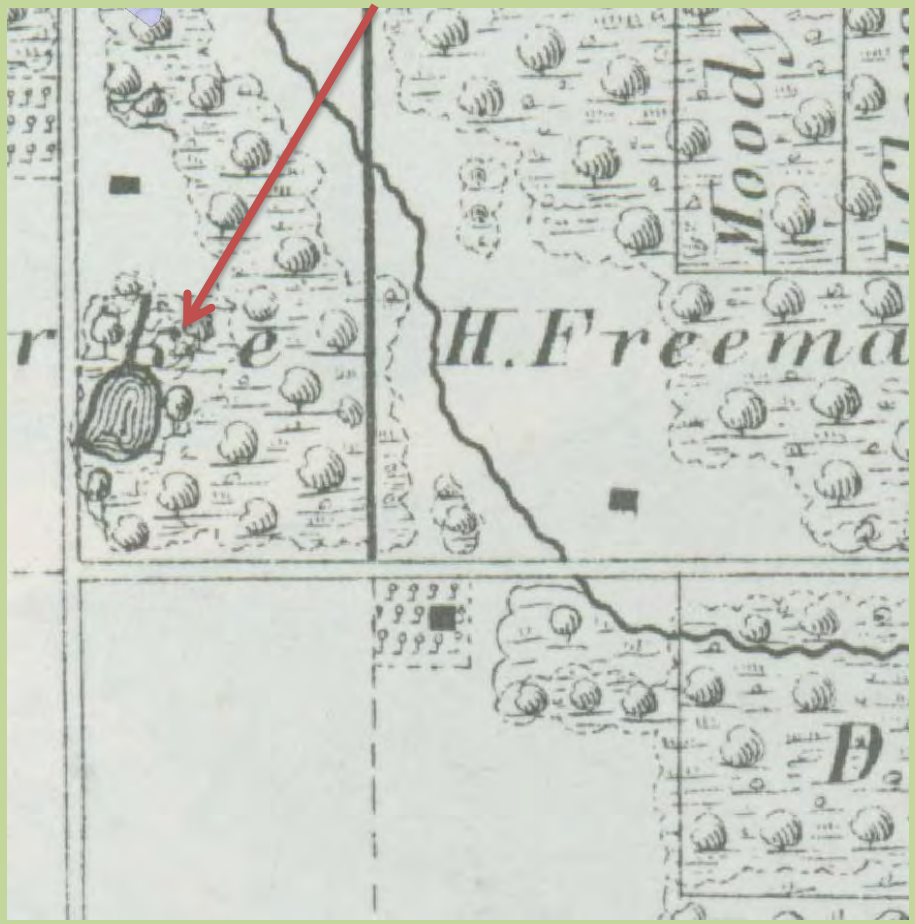
28 natural ponds (62.36 acres)
mapped in 1872 had been drained by 2013

Legend

MCCD Sites

Example of Drained Natural Pond:

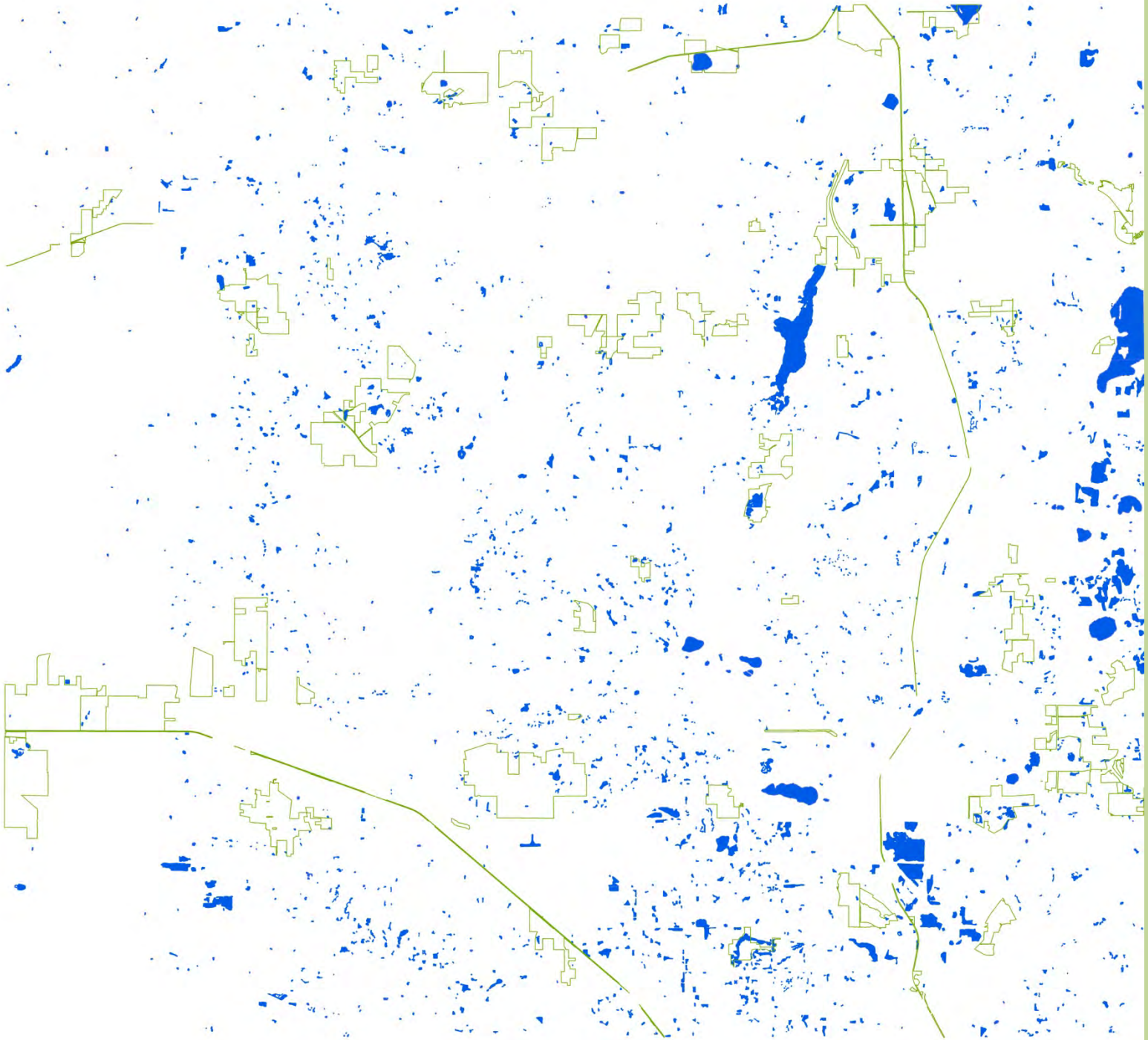
Natural Pond



1872 Plat Map

Drained Natural Pond

2013 Aerial Imagery



By 2013, 2,609 ponds (6,285 acres) had been added

For a total of 2,684 total ponds (8,116 acres)

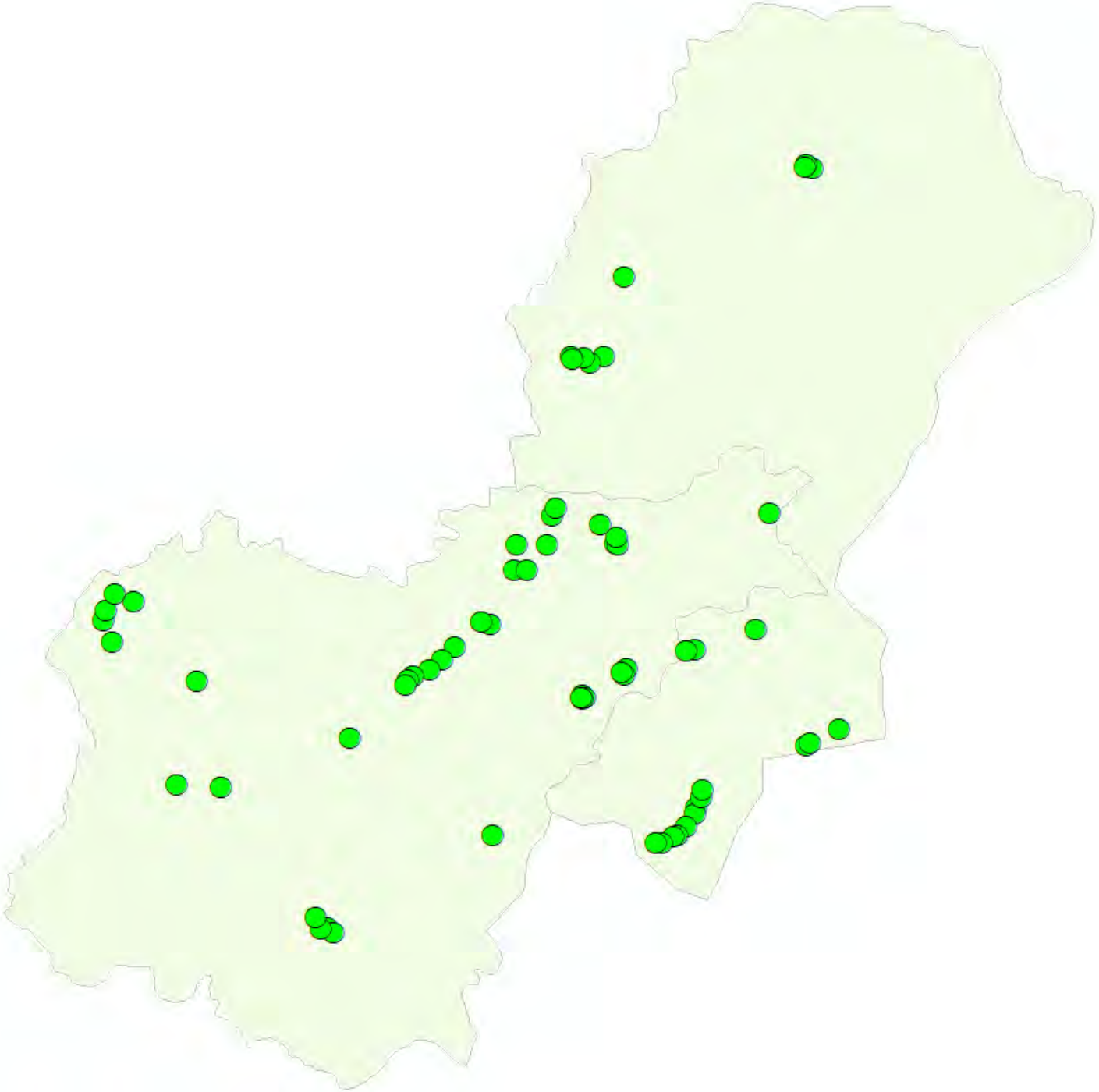
Legend

MCCD Sites

Boone Creek

Water Features by the numbers:

64 natural springs, source 1872 plat maps

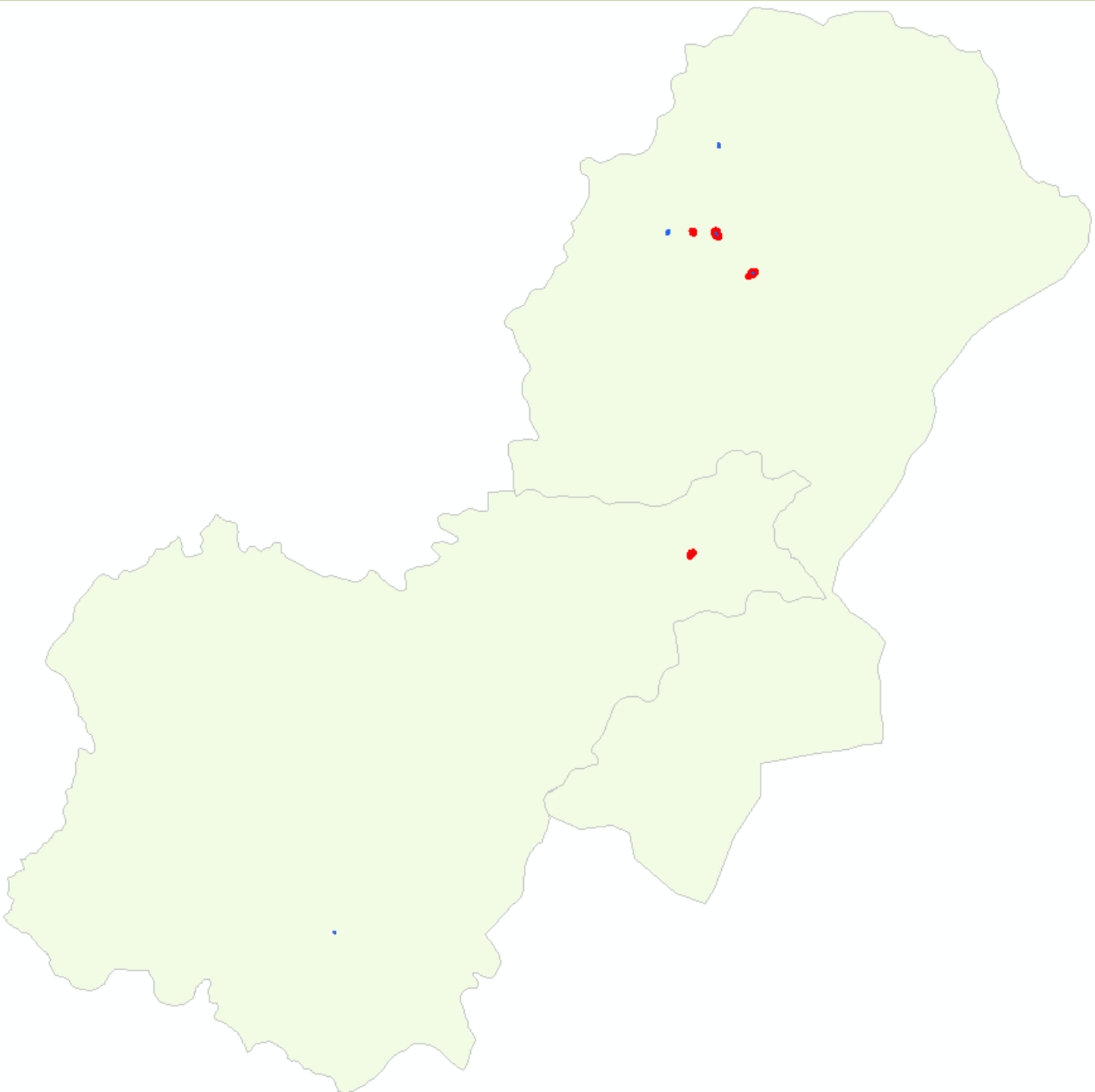


Water Features by the numbers:

7 natural ponds were mapped in 1872 plat maps, for a total of 10.62 acres of ponds.

4 of those ponds, 8.66 acres, have been drained.

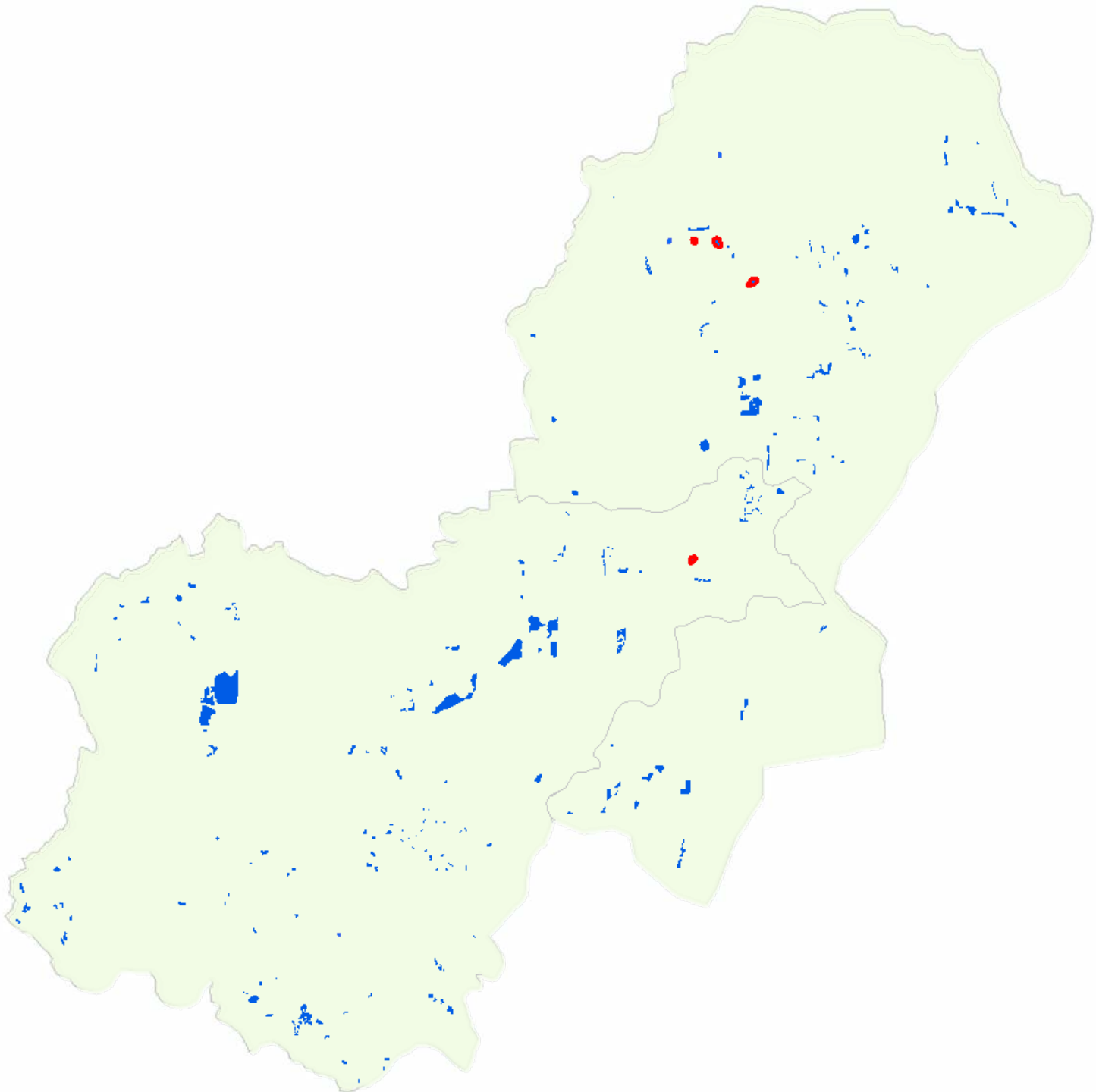
= 1.96 acres of natural ponds



Water Features by the numbers:

Three natural ponds, 1.96 total acres, remain.

247 artificial ponds, 327.41 acres,
have been added.

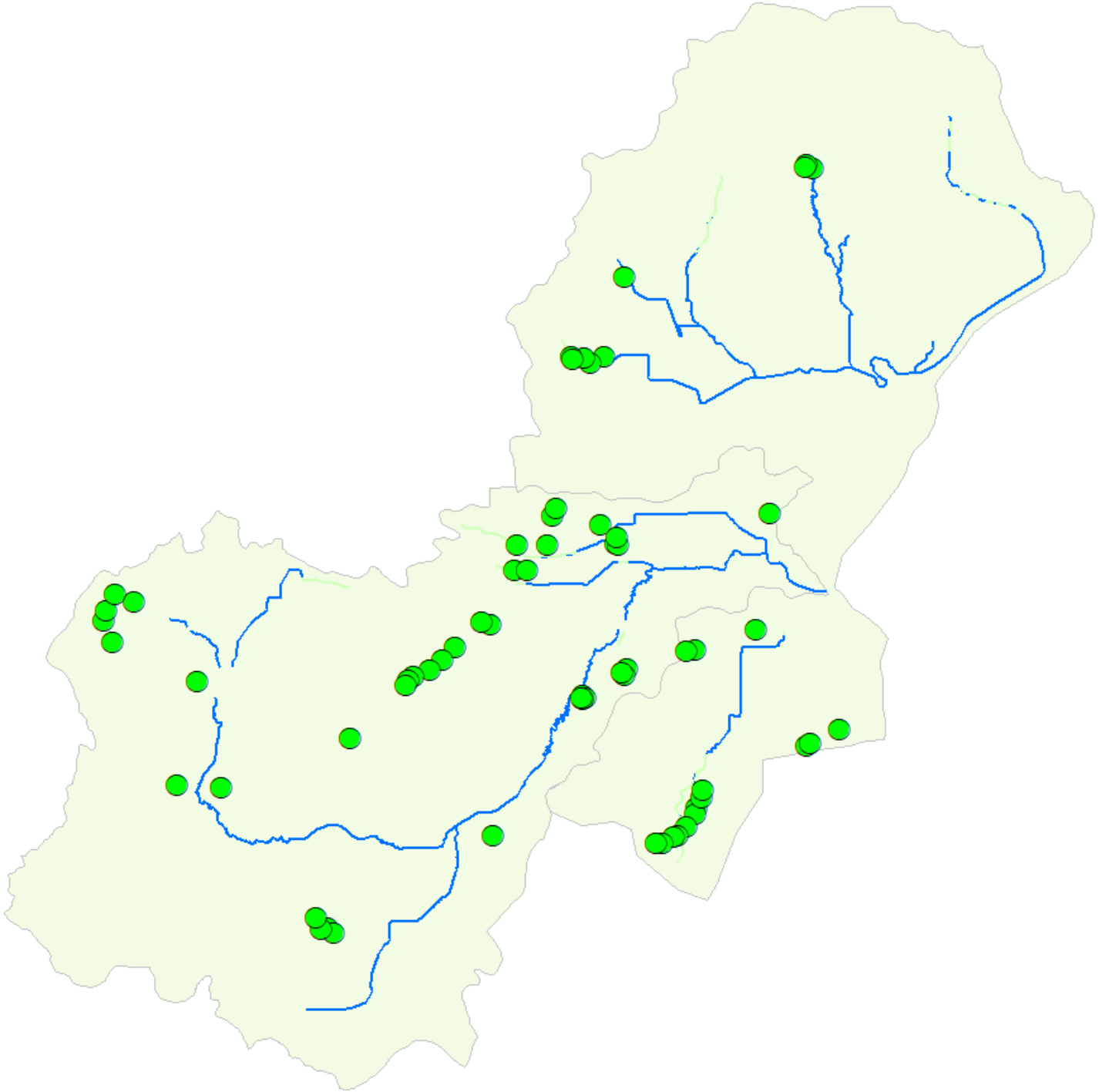


Water Features by the numbers:

39.73 miles of stream (historically)

5.23 miles of tributaries have been drained

= 34.5 miles of stream



Water Features by the numbers:

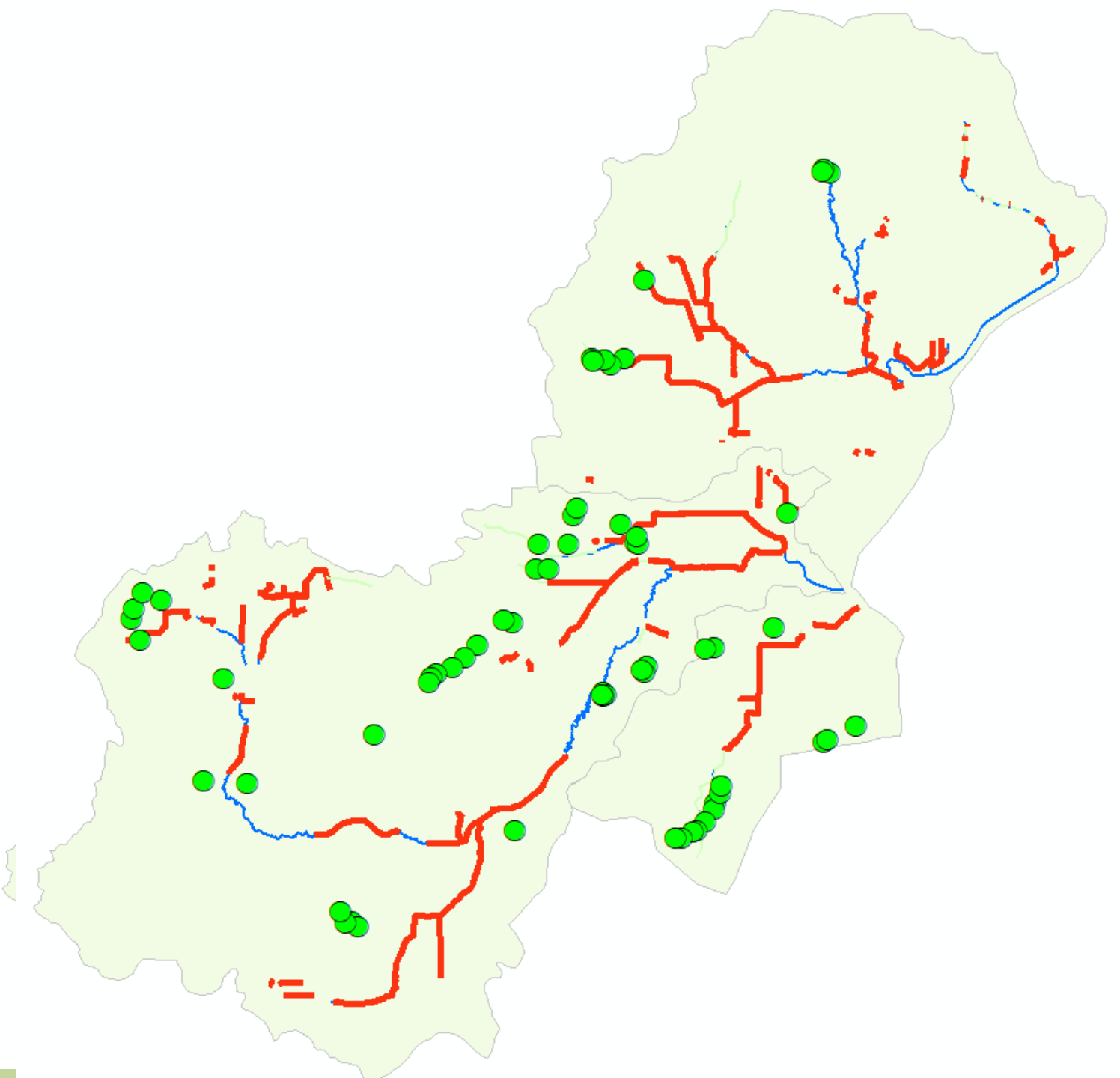
34.5 miles of stream

9.06 miles of manmade ditches

= 43.56 miles of waterways

32.12 miles of the waterways are channelized streams or ditches

73.74% of the waterways are channelized streams or ditches.

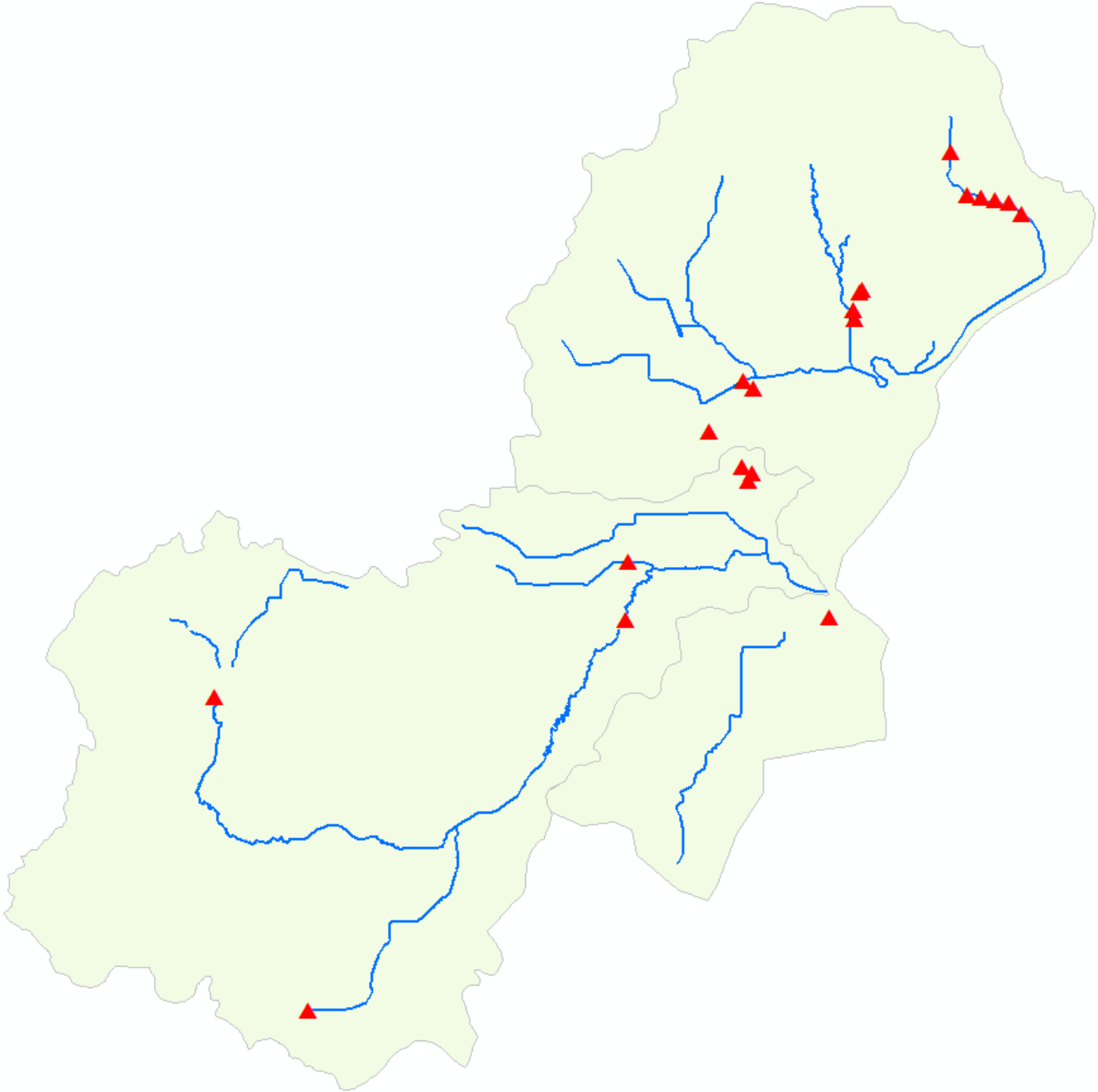


Water Features by the numbers:

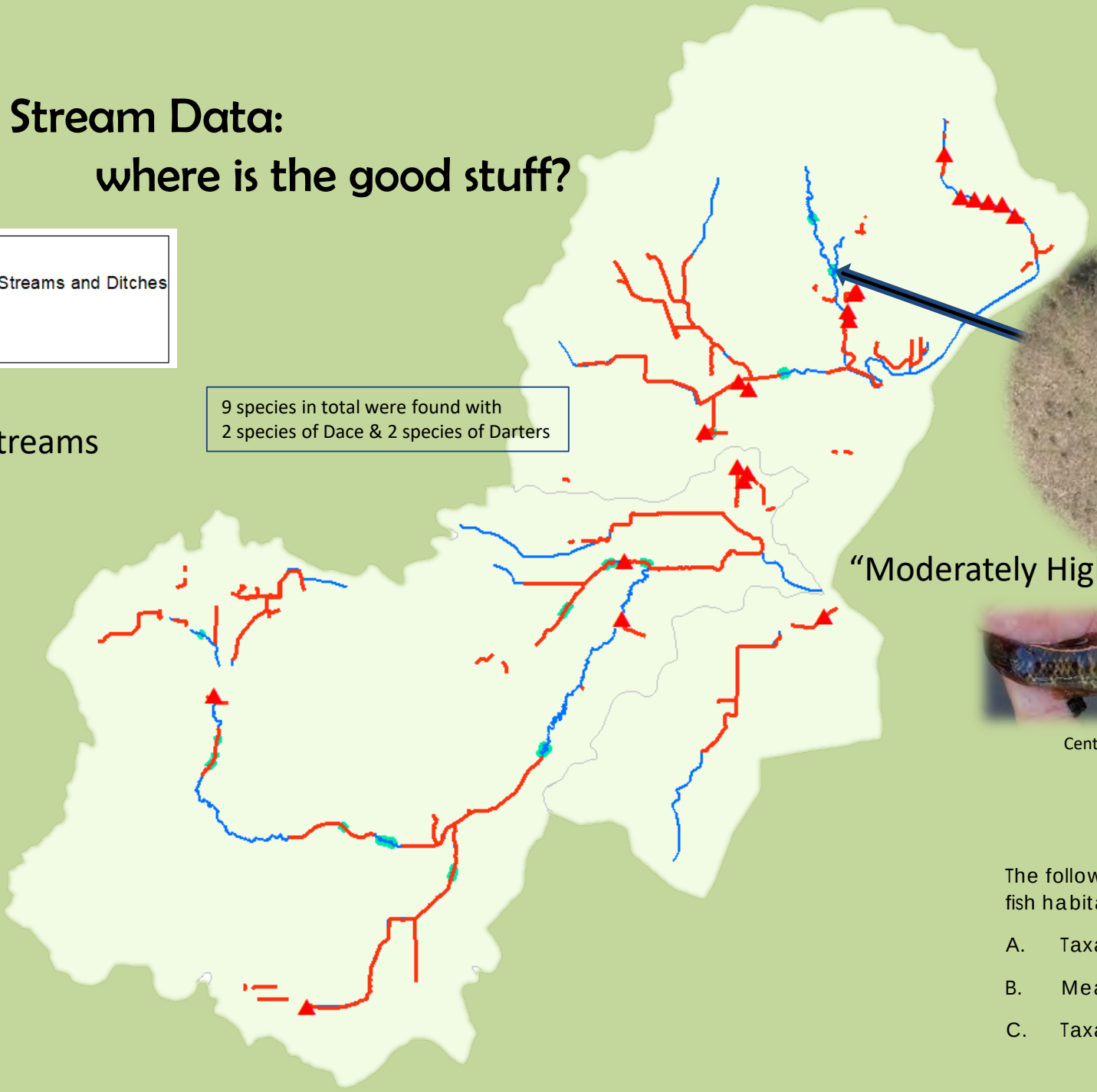
Dams are used to modify water flow. They alter the stream substrate through upstream siltation and impede fish passage.

There are 21 known dams in the Boone-Dutch watershed.

Raised culverts like those found under roadways can have the same effects as dams. It is not known how many raised culverts are in the watershed.



Biological Stream Data:
where is the good stuff?



9 species in total were found with
2 species of Dace & 2 species of Darters

1st Order Streams

Fish

Blacknose Dace

"Moderately High"

Orangethroat Darter

Southern Redbelly Dace

Central Mudminnow

The following metrics were used to quantify the quality of the fish habitat found in headwater streams (1st order streams):

A. Taxa richness of native fish species

B. Mean tolerance index of fish present in the stream

C. Taxa richness of native darters, dace and sculpins

Honoring the Water Goddess