SANGAMON COUNTY

2040 COMPREHENSIVE PLAN

Environmental

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1. Topography & Geology

Topography & Geology

Sangamon County has areas of varied topography near streams, creeks, and rivers, but it is predominantly flat. The elevation has a low of approximately 490 feet near the Menard County line along the Sangamon River and a high of approximately 690 to 715 feet in Talkington Township and near Buffalo Hart.

Sangamon County has several layers of bedrock. The upper layer of bedrock is called Pennsylvanian. Below the Pennsylvanian bedrock are layers of Mississippian, Devonian, Silurian, Ordovician, and Cambrian rock (Bergstrom, Piskin, & Follmer, 1976). Sangamon County is covered on 82 percent of its surface by the Shelburn-Patoka Formations undivided, 16 percent by the Bond Formation, and 3 percent by the Carbondale Formation (United States Geological Survey, n.d.).[1]

The surface of Sangamon County is primarily part of a feature called the Springfield Plain, which is a relatively flat upland (areas outside the floodplain) with numerous shallow valleys. The surface materials of Sangamon County were formed by glacial-interglacial periods. On the surface, most of Sangamon County contains Peoria loess (wind-blown soil). Below the loess is a layer called silt (fine sand, clay or other material carried by running water deposited as a sediment). In many areas of Sangamon County this is called the Roxana silt, which is well-drained in rolling areas and less well-drained in flat areas. Below the silt layer, many areas of Sangamon County have a glacial sand and silt layer called till of materials left over by glaciers. This layer, in its upper limits, is very weathered and is called the Sangamon Soil. It behaves similarly to the Roxana silt in that it is better drained in rolling than in flat areas. The weathering of the Sangamon Soil tended to occur in the approximately 55,000 year interglacial period between the Illinoian and Wisconsonian glacier periods. In the Sangamon River valley there is a layer called the Cahokia alluvium, which has an average of 8 feet to 12 feet thick fine-grained sediment deposited by floodwaters.

As the glaciers retreated, they also left ridges in the earth. There is a glacially created ridge called the Buffalo Hart Moraine that rises by as much as 75 feet above the Springfield Plain in the northeast part of the county (Bergstrom, Piskin, & Follmer, 1976). Much more detail about the soils of Sangamon County is contained in the latest soil survey by the Natural Resources Conservation Service (NRCS, 2000).

Mine Subsidence

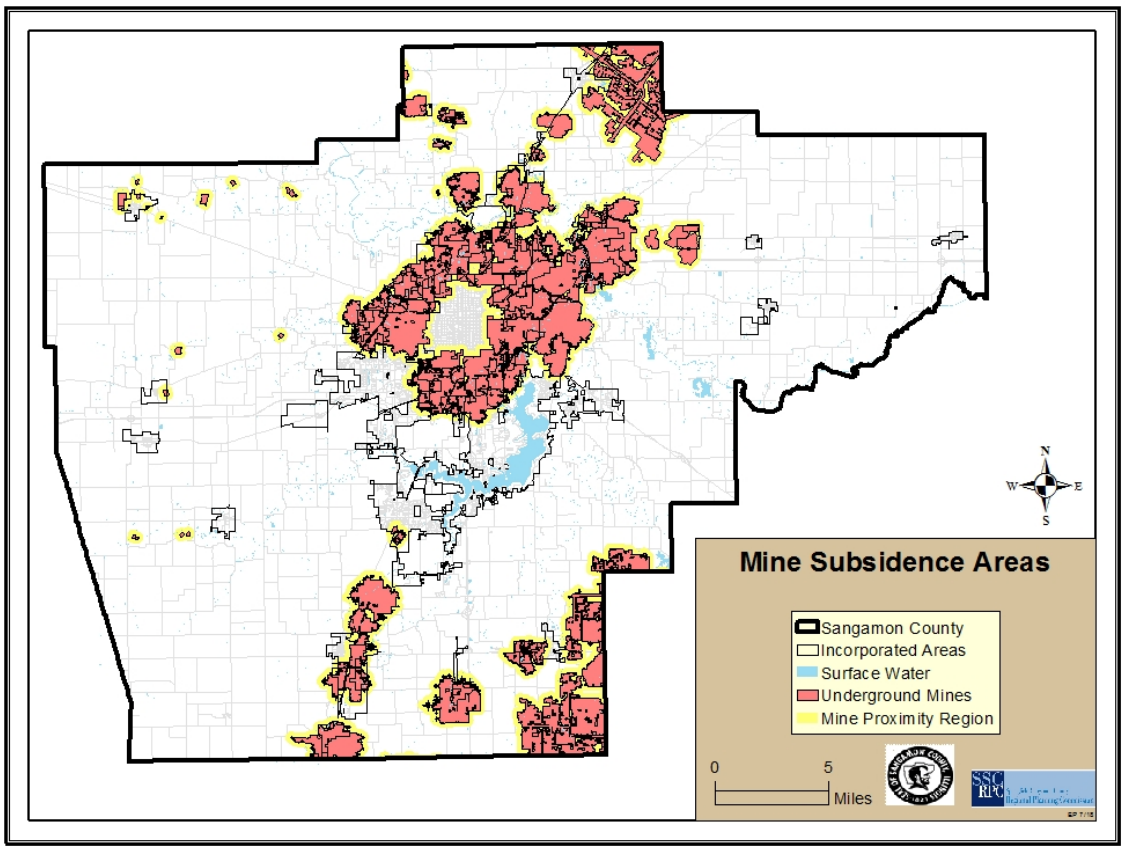
Sangamon County has one active underground coal mine at Williamsville. The Viper mine is located along Interstate 55 and is predominantly in Logan County but crosses over into Sangamon County. In 2016, the Viper mine produced approximately 1.6 million short tons of coal. The Viper mine first started extracting coal out of the shaft near Williamsville in 2012 after a $20 million 5.5-mile overland conveyor belt project was completed. The project was aided by the extension of the Springfield/Sangamon County Enterprise Zone to the area in 2009 in which the mine received property tax abatements for 10 years. The completion of the project of the new shaft and conveyor belt is expected to extend the life of

[1] Numbers may not add to 100 percent due to rounding.

the mine by at least 20 years. Most of the coal extracted from the Viper mine is bound for City Water, Light & Power in Springfield (Landis, 2012).

Figure 1 depicts undermined area in Sangamon County including dozens of former coal mines that operated from the late 1800s to 1964. The map depicts the location of the known underground mines in red with yellow representing a proximity region where mine subsidence may occur due to the location near the underground mines. Mine subsidence is the sinking of the ground surface due to the collapsing of the voids left from coal mining. The *Sangamon County Multi-Jurisdictional Natural Hazard Mitigation Plan* (2015) contains more detailed information on mine subsidence.

FIGURE 1



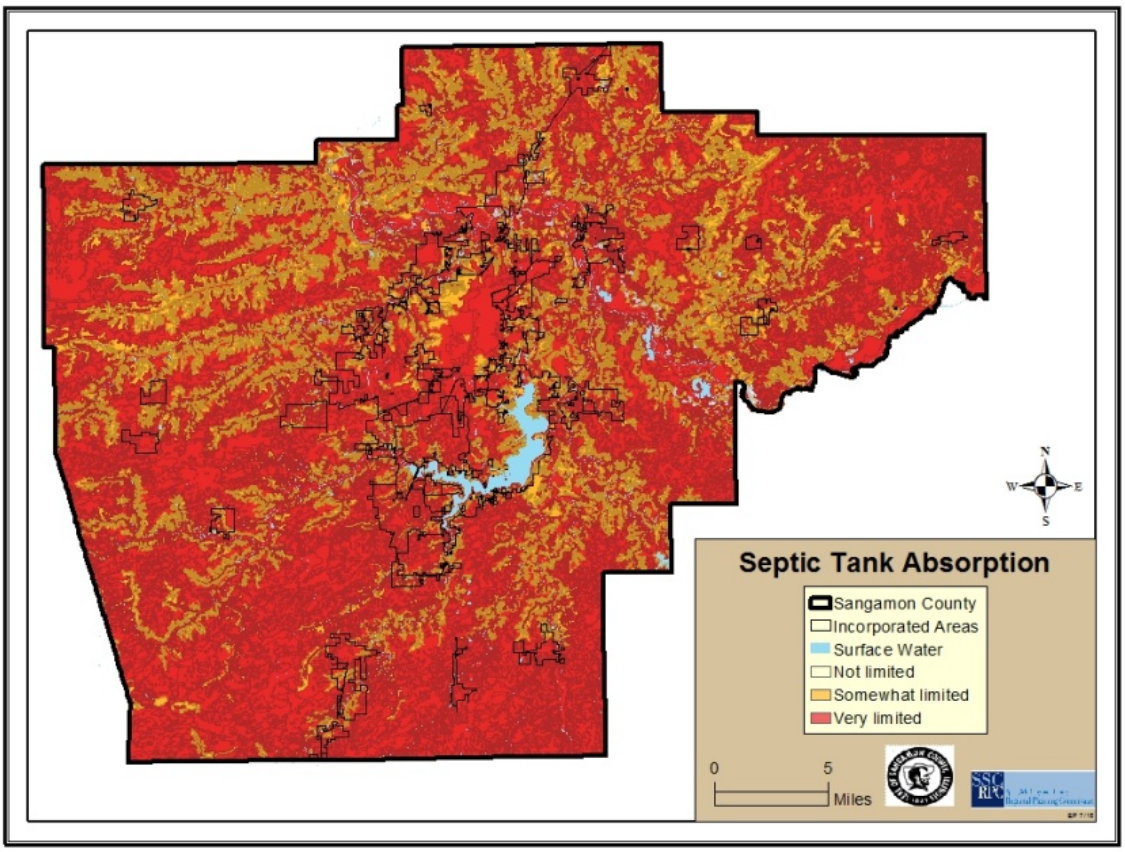
2. Area Soils

Soil Suitability for Septic Fields

Soils are an important consideration for growth planning. On a map produced by the Natural Resources Conservation Service (NRCS) in 2000, (hereafter called the soil map) Sangamon County's soils are rated according to their ability to support septic fields. The soil map has a qualitative rating of each soil type for factors including but not limited to: slope, restricted permeability, depth to saturated zone (height of water table), depth to bedrock, poor filtering capacity, and flooding to arrive at a score. The higher the

score, the more limited the soil type is for septic fields. Figure 2 shows the areas where soils are limited for septic fields in Sangamon County.

FIGURE 2



Areas in orange are somewhat limited for septic fields, meaning they are moderately favorable for septic field usage. Areas in red are very limited for septic field usage, meaning the soil type has at least one feature that is difficult and expensive to overcome without major soil reclamation, design, or installation features. High maintenance and poor performance can be expected if a septic field is placed in these areas (NRCS, 2000).

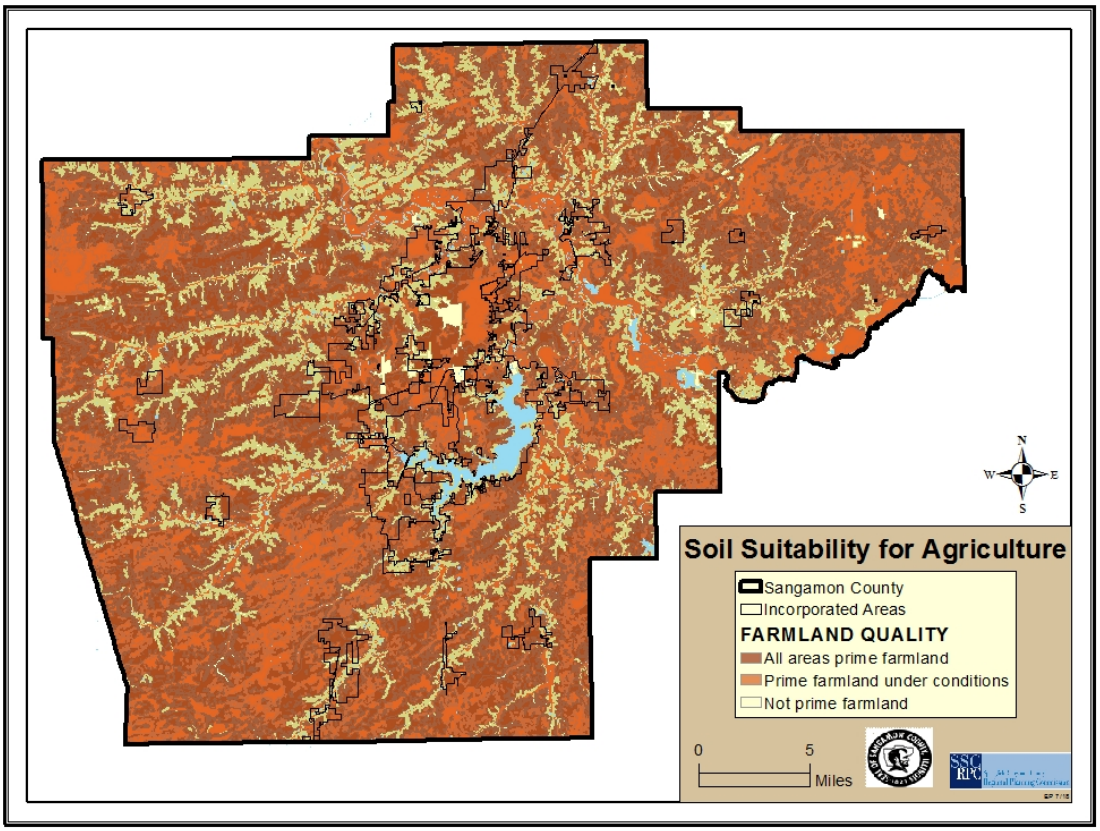
The map indicates a large area of very limited soils in the southern part of Sangamon County, roughly south of Springfield, Chatham, and Rochester southeasterly towards Divernon, Thayer, and Pawnee. Additionally, there is a large area of very limited soils in the far eastern part of Sangamon County near and west of Illiopolis. The reader should keep in mind that many of the areas in the northern and northwestern part of Sangamon County, where more orange somewhat limited soils occur, could be located on hillsides where the soils may be more limited than the map indicates. Often, soils for septic field absorption and farmland quality appear to have an inverse relationship: the worse the soils for septic, the better they tend to be for cropland.

Soil Suitability for Agriculture/Farmland Quality

Sangamon County historically performs well in crop production, and this is attributed to the soil being suitable for agriculture. In fact, Sangamon County was ranked first in the state in 2017 for soybean production with 70.3 bushels per acre and tenth in the state for corn yield with a 224.4 bushel average (USDA, 2018b) (USDA, 2018a).

According to the 2012 Census of Agriculture, Sangamon County had 1,092 farms with an average of 471 acres per farm. Figure 3 shows the areas with prime farmland depicted in the darker brown.

FIGURE 3

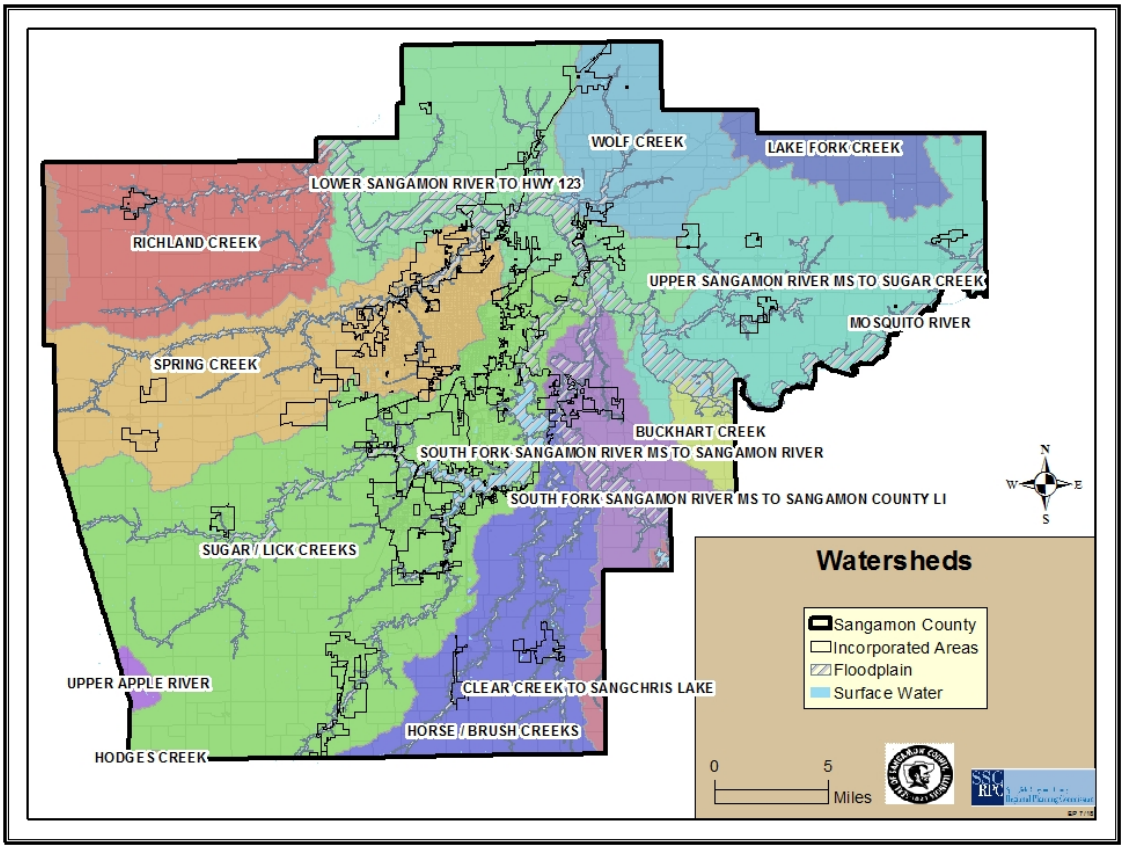


3. Watersheds, Floodplains & Wetlands

Watersheds

A watershed is an area that is drained by a river, creek, or intermittent stream of varying size. Figure 4 indicates different watersheds in Sangamon County. The major river in Sangamon County is the Sangamon River with tributaries including the South Fork of the Sangamon River, Spring Creek, and Sugar Creek having confluences (mouths) within county limits.

FIGURE 4



Major surface lakes in Sangamon County include Lake Springfield, created when Springfield dammed Sugar Creek in the 1930s, and Sangchris Lake which, although its dam is in Sangamon County the majority of its acreage is in Christian County.

There are a few impaired bodies of water in Sangamon County. The table (Figure 5) indicates 13 bodies of water (streams and lakes) that the Illinois Environmental Protection Agency (IEPA, 2018) defined as impaired, meaning “a condition in which at least one designated use, e.g. human recreational contact, eating fish, or processing water for food or drinking water supplies, is not attained,” (p. 1). IEPA uses the information contained about impaired streams and lakes to prioritize whether bodies of water need further study and mitigation.

FIGURE 5

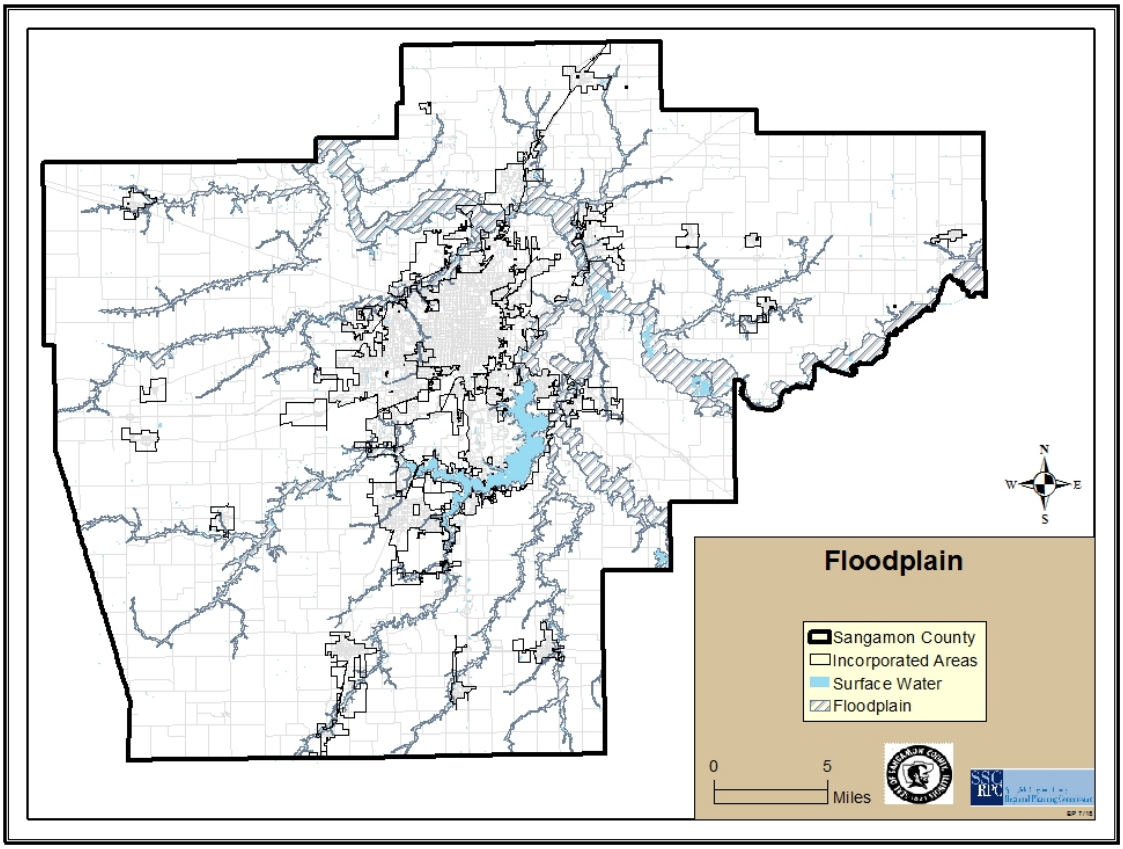
Water Name	Designated Use(s)	Cause(s)	Source
Brush Creek	Aquatic Life	Dissolved Oxygen	Unknown
Buckhart Creek	Aquatic Life	Dissolved Oxygen, Sedimentation/Siltation	Channelization & Crop Production (Crop Land or Dry Land)
Fancy Creek	Aquatic Life	Unknown Cause	Unknown
Hoover Branch	Aquatic Life	Sedimentation/Siltation	Crop Production (Crop Land or Dry Land)& Urban Runoff/Storm Sewers
Lake Springfield	Aquatic Life (A); Aesthetic Quality (Q)	Dissolved Oxygen (A); Total Suspended Solids (Q)	Unknown, Golf Courses, Agriculture, Runoff from Forest/Grassland/ Parkland, Other Recreational Pollution Sources
Lick Creek	Aquatic Life	Dissolved Oxygen	Loss of Riparian Habitat & Source Unknown
Panther Creek	Aquatic Life	Dissolved Oxygen, Total Phosphorus	Urban Runoff/Storm Sewers & Municipal Point Source Discharges
Richland Creek	Aquatic Life	Unknown Cause	Unknown
Sangchris Lake	Aesthetic Quality (Q); Fish Consumption (C)	Total Phosphorus (Q), Total Suspended Solids (Q); Mercury (C)	Atmospheric Deposition - Toxics, Unknown, Other Recreation Pollution Sources, Agriculture, & Runoff from Forest/Grassland/Parkland
Sangamon River	Aquatic Life (A); Fish Consumption (C); Primary Contact Recreation (P)	Nickel (A), Dissolved Oxygen (A), pH (A), Silver (A); PCBs (C); Fecal Coliform (P)	Unknown
South Fork Sangamon River	Aquatic Life (A); Fish Consumption (C);	pH (A), Total Phosphorus (A); Chlordane (C)	Unknown & Crop Production (Crop Land or Dry Land)
Spring Creek	Aquatic Life (A); Fish Consumption (C);	Dissolved Oxygen (A), pH (A), Sedimentation/Siltation (A); PCBs (C)	Unknown, Crop Production (Crop Land or Dry Land) & Urban Runoff/Storm Sewers
Sugar Creek	Aquatic Life	Boron, Dissolved Oxygen, Total Phosphorus	Industrial Point Source Discharge, Unknown, Municipal Point Source Discharges, Crop Production (Crop Land or Dry Land), & Upstream Impoundments

The major waterway that is impaired for primary human recreational contact is the Sangamon River near Riverton, the north side of Springfield, and Sherman. The cause for the impairment is fecal coliform.

Floodplains

When planners talk about "floodplains", it typically means areas subject to the 100-year or one percent annual chance flood, also called the Special Flood Hazard Area (SFHA). According to FEMA (2005), floodplains provide several natural and beneficial functions. First, they provide natural flood and erosion control. Floodplains provide storage of floodwaters during times of high water flow and contribute to the hydrologic cycle by recharging groundwater, refreshing aquifers and smoothing out the frequency and duration of low water flows during droughts. Second, floodplains serve important biologic resources and functions. They maintain water quality by filtering run-off, moderating water temperatures and processing organic waste; important functions that improve aquatic habitats. Floodplains are also hunting and breeding grounds for wildlife helping to conserve natural areas. Additionally, floodplains can contribute to an improved quality of life through societal benefits providing opportunities for outdoor and scientific education. Finally, floodplains can provide recreational opportunities when there is enough water to support boats, canoes, kayaks, or inner tubes. Figure 6 shows floodplains in Sangamon County, several of which are notable.

FIGURE 6



Floodplains in the eastern county: Sangamon River and the South Fork of the Sangamon River

The most important floodplain in Sangamon County is the Sangamon River. It flows for approximately 54 miles through Sangamon County from east to west (FEMA, 2007). The river drainage area in Sangamon County is between approximately 1,090 square miles near the Macon County line to approximately 2,833 square miles near the Menard County line (FEMA, 2007). There is a river gauge at Riverton that tracks both flow in cubic feet per second and water elevation. The largest flood at the Riverton gauge was the flood of May, 1943. The Sangamon River has sections which have detailed studies (floodway and 100-year flood elevation calculated) and limited detail studies (100-year flood elevation only).

The South Fork of the Sangamon River originates in eastern Christian County and flows for approximately 92 miles across Christian and Sangamon Counties to its mouth with the Sangamon River near Riverton (FEMA, 2007). In total, it drains approximately 885 square miles near the mouth (FEMA, 2007). Like the Sangamon River, the South Fork has sections which have detailed studies (floodway and 100-year flood elevation calculated) and limited detail studies (100-year flood elevation only) (FEMA, 2007).

Floodplains in the southern and western county

The southern part of Sangamon County contains three floodplains of note. Lick Creek and Sugar Creek both feed water into Lake Springfield. The water proceeds through Spaulding Dam downstream as Sugar Creek to the South Fork and the Sangamon River. Lick Creek is generally not studied, meaning while floodplains are shown on the maps, there are no 100-year flood elevations calculated. There is a small exception in Loami for a tributary to Lick Creek, which was studied in 1995 (FEMA, 2007). Sugar Creek is like the Sangamon River and the South Fork in that it has sections that have detailed studies (floodway and 100-year elevation calculated) and limited detail studies (100-year flood elevation only) (FEMA, 2007). The third floodplain of note in southern Sangamon County is Horse and Brush Creeks which flow generally south to north. Horse Creek meets Brush Creek near Vigal Road approximately one mile east of Pawnee Road in Cotton Hill Township. Horse Creek then continues flowing northward to its mouth with the South Fork near Rochester. Horse and Brush Creek are notable because they are proposed to be dammed by the City of Springfield to form Hunter Lake, a potential future project. Part of Horse Creek has a limited detail study and part of Brush Creek has a limited detail study. (FEMA, 2007).

The western part of Sangamon County contains Spring Creek, which is approximately 18 miles long in Sangamon County (FEMA, 2007). It has two tributaries which flow through Springfield and surrounding communities such as Jerome and Leland Grove, the Jacksonville Branch and the Town Branch. Both tributaries and the portion of Spring Creek in Springfield are heavily urbanized. The Jacksonville Branch and Spring Creek in Springfield both have detailed studies (floodway and 100-year flood elevation calculated). Spring Creek drains approximately 123 square miles at its mouth with the Sangamon River near the 8th Street sewage plant and Color Plant Road in Springfield.

Floodplains in the northern county

The major floodplain on the southern edge of northern Sangamon County is the Sangamon River. Other smaller tributaries in the northern parts of the county near Sherman and Williamsville include Fancy Creek and Wolf Creek. Devine Drive, near Riverton and Spaulding, has low lying areas that flood due to the Sangamon River near its confluence with Wolf Creek. Fancy Creek and Wolf Creek are mostly not studied, meaning no 100-year flood elevations are calculated.

The flood of 2015-2016 (from the Natural Hazard Mitigation Plan (2015))

The most recent notable flood along both the Sangamon River and the South Fork of the Sangamon River occurred late in 2015 and into 2016. Both streams had floods that exceeded the 100-year flood elevations during this event. During December of 2015, heavier than average rains fell over the region. In Springfield, 6.56 inches of precipitation fell in December, 4.04 inches more than the 1981-2010 average of 2.52 inches. The rains were heaviest between December 23 and December 28 in Springfield. Two-thirds of the monthly rain total (4.37 inches) fell in three days between December 26 and December 28. Heavier rainfall occurred outside Springfield as parts of Christian County received over ten inches of rain, according to the National Weather Service.

The heavy rainfall, combined with saturated ground conditions, led to general flooding along the South Fork of the Sangamon River and the Sangamon River. Major roads into Springfield including Illinois Route 4 at the Sangamon River bridge near Sherman and Illinois Route 29 between Springfield and Rochester closed due to the flooding.

Flooding along the South Fork of the Sangamon River was record setting. The South Fork reached a crest four feet above the previous record set in 2002, according to the National Weather Service. The crest exceeded the 100-year flood elevation. Figures 7 & 8 show the crest data on 12/31/2015 in relation to other noteworthy floods in the past.

Flooding along the Sangamon River was also noteworthy. The river rose approximately ten feet in two days between December 27 and December 29. The flood exceeded the 100-year flood elevation at Riverton, cresting at 30.00 feet on December 31, but did not reach historic crests seen in 1926 and 1943, according to the National Weather Service. The National Weather Service also indicates the flood was within 0.15’ of two other crests in 1926 and 2002. The Sangamon River at Riverton was above flood stage for approximately seven days from December 28 through January 4.

Fortunately, there was no loss of life in Sangamon County during the flooding event in December 2015. In addition, sandbagging efforts and deployment of the communities’ respective emergency management plans minimized the damage to property.

FIGURE 7: Historically High Flood Events on the South Fork of the Sangamon River at Rochester

Date	Elevation
12/31/2015	**547.98**
5/13/2002	543.85
4/14/1994	543.70
4/14/1979	543.22
2/26/1985	542.09
9/18/2008	541.47
6/18/1970	541.26
4/21/2013	541.09
11/22/1985	540.44
1/23/1974	540.43
5/11/1996	540.22
9/27/1993	540.15
4/25/1973	540.14

Note: 100-year flood elevation is 545.5 feet.

FIGURE 8: Historically High Flood Events on the Sangamon River at Riverton

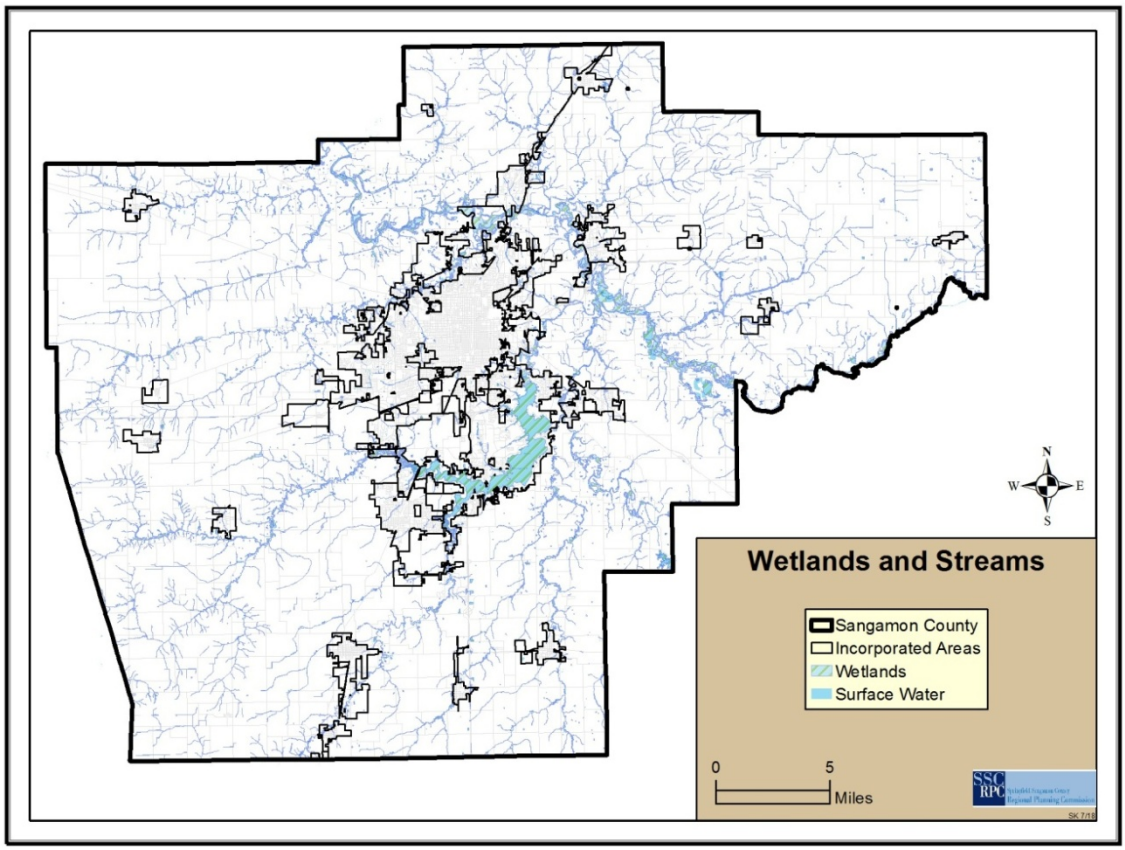
Date	Elevation
5/19/1943	539.90
9/11/1926	538.53
12/31/2015	**538.08**
5/14/2002	538.08
4/13/1994	536.66
4/11/1922	536.60
2/2/1916	536.41
6/6/1917	536.18
9/30/1911	535.60
6/9/2008	535.27
8/24/1915	535.23
4/12/1979	535.16

Note: 100-year flood elevation is 537 feet.

Wetlands

Figure 9 shows the location of wetlands in Sangamon County.

FIGURE 9



Wetlands are characterized by a code system developed by the United States Fish and Wildlife Service (Cowardin, Carter, Golet, & LaRoe, 1979/1992). Analysis of the latest US Fish and Wildlife Service wetland data by staff shows there are three types of wetlands that cover 26,930.26 acres, or approximately 4.8 percent of the total area of Sangamon County. They are lacustrine (characteristic of lakes), palustrine (characteristic of prairies, bogs, and fens) and riverine (characteristic of rivers). The table (Figure 10) indicates palustrine has the largest acreage, followed by lacustrine, and then riverine.

FIGURE 10

Wetlands Type	Acres
Lacustrine	6,495.40
Palustrine	14,886.16
Riverine	5,548.70
Total	**26,930.26**

The largest lacustrine wetlands code is L1UBHh (lake, unconsolidated bottom, permanently flooded, diked or impounded) with approximately 6,022 acres. This code is characteristic of places such as Lake Springfield. The largest palustrine code is PFO1A (palustrine, forested, broadleaf deciduous and temporarily flooded) with approximately 8,970 acres. This code is characteristic of places such as the floodplain forests adjacent to Business 55 as you approach the Sangamon River bridge from the south. The largest riverine code is R2UBH (riverine, low slope with mud/sand on the bottom, and at least unconsolidated bottom that is permanently flooded) with approximately 2,456 acres. This code is characteristic of places such as the Sangamon River adjacent to Wheeland Park in Riverton. Wetlands are mostly located in the floodplain in Sangamon County.

4. Natural Areas

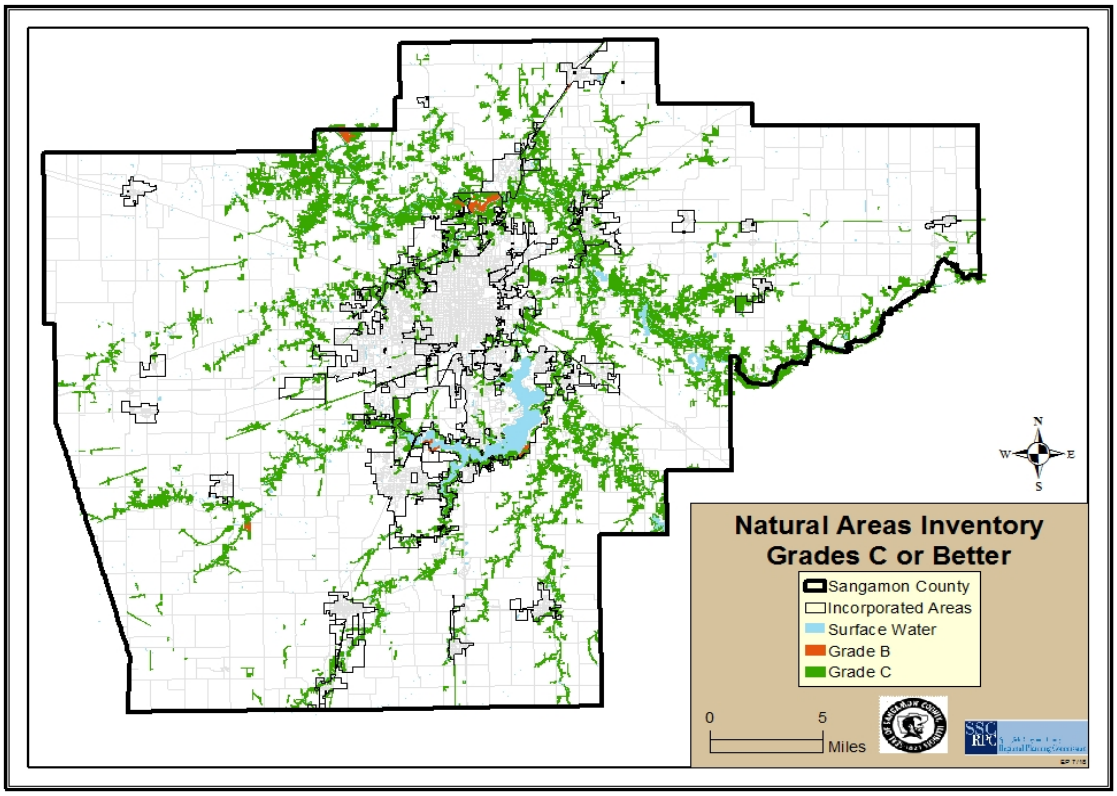
Natural Areas Inventory

In the 1970s, the Illinois Department of Conservation developed the Illinois Natural Areas Inventory (INAI) which described and graded the characteristics of natural areas. In 2004, the Friends of the Sangamon Valley contracted with LaGesse and Associates to document the natural areas of Sangamon County, which resulted in the Sangamon County NAI. LaGesse and Associates assigned grades to evaluate the quality of natural areas using the descriptions below, which were derived from the state's work on the INAI:

Grade A: Relatively stable or undisturbed communities.
Grade B: Late successional or lightly disturbed communities.
Grade C: Mid-successional or moderately to heavily disturbed communities.
Grade D: Early successional or severely disturbed communities.
Grade E: Very early successional or very severely disturbed communities.

Figure 11 shows the mapped natural areas of Sangamon County with grades of C or higher. Grade C or higher was chosen as this includes the least disturbed plant communities.

FIGURE 11



The map indicates two larger Grade B natural areas in Sangamon County and several smaller areas. One large area is clustered near the north side of the Sangamon River near Carpenter and Riverside Parks between Springfield and Sherman. Additionally, there is a large Grade B natural area along the east side of the Sangamon River near the Menard County line. The part of this area owned by the state is called the Sangamon River State Fish and Wildlife Area. Smaller clusters of Grade B natural areas along the south shoreline of Lake Springfield are described in more detail in the adopted Springfield and the draft Chatham comprehensive plans written by the SSCRPC. There is a smaller cluster of Grade B natural areas southeast of Loami that corresponds to the Nipper Wildlife Sanctuary and that contains wetlands, floodplain forest, and prairies. In general, Grade B natural areas are under some form of public or non-profit ownership in Sangamon County. However, there are still some small pockets under private ownership in scattered areas.

Grade C natural areas are distributed throughout Sangamon County. The largest concentration is within floodplains.

Endangered and Threatened Species

The following table (Figure 12) indicates the list of federal and state threatened and endangered species for Sangamon County. Conservation of land will play an important role in aiding in the reestablishment of these species.

FIGURE 12

Sangamon County Endangered and Threatened Species*		
FEDERAL LIST (U.S. Fish and Wildlife Service)		
Common Name	**Scientific Name**	**Status**
Indiana bat	*Myotis sodalis*	Endangered
Northern long-eared bat	*Myotis septentrionalis*	Threatened
Eastern prairie fringed orchid	*Platanthera leucophaea*	Threatened
STATE LIST (Illinois DNR - as of April 2018)		
Common Name	**Scientific Name**	**Status**
Smooth softshell (turtle)	*Apalone mutica*	Endangered
Short-eared owl	*Asio flammeus*	Endangered
Northern harrier	*Circus cyaneus*	Endangered
Loggerhead shrike	*Lanius ludovicianus*	Endangered
Indiana bat	*Myotis sodalis*	Endangered
Black-crowned night heron	*Nycticorax nycticorax*	Endangered
Heart-leaved plantain	*Plantago cordata*	Endangered
Royal catchfly	*Silene regia*	Endangered
Great chickweed	*Stellaria pubera*	Endangered
Prairie Spiderwort	*Tradescantia bracteata*	Endangered
Kirtland's snake	*Clonophis kirtlandi*	Threatened
Least bittern	*Ixobrychus exilis*	Threatened
Bunchflower	*Melanthium virginicum*	Threatened
Mudpuppy	*Necturus maculosus*	Threatened
Franklin's ground squirrel	*Spermophilus franklinii*	Threatened
Ornate box turtle	*Terrapene ornata*	Threatened
Lined snake	*Tropidoclonion lineatum*	Threatened
Barn owl	*Tyto alba*	Threatened

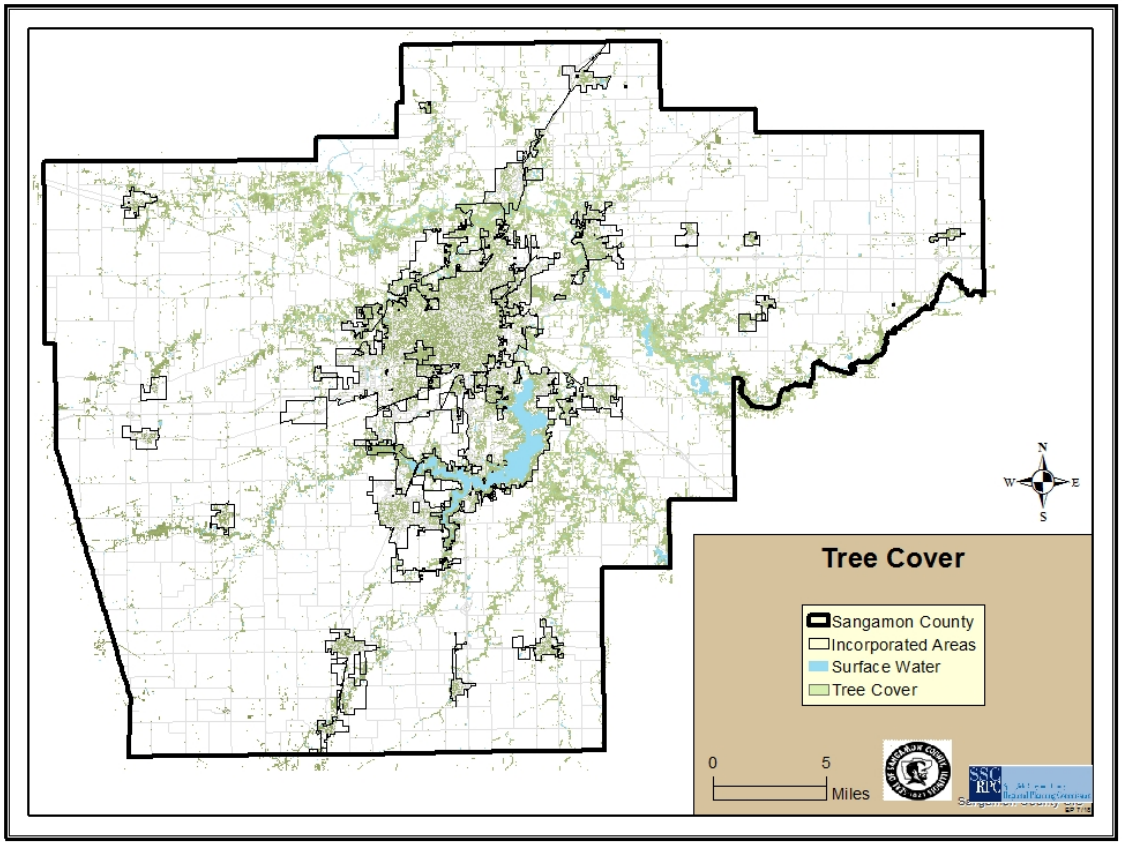
*Blue text denotes a federal endangered species. Red text denotes a state endangered species.

Tree Cover

Tree cover provides several benefits. Trees provide shade and improve air quality. Clustering of trees also provides privacy for residents, noise reduction, and habitats for various wildlife. Since the county is relatively flat, clusters of trees can provide windbreaks which can be a benefit to hinder blowing snow in

the winter months. Figure 13, derived from 2007 data, shows the tree cover in the county is densest around areas that are located in the floodplain and conservation areas and within the incorporated areas.

FIGURE 13



Conclusion

In summary:

- Sangamon County is fairly flat and has a topography that varies in elevation by approximately 200 feet.
- Sangamon County has one active coal mine and many abandoned coal mines. One legacy is mine subsidence, the sinking of the ground surface due to the collapsing of the voids left from coal mining.
- Major watersheds (and floodplains in Sangamon County) include the Sangamon River, the South Fork of the Sangamon River, Spring Creek, and Sugar Creek. Major surface lakes include Sangchris Lake and Lake Springfield.
- Major floodplains in Sangamon County are in the eastern portion of the county. However, there are notable floodplains in the southern, western, and northern parts as well.

- Wetlands cover slightly less than 5 percent of Sangamon County according to the latest US Fish and Wildlife Service data.
- Notable Grade B Natural Areas include: larger clusters such as near the Sangamon River State Fish & Wildlife Area. Grade C natural areas tend to cluster in floodplain areas.
- Sangamon County has three federally endangered/threatened species and eighteen state threatened/endangered species.
- Tree cover is densest in the floodplains, conservation areas, and in incorporated areas in Sangamon County.

There are several additional plans/studies that are indispensible aids to support and extend this section. The *Greenways and Trails Plan* (1997) contains information about open space and recreational trail needs throughout Sangamon County. The group report on the Environment, Natural Resources, and Open Space for the *Sangamon County Regional Strategic Plan* (2009) highlights many topics discussed in this section in greater detail. The *Sangamon County Regional Strategic Plan* (2014) indicates many goals and strategies that could be incorporated regarding conservation. Finally, the *Sangamon County Multi-Jurisdictional Natural Hazard Mitigation Plan* (2015) indicates goals and objectives related to natural hazards in much more detail than the flooding discussed in this section. The reader is directed to these sources (in addition to the references cited below) should there be more detailed interest in the information presented in this section.

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