

Physical Geography

The area of the County totals approximately 998.4 square miles, consisting of an estimated 995.8 square miles of land surface and approximately two square mile of water surface.¹

Champaign County is situated in one of the flattest areas of Illinois and its geography is characterized by glacial topography. The latest stage of glaciation in the County occurred approximately 17,000 years ago during which time the Wisconsin glacier deposited large accumulations of glacial drift (approximately 200 to 300 feet) forming the present relief of the County. Over time, this glacial drift was covered by as much as five feet of windblown silt (or loess) in most areas.² Glacial drifts are commonly referred to as 'moraines', defined as accumulations of earth and stones carried and finally deposited by a glacier.³

The surface of the County is crossed by several 'end moraines' separated by wide, nearly level 'ground moraines' and 'outwash plains'. The pattern of end moraines present in the County represents the successive advances and retreats of the Wisconsin glacier.⁴ Figure 10-1 indicates the locations of end moraines that are present in Champaign County. Appendix 7 provides a further description of the formation of end moraines in Illinois.

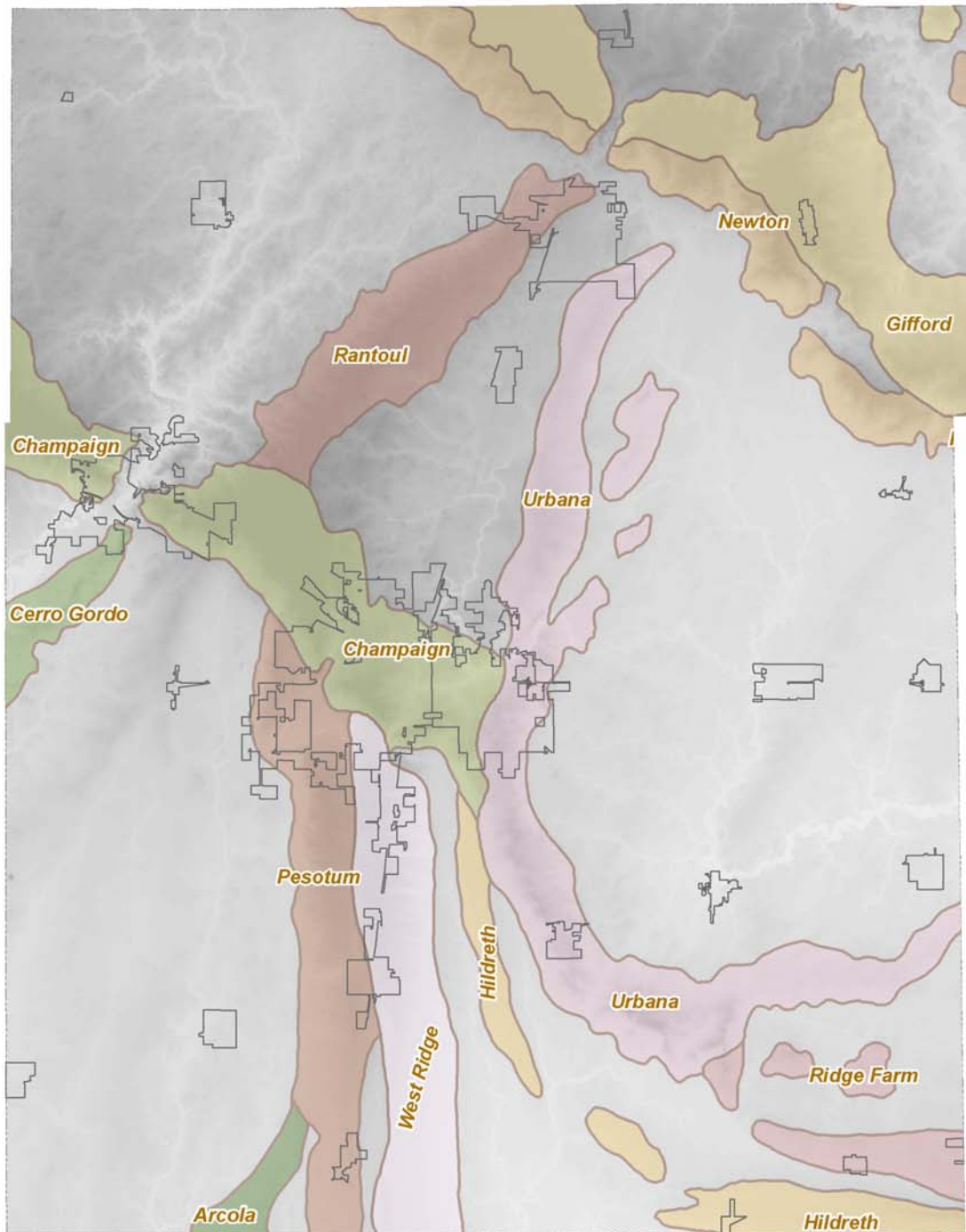
Outwash plains occur along the outer margins of most of the end moraines in Champaign County. Outwash plains present in the County are described as follows:

"A [...commonly smooth] ..landform consisting of material deposited by glacial meltwater.... As the glacier melted, the ice produced great quantities of water. The meltwaters washed out material that had been held in the ice. The flowing water sorted the outwash material and deposited the sediments in layers, or strata, of different textures. The size of particles that make up the outwash material varies, depending upon the velocity of the meltwater that carried the material. As the velocity of the meltwater slowed, the coarser textured material was deposited first. The depositing of particles of different sizes caused the layering or stratification, in the outwash deposits. The outwash in Champaign County ranges from loamy sediments to sand and gravel... In some areas of the County the outwash has been a commercial source of sand and gravel."⁵

The surface slope of the County is generally from north to south. The ridgelines of the end moraines determine the direction of runoff flows largely to the south, southwest, or southeast and east.

Within Champaign County the total elevation change is approximately 230 feet. The highest feature in the County is an unmarked point on the Champaign Moraine located north of Rising in Hensley Township with an elevation of 860 feet above mean sea level. The lowest elevation occurs at the east edge of the County where the Salt Fork River exits the County flowing eastward with a normal high water line of 625 feet above mean sea level. Figures 10-2 and 10-3 further illustrate the elevation change within the County.

Figure 10-1: End Moraines within Champaign County



End Moraines Champaign County

Legend

Arcola	Hildreth	Ridge Farm
Cerro Gordo	Newton	Urbana
Champaign	Pesotum	West Ridge
Gifford	Rantoul	Municipal Boundary



Date Map Prepared:
October, 2007

Figure 10-2: Elevation Map of Champaign County

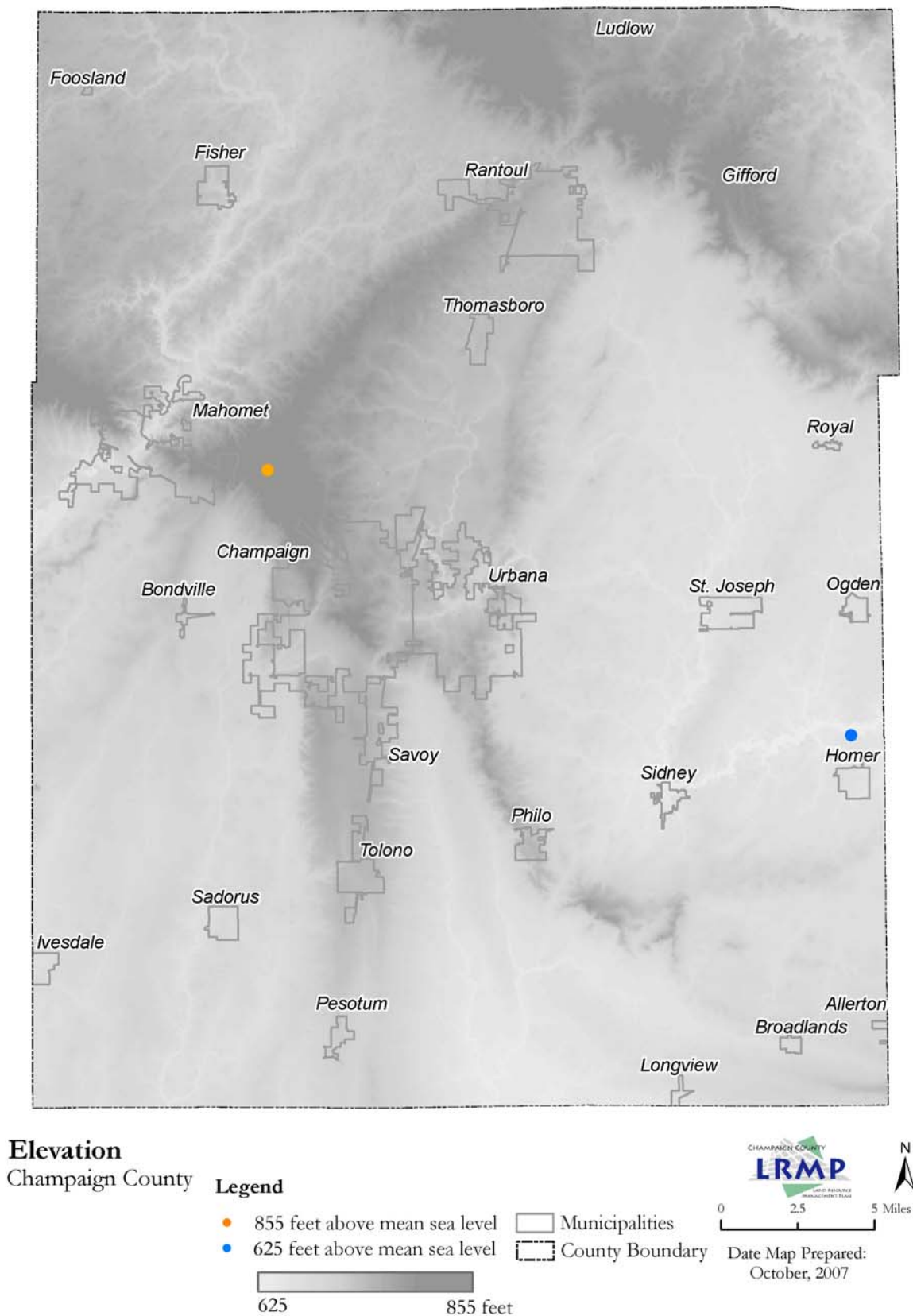
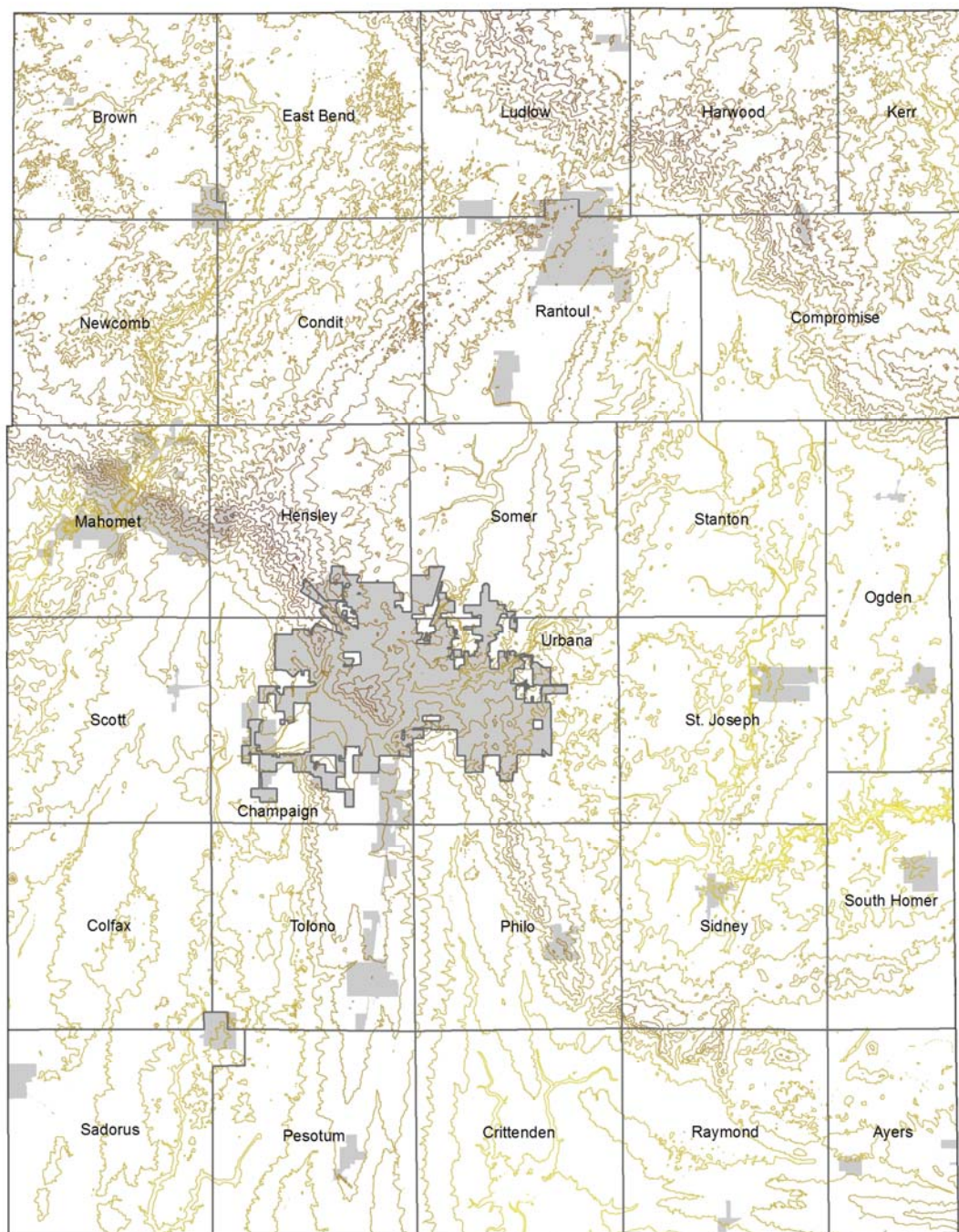


Figure 10-3: Champaign County Elevation Map with Contours



Contour Map
Champaign County

Legend

- Civil Townships
- County Boundary
- 625 855 ft



0 2.5 5 Miles

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Water Resources

Major water resources within Champaign County consist of: precipitation in the form of rain or snow; flowing surface streams; and underground aquifers. These water resources are integral components of the water (hydrologic) cycle, described in Appendix 8.

Precipitation

Drought. Climate conditions that include a lack of precipitation over an extended period of time adversely impact the availability of surface water resources and may also adversely impact the availability of groundwater in shallow unconfined aquifers, with the impacts more apparent in groundwater aquifers with a direct surface connection. Drought conditions can significantly diminish both surface water and groundwater resources over relatively short periods of time.⁶

In Champaign County, the most recent severe drought occurred in 1988, at which time the Palmer Drought Severity Index was at -4.66, signifying an extreme drought. (The Palmer Drought Severity Index is a measure that takes into account both rainfall and temperature; drought conditions are present if the Palmer Drought Index drops below -1). A recent minor drought occurred during 2005. Statewide, May and June are typically the wettest months, and January and February are the driest.⁷

Rainfall. The annual average rainfall in Champaign County is estimated at 37 to 40 inches.⁸

Snowfall. Snowfall contributes directly to water resources, and melting snow recharges soil moisture. The annual average snowfall in Champaign County is 26.2 inches. Recent extreme snowfall events occurred during the winter of 1977-78 (67.4 inches) and during the winter of 1981-82 (58.4 inches).⁹

Surface Water

Champaign County is centrally located within the eastern Illinois “Headwaters” area, a region spanning across seven other counties.¹⁰ Figures 10-4 and 10-5 depict regional representations of surface waters that occur within these five major watershed areas in Champaign County:

- Upper Sangamon
- Vermilion
- Embarras
- Upper Kaskaskia
- Middle Wabash-Little Vermilion

Champaign County contains the headwaters area for five major streams: the Embarras River, the Little Vermilion River, the Vermilion River, the Upper Kaskaskia River, and the Upper Sangamon River. Figure 10-6 is a map of these streams and their watershed areas within the limits of Champaign County.

The western part of the County contains the Upper Kaskaskia River basin and the Upper Sangamon River basin; these watersheds generally drain to the southwest. Eastern portions of the County contain the watersheds of the Embarras River, the Little Vermilion River, and the Vermilion River; these draining generally to the southeast.

On a regional basis, the larger of the natural streams within the County, the Sangamon, Kaskaskia, Embarras, and Middlefork Rivers, supply water to reservoirs and points downstream,

as illustrated in Figure 10-5. Of regional interest is the relatively recent identification of a hydraulic window in the glacial materials overlying the Mahomet Aquifer that connects the Mahomet Aquifer water to the Sangamon River. This connection occurs in the Allerton Park area (in neighboring Piatt County). The connection allows Mahomet aquifer water to discharge to the Sangamon River under normal conditions, but allows the Sangamon River to recharge the aquifer when the river is high or when the aquifer is pumped.¹¹

Upper Sangamon Watershed

The Upper Sangamon watershed consists of approximately 925 square miles and spans seven counties including Champaign County. The upper Sangamon River watershed supplies the Lake Decatur reservoir, constructed in 1922 to provide water for the City of Decatur domestic supply, industrial processing needs and recreational use. Since its construction, the Lake has had major problems with siltation and excessive nitrate levels from agricultural runoff.

From 1923 through 1983, Lake Decatur lost an estimated 35% of its designed storage volume. Although this trend has since been slowed by ongoing dredging, as of 2004 Lake Decatur was described as having an average depth of only 8 feet. Because of the loss of reservoir storage capacity, City officials described plans in July 2007 to construct a second Decatur reservoir for reserve water storage purposes.¹²

Vermilion Watershed

The Vermilion watershed drains approximately 500 square miles. Approximately 73% of the watershed is located in eastern Champaign County and 27% is located in western Vermilion County.

The Middle Fork of the Vermilion River is a tributary of the Vermilion River (Wabash River tributary). The Middle Fork arises in Ford County and flows southeast to join the Vermilion near Danville. In its natural state, the Middle Fork drained a large upland marsh in Ford County. The Middle Fork has been extended into the marsh by drainage ditches. Including the ditches, the Middle Fork is about 58 miles long. The Middle Fork arises near Roberts, and flows southeast toward Danville. The Middle Fork is notable as the only river in Illinois designated as a National Wild and Scenic River by United States National Park Service. This scenic stream flows through Kickapoo State Park near Danville and is a favorite of Illinois canoeists.

The Salt Fork is a tributary of the Vermilion River (Wabash River tributary). In its natural state, the Salt Fork drained a vast upland marsh between Urbana and Rantoul. The Salt Fork has been extended into these marshes by drainage ditches. Including the ditches, the Salt Fork is approximately 38 miles long.

Embarras Watershed

The Embarras River watershed covers approximately 2,400 square miles in portions of 10 counties, including Champaign County.

Lake Charleston, constructed in 1947, is the only major impoundment on the Embarras River. A 100-mile stretch of the mid-section of the Embarras River is designated as a Biologically Significant Stream. The extensive sand and gravel bottom of this section of the river provides habitat for a number of rare fish species. Mussel diversity is high in this river and several threatened or endangered species live here.

Kaskaskia Watershed

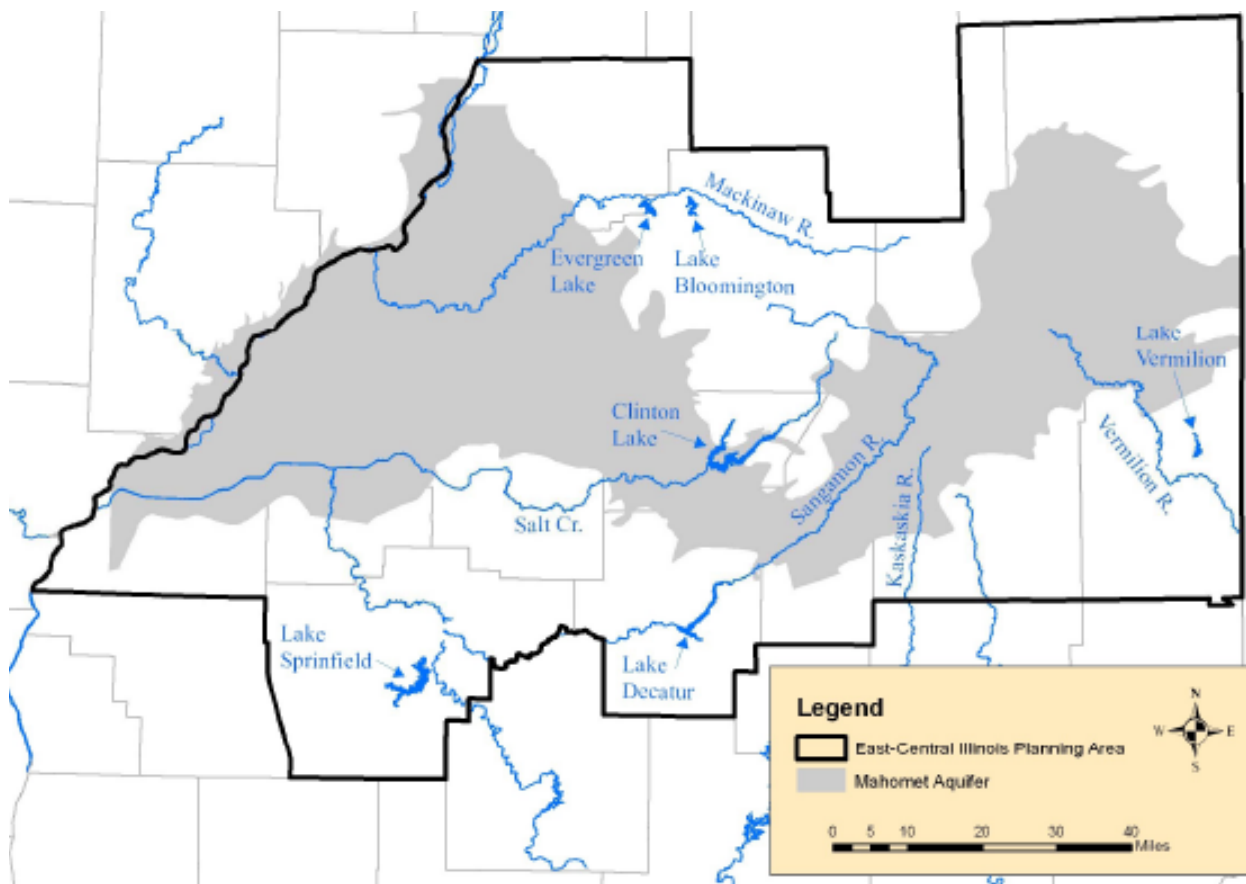
The Kaskaskia River watershed drains 5,801 square miles in parts of 17 counties, including Champaign County.

Downstream of Champaign County, the flow of the Kaskaskia River is interrupted by two major impoundments: Lake Shelbyville and Lake Carlyle. Lake Shelbyville is an artificial lake created by damming the Kaskaskia River at Shelbyville, completed in 1970. The Lake is situated in Shelby and Moultrie Counties and is surrounded by a State Fish and Wildlife Area. Further downstream is Lake Carlyle, located 50 miles east of St. Louis. Lake Carlyle is Illinois' largest manmade lake, with approximately 40 square miles of surface water, and is also surrounded by a State Fish and Wildlife Area.

Middle Wabash / Little Vermilion Watershed

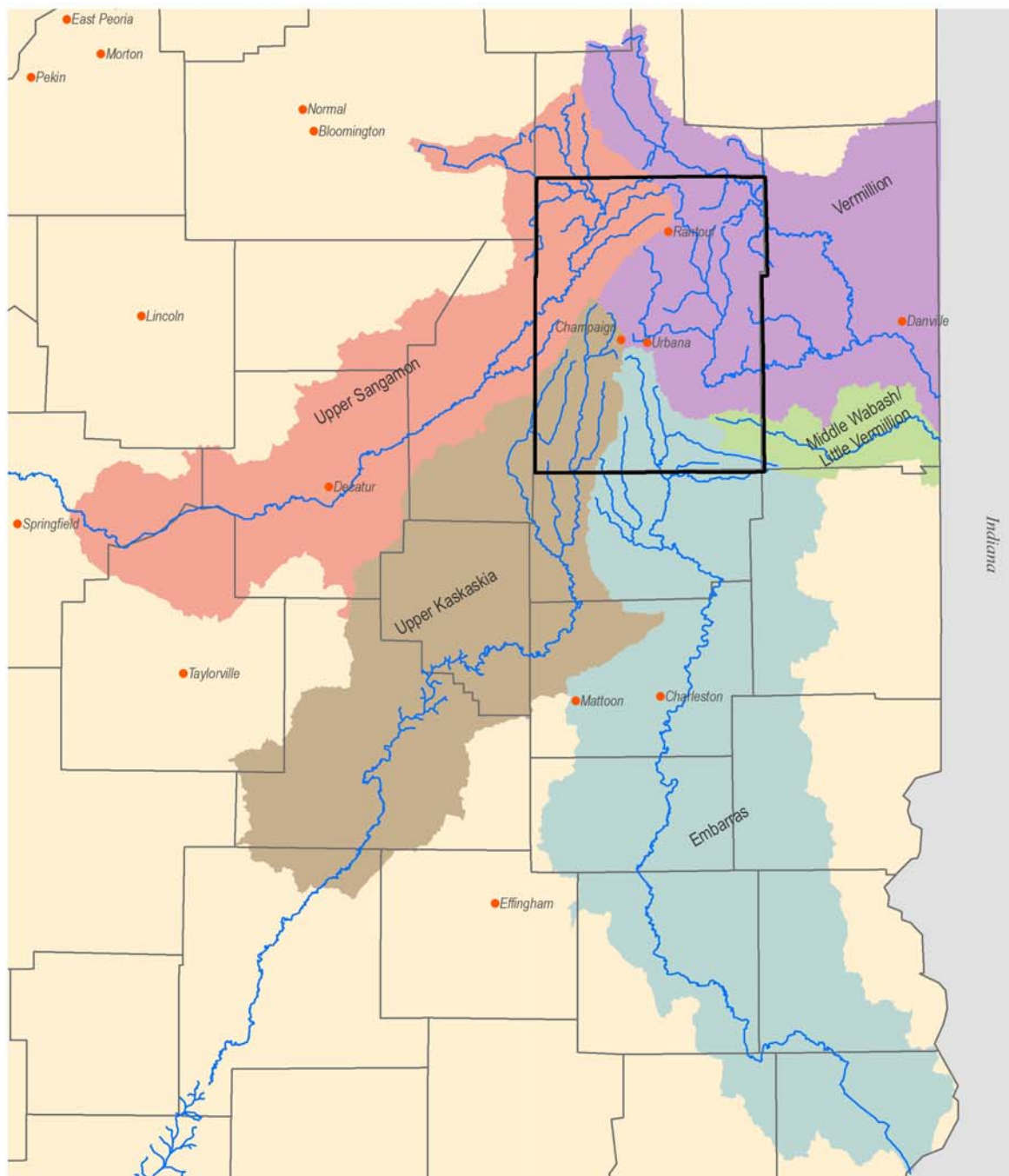
The headwaters of the Middle Wabash-Little Vermilion watershed are located in the southeastern portion of Champaign County within Ayers, Sidney, South Homer and Raymond Townships. The downstream areas of this watershed cover 10 counties situated within Illinois and Indiana.

Figure 10-4: Major Surface Water Sources in East Central Illinois



Source: *Surface Water Availability in the East Central Illinois Planning Area: Factors that Affect the Distribution and Availability of Surface Waters for Water Supply*, H. Vernon Knapp, Center for Watershed Science, Illinois State Water Survey, August, 2007

Figure 10-5: Extents of Streams and Watersheds



Extents of Streams and Watersheds

Champaign County and Watershed Extents

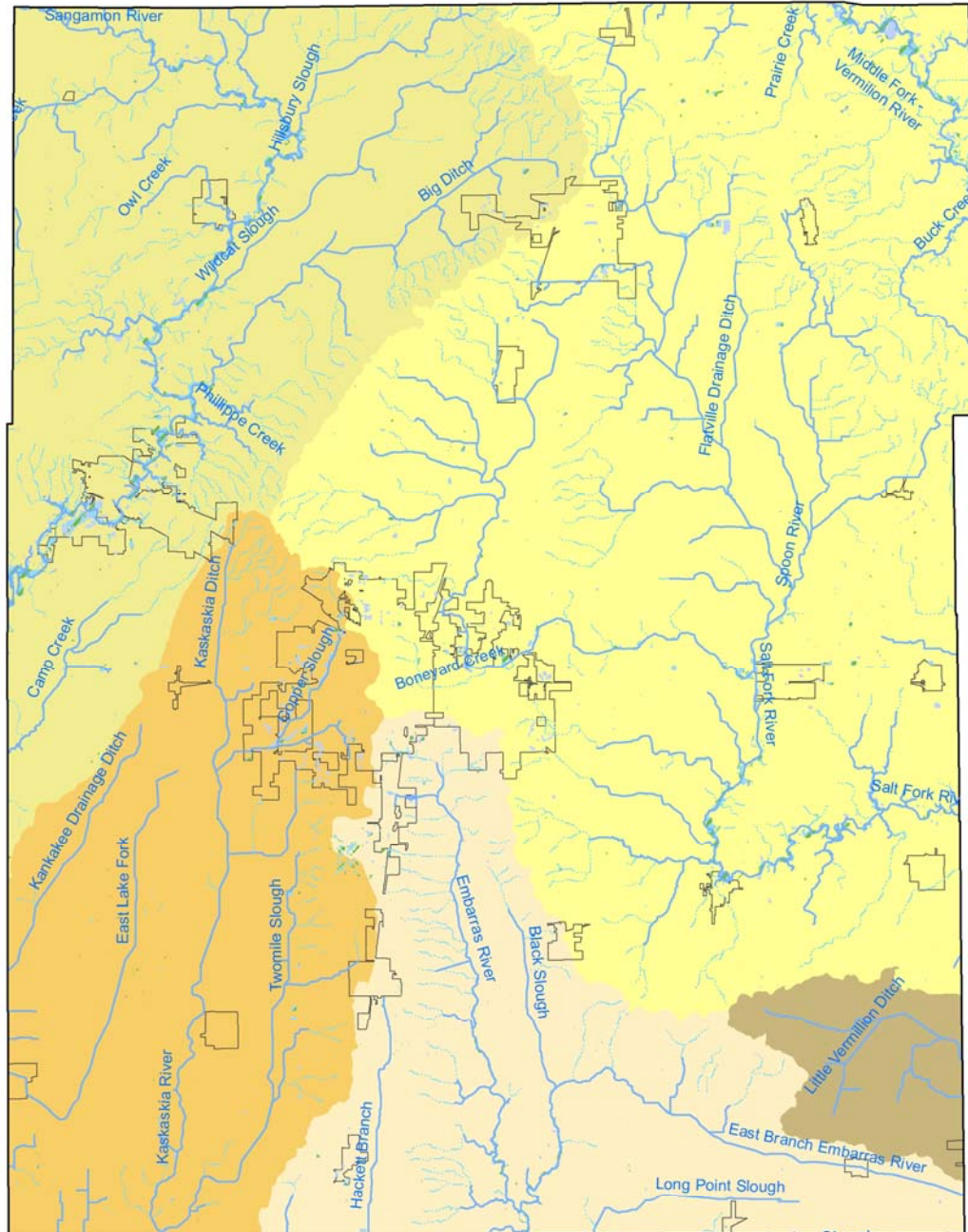
Legend

- Streams Flowing Through Champaign County
- County Boundary
- Champaign County
- Municipality



Date Map Prepared:
October, 2007

Figure 10-6: Major Watersheds of Champaign County



Surface Hydrology and Watersheds

Champaign County

Legend

- Middle Wabash-Little Vermilion
- Vermilion
- Embarras
- Upper Sangamon
- Upper Kaskaskia

- Intermittent
- Non-Intermittent
- Lake
- Wetlands
- Municipal Boundary
- County Boundary



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Water Quality

The Illinois Environmental Protection Agency (IEPA) assesses and monitors water quality from 40 stations located in Champaign County. Recent assessments found 43 water bodies within the County that are impaired to some degree. Figure 10-7 shows waterways assessed by the IEPA for water quality and waterways that are listed under Section 303(d) of the Clean Water Act because they have not attained the required water quality standard. Of the total 400 miles of waterways in Champaign County, 170 miles of waterways are listed as Category 5, meaning that they do not meet water quality standards.¹³

Sediments and nutrients are the leading stressors of water quality in Champaign County, coming from both agriculture and municipal sources.¹⁴ Tile drainage, erosion, and chemical seepage are closely linked to agriculture practices while, erosion, polluted storm water discharge, channelization, habitat alterations, and chemical seepage can all be linked to urbanization practices.

Waters are deemed impaired when they cannot meet use expectations set for them under state and federal law. When this happens, Total Maximum Daily Load (TMDL) reports are developed for impaired waters to determine the maximum amount of a pollutant a water body can receive and still meet water quality standards and support its designated uses. Designated uses include: aquatic life, public water supply, swimming, recreation, fish consumption, and aesthetic quality.

TMDL regulations have been approved for three of the five watersheds in Champaign County. These regulations set pollution reduction goals that are necessary to improve the quality of impaired waters. The TMDL's within Champaign County regulate pollutants including: nitrates, fecal coliform, phosphorus, and nitrogen.

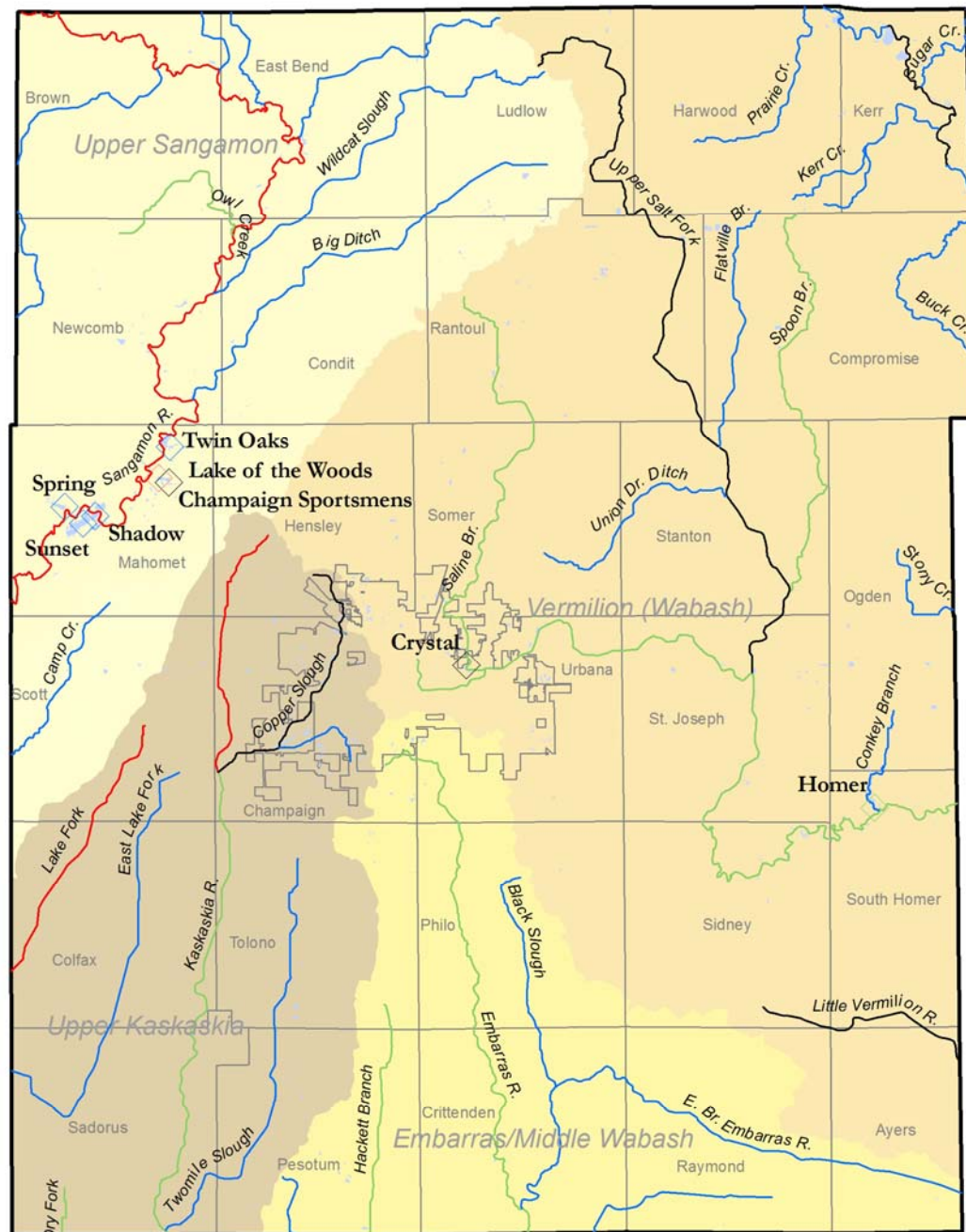
The most frequent impairments to waterways in Champaign County are to: aquatic life support; primary contact recreation (swimming); fish consumption; and secondary contact (boating). These uses are important parts of life and livelihoods across the region. Surface water quality also impacts groundwater quality, which is the source of the majority of our region's drinking water.

The EPA Index of Watershed Indicators (IWI) is a database of information gathered between 1990 and 1999, intended to highlight watershed health in the US. The IWI rates watershed health based on current level of water quality and vulnerability to further water quality degradation.

The EPA IWI rated four Champaign County watersheds (the Embarrass, Kaskaskia, Middle Wabash-Little Vermillion and Vermillion) as below EPA water quality standards, with these watersheds rated as having relatively 'less serious water quality'. One watershed, the Upper Sangamon, was determined as having 'more serious water quality.' The Upper Sangamon was rated as 'well below quality standards set by the EPA'. All five watersheds in Champaign County were rated as having 'low vulnerability for further water quality degradation' with actions to prevent further degradation as appropriate, but as less urgent than actions warranted in more vulnerable watersheds.¹⁵

National Pollutant Discharge Elimination Systems (NPDES) is a permit program for all point sources that discharge pollutants into United States waters. Agricultural activities that contribute to point source pollution, such as a concentrated animal feeding operation, are regulated and monitored through the National Pollutant Discharge Elimination System. Non-point source pollution occurs especially during specific times of the year, primarily spring when there is less vegetation.¹⁶

Figure 10-7: Water Quality of Streams and Lakes



Water Quality of Streams and Lakes - 2004

Champaign County

Legend

- | | | |
|--------------------------|-------------------------|-------------------|
| ◊ Evaluated, Listed | — Evaluated, Listed | □ Civil Township |
| ◊ Monitored, Listed | — Monitored, Listed | ▬ County Boundary |
| ◊ Evaluated, Not Listed | — Evaluated, Not Listed | ■ Lakes |
| ◊ Not Assess, Not Listed | — Monitored, Not Listed | |

Listed = Does not meet water quality standards

Evaluated = Site specific analysis

Monitored = Non site specific land use and pollution analysis



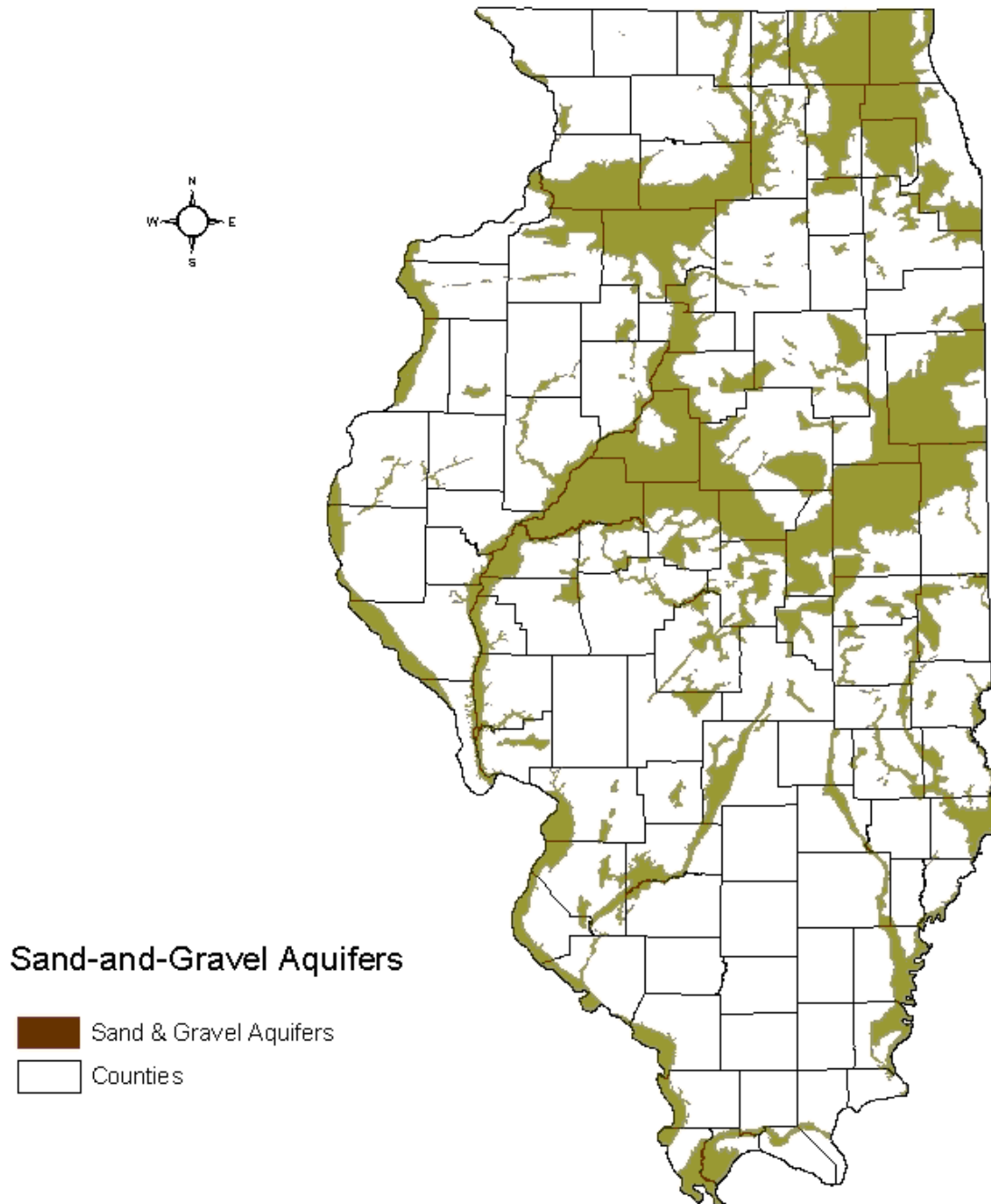
0 2.5 5 Miles

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Groundwater

Sand and Gravel Aquifers. Groundwater from sand and gravel aquifers serves as the primary water source in Champaign County.¹⁷ Figure 10-8 illustrates the larger context and distribution of the major sand and gravel aquifers present across Illinois.

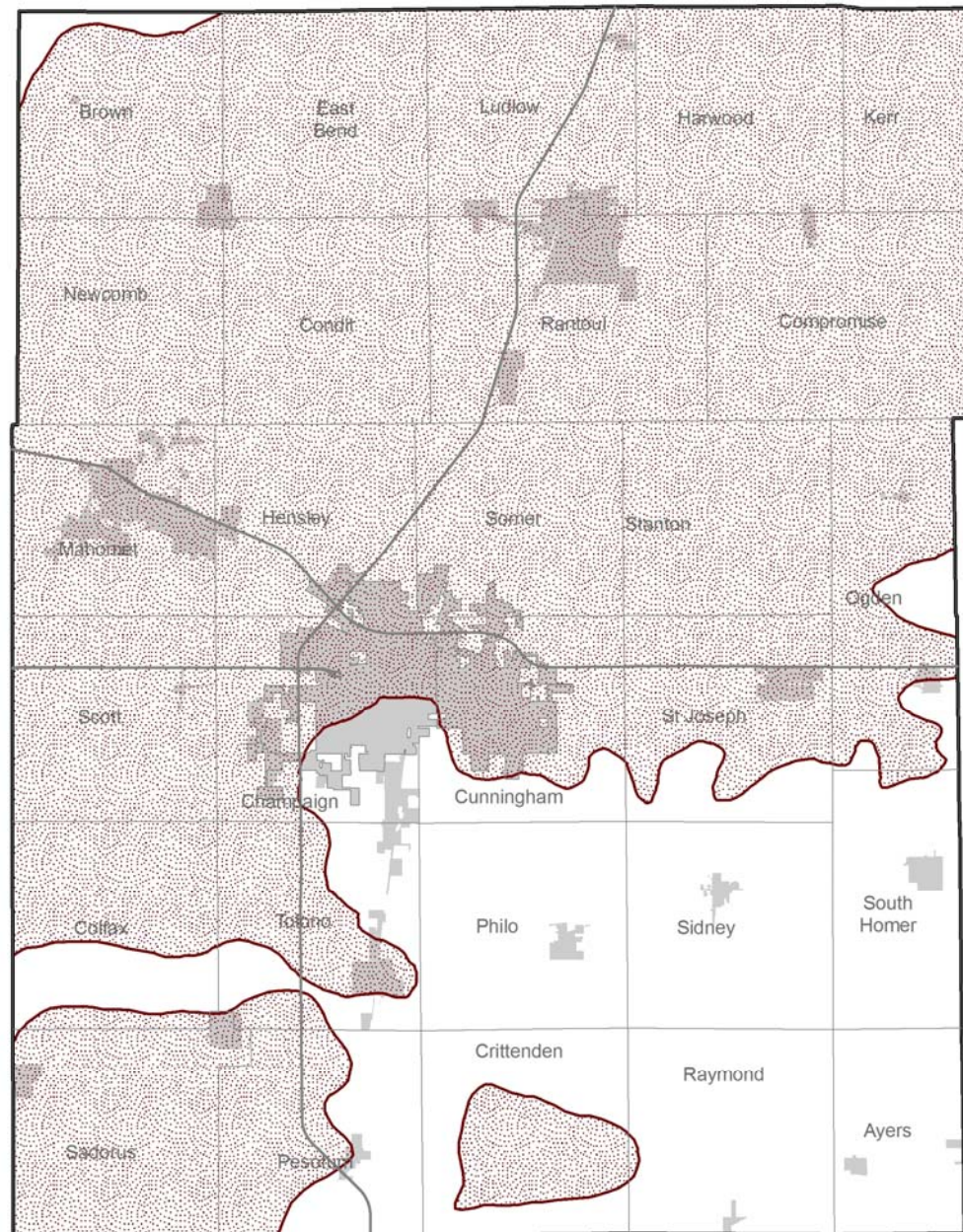
Figure 10-8: Primary Sand and Gravel Aquifers in Illinois



Source: Illinois Water Planning website

Figure 10-9 illustrates the distribution of major sand and gravel aquifers within Champaign County. The sand and gravel water-bearing aquifers exist below the water table, with the water table typically located within a depth of 10 feet from the land surface. The sand and gravel aquifers generally range in thickness from 10 to 150 feet, and are generally situated at depths of between 100 to 300 feet below the surface across a large portion of the County.¹⁸

Figure 10-9: Primary Sand and Gravel Aquifers in Champaign County



Primary Sand and Gravel Aquifers
Champaign County

Legend

- | | |
|--|--|
|  Aquifer |  Municipal Boundary |
|  Civil Township |  County Boundary |

CHAMPAIGN COUNTY
LRMP
Land Resource Management Plan

0 2.5 5 Miles

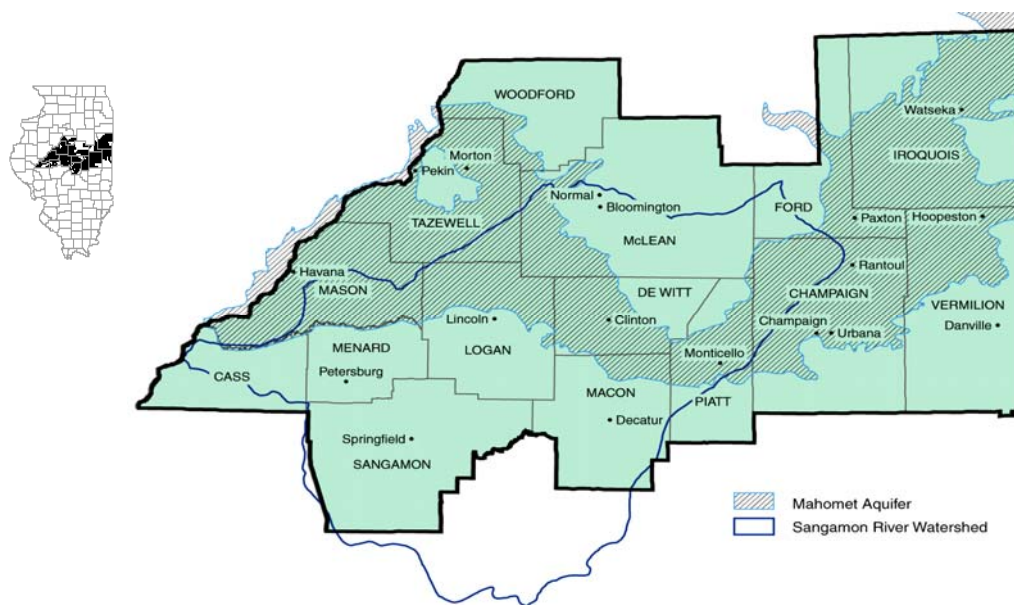
Date Map Prepared:
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Groundwater availability is known to be somewhat problematic in the south half of the southeastern portion of the County—the area generally situated east of U.S. Route 45 and south of Philo. The layer of sand and gravel water-bearing deposits in this area is not as thick, ranging from one to 25 feet in thickness. In this area groundwater is available, but it may or may not be available at any given location and the groundwater supply may be undependable during periods of drought.¹⁹

In general, shallow sand and gravel aquifers do not have water stored in overlying deposits from which they can draw during times of drought. The water levels in such aquifers are more sensitive to climatic conditions and will decline in response to dry weather. Available drawdown in wells (the difference between the non-pumping water level and the allowable pumping level) will be correspondingly reduced. The situation can be further exacerbated by the effects of well interference. Water demand often increases during drought, causing wells to be operated at higher pumping rates and/or for longer periods.²⁰

The Mahomet Aquifer. The Mahomet Aquifer is one of the largest and deepest sand and gravel aquifer located above bedrock surface in the state, supplying groundwater in East Central Illinois, including much of Champaign County. The Mahomet Aquifer covers an area of about 3,700 square miles in East Central Illinois. Figure 10-10 illustrates the regional scope of the Mahomet Aquifer, and indicates the general location of the Mahomet Aquifer below Champaign County. Large supplies of groundwater, chiefly for municipal and industrial use, are withdrawn from wells in the Mahomet Aquifer's permeable sands and gravels present in thick deposits of glacial drift in the area. The glacial drift exceeds 400 feet in thickness in places.²¹

Figure 10-10: The Mahomet Aquifer

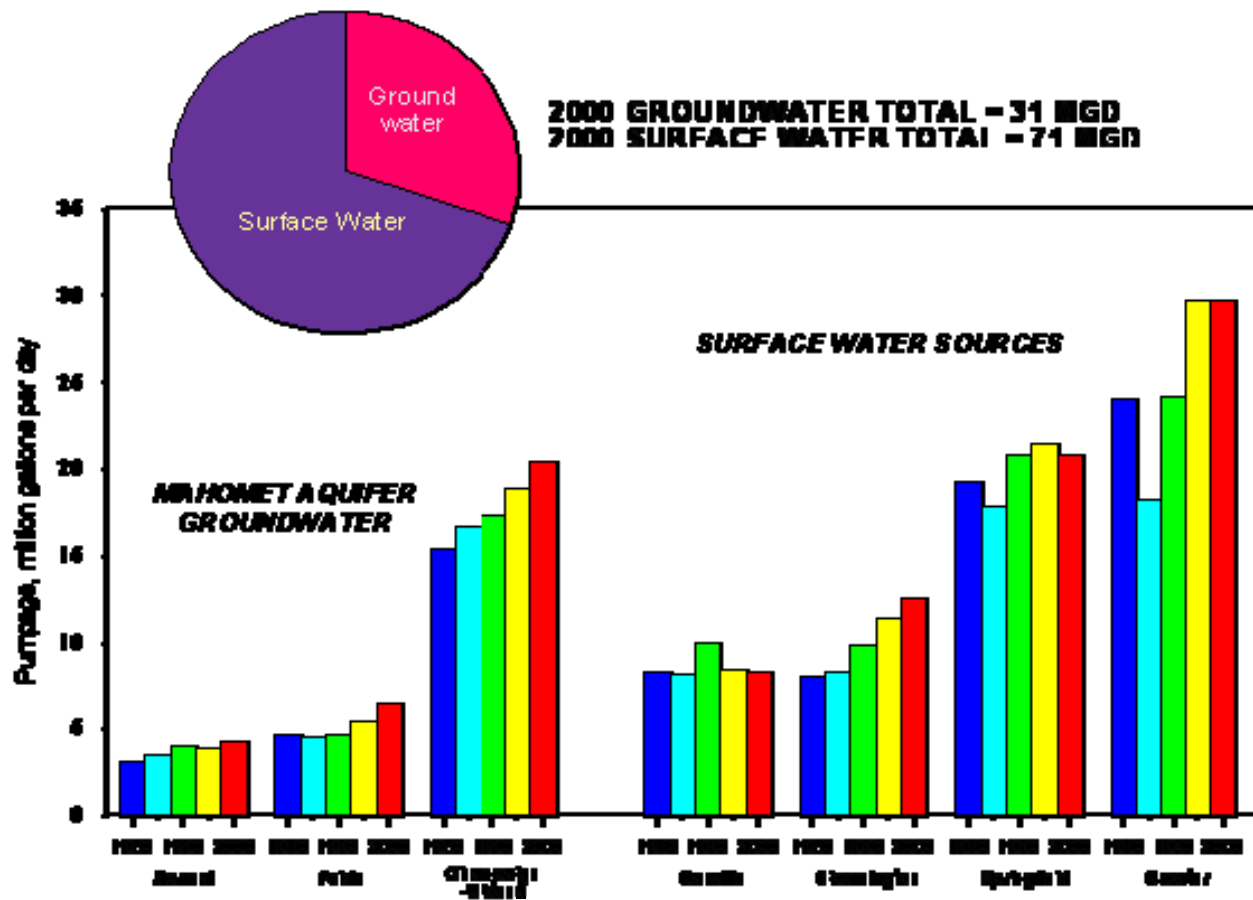


Source: <http://www.mahometaquiferconsortium.org/>

Many East Central Illinois communities, industries, and irrigators depend on the Mahomet Aquifer for their water supply. In 1995, regionwide withdrawals from the Mahomet Aquifer for municipal use were estimated at over 30 million gallons per day (mgd). A recent estimate is that on a regional basis, approximately 56 mgd are withdrawn from the Mahomet Aquifer for municipal use,

with Champaign-Urbana area withdrawals alone estimated to have reached levels of approximately 25 mgd.²²

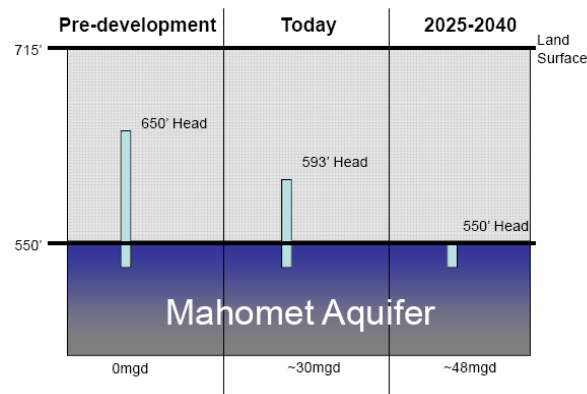
Figure 10-11: Area Groundwater and Surface Water Withdrawals



Source: Water Supply and Demand in East-Central Illinois: Planning for the Future

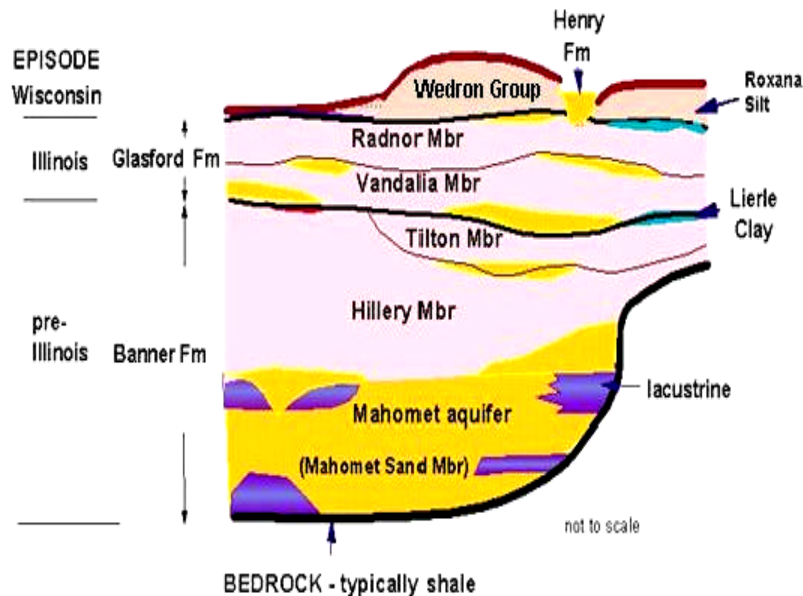
Locally, the top of the Mahomet Aquifer occurs at elevations of 500 - 550 feet. Long-term observations of groundwater levels at Champaign show a decline in the artesian head of the Mahomet Aquifer of nearly 50 feet since 1950; this decline may be attributed to the increasing water demand in the Champaign-Urbana area. Similar or perhaps greater declines can be expected in other areas of development as use of the aquifer increases.²³

Figure 10-12: Decline in Artesian Head* West of Champaign



*Note: The majority of confined aquifers are classified as artesian because the hydraulic head in a confined well is higher than the level of the top of the aquifer. "Artesian head" describes the highest level of groundwater under pressure that is able to rise above the aquifer level.

Figure 10-13: Sediments and Position of the Mahomet Aquifer in the Mahomet Bedrock Valley



Source: *Hydrogeology and Groundwater Availability in Southwest McLean and Southeast Tazewell Counties, Part 1. Aquifer Characterization*, B. L. Herzog et al., Illinois State Geological Survey and Illinois State Water Survey Cooperative Groundwater Report 17, 1995.

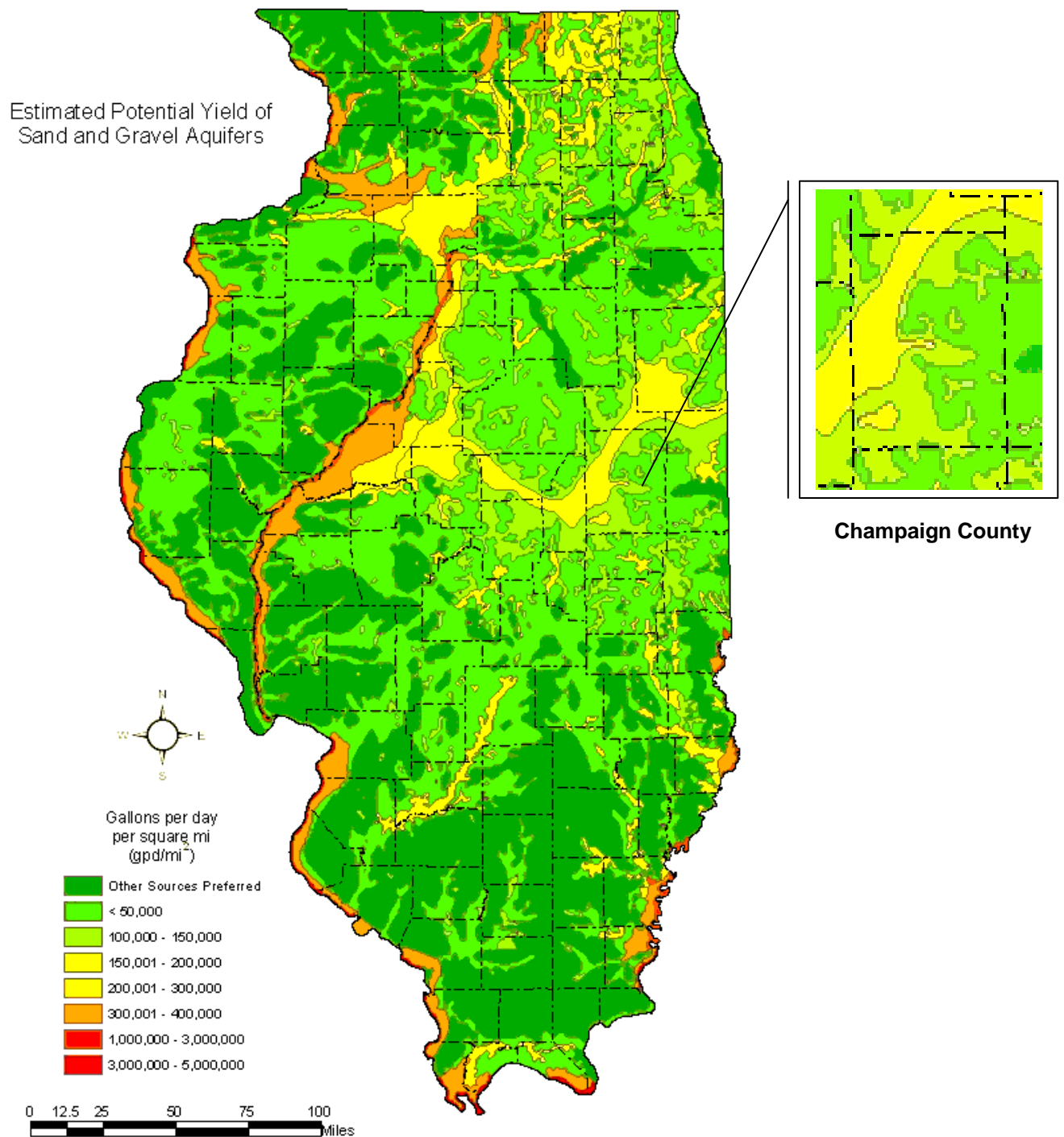
Glasford Formation and Wedron Group. Lying above the Mahomet Aquifer are two other major glacial units found in East Central Illinois: the "Glasford Formation" and overlying "Wedron Group" (see Figure 10-13). There are relatively shallow deposits of sand and gravel that are found within the Glasford Formation and within the Wedron Group. These sand and gravel aquifers are smaller in area and described as typically thin--usually at least 25 feet thick, but more than 50 feet thick at some locations. These sand and gravel aquifers also supply water to local

municipal and domestic wells. At some locations, the sand and gravel aquifers found within the Glasford Formation are hydraulically connected to the Mahomet Aquifer.

As illustrated in Figure 10-13, what is referred to as the entire 'Mahomet Bedrock Valley aquifer system' is comprised of the Mahomet Aquifer and aquifers in the Glasford Formation, Banner Formations and minor aquifers in the Wedron Group.²⁴

Potential Aquifer Yields. The terms "potential yield" or "safe yield" often are used when applied to aquifers. Potential aquifer yield is the maximum amount of groundwater that can be continuously withdrawn without creating critically low water levels or exceeding recharge. Figure 10-14 is a map of estimated potential aquifer yield for Illinois' major sand and gravel aquifers, based on estimates developed by the Illinois State Water Survey. The potential yields are expressed as recharge rates, in gallons per day per square mile (gpd/mi²). The calculations used to prepare the sand and gravel yield map assumed full development of the sand and gravel aquifers, which includes reducing potential recharge to underlying bedrock aquifers as well as potential base flow to streams. The actual full development of the sand and gravel aquifers could have unknown undesirable effects. The primary sand and gravel aquifers within Champaign County (as shown in Figure 10-14) are considered as aquifers with potential yields greater than 100,000 gallons per day per square mile (gpd/mi²).²⁵

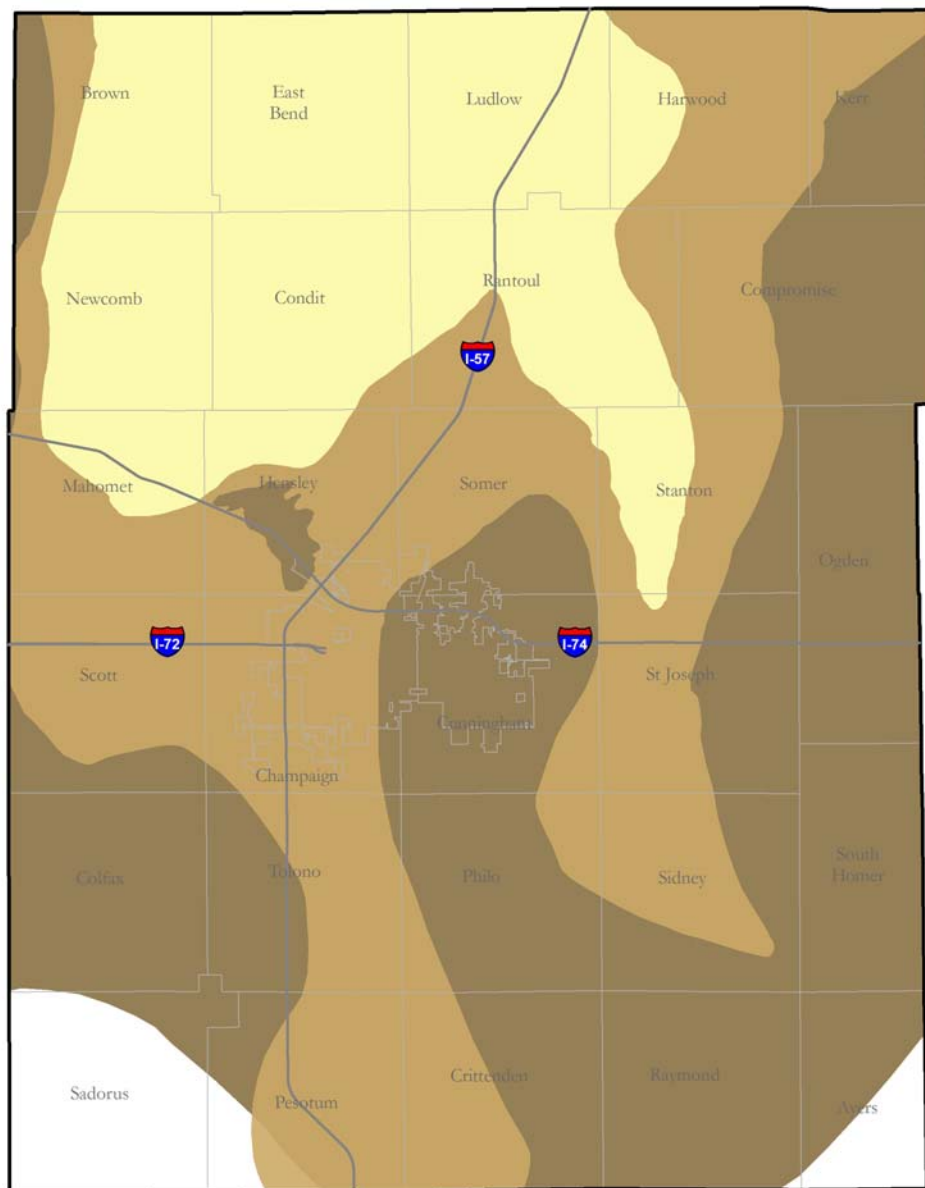
Figure 10-14: Estimated Potential Yield of Sand and Gravel Aquifers in Illinois



Source: Illinois Water Planning website <http://www.sws.uiuc.edu/wsp/wsground.asp>

Shallow Bedrock Aquifers. Beneath the sand and gravel water-bearing deposits lies a system of shallow bedrock aquifers. These are situated at depths ranging from approximately 300 to 500 feet below land surface, as shown in Figure 10-15. Within Champaign County, the bedrock aquifers are not utilized as a water resource because of the availability of groundwater from the major sand and gravel aquifers. The quality of groundwater from bedrock aquifers is considered inferior to that of the major sand and gravel aquifers because of the higher levels of arsenic present. Deeper wells are required to access groundwater from the bedrock aquifers.²⁶

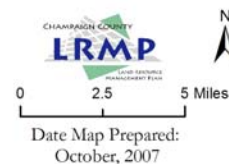
Figure 10-15: Shallow Bedrock Aquifers



Shallow Bedrock Aquifers
Champaign County

Legend

- Within 300 feet
- Within 500 feet
- Greater than 500 feet
- Township Boundary
- County Boundary
- Interstate



Mineral Resources

Sand and Gravel

Champaign County contains rich deposits of sand and gravel resources as a result of glacial activity as previously noted. The outwash plains near the Cerro Gordo and Bloomington moraines are a major source of commercial sand and gravel in the County. In recent years sand and gravel pits were situated along the Sangamon River in southwest Mahomet Township and at locations along the Middlefork River in Compromise Township. Sand and gravel mining operations continue in the County, with ongoing reclamation of mined areas and the expansion of mining operations to new sites nearby existing processing plants. The Champaign County Forest Preserve District has acquired previously mined sites and participates in the reclamation of previously mined properties. One reclamation site is the Riverbend Forest Preserve, located in Mahomet Township, a 275-acre site opened to the public in 2005 and containing approximately 130 acres of clear water in two artificial lakes, one of which is now the largest lake in the County.²⁷

Coal

There are approximately 305 million tons of coal consisting of the Danville (No. 7) and Herrin (No. 6) seams, below the surface of the County. No coal mining occurs presently in the County. Two historic records exist for coal shaft mines that existed in the Urbana and Sidney areas, with the coal shaft mine in the Sidney area operating in 1885.²⁸

Soil Resources

"Champaign County's soils are its most basic and widespread natural resource [and are] ranked among the best in the world for agricultural production capacity.... Soils are a living system modified by physical, chemical and biological processes. ...They are an intricate combination of minerals, organic compounds, and living organisms continuously interacting in response to natural and human induced stresses. Once destroyed, they cannot be restored."

Excerpt from Champaign County Environmental Advisory Panel Final Report

Prime Farmland

Most of the County's soils have been altered from their original state by the agricultural activity and urban development that has occurred to date. Approximately 94.6 percent of the farmland within the County is classified as 'Prime Farmland' according to the U.S. Department of Agriculture.²⁹

In 1986 the Champaign County Board adopted the use of the Land Evaluation and Site Assessment (LESA) system as a means to assess site suitability for agricultural cropland use. The LESA system consists of two numerical evaluation scores, the Land Evaluation (LE) score, and the Site Assessment score that are added together, with the resulting sum referred to as the LESA score, which is compared to an idealized standard ranking land in terms of its suitability for agricultural use. The LE portion of the score is a relative value ranking of all soils in the County based on soils capability classification and productivity measure, with the highest possible score being 100.

Best Prime Farmland

Soils in Champaign County are ranked by 'Agricultural Value Groups' based on the LE score of the County's LESA system, as shown in Table 10-1. This ranking includes an assessment of three soils criteria: land capability classification; important farmland identification; and soil productivity. A relative value was determined for each Agricultural Value Group, with the best group assigned a relative value of 100 and all other groups assigned lower relative values.³⁰

In 1999, a sub-category 'Best Prime Farmland', consisting of soils with an LE score of 85 or higher, was developed by County planning staff in order to distinguish higher quality soils within the Prime Farmland category.

Table 10-1: Agricultural Value Groups for 'Prime Farmland' Soils in Champaign County

Agricultural Value Group	Prime Farmland Soils	LE Score	Approximate Percentage of County Soils
1	149A Brenton, 154A Flanagan, 198A Elburn	100	20%
2	152A Drummer	98	38%
3	56B Dana, 56B2 Dana, 102A La Hogue, 148B2 Proctor, 171B Catlin, 219A Millbrook, 234A Sunbury, 398A Wea, 481A Raub, 490A Odell	87	13%
4	67A Harpster, 125A Selma, 153A Pella, 232A Ashkum, 236A Sabina, 242A Kendall	85	7%
5	134A Camden, 134B Camden, 146A Elliott, 146B2 Elliott, 146C2 Elliott, 221B Parr, 223B2 Varna, 223C2 Varna, 233B Birkbeck, 235A Bryce, 243B St. Charles, 291B Xenia, 330A Peotone, 570B Martinsville	79	10%
6	23A Blount, 23B2 Blount, 91A Swygert, 91B2 Swygert, 91C2 Swygert, 131B Alvin, 150B Onarga, 194B Morley, 206A Thorp, 387B Ockley	70	4%

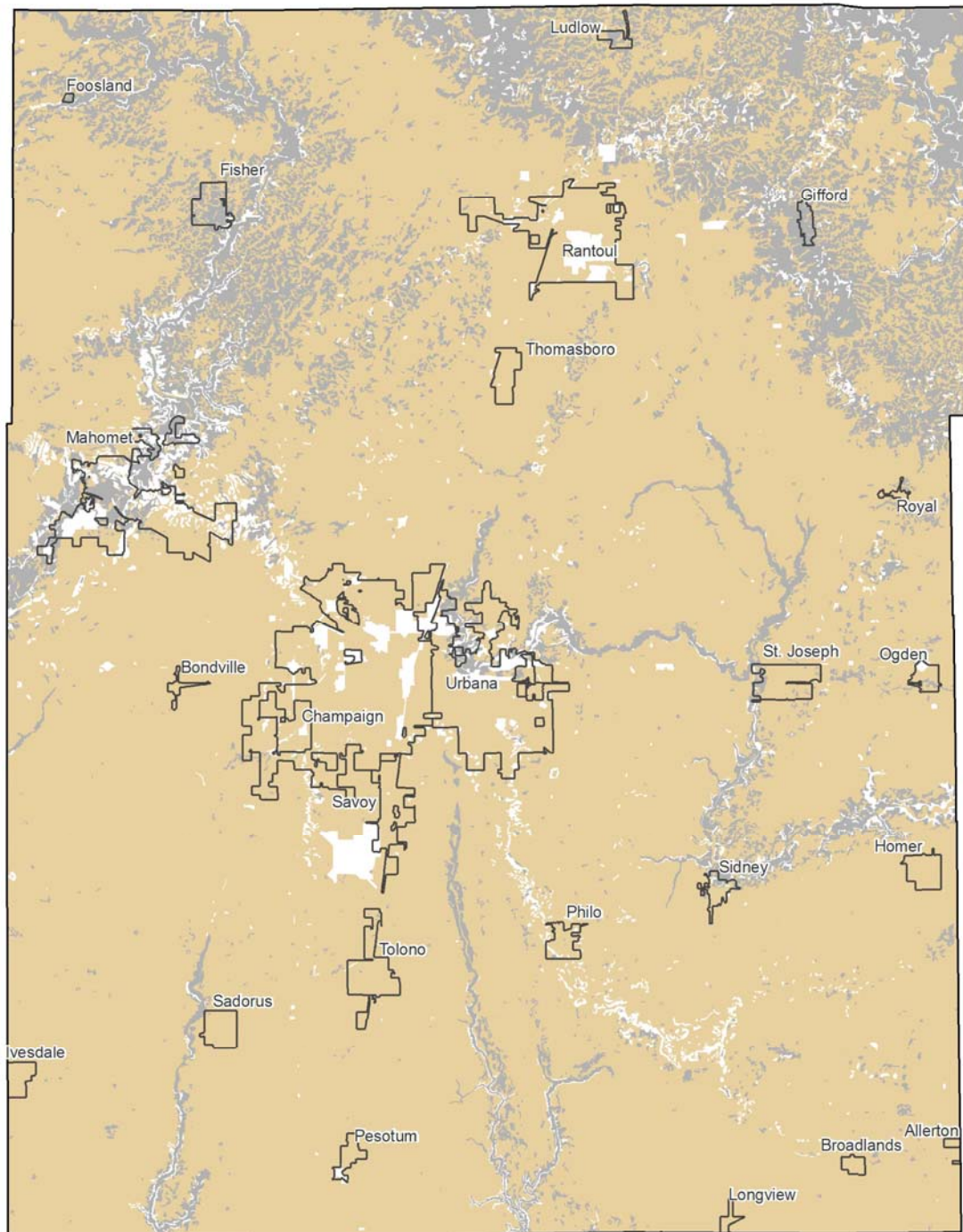
Source: Champaign County Land Evaluation and Site Assessment System and Champaign County GIS Consortium

Figure 10-16 displays areas of 'Best Prime Farmland' soils in the County, consisting of soils in Agricultural Value Groups 1 – 4, and 'Prime Soils' consisting of soils in Agricultural Value Groups 5 and 6, as listed in Table 10-1. In Champaign County, 'Best Prime Farmland' soils comprise approximately 77 percent of the total land area, and the broader category of 'Prime Farmland' soils comprise approximately 95 percent of the total land area.

Suitability of Soils for Selected Purposes

The Soil Survey of Champaign County includes ratings of the suitability of soil types found in the County for the planning and management for selected purposes, including: crops, pasture and hayland, woodland areas, sites for buildings, sanitary facilities including septic tank absorption fields, highways and other transportation systems.

Figure 10-16: Champaign County Soils



Farm Soils

Champaign County

Legend

Land Evaluation Site Assessment (LESA) Rating

- | | |
|--|---|
| Best Prime Farmland | Non-Prime Farmland |
| Prime Farmland | Municipal Boundary |



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October, 2007

Hydric Soils

Hydric soils are soils that were formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions within the top 20 inches of soil depth. Established indicators of hydric soils are used to identify hydric soils by the Soil Survey field investigators. Undrained hydric soils are capable of supporting ecological wetland plant species. A large portion of the County's soils consist of hydric soils that have been drained and that are presently used as cropland, or for purposes other than wetland. Hydric soils that have been used for purposes other than wetland are capable of being restored to a wetland.³¹ The following soil types meet the definition of hydric soils in Champaign County:

Table 10-2: Hydric Soils in Champaign County

Map Unit	Soil Name
67A	Harpster
152A	Drummer
153A	Pella
206A	Thorp
232A	Ashkum
235A	Bryce
330A	Peotone
637A+	Muskego
3107A	Sawmill
3302A	Ambraw

Source: Soil Survey of Champaign County, Illinois

Wetland Areas

Today, the majority of existing wetlands in Champaign County consist of relatively small areas of less than one acre in size. Wetlands are identified and mapped by the National Wetlands Inventory (NWI).³² To be considered a wetland, an area must have one or more of the following three attributes: 1) periodically support wetland plants; 2) substrate of predominately undrained hydric soil; or 3) covered by shallow water for at least part of the year. Generally, three categories of wetlands are found in Champaign County: shallow water wetlands, emergent wetlands and forested wetlands, with forested wetlands located in woodland areas.

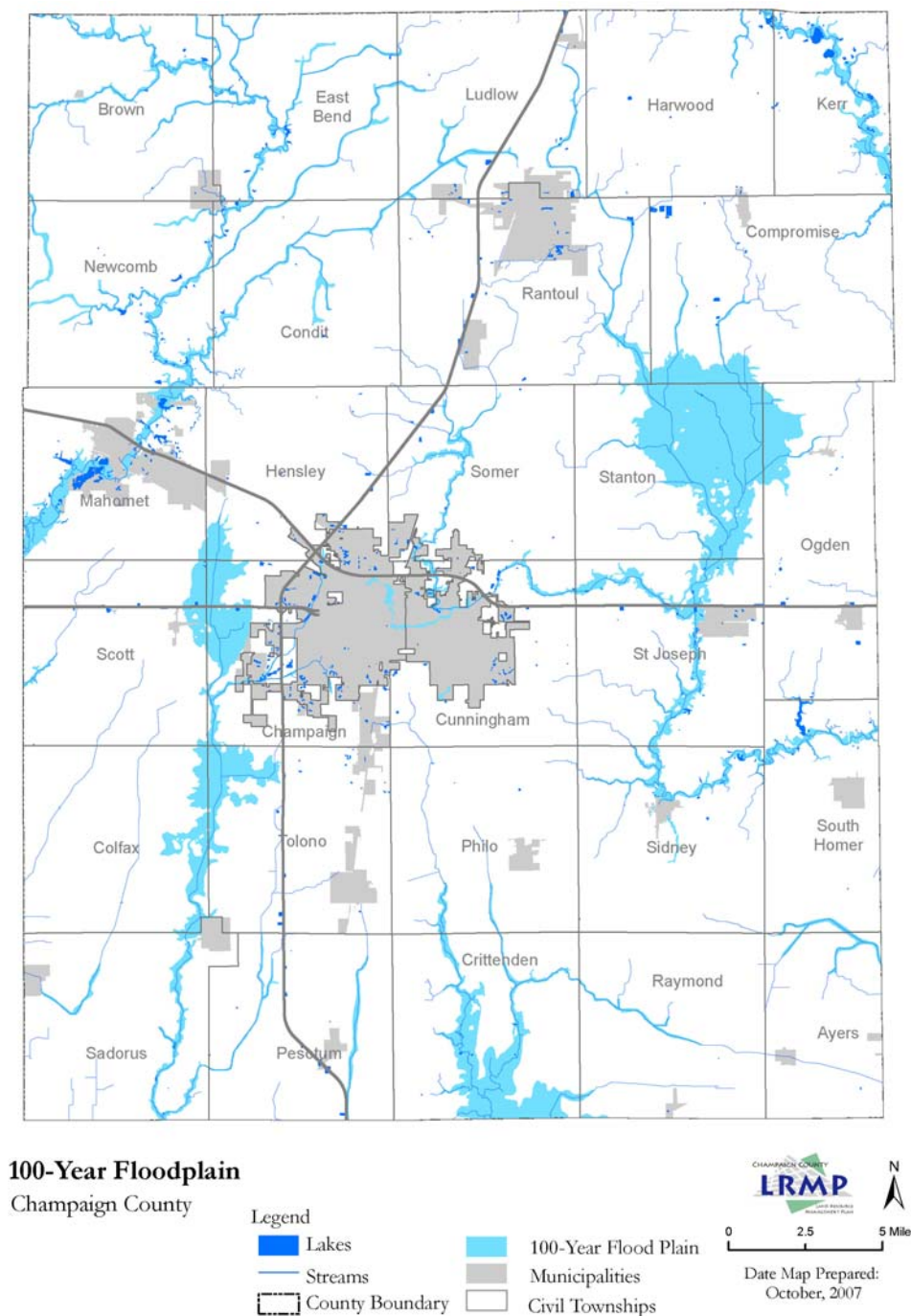
The NWI identified a total of 345 shallow water wetland sites in the County averaging 1.94 acres in size; over half of these sites are less than one acre. A total of 833 emergent wetlands sites are located in the County. As with the shallow water wetlands, most of these sites cover a very small area, with 538 of the 833 emergent wetlands less than one acre in size.

100-Year Floodplain

From an ecological perspective, the floodplain can be considered as a natural resource. The landscape along the major stream networks of the County are generally riparian areas consisting of the following environmental components: stream channel; topographic floodplain; and transitional upland fringe.³³ 'Riparian' is a term that refers to the riverside or riverine environment next to the stream channel. Within the County, the location of the 100-year floodplain is largely consistent with the location of riparian areas adjacent to the major streams.

The Federal Emergency Management Agency (FEMA) has produced paper floodplain maps, used for regulatory and flood insurance purposes as well as identifying sensitive riparian corridors. These maps are called Flood Insurance Rate maps, or FIRMs. Many of Illinois' FIRMs are outdated, some as much as 20 years. Champaign County FIRMs generally date to 1986, and are presently undergoing updating and modernization. The new floodplain maps will be fully digital, using the latest geographic information system (GIS) technology. The Illinois State Water Survey has contracted to prepare digital maps for Champaign County with completion expected during 2008. Figure 10-17 portrays the 100-year floodplain areas within the County.

Figure 10-17: 100-Year Floodplain



Bottomland Soils

The 100-year floodplain shown in Figure 10-17 includes significant areas of ‘Bottomland Soils’, identified by the Soil Survey of Champaign County as the normal floodplain of a stream.

Table 10-3: Bottomland Soils in Champaign County

Map Unit	Soil Name
3473A	Rosburg silt loam, 0 to 2 percent slopes, frequently flooded
3302A	Ambrow silty clay loam, 1 to 2 percent slopes, frequently flooded
3107A	Sawmill silty clay loam, 0 to 2 percent slopes, frequently flooded

Source: Soil Survey of Champaign County, Illinois

Woodlands and Grasslands

The following passage describes the evolution of plant communities after the last ‘ice age’ and through the early 19th century in Champaign County:

“The succession of glaciers left the underlying bedrock of the county with a cover of till (clay) and outwash (sands and gravels). Nowhere in the county does the bedrock reach the surface. The well-drained moraines and the boggy lowlands left by the glaciers were colonized by successions of plant communities, culminating in the mixture known as prairie. Prairies are essentially treeless areas dominated by tall grasses. Only 20 percent of the total area of the county at the time of arrival of the first Euro-American settlers was forested, mostly along the river corridors.”³⁴

Forest Soils

Areas that were forested in pre-settlement times have soils that developed under forest cover. A total of 28 soil types have been identified by the Natural Resource Conservation Service as ‘Forest Soils’:

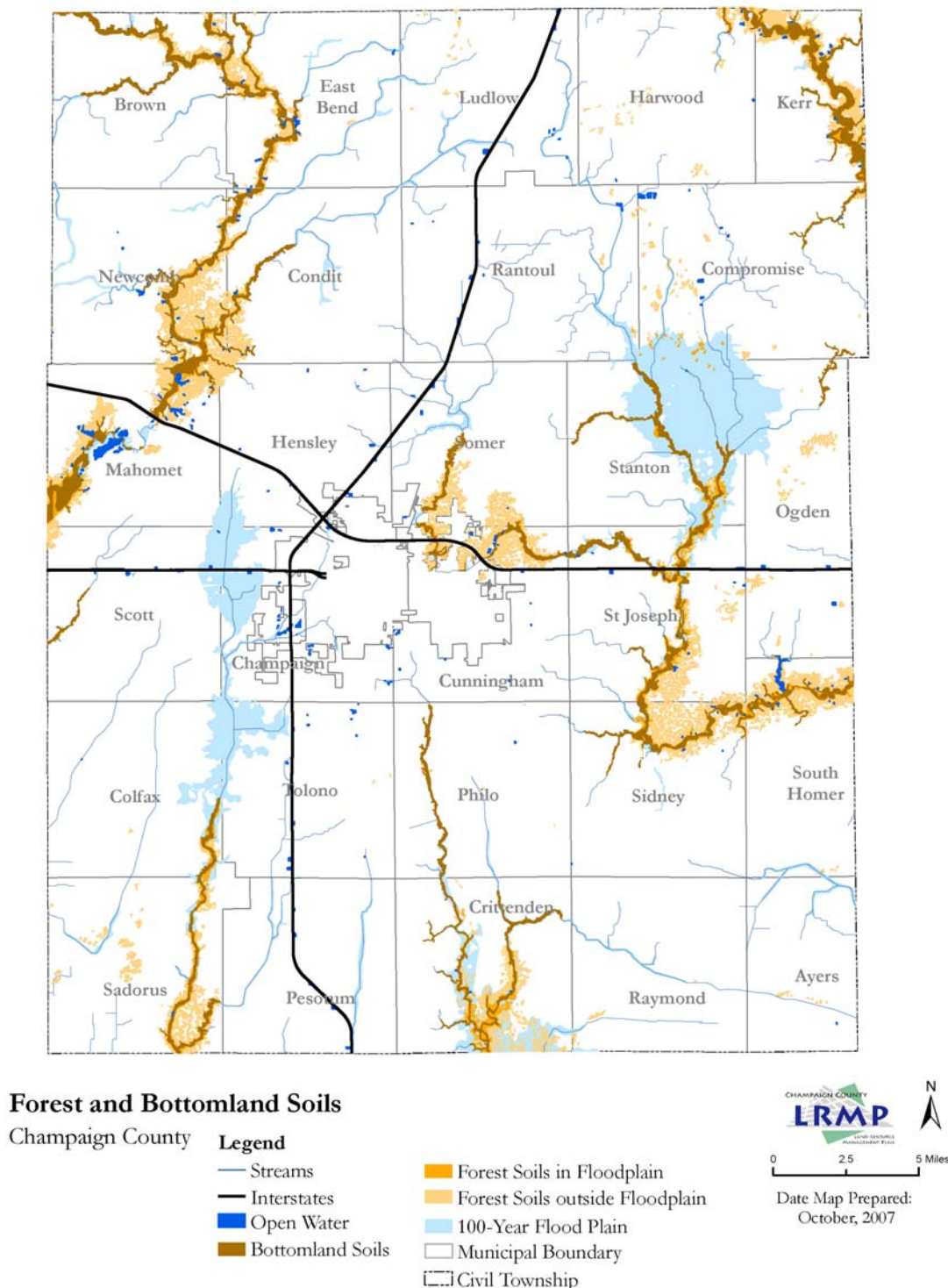
Table 10-4: Forest Soils in Champaign County

Map Unit	Soil Name	Map Unit	Soil Name
23A	Blount silt loam	234A	Sunbury silt loam
23B2	Blount silt loam	236A	Sabina silt loam
618B	Miami silt loam	241D3	Chatsworth silty clay
618C2	Miami silt loam	242A	Kendall silt loam
618D2	Miami silt loam	680B	St. Charles silt loam
6.18E+04	Miami silt loam	291B	Xenia silt loam
3473A	Ross silt loam	3302A	Ambrow silt clay loam
131B	Alvin fine sandy loam	322C2	Russell silt loam
134B	Camden silt loam	387B	Ockley silt loam
530B	Morley silt loam	387C3	Ockley clay loam
530D2	Morley silt loam	3107A	Colo silty clay loam
5.30E+04	Morley silt loam	570B	Martinsville silt loam
219A	Millbrook silt loam	570C2	Martinsville loam
233B	Birkbeck silt loam	570D2	Martinsville loam

Source: Soil Survey of Champaign County, Illinois

Figure 10-18 illustrates the locations of Bottomland Soils and Forest Soils as they relate to the 100-Year Floodplain Areas within the County. The 100-Year Floodplain contains large areas that do not include Forest Soils. They represent areas that most likely were never forested. These areas occur along the headwaters areas of the Upper Salt Fork River and Spoon River in Stanton and Compromise Townships and along the Kaskaskia River in Scott and Colfax Townships.

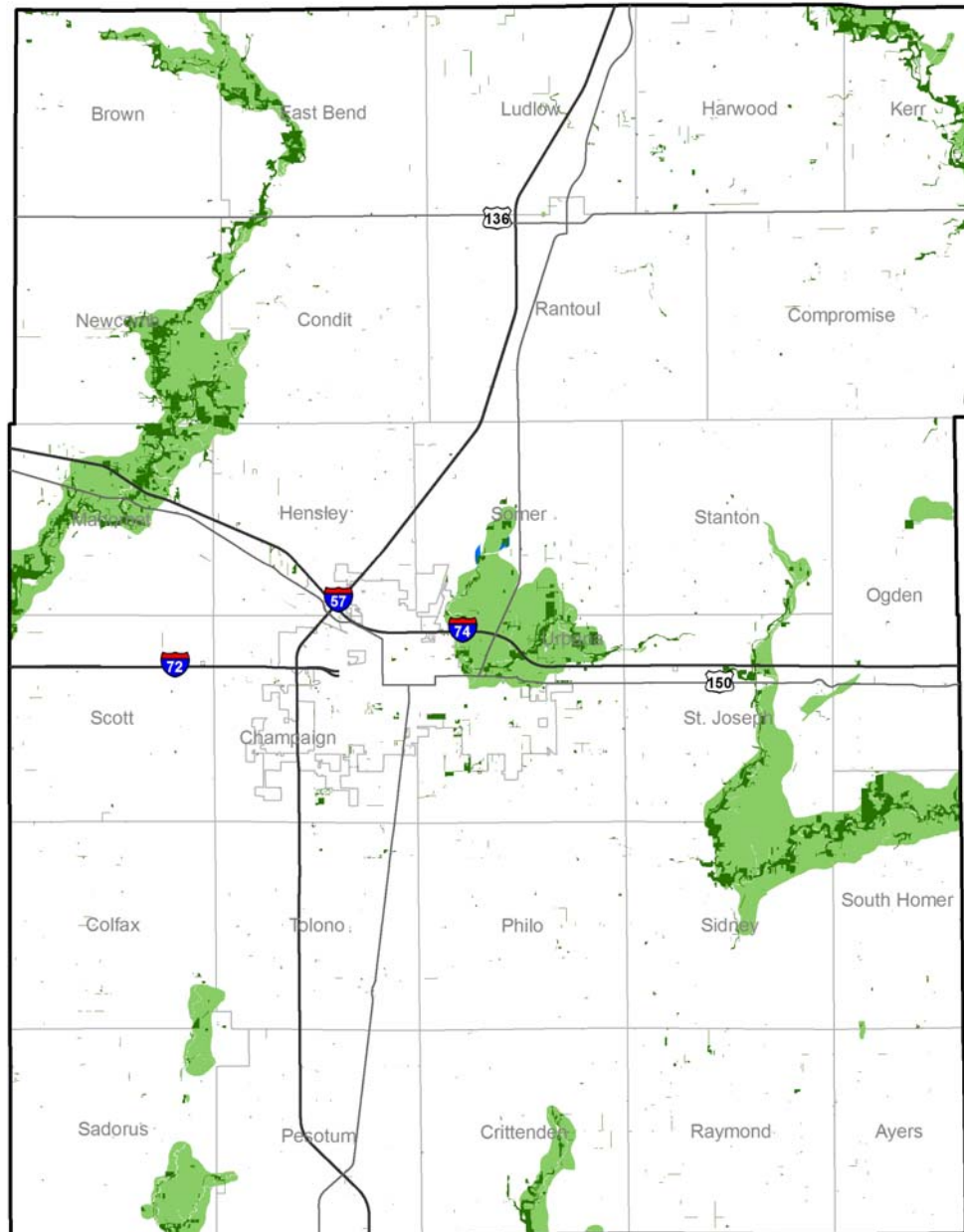
Figure 10-18: Bottomland Soils and Forest Soils



Forested Areas in Pre-Settlement Times

Areas within the County that were forested during pre-settlement times are illustrated in Figure 10-19. Generally, these previously forested areas are presently located within the 100-Year Floodplain and in areas of contiguous Forest Soils and Bottomland soils.

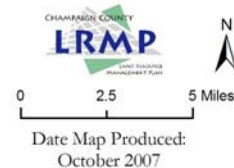
Figure 10-19: Change in Forested Areas



Change in Forested Areas
Champaign County

Legend

- | | |
|--|--|
| Presettlement Forest | Civil Township |
| Current Forest | County Boundary |



Woodland Areas

Figure 10-20 displays large woodland areas of the County. These woodlands primarily exist within or adjacent to the 100-Year Floodplain areas identified in Figure 10-17. The Woodland Areas shown within or adjacent to the 100-Year Floodplain vary in size. In identifying and mapping Woodland Areas, the following types of existing developed areas were not included:

- 1) houses located at the perimeter of a Woodland Area; and
- 2) isolated woodlands already divided into lots of five acres or less in area.

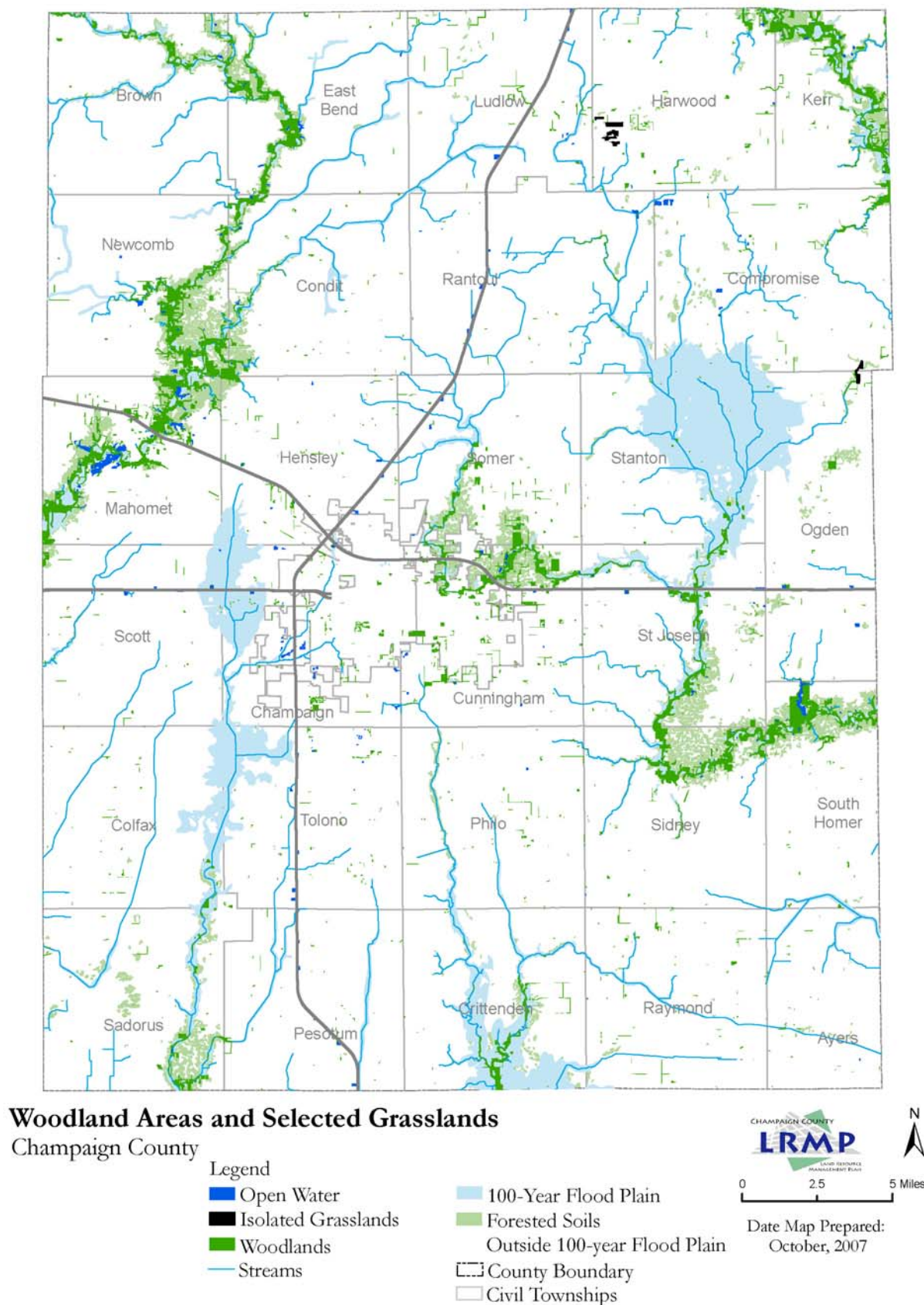
Also shown are existing 'Isolated' Woodland Areas that are not adjacent to the 100-Year Floodplain Areas. The Isolated Woodland Areas shown in Figure 10-20 represent only the isolated Woodland Areas of the County that are 10 acres or larger in size.

Grasslands

Vegetation data obtained in 1995 as part of the Illinois Critical Trends Assessment Project were identified based on land cover (satellite) data to map certain grassland areas in the County that appear on Figure 10-17 map of Woodland Areas and Selected Grasslands. The following selection criteria were utilized to identify and map certain grasslands:

- Upland grassland located adjacent to the 100-Year Floodplain or adjacent to the likely pre-settlement forested areas were included.
- Grasslands that appeared to be lawn areas were not included.
- Certain active pastures, such as those used by horse-boarding and/or stable facilities, were not included.
- Old pastures that are not apparently actively used for grazing were included.

Figure 10-20: Woodland Areas and Selected Grasslands



Wildlife Habitat

A general assessment in the form of a first statewide ‘state of the environment’ Critical Trends Assessment Project (CTAP) was published by the Illinois Department of Natural Resources (IDNR) in 1997. Champaign County is located within the “Grand Prairie” Region of the state. Observations and trends were noted generally in the initial CTAP Report, +s included in the 1997 CTAP Report:

“Habitat fragmentation and other physical changes have surpassed conventional pollution as threats to ecosystem functioning. The splintering of wetlands, prairies, and forests into fragments makes it harder for small, isolated populations of plants and animals to breed; it also leaves them vulnerable to accidental eradication through fire or other mishap. Competition from exotic species often increases as well, since many exotics from cowbirds to honeysuckle thrive along the increased ‘edge’ environment produced when contiguous habitats are split by development.” ³⁵

A series of ecological studies have followed the initial CTAP assessment, specific to selected bird, aquatic and plant populations on a statewide basis. Most recently in 2004, the IDNR issued the *Critical Trends Assessment Program 2003-2004 Report*, a follow-up report regarding recent statewide monitoring of terrestrial and aquatic ecosystems. Observations and trends are noted generally in this CTAP Report, with few observations made specific to the Grand Prairie Region.

IDNR maintains a list of endangered and threatened species by county, updated quarterly. Table 10-5 lists those species determined to be endangered or threatened in Champaign County as of September 2007. For the most up-to-date information, the IDNR website can be consulted: http://dnr.state.il.us/ORC/list_tande_bycounty.pdf.

Table 10-5: Champaign County Endangered and Threatened Species, September 2007

Scientific Name	Common Name	# of Occurrences	Last Observed
Endangered Species			
<i>Bartramia longicauda</i>	Upland Sandpiper	2	1999
<i>Circus cyaneus</i>	Northern Harrier	1	1994-SUM
<i>Hybopsis amnis</i>	Pallid Shiner	2	1928-08-18
<i>Lampsilis fasciola</i>	Wavy-rayed Lampmussel	3	2006-07-25
<i>Phlox pilosa</i> ssp. <i>sangamonensis</i>	Sangamon Phlox	5	2005-05-25
<i>Tyto alba</i>	Barn Owl	1	2005-08-02
Threatened Species			
<i>Alasmidonta viridis</i>	Slippershell	1	2004-07-15
<i>Ammocrypta pellucidum</i>	Eastern Sand Darter	1	1958-08-04
<i>Ammodramus henslowii</i>	Henslow's Sparrow	1	1993-08-01
<i>Cyclonaias tuberculata</i>	Purple Wartyback	1	2002-07-22
<i>Elliptio dilatata</i>	Spike	2	1988-08-20
<i>Emydoidea blandingii</i>	Blanding's Turtle	1	1953-05-01
<i>Ixobrychus exilis</i>	Least Bittern	1	1993-08-01
<i>Lanius ludovicianus</i>	Loggerhead Shrike	1	1990-05-23
<i>Spermophilus franklinii</i>	Franklin's Ground Squirrel	4	2004-06-26
<i>Tomanthera auriculata</i>	Ear-leafed Foxglove	1	1933-09-19
<i>Villosa lienosa</i>	Little Spectaclecase	2	2006-08-23

Source: Illinois Threatened and Endangered Species by County as of September 10, 2007, Illinois Natural Heritage Database; http://dnr.state.il.us/ORC/list_tande_bycounty.pdf

According to the Illinois Endangered Species Protection Act (520 ILCS 10/2), it is unlawful for any person "...to possess, take, transport, sell, offer for sale, give or otherwise dispose of any animal or the product thereof of any animal species which occurs on the Illinois List.... 'Endangered Species' means any species of plant or animal classified as endangered under the Federal Endangered Species Act of 1973...plus such other species which the Board may list as in danger of extinction in the wild in Illinois due to one or more causes including but not limited to, the destruction, diminution or disturbance of habitat, overexploitation, predation, pollution, disease, or other natural or manmade factors affecting its prospects of survival. 'Threatened Species' means any species of plant or animal classified as threatened under the Federal Endangered Species Act of 1973...plus such other species which the Board may list as likely to become endangered in the wild in Illinois within the foreseeable future."

Illinois Natural Area Inventory Sites, Illinois Nature Preserves and Biologically Significant Streams

The IDNR published a summary regional assessment of resource-rich areas in *The Illinois Headwaters: An Inventory of the Region's Resources*.³⁶ The report describes selected areas located within the 'Headwaters' region (largely comprised of Champaign County) that have been designated as Illinois Natural Area Inventory (INAI) sites, Illinois Nature Preserves and Biologically Significant Streams.

The Middle Fork, parts of the Salt Fork, and the Sangamon River in Champaign County are designated Biologically Significant Streams. The Middle Fork is designated by IDNR as one of the highest quality streams in the State. At present, the Illinois Environmental Protection Agency lists waters in parts of the Sangamon, Salt Fork, Kaskaskia, Embarras, and Little Vermillion Rivers as 'impaired'.

The INAI survey was conducted in the 1970s to identify valuable remaining natural areas throughout the state. INAI sites within Champaign County include: Trelease Woods; Brownfield Woods; Nettie Hart Woodland Memorial; Middle Fork River; Spoon River; and Sangamon River. Additionally, the Tomlinson Pioneer Cemetery Prairie located in Kerr Township is a designated Illinois Nature Preserve.

University of Illinois Preserve Areas

The University of Illinois owns several wooded sites, prairies or pastures within the County that are managed by the University's Committee on Natural Areas. The properties are closed to the public; only authorized research and class field trips are permitted on the preserve sites. Research permits may be issued to University of Illinois faculty, staff, and students, Illinois Department of Natural Resources personnel, or qualified researchers from other colleges/universities. These preserves are described as follows:³⁷

Brownfield Woods. Located approximately six miles northeast of the UIUC campus, this is a 64.6-acre virgin deciduous upland forest. The woods is primarily a mature oak/ash/maple forest with a high, closed canopy and fairly open understory. Sugar maple has become the dominant tree species. The woods is a remnant of a much larger prairie grove (Big Grove) which was present at settlement times. A small creek, fed by runoff and field tiles, runs diagonally through the woods. The east and south perimeter of the woods is abutted by a township road. A mix of agricultural land and wooded residential land are situated around the woods.

CCDC Collins Woods. Located approximately two miles north of St. Joseph, IL, this is a second growth deciduous forest. The eastern half is a mix of older trees and successional growth. The western half is a more mature oak woods with damp, old river oxbow bottom lands. A housing development abuts the west side and agricultural land abuts the other sides.

Nettie Hart Memorial Woods. Located approximately 15 miles northwest of the UIUC campus, this is a 40 acre, approximately 150 year old second growth upland and mesic woods. There is primarily oak/hickory on the well-drained uplands and slopes and silver maple on the bottom land. The woods has a closed canopy with a moderately dense understory. The Sangamon River runs along the western edge of the property and a permanent creek cuts along the south edge. Woods abut the property on the north and south sides. A housing development is encroaching toward the woods west of the river and across the road on the east side is agricultural land and an open woods farmstead.

Nanney Research Area. Located approximately 18 miles south of the UIUC campus, this is a 41-acre strip of land along the Embarras River in the southern portion of the County. The Embarras River forms the east and north boundary. This adjacent portion of the river has not been channelized or diked and retains a meandering nature. About 60% of the site is good quality river and stream floodplain/seasonal wetlands. The higher ground is successional woodland. Agricultural land abuts the site on the south and west sides. Floodplain and sloped woodlands are east and north of the river.

Phillips Tract. Located approximately six miles northeast of the UIUC campus across the road from Trelease Woods, this is a 130-acre former farm. The area contains alfalfa, bluegrass, recreated prairie, oldfield, and agricultural fields, a 30 year old successional area and rotating 1-to-5 year old successional strips, and oldfield/successional woods. Two outbuildings are situated on the site. The Saline Branch of the Salt Fork River runs through the property. Agricultural land abuts to three sides with Trelease Woods and Prairie across the road to the east.

Trelease Woods. Located about six miles northeast of the UIUC campus, this is a 60.5-acre woods and 10.7 acre buffer "virgin" deciduous upland forest, primarily a mature oak/ash/maple forest with a high, closed canopy and moderately dense understory. Sugar maple has become the dominant tree species. The woods is a remnant of a much larger prairie grove (Big Grove) which was present at settlement times and was originally connected with Brownfield Woods. There are two, small, man-made seasonal ponds located in the woods and on the south edge of the woods. Over ten acres of buffer lands on the north and northeast sides of the woods were seeded to alfalfa and mixed prairie species in 2002. Trelease Prairie runs up to the south edge of the woods. Agricultural land abuts on three sides of the woods with Phillips Tract across the road on the west side.

Trelease Prairie. This is a 19.9-acre recreated tallgrass prairie. Restoration began in the 1940's and is currently maintained by periodic burning. Agricultural land abuts the south and east sides with Trelease Woods on the north and Phillips Tract across the road to the west.

Conservation Reserve Program & Conservation Reserve Enhancement Program within the County

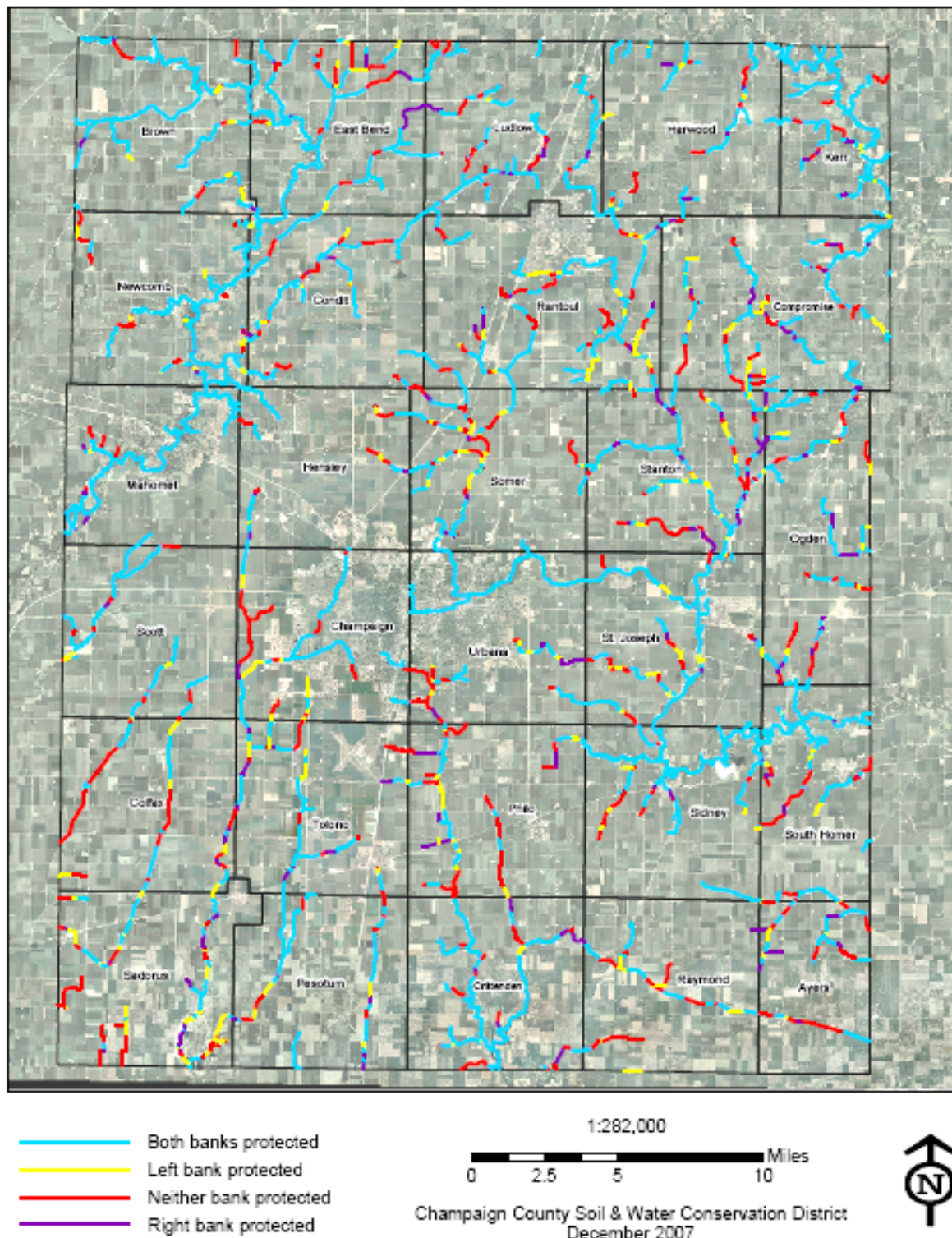
The Conservation Reserve Enhancement Program (CREP) is a federal-state natural resources conservation program that addresses state and nationally significant, agricultural-related environmental concerns. Through CREP, program participants receive financial incentives from USDA's Commodity Credit Corporation (CCC) and state partners to voluntarily enroll in the Conservation Reserve Program (CRP) in contracts of 10 to 15 years. Participants remove cropland and marginal pastureland from agricultural production and convert the land to grasses, forbs, shrubs, trees, other vegetation and wetlands. USDA's Farm Service Agency (FSA) administers CRP and CREP on behalf of CCC.

Stream banks are measured as occurring along one side the bank of a stream or channel. There are approximately 691 stream miles within the County, comprising over 1380 miles of stream banks.

At present, approximately 72 percent of the stream banks within the County meet the minimum required criteria as an established vegetative filter strip, as illustrated in Figure 10-21. Some the stream banks meeting the minimum established criteria already existed and were not planted as part of the CRP or CREP conservation program requirements.

Figure 10-21: Status of Vegetation along Streambanks in Champaign County

72% of Streambanks Meet Minimum Criteria for Vegetative Filter Strip Protection



Source: Champaign County Soil and Water Conservation District