



Volume 4

Socio-Economic Profile
Environmental Quality
Archaeological Resources

KANKAKEE RIVER AREA ASSESSMENT



KANKAKEE RIVER AREA ASSESSMENT

VOLUME 4

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Other CTAP Publications

The Changing Illinois Environment: Critical Trends

- *Summary Report*
- *Volume 1: Air Resources*
- *Volume 2: Water Resources*
- *Volume 3: Ecological Resources*
- *Volume 4: Earth Resources*
- *Volume 5: Waste Generation and Management*
- *Volume 6: Sources of Environmental Stress*
- *Volume 7: Bibliography*

Illinois Land Cover, An Atlas, plus CD-ROM

Inventory of Ecologically Resource-Rich Areas in Illinois

The Rock River Country: An Inventory of the Region's Resources

Rock River Area Assessment, technical report

The Cache River Basin: An Inventory of the Region's Resources

Cache River Area Assessment, technical report

The Mackinaw River Country: An Inventory of the Region's Resources

Mackinaw River Area Assessment, technical report

The Illinois Headwaters: An Inventory of the Region's Resources

Headwaters Area Assessment, technical report

The Illinois Big Rivers: An Inventory of the Region's Resources

Big Rivers Area Assessment, technical report

The Fox River Basin: An Inventory of the Region's Resources

Fox River Area Assessment, technical report

Annual Report 1996, Illinois RiverWatch

Stream Monitoring Manual, Illinois RiverWatch

PLAN-IT EARTH, Flowing Waters Module

PLAN-IT EARTH, Forest Module

Forest Monitoring Manual, Illinois ForestWatch

Illinois Geographic Information System, CD-ROM of digital geospatial data

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About This Report

The Kankakee River Area Assessment examines an area situated along the Kankakee River in eastern Illinois. Because significant natural community and species diversity is found in the area, it has been designated a state Resource Rich Area.¹

This report is part of a series of reports on areas of Illinois where a public-private partnership has been formed. These assessments provide information on the natural and human resources of the areas as a basis for managing and improving their ecosystems. The determination of resource rich areas and development of ecosystem-based information and management programs in Illinois are the result of three processes -- the Critical Trends Assessment Program, the Conservation Congress, and the Water Resources and Land Use Priorities Task Force.

Background

The Critical Trends Assessment Program (CTAP) documents changes in ecological conditions. In 1994, using existing information, the program provided a baseline of ecological conditions.² Three conclusions were drawn from the baseline investigation:

1. the emission and discharge of regulated pollutants over the past 20 years has declined, in some cases dramatically,
2. existing data suggest that the condition of natural ecosystems in Illinois is rapidly declining as a result of fragmentation and continued stress, and
3. data designed to monitor compliance with environmental regulations or the status of individual species are not sufficient to assess ecosystem health statewide.

Based on these findings, CTAP has begun to develop methods to systematically monitor ecological conditions and provide information for ecosystem-based management. Five components make up this effort:

1. identify resource rich areas,
2. conduct regional assessments,
3. publish an atlas and inventory of Illinois landcover,
4. train volunteers to collect ecological indicator data, and
5. develop an educational science curriculum which incorporates data collection

At the same time that CTAP was publishing its baseline findings, the Illinois Conservation Congress and the Water Resources and Land Use Priorities Task Force were presenting their

¹ See *Inventory of Resource Rich Areas in Illinois: An Evaluation of Ecological Resources*.

² See *The Changing Illinois Environment: Critical Trends*, summary report and volumes 1-7.

respective findings. These groups agreed with the CTAP conclusion that the state's ecosystems were declining. Better stewardship was needed, and they determined that a voluntary, incentive-based, grassroots approach would be the most appropriate, one that recognized the inter-relatedness of economic development and natural resource protection and enhancement.

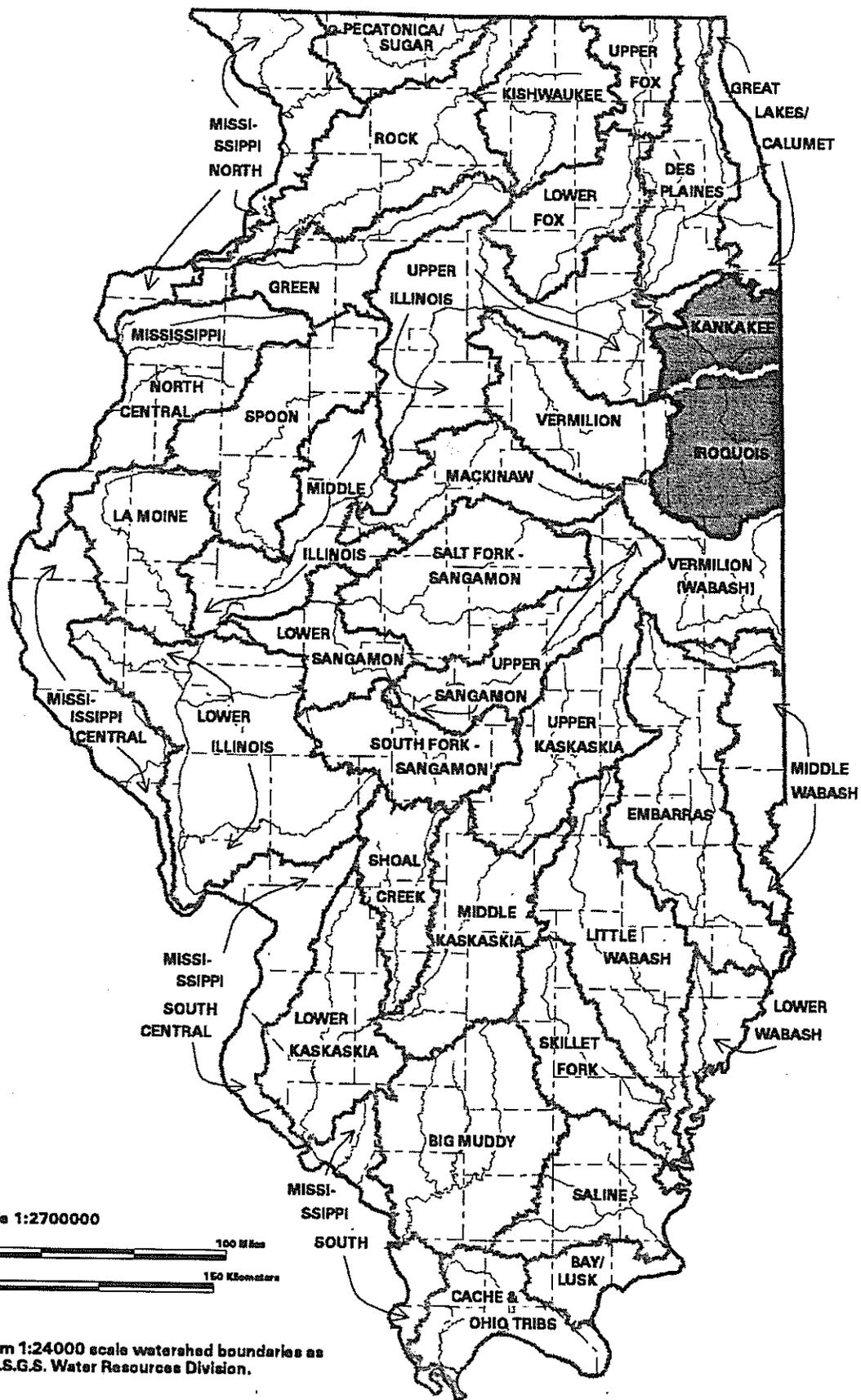
From the three initiatives was born Conservation 2000, a six-year program to begin reversing ecosystem degradation, primarily through the Ecosystems Program, a cooperative process of public-private partnerships that are intended to merge natural resource stewardship with economic and recreational development. To achieve this goal, the program will provide financial incentives and technical assistance to private landowners. The Rock River and Cache River were designated as the first Ecosystem Partnership areas.

At the same time, CTAP identified 30 Resource Rich Areas (RRAs) throughout the state. In RRAs where Ecosystem Partnerships have been formed, CTAP is providing an assessment of the area, drawing from ecological and socio-economic databases to give an overview of the region's resources -- geologic, edaphic, hydrologic, biotic, and socio-economic. Although several of the analyses are somewhat restricted by spatial and/or temporal limitations of the data, they help to identify information gaps and additional opportunities and constraints to establishing long-term monitoring programs in the partnership areas.

The Kankakee River Area Assessment

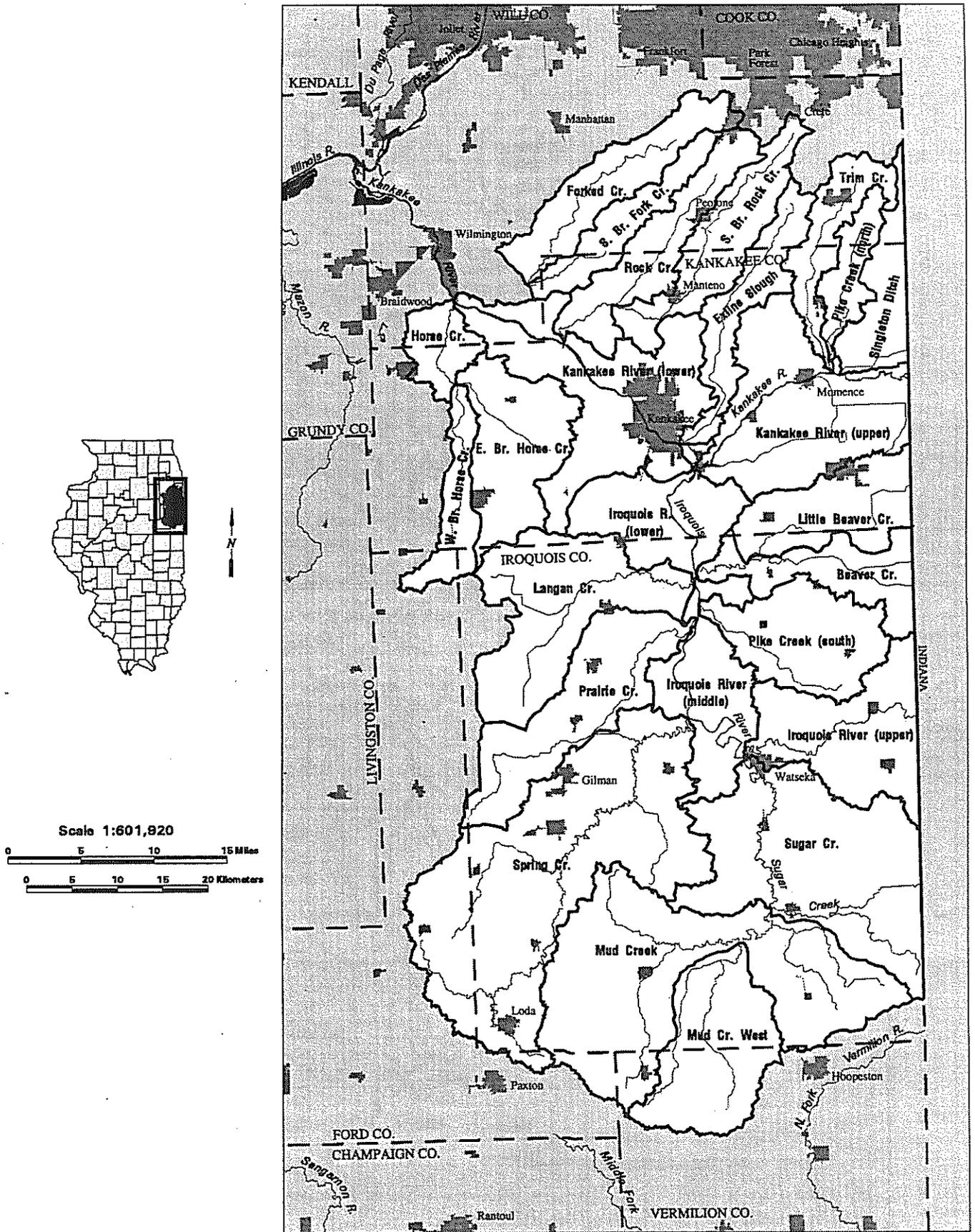
The Kankakee River Area Assessment covers an area of approximately 2,019 mile² (1,292,230 acres) spanning parts of five counties in eastern Illinois, including most of Kankakee and Iroquois counties and parts of Will, Ford, and Vermilion counties. The Kankakee River originates three miles southwest of South Bend, Indiana, enters Illinois six miles east of Momence, and flows 62 miles before its confluence with the Des Plaines River to form the Illinois River. The Iroquois River, originating in Jasper County, Indiana, is the largest tributary of the Kankakee River. Once the Iroquois enters Illinois it flows 55 miles until it joins the Kankakee River just below Aroma Park. The boundary of this assessment report encompasses 25 subbasins within the Illinois portion of the Kankakee and Iroquois River drainage basins. Over 90% of this area occurs in the "Grand Prairie" division of the state. Two of the 25 subbasins in this area, the Kankakee River (upper) and Kankakee River (lower), totaling 231,005 acres, have been designated as a "Resource Rich Area" because they contain significant natural community diversity. The Kankakee Ecosystem Partnership was subsequently formed around this core area of high quality ecological resources.

This assessment is comprised of five volumes. In Volume 1, *Geology* discusses the geology, soils, and minerals in the assessment area. Volume 2, *Water Resources*, discusses the surface and groundwater resources and Volume 3, *Living Resources*,



Drainage basins from 1:24000 scale watershed boundaries as delineated by the U.S.G.S. Water Resources Division.

Major Drainage Basins of Illinois and Location of the Kankakee River Assessment Area



Subbasins in the Kankakee River assessment area. Subbasin boundaries depicted are those determined by the Illinois Environmental Protection Agency.

describes the natural vegetation communities and the fauna of the region. Volume 4 contains three parts: Part I, *Socio-Economic Profile*, discusses the demographics, infrastructure, and economy of the area, focusing on the two counties with the greatest amount of land in the area -- Kankakee and Iroquois counties; Part II, *Environmental Quality*, discusses air and water quality, and hazardous and toxic waste generation and management in the area; and Part III, *Archaeological Resources*, identifies and assesses the archaeological sites, ranging from the Paleoindian Prehistoric (B.C. 10,000) to the Postwar (A.D. 1946), known in the assessment watershed. Volume 5, *Early Accounts of the Ecology of the Kankakee Area*, describes the ecology of the area as recorded by historical writings of explorers, pioneers, early visitors and early historians.



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PART I

SOCIO-ECONOMIC PROFILE

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Summary

The Kankakee and Iroquois rivers originate across the border in Indiana, flow through the counties in Illinois of the same names, meet south of the city of Kankakee and then flow northwest into the Illinois River. The Kankakee River Partnership area incorporates the entire Illinois portion of the Kankakee watershed above Horse Creek. This report profiles the socio-economic characteristics of the area, focusing primarily on Kankakee and Iroquois counties (although southern Will County, and very small parts of Ford and Vermilion counties are also part of the watershed).¹ It provides a historical perspective as well as a current picture of the human-related resources of the region.

During the past 120 years the population in the Kankakee River area grew 153%, only half the 350% growth experienced statewide. Kankakee County grew the most, quadrupling in population, while Iroquois County gained only 19% over its 1870 population. During the past decade, the area has lost population due to the loss of some of its industrial base.

In 1990 the two-county area was home to 127,000 or 1% of the state's population. In Kankakee County almost seven out of ten people live in urban areas, while in Iroquois County less than one out of five do. More than 50,000 live in the city of Kankakee and its suburbs; only 5,400 live in Watseka, Iroquois' largest city. Even in Kankakee County, however, only 5.1% of the land is urban.

The age distribution in Kankakee County looks very much like the rest of the state. Iroquois County has a slightly older population, with 18% elderly and a median age four years higher than statewide. Mortality rates for the major causes of death (heart disease, cancer and stroke) are above the state average in Iroquois County reflecting its higher percentage of elderly, while mortality rates are close to the state average in Kankakee County.

Between 1970 and 1990, education levels increased in the Kankakee River area but lagged behind the rest of the state. In 1990 the percentage of those completing high school was three percentage points less than statewide (73% compared to 76%); for college it was 9.5 percentage points less (11.5% compared to 21%). Per capita income is also slightly lower in the area than it is statewide; in 1990 it was \$4,325 lower. Even so, per capita income rose 37% between 1970 and 1990.

¹ While the accompanying natural resources assessment emphasizes the watershed as its unit of analysis, socio-economic data are displayed geographically using the 128 census block groups defined by the U.S. Census Bureau to encompass the two counties. Census block groups are small, sub-county level areas delineated by the U.S. Census Bureau for purposes of the decennial census. They are designed to be relatively homogeneous with respect to population characteristics, economic status, and living conditions. In practice they vary considerably in population and size. In the two-county area, the census block groups range from 31 to 4,532 in population and from 34 acres to 51,734 acres in land area.

The Kankakee River area generates nearly 1 % (0.99%) of the state's employment with more than 65,000 employed and \$2.5 billion in personal income. The area has a diverse economy. Services and trade provide the most jobs, but farming and manufacturing remain important forces in the local economy. Following the statewide trend of a declining manufacturing base and growing service sector, manufacturing employment has fallen by 32% in the last 25 years, while service sector employment has risen by 120%. Although manufacturing is still the largest source of earnings in Kankakee County (reflecting its higher wages), there is only one manufacturer on the list of the 10 largest employers. Health and educational services and wholesale/retail trade dominate this list. In predominantly rural Iroquois County farming is still the third largest employment sector, although since the mid-80s services and trade employ more people.

Although Kankakee County has a significant urban population and economy, like Iroquois its land cover is predominantly agricultural. More than 90% of the land in the Kankakee River area is agricultural, the vast majority row crops (corn and soybeans). Iroquois County ranks second in the state in cropland acreage and Kankakee 18th. In Iroquois County, nearly half of the property tax base consists of farm property.

Although the Kankakee River area is not a rapidly growing area, it has experienced some urban sprawl. Urban land has grown by 12.7% during the past decade. In addition, in the last 20 years 104 miles of roads have been added (mostly in the more urban Kankakee County), bringing the total to 4,098 miles, 3% of the state's total road mileage. Vehicle miles traveled have grown by 22% over the same time period (only half as much as the rest of the state), with most of the growth occurring after oil prices began to decline in the early 1980s.

Outdoor recreation opportunities in the Kankakee River area are shaped largely by the river itself. The largest state site, the Kankakee River State Park, is visited by approximately 1.2 million people annually who come to hike, camp, hunt, fish, ride horses, watch wildlife, and to go boating. The second largest state site is the Iroquois County Conservation Area, known for its sand dune and prairie marsh habitats and its excellent pheasant hunting. Visitors to these sites generate about \$14 million in output and 220 jobs to the local economy.

The human resources of the Kankakee River area provide an important context for future plans to manage and preserve the unique and ample natural resources of the area. This report is part of an overall assessment of the area's natural and human resources.

Demographic Trends

The character of an area is determined not only by its natural environment, but also by its human environment -- the size, growth, density, distribution and characteristics of the population living there. The following section describes population growth and distribution, and trends in age, income, education, households, and housing.

Population

Between 1870 and 1990 the combined populations of the two Kankakee River counties have grown 153%, quite a bit below the statewide growth of 350%.¹ Most of the increase occurred in Kankakee County, which grew 295%; Iroquois County grew by only 19%. As of 1990, the Kankakee River area was home to 1% of the state's population.

1990
Two-county Kankakee River area
Square miles: 1,794
Population: 127,042
Density: 70.8 persons per sq. mi.
Urban population: 56.4%
4 cities
34 villages

The growth in Kankakee County was steady over most of the period, with sharp growth

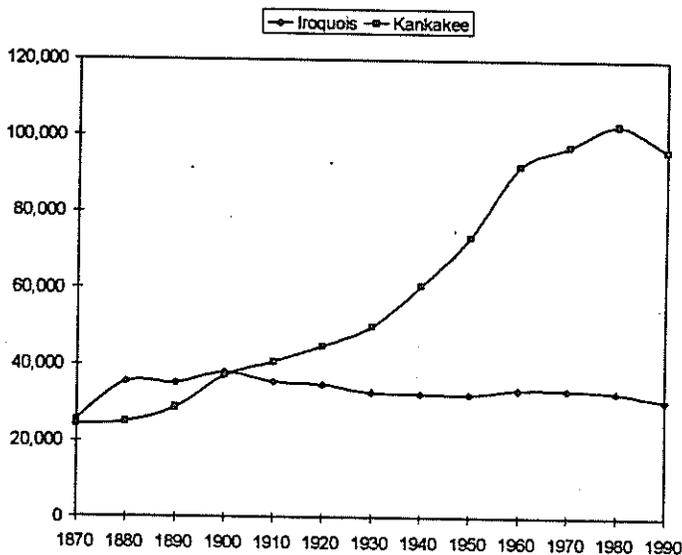


Figure 1-1. Kankakee River Area Population Trends

¹ Population data was taken from the 1993 Illinois Statistical Abstract.

Figure 1-2.

Municipalities and Major Highways

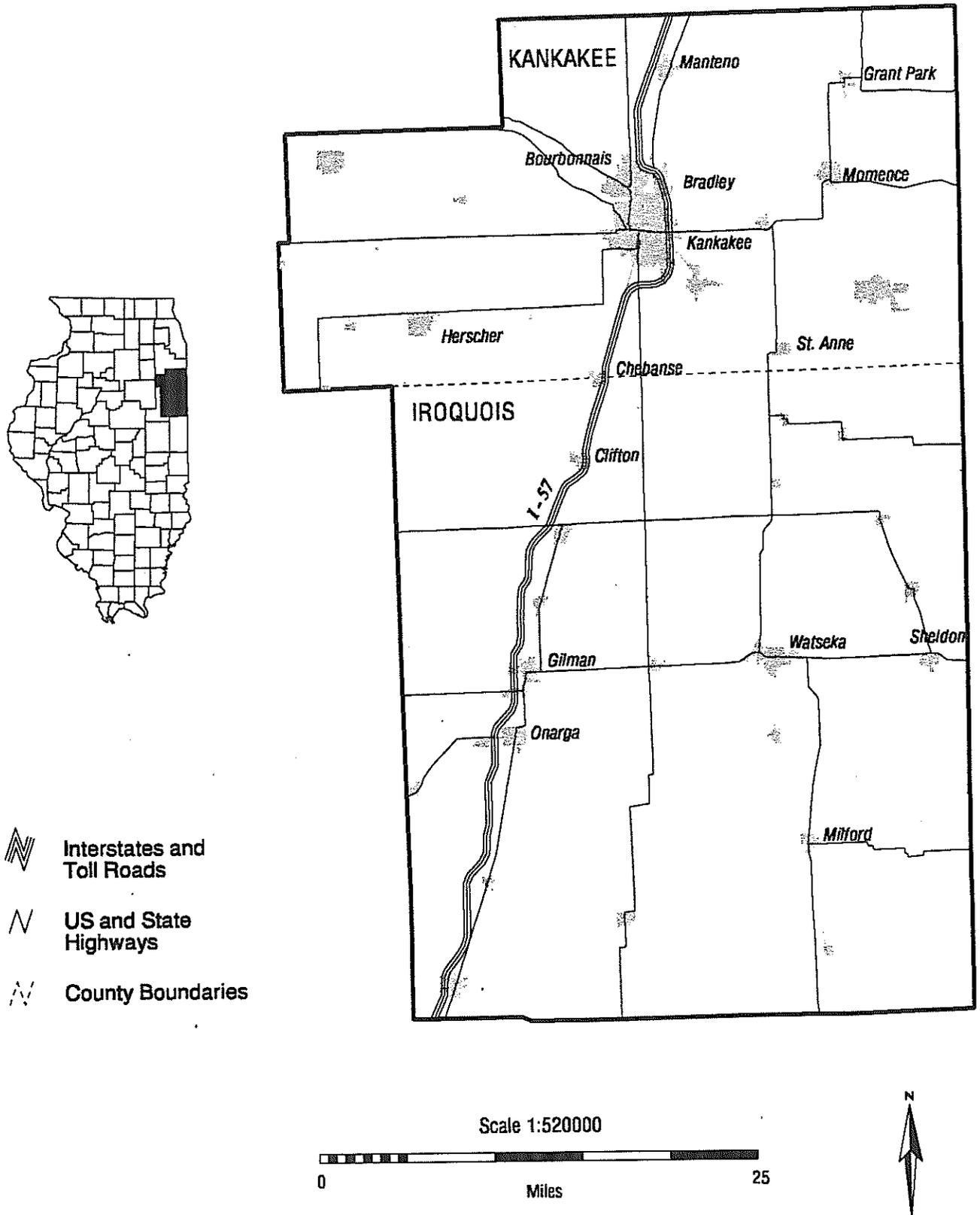


Table 1-1. Population

	1990 Population	% of State Population	County Rank ²	% change, 1970-1990
Iroquois	30,787	0.27%	48	-8%
Kankakee	96,255	0.8%	18	-1%
Kankakee River area	127,042	1.1%	--	-2.9%
Statewide	11,430,602	100.0%	--	2.9%

between 1930 and 1960, but declines beginning in 1980. Population is projected to grow about 10% between 1990 and 2020² with the majority of the growth in Kankakee County.

Urban Population

A little over half of the area's population live in urban areas (communities greater than 2,500 population), compared to 85% of the population statewide.³ In Kankakee County almost seven out of ten people live in urban areas; in Iroquois County less than one out of five do. Trends in population density are shown in Figure 1-3. Overall, the population density of the Kankakee River area is a little over one-half the statewide average density.

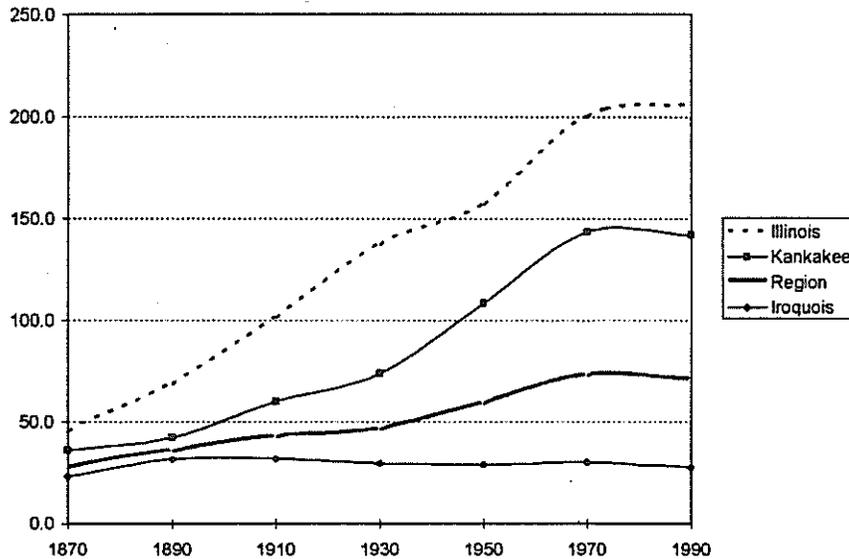


Figure 1-3. Population Density (persons per square mile)

² Projections and county ranking taken from 1994 State Profile, Woods & Poole Economics, Inc.

³ Urbanization data from 1990 and 1993 Illinois Statistical Abstract.

Table 1-2. Incorporated Municipalities, Kankakee River Area

	City, town or village	1990 Population		City, town or village	1990 Population
Iroquois County			Kankakee County		
Ashkum	V	650	Aroma Park	V	690
Beaverville	V	278	Bonfield	V	299
Buckley	V	557	Bourbonnais	V	13,929
Chebanse	V	1,082	Bradley	V	10,910
Cissna Park	V	805	Buckingham	V	340
Clifton	V	1,347	Clark City	V	na
Crescent City	V	541	Grant Park	V	1,024
Danforth	V	457	Herscher	V	1,278
Donovan	V	361	Hopkins Park	V	601
Gilman	C	1,816	Irwin	V	89
Iroquois	V	199	Kankakee	C	27,531
Loda	V	390	Manteno	V	3,488
Martinton	V	299	Momence	C	2,968
Milford	V	1,512	Reddick (also in Livingston Co.)	V	208
Onarga	V	1,281	St. Anne	V	1,153
Papineau	V	142	Sun River Terrace	V	532
Sheldon	V	1,109	Union Hill	V	70
Thawville	V	241			
Watseka	C	5,424			
Wellington	V	294			
Woodland	V	313			

Source: Illinois Counties & Incorporated Municipalities, December 1, 1993; Illinois Secretary of State.

Urban Land Use

Only a very small percentage of the area's land is urban -- 35,725 acres according to satellite imagery taken between 1992 and 1994 -- only 3.1% of the area.⁴ Kankakee County has the greatest amount with 5.1%.

Land use information is also available from the U.S. Department of Agriculture Soil

Table 1-3. Urban Acreage

	Urban Acres	% of Total
Iroquois	13,418	1.9%
Kankakee	22,307	5.1%
Region	35,725	3.1%
Illinois	2,087,390	5.8%

⁴ *Illinois Landcover, An Atlas*, IL Department of Natural Resources, June 1996. Used here, urban land includes low, medium and high density urban land, transportation, and urban grasslands.

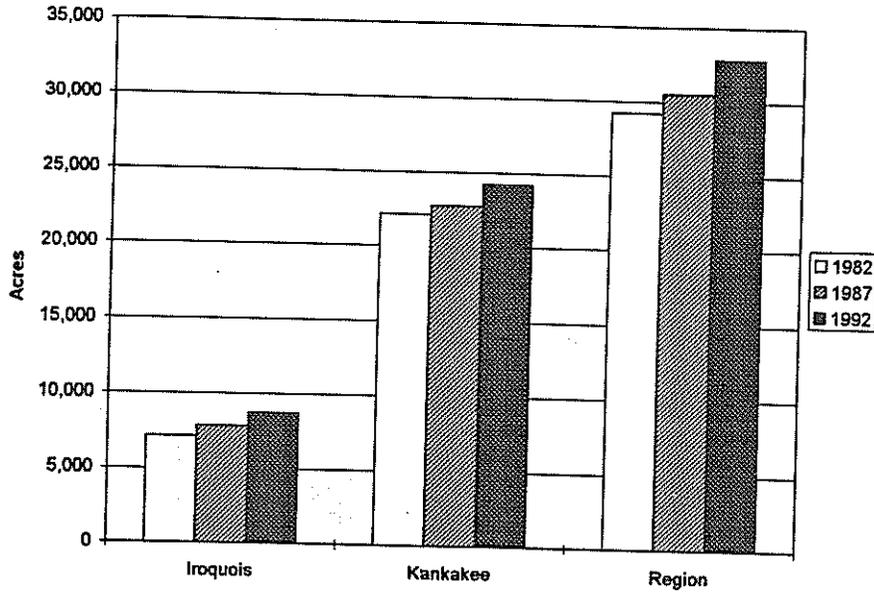


Figure 1-4. Urban Land Use

Conservation Service, which has conducted a *National Resources Inventory* (NRI) in 1982, 1987 and 1992 (Figure 1-4).⁵ According to the NRI, between 1982 and 1992 urban land use grew 12.7%, (to 2.9% of land in the two-county area), compared to a 13.7% increase statewide (to 6.3% of Illinois' land area). The largest increase occurred in Iroquois County, up 22.5%.

Population Characteristics

Age

The population in the two-county area is aging, as it is throughout the state. Between 1970 and 1990, the percentage of persons younger than age 20 dropped from 37.8% to 30.6% of the area population. The number of persons older than age 64, however, rose from 11.4% to 14.8% of the population.⁶ In 1990 Kankakee County had the largest percentage of residents under the age of 20 (31.4%), while Iroquois had the largest percentage of residents over the age of 64 (18.3%).

1990	
Two-county Kankakee River area	
Age 0-19:	30.6%
Age 65+:	14.8%
Median age:	33.8
Per capita income:	\$18,134
Persons in poverty:	12%
Minorities:	12.3%
Females/males:	52:48
High school education:	73%
College education:	11.5%

⁵ Because different methodologies are used and the data are collected from representative sample points in each state, the NRI data vary slightly from the satellite data.

⁶ Age, race and education data from the *1997 State Profile*, Woods & Poole Economics, Inc.

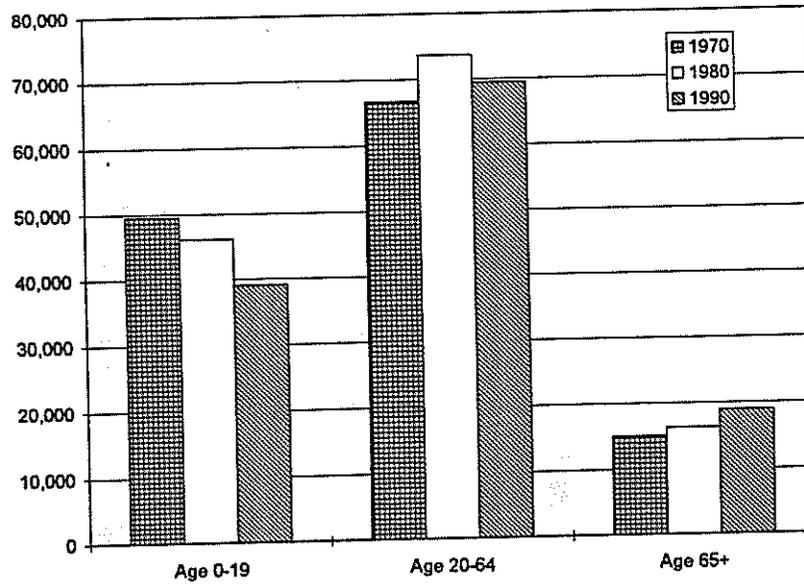


Figure 1-5. Age Distribution, Kankakee River Area

In 1992, Iroquois County ranked 28th in the state in the percentage of elderly, while Kankakee County ranked 85th. By 2020, the number of elderly is projected to continue to increase, to 26% of the population in Iroquois County and 19% in Kankakee County.

Between 1970 and 1990, the median age rose 4.5 years in the region (Table 1-4), close to the statewide increase of 4.4 years. Median age rose the most in Iroquois County, up 5.4 years.

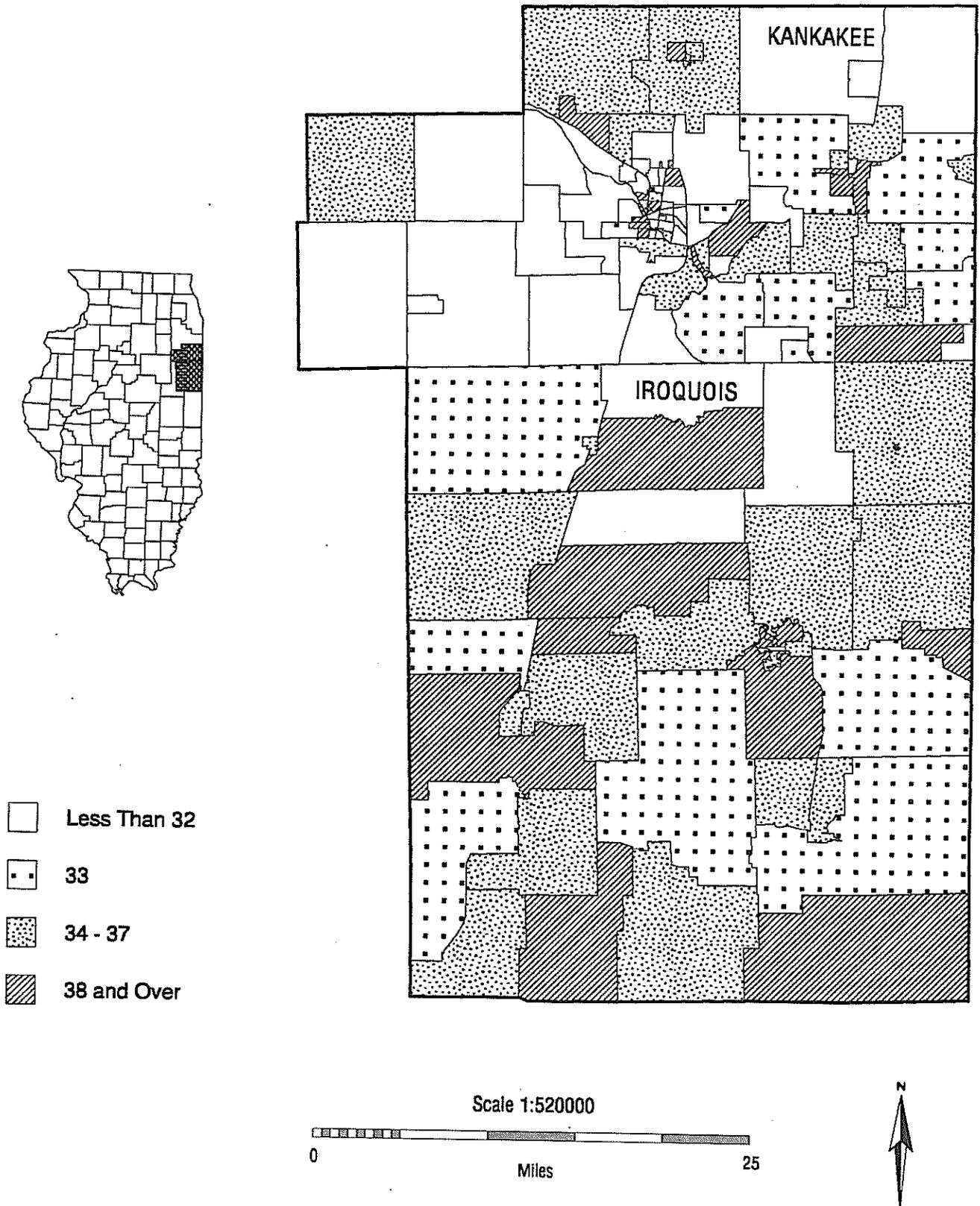
Table 1-4. Median Age

Median age	1970	1980	1990
Iroquois	31.4	33.1	36.8
Kankakee	28.6	28.9	32.9
Region	29.3	29.9	33.8
Illinois	28.4	29.9	32.8

Figure 1-6 shows age distribution by census block group. The predominantly younger populations are located in the areas around the city of Kankakee, Bradley, Bourbonnais and Watseka. The populations with a higher mean age are concentrated in the rural areas of Iroquois County.

Figure 1-6.

Estimated Mean Age by 1990 Census Block Group



Race and Gender

A little over 12% of the area residents are of a minority race, compared to 18% statewide. Almost all of the minorities live in Kankakee, 15.2%, with only 1% in Iroquois County. The ratio of females to males has remained fairly stable in the area over the last 20 years, with females outnumbering males 51.6 to 48.4 in 1990, almost equal to the statewide ratio of 51.5 to 48.5.⁷

Education

Between 1970 and 1990, education levels increased in the Kankakee River area but lagged behind the rest of the state. In both 1970 and 1990, the percentage of residents with a high school education was three percentage points less than statewide. The number with four years of college was four percentage points lower than statewide in 1970; by 1990 the gap had widened to 9.5 points. Kankakee County had the greater percentage of college educated residents in 1990 - 12% compared to 10% in Iroquois County.

The census map in Figure 1-8 shows that the populations most likely to have a high school education (or higher) are clustered around the urban areas of Kankakee, Bradley, Bourbonnais and Watseka, closely matching the areas with the youngest populations.

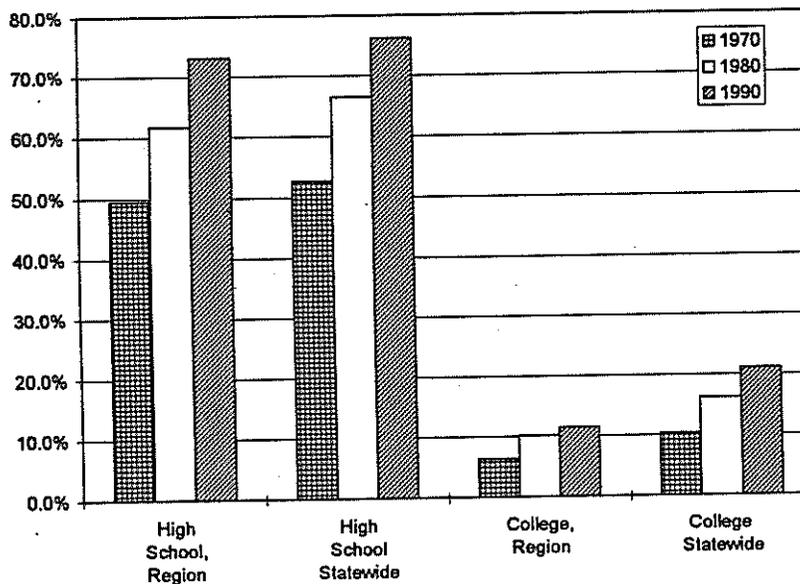


Figure 1-7. Education Trends

⁷ Gender data from 1970, 1980, and 1990 Census.

Figure 1-8.

Educational Attainment by 1990 Census Block Group

Percentage of those over 25 who are High School graduates or higher.

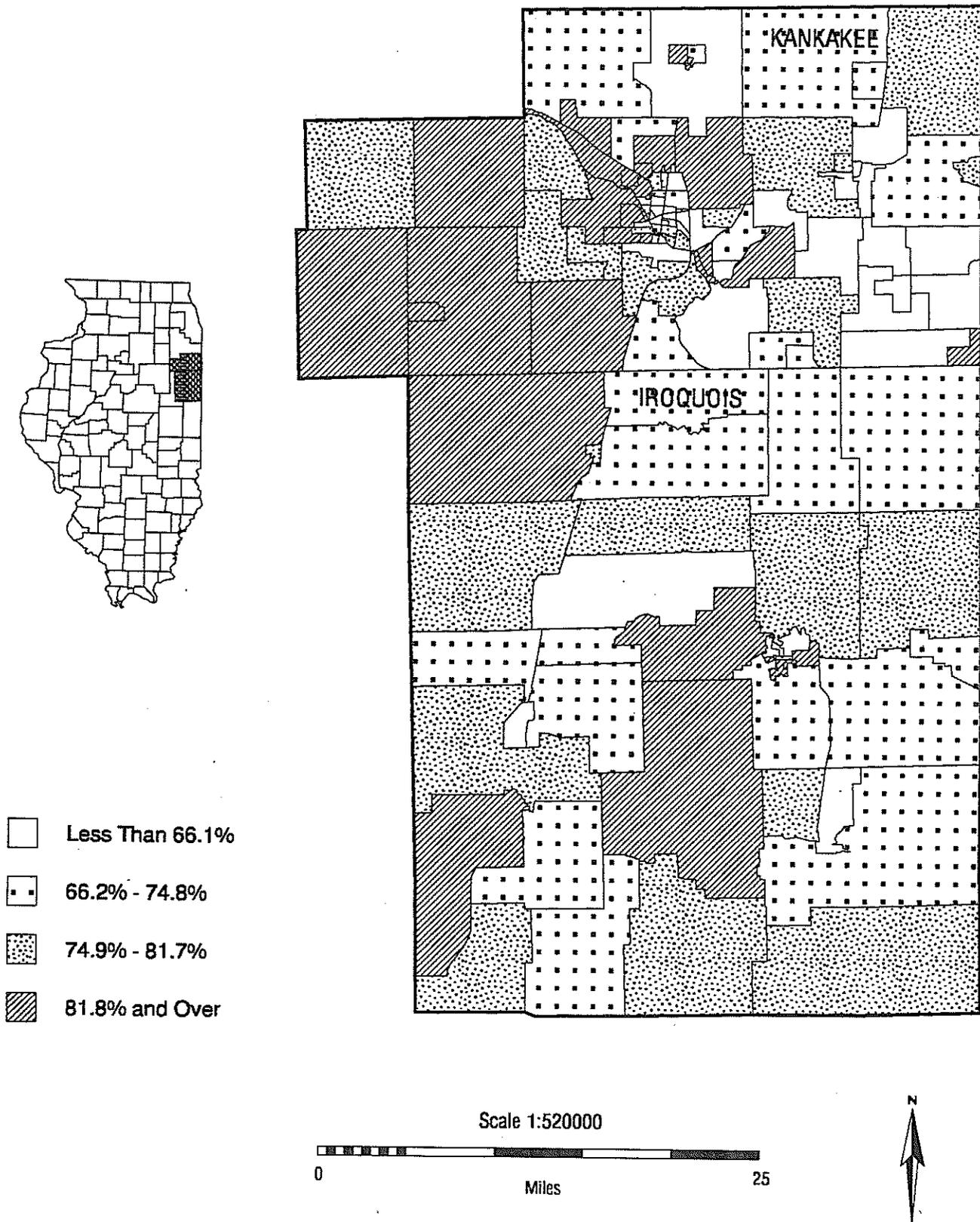


Table 1-5. 1990 Educational Attainment
(persons age 25 and over)

	Not Completing High School	Completing High School Only	Completing Four or More Years of College
Iroquois	26.6%	63.4%	10.1%
Kankakee	26.9%	61.1%	11.9%
Region	26.8%	61.7%	11.5%
Illinois	23.8%	55.2%	21.0%

Per Capita Income

Per capita income is lower in the Kankakee River area than it is statewide; in 1990 it was \$4,325 lower than statewide per capita income.⁸ Between 1970-1990 per capita income rose 37% in the two-county area, with Kankakee County experiencing the greater increase. Statewide it rose 41%. In 1992, of 102 Illinois counties, Iroquois County ranked 26th and Kankakee 42nd in personal income per capita.

The map in Figure 1-10 resembles the maps for both age and educational attainment, with the highest per capita income generally around urban areas, although not necessarily within the central parts of the cities.

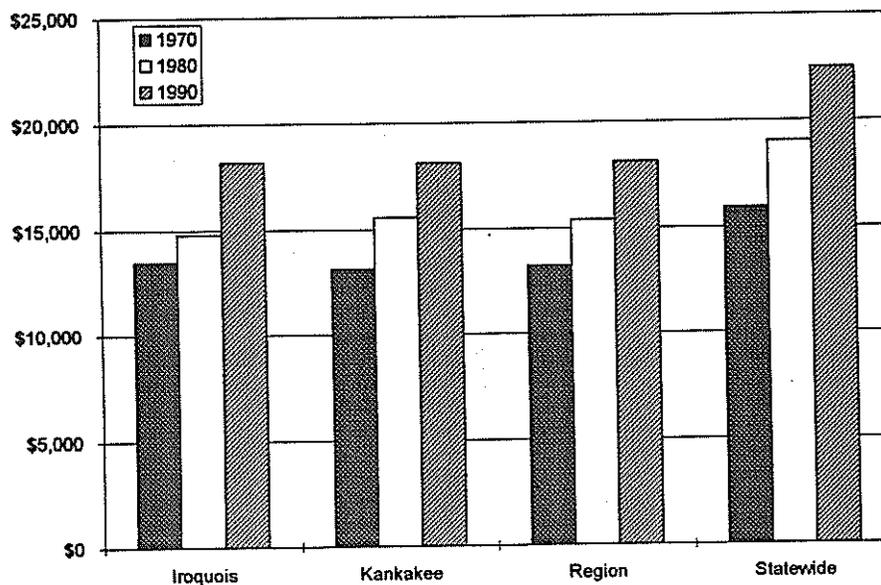
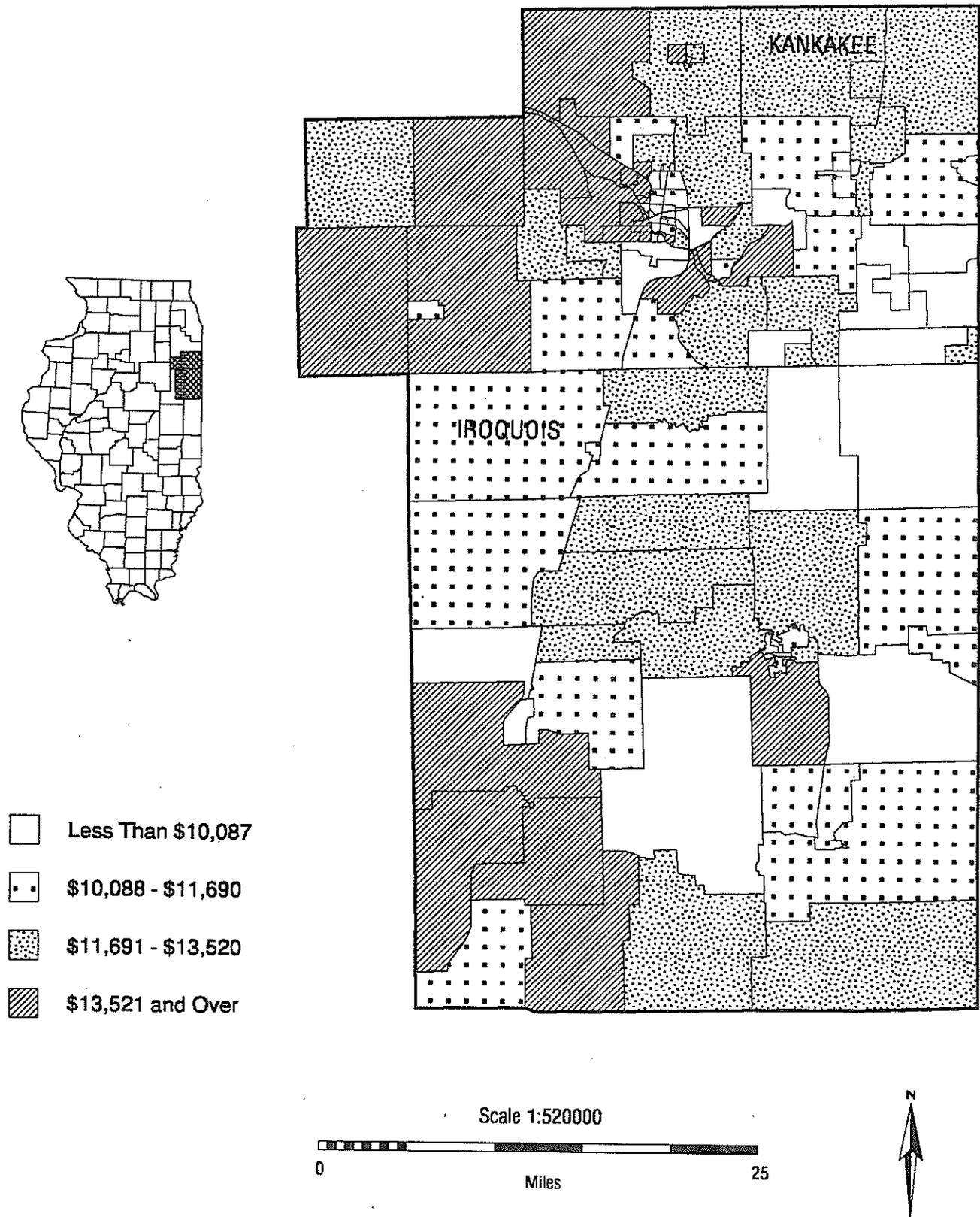


Figure 1-9. Per Capita Income

⁸ Per capita income data from 1997 State Profile.

Figure 1-10.

Per Capita Income By 1990 Census Block Group



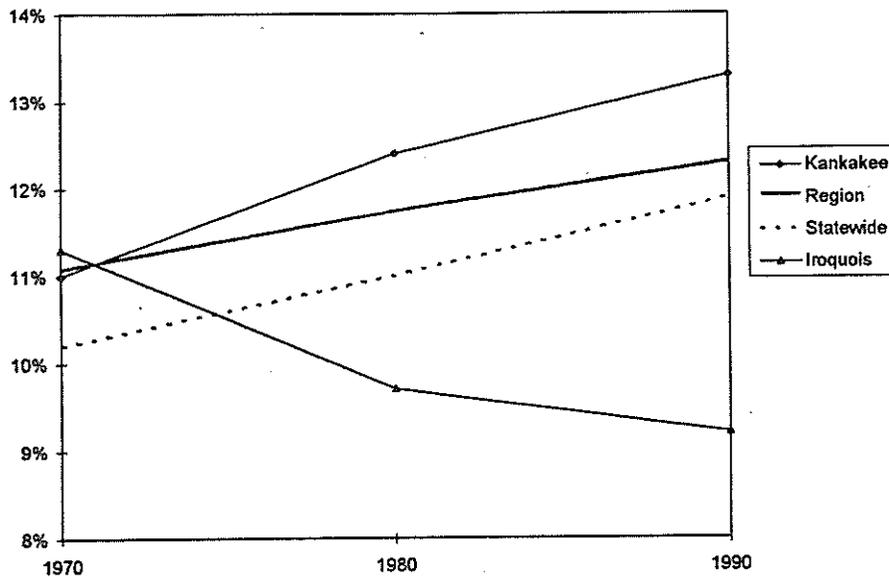


Figure 1-11. Percent of Population Living in Poverty

The overall poverty rate in the area equals the statewide rate of 12%. Between 1970 and 1990, the percentage of people living in poverty⁹ increased 11% in the two-county area while statewide the percentage rose 17%. All of the increase occurred in Kankakee County, where the rate rose two percentage points, from 11% to 13% of the population. The rate dropped 19% in Iroquois County.

Households and Housing

Households

Between 1970 and 1990 the number of households in the two-county area increased 18.6%, even while the population dropped 3% (Table 1-6). The number of persons per household dropped from 3.1 to 2.6 persons. Statewide, the number of households increased 19% while the average number of people living in them dropped from 3.1 to 2.7.¹⁰

1990	
Two-county Kankakee River area	
Households:	46,530
Persons Per Household:	2.6
Median Household Income (1989):	\$32,139
Housing Units:	49,820
Vacancy Rate:	6.8%
Median Value, Owner-occupied:	\$56,999

Between 1979 and 1989 the median income of Kankakee River area households dropped 2% (\$646) to \$32,139, compared to statewide growth of 1.6% (\$603).¹¹ Household income declined the most in Iroquois County (5.5%).

⁹ Poverty data from 1970, 1980, and 1990 Census.

¹⁰ Household data from 1997 State Profile.

¹¹ Median household income data from 1980 and 1990 Census.

Table 1-6. Number of Households
(in thousands)

	1970	1980	1990
Iroquois	11	12.08	11.82
Kankakee	28.23	34.99	34.71
Region	39.23	47.07	46.53
Statewide	3525.82	4067.87	4208.67

Table 1-7. Median Household Income
(in 1993 Dollars)

	1979	1989	% change
Iroquois	\$31,336	\$29,625	-5.5%
Kankakee	\$33,249	\$32,943	-0.9%
Region	\$32,785	\$32,139	-2.0%
Statewide	\$36,962	\$37,565	1.6%

Housing

The median value of owner-occupied housing units (in 1993 dollars) increased 30% between 1970 and 1980, then dropped 17% over the next 10 years.¹² Over the 20-year period, 1970-1990, housing values grew only 8% in the area (to \$56,999) compared to 30% statewide (to \$90,131).

Housing units in the area increased by one-fifth between 1970 and 1990, while the number of vacant units increased by one-fourth. Statewide, units were up almost one-fourth and the number of vacant units one-half. In the two-county area, the greatest increase

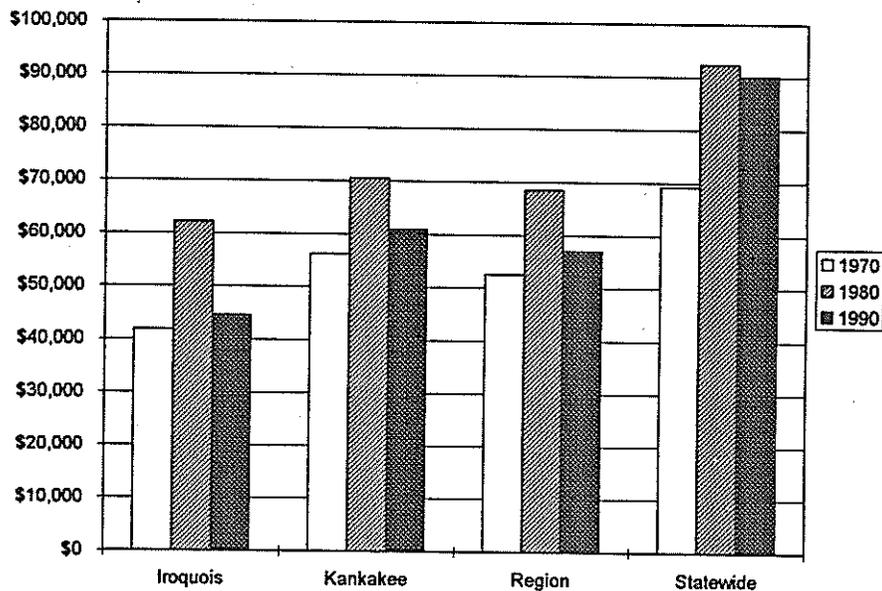


Figure 1-12. Median Value of Owner-Occupied Housing, in 1993 Dollars

¹² Data on median value of housing from 1970 *Census* and 1993 *Illinois Statistical Abstract*.

Table 1-8 Housing Units

	1970		1980		1990	
	Units	Vacant	Units	Vacant	Units	Vacant
Iroquois	11,893	8.5%	13,486	10.6%	12,819	8.0%
Kankakee	29,660	5.8%	37,587	7.1%	37,001	6.4%
Region	41,553	6.6%	51,073	8.0%	49,820	6.8%
Illinois	3,703,367	5.4%	4,319,672	6.3%	4,506,275	6.7%

occurred in Kankakee County where the number of housing units jumped by one-quarter and the number of vacant units by almost two-fifths.¹³

Conclusion

Since 1870 population in the Kankakee River area grew 153%, under half of the 350% statewide growth. Kankakee County grew the most with a 295% increase, while Iroquois County grew only 19%. In 1990 the two-county area was home to 1% of the state's population.

A little over half of the area's population live in urban areas (communities greater than 2,500 population), less than the 85% statewide figure. In Kankakee County almost seven out of ten people live in urban areas, in Iroquois County less than one out of five do. Only a small percentage of land in the area, 3%, is devoted to urban uses. Kankakee County has the greatest amount of urban land -- 5.1%.

The area populace is slightly older than it is statewide; the median age is one year higher in the region than it is statewide. In 1992, Iroquois County ranked 28th in the state in the percentage of elderly while Kankakee ranked 85th. Education trends have been slightly lower than the state as a whole: in 1990 the percentage of those completing high school was three percentage points less than statewide (73% compared to 76%); for college it was 9.5 percentage points less (11.5% compared to 21%).

Per capita income is also slightly lower in the area than it is statewide; in 1990 it was \$4,325 lower. Even so, per capita income rose 37% between 1970 and 1990, at the same time that the poverty rate jumped 11% (to 12% of the population, identical to the statewide rate). Only Kankakee County experienced an increase in poverty; the rate fell in Iroquois County.

Following state and national trends, the number of households grew (18.6%), while average household size shrunk from 3.1 to 2.6 persons. Between 1979 and 1989, median household income dropped 2% in the area, to \$32,139, 86% of the statewide median household income. In 1979 it was 89% of the statewide median.

¹³ Housing units and vacancies from 1990 and 1993 *Illinois Statistical Abstract*.

Health Trends

The most commonly used measure of a population's health is the mortality rate -- the number of deaths per 100,000 people. Mortality rates are provided for total deaths and by cause of death. Other measures of health are infant mortality rates and premature births, the number of teenage and single mothers, and access to health care, measured by the number of hospital beds and doctors per 100,000 people. Health is typically influenced by the demographics and economics of the region, as well as by environmental quality.

Mortality Rates¹

The mortality rate in the two-county Kankakee area is about 4% above the state average.² The rate in the area was below the state average until the mid-70s, but has been above ever since. The mortality rate in the area is dictated by mortality in Kankakee County, where 75% of the Kankakee area population is located. In 1994, the Kankakee County rate was 860 deaths per 100,000 (4.5% below state average), compared to the Iroquois County rate of 1,178 (31% above the state average).

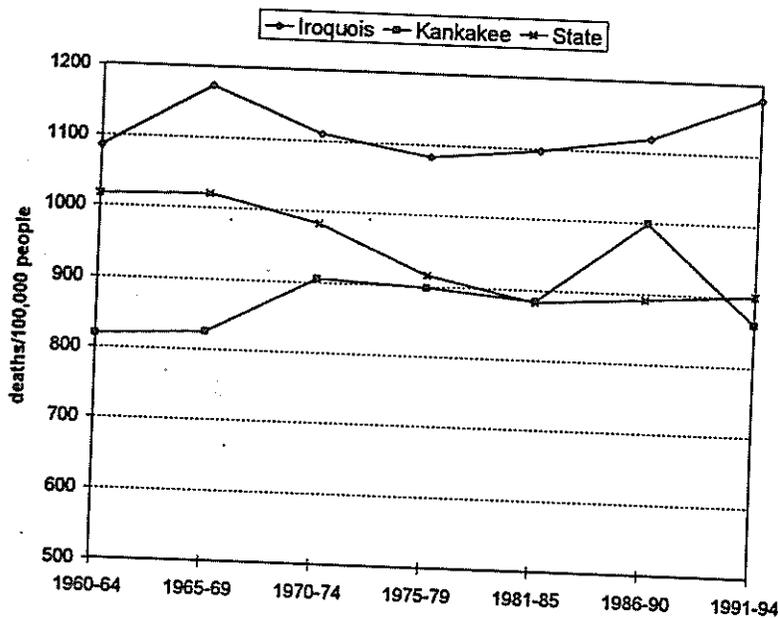


Figure 1-13. Total Mortality Rate

¹ Mortality rate data is from Illinois Department of Public Health: Division of Health Statistics, *Vital Statistics Illinois*, various years.

² In the discussion of the mortality rates, references to a mortality rate for a particular year is actually a five-year average rate. For example, when citing the 1960 mortality rate it is in fact the 1960-64 average mortality rate.

Table 1-9. Mortality Rates
(deaths per 100,000 people)

	1960-64	1965-69	1970-74	1975-79	1981-85	1986-90	1991-94
Iroquois	1,085	1,173	1,110	1,083	1,097	1,119	1,178
Kankakee	819	826	905	898	885	999	860
Kankakee Area	890	913	957	945	937	1,028	936
State	1,016	1,020	983	915	882	892	900

The area mortality rate increased 10% between 1960 and 1990, but has dropped 9% since then. Overall, the rate was 5% higher in 1994 than it was in 1960, while statewide it was 11% lower. Within the Kankakee area, the rate increased 5% in Kankakee County and 9% in Iroquois County.

Major Causes of Death

The three major causes of death, in descending order, are heart disease, cancer, and stroke. During the 1991-1994 time period they accounted for more than 64% of all deaths statewide and 73% in the Kankakee area. Deaths from both heart disease and stroke have declined in the state and the Kankakee area since 1960, while deaths from cancer have risen considerably.

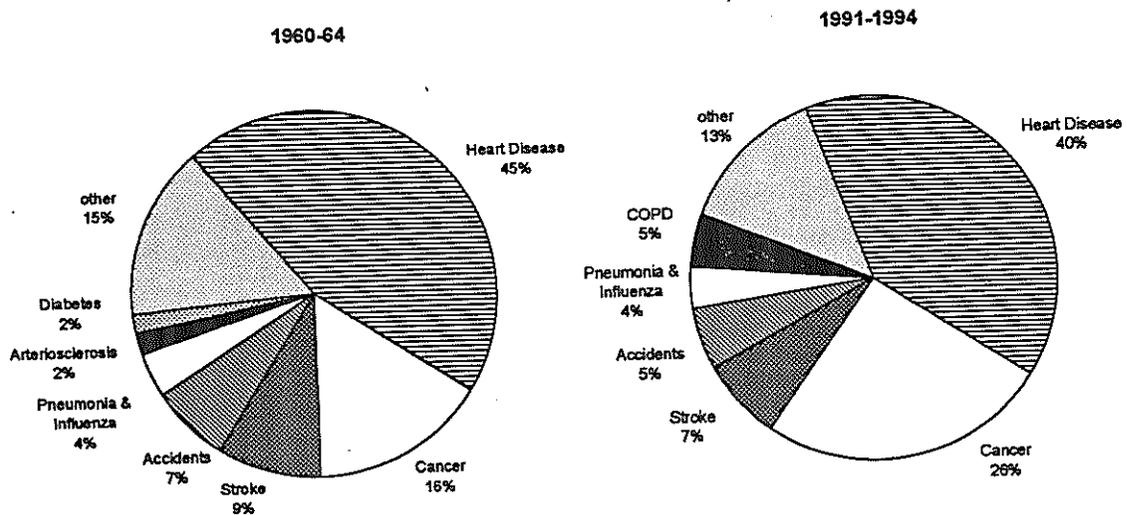


Figure 1-14. The Major Causes of Death in the Kankakee area

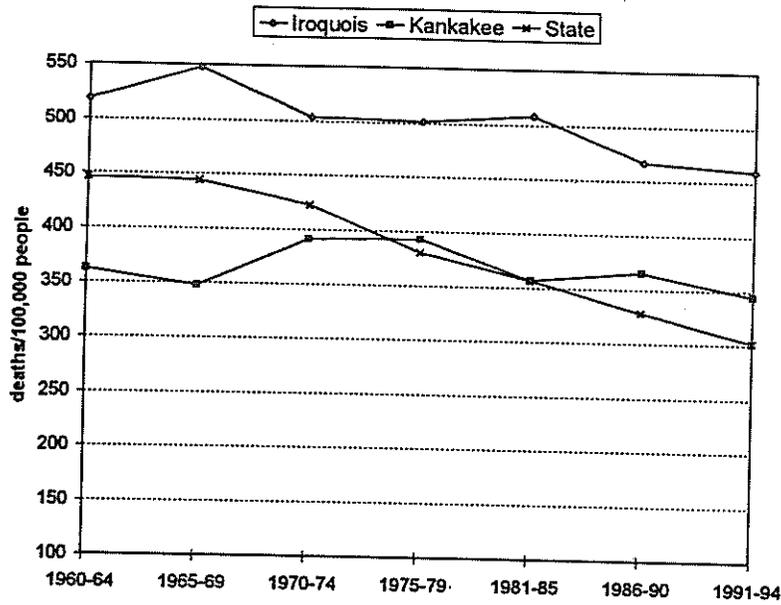


Figure 1-15. Heart Disease Mortality

Heart Disease

In 1994 the mortality rate from heart disease was 23% higher in the Kankakee area than statewide, 372 deaths per 100,000 compared to 302. There is a considerable difference in the heart disease mortality rate within the region; in Kankakee County it was 14% above the state average in 1994, compared to 52% above the state average in Iroquois County.

Since 1960 the heart disease mortality rate has declined in the Kankakee area at a slower pace than the state rate -- 8% compared to 32%. The rate fell 11% in Iroquois County and 5% in Kankakee County.

Table 1-10. Heart Disease Mortality
(deaths per 100,000 people)

	1960-64	1965-69	1970-74	1975-79	1981-85	1986-90	1991-94
Iroquois	519	548	504	502	509	467	460
Kankakee	362	348	392	393	357	366	345
Kankakee Area	404	398	420	421	394	390	372
State	446	444	422	381	357	328	302

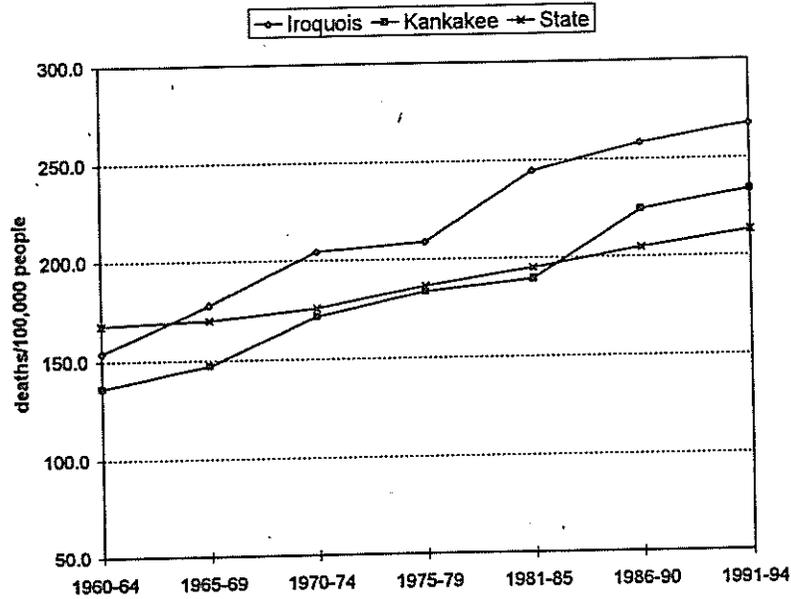


Figure 1-16. Cancer Mortality

Cancer

Since 1970, the cancer mortality rate in the Kankakee area has been above the state rate; in 1994 the rate was 242 deaths per 100,000 population, compared to 213 statewide. In Iroquois County the rate was 26% higher than the state rate, while in Kankakee County it was 10% higher.

The area's cancer mortality rate has increased at a greater pace than it has statewide -- up 72% compared to 27% statewide.

Table 1-11. Cancer Mortality
(deaths per 100,000 people)

	1960-64	1965-69	1970-74	1975-79	1981-85	1986-90	1991-94
Iroquois	154	178	205	209	245	258	268
Kankakee	136	147	172	184	190	224	234
Kankakee Area	141	155	180	190	203	233	242
State	168	170	176	187	195	205	213

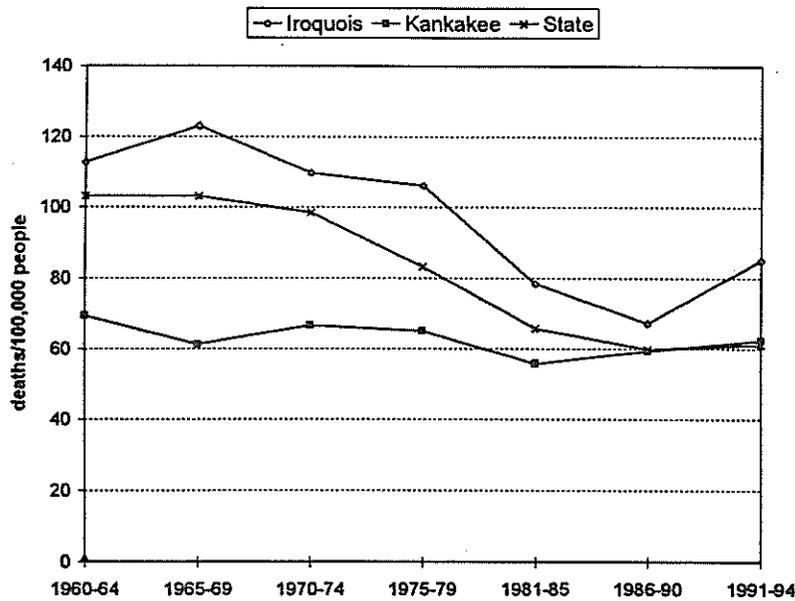


Figure 1-17. Stroke Mortality

Stroke

Stroke mortality has dropped dramatically since 1960 -- 16% in the Kankakee area and 41% statewide. The most significant decline in the area was in Iroquois County, where the rate fell 25%; in Kankakee County it fell 10%.

The death rate from stroke was consistently lower in the Kankakee area than in the state until 1986 when it began rising. By 1994 it was 11% above the state average. Iroquois County had the higher stroke mortality, 39% above the state average and 25% higher than Kankakee County.

Mortality and Demographics

The higher mortality rate in the area compared to the state reflects in part the difference in demographic characteristics. For example, the Kankakee area has a higher elderly population than does the state as a whole. The elderly population has been shown to be positively correlated with mortality rates.

Table 1-12. Stroke Mortality
(deaths per 100,000 people)

	1960-64	1965-69	1970-74	1975-79	1981-85	1986-90	1991-94
Iroquois	113	123	110	106	78	67	85
Kankakee	69	61	67	65	56	59	62
Kankakee Area	81	77	78	75	61	61	68
State	103	103	98	83	66	60	61

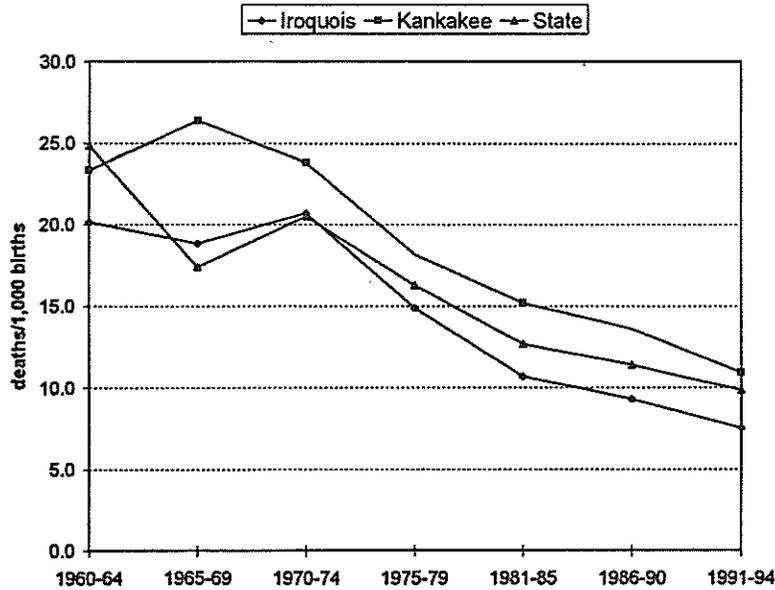


Figure 1-18. Infant Mortality

Demographics also help to explain some of the differences in health within the region. In Kankakee County, which has the lowest mortality rate in the region, the median age is 11% lower than in Iroquois County and the elderly population is 22% lower.

Infant Mortality and Premature Births³

Another measure of community health is the infant mortality rate, which has typically been slightly higher in the Kankakee area than it has statewide. In 1994, there were 10 deaths per 100,000 population in the area (5% above the state average).

Table 1-13. Infant Mortality
(deaths per 100,000 population)

	1960-64	1965-69	1970-74	1975-79	1981-85	1986-90	1991-94
Iroquois	20.2	18.9	20.7	14.9	10.7	9.3	7.5
Kankakee	23.3	26.4	23.8	18.2	15.2	13.6	10.9
Kankakee Area	22.5	24.6	23.2	17.5	14.1	12.8	10.3
State	24.5	24.1	20.5	16.3	12.7	11.4	9.8

³ This data is from Illinois Department of Public Health: Division of Health Statistics, *Vital Statistics Illinois*, various years.

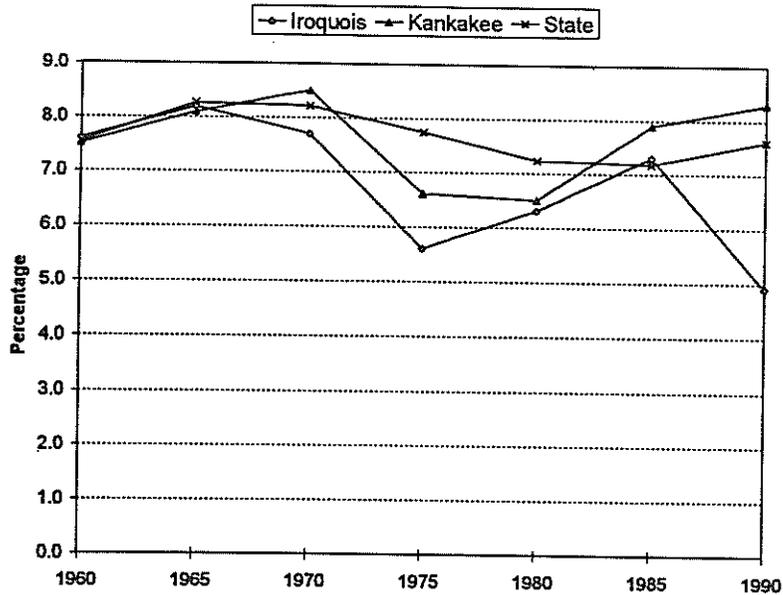


Figure 1-19. Premature Births as a Percentage of Total Births

Infant mortality has been declining at a steady rate since 1960, down 60% statewide and 54% in the area.

The Kankakee area had the same percentage of premature births as the state in 1990.⁴ Within the Kankakee area the premature birth rates are typically lower in Iroquois County. In 1990, the percentage of premature births was 41% lower in Iroquois County than in Kankakee County.

The premature birth rate has varied more in the Kankakee area than it has statewide. It dropped 15% from 1960 to 1975, but increased 19% since then.

Table 1-14. Percentage of Premature Births

	1960	1965	1970	1975	1980	1985	1990
Iroquois	7.6	8.2	7.7	5.6	6.3	7.3	4.9
Kankakee	7.5	8.1	8.5	6.6	6.5	7.9	8.3
Kankakee Area	7.5	8.1	8.3	6.4	6.5	7.8	7.6
State	7.6	8.3	8.2	7.7	7.2	7.2	7.6

⁴ From 1960-85, the Illinois Department of Public Health defined premature births (in the *Vital Statistics of Illinois*) as babies born at a weight less than 2501 grams. In 1990, the *Vital Statistics Report* included the number of babies at less than 2599 grams.

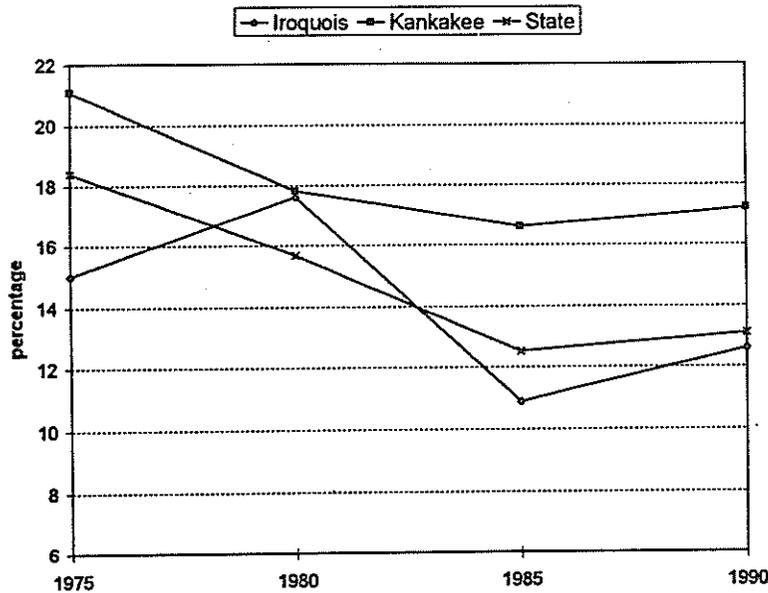


Figure 1-20. Percentage of Births to Teenage Mothers

Teenage and Single Mothers⁵

The rates of infant mortality and premature births are influenced by the number of teenage and single mothers who often have less income and, therefore, less access to health care.

Between 1975 and 1994 the teen birth rate declined both statewide and in the two counties -- about 29% in the state, and 19% in the Kankakee area. Kankakee County has had the largest decline in teenage mothers, falling 20% since 1975.

The area's teen birth rate has consistently been above the state average, 23% higher in 1994.

Table 1-15. Percentage of Births to Teenage Mothers

	1975	1980	1985	1990	1994
Iroquois	15.0	17.6	10.9	12.6	12.7
Kankakee	21.1	17.8	16.6	17.2	16.8
Kankakee Area	19.7	17.8	15.3	16.3	16.0
State	18.4	15.7	12.5	13.1	13.0

⁵ This data is from Illinois Department of Public Health: Division of Health Statistics, *Vital Statistics Illinois*, various years.

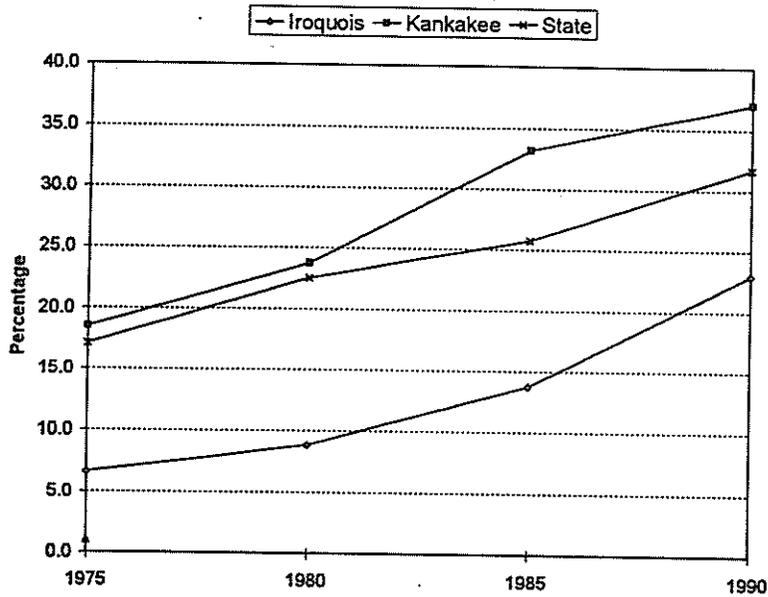


Figure 1-21. Percentage of Births to Single Mothers

Though the percentage of births to teenage mothers has declined since 1975, the percentage of births to single mothers has increased. It jumped 85% statewide, and has more than doubled in the Kankakee area. The rate in the Kankakee area was 8% above the state average in 1990.

Table 1-16. Percentage of Births to Single Mothers

	1975	1980	1985	1990
Iroquois	6.6	8.8	13.7	23.0
Kankakee	18.5	23.7	33.2	37.0
Kankakee Area	15.8	20.3	28.6	34.3
State	17.1	22.5	25.7	31.7

Health Care Access

A key aspect of health is the availability of health care providers and facilities, specifically the number of doctors and staffed hospital beds. The Kankakee area has more hospital beds and fewer doctors per 100,000 people than the state average. In 1994, the number

Table 1-17. Hospitals in the Kankakee Region (1994)

	City	Staffed Beds
Central Community Hospital	Clifton	33
Iroquois Memorial Hospital	Watseka	112
Riverside Medical Center	Kankakee	296
St. Mary's Hospital	Kankakee	214

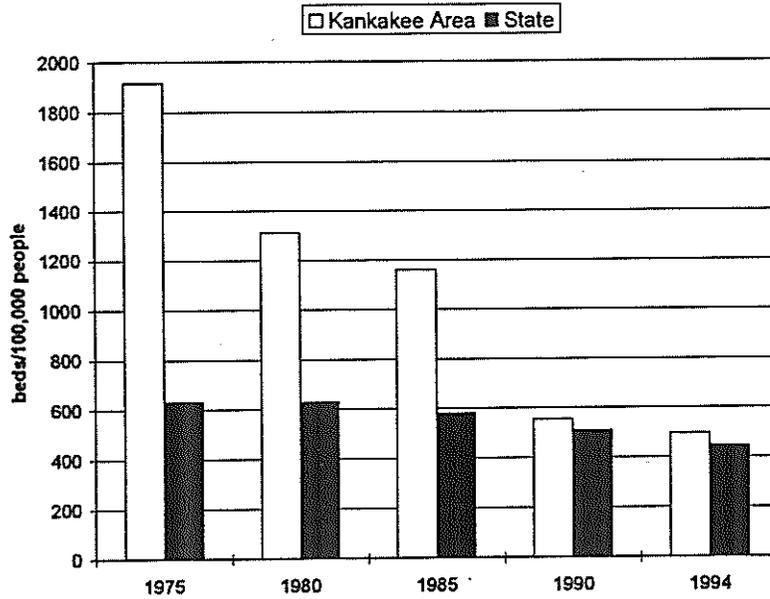


Figure 1-22. Staffed Hospital Beds (Per 100,000 People)

of beds per 100,000 people in the Kankakee area was 11% more than statewide, with the majority of beds located in two Kankakee hospitals.

The Kankakee area had fewer doctors per 100,000 people than the state. In 1994, there were 126 doctors per 100,000 people, 45% below the state average of 229. There is a large variance within the region: Iroquois County had only 70 doctors per 100,000 people, while Kankakee County had 143 doctors per 100,000 people.

In both the Kankakee area and statewide, trends in health care availability have been toward more doctors and fewer hospital beds. Figures 1-22 and 1-23 show that since

Table 1-18. Number of Staffed Hospital Beds⁶
(per 100,000 people)

	1975	1980	1985	1990	1994
Iroquois	543	506	444	471	463
Kankakee	2382	1569	1391	579	504
Kankakee Area	1915	1312	1158	553	495
State	631	628	579	507	447

⁶ Data on number of hospital beds is from the Illinois Hospital & Health Systems Association.

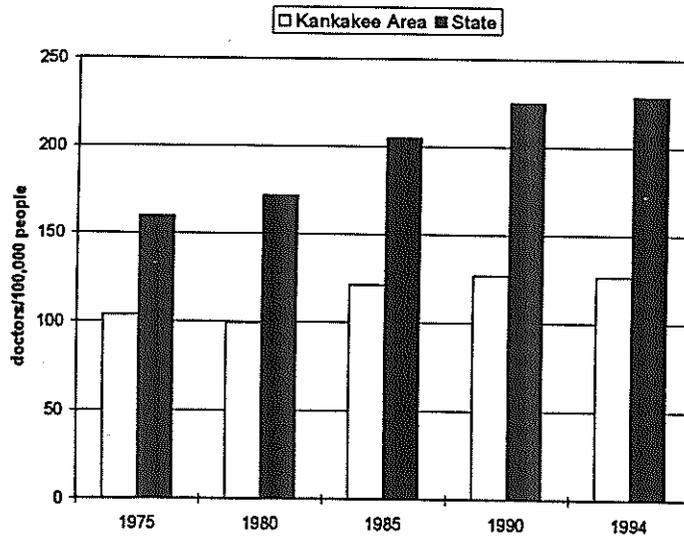


Figure 1-23. Number of Doctors Per 100,000 People

1975 the number of staffed hospital beds has declined 29% statewide while the number of doctors has increased about 43%. In the Kankakee area there are 74% fewer hospital beds and 22% more doctors since 1975.

Table 1-19. Number of Doctors per 100,000 Population⁷

	1975	1980	1985	1990	1994
Iroquois	67	70	81	81	70
Kankakee	116	109	134	141	143
Kankakee Area	104	99	121	127	126
State	160	172	205	225	229

Conclusion

The total mortality rate has declined in Illinois, but has increased in the Kankakee area. Infant mortality and mortality rates for heart disease and stroke have declined in both the Kankakee area and the state, while cancer mortality has increased significantly, especially in the Kankakee area. Mortality rates in Iroquois County have consistently been above the state average, while they are close to the state average in Kankakee County.

The percentage of births to teenage mothers declined in both the Kankakee area and the state, while the percentage of births to single mothers rose significantly. With respect to health care availability, the Kankakee area is above the state average in staffed hospital beds per 100,000 people and below in number of doctors per 100,000 people.

⁷ Data on number of doctors is from the Illinois Department of Professional Regulation.

The Regional Economy

The Kankakee River area represents nearly 1% of the state's jobs with over 65,000 persons employed. In 1994, this area had a total personal income¹ of \$2.5 billion, accounting for 0.94% of the state total (Table 1-20). Kankakee County contains more than three-fourths of the area's population, employment and personal income.

During the period 1970 to 1994 both employment and total personal income in the area grew slower than the state: the average annual employment growth rate for the area was 0.92% compared to the state rate of 1.08%; area income growth averaged 1.51%, lower than the state rate of 1.8%.

The map in Figure 1-25 shows that a diverse set of employers are present in Kankakee County, while agriculture is the most significant employer in Iroquois County. Retail trade is also a significant source of employment at the inter-section of two major thoroughfares.

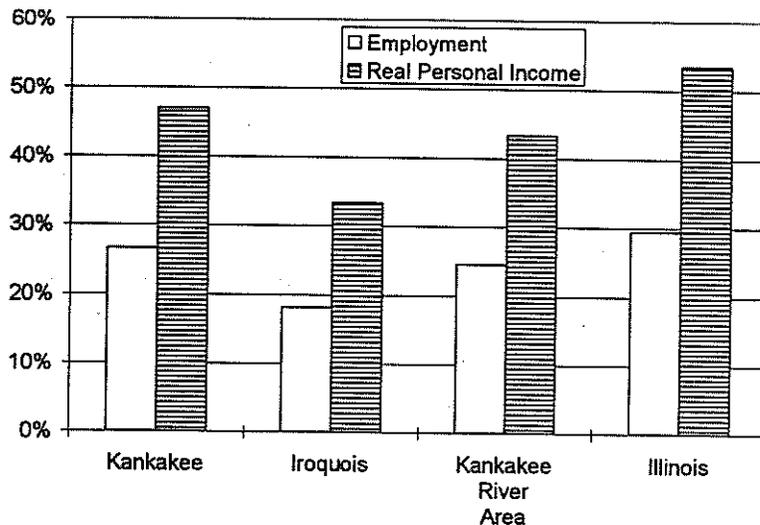


Figure 1-24. Changes in Employment and Personal Income, 1970-1994

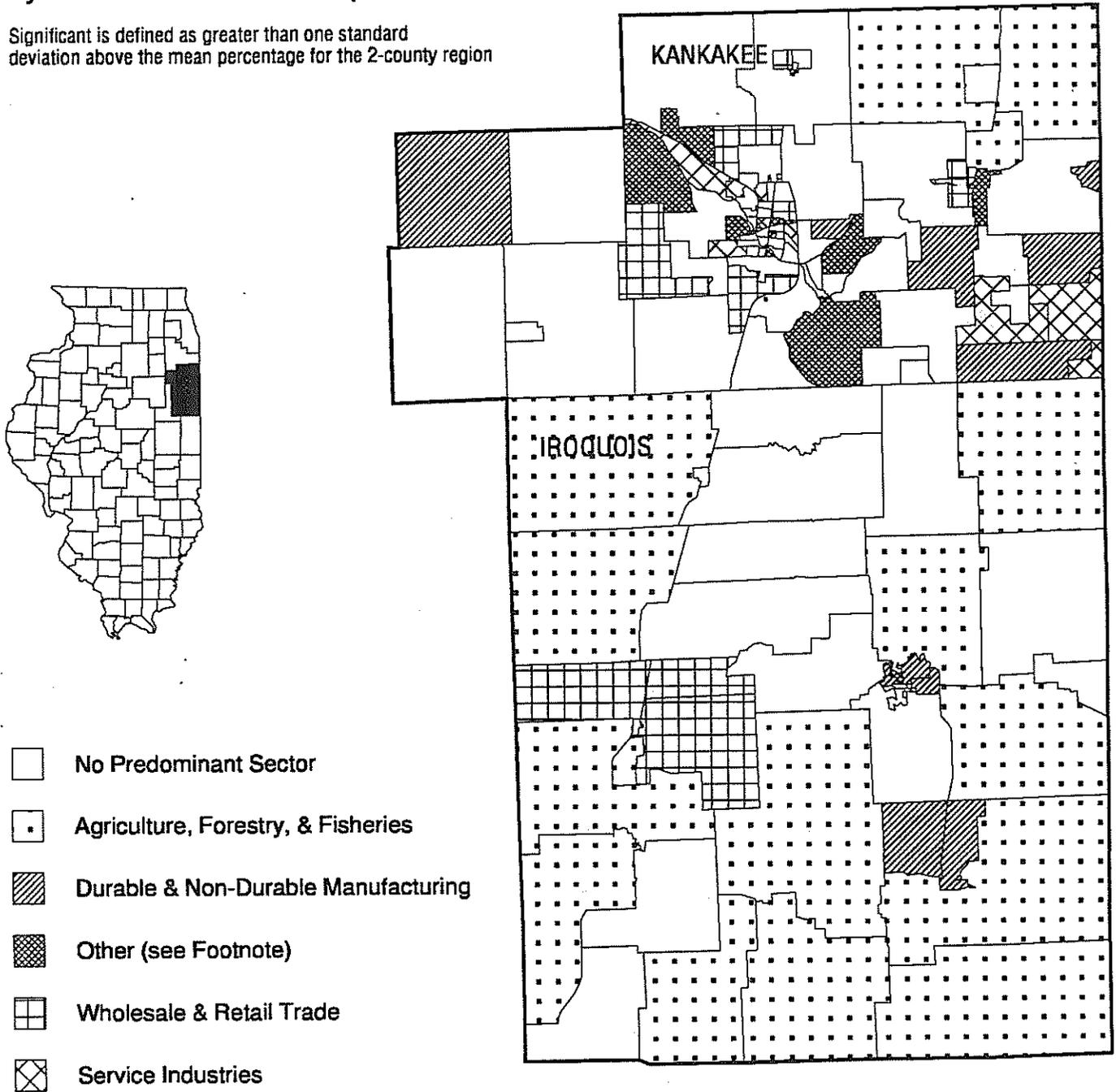
¹ Income and earnings discussed in this chapter are reported in 1994 dollars. Total personal income includes the earnings (wages and salaries, other labor income, and proprietor's income); dividends, interest, and rent; and transfer payments received by the residents of the area.

Source: Regional Economic Information System, 1969-1994, US Department of Commerce, Bureau of Economic Analysis.

Figure 1-25.

Significant Employment Sectors By 1990 Census Block Group

Significant is defined as greater than one standard deviation above the mean percentage for the 2-county region



Other includes Public Administration, Construction, Transportation, and Communications and Other Public Utilities

Scale 1:520000

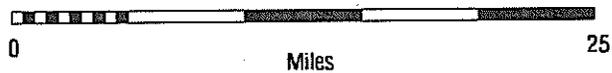


Table 1-20. 1994 Employment and Personal Income

	Employment	% of State Employment	Income (million \$)	% of State Income
Kankakee County	50,213	0.76	1,918	0.71
Iroquois County	15,310	0.23	617	0.23
Kankakee River Area	65,523	0.99	2,535	0.94
Illinois	6,648,279	100	269,680	100

Some residents commute from their home counties to other counties, as reflected by the positive personal income residence adjustment² for both counties. On average, 11% of area employment earnings were generated outside of the home county.

Table 1-21. Composition of Total Personal Income (1994)
(millions of dollars)

	Kankakee	Iroquois	Kankakee River Area	Illinois
Earnings	1,247	313	1,560	205,805
less contributions	89	19	108	14,579
plus residence adjust.	108	76	184	- 323
Adjusted Earnings	1,266	371	1,636	190,903
Div., Int., & Rent	255	125	380	45,069
Transfer Payments	397	121	518	41,502
Total Personal Income	1,918	617	2,535	277,474

Structural Change in the Economy

Since the early 1970s, the economy of the Kankakee River area, as other areas of the state, has changed steadily from a manufacturing base to a more service-related economy, e.g., wholesale/retail trade, business, health, and educational services.

The share of manufacturing employment fell from 25% of the total in 1970 to 14% in 1994 (Figure 1-26). The share of manufacturing earnings dropped from 34% to 22% (Figure 1-27).

During the 1970-1994 period, employment growth was centered in the service sector -- between 1970-94, it grew 3.3% per year, to 28% of total employment, becoming the largest sector in the area. Service earnings also increased from 13% to 22%. The wholesale/retail sector increased its share of total employment 5%, to 24%, making it the second largest employment source in the area.

² Adjustment are made to transfer income earned by 'place-of-work' to income earned by 'place-of-residence'. A negative adjustment means that people commute to the county for work; a positive adjustment means that more people commute out of the county.

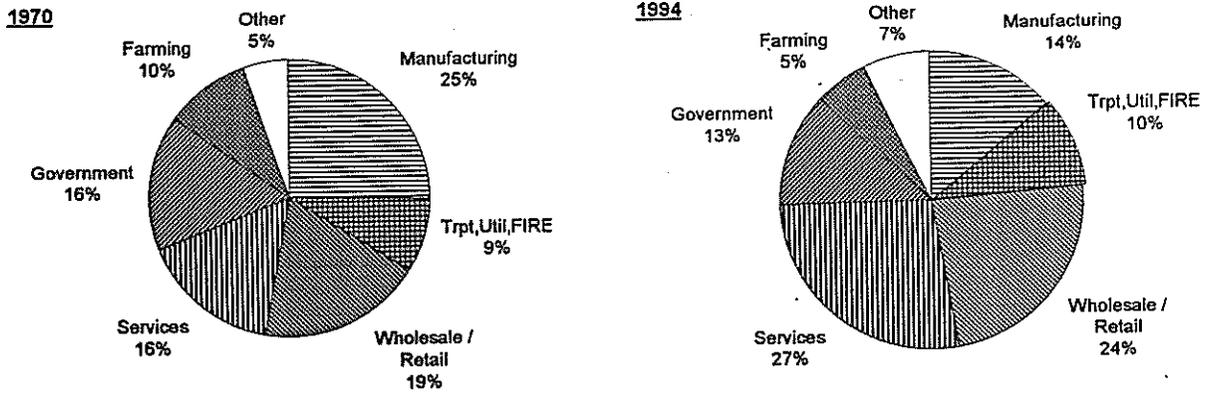


Figure 1-26. Employment Distribution in the Kankakee River Area, 1970 and 1994

Farming employment declined 1.6% annually, the result of increased productivity and the nationwide trend toward larger operations. As with statewide farm income, the area's farm income fluctuated from year to year in response to crop yields and agricultural product prices. Farm income was about the same in 1994 as in 1970.

Payroll and earnings in the government sector remained fairly stable over the period. Jobs and earnings in the remaining also remained stable or displayed only moderate growth.

Economic Characteristics by County

The economic development and growth in the area is one of contrast and change. Kankakee County has a heavier concentration of population and industry than Iroquois. The major business establishments are located in the cities of Kankakee, Bradley, and Bourbonnais. Iroquois County remains basically rural with a much smaller manufacturing base in the cities of Watseka and Milford. Table 1-22 shows diverse businesses consisting of health services, educational institutions, goods-producing industries, and retail trade.

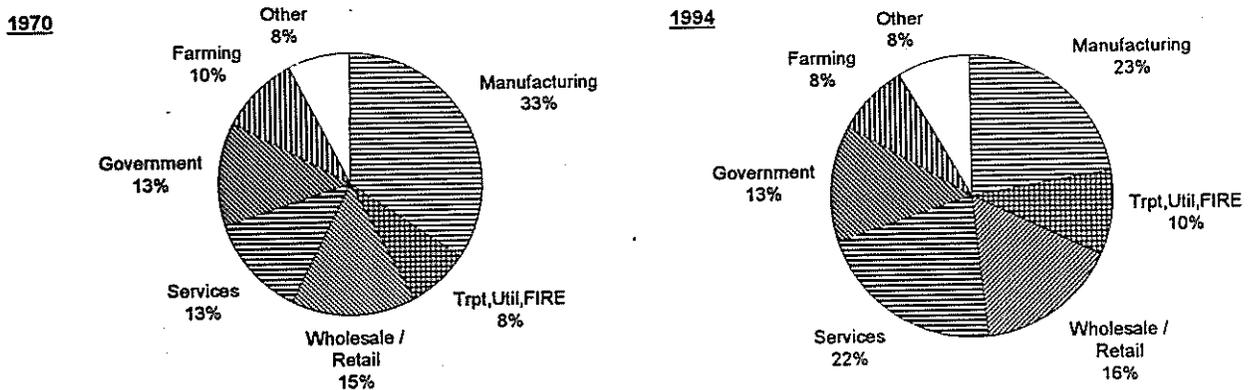


Figure 1-27. Earnings Distribution in the Kankakee River Area, 1970 and 1994.

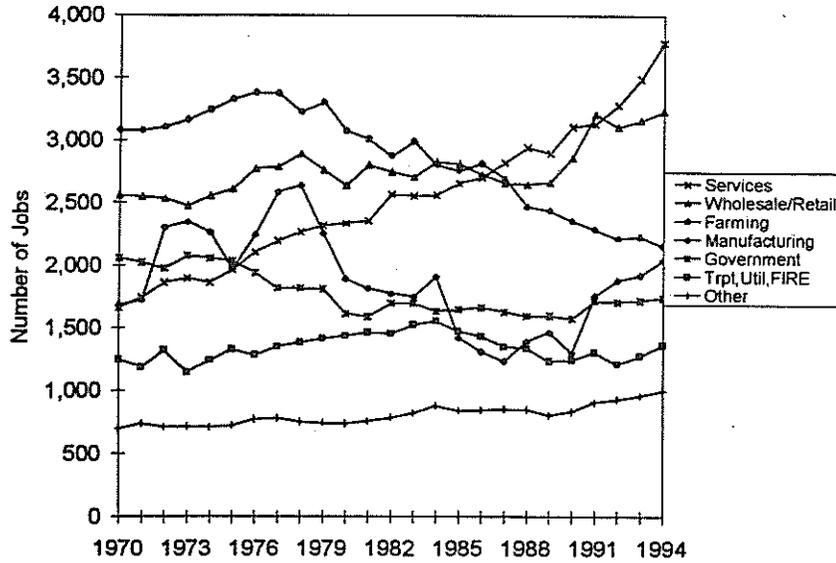


Figure 1-28. Iroquois County Employment, by Sector

Iroquois County

In 1994, 15,310 people were employed in Iroquois County, earning \$313 million. From 1970 to 1994, annual employment and earnings increased 0.7% and 0.4% respectively, while the statewide growth rate was 1.08% for the employment and 1.80% for the earnings.

Farming was the largest employment sector in the 1970s and early 1980s, but has been decreasing since mid-1980s, falling behind services and wholesale/retail trade. Farm earnings showed a pattern of cyclic variations, mostly due to fluctuating agricultural prices and extreme weather years.

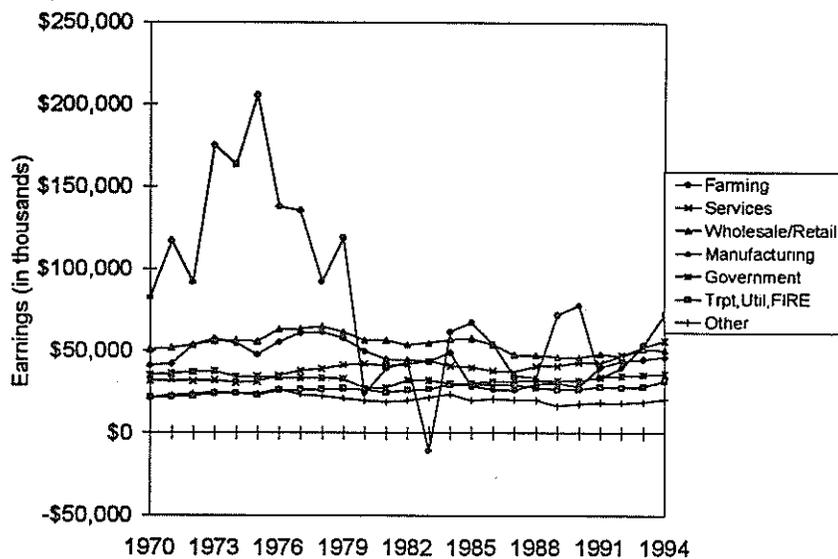


Figure 1-29. Iroquois County Earnings, by Sector

Table 1-22. Major Employers, Kankakee River Area

Company	City	Map Legend	Business Classification	SIC	Employees
Kankakee County					
IL Dept. of Mental Health	Kankakee	1	Psychiatric Hospital	806	1,350
Riverside Medical Center	Kankakee	2	Medical & Surgical Hospital	806	1,200
St. Mary's Hospital	Kankakee	3	Medical & Surgical Hospital	806	1,100
Centeon L.L.C.	Bradley	4	Blood Derivatives	283	800
Olivet Nazarene Univ.	Bourbonnais	5	Colleges & Universities	822	750
Kmart Corp.	Manteno	6	Department Stores	531	575
Baker & Taylor Inc.	Momence	7	Books, Periodicals & Newspaper	519	500
Sears Logistics Services	Manteno	8	Personal Service Agents	738	500
Armstrong World Industries	Kankakee	9	Asbestos Insulating Materials	329	400
Kankakee Community College	Kankakee	10	Junior Colleges	822	350
H J Heinz Company	Kankakee	11	Dog & Cat Food	204	350
Henkel Corporation	Kankakee	12	Alcohols, Non-beverage	286	350
CBI Services Inc.	Bourbonnais	13	Plate Work for the Nuclear Ind.	344	350
Cigna Corporation	Bourbonnais	14	Fire, Marine & Casualty Insurance	633	325
IL Dept. of Veterans Affairs	Manteno	15	Nursing Care Facility	805	300
Birmingham Steel Corporation	Bourbonnais	16	Cold Finishing of Steel Shape	331	280
GNB Industrial Battery Co.	Kankakee	17	Storage Batteries	369	275
Kankakee County Training	Bradley	18	Job Training Services	833	250
Liquid Carbonic Ind. Corp.	Bourbonnais	19	Industrial Vessels, Tanks & Containers	344	250
Iroquois County					
Uarco Incorporated	Watseka	20	Manifold Business Forms	276	451
Delany Motors Inc.	Milford	21	Electric Motor & Generator	362	400
T & D Metal Products LLC	Watseka	22	Boxes, Stamped Metal	346	380
Iroquois Memorial Hospital	Watseka	23	Medical & Surgical Hospital	806	267

Source: Dun and Bradstreet, Dun's Direct Access Business Database, New York, 1995

Figure 1-30.

Major Employers in the Kankakee River Area

Location of Employers with more than 800 employees.

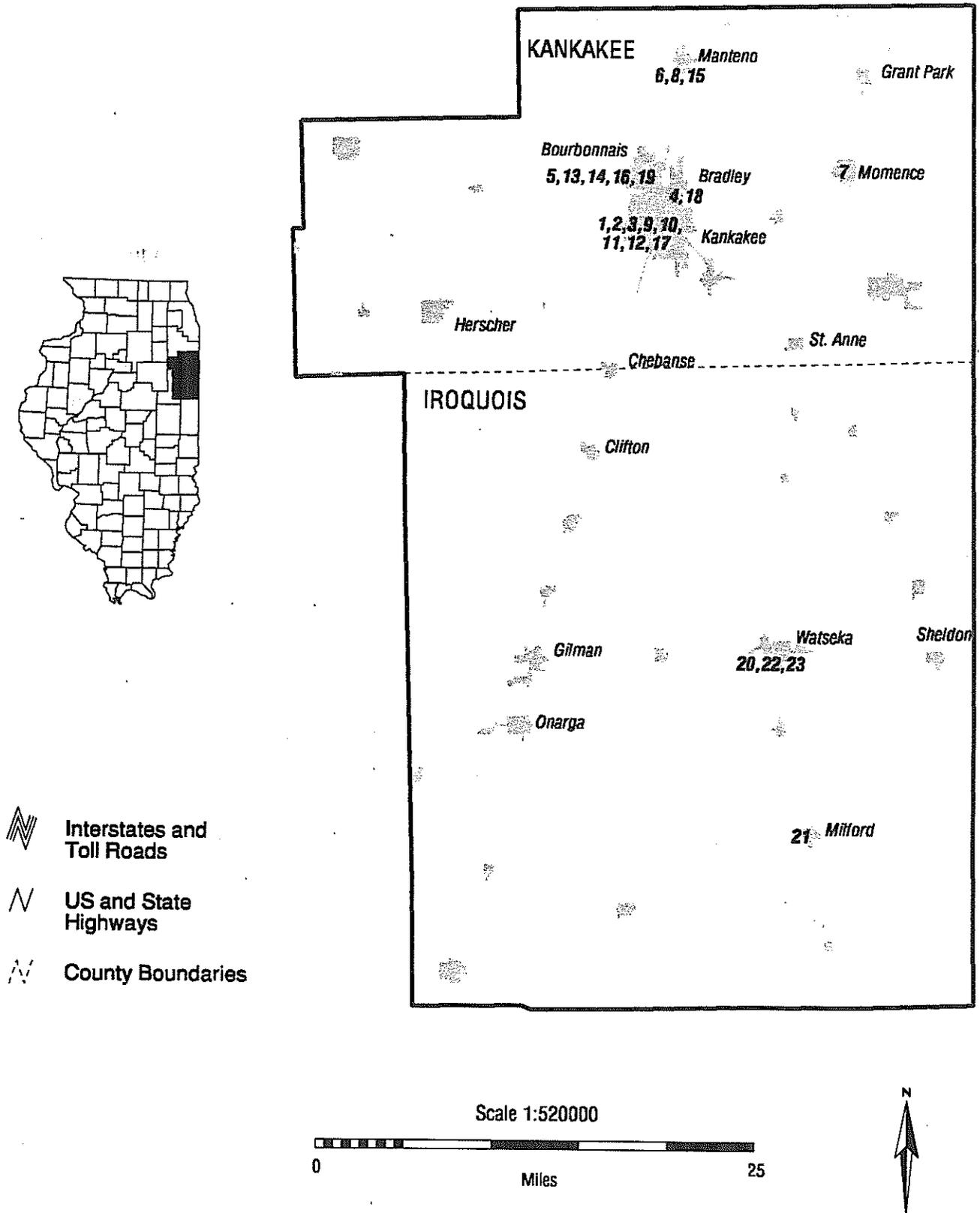


Table 1-23 Iroquois County Selected Statistics

	1994 Employment	Percent Change 1970-94	Average Annual Change	% of Workforce	1994 Earnings (million \$)	Percent Change 1970-94	Average Annual Change	% of Total Earnings
Manufacturing	2,043	21.8	0.82%	13.3	46	12.3	0.48%	14.8
Tran., Utilities, FIRE	1,361	9.5	0.38%	8.9	32	50.1	1.71%	10.1
Wholesale/Retail	3,236	26.6	0.99%	21.1	51	-0.06	0.00%	16.1
Services	3,781	128.0	3.49%	24.7	56	78.3	2.44%	17.9
Government	1,739	-15.4	-0.69%	11.4	36	2.46	0.10%	11.5
Farming	2,154	-30.1	-1.48%	14.1	72	-11.8	-0.52%	23.1
Other	996	43.5	1.52%	6.5	20	-3.1	-0.13%	6.5
TOTAL	15,310	18.1	0.70%	100	313	10.9	0.43%	100

The services sector showed the greatest growth (128%) during the 1970-94 period. Employment grew 3.5% annually and it has become the largest sector, accounting for nearly one quarter of the county's work force in 1994. The sector's average annual earnings growth rate (3.0%) was also above all other sectors.

The three largest employers in Iroquois County -- Uarco Incorporated, Delany Motors, and T&D Metal Products -- employ more than 1,200 workers. Of 710 private non-farm establishments in 1994, thirty-one had 50 or more employees.³ More than half of these establishments were in the services and retail trade sectors.

In 1994, total personal income in Iroquois County was \$617 million, ranking 44th in the state. The 1970-1994 income average annual growth was 1.2%, lower than the statewide rate of 1.8%.

Kankakee County

Kankakee County represents more than three-quarters of the area's total employment and earnings, with more than 50,000 workers and combined earnings of \$1.2 billion. The 1970-94 average annual employment growth was 0.99% while earnings grew 0.85% annually. Services, the largest sector in 1994, rose significantly over the 1970-1994 period in terms of employment (113%) and earnings (111%). Following the services sector, the wholesale/retail sector was the second largest employer in the county.

³ 1997 State Profile, Woods & Poole Economics, Inc.

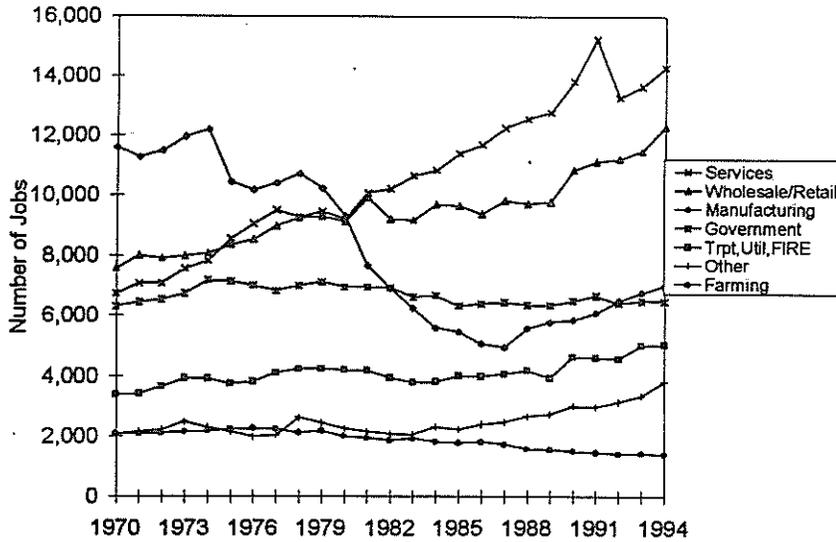


Figure 1-31. Kankakee County Employment, by Sector

Manufacturing declined significantly during the recessions of the mid-70s and early 80s, and never fully recovered. Employment is 40% less than in 1970. Although employment in the manufacturing sector has fallen behind the services and wholesale/retail sectors since the 1980s, it still had the largest earnings in 1994.

In 1994, many of the 2,235 private non-farm establishments (95%) operated with fewer than 50 employees. The businesses represented a variety of industries, concentrating in services, wholesale/retail, and construction. The county's largest three employers are medical hospitals with a total of 3,650 employees.

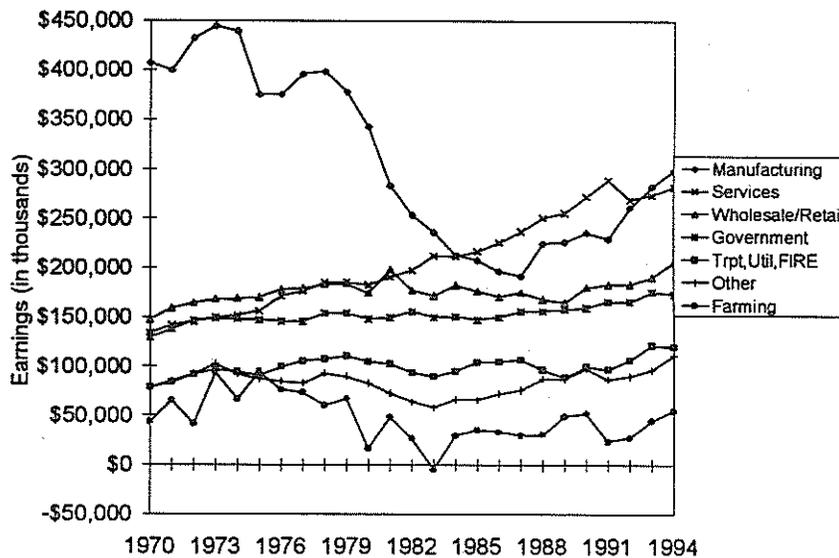


Figure 1-32. Kankakee County Earnings, by Sector

Table 1-24. Kankakee County Selected Statistics

	1994 Employment	Percent Change 1970-94	Average Annual Change	% of Workforce	1994 Earnings (million\$)	Percent Change 1970-94	Average Annual Change	% of Total Earnings
Manufacturing	6,967	-39.8	-2.09%	13.9	299	-26.6	-1.28%	24.0
Trans., Utilities, FIRE	5,036	48.5	1.66%	10.0	120	53.2	1.79%	9.6
Wholesale/Retail	12,284	62.7	2.05%	24.5	206	39.6	1.40%	16.6
Services	14,280	113.0	3.20%	28.4	282	110.6	3.15%	22.6
Government	6,457	2.7	0.11%	12.9	174	34.2	1.23%	13.9
Farming	1,374	-34.6	-1.75%	2.7	55	26.4	0.98%	4.4
Other	3,815	84.9	2.59%	7.6	111	43.5	1.52%	8.9
TOTAL	50,213	26.6	0.99%	100	1,247	22.6	0.85%	100

From 1970 through 1994, total personal income rose 47%, reaching \$1.9 billion, making Kankakee 18th among the counties in the state. The 1970-1994 average annual income growth was 1.6%.

Conclusion

The economy of the Kankakee River area supports 65,000 jobs and generates \$2.5 billion in personal income. Kankakee County provides more than three-fourths of employment and earnings in the area. Farming is still dominant in Iroquois County, although services and trade now employ more people.

The area represents a diverse economic structure of health service, manufacturing, and agriculture. Services and trade provide the most jobs, but farming and manufacturing remain important forces in the local economy.

Agriculture

Illinois possesses some of the richest agricultural resources in the world and agriculture continues to be a key component of the state's economy and character. Information about agriculture coupled with demographic and economic information can be strong indicators of a region's development and its suitability for various resource management strategies.

Agricultural Lands

Nine out of ten acres in the Kankakee River area are considered agricultural, significantly more than statewide where 77% of land is agricultural.¹ Crops are grown on the vast majority (85%) of the agricultural land. Agricultural landscape dominates both counties covering 94% of Iroquois County and 89% of Kankakee County (Table 1-25). Iroquois County, the third largest county in Illinois, is the second in the state for cropland. The number of farms in the region declined 26% between 1978 and 1992, which is slightly more than the statewide decline of 23%. Over this same period, the amount of farm acreage in the region also declined, 6.5%, same as the statewide decline.²

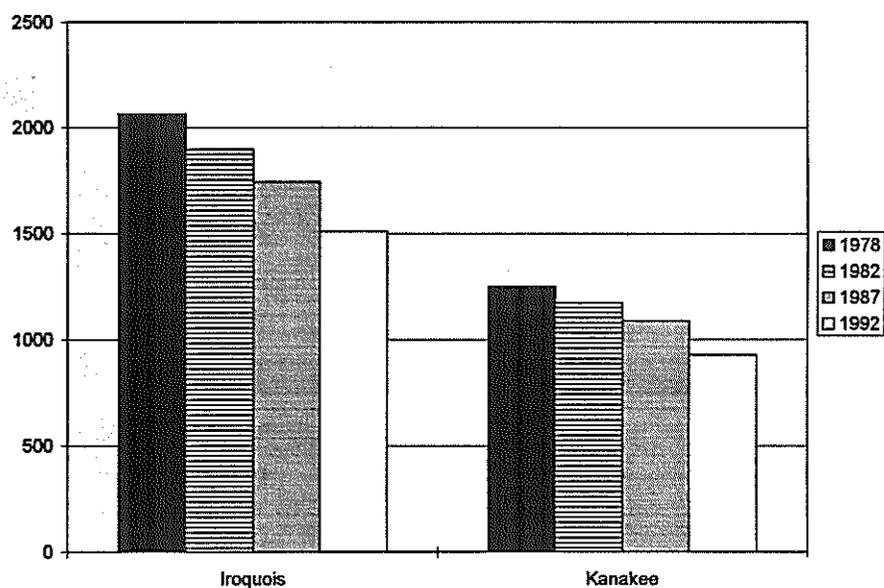


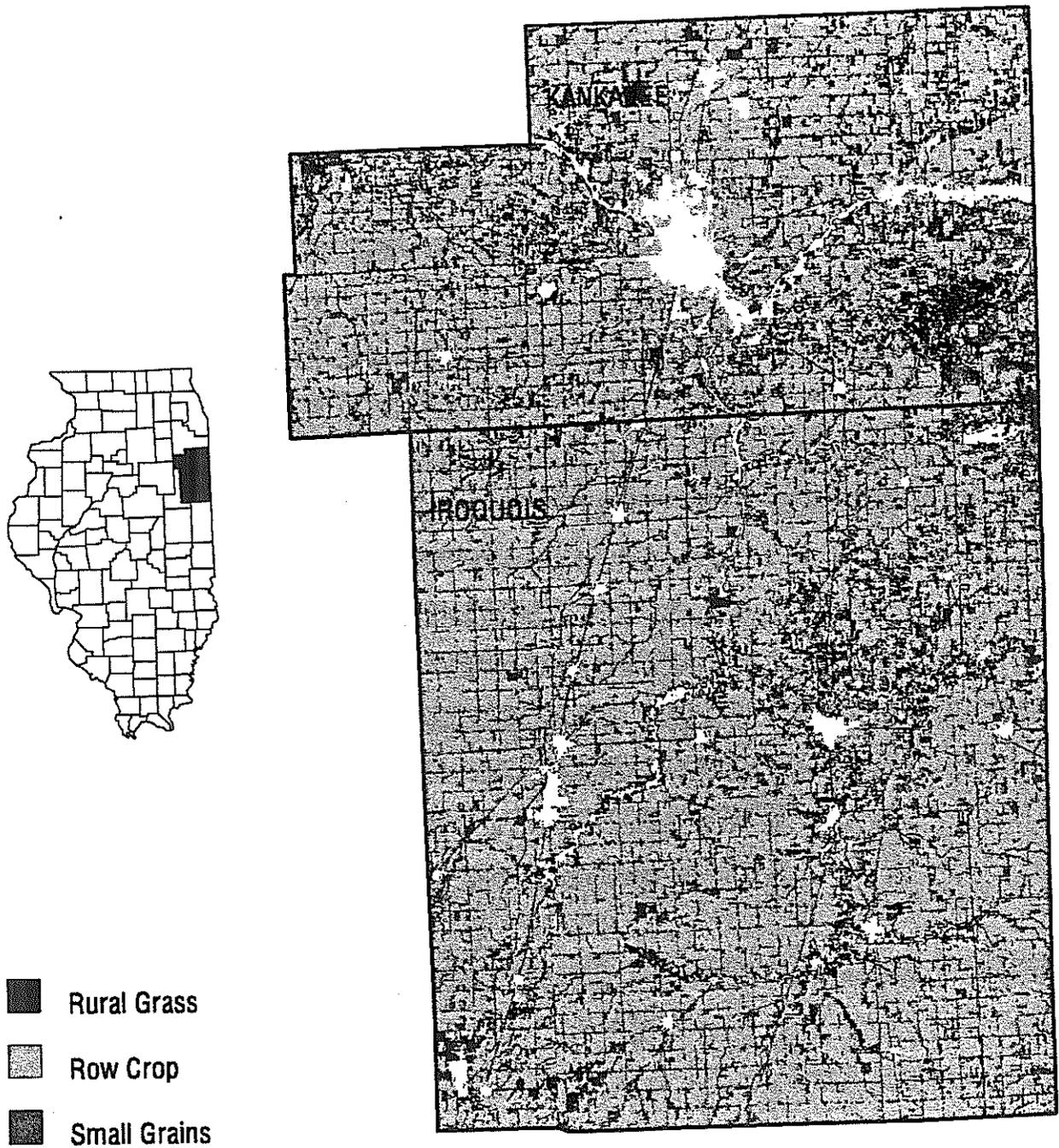
Figure 1-33. Farms in Kankakee River Area

¹ Department of Natural Resources. *Illinois Land Cover, An Atlas*, June 1996. Agricultural land is defined as cropland (planted in row crops, small grains orchards, and nurseries) and rural grasslands (fallow fields, pasture, and greenways) and may include a small amount of non-farm grasslands.

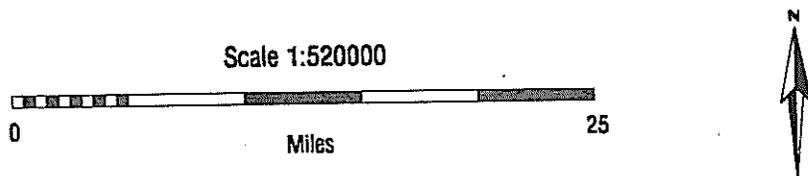
² Information taken from *Agricultural Statistics*, Illinois Department of Agriculture, various years and *Census of Agriculture* U.S. Department of Census years 1982, 1987, and 1992.

Figure 1-34.

Agricultural Land Cover



Source: Land Cover database for Illinois 1991-1995 (IDNR, 1995)



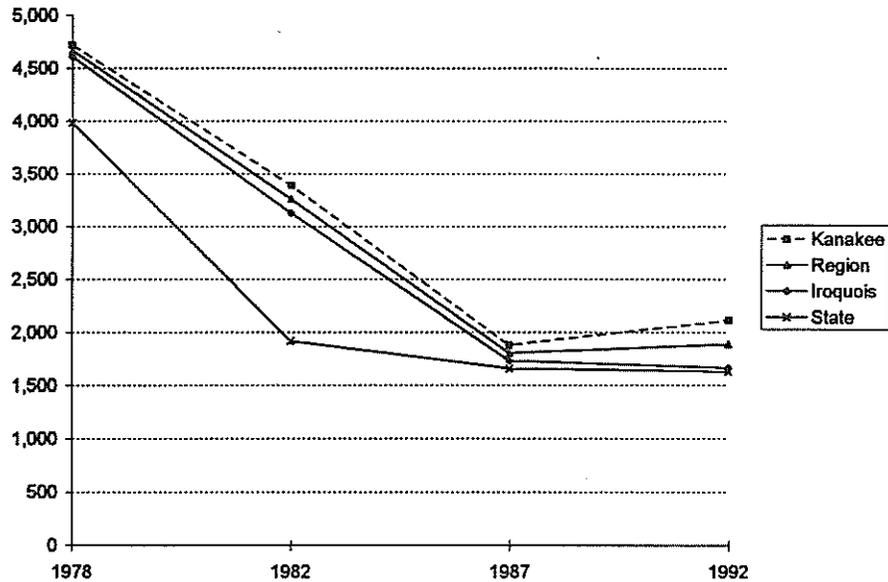


Figure 1-35. Value of Farmland (1994 dollars)

The value of the region's agricultural land and buildings has declined between 1978 and 1992 (in 1994 dollars), although land values began rising slightly after 1987. Statewide, agricultural land value has remained relatively flat between 1987 and 1992 and while Iroquois County land values are approaching the statewide average, Kankakee County land values remain higher.

Agricultural Cash Receipts and Production

Total Cash Receipts

Between 1980 and 1994, farm cash receipts³ (the amount received from the sale of crops and livestock) varied due to market prices, weather, and acres planted, but declined overall (Figure 1-36). In 1994, total receipts for the Kankakee River area represented 4%

Table 1-25. Agricultural Land Cover

	Agricultural Acres	Percent of County
Iroquois	674,448	94%
Kankakee	387,013	89%
Region	1,061,461	92%
State	27,928,797	77%

³ Dollars are adjusted to 1994

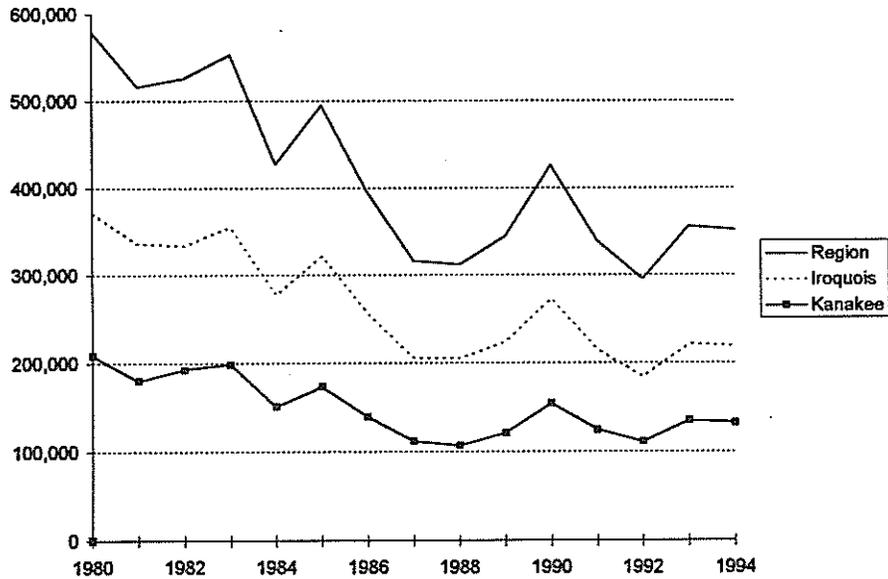


Figure 1-36. Kankakee River Area Total Cash Receipts (1994 dollars)

of Illinois farm receipts. For that year, Iroquois County had \$218 million in cash receipts, one of the top leaders in the state. Kankakee County had \$132 million in total cash receipts. Of the region's total receipts, 89% were from crops and 11% were from livestock.

Crop Cash Receipts

In recent years, the region's crop receipts⁴ (five-year) average was \$296 million, or about 5% of the state's \$5.9 billion total crop receipts. Crop receipts include the sale of corn, soybeans, wheat and 'other' crops such as sweet corn, other vegetables, melons, and other fruits. Statewide, corn brings in more cash receipts than soybeans, and within the region, corn contributes 52% and soybeans 35% of the total crop receipts. Iroquois County contributes 61% of the region's crop receipts while Kankakee County accounts for 39%. Both Iroquois

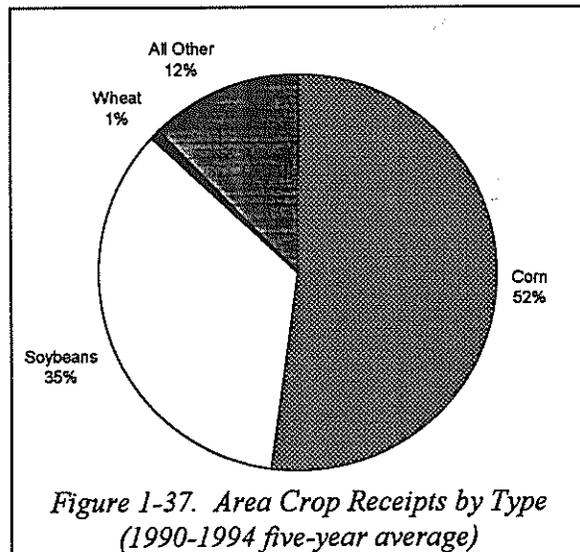


Figure 1-37. Area Crop Receipts by Type (1990-1994 five-year average)

⁴ Due to fluctuations in seasonal production, comparisons are based on a five year average from 1990-1994. This average was calculated for both crop and livestock cash receipts and is often used instead of the last year of data or 1994.

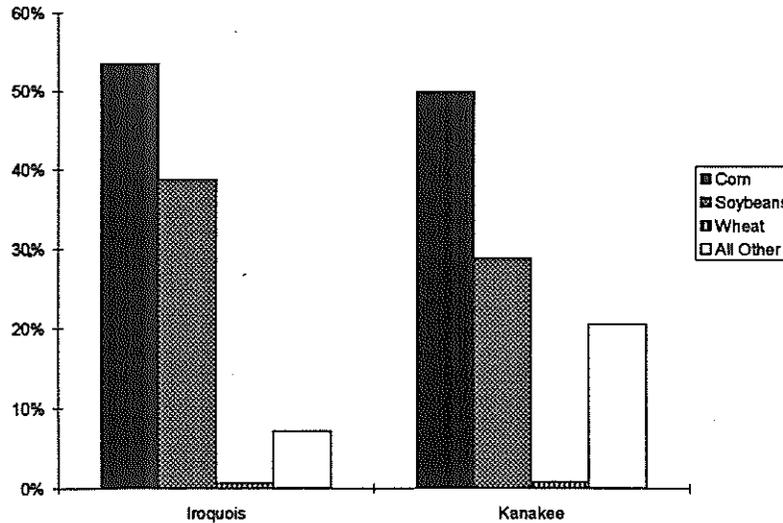


Figure 1-38. County Crop Receipts by Type (1990-1994 five-year average)

and Kankakee counties are among the state leaders in crop receipts. While corn and soybeans are dominate cash crops, ‘other’ crops are a significant portion in Kankakee County.

Crop Production

Production of both corn and soybeans fluctuated significantly between 1980 and 1995 due to factors such as weather and market price. Regional corn production ranged from 23.7 million bushels during the drought of 1988 to a high of 82 million bushels in 1994.

Iroquois County, the region’s largest corn and soybean producer, is consistently one of the leaders in the state for both.

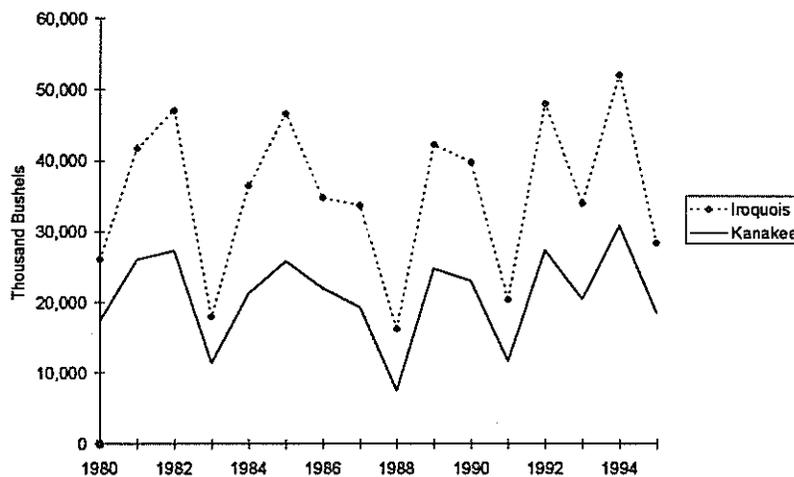


Figure 1-39. Kankakee River Area Corn Production

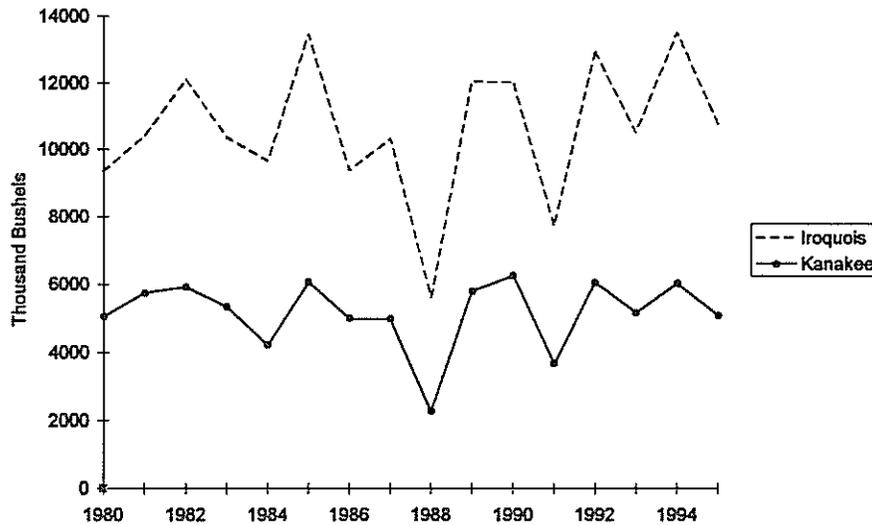


Figure 1-40. Kankakee River Area Soybean Production

Regionally, soybean production hit a low of 7.8 million bushels in 1988 and topped 19 million bushels in 1985 and again in 1994.

Area farmers also planted wheat, hay, and oats, although at somewhat lower production rates. Kankakee County had significant crop receipts from 'other' crops. The region has 15% of the statewide nursery and greenhouse acreage. This includes growing a variety of items, from sod to flowers.

The region also has about 8% of the statewide acreage planted in vegetables, sweet corn and melons. 'Other' crops planted in Iroquois County include lima beans and sweet corn. 'Other' crop planted in Kankakee include; cucumbers & pickles, mustard greens, snap beans, sweet peppers, pumpkins, squash, sweet corn and tomatoes. Kankakee had the largest acreage of cantaloupes, dry onions, head cabbage and watermelons in the state.

Table 1-26. Nurseries and Greenhouses, 1992

	Farms	Acres
Iroquois	10	NA
Kankakee	50	4,677
Region	60	4,677
State	1,036	30,655

Table 1-27. Farms Planting Vegetables, Sweet Corn and Melons, 1992

	Farms	Acres
Iroquois	51	3,385
Kankakee	44	4,172
Region	95	7,557
State	1,714	97,197

Livestock Cash Receipts

During the 1990-94 period, the Kankakee River area contributed \$57 million (2%) of the state's \$2.4 billion average annual livestock receipts.⁵ Livestock receipts come from the sale of cattle, hogs, and 'other' livestock such as, dairy cattle, poultry, and sheep.

Statewide, hogs provide 48% of livestock cash receipts, cattle 32% and 'other' livestock 20%.

Regionally, receipts are almost equally split between cattle, hogs, and 'other' livestock. Iroquois County had the highest livestock receipts, averaging \$43 million, and contributed at least 70% to each of the three livestock categories. In both counties, receipts are split fairly evenly among livestock types.

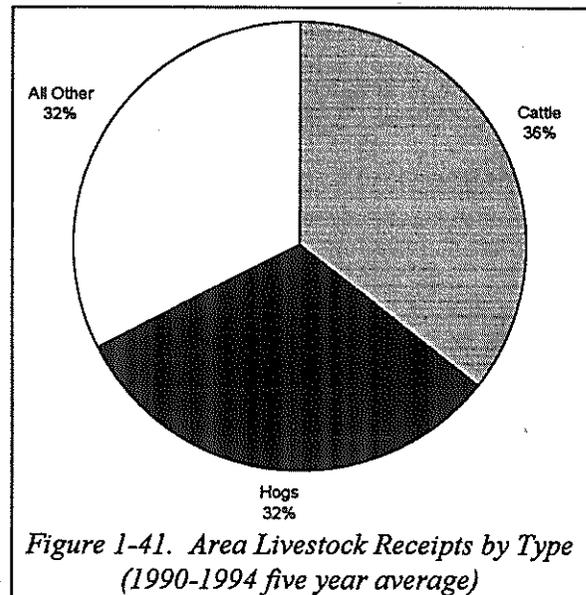


Figure 1-41. Area Livestock Receipts by Type (1990-1994 five year average)

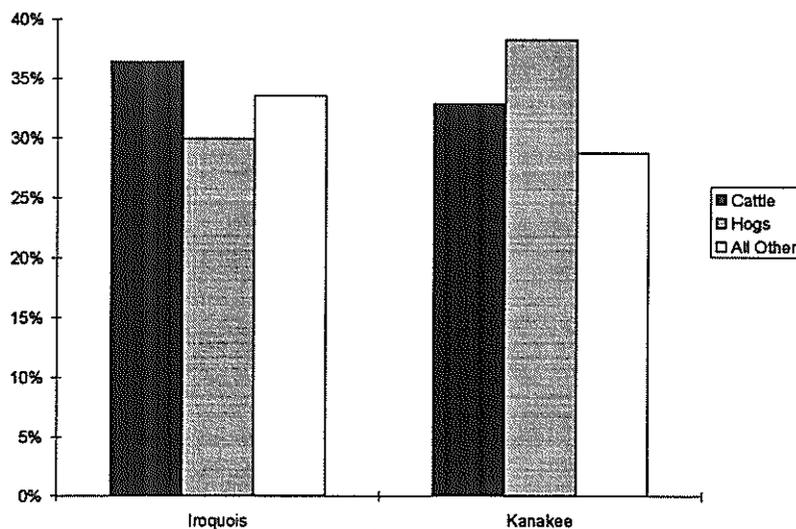


Figure 1-42. County Livestock Receipts by Type (1990-1994 five-year average)

⁵ Due to fluctuations in seasonal production, comparisons are based on a five year average from 1990-1994. This average was calculated for both crop and livestock cash receipts and is often used instead of the last year of data or 1994.

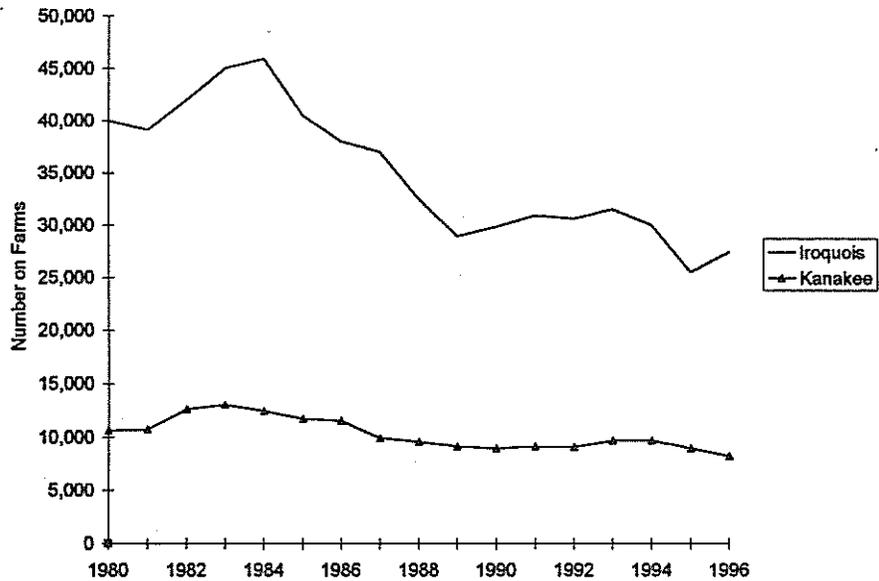


Figure 1-43. Cattle Inventory

Livestock Production

The region's livestock inventory accounts for 2% of cattle statewide and 1% of hogs. The average inventory between 1990 and 1995 was roughly 77,000 hogs and 38,000 head of cattle with Iroquois County leading in both. Since the early 1980's, the number of cattle has declined in the region. The hog inventory has also declined after peaking in 1989. Production estimates are not readily available for the 'other' category, but appear to include a variety of operations such as dairy, sheep and other specialties.

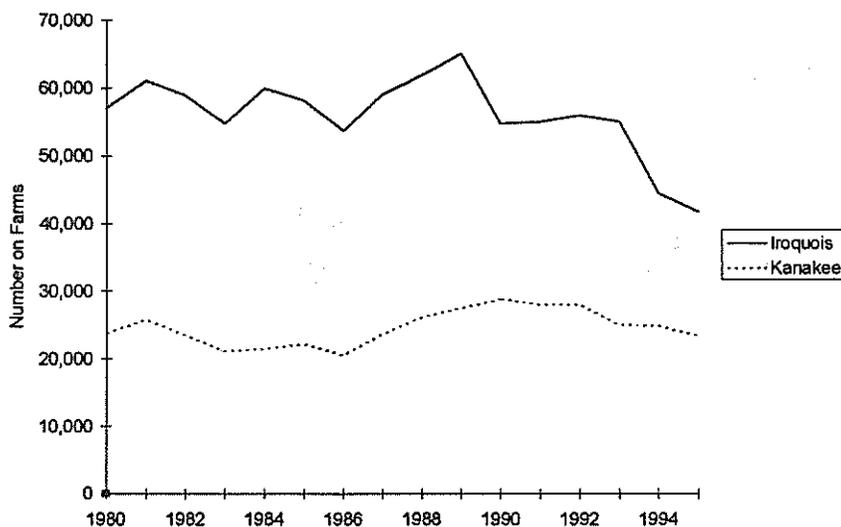
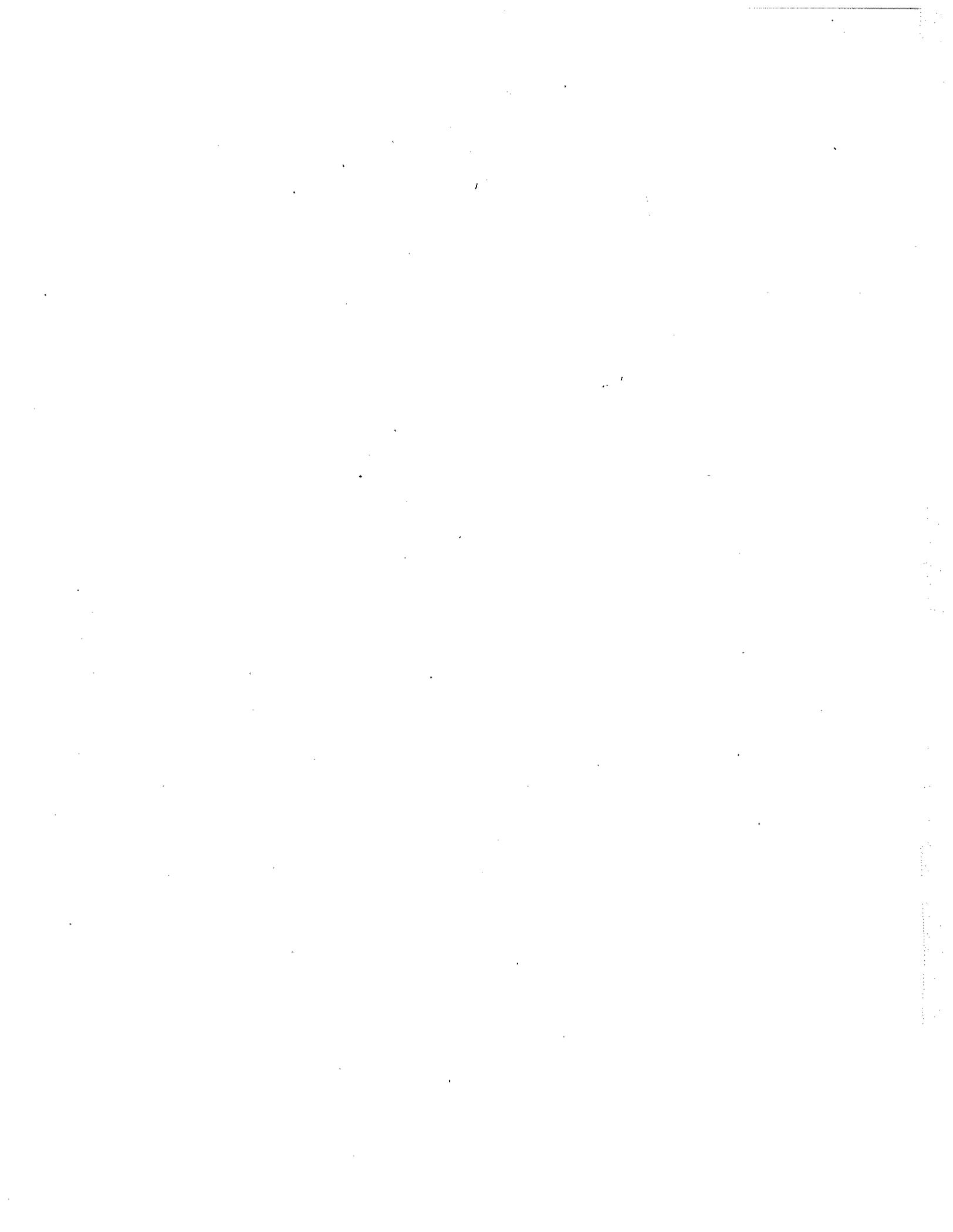


Figure 1-44. Hogs and Pigs Inventory

Conclusion

Agriculture in the Kankakee River area produces corn, beans, hogs, beef and dairy cattle as well as assorted vegetables, melons, and nursery crops. The region during the 1990s has averaged \$296 million in annual crop cash receipts and \$57 million in livestock receipts. Value of farms in Kankakee County, are higher than the statewide average, while Iroquois farms are closer to the statewide average. Like the rest of the state, the number of farms is declining.

Highlights of the region's agriculture include: in 1994 produced 82 million bushels of corn and 19 million bushels of soybeans; maintained an annual average (1990-95) inventory of 77 thousand hogs and 38 thousand head of cattle. Iroquois is a statewide leader in corn and bean production and Kankakee is a statewide leader in vegetables, melons and nursery crops.



Outdoor Recreation

The Kankakee River area offers a variety of outdoor activities, including hiking, fishing, hunting, canoeing, and picnicking.¹ Thirty-five miles of the Kankakee River are designated as biologically significant, as are several tributaries, indicating that it is among the highest quality streams in Illinois.

Publicly-Owned Recreation Sites

Kankakee River State Park

Kankakee River State Park's 4,000 acres stretch along both sides of the Kankakee River, just northwest of the city of Kankakee. The naturally channeled river is the site's centerpiece; it is notable both for its biological and geological significance, and for the outdoor recreation opportunities it provides. Activities include hiking, picnicking, horseback riding, snowmobiling, canoeing, fishing, boating, hunting, and camping.

The park's extensive trail system lies on both sides of the river. The north side features hiking, biking, and cross-country skiing trails. A three-mile route along Rock Creek leads past limestone canyons and a waterfall. Horse and snowmobile trails can be found on the south side. The twelve-mile horse trail is open in spring and summer, and horses can be rented at the park's stable. Snowmobiling is allowed when there is a snow cover of four inches or more.

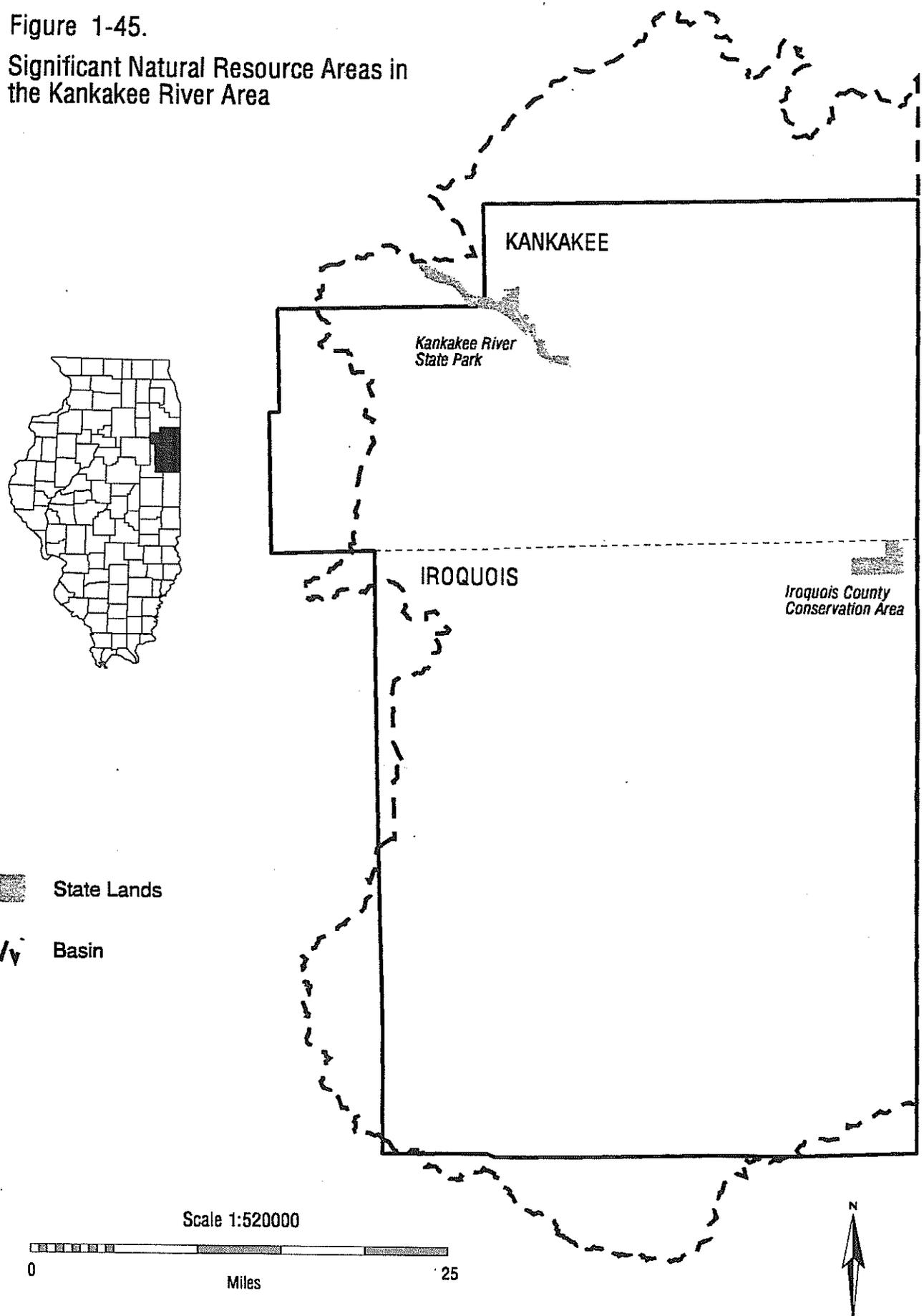
The river is ideal for canoeing. Visitors can rent canoes at Bird Park in Kankakee, and take the four- to six- hour trip to the Kankakee River SP. Fishing at the river is also good -- game fish include smallmouth bass, channel catfish, walleye, and northern pike. Two boat launches are available for crafts with motors of 10 horsepower or less, but visitors are cautioned that boating on the shallow, rocky river can be hazardous.

The site's abundance of wildlife makes it popular for hunting. Available game include deer (archery only), duck, pheasant, woodcock, dove, rabbit, squirrel, fox, coyote, and raccoon.

The park also provides an array of camping alternatives. The Potawatomi Campground has 110 sites with modern amenities, including electricity. The Chippewa Campground has 150 sites, from modern sites with amenities to more primitive sites.

¹ Unless otherwise noted, information in this chapter is from IDNR promotional materials, internal documents, and discussions with IDNR personnel.

Figure 1-45.
Significant Natural Resource Areas in
the Kankakee River Area



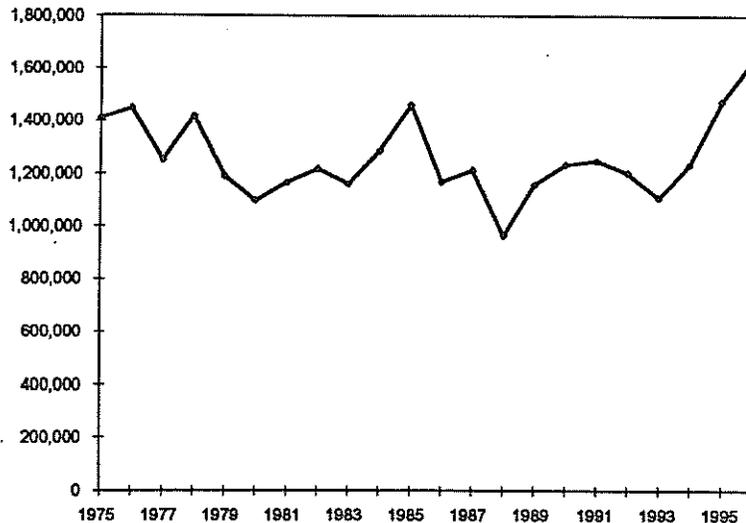


Figure 46. Attendance at Kankakee River State Park, 1975-1996

Attendance at Kankakee River SP has averaged over 1.2 million visitors annually since 1980. Attendance has increased sharply in recent years, from 1.1 million visitors in 1993 to its high of over 1.6 million in 1996. Staff attributes this increase to several factors, including the new visitors center, interpretive programs, special events (including a French and Indian War reenactment each July), and efforts to promote a family-friendly atmosphere (including a ban on alcohol).

Iroquois County Conservation Area

Iroquois County Conservation Area, a 2,500-acre site in northeastern Iroquois County, contains unique topographical features shaped largely by glacial activity. These include some of the finest and most extensive examples of sand dune and prairie marsh habitats remaining in Illinois. The sand dunes in the Hooper Branch Savannah preserve within the site were formed from the sandy beaches of a glacial lake that existed 14,000 years ago. The savanna (characterized by a mix of trees, forbs, and prairie grasses) that subsequently developed is still noticeable today. The wet prairies and boggy areas were also formed by glacial activity and likewise support vegetation rarely seen in Illinois.

Hunting is the most prominent recreational activity at the site which is operated primarily as a permit pheasant hunting area. Squirrel, dove, rabbit, quail, non-permit pheasant and archery deer hunting are also available at certain times of the year. Lesser opportunities exist for woodcock, rail, snipe, and shotgun deer hunting. Hunting-related facilities include an archery range, a hand trap range, and a dog training area (closed in spring and early summer).

The site also has several picnic areas, and hiking and wildlife-watching opportunities are available when hunting is not allowed. Snowmobiling is also available when conditions permit.

With its emphasis on hunting opportunities, attendance at Iroquois County CA is limited, with an estimated average of less than 16,000 visitors annually. Attendance in 1996 was 1% that of nearby Kankakee River SP.

Natural Areas and Nature Preserves

The Kankakee River area also includes 8 nature preserves and 33 natural areas. They include a variety of habitats, including savannas, dunes, and upland and bottomland forests. With an emphasis on natural conservation, these sites are generally undeveloped, little known, and lightly visited.

Economic Impacts of State Sites

Parks and other state-owned lands contribute to the local economy mostly through increased local tourism. To examine the economic impact of the Kankakee River SP and Iroquois County Conservation Area, IDNR used IMPLAN, an input-output model built on county level data.²

Overall, park visitors generate about \$14.0 million in economic output, \$4.4 million in personal income, and 220 jobs. Almost 80% of the jobs are in the trade and services sectors, but the manufacturing sector also receives a significant boost.

Boating

Kankakee and Iroquois counties accounted for over 7,100 boat registrations in 1996, up 27% from 1988. Kankakee County, with most of the area's population, accounts for almost three-fourths of the registrations. Iroquois County, however, has a high concentration of boat registrations, with about 56 registrations per 1,000 residents, compared to 49 for Kankakee County and 47 statewide (excluding Cook County³).

Table 28. Boat Registrations, 1988 and 1996

	1988	1996
Kankakee Co.	4,131	5,186
Iroquois Co.	1,489	1,952
Kankakee River Area	5,620	7,138

² IMPLAN is designed to trace the ultimate impacts of a stimulus (such as increased and decreased tourism) as it flows through the economy.

³ Including Cook County, which has 44% of Illinois' population but only 18% of the registrations, there are about 32 registrations per 1,000 residents.

Fishing and Hunting

Over 11,300 fishing licenses⁴ were purchased in the Kankakee River area in 1993, down from almost 13,000 in 1987. Kankakee County accounted for 85% of the licenses. Out-of-state anglers accounted for 3.2% of the sales, below the 6.1% statewide average. This low proportion of out-of-state anglers, despite sharing a border with Indiana, is probably due to the lack of high-profile fishing lakes in the area.

Hunters purchased more than 5,300 licenses⁵ in the Kankakee River area in 1993, up slightly from 1987 and 1990. Out-of-state hunters accounted for 5.6% of all license sales, compared to only 3.4% statewide. The high level of non-resident activity is probably due to the area's largely rural character and its eastern border with Indiana.

Deer is the most popular game in the area, based on the estimated 38,900 hunter-days in the field annually.⁶ This accounts for about 1.8% of the statewide activity and 1.3% of the harvest. While the long-gun season attracts more individual hunters, bow hunters spend more than 4.5 times as many days in the field due to the longer archery season. Long gun hunting accounts for about 63% of the 1,900 deer harvested.

Pheasant is the next most popular game, with 30,500 days afield (5.6% of the state total), and 21,150 birds harvested. Rabbit, squirrel, dove, and quail are also popular.

Table 29. Hunting Activity

Game	Hunters	Days Afield	Harvest
Deer		38,868	1,859
Archery	1,654	31,920	684
Long Gun	1,823	6,948	1,175
Pheasant	5,441	30,541	21,148
Rabbit	3,582	20,133	13,930
Squirrel		10,937	11,987
Fox	1,601	7,132	10,126
Gray	464	3,805	1,859
Dove	2,214	9,729	42,563
Quail	860	6,710	3,523

⁴ Includes combination hunting/fishing licenses, resident fishing, non-resident fishing, 10-day non-resident fishing, and Lake Michigan fishing licenses.

⁵ Includes combination hunting/fishing, resident hunting, and 5-day non-resident hunting licenses.

⁶ Hunting data from IDNR's "Hunter Activity and Wildlife Harvest in Illinois: County Averages for 1989-1993". This report relied on mailed hunter surveys. The authors caution that no adjustments were made to account for known biases inherent to this sampling technique.

Conclusion

Outdoor recreation opportunities in the Kankakee River area are shaped largely by the river itself. In addition to fishing, canoeing, and boating opportunities, it provides the setting for the Kankakee River State Park, which attracts 1.2 million visitors annually. These visitors generate about \$14 million in output and 220 jobs in the local economy. While fishing in the area is good, it draws a fairly low percentage of out-of-state visitors (considering its proximity to Indiana). Deer is the most popular game for hunters, followed by pheasant. Boating is fairly popular, even though the area lacks high-profile boating lakes.

Transportation Infrastructure

A region's transportation infrastructure -- its roadways, airports, waterways, and railways -- enables businesses and residents to move goods and people. Coupled with information regarding demographics and economics, trends in transportation infrastructure and its usage are strong indicators of the nature of a region's development and its suitability for various resource management strategies.

Auto Traffic

Roads

North-south route interstate 57 runs through major portions of Kankakee and Iroquois counties. To the north, this interstate connects the region to Chicago and to the south, Champaign.

Between 1973 and 1993, 104 miles of road were added in the Kankakee River area, bringing the total to 4,098 miles, 3% of the state's total mileage. Since 1980 the area's road miles grew 0.11% annually, lower than the annual statewide growth of 0.19%.¹ The road network has grown at a higher annual rate in Kankakee County however; Iroquois, a much larger county has a larger road network with about 60% of the area's roads.

Vehicle Registration

Area residents registered 75,477 passenger cars in 1992,² with 76% of those registered in Kankakee County. Regionally car registrations have increased by 21% over 1972 levels, less than the 32.2% increase statewide. Annual growth in the region was 0.97% compared to 1.4% statewide.

Motorcycle registrations have been more volatile. Between 1972 and 1982, registrations

Table 1-30. Miles of Road in the Kankakee River Area

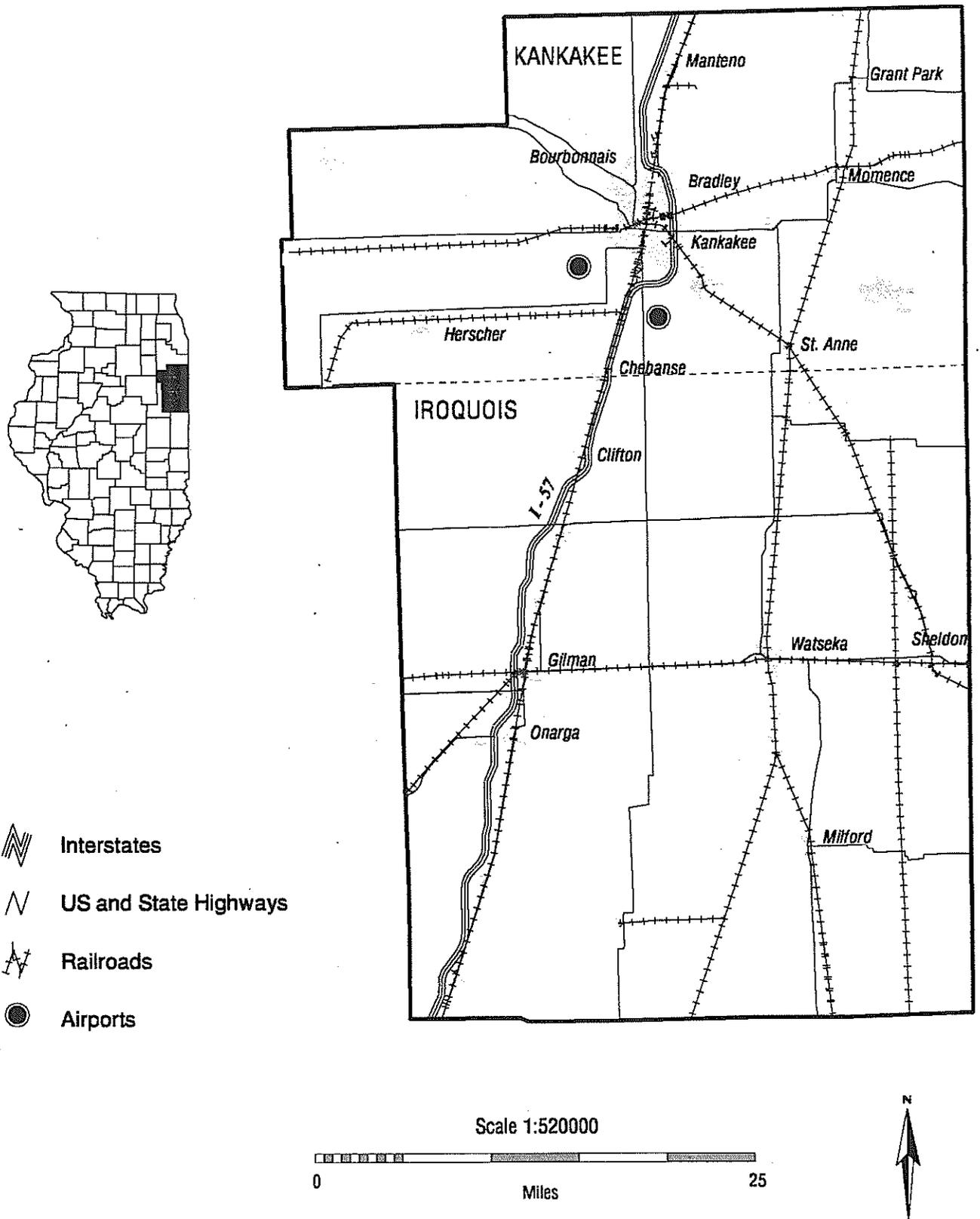
	1973	1983	1993
Iroquois	2,419	2,420	2,428
Kankakee	1,575	1,638	1,670
Region	3,994	4,058	4,098

¹ Mileage data from Illinois Department of Transportation: Office of Planning and Programming; *Illinois Travel Statistics*, various years.

² Vehicle registration data from the State of Illinois Office of the Secretary of State; *County Statistical Report for Motor Vehicle License Units and Transactions Received*, various years.

Figure 1-47.

Major Airports, Roads and Railroads



jumped from 2,190 to 5,131 then declined to 3,125 by 1992. Both counties followed this pattern, as did the state as a whole. The rapid growth in the 1970's and early 1980's may have been largely due to high gasoline prices. The subsequent decline is probably due to better fuel efficiency in cars, lower gas prices, changing lifestyles, and an aging population.

Registrations for trucks (excluding semis) and buses in the area increased from 14,994 to 25,821 between 1972 and 1992, an annual growth rate of 2.72%, lower than the state average of 3.4%. In 1992, roughly 84% of the vehicles in this category were pick-ups, which have been reported separately since 1988. The region has a lower proportion of cars to pick-up trucks, 3.4 to 1, than the statewide car-truck ratio, of 5.3 to 1.

There were roughly 10,787 semis and trailers registered in the two counties in 1992, about 60% more than the number for 1972.³ Of course, semis usually function as long-distance haulers; locally-registered semis may spend little time at "home", while out-of-town semis routinely drive through. How many miles semis drive locally is difficult to determine from available data.

Vehicle-Miles Traveled (VMT)

In 1993, the Kankakee River area accounted for an estimated 1,228 million vehicle-miles traveled (VMT), 1.37% of the state total. Kankakee County had 62% of the region's VMT (767 million).

Since 1973, annual VMT in the area has grown at an average annual rate of 0.98%,

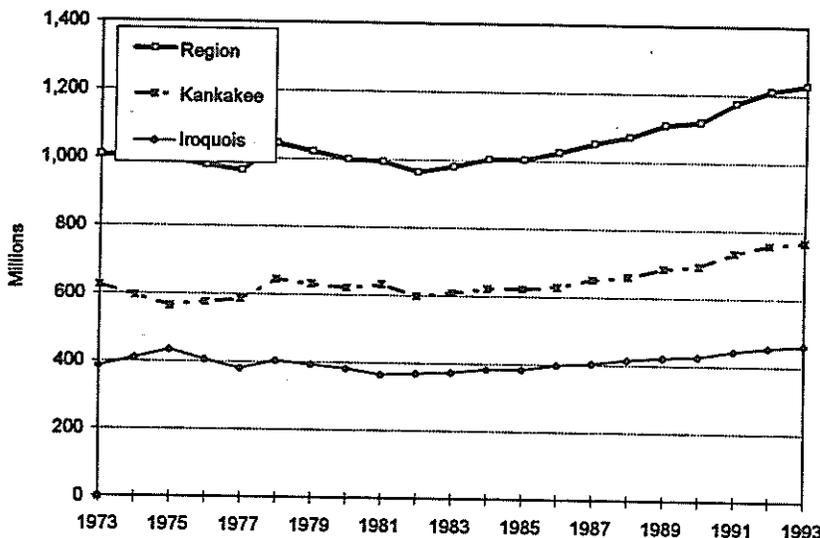


Figure 1-48. Vehicle-Miles Traveled in the Kankakee River Area, 1973-1993

³ This figure includes roughly 3,888 "regional" trucks -- mostly semis -- registered through IDOT's IRP program, where licensees pay prorated fees based on the percentage of miles driven in Illinois.

compared to a statewide average of 1.95%.⁴ This growth level has not been constant. Between 1973 and 1980, an era marked by severe oil shortages in 1973 and 1978, the region's VMT decreased by 0.12% annually. Clearly drivers adjusted to high gas prices by driving less. From 1980 to 1993 annual VMT growth was 1.57%.

Other Traffic

Bus Lines

Greyhound intercity bus service for the region is available in the city of Kankakee.

Air Traffic

The Kankakee River area contains two types of public use airports,⁵ a private airport and a public reliever airport in and around the city of Kankakee. Because aviation demand in the northeastern Illinois region is exceeding the capacity of Midway and O'Hare, and Chicago area passenger and cargo activity is expected to double by the year 2020, a 20,000 plus-acre international airport has been proposed to be built just north of Kankakee County, in Peotone, Will County. The South Suburban Airport would be designed to initially handle 14 million passengers.

Rail

The Kankakee River area has Amtrak passenger rail service at Kankakee in Kankakee County and Gilman in Iroquois County. The line runs north to Chicago and south to southern Illinois.

There are approximately five high density freight rail services (or lines transporting over 5 million tons of freight per mile) running through this region. There are also roughly five rail services handling light density freight (lines carrying less than 5 million tons). The light density freight lines typically serve agricultural businesses or connect industrial firms in urban areas to the high density freight network.⁶

Conclusion

The Kankakee River area is traversed by one major interstate highway, I-57, running north-south. Growth in road-miles was slight, only 2.6% between 1973 and 1993, while vehicle-miles traveled (VMT) grew roughly 22%. In addition to major interstate travel, the area has access to Amtrak, Greyhound service, and several airports.

⁴ VMT data from *Illinois Travel Statistics*.

⁵ See Illinois Department of Transportation, Division of Aeronautics, *Illinois Airport Directory*, 1996.

⁶ Rail Density data from IDOT's *Illinois Rail Plan: 1991-92 Update*.

Property Taxes

Property taxes are the major source of tax revenue for local government in Illinois, providing more than 75% of total revenue.¹ These taxes finance the majority of local government services, including school districts, county, township, and municipal governments, and special districts such as fire, park, sanitary, library, and airport.

Property taxes depend primarily on the tax rates and the equalized assessed valuation² (i.e., tax base) of property in the county. The tax rate is dependent on the amount of revenue sought by the local governments (tax levy), the assessed value of the property (tax base), and the legal maximum tax rate. The tax base is based primarily on the assessed values, which are usually reassessed every four years, and the amount of residential, commercial, and industrial expansion.

Tax Revenues

Property tax revenues in Illinois have increased significantly in the last ten years, after a steady decline during the 1970's and early 1980's. Real property tax revenues collected in Illinois went from more than \$9.5 billion in 1971 to almost \$12.1 billion in 1994.

In the Kankakee area, property taxes have fluctuated between \$69 - \$93 million annually. Overall, property tax revenues in 1994 are 5% above the 1971 level. Kankakee County had

**Table 1-31. Real Property Tax Revenue
(Million 1994\$)**

	1971	1975	1980	1985	1990	1994
Iroquois	35.1	30.8	31.0	25.5	20.9	22.6
Kankakee	57.4	58.0	50.7	44.5	48.0	65.4
Kankakee Area	92.5	88.8	81.8	70.0	68.9	88.0
State	9,497.8	8,815.4	8,337.5	8,645.5	10,919.8	12,140.1

¹ All property tax data is from Illinois Department of Revenue, *Illinois Property Tax Statistics*, various years.

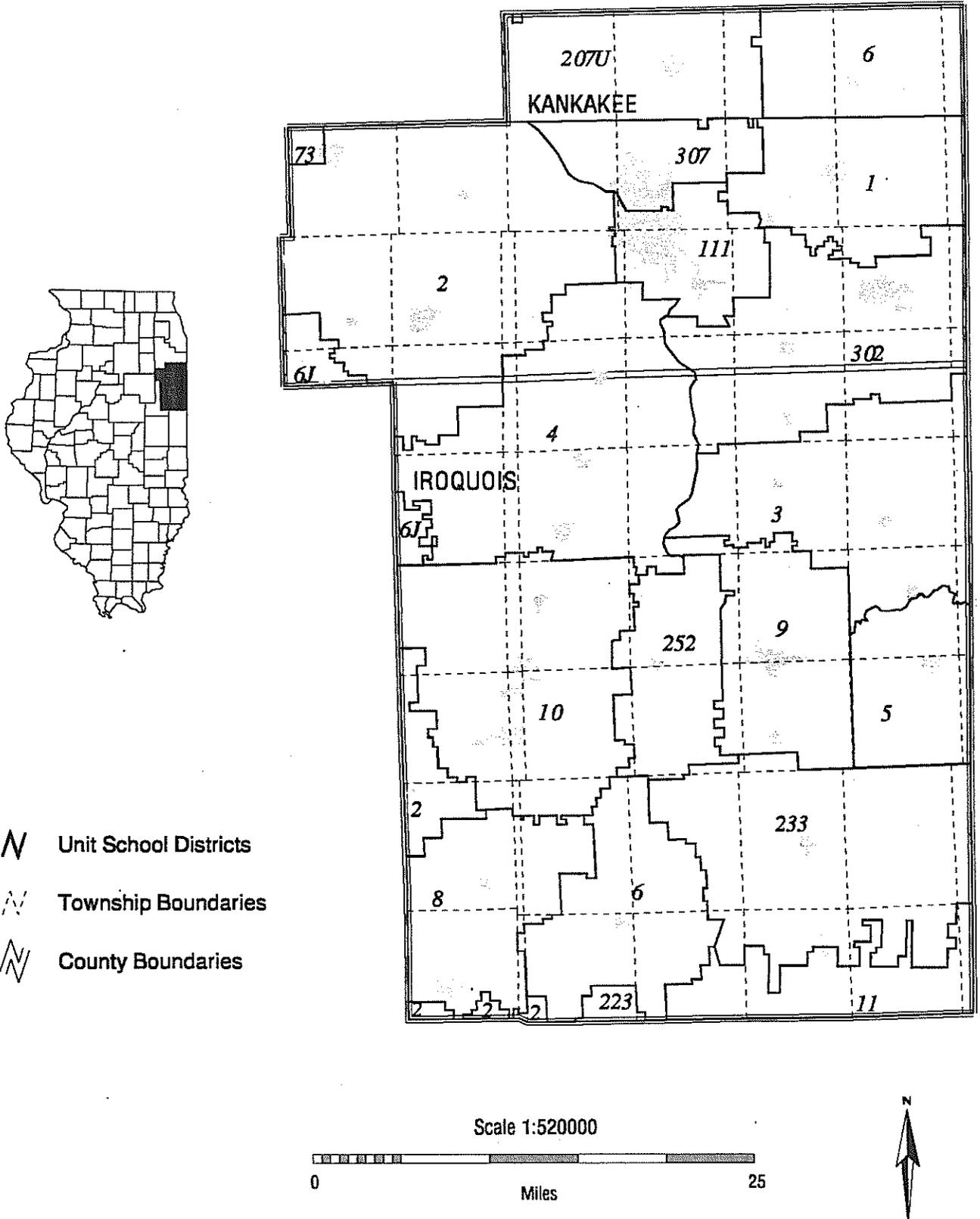
² Equalized assessed valuations are determined by several factors including:

- property is assessed at 33.3% of fair market value (except where property is classified);
- equalization process is to correct for counties which over- or under assess property;
- the amount of farmland in a county, which is assessed on productivity instead of market value.

Figure 1-49.

Major Property Tax Districts

Counties, townships, municipalities and 1992 unit school districts and codes.



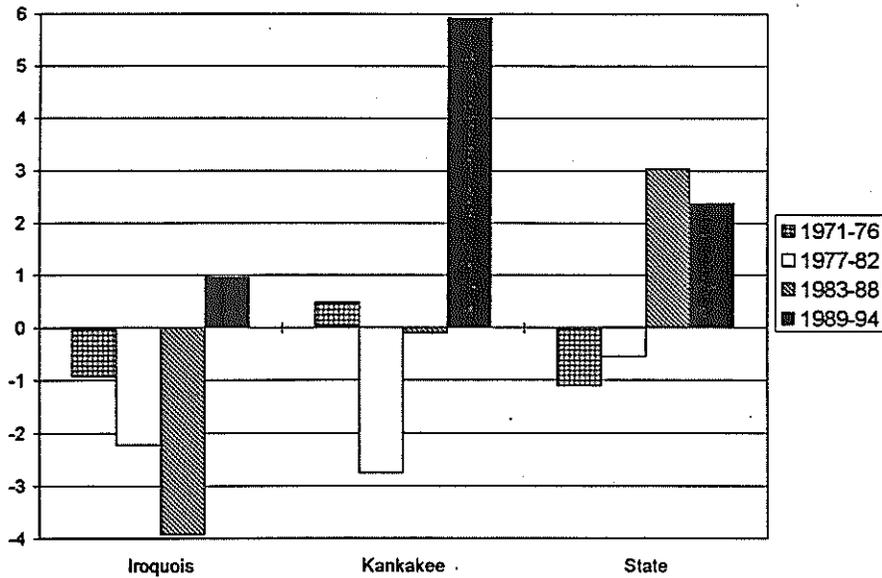


Figure 1-50. Average Annual Percentage Change in Property Tax Revenue (using 1994 dollars)

a 22% decrease in property tax revenues between 1971 and 1985, but revenues have increased 47% since then. Revenues have declined 36% in Iroquois County since 1971.

Property Tax Base

The property tax base in Illinois has declined 12% since 1969, though it has rebounded (30% increase) from the low point in 1985. The tax base in the Kankakee area has declined 52%, even though it has rebounded 31% since 1990.

The largest decline occurred in Iroquois County, where the tax base has declined 68% since 1969. The tax base also declined in Kankakee County by 42%.

Table 1-32. Real Property Tax Base (Million 1994\$)

	1969	1975	1980	1985	1990	1993
Iroquois	889	709	614	417	264	288
Kankakee	1,517	1,161	928	706	627	877
Kankakee Area	2,406	1,870	1,542	1,122	891	1,165
State	171,029	139,822	123,209	115,165	133,978	150,145

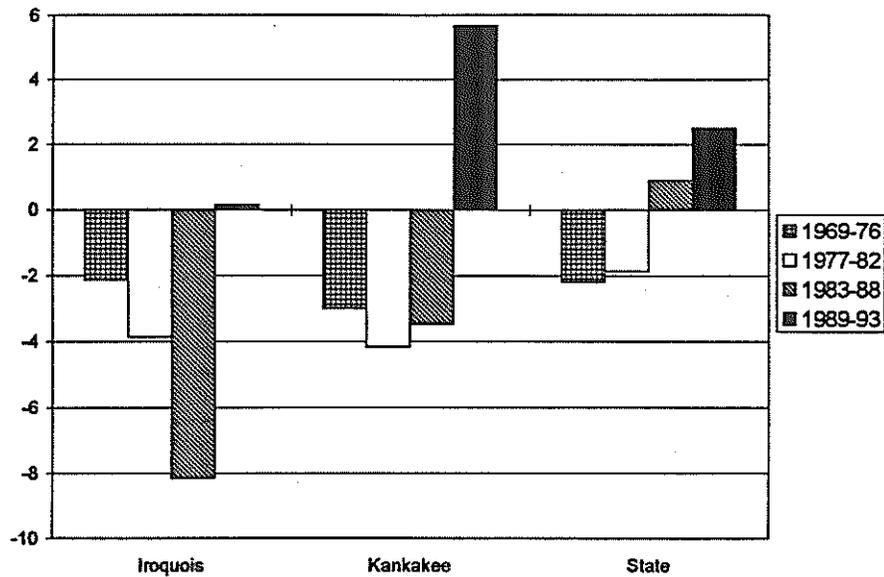


Figure 1-51. Average Annual Percentage Change in Property Tax Base (using 1994 dollars)

Figures 52 and 53 show the make up of the tax base in 1981 and 1994 by the different classes of property. In 1994, residential property provided the largest chunk of the state's tax base (54%), followed by commercial (27%), industrial (14%), and farm property (4.5%). This was not much of a change since 1981 except that farm property dropped from 12.4% to 4.5% of the tax base. Because of this decline, residential and commercial properties accounted for a higher proportion of the tax base in 1994 than in 1981.

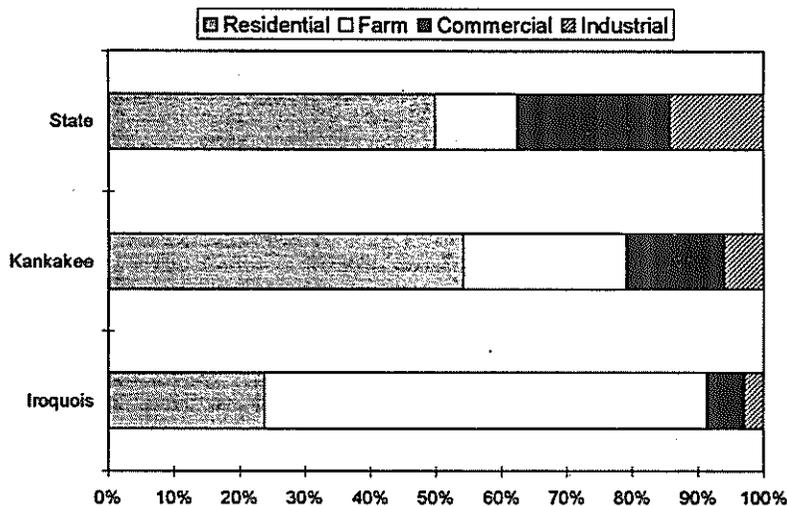


Figure 1-52. 1981 Property Tax Base by Class of Property

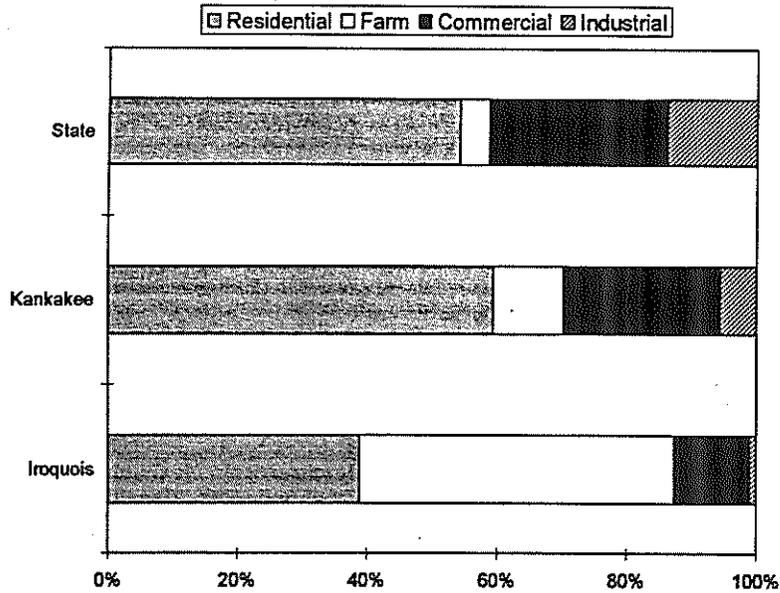


Figure 1-53. 1994 Property Tax Base by Class of Property

In the Kankakee River area, the make up of the tax base varies among the two counties because of the different types of economic activity dominating each. Iroquois County, for example, is a rural farm community and subsequently obtains a relatively large proportion of its tax base from farm property, 47% in 1994. The tax base in Kankakee County reflects its more urban character, with residential property providing 59% of the taxes and commercial property 24%.

Since 1981, both counties have had more of the tax base come from residential and commercial property and less from farm property. In Iroquois County the proportion of the tax base from farm property fell from 67% to 47%, while the residential property tax base increased from 24% to 38%. In Kankakee County, residential increased from 54% to 59% and commercial property from 15% to 24%, while farm property declined from 25% to 11%.

The percentage of the tax base from industrial property has always been significantly below the state average in both counties.

Tax Rates

Over the past couple of decades the average property tax rate has risen in the state and the Kankakee area (Figure 60). The tax rate is typically expressed in dollars collected per \$100 dollars of tax base. Since 1966, the statewide average property tax rate has risen from \$4.60 to \$8.22 per \$100 of tax base -- almost an 80% increase. The tax rate has increased

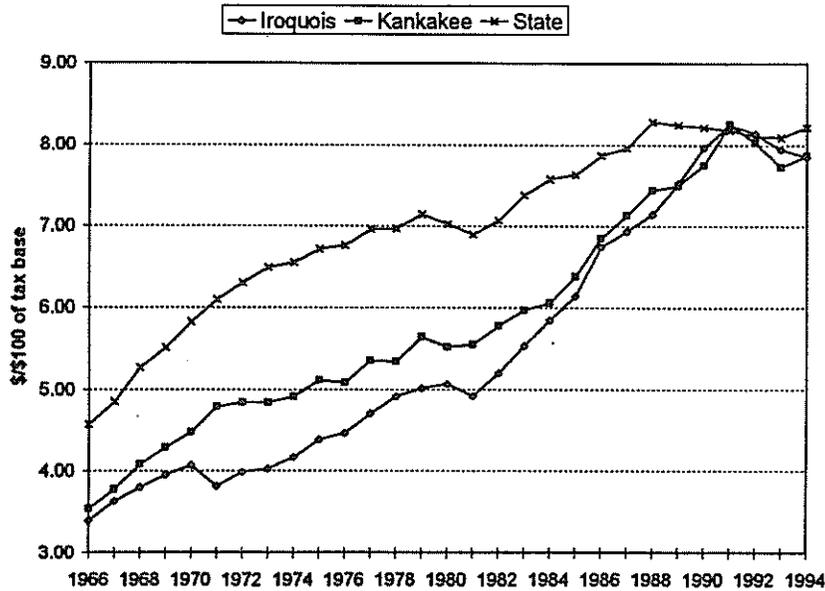


Figure 1-54. Average Property Tax Rate

130% in Iroquois County and 122% in Kankakee County, although both counties have been below the state average almost every year since 1966 (except 1991 and 1992). Iroquois County also had lower property tax rates than Kankakee County until 1989; the rates for the two counties have been about the same since.

Even within a county, there are significant differences in the tax rate. In Kankakee County, for example, the tax rate is \$8.10/\$100 of tax base in Bourbonnais, while it is \$9.77/\$100 in Kankakee -- a 21% difference.

Tax rate increases are directly related to a greater need for revenue and/or a significant decline in the tax base. For example, between 1969 and 1994 the tax base in Kankakee County declined by almost 42%, while revenue increased 14%. To raise these additional revenues tax rates were increased 122%.

Property Tax Distribution

In Illinois, property taxes are used to finance a variety of local government services, with the majority going to school districts (Figure 61). The remainder goes to municipal (16%), county (10%), and township governments (3%), and to other services (12%) such as fire, sanitary, park, library, and airport services.

A majority of property tax revenues in the area also goes to schools -- 61% in Iroquois County and 59% in Kankakee County. Iroquois County is above the state average in tax distribution to both county and township governments, allotting 13% and 12% compared to

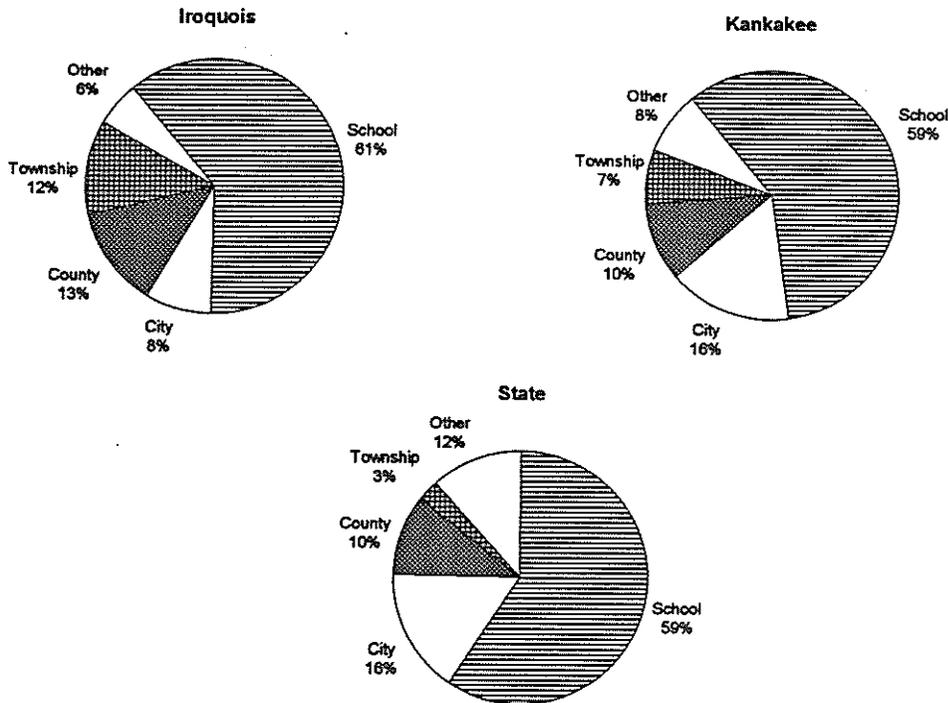


Figure 1-55. 1994 Property Tax Distribution³

10% and 3% statewide; Kankakee has a higher percentage going to townships (7%). Both counties are also below the 12% state average of taxes distributed to other government services, and Iroquois is below the 16% distributed to city governments statewide. Compared to 1980, more property taxes are going to municipal governments and special services and less for schools in the Kankakee area.

Conclusion

Property tax revenues have decreased in the Kankakee area and increased statewide. Revenues increased 14% in Kankakee County, which represents about 75% of the revenues in the area. However, Iroquois County had an 36% decline in tax revenues.

Property taxes are determined by the tax base and the tax rate. Overall, the tax base has declined and the tax rates have risen in the Kankakee area and the state. The tax base declined 52% in the Kankakee area while the tax rates have more than doubled.

³ The property tax distributions are based on total property taxes extended, which is the dollar amount of taxes billed to property taxes extended. This is different from the amount collected due to charges against collections such as protest, delinquencies, certificates of error and other changes. The amount collected is typically more than 97% of the amount of taxes extended.

For the state, the majority of the tax base is from residential property. This trend holds true for Kankakee County which obtains 59% of its tax base from residential property. Iroquois County, however, obtains the largest percentage of its tax base from farm property (47%).

For both the Kankakee area and the state, the majority of property tax revenues (61% in Iroquois and 59% in Kankakee) go to school districts.

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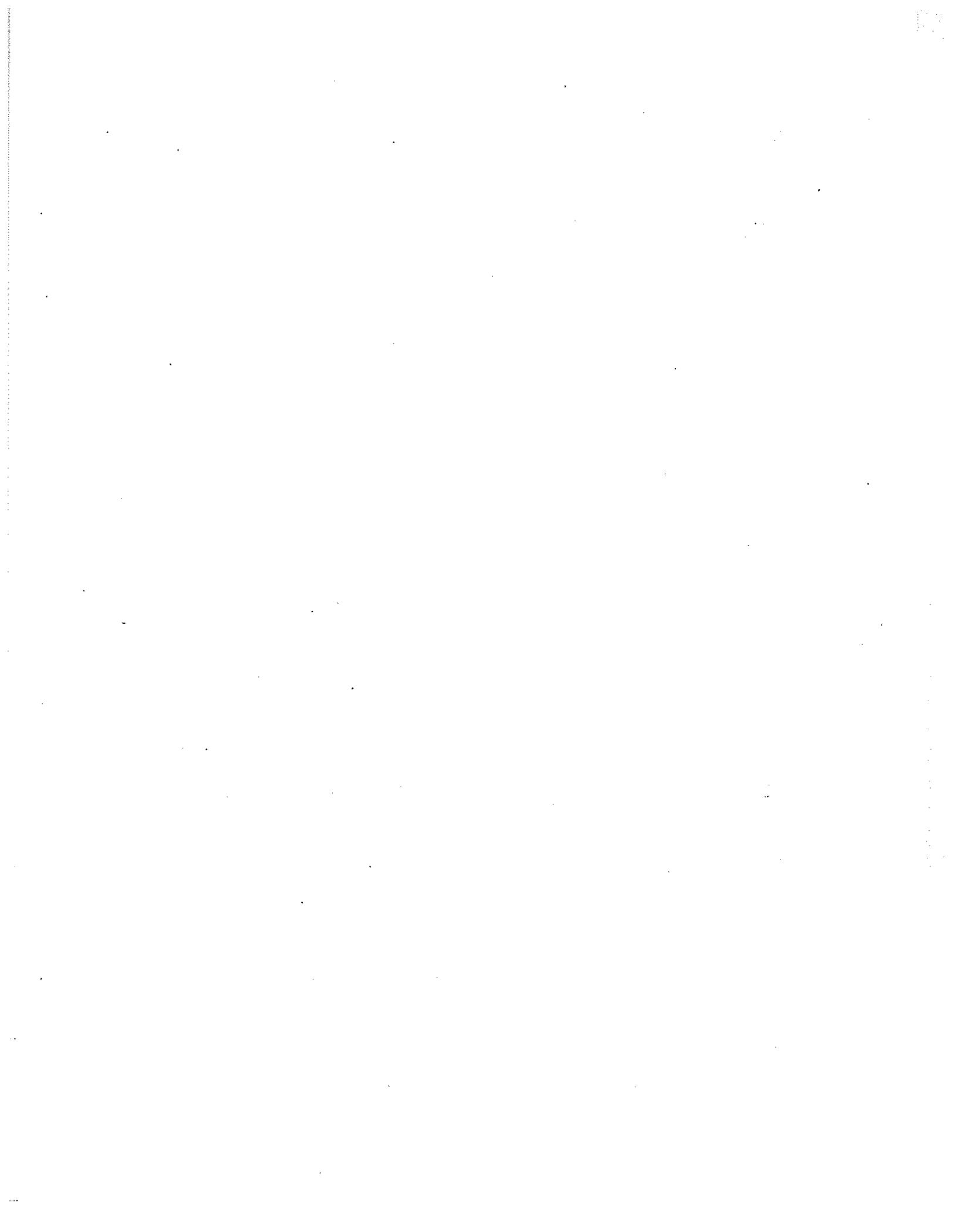
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PART II

ENVIRONMENTAL QUALITY



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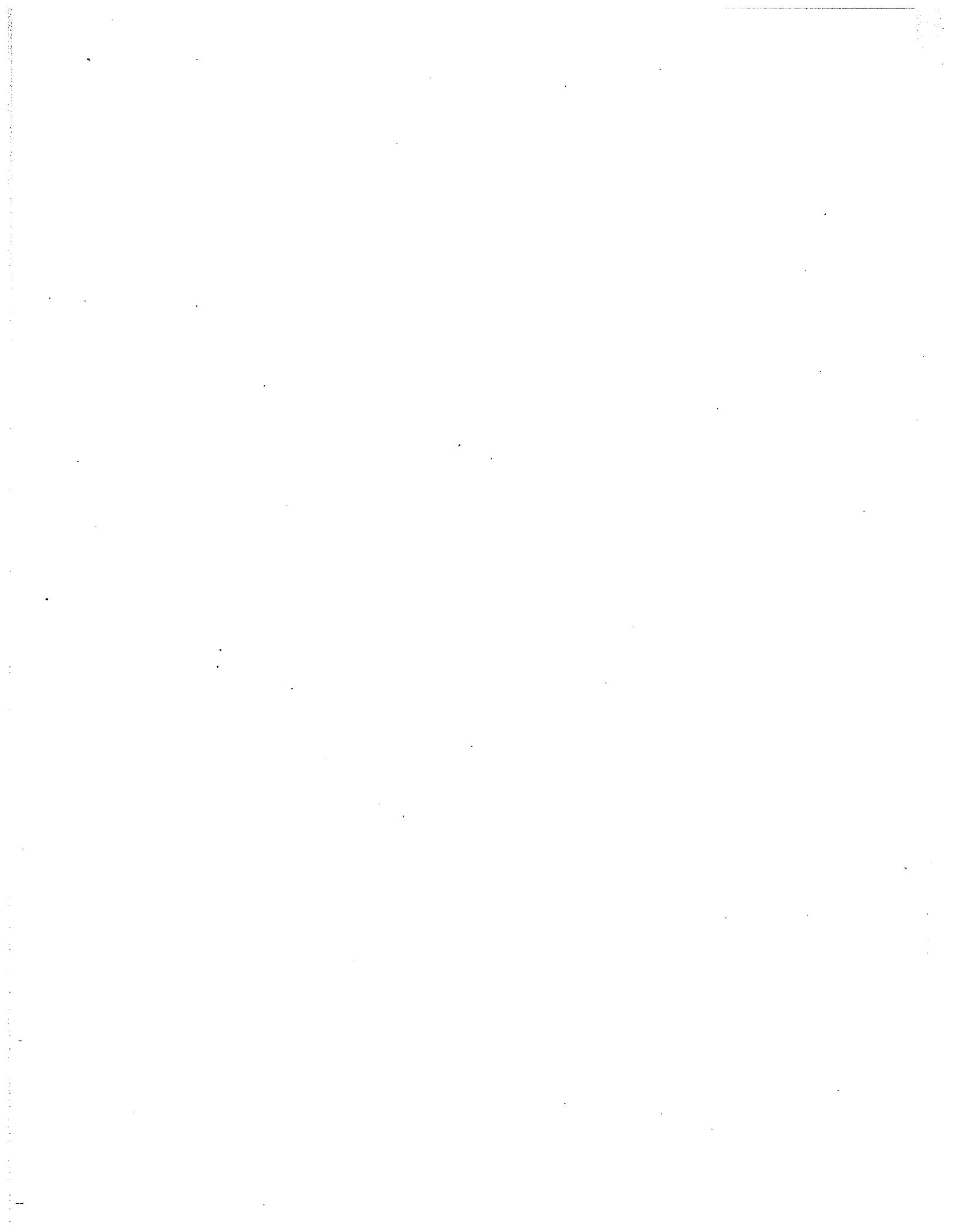


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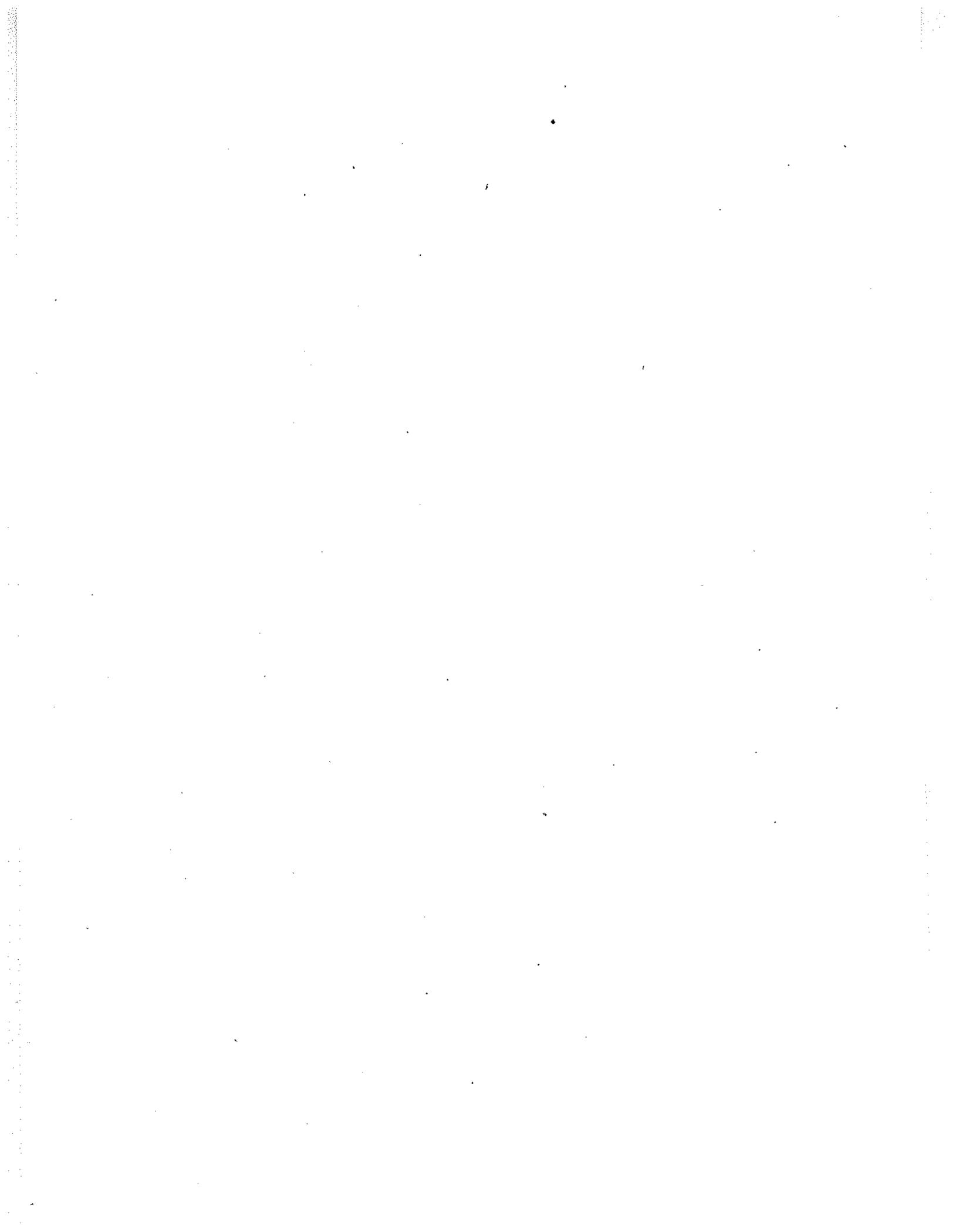
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Air Quality

Air Pollutant Concentrations

The Kankakee-Iroquois River basin lies across two U.S. Environmental Protection Agency (USEPA) Air Quality Control Regions (AQCRs): the East Central Illinois Intrastate, AQCR 66, and the Metropolitan Chicago Interstate, AQCR 67. Although no USEPA air quality measurement stations lie in the basin, two stations in Champaign and five in Will County are in the vicinity of the basin's southern and northern reaches, respectively. Air quality data for 1991-1995 from these stations are summarized in Tables 2-1-2-6.

Table 2-1 lists these air quality measurement locations, their Universal Transverse Mercator (UTM) coordinates, and the criteria pollutants measured at each (Illinois Environmental Protection Agency, IEPA, 1996). Criteria pollutants are those for which federal air quality standards have been set.

Table 2-1. Air Quality Site Directory for the Kankakee River Basin
(Selected sampling sites from USEPA Air Quality Control Regions 66 and 67)

City name (AIRS code)	Address	UTM coordinates (km)		Equipment
AQCR 66				
Champaign County	Booker T. Washington Elementary 606 E. Grove	N.	4442.017	O ₃ , SO ₂
		E.	395.248	
Champaign (0190005)	Post Office 600 N. Neil	N.	4441.819	PM ₁₀
		E.	394.066	
Will County	Commonwealth Edison Training Ctr. 35400 S. Essex Rd.	N.	4563.890	O ₃
		E.	400.178	
Joliet (1971002)	Pershing Elementary School Midland St. & Campbell St.	N.	4597.636	PM ₁₀ , Pb
		E.	406.854	
Joliet (1970013)	Water Plant West Route 6 and Young Rd.	N.	4590.279	PM ₁₀ , SO ₂
		E.	401.284	
Rockdale (1971009)	Volunteer Fire Department Midland & Otis	N.	4595.330	PM ₁₀
		E.	406.953	
South Lockport (1971008)	Fitness Forum 2021 Lawrence	N.	4603.045	O ₃
		E.	412.075	

Published annual reports from the IEPA (1992-1996) indicate that data for ozone (O₃), particulate matter with aerodynamic particle diameters smaller than 10 micrometers (PM₁₀), sulfur dioxide (SO₂), and lead (Pb) are available from one or more of these sampling sites. Neither carbon monoxide (CO) nor nitrogen dioxide (NO₂) was measured at any of these stations.

Air quality standards are written to protect human health (*primary* standards) and welfare (*secondary* standards). Because health and ecological effects vary according to the nature of the pollutant, standards also vary in terms of averaging times and the metric (maximum or mean) of the measurement. For example, the ozone standard is written in terms of the maximum daily 1-hour average concentration, while the particulate matter standard is written in terms of the maximum 24-hour average and the annual mean concentrations.

Table 2-2 gives ozone data for sites at Champaign, Braidwood, and South Lockport, Illinois. Note that ozone was only measured between April and October (the ozone season) of each year. The values listed are the highest 1-hour mean concentrations each year, ranging from 0.081 to 0.130 parts per million (ppm). There was one observed exceedence of the primary standard for ozone, at South Lockport in 1994.

Table 2-2. Daily Maximum 1-hour Mean Ozone Concentrations, April-October
(in parts per million, ppm)

Station	1991	1992	1993	1994	1995
Champaign-Washington Elementary	0.086	0.094	0.081	0.096	0.104
Braidwood	—	—	—	—	0.116
South Lockport	0.124	0.107	0.094	0.130	0.119

Note: The bold value indicates an observed exceedence of the primary standard of 0.12 parts per million (ppm). The 1991 value at South Lockport does not count as an exceedence because it rounds to 0.12 ppm.

Table 2-3 lists PM₁₀ data for 1991-1995. The highest annual maximum 24-hour mean concentration observed was 125 micrograms per cubic meter (µg/m³) at Rockdale in 1994, and the lowest was 40 µg/m³ at the Joliet Water Plant West site, also in 1994. Annual mean PM₁₀ concentrations ranged from 20 µg/m³ at the Joliet Water Plant West site in 1994 to 34 µg/m³ at the Rockdale site in both 1991 and 1994. No exceedences of the standards for particulate matter were observed at any of these sites.

Table 2-3. Concentrations of Particulate Matter Less Than 10-µm Diameter
(in micrograms per cubic meter, µg/m³)

Station		1991	1992	1993	1994	1995
Champaign-Post Office	Max. 24-hour mean	70	75	51	53	53
	Annual mean	30	31	22	25	22
Joliet-Pershing Elem.	Max. 24-hour mean	91	71	78	124	61
	Annual mean	31	31	26	25	24

Table 2-3. Concluded

Station		1991	1992	1993	1994	1995
Joliet-Water Plant	Max. 24-hour mean	---	---	---	40	60
	Annual mean	---	---	---	20	22
Rockdale	Max. 24-hour mean	96	78	60	125	66
	Annual mean	34	33	*	34	26

Note: There were no observed exceedences of the annual mean primary standard of $50 \mu\text{g}/\text{m}^3$ or the 24-hour primary standard of $150 \mu\text{g}/\text{m}^3$ at any station. An asterisk (*) indicates that the data did not meet minimum statistical selection criteria.

Table 2-4 presents SO_2 data, including maximum observed 3-hour and 24-hour concentrations and annual mean concentrations for sites in Champaign and Joliet. The maximum 3-hour mean concentrations ranged from 0.035 ppm in 1995 to 0.181 ppm in 1991 at Champaign. Maximum 24-hour mean concentrations ranged from 0.013 ppm in 1995 to 0.070 ppm in 1991 at Champaign. Annual mean concentrations ranged from 0.003 ppm at Champaign in 1992 and 1995 to 0.005 ppm at both sites in 1991. Neither site recorded any exceedences of the primary or secondary standards for 3-hour mean, 24-hour mean, or annual mean SO_2 .

Table 2-4. Sulfur Dioxide Concentrations
(in parts per million, ppm)

Station		1991	1992	1993	1994	1995
Champaign-Washington Elementary	Max. 3-hr mean	0.181	0.050	0.037	0.118	0.035
	Max. 24-hr mean	0.070	0.023	0.022	0.042	0.013
	Annual mean	0.005	0.003	*	0.004	0.003
Joliet-Water Plant	Max. 3-hr mean	0.076	0.115	0.086	0.087	0.091
	Max. 24-hr mean	0.027	0.032	0.030	0.036	0.037
	Annual mean	0.005	0.004	0.004	0.004	0.004

Note: An asterisk (*) indicates that the data did not meet the minimum statistical selection criteria. There were no observed exceedences of the annual mean primary standard of 0.03 ppm, the 24-hour primary standard of 0.14 ppm, or the 3-hour secondary standard of 0.50 ppm.

Table 2-5 shows annual mean concentrations of lead (Pb) at the Pershing Elementary site in Joliet for 1991-1995. Concentrations varied only from 0.01 to 0.02 $\mu\text{g}/\text{m}^3$, with no exceedences of the primary Pb standard.

Table 2-5. Annual Mean Lead Concentrations
(in micrograms per cubic meter, $\mu\text{g}/\text{m}^3$)

Station	1991	1992	1993	1994	1995
Joliet-Pershing Elementary	0.01	0.02	0.02	0.02	0.02

Note: There were no observed exceedences of the primary standard of a quarterly arithmetic mean of $1.5 \mu\text{g}/\text{m}^3$ at this station.

Air Pollutant Emissions Inventory

Table 2-6 presents estimated 1995 emissions of five criteria pollutants for the three counties having significant areas within the Kankakee-Iroquois River basin: Iroquois, Kankakee, and Will Counties. The estimated emissions are for stationary point sources only; they do not include emissions from mobile or area sources. The table also shows the percentage of each pollutant's three-county total attributable to each county in 1995. Will County accounted for virtually all of the sulfur dioxide and nitrogen oxide emissions, 90% of the carbon monoxide emissions, and most of the particulate matter and volatile organic carbon emissions.

Table 2-6. Estimated Stationary Point Source Emissions
(Source: Illinois Environmental Protection Agency, 1996)

County	Particulate matter		Sulfur dioxide		Nitrogen oxides		Volatile organic material		Carbon monoxide	
	T/yr	%	T/yr	%	T/yr	%	T/yr	%	T/yr	%
Iroquois	779	9	16	0	43	0	130	2	138	2
Kankakee	1,707	19	95	0	2,077	4	1,574	19	613	8
Will	6,637	73	76,325	100	48,551	96	6,658	80	6,618	90
Total	9,123	100	76,436	100	50,671	100	8,362	100	7,369	100

Visibility

Visibility can serve as an index of the concentration of airborne fine particles, especially ammonium sulfate, although atmospheric humidity also affects visibility to some extent. The poorer the visibility, the higher the concentration of fine particles. A report of the National Acid Precipitation Assessment Program reviewed spatial and temporal variations in visibility in the United States (NAPAP, 1990). A map of spatial variations of visibility during the mid-1970s shows that central and northeastern Illinois had some of the poorest median midday airport visibility in the contiguous United States--about 10-11 miles. This contrasts with values of 20-45 miles in the Great Plains and values greater than 50 miles over most of the mountainous western United States.

The NAPAP report also documents seasonal and long-term visibility trends. In 1950, visibility in central and northeastern Illinois was worse in the first calendar quarter (roughly during winter) than during the rest of the year. By 1980, however, the situation had changed significantly: winter visibility stayed roughly constant, but spring, fall, and especially summer visibility had decreased substantially in central and northeastern Illinois and most of the eastern United States. These trends coincide with increased use of electric power for summer air conditioning and the trend at that time toward construction of tall stacks for dispersion of power plant plumes.

In addition, the NAPAP report documents the high correlation between sulfur emissions and haziness in the northeastern United States, and the trend toward decreasing sulfur emissions in the region since the 1970s. In view of the further reductions in sulfur emissions mandated by the 1990 Clean Air Act amendments, airborne fine sulfate concentrations should continue to trend downward, and this should translate into increased visibility in central Illinois in the future.

Atmospheric Wet Deposition

Deposition of materials in precipitation (i.e., wet deposition) is measured routinely by the National Acid Deposition Program/National Trends Network (NADP/NTN) at many locations across the country. Three of these locations are in the vicinity of the Kankakee-Iroquois basin. NADP/NTN site IL-11 is at Bondville, near Champaign, site IL-19 is at Argonne National Laboratory, and site IN-41 is at the Purdue Agricultural Research Center in Indiana. Table 2-7 gives the measured major ion depositions, weighted mean concentrations, and precipitation at these sites for 1993 and 1994.

Concentrations of all individual ions were higher at the Purdue site in 1994, as can be expected from the usual inverse relationship between concentration and precipitation amount. At the Illinois sites, some ions had higher concentrations in 1994; others, notably Na, NH₄, NO₃, Cl, and SO₄, were higher in 1993. Although deposition fluxes of all ions were higher in 1993 at the Illinois sites because of the greater precipitation that year, this was not the case at the Purdue site, where Ca, Mg, and K depositions were higher in 1994, despite the smaller precipitation amount.

Table 2-7. Concentrations and Deposition of Major Ions in Precipitation in the Vicinity of the Kankakee River Basin

(Data source: National Atmospheric Deposition Program, 1995-1996)

	Ca	Mg	K	Na	NH ₄	NO ₃	Cl	SO ₄	H (lab)	pH (lab)	Precip (cm)
Argonne	Concentration, in mg/L										
1993	0.19	0.043	0.021	0.091	0.45	1.73	0.17	2.70	0.0436	4.36	103.3
1994	0.22	0.050	0.024	0.065	0.35	1.41	0.15	2.11	0.0335	4.47	79.0
2-yr precip. wtd. mean	0.20	0.046	0.022	0.080	0.41	1.59	0.16	2.44	0.0392	4.41	91.2
Bondville											
1993	0.17	0.025	0.019	0.086	0.39	1.70	0.15	2.66	0.0498	4.30	101.0
1994	0.19	0.026	0.023	0.069	0.44	1.50	0.13	2.26	0.0359	4.45	80.3
2-yr precip. wtd. mean	0.18	0.025	0.021	0.078	0.41	1.61	0.14	2.48	0.0436	4.36	90.7
Purdue											
1993	0.15	0.026	0.016	0.060	0.36	1.50	0.11	2.49	0.0433	4.36	111.5
1994	0.19	0.034	0.023	0.069	0.43	1.58	0.13	2.60	0.0442	4.36	94.2
2-yr precip. wtd. mean	0.17	0.030	0.019	0.064	0.39	1.54	0.12	2.54	0.0437	4.36	102.9

Table 2-7. Concluded

	Ca	Mg	K	Na	NH ₄	NO ₃	Cl	SO ₄	H (lab)	pH (lab)	Precip (cm)
Argonne	Deposition, in kg/ha										
1993	1.97	0.444	0.217	0.940	4.62	17.83	1.73	27.90	0.4500	---	103.3
1994	1.71	0.395	0.190	0.513	2.80	11.17	1.17	16.68	0.2650	---	79.0
2-yr. mean deposition	1.84	0.420	0.204	0.727	3.71	14.50	1.45	22.29	0.3575	---	91.2
Bondville											
1993	1.72	0.252	0.192	0.868	3.91	17.11	1.54	26.89	0.503	---	101.0
1994	1.55	0.209	0.185	0.554	3.52	12.01	1.05	18.12	0.288	---	80.3
2-yr. mean deposition	1.64	0.231	0.189	0.711	3.72	14.56	1.30	22.51	0.396	---	90.7
Purdue											
1993	1.68	0.290	0.178	0.669	4.05	16.77	1.25	27.77	0.4820	---	111.5
1994	1.75	0.320	0.217	0.650	4.00	14.85	1.22	24.45	0.4160	---	94.2
2-yr. mean deposition	1.72	0.305	0.198	0.660	4.03	15.81	1.24	26.11	0.4490	---	102.9

References

- Illinois Environmental Protection Agency. 1992-1996. Illinois Annual Air Quality Reports, 1991-1995. Bureau of Air, P.O. Box 19276, Springfield, IL 62794-9276.
- National Acid Precipitation Assessment Program. 1990. Acidic Deposition: State of Science and Technology Report 24, Visibility: Existing and Historical Conditions-- Causes and Effects. Washington, D.C.
- National Atmospheric Deposition Program/National Trends Network. 1995-1996. NADP/NTN Annual Data Summaries, 1993-1994. Precipitation Chemistry in the United States. Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO.

Water Quality

The *Illinois Water Quality Report, 1994-1995* (Illinois Environmental Protection Agency, IEPA, 1996) assesses the water quality conditions of the state's surface and ground-water resources. The IEPA report, which satisfies the reporting requirements of section 305(b) of the federal Clean Water Act, examines water quality in terms of designated uses. The report evaluates trends in stream and lake water quality and describes the numerous programs designed to protect the water resources in Illinois.

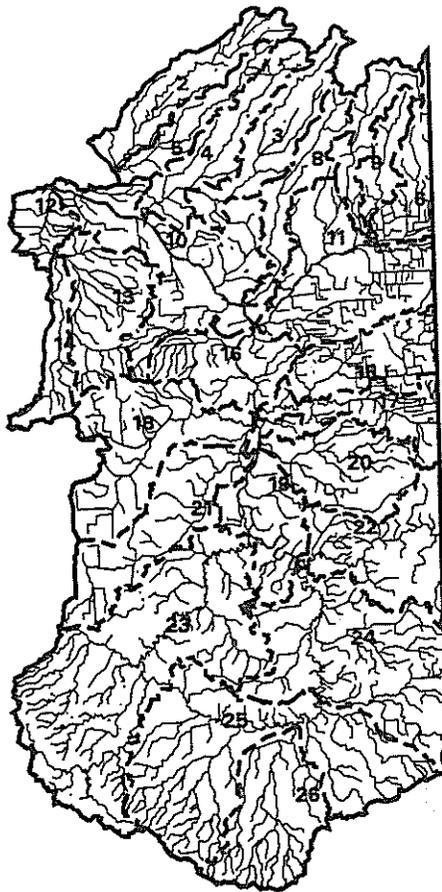
In 1993, the IEPA began restructuring its program activities around a priority watershed management process called the Targeted Watershed Approach (TWA). This approach significantly broadens the identification of water quality problems by considering a waterbody's potential for improvement and factoring in existing high quality resources into the geographic targeting process.

This chapter describes the water quality of rivers and streams, lakes, and watersheds in the Kankakee River basin. Figure 2-1 gives a general picture of these features.

Overall Use Support

The Illinois Pollution Control Board adopted four designated uses for Illinois' waters: General Use, Public and Food Processing Water Supplies, Lake Michigan, and Secondary Contact and Indigenous Aquatic Life Use. Overall use support is based on designated uses and refers to the overall condition of a stream or lake. Following are the five categories of overall use support:

- Full Support - The water quality meets the needs of all designated uses protected by applicable water quality standards.
- Full Threatened - The water quality is presently adequate to maintain designated uses, but if a declining trend continues, only partial support may be attained in the future.
- Partial Support/Minor Impairment (Partial Minor) - The water quality has been impaired, but only to a minor degree. There may be minor exceedences in applicable water quality standards or criteria for assessing the designated use attainment.
- Partial Support/Moderate Impairment (Partial Moderate) - Water quality conditions are impaired to a greater degree, inhibiting the waterbody from meeting all the needs for that designated use.
- Non-Support - The water quality is severely impaired and not capable of supporting the designated use to any degree.



- WS WSID
- 2 ILFB01
 - 3 ILFFB01
 - 4 ILFF01
 - 5 ILFBC01
 - 6 ILFRO1
 - 7 ILFQ01
 - 8 ILFN01
 - 9 ILFGA01
 - 10 ILF04
 - 11 ILF02
 - 12 ILFC01
 - 13 ILFCC01
 - 14 ILFCB01
 - 15 ILFLDA01
 - 16 ILFL02
 - 17 ILFLD01
 - 18 ILFLE01
 - 19 ILFLO3
 - 20 ILFLF01
 - 21 ILFLG01
 - 22 ILFL04
 - 23 ILFLH01
 - 24 ILFLI02
 - 25 ILFLIC01
 - 26 ILFLID01

Scale = 1:1000000



-  Basin Boundary
-  Watershed Boundary

-  Major Rivers and Streams
-  Rivers and Streams
-  Lakes

Figure 2-1. General Overview of the Kankakee River Basin
(Source: Illinois Environmental Protection Agency)

Rivers and Streams

The basin has a total of about 2,639 river miles (measured at a 1:100,000 scale). Of these, approximately 641 miles (24.3%) have been assessed by the IEPA. Table 2-8 and Figure 2-2 show the overall use support for rivers and streams in the basin.

Table 2-8. Overall Use Support for Rivers and Streams
(Source: Illinois Environmental Protection Agency, 1996)

Use support	River miles	Percent of assessed miles
Full	631.50	98.51
Partial Minor	9.54	1.49
Total	641.04	100.00

Lakes

There are 88 lakes in the Kankakee River basin (1:100,000 scale), with a total surface area of 809.4 acres and an average lake surface area of 9.2 acres. Of the 88 lakes in the basin, three were assessed in the *Illinois Water Quality Report, 1994-1995*. Table 2-9 and Figure 2-3 show the overall use support for these lakes.

Table 2-9. Overall Use Support for Lakes
(Source: Illinois Environmental Protection Agency, 1996)

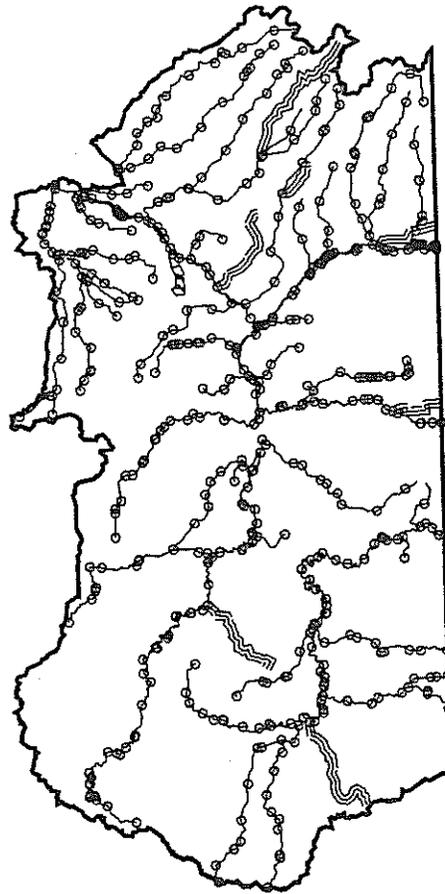
Lake name	Surface area, in acres	Use support
Bayles	125.0	Partial Moderate
Iroquois	125.0	Partial Minor
Monee Reservoir	46.0	Partial Minor

Sources of Impairment

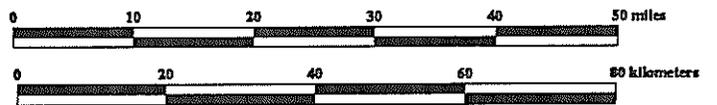
Once the overall use support of an area has been determined, any sources of impairment must be found before the water quality can be improved. Impairment sources are identified only for waterbodies with less than full support in the Kankakee River basin.

Rivers and Streams

The IEPA (1996) assessed the source and magnitude of impairment for Shavetail Creek (station code FLHA01), a 9.5-mile stream in the basin. Shavetail Creek has a high degree of impairment from agricultural sources (nonpoint source impairment).



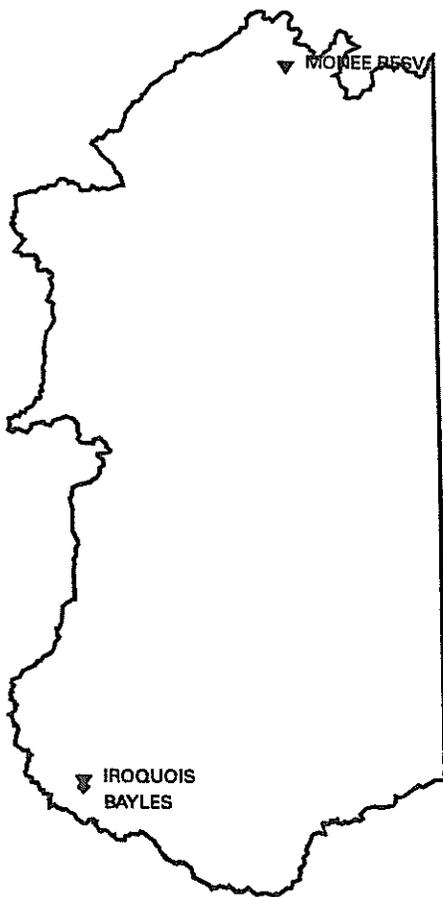
Scale = 1:1000000



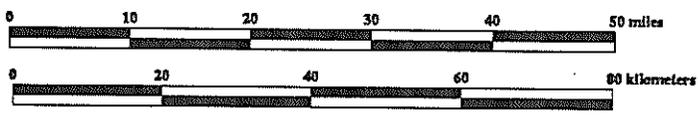
 Basin Boundary
 Watershed Boundary

 Full Support
 Full Threatened
 Partial Minor
 Partial Moderate
 Non-Support

Figure 2-2. Overall Use Support for Rivers and Streams in the Kankakee River Basin
 (Source: Illinois Environmental Protection Agency)



Scale = 1:1000000



-  Basin Boundary
-  Watershed Boundary
-  Full Support
-  Full Threatened
-  Partial Minor
-  Partial Moderate
-  Non-Support

Figure 2-3. Overall Use Support for Lakes in the Kankakee River Basin
 (Source: Illinois Environmental Protection Agency)

Lakes

Table 2-10 shows the sources of impairment for the three assessed lakes in the Kankakee River basin. In addition, the table shows the magnitude of impairment for each source: high (H), moderate (M), slight (S), or none (N).

Table 2-10. Sources of Lake Impairment
(Source: Illinois Environmental Protection Agency, 1996)

Lake name	Ag.	Const.	Urban runoff	Mining	Land disposal	Hydro. mod.	Cont. sed.
Bayles	S	N	N	N	N	N	S
Iroquois	M	N	H	N	S	S	S
Monee Reservoir	N	N	N	N	N	N	N

Note: All fields represent nonpoint source impairments. Ag. = Agriculture; Const. = Construction; Hydro. mod. = Hydrologic modification; Cont. sed. = Contaminated sediments.

Trends

Rivers and Streams

Another way to examine water quality is through trends. The IEPA analyzes rivers and streams using the Seasonal Kendall trend analysis on selected ambient stream assessment stations throughout the state. Following are some of the objectives behind the trend analysis presented in the *Illinois Water Quality Report* (IEPA, 1996):

- Evaluate the water quality impact from a point source discharge and the need for additional wastewater treatment controls.
- Characterize the existing and potential aquatic resource of the receiving stream.
- Determine whether there is a significant biological impact on the receiving stream.
- Identify a recommended stream monitoring site for National Pollutant Discharge Elimination System (NPDES) monitoring requirements to determine compliance with water quality standards.
- Identify additional data needs if information is not adequate to achieve the above objectives.

Table 2-11 shows the trend associated with each parameter used in the Seasonal Kendall trend analysis. The analysis was performed at station FL02, located on the Iroquois River near Chebanse, which drains approximately 1,403 square miles.

Table 2-11. Water Quality Trends for the Iroquois River near Chebanse
 (Source: Illinois Environmental Protection Agency, 1996)

Parameter	Trend
Water Temperature	None Detected
Specific Conductance	None Detected
Dissolved Oxygen	None Detected
pH	Upward
Chemical Oxygen Demand	None Detected
Total Suspended Solids	None Detected
Total Ammonia Nitrogen	None Detected
Nitrate + Nitrite Nitrogen	None Detected
Total Phosphorus	None Detected
Boron	None Detected
Stream Flow	None Detected

Lakes

As with rivers and streams, the water quality of lakes can be examined in terms of trends. According to the IEPA (1996), "lake waterbodies with three or four years of calculated trophic state index (TSI) values were reviewed for trends using a linear regression, nonstatistical analysis."

Not all lakes were examined for water quality trends. There were no trends detected in the three assessed lakes (Bayles, Iroquois, and Monee Reservoir).

Targeted Watershed Approach

Water quality conditions can also be examined from a watershed perspective. The IEPA's watershed monitoring program is called the Targeted Watershed Approach. Following is an excerpt from *GIS Technology Support for the Targeted Watershed Approach* by Sinclair et al. (1996).

"The Targeted Watershed Approach (TWA) was developed to establish a framework for prioritizing Bureau of Water program activities with targeted watersheds...

"The TWA was conceived and developed primarily to facilitate water quality management planning. Objectives for the utilization of this approach are:

- Identify watersheds with the most critical water quality problems and direct programs and resources to the solution of those problems.

- Direct programs and resources to those watersheds considered to have the highest potential for improvement based on the State’s Biological Stream Characterization (BSC) process, and other factors.
- Protect existing high-quality water resources considered to be threatened (i.e., those waters displaying declining water quality trends but still fully supporting overall use attainment).
- Integrate point and nonpoint source programs activities.”

The TWA has three watershed priority categories: point source predominated, combination point/nonpoint source predominated, and nonpoint source predominated. Table 2-12 further breaks down the categories of prioritization in the TWA.

Table 2-12. Prioritization of Targeted Watersheds
(Source: Sinclair et al., 1996)

Category*	Description
Priority 1	<ul style="list-style-type: none"> - Waters identified in section 303(d) of the Clean Water Act - Threatened waters - Surface water intakes that currently have Safe Drinking Water Act (SDWA) MCL violations - Ground-water (GW) sources with SDWA monitoring detections over the GW quality standards for Atrazine - Ambient GW monitoring network Nitrate detections over the GW quality standards
Priority 2	<ul style="list-style-type: none"> - Watersheds with high potential for improvement - Surface water intakes with previous (SDWA) MCL violations - GW sources with SDWA monitoring detections below GW quality standards for Atrazine and Alachlor - Ambient GW monitoring network Nitrate detections of 3-10 ppm
Priority 3	<ul style="list-style-type: none"> - Watersheds with lower potential for improvement
Priority 4	<ul style="list-style-type: none"> - Watersheds with suspected nonpoint source impacts as assessed and identified in the Clean Water Act 305(b) report

*Note: Priorities 1-3 include point source predominated, combination point/nonpoint source, and nonpoint source only. Priority 4 is nonpoint source only.

There are 25 watersheds in the Kankakee River basin. Watershed name, identifier (corresponding to the Waterbody Identifier in the *Illinois Water Quality Report*), acres, square miles, and percent of basin are shown in Table 2-13.

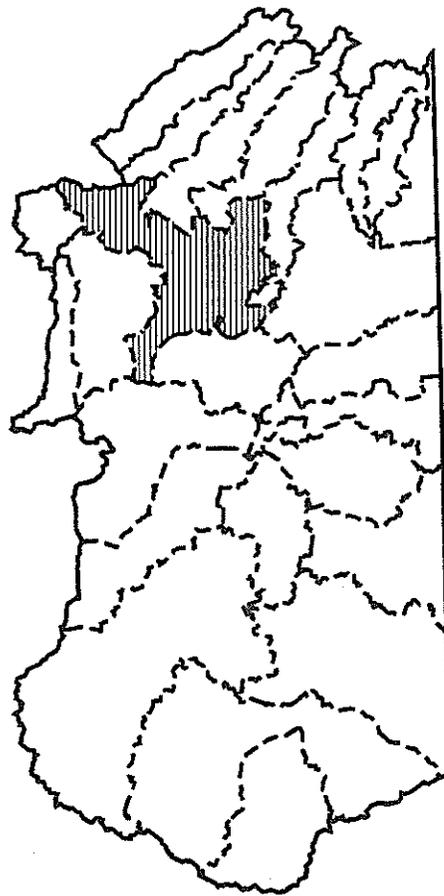
Table 2-13. Watersheds of the Kankakee River Basin
 (Source: Illinois Environmental Protection Agency, 1996)

Watershed name	Watershed identifier	Acres	Square miles	Percent of basin
Kankakee River	ILF02	76,878.90	120.13	5.95
Kankakee River	ILF04	82,267.19	128.55	6.37
Forked Creek	ILFB01	38,146.25	59.61	2.95
S. Br. Fork Creek	ILFBC01	22,986.01	35.92	1.78
Horse Creek	ILFC01	15,484.61	24.20	1.20
W. Br. Horse Creek	ILFCB01	19,803.66	30.94	1.53
E. Br. Horse Creek	ILFCC01	46,424.62	72.54	3.59
Rock Creek	ILFF01	37,934.10	59.27	2.94
S. Br. Rock Creek	ILFFB01	38,432.78	60.05	2.97
Iroquois River	ILFL02	39,108.75	61.11	3.03
Iroquois River	ILFL03	41,460.63	64.78	3.21
Iroquois River	ILFL04	54,833.01	85.68	4.24
Beaver Creek	ILFLD01	31,627.75	49.42	2.45
Little Beaver Creek	ILFLDA01	38,150.81	59.61	2.95
Langan Creek	ILFLE01	68,080.43	106.38	5.27
Pike Creek	ILFLF01	45,013.01	70.34	3.48
Prairie Creek	ILFLG01	56,617.81	88.47	4.38
Spring Creek	ILFLH01	160,211.49	250.34	12.40
Sugar Creek	ILFLI02	103,060.48	161.04	7.98
Mud Creek	ILFLIC01	127,288.93	198.90	9.85
Mud Creek West	ILFLID01	54,287.24	84.83	4.20
Exline Slough	ILFN01	29,743.08	46.48	2.30
Trim Creek	ILFQ01	24,470.34	38.24	1.89
Pike Creek	ILFQA01	16,021.06	25.03	1.24
Singleton Ditch	ILFR01	23,850.03	37.27	1.85
Total		1,292,182.97	2,019.13	100.00

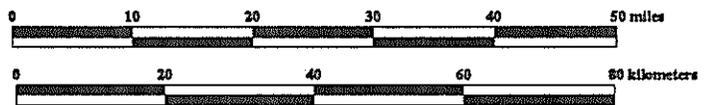
Figure 2-4 depicts the Kankakee River watershed (watershed identifier ILF04), the only nonpoint source predominated watershed in the basin

References

- Illinois Environmental Protection Agency. 1996. Illinois Water Quality Report, 1994-1995. Illinois Environmental Protection Agency. Springfield, IL.
- Sinclair, R.A., B.R. Ward, and Illinois Environmental Protection Agency. 1996. GIS Technology Support for the Targeted Watershed Approach. Illinois State Water Survey Contract Report 600. Champaign, IL.



Scale = 1:1000000



 Basin Boundary
 Watershed Boundary

 Priority 1
 Priority 2
 Priority 3
 Priority 4

Figure 2-4. Nonpoint Source Predominated Targeted Watersheds
 (Source: Illinois Environmental Protection Agency)

Hazardous and Toxic Waste Generation and Management

This section of the Area Assessment examines the historical and current location of sites that may contain environmental contaminants and manufacturing facilities that may emit pollutants. The aim of the report is to help major stakeholders develop goals and strategies for the use and protection of natural resources in Areas where Ecosystem Partnerships have been formed. The reader is encouraged to review *The Changing Illinois Environment: Critical Trends, Volume 5* (ENR, 1994), which provides in-depth background information about waste generation and management trends in Illinois.

The report draws upon the following environmental databases as resource material:

- Historical Hazards (HH)
- Surface Impoundment Inventory (SII)
- Landfills Database
- Superfund
- Toxics Release Inventory (TRI)

The older a database, the more likely it is to contain out-dated entries. With minor exceptions, the data is shown verbatim. See the *Headwaters Area Assessment, Volume 4* (DNR, 1997), for a more detailed discussion of each of these databases and a list of contacts for further information. Alternatively, additional information can be obtained from WMRC Data Management at One East Hazelwood Drive, Champaign, IL 61820, telephone number 217-333-8940.

Assessment of Sites in the Region

Specific potential sources of waste generation and disposal in the Kankakee Area are discussed below. See the maps, Figures 2-5 — 2-7, for geographic locations of these sites.

Historical Hazards Database

It is estimated that "approximately 90% of hazardous waste disposal since the 1800s has been unregulated" (Colten, 1990). Since World War II both the quantity and types of hazardous chemicals used and produced by industry has grown rapidly. The changing urban landscape only adds to the confusion about how, where, and to what extent,

Figure 2-5. Landfills, Superfund Sites, TRI Sites, Surface Impoundment Sites, and Towns in Historical Hazards Database in the Kankakee Area

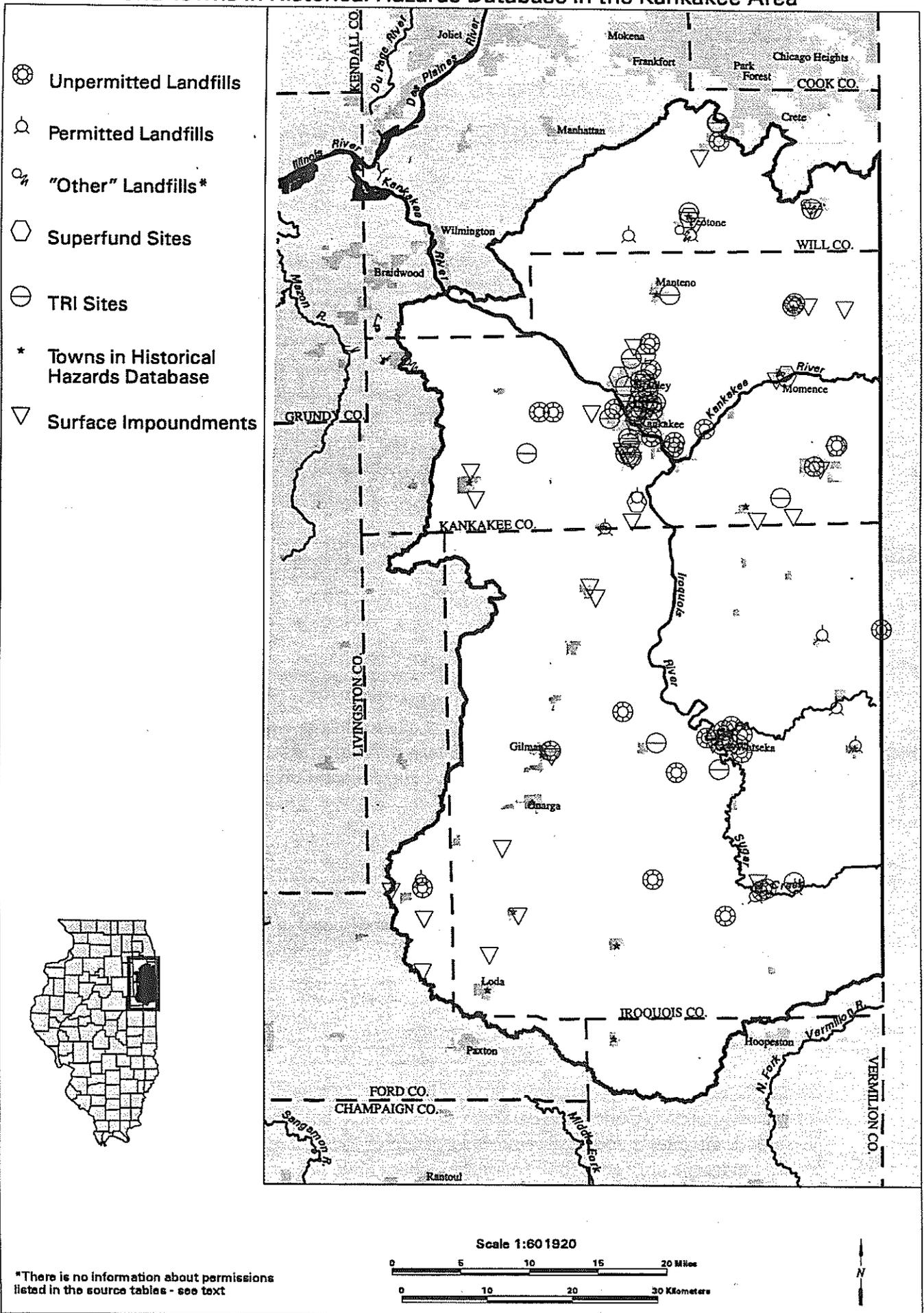
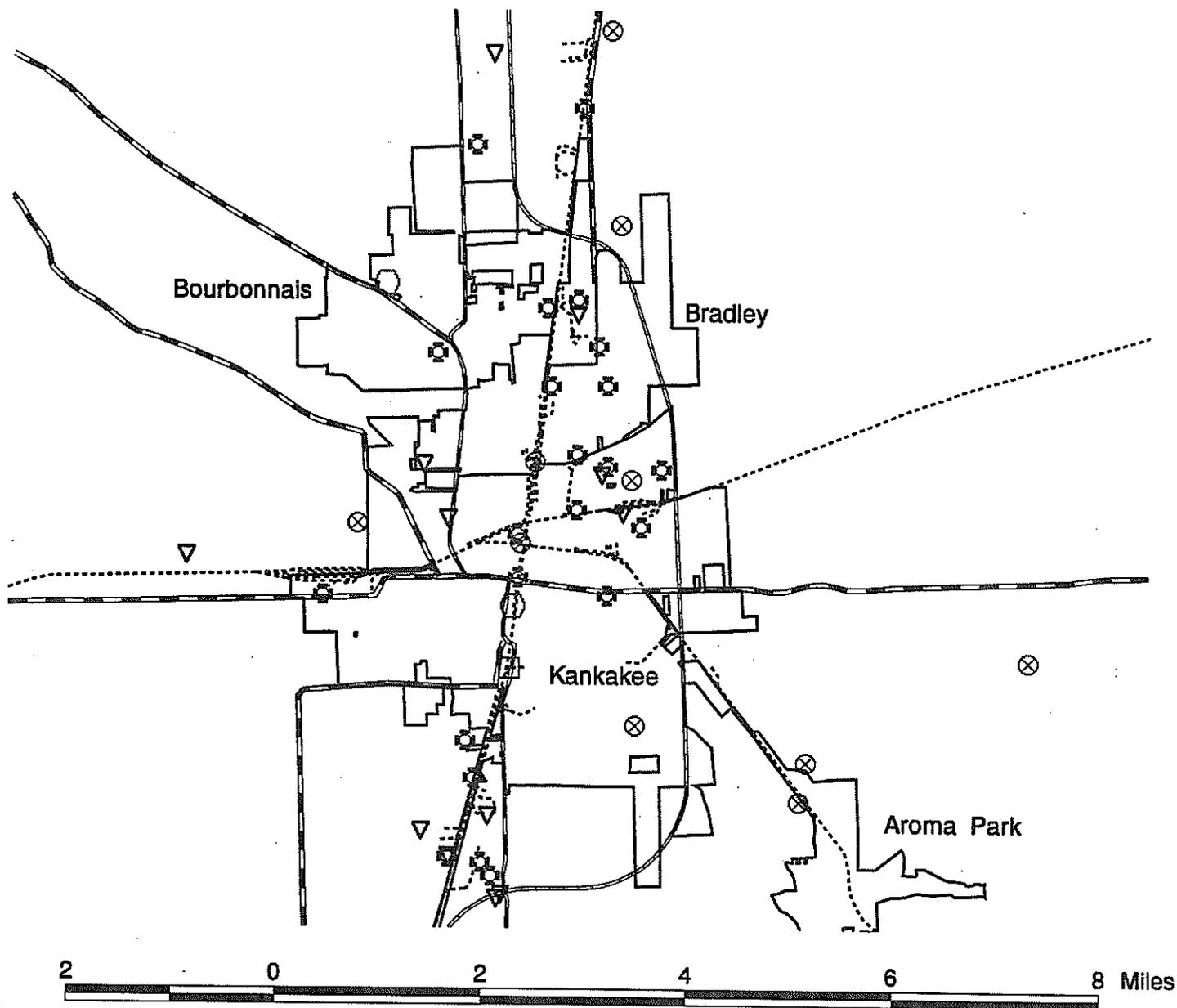


Figure 2-6. Kankakee Vicinity Landfills, Superfund Sites, TRI Sites and Surface Impoundments in the Kankakee Area

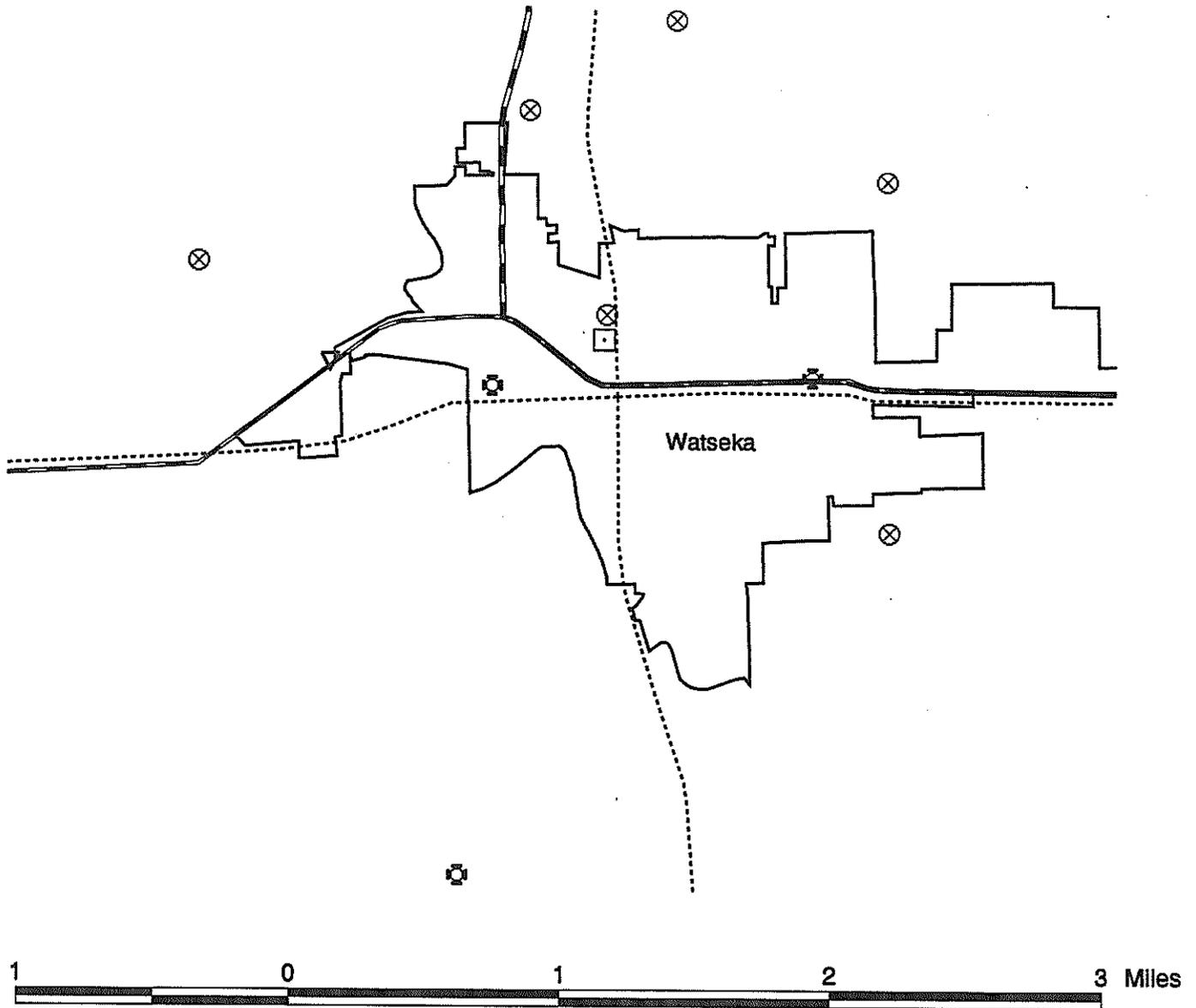


- ⊗ Unpermitted Landfills
- ⊠ Permitted Landfills
- ⊡ "Other" Landfills*
- ▽ Surface Impoundments
- ⊙ TRI Sites
- ⊙ Superfund Sites
- ══ Interstates
- ══ US Highways
- State Highways
- ⋯ Railroads
- ▭ Municipal Boundary
- - - Watershed Boundary



*There is no information about permissions in the source tables - see text

Figure 2-7. Watseka Vicinity Landfills, Superfund Sites, TRI Sites and Surface Impoundments in the Kankakee Area



- ⊗ Unpermitted Landfills
- ⊠ Permitted Landfills
- ⊡ "Other" Landfills*
- ▽ Surface Impoundments
- ⊕ TRI Sites
- ⊙ Superfund Sites
- ══ US Highways
- ══ State Highways
- - - Railroads
- ▭ Municipal Boundary
- ▭ Watershed Boundary

*There is no information about permissions in the source tables - see text

hazardous wastes still affect locales. Frequently, both solid and liquid wastes were dumped on-site or landfilled along with municipal refuse. Few, if any, records were kept by manufacturing firms about specific disposal practices prior to the Resource Conservation and Recovery Act (RCRA) of 1976. In many cases these practices created potential risks and liabilities for buyers and sellers of real estate.

There are 17 towns in the Area shown in the Historical Hazards database (see Table 2-14). Each of these towns contains one or more possible sources of pollutants from historical industrial facilities.

Table 2-14. Historical Hazards Towns in the Kankakee Area

Buckley	Grant Park	Manteno	Peotone	Watseka
Chebance	Herscher	Milford	Rankin	
Cissna Park	Kankakee	Momence	Sheldon	
Gilman	Loda	Onarga	St. Anne	

Surface Impoundments Database

A surface impoundment is a lined or unlined lagoon used for the storage of liquids alone or mixed with solids, usually uncovered.

In the Area the Surface Impoundment Inventory shows 35 surface impoundment sites with a total of 65 impoundments. Of these sites, 6 are agricultural, 31 industrial, 28 municipal, and 0 mining.

Since these data were collected in 1980, some of these impoundments may no longer exist, and new ones may have been built. It should be noted that land at a former impoundment site may be contaminated even though the surface impoundment itself has been filled and possibly covered.

Surface impoundments can pose a significant risk to groundwater in shallow aquifers, because Illinois is in a humid region where precipitation amounts are generally greater than evaporation. This means that eventually some impounded liquid will either overflow, drain into the ground, or need to be drained off deliberately (Pishkin, 1980).

Superfund Sites Database

There are seven active Superfund sites in the Area (see Table 2-15). It appears that one site has a match in the landfill tables. The match is not definite, because the landfill tables have IEPA numbers and the Superfund sites tables have USEPA numbers, so other, less

concise information must be used, such as name, permit history, etc. One site in the Area is on the Final National Priority List (NPL).

Table 2-15. Superfund Sites in the Kankakee Area

EPA ID	Site Name	City	Description	NPL Status
ILD025566324	A.O. Smith	Kankakee	N/A	No
ILD000670836	Armstrong World Industries	Kankakee	N/A	No
ILD980996862	Birmingham Steel Corp Illinois Steel	Bourbonnais [sic]	N/A	No
ILD980608137	CID Landfill	Otto Township	N/A	No
ILD980792303	Cross Brothers Pail Recycling (Pembro	Pembroke Twp	Site is an abandoned drum and pail reclamation facility. Soil and groundwater contamination have been documented. Two residential wells are contaminated.	Final
ILD069503944	Custom Blended Oils	Pentone [sic]	N/A	No
ILD082089012	Peterson Puritan	Momence	N/A	No

Landfills Database

Landfills have been by far the most common means of disposal for solid waste. There are 49 landfills recorded in the Area — 12 permitted, 34 unpermitted and 3 “other.” The “other” landfills have no permissions in the “permit” and “illegal” fields in the source tables.

Most of the unpermitted landfills are indicated to as containing "non-hazardous" waste; however, the term "hazardous" has various meanings in different contexts. Some of the unpermitted landfills are classified as open or random dumps. These may be minor in extent, and contain only household waste or demolition debris from buildings and roads. These landfills and dumps must be examined on a case-by-case basis in order to assess any potential risk they may pose.

Though other environmental problems are associated with landfills, one of the most serious is water from rain or snow leaching contaminants from waste inside the landfill into the surrounding soil. Many landfills, especially unpermitted ones, have no barrier or liner to prevent this. These contaminants may then be transported into shallow aquifers, wells, streams and rivers. These leachates can contaminate drinking water and adversely affect the environment in general. The possible range of contaminants is large, ranging from VOCs (volatile organic compounds) from discarded cleaning or painting compounds, heavy metals leached from household or vehicle batteries, oil from discarded machinery, and pesticides, to name but a few. Additionally, organic waste, such as discarded food, can provide a breeding ground for undesirable bacteria, and may attract unwanted wildlife. Flooding of landfills can expose refuse and mobilize contaminants.

TRI Database

The Toxics Release Inventory (TRI) covers year-by-year releases and transfers of chemicals by medium from manufacturing facilities. Releases include air, land, water, and underground injection. Transfers are of six types: to publically owned treatment works (POTWs), to treatment, to disposal, to recycling, to energy recovery, and to "other" facilities. Other information, most notably on pollution prevention, is also contained in the database, but not used in this report.

There are 34 TRI facilities in the Area for the years 1987-1993, with 27 reporting in 1993 (see Table 2-16). There were no releases to underground injection in the Area.

Illinois ranked 7th in the country for TRI total releases in 1993.

The chemical industry, as defined by SIC (standard industrial classification) code, is the single largest emitter of TRI chemicals nationwide in 1993. Of the 27 facilities which reported in 1993, ten have a chemical primary SIC code listed.

A wide variety of chemicals were released to this and other Areas over the seven-year period from 1987 to 1993. Listed here are the top five chemicals released to air, land, surface water, and underground injection, as well as two types of transfers: recycling and energy recovery. Considerable expertise is required to determine whether or not releases pose a threat to resources or people in the Area. Once in the environment, external factors may act on or other chemicals may interact with these compounds.

Notice that for the Area the top five total releases match exactly the top five air releases.

Table 2-16. TRI Facilities in the Kankakee Area

American Spring Wire Corp.	Federal Signal Corp. Signal Div.	Rohm & Haas Delaware Valley Inc.
Armour Pharmaceutical Co.	GNB Battery Tech. Inc.	Sea Sprite Inc.
Armstrong World Ind. Inc.	H & R Ind. Inc.	Steel Structures Inc.
Birmingham Steel Corp. Kankakee Illinois Steel Div	Harsco Corp. Heckett Div. Plant 3	Sun Chemical Corp. General Printing Ink Div.
Borden Inc. Dairy	Henkel Corp.	T & D Metal Prods.
Bunge Foods.	Howard Ind. Inc.	Uarco Inc.
Cargill Inc.	Lifetime Doors Inc.	United Coatings Inc.
CBI Services Inc.	Miles Inc.	Valspar Corp.
Cleveland Steel Container Corp.	Nutrasweet Co.	Van Leer Containers Inc.
Crown Cork & Seal Co. Inc.	Pilot Battery Inc.	W. W. Henry Co.
Dowbrands	Power Packaging Inc.	
Essex Specialty Prods. Inc	Quaker Oats Co.	

Top Five TRI Releases for the Area for 1993

Air

- Glycol Ethers 277,166 lbs.
- N-butyl alcohol 218,796
- Toluene 148,175
- Methanol 103,202
- Xylene (mixed isomers) 79,275

Land

- Manganese 5
- Chromium 3
- Nickel 3

These were the only releases to land in the Area for 1993.

Surface Water

● Lead Compounds	61 lbs.
● Vinyl Acetate	37
● Butyl Acrylate	23
● Styrene	12
● Sulfuric acid	5

Underground Injection

There were no releases to underground injection in the Area in 1993.

Top Five TRI Transfers for the Area for 1993

Recycling

● Zinc compounds	10,184,956 lbs.
● Lead compounds	3,587,256
● Manganese compounds	488,878
● Lead	130,084
● Nickel	85,562

Energy Recovery

● Methyl Ethyl Ketone	123,744 lbs.
● Methanol	83,919
● Styrene	62,000
● Glycol ethers	58,990
● Xylene (mixed isomers)	56,366

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PART III

ARCHAEOLOGICAL RESOURCES

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Archaeological Resources in the Kankakee River Assessment Area Watershed

Introduction

Illinois has long been the subject of archaeological research. This interest stemmed initially from recognition of a rich and complex record of human settlement and cultures in and near the major river valleys in the state. Though not all areas within the state have an equal distribution of archaeological resources, the smaller stream valleys and surrounding uplands have an equally long, and potentially as complex, record of prehistoric and historic use. Study of cultural resources in these smaller river drainage areas can provide valuable information that may enhance and complement our knowledge of cultural developments within the state as a whole. The more recently glaciated areas in the northeastern part of the state provided environmental settings for prehistoric and early historic inhabitants that were substantially different from the older upland landscapes and major river valleys in the southern two-thirds of Illinois. These settings include substantially greater proportions of poorly drained areas, large numbers of natural lakes, and small tracts with internal drainage. The Kankakee River Assessment Area Watershed (KRAAW) includes portions of this younger landscape, but also includes the Illinois portion of the Iroquois River drainage. The Iroquois River drainage lies at the northern edge of the older Illinoian till plain, and its older landscape generally has flatter topography and fewer natural lakes. These environmental differences within the KRAAW potentially affected both prehistoric and historic settlement and land use and should be partially reflected in the distribution of archaeological resources within the KRAAW.

Over the past century, archaeologists have developed a framework of cultural history for the 12,000 years of human occupation that has been documented in the state (see Table 3-1). In the process of constructing this framework, archaeologists have developed and contributed to a still-growing body of knowledge about human culture and earth history. Using interdisciplinary and evolutionary approaches, archaeological research has contributed to our understanding of both present and past climate, plant and animal communities, and landscapes. In our present framework, Illinois culture history has been divided into a series of temporal periods. Each period is associated with fundamentally different cultures and ways of life, as indicated by the material culture or artifacts which are the remains of human habitation. The basic unit of study in archaeological research is the site--a location where artifacts are found. Documentation of sites associated with various temporal periods and study of the distribution of sites on the landscape provide opportunities to refine our understanding of the past and to investigate how human

Table 3-1. Chronological Framework for Illinois Culture History

Period	Subperiod	Calendar Years (Dates indicate beginning of period)
Historic	Postwar	A.D. 1946
	Urban Industrial	A.D. 1901
	Early Industrial	A.D. 1871
	Frontier	A.D. 1841
	Pioneer	A.D. 1781
	Colonial	A.D. 1650
	Native American	A.D. 1650
	Unidentified	A.D. 1650
Protohistoric		A.D. 1500
Upper Mississippian	Oneota	A.D. 1400
Mississippian		A.D. 900
Woodland	Late Woodland	A.D. 300
	Middle Woodland	200 B.C.
	Early Woodland	1000 B.C.
		1000 B.C.
Archaic	Late Archaic	3000 B.C.
	Middle Archaic	6000 B.C.
	Early Archaic	8000 B.C.
		8000 B.C.
Paleo-Indian		10000 B.C.
Prehistoric	Indeterminate	

cultures have developed and adapted to changing environmental and social conditions.

To the best of our present knowledge, human history in Illinois begins with the arrival of Native Americans during the terminal stages of the last glaciation. During the Paleo-Indian period, people lived in environmental conditions very different from any found in the state today. This initial period of human settlement was characterized by coniferous forests and presence of several animal species that are either extinct (mammoth and mastodon, for example) or which now inhabit regions farther north. Paleo-Indian sites as a rule are rare, small, and have few artifacts. Based mainly on research in other regions of North and South America, we infer that Paleo-Indian people were hunters and gatherers that were completely dependent on seasonal availability of resources for their survival.

During the Archaic period, more modern climatic conditions prevailed, with plant and animal communities found at or near their present distributions. During this period (8000-1000 B.C.), Native Americans continued their hunting and gathering practices, but by the end of the period were cultivating several native plants for seeds, and systematic horticulture was being practiced. In and near many of the larger stream valleys, larger and more permanent communities begin to be found during the Middle Archaic subperiod. These more substantial sites served as bases from which people embarked on hunting and gathering trips into upland or other settings for the purpose of acquiring specific types of resources. Between about 6000 and 2000 B.C. there is a period of markedly warmer and drier conditions which led to the establishment of prairie vegetation communities in the interior of the state, especially in low-relief upland areas. During this time of warmer and drier conditions, Native American settlements appear to be found closer to streams or other permanent water bodies.

Characteristics of the Woodland Period include greater dependence on cultivated plants, establishment of long-lasting villages often associated with construction of mounds that served as cemeteries, elaboration of long-distance trade networks, and widespread use of pottery vessels. During the Middle Woodland subperiod, mound construction and long-distance trade was most elaborate, resulting in a period of pan-regional social integration associated with indications of social differentiation. During the Late Woodland subperiod, corn becomes a food staple for the first time, and the bow-and-arrow becomes the weapon of choice, largely replacing the spear thrower.

During the Mississippian Period we see development of socially and economically complex societies. There is strong emphasis on cultivated crops, especially corn, squash, and a variety of native plants that are now considered to be weeds. A powerful elite social class oversaw construction of monumental public works projects, including plazas and large earthen mounds in the center of larger towns. Mississippian culture spread throughout the Mississippi River valley and its tributaries and into the southeastern United States. Artistic styles and cultural materials associated with Mississippian cultures are found in virtually all portions of the state and throughout the Southeast. This

cultural adaptation affected many people located well outside of its original heartland in the central Mississippi River valley.

In general, Upper Mississippian and Protohistoric cultures are poorly documented. Most sites of these time periods appear to be concentrated in major river valleys, but there is some indication of dispersed communities in upland and small valley settings. Some elements of Mississippian culture, such as corn gardening, persist into later times, but social differentiation and large-scale earthwork construction diminish greatly by A.D. 1400. Cultivated beans are added to the diet.

The arrival of the French in the late 17th century provides the first written accounts of Native American lifeways in Illinois. With this record comes the identification of specific Native American tribes and more detailed documentation of everyday life. Historic Native American sites are generally rare on the landscape but provide important information on lifeways that were in rapid transition as a result of cultural contact and conflict. Historical documents also provide information about European and Euro-American lifeways on the frontier. Few sites are recognized for the Colonial Historic subperiod, but increasing European and Euro-American influences and settlement provide more cultural material and sites associated with the Pioneer Historic subperiod. The increasing Euro-American presence also resulted in greater conflicts between Native Americans and European settlers. The conflicts culminated in the early 19th century with the Black Hawk War and the Battle of Tippecanoe (Indiana), after which tribes were required to move west across the Mississippi River. By the beginning of the Frontier Historic subperiod, Native American settlements in Illinois are generally absent, and Euro-American settlement has spread throughout the state.

Written history does not adequately record many aspects of daily life; instead, written histories often focus on singular events or persons. We have learned that archaeological investigations can provide insight into past cultural behavior that supplements and expands the written historic records. Increasingly, archaeologists are exploring the combined written and material record of the past two centuries to provide a more comprehensive interpretation of human history, including both Native American and Euro-American cultures.

Archaeological Resources of the Kankakee River Assessment Area Watershed

When compared with some other regions in Illinois, archaeologists have conducted a comparatively small amount of work in the Kankakee River Assessment Area Watershed (KRAAW). This work stems largely from requirements for compliance with Federal and State cultural resource management laws that may require survey, or in some cases excavation, of sites affected by development and construction projects. Virtually all of the research to date has consisted of identifying and documenting sites through systematic and nonsystematic surveys, though there are some notable exceptions to this trend, as discussed in more detail in appropriate sections below. One factor affecting our current state of understanding of archaeological resources is that not all watershed regions have received equal attention. Even within a single watershed region, both industrial development and archaeological research interests--the two major factors that provide impetus to study of cultural resources--have waxed and waned over time. The record of archaeological research in the KRAAW largely reflects the impact of Federally mandated cultural resource management studies that post-date the 1960s. The continuing metropolitan expansion of Chicago and its suburbs has resulted in documentation of numerous sites in the northern part of the KRAAW, some of which have been excavated and provide more information about past lifeways. The southern half of the study area has received comparatively little attention, and systematic scientific survey includes mainly a few isolated small tracts. Still, the KRAAW has proved to be a region rich in archaeological resources that has provided information on a variety of research issues and has the potential to continue to contribute to our understanding of the past.

The region was first investigated through excavations and nonsystematic survey conducted in the lower Kankakee drainage by George Langford (1919, 1927a, 1927b, 1929), then at the University of Illinois. In contrast to many of his contemporaries, Langford investigated both mound and village contexts; his initial exploration of the Fisher mound and village site in Will County (just outside the project area) provided the first documentation of the local Upper Mississippian manifestation that now bears his name. Moorehead (1929) explored a few additional mounds, and Elaine Bluhm documented several sites in the region during the 1940s to 1960s. However, overall there was relatively little professional work conducted in the KRAAW compared to other drainages in the state. The lower portion of the KRAAW has a number of mound sites recorded, and while these cannot usually be assigned to specific time periods without excavation, many of them are probably associated with Late Woodland, Mississippian, or Upper Mississippian cultures (see Doershuk 1988). Many fewer mounds are located in the upper portions of the Kankakee drainage and in the Iroquois drainage, which probably contributed to the relatively low level of both professional and avocational archaeological interest in the study area during the late 19th and early 20th centuries.

The first systematic site survey was conducted in the KRAAW through the auspices of

the Historic Sites Surveys of the early 1970s (Bareis 1972; Clouse and Drolet 1974; Phillips and Clouse 1975; Sullivan 1976). The results of these systematic surveys were incorporated into regional settlement analyses and predictive models of prehistoric site location (Hall and Weston 1978; Weston 1977). A large number of sites was recorded in Kankakee County in 1973 by Mark McConnaughy, an undergraduate student working independently of these sponsored surveys. Unfortunately, systematic records of areas that were surveyed but were devoid of sites were not maintained in this latter study.

After implementation of Federal cultural resource management legislation in the 1960s, archaeological information from the region increased significantly, especially in the northern part of the KRAAW. These laws often require archaeological surveys or site evaluations of areas affected by development or construction projects, and the expansion of metropolitan Chicago and its suburbs in the surrounding collar counties has resulted in considerable growth in the archaeological data base. Some of the institutions that have been major contributors to this information base through contract archaeology projects include Midwest Archaeological Research Services, the Public Service Archaeology Program of the University of Illinois, and the Illinois Transportation Archaeology Research Program (University of Illinois), which has conducted multiple surveys for the Illinois Department of Transportation, including survey of the proposed South Suburban Airport in east-central Will County (Harris 1997). As a result of these and other projects, records maintained with the Illinois Archaeological Survey site files indicate about 1.0% of the total KRAAW area has been subjected to systematic archaeological survey.

However, not all archaeology in the region has been driven by economic concerns alone. Research and cultural resource management interests were combined in the intensive survey of Kankakee River State Park and surrounding areas (Harn et al. 1994; Hassen and Schroeder 1987), conducted by the Illinois State Museum for the Illinois Department of Conservation. Combined research and contractual archaeology work in the region continue to document and evaluate sites, and the archaeological data base is growing yearly.

However, even a cursory glance at the distribution of known archaeological sites in the KRAAW (Figure 3-1) shows a very uneven distribution of sites. This uneven distribution is the direct result of where previous archaeological efforts have been concentrated. The two large concentrations of sites visible along the lower Kankakee River and in east-central Will County are almost exclusively within the boundaries of the Kankakee River State Park (KRSP) and the proposed South Suburban Airport (SSA), respectively. Another small cluster of sites in central Will County is associated with survey of the Laughton and Ce-Na-Ge-Wine forest preserves (Wagner 1995). Many of the series of sites that follows the course of the lower Iroquois River and the Kankakee River upstream from Kankakee city were reported by McConnaughy in 1973 and Phillips and Clouse (1975). Finally, many of the sites in Iroquois County were located as a result of the Historic Sites Surveys (Bareis 1972; Clouse and Drolet 1974). All large-area systematic surveys that have been conducted in the region have documented multiple sites, but the

uneven distribution of surveys results in site distribution patterns that are highly dependent on the location of surveys, and by extension, the location of research projects and construction/development projects that required survey. Any statements that can be made about site location distributions or patterns of prehistoric or historic settlement or land use are strongly biased by the distribution of the surveyed areas, which are certainly not representative of the entire region. The potential biases of this nonrepresentative site distribution should be kept in mind during the following discussions.

Based on information recorded in the electronic data base of the Illinois Archaeological Survey site files as of 3 June 1997, a total of 1144 archaeological sites has been recorded in the KRAAW (Figure 3-1). These range in age from Paleo-Indian through the Postwar Industrial periods (Figures 3-2 through 3-22). While this number may seem large, it is important to consider that over half of these sites have not been assigned to any specific temporal period. Of this total, 635 (55.5%) have been recorded simply as unidentified prehistoric sites (Figure 3-2).

The overall site distribution (Figure 3-1) generally conforms to the valleys of the Kankakee and Iroquois rivers and their major tributaries. However, sites are also found in areas that are almost entirely upland in nature (SSA area, e.g.). Given the effects of nonrepresentative survey areas discussed above, it is doubtful that the known site distributions reflect patterns of actual prehistoric and historic settlement and land use over the entire study area. Still, there may be patterns of site density or distribution that can be discerned, though they may be related only to selected areas within the KRAAW. In addition, many sites have no intuitively obvious relationship to major watercourses or other resources. This is especially true for site distributions in the later Historic subperiods, which reflect a shift away from rivers and the influence of rail, highway, and air transportation, and to regional economic systems.

Several of the sites have more than one temporal period or component present. The total number of recorded components is 1417 (Table 3-2). Of the recorded components, almost half (635 or 44.5%) are unidentified or culturally indeterminate prehistoric sites (Figure 3-2); no temporally or culturally diagnostic artifacts have been found at these sites. Their distribution mirrors the total number of sites, and shows strong emphasis on major stream valleys and locations of intensively surveyed areas within the KRAAW.

Only 10 Paleo-Indian components (0.7% of total components) are recorded in the KRAAW (Figure 3-3). These are confined to the northern part of the watershed area, but occur in all three areas that have been surveyed most intensively (SSA, KRSP, and McConnaughy/Phillips surveys). These sites demonstrate systematic use of the region during its earliest period of occupation. Paleo-Indian sites are notoriously difficult to locate because they often have very low artifact density.

Sites with components assignable to undifferentiated Archaic period (Figure 3-4) are more numerous and account for 71 of the recorded components (5.0%), and most are

Table 3-2. Archaeological Resources in the Kankakee River Assessment Area Watershed.

Period	Subperiod	Calendar Years (Dates indicate beginning of period)	Number of Components
Historic	Postwar	A.D. 1946	18
	Urban Industrial	A.D. 1901	68
	Early Industrial	A.D. 1871	82
	Frontier	A.D. 1841	39
	Pioneer	A.D. 1781	5
	Colonial	A.D. 1650	0
	Native American	A.D. 1650	6
	Unidentified	A.D. 1650	75
Protohistoric		A.D. 1500	2
Upper Mississippian	Oneota	A.D. 1400	5
Mississippian		A.D. 900	78
Woodland	Late Woodland	A.D. 300	45
	Middle Woodland	200 B.C.	29
	Early Woodland	1000 B.C.	21
	Unidentified	1000 B.C.	59
Archaic	Late Archaic	3000 B.C.	74
	Middle Archaic	6000 B.C.	27
	Early Archaic	8000 B.C.	68
	Unidentified	8000 B.C.	71
Paleo-Indian		10000 B.C.	10
Prehistoric	Indeterminate	10000 B.C.	635
Total			1417

located along major stream valleys. These sites produced artifacts identifiable to the Archaic period (8000 to 1000 B.C.), but were not assigned to any more specific subperiod within this broad time span. The distribution of these sites shows no cluster associated with the SSA or KRSP survey areas. Many of the undifferentiated Archaic period sites were identified by McConnaughey or through the Historic Sites Surveys, and the analytical methods used in these surveys did not differentiate Archaic sites into finer temporal subperiods. The more recent surveys in the KRSP and SSA have assigned sites to specific subperiods.

More specific temporal assignment was available for 68 (4.8%) sites with Early Archaic components (Figure 3-5), 27 sites (1.9%) with Middle Archaic components (Figure 3-6), and 74 sites (5.2%) with Late Archaic components (Figure 3-7). All of these temporal subperiods show a site clusters in the SSA and KRSP survey areas. Early and Late Archaic sites are also distributed broadly across much of the drainage in Iroquois County, but Middle Archaic sites are not found in this part of the KRAAW.

Sites with undifferentiated Woodland period components (Figure 3-8) account for 59 (4.2%) of the recorded components. They are distributed like the undifferentiated Archaic period sites, and for the same reasons. Many of the more recent surveys have been able to assign Woodland sites to one of the more specific subperiods.

Early Woodland sites (Figure 3-9) are difficult to identify, and this time period is poorly represented in many regions in the state. Early Woodland sites account for only 21 (1.5%) of the recorded components. Two Early Woodland sites in Iroquois County were recently subjected to test excavation by the University of Illinois Public Service Archaeology Program (Adams 1994), but no substantial remains were found. Middle Woodland components (Figure 3-10) are slightly more numerous, accounting for 29 (2.0%) of the reported components. Late Woodland sites (Figure 3-11) are still more numerous, with 45 components recognized (3.2%). This pattern of increasing site frequency through the Woodland period is consistent with region trends in population growth and increasing social complexity throughout the Woodland period.

The Mississippian period (Figure 3-12) is generally well-expressed in the KRAAW, with 78 components identified, accounting for 5.5% of the total. Mississippian sites are most common near the major river valleys, which is also consistent with regional trends in subsistence and settlement. The SSA survey area, located in primarily upland settings, contains no sites with identified Mississippian components. Several of the Mississippian sites may contain Upper Mississippian components; the diagnostic artifacts of both cultural periods are similar. Only five sites (0.4%) have been recognized as containing definitive Upper Mississippian components (Figure 3-13). All of these sites are apparently related to Langford culture, a regional Upper Mississippian manifestation that is more common in the Des Plaines and upper Illinois River drainages. The Fisher site, one of the first identified Langford culture sites, is located just northwest of the KRAAW boundary (Langford 1927a, 1927b, 1929).

Only two sites (0.1%) have been identified that contain Protohistoric period components (Figure 3-14). This low frequency is consistent with trends in population distributions throughout the Midwest for this latest prehistoric period, but also may stem in part from our poor understanding of this time period in general. Because so few sites of this time period have been positively identified or excavated, we know very little about their archaeological signatures. Consequently, they may be severely under-represented, and their material culture may be misidentified as Upper Mississippian, Mississippian, or even unidentified prehistoric. Both Protohistoric components in the KRAAW are located either within or immediately adjacent to the KRSP survey area; neither has been excavated (Harn et al. 1994)

Collectively, Historic period components are of moderate frequency in the KRAAW, accounting for 293 (20.7%) of the recorded components. About one-fourth (n = 75; 5.3% of total) of the Historic period components are undifferentiated and cannot be assigned to a specific temporal subperiod (Figure 3-15).

Though only six sites (0.4%) with Historic Native American components have been identified (Figure 3-16), these are potentially significant to our understanding of this dynamic time period. Miami-speaking groups, including possibly the Wea and Piankashaw, occupied the general region during the earliest Historic times, between about 1640 and 1680 (Callender 1978). These groups may have occupied the KRAAW during Protohistoric times as well, but there is evidence for a rather high degree of territorial variation during the 17th century, which may also characterize the Protohistoric period and contribute to the difficulty we have in identifying Protohistoric period sites. Between about 1680 and 1765, the KRAAW region was occupied by various subgroups of the Mascouten (Goddard 1978; see also Bauxar 1978), while between about 1770 and 1800, the Potawatomi occupied the region along with growing numbers of Euro-American settlers (Clifton 1978). This relatively large degree of tribal group movement during the early Historic period is attributed mainly to the twin influences of economic interactions induced by the fur trade and increasing conflict with Euroamerican settlers. After the Tippecanoe Battle in 1811, some Potawatomi were ceded specific sections as small reservations. These include preserve tracts ceded to Ce-Na-Ge-Wine and Joseph Laughton in 1820, located in western Will County within the KRAAW (see Wagner 1995). However, by about 1840, all Native American groups had been removed to more westerly reservations. The Windrose site (11KA326) within the KRSP is a short-term early 19th century Potawatomi residential site. It was first identified during the intensive survey of the KRSP (Harn et al. 1994) because of illegal artifact collector activities. Additional professional excavations were undertaken, but analyses are not yet completed.

No sites have been identified as having a Historic Colonial period component (Figure 3-17). Given the historic documentation of early French and Indian interaction in the region, more sites containing Historic Native American and Historic Colonial components are expected to be documented as systematic survey of the region continues. The low representation of these components is most probably due to the combined effects

of nonsystematic sampling and the lack of specific archaeological signatures for time periods that have very sparse material expression.

Historic Pioneer components (Figure 3-18) are scarce; only five (0.4%) have been identified to date in the KRAAW. Two are located in the KRSP survey area, two are represented by the Ce-Na-Ge-Wine and Joseph Laughton settlements investigated by Wagner (1995), and one is located in the SSA project area. None have been excavated.

Historic Frontier components (Figure 3-19) are considerably more numerous (n=39; 2.8% of components). They also cluster in three areas--the KRSP, SSA, and Ce-Na-Ge-Wine/Joseph Laughton tracts. Many of these sites have later historic components as well. Sites with Historic Early Industrial components (Figure 3-20) comprise 5.8% of the total number of components (n=82), while Historic Urban Industrial components (Figure 3-21) number 68 (4.8% of components). Both of these periods show the same three spatial clusters identified for the Historic Frontier subperiod. The large number of Historic Early Industrial and Historic Urban Industrial components can be directly related to the growth of Chicago as a regional and national center of economic exchange, and the consequent growth of support communities in the surrounding area. However, few sites of these time periods have been investigated more intensively than the survey documentation level, and there is much to learn about the impact of Chicago on both economic and social organization during this period. Historic Early Industrial and Urban Industrial components often occur together, suggesting relatively long-term occupation of Historic period sites.

Historic Postwar components (Figure 3-22) are less frequent (n=18; 1.3%), mainly because sites of this recent age have only recently been systematically recorded. Many of the sites of this period have extant structures and are significant to local community histories. More recently, archaeologists have recognized the contribution that these sites can make to our understanding of historical and social processes, and they have been more systematically documented.

Little formal investigation has been conducted using these site distribution data, either in terms of Historic or Prehistoric period settlement pattern analysis. In spite of this lack of formal analysis, the brief examination of the distributional data suggests several possible avenues for future investigation. Most of the temporal periods and subperiods show differential distribution of sites within the KRAAW, but this is mainly due to spatial nonrepresentation in survey coverage. Of more interest are changes in site distribution through time that may be linked to the effects of social or environmental changes on human settlement and land use patterns. These patterns may reflect changes in actual historic or prehistoric settlement practices, and should be formally tested to develop more robust interpretations of settlement organization.

Some of the most noticeable changes are probably attributable to environmental changes brought about by a global warming and drying trend that occurred during the middle

Holocene (8,000 to 5,000 years ago). Possible effects of environmental change are seen in the distribution and abundance of Middle Archaic sites (Figure 3-6) compared to both earlier and later subperiods (Figures 3-5 and 3-7). Middle Archaic sites are less numerous than either Early or Late Archaic sites, and they appear to be located closer to the main valleys of the Kankakee and Iroquois rivers.

Another noticeable change in site distribution is evident when the overall distribution of Archaic and Woodland period sites is compared. Population growth is inferred for the Woodland-Mississippian periods based on the documentation of larger sites, more burials, and sites with greater artifact density. While there are nearly equal numbers of components assigned to the time span of the Woodland-Upper Mississippian periods (n=237; 16.7%) and to the Archaic period (n=240; 16.9%), when standardized by time unit, the density of Woodland-Mississippian period sites (7.9 sites/century) is more than twice that of the Archaic period (3.4 sites/century). This strongly supports an inference of large-scale changes in overall settlement organization that most probably resulted from the increasing importance of cultivated crops during the Woodland and Mississippian periods. Sites may be less numerous compared to Archaic period sites, but they probably reflect more permanent occupations, greater population density, and considerably greater investment of energy into the land itself as a resource.

The archaeological data base for the KRAAW indicates that the region was continuously occupied for the last 12,000 years, in spite of major changes in both social and physical environments over this time span. The only possible exception to this observation is the Historic Colonial period. However, this time period has been extremely difficult to identify in any region of the state, and the archaeological signature of sites dating to this time period is often obscured by the greater number of artifacts discarded by later occupants. The apparent absence of sites assigned to this period may say more about our current state of knowledge about this time span than it does about any pattern of land use or settlement in the region.

The distribution of sites assigned to most of the later historic subperiods shows the increasing influence of Chicago as an urban/industrial/economic center, especially when the distribution and density of sites in the northern half of the KRAAW is compared to the southern half. This expansion continues today and has influenced the distribution of surveyed areas within the KRAAW, with much better representation afforded in the northern section. The expansion of rail and overland transportation routes is one factor that affected site location and duration of occupation during the Historic period. This relationship with the Chicago area make the KRAAW particularly informative for Historic period research, and many of the unwritten aspects of historic period lifeways may be brought to light given continued survey and excavation of Historic sites in the region. Future archaeological site surveys are needed to correct for potential biases in the current data base resulting from nonsystematic survey. If these potential biases can be accounted for and overcome, the archaeological resources of the KRAAW can make significant contributions to our understanding of Illinois history and prehistory.

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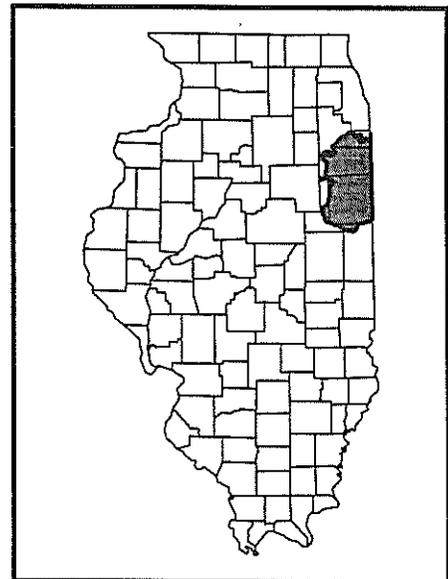
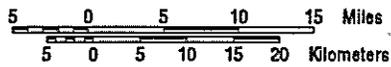
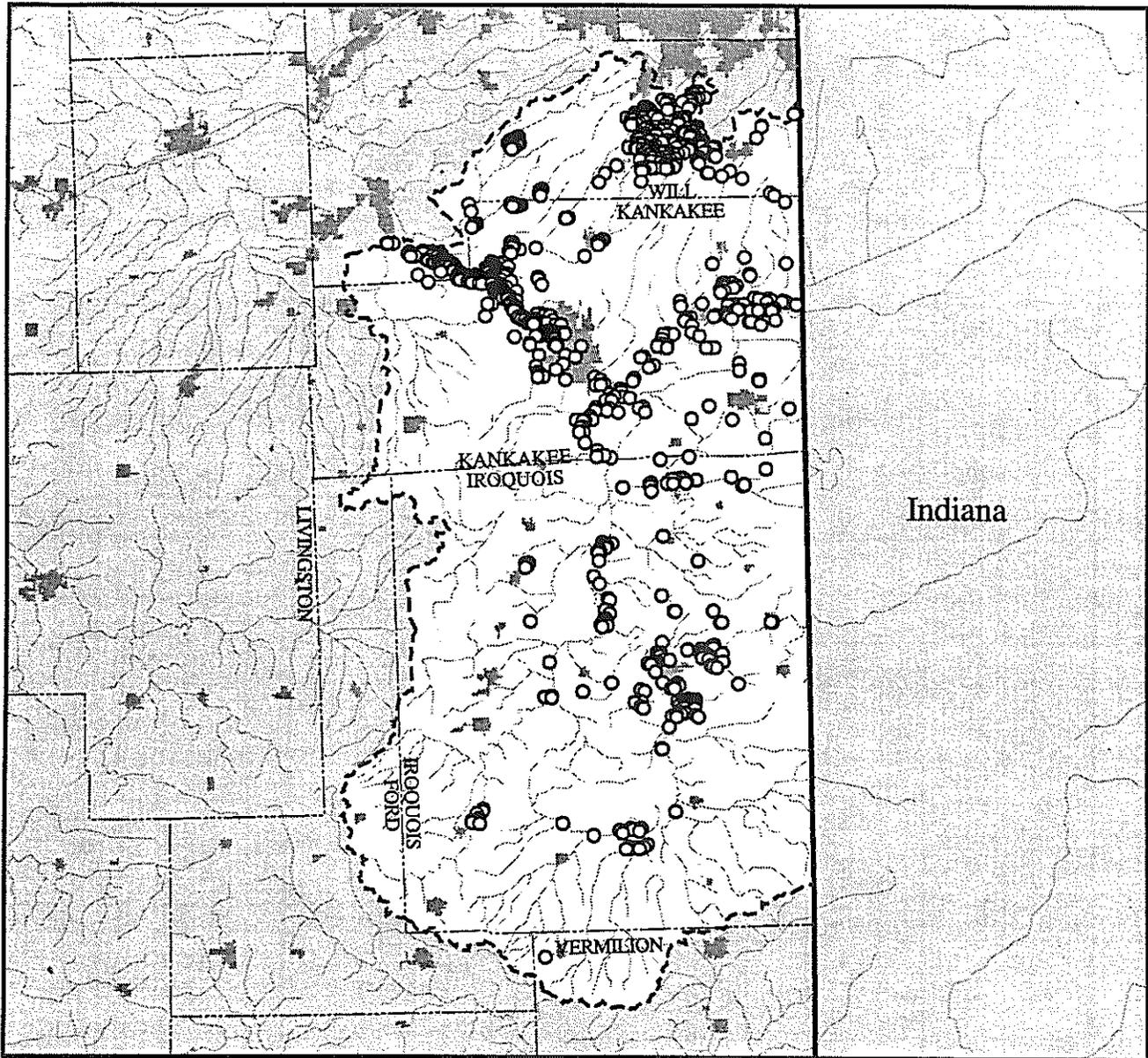
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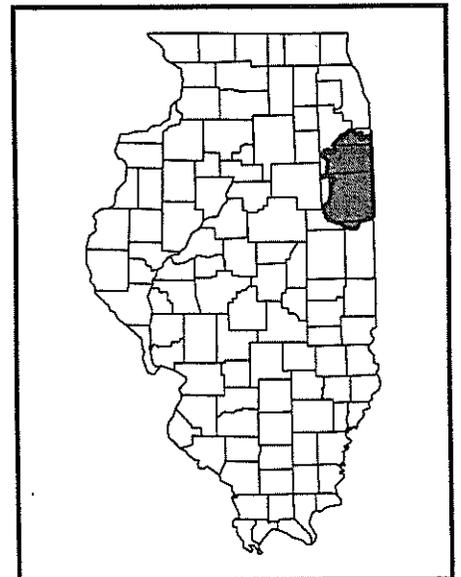
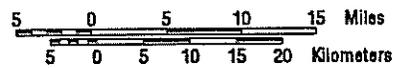
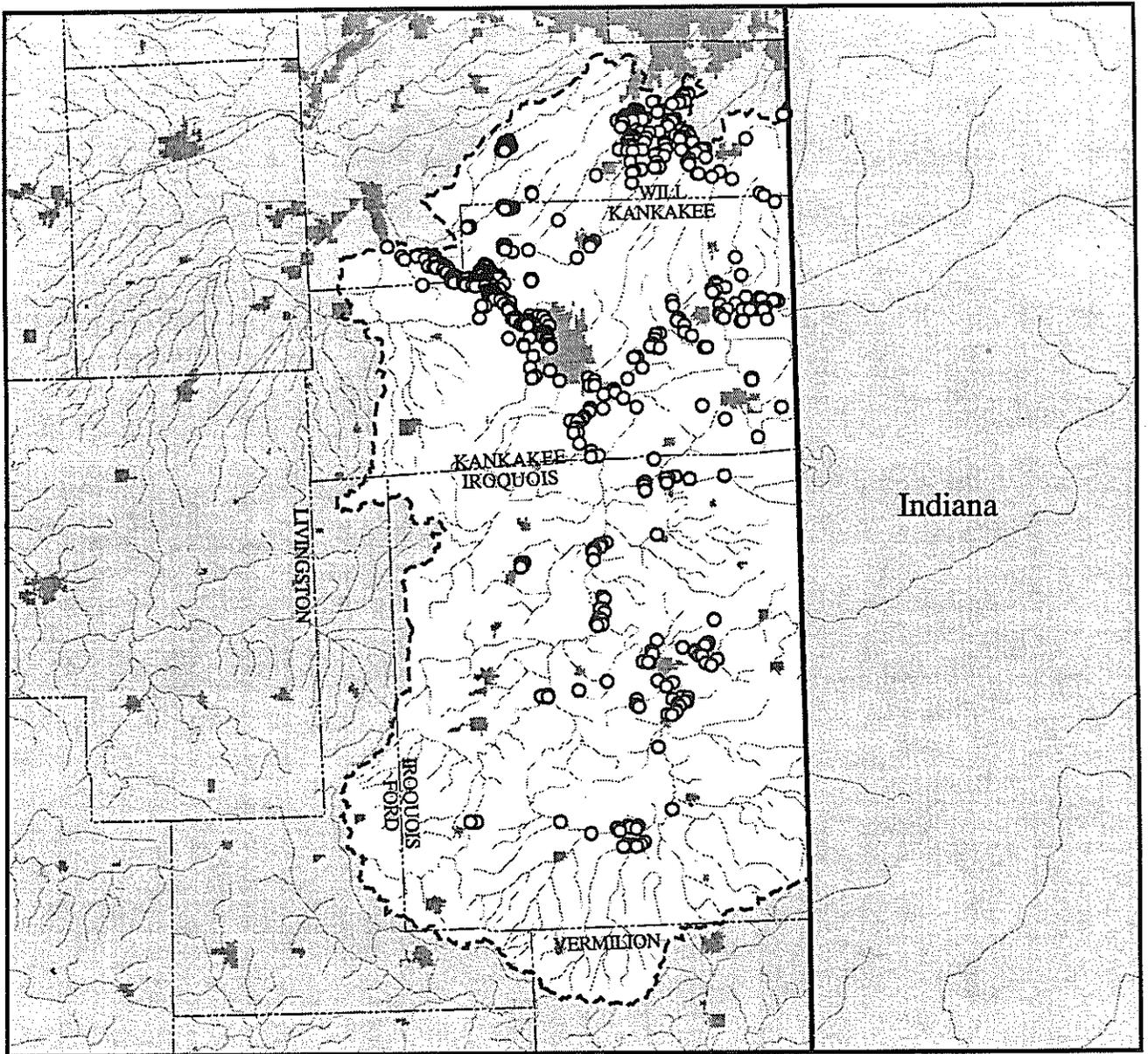
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IAS Database: June 03, 1997

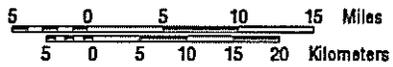
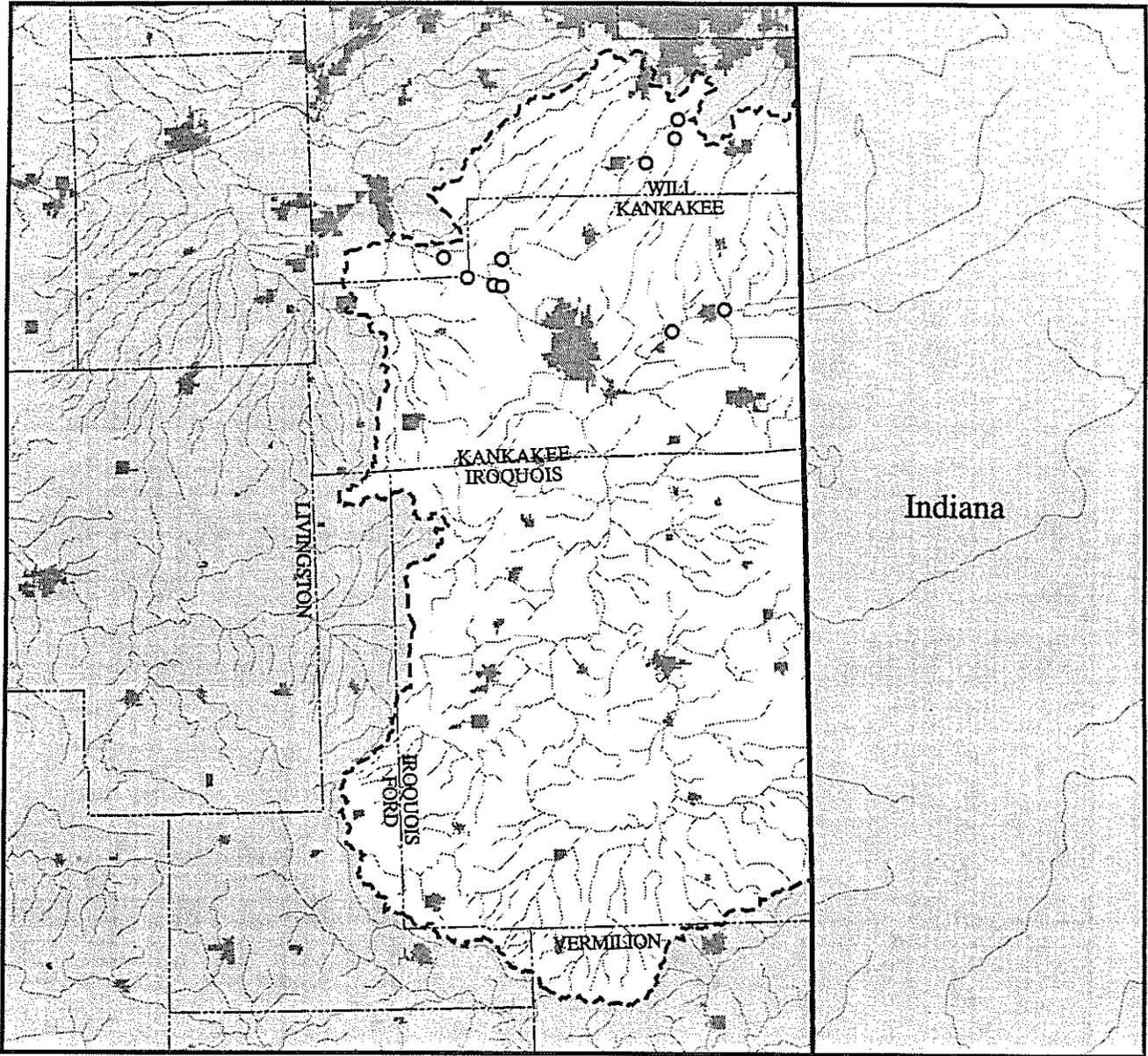
Figure 3-1. All archaeological components.



○ Archaeological site (n = 635)

IAS Database: June 03, 1997

Figure 3-2. Unidentified Prehistoric archaeological components.



○ Archaeological site (n = 10)

IAS Database: June 03, 1997

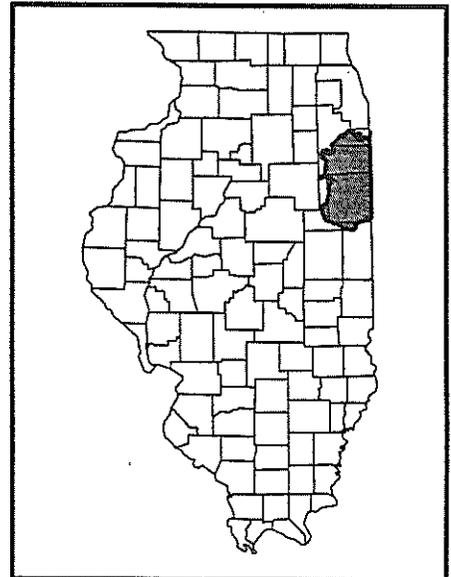
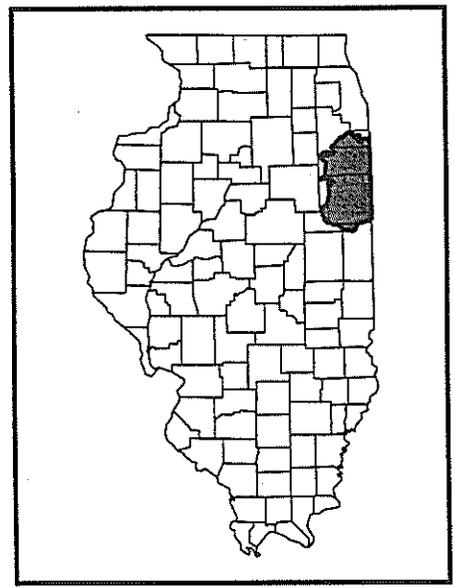
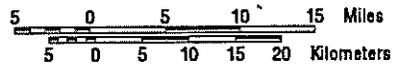
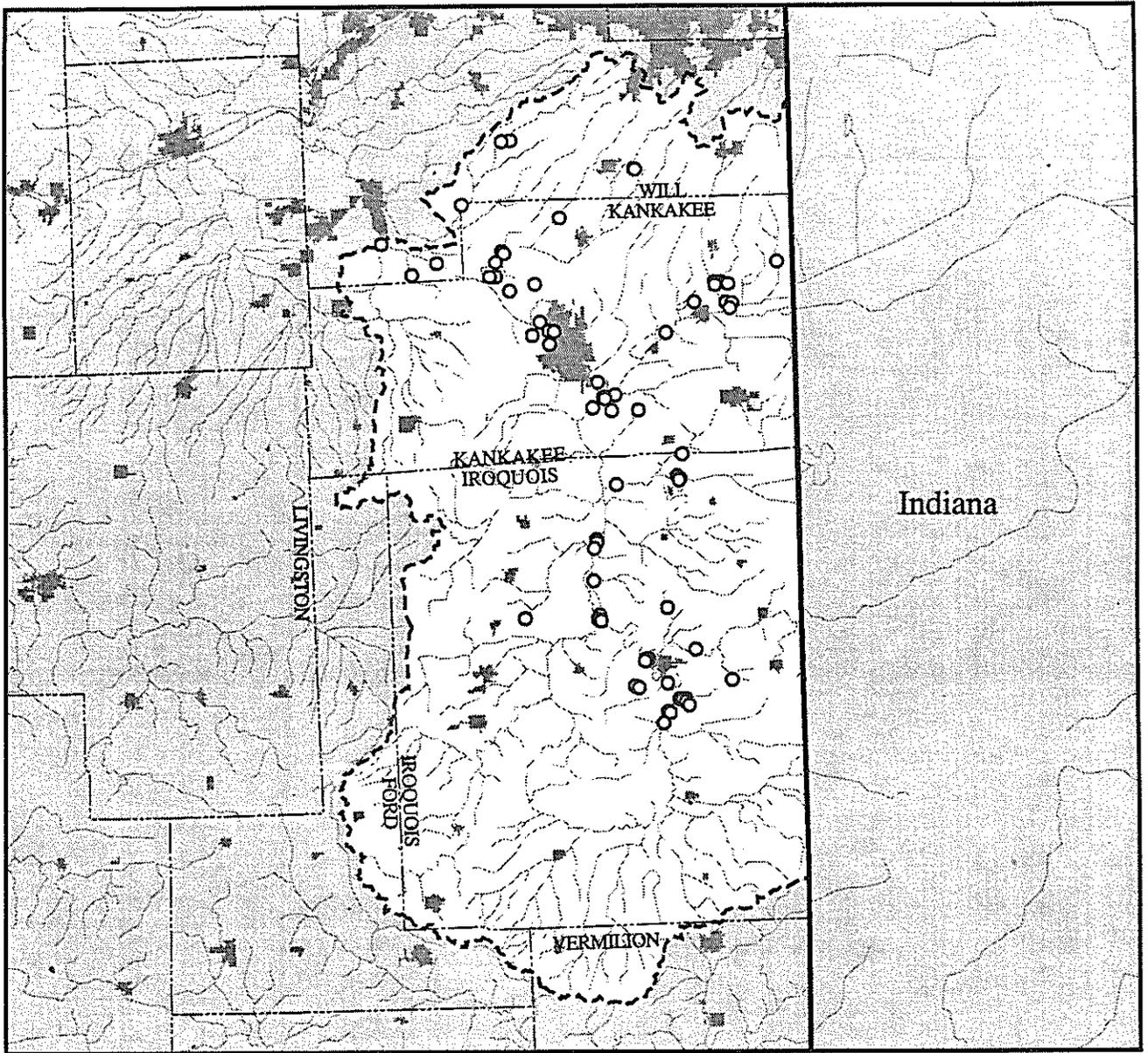


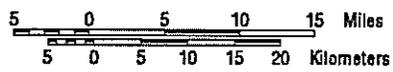
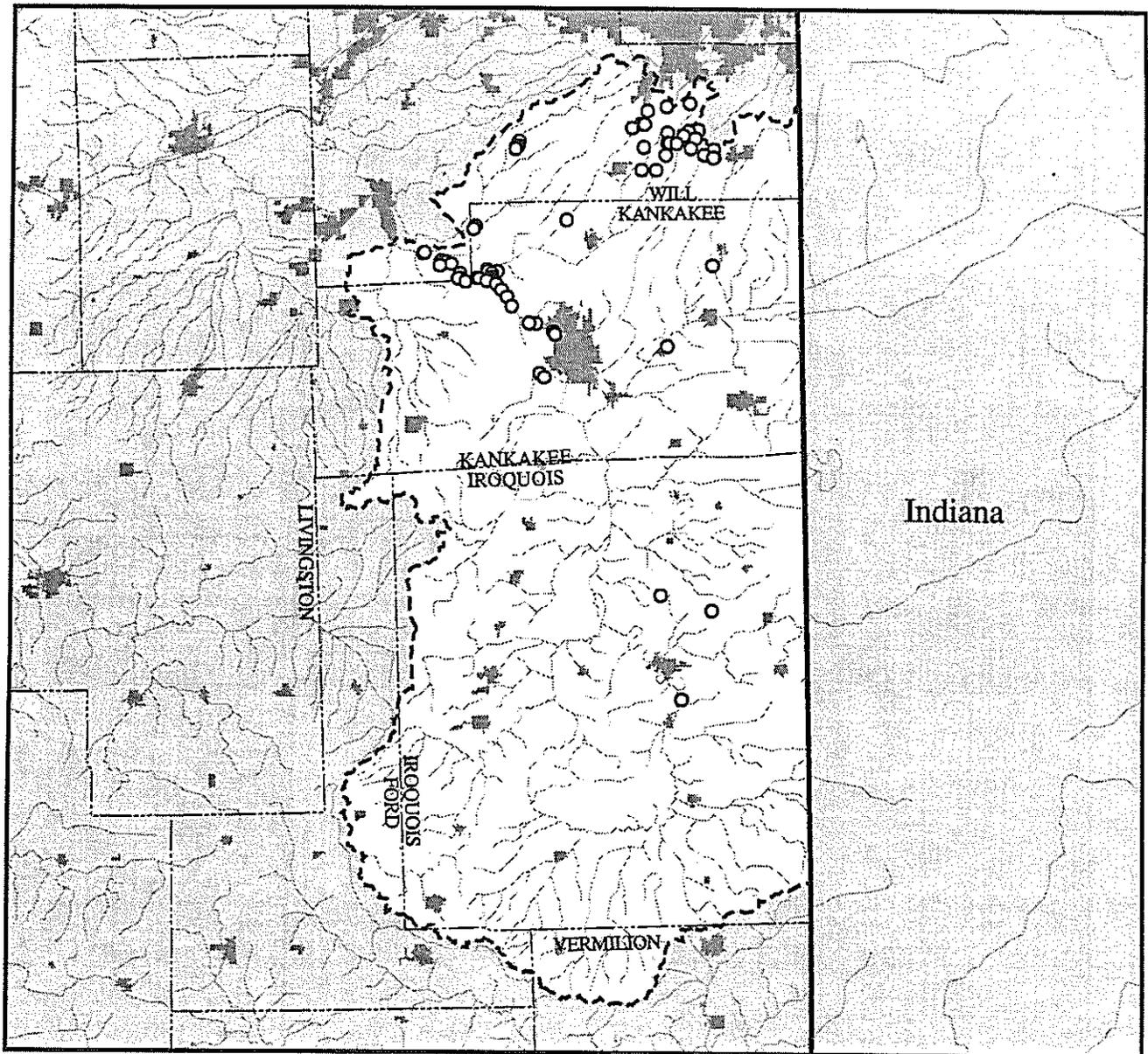
Figure 3-3. Paleo-Indian archaeological components.



○ Archaeological site (n = 71)

IAS Database: June 03, 1997

Figure 3-4. Unidentified Archaic archaeological components.



- Archaeological site (n = 68)
IAS Database: June 03, 1997

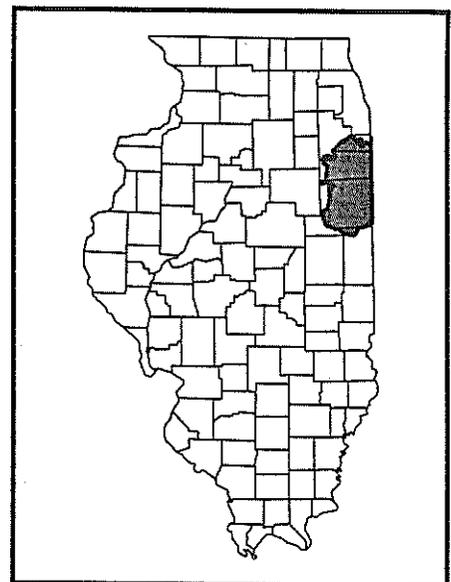
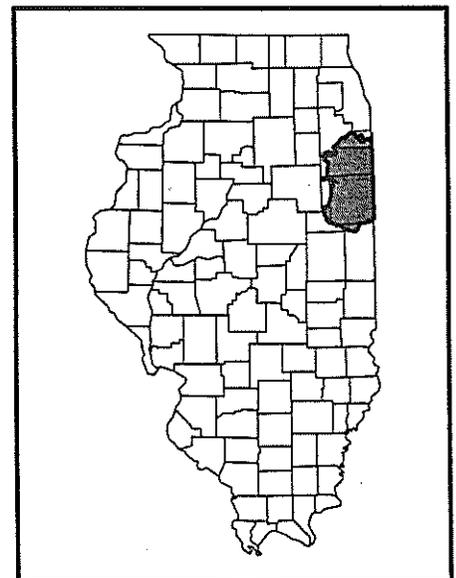
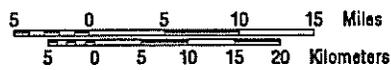
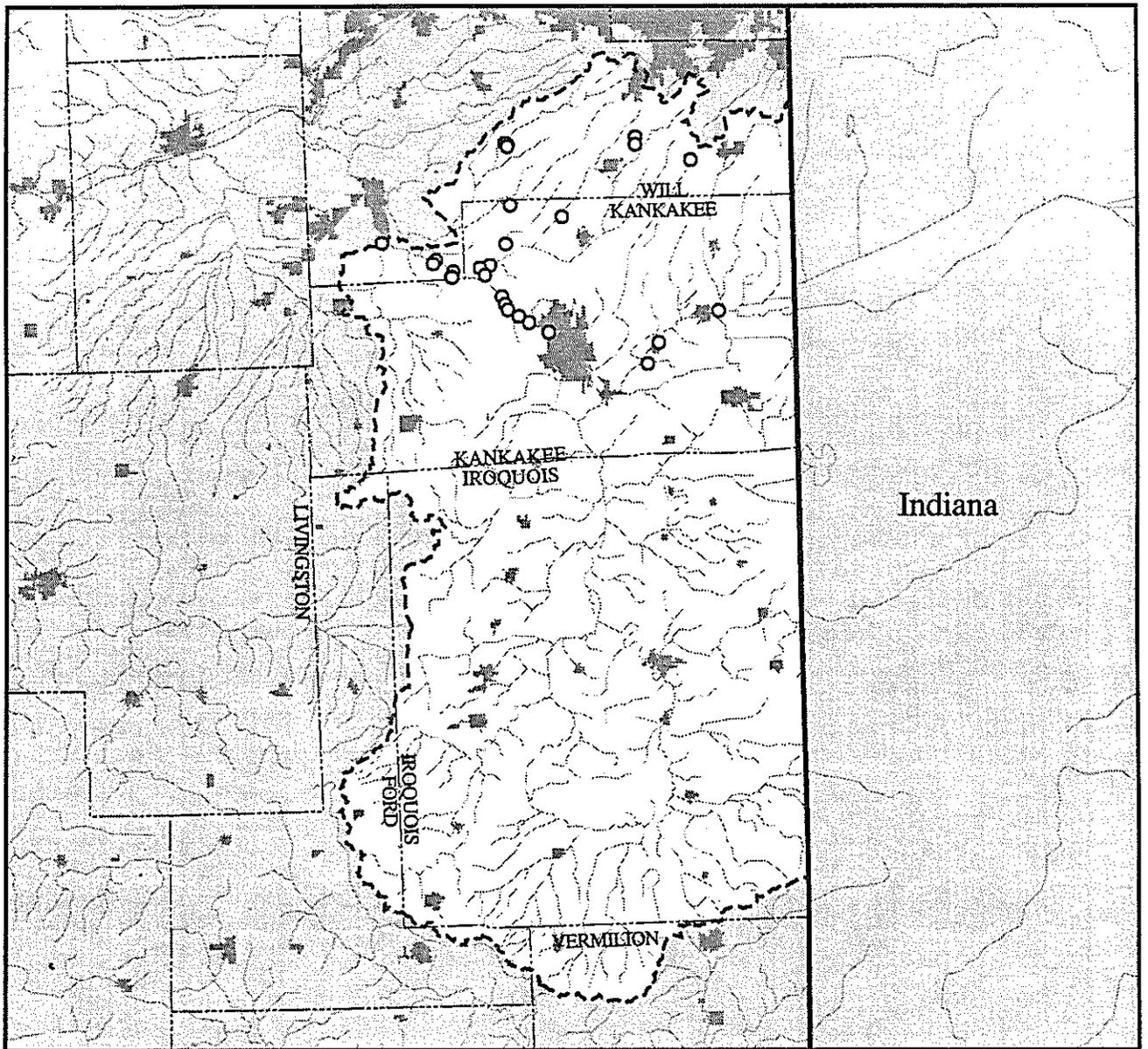


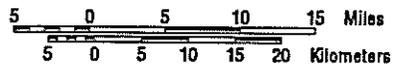
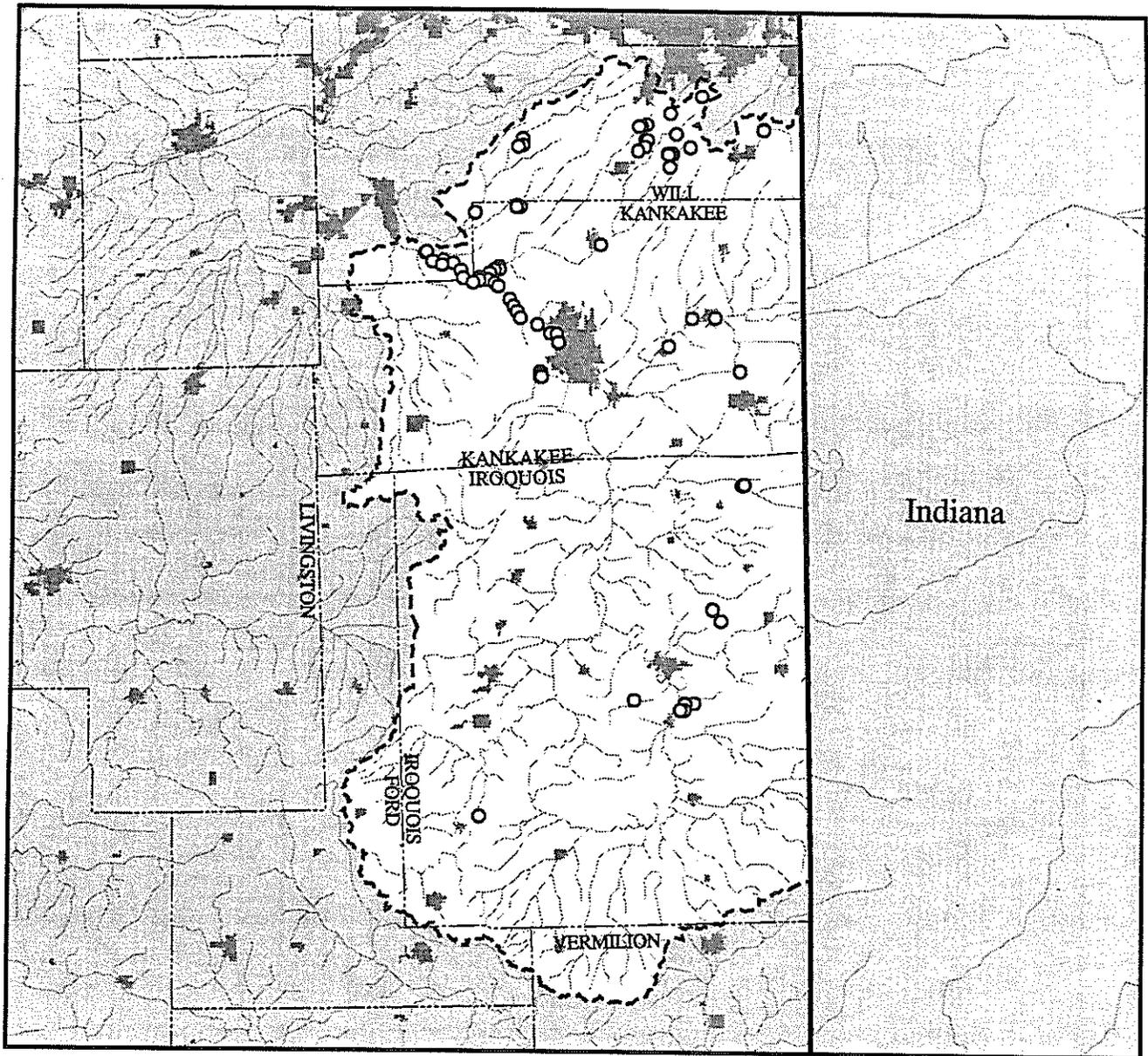
Figure 3-5. Early Archaic archaeological components.



○ Archaeological site (n = 27)

IAS Database: June 03, 1997

Figure 3-6. Middle Archaic archaeological components.



- Archaeological site (n = 74)
- IAS Database: June 03, 1997

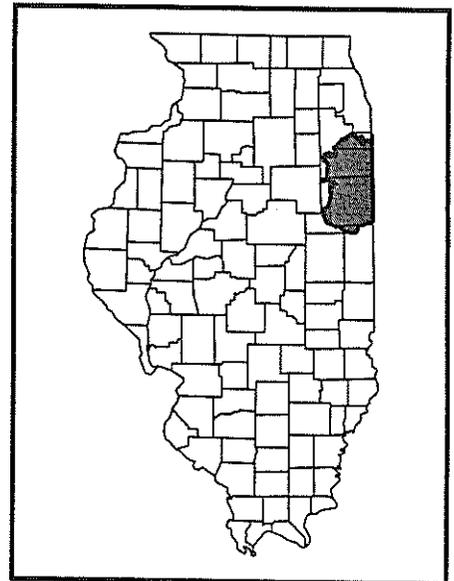
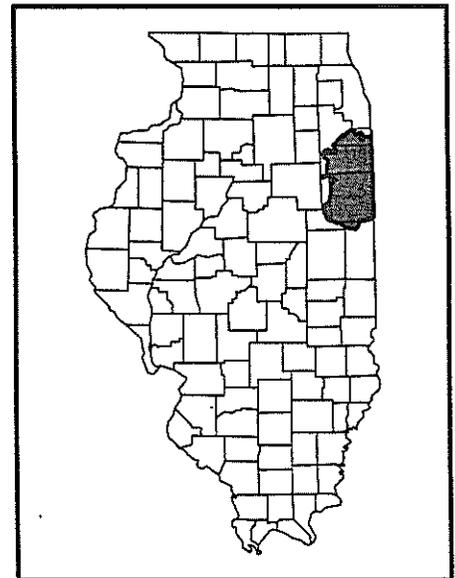
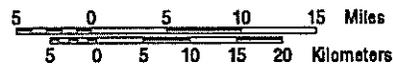
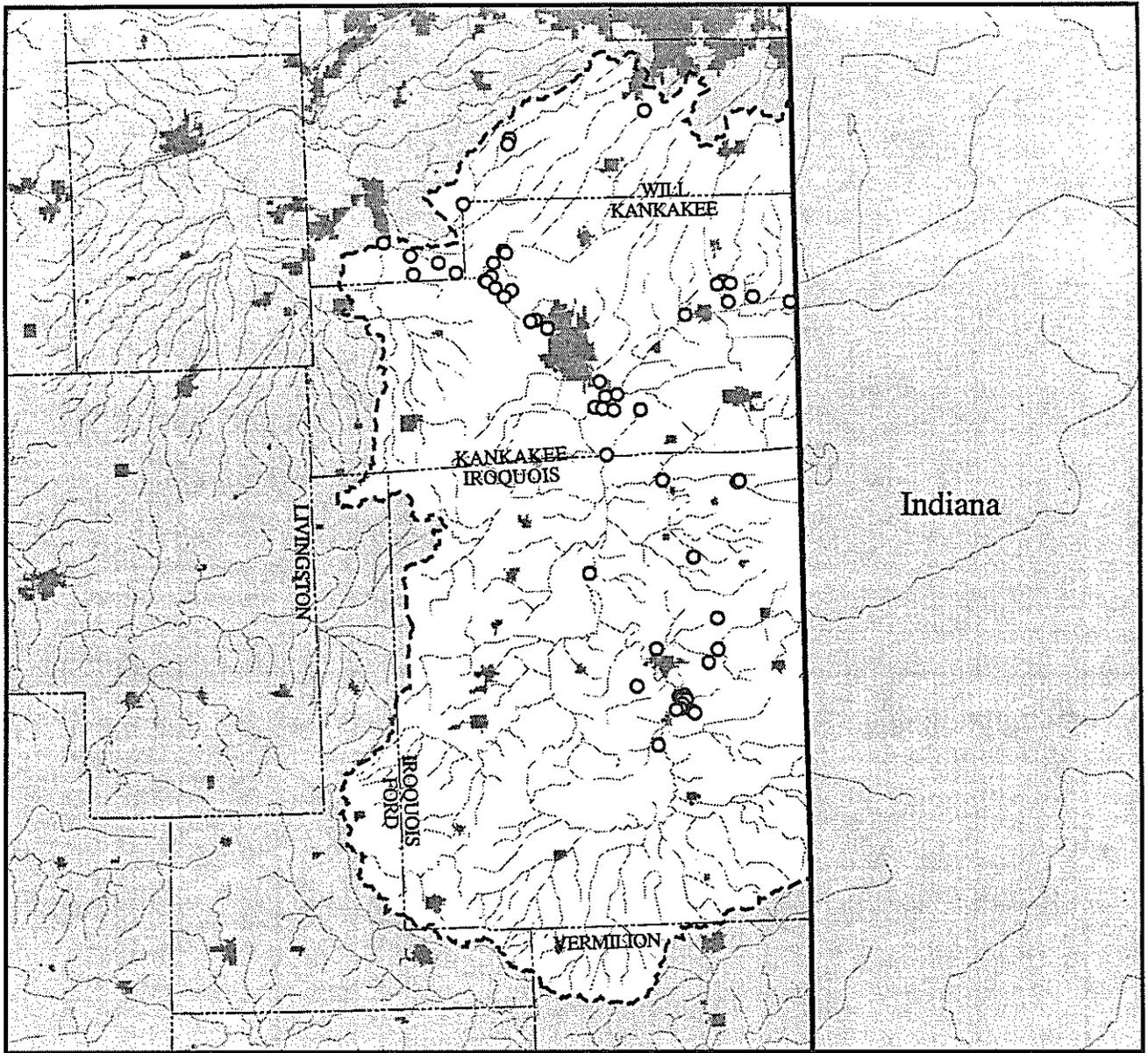


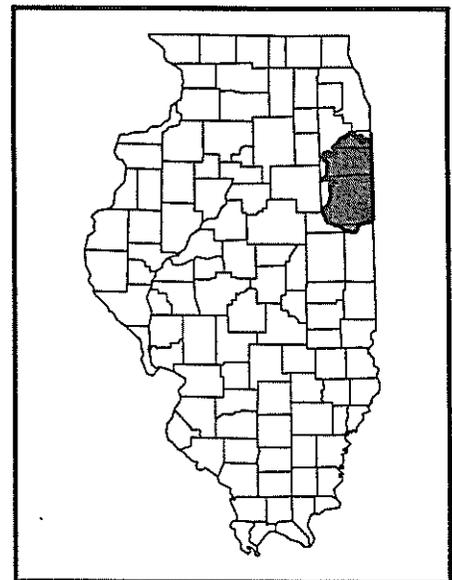
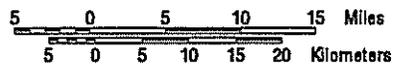
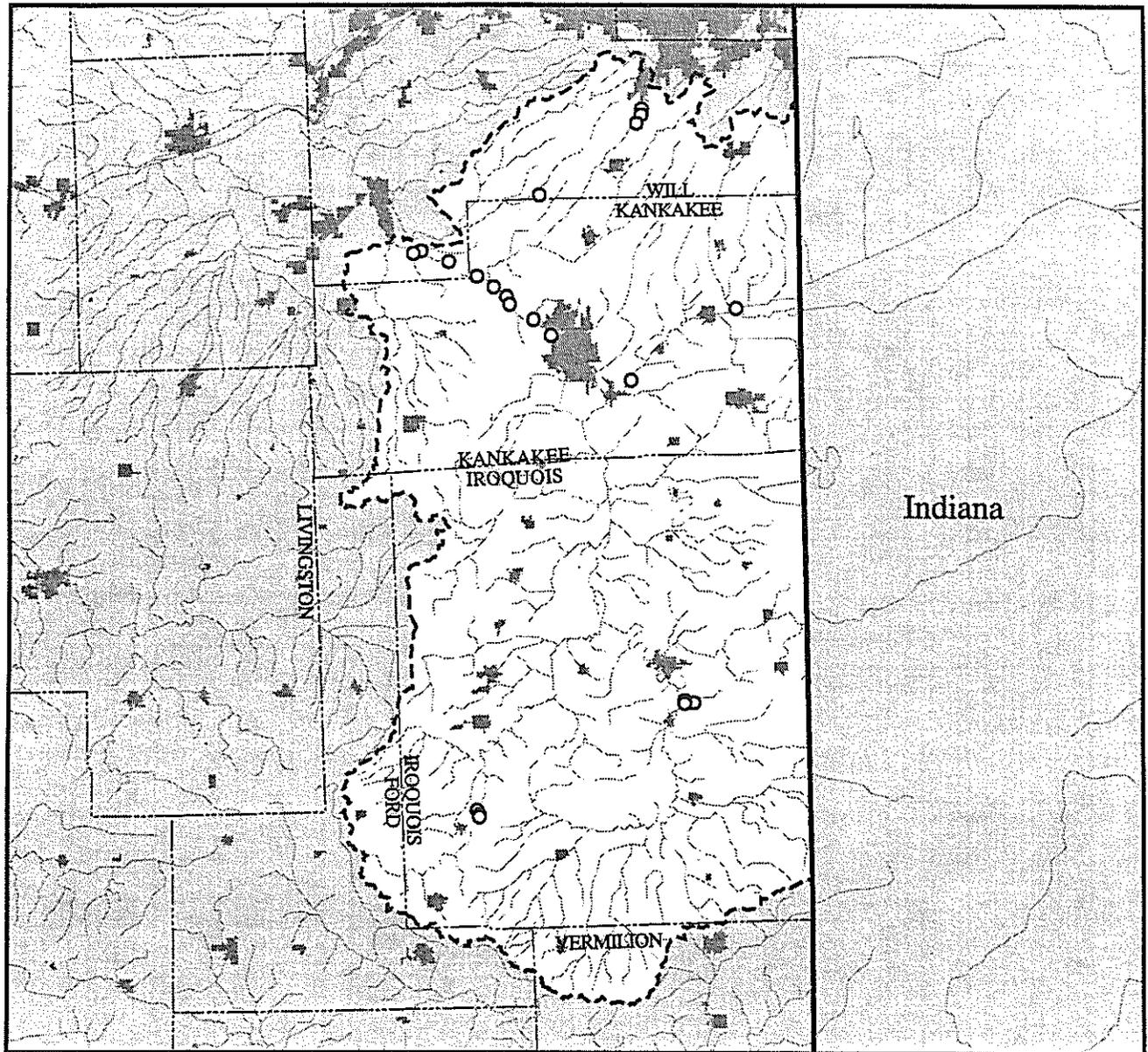
Figure 3-7. Late Archaic archaeological components.



○ Archaeological site (n = 59)

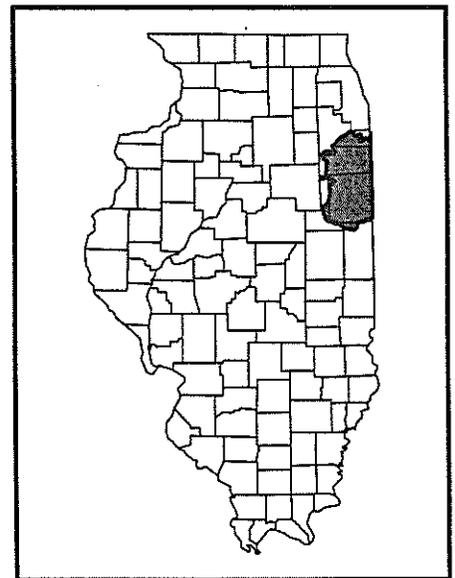
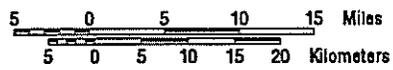
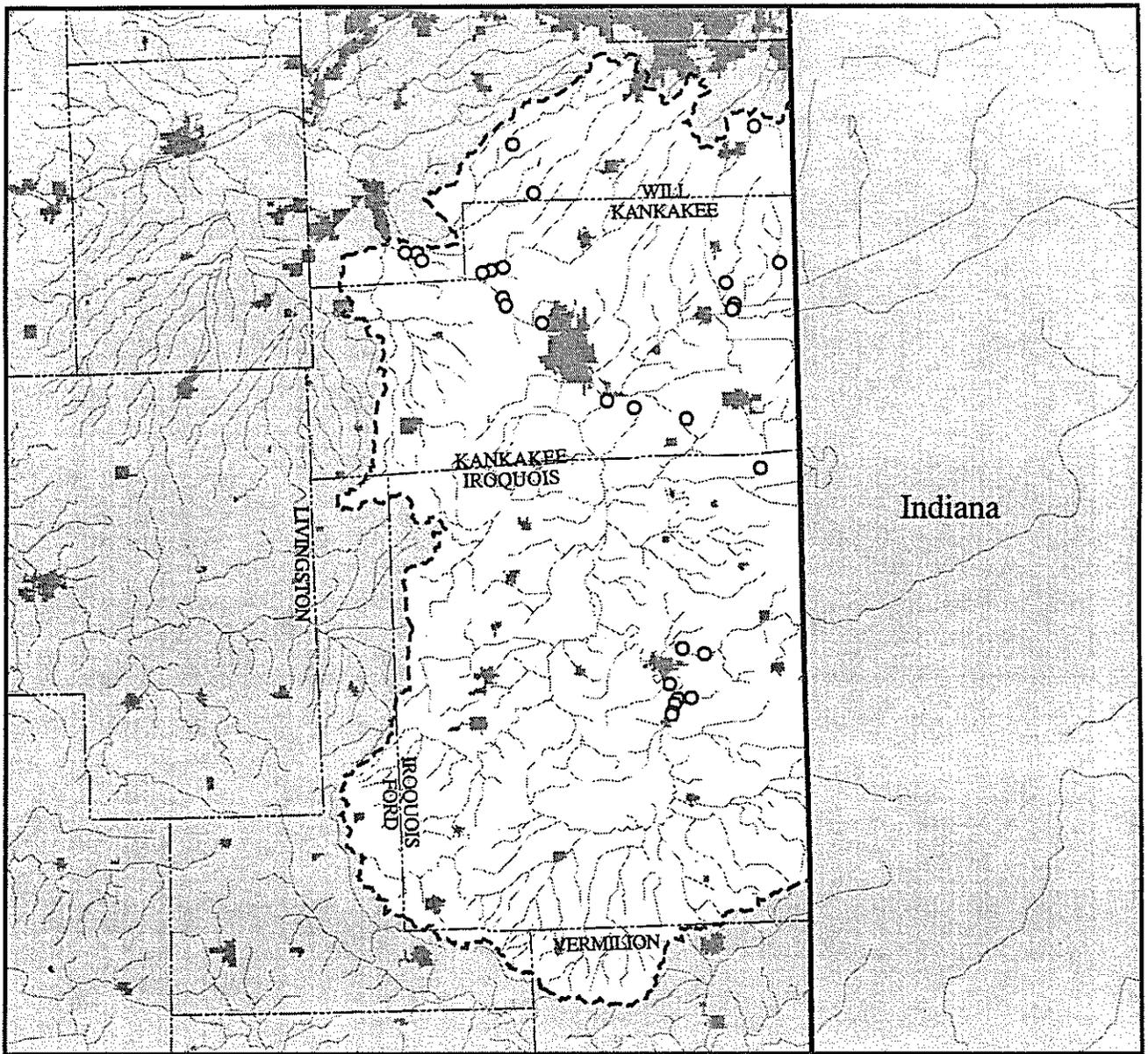
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Figure 3-8. Unidentified Woodland archaeological components.



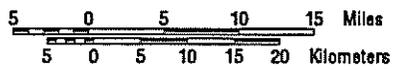
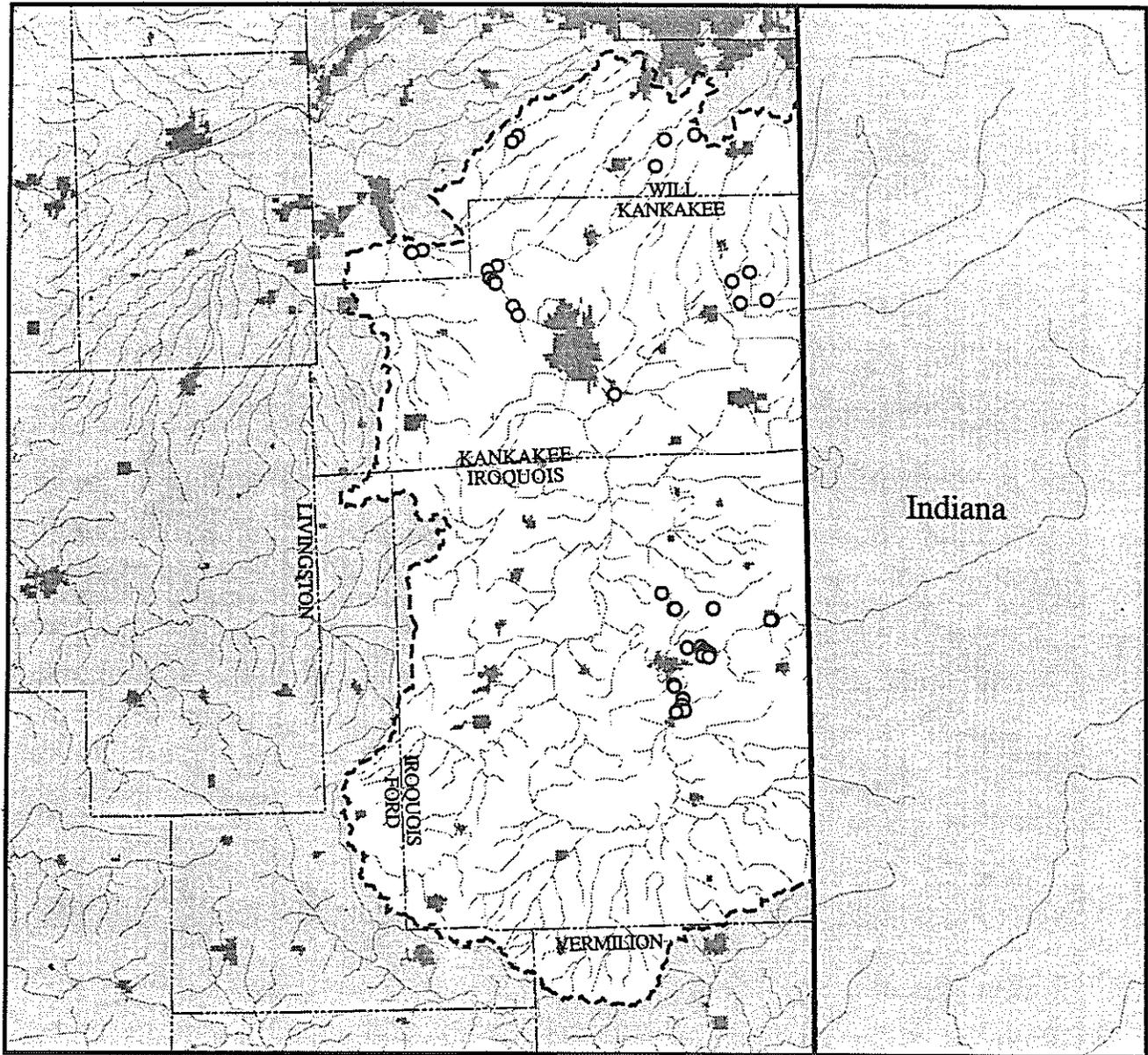
○ Archaeological site (n = 21)
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Figure 3-9. Early Woodland archaeological components.



○ Archaeological site (n = 29)
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Figure 3-10. Middle Woodland archaeological components.



- Archaeological site (n = 45)
IAS Database: June 03, 1997

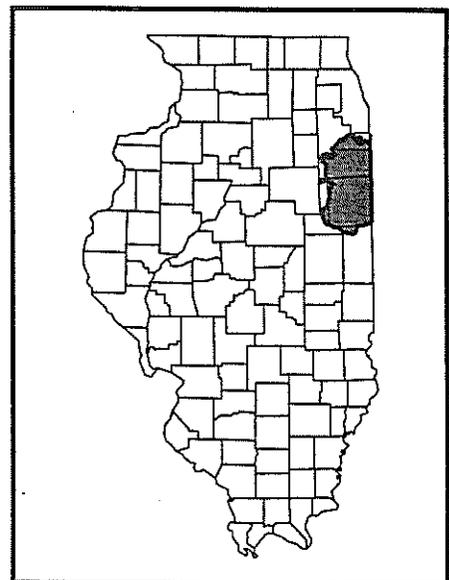
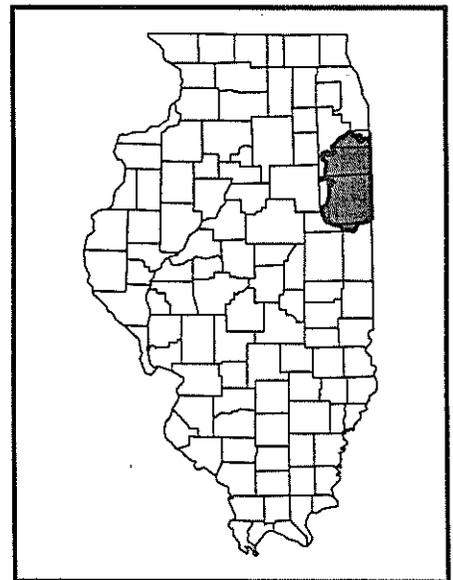
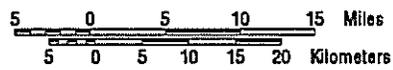
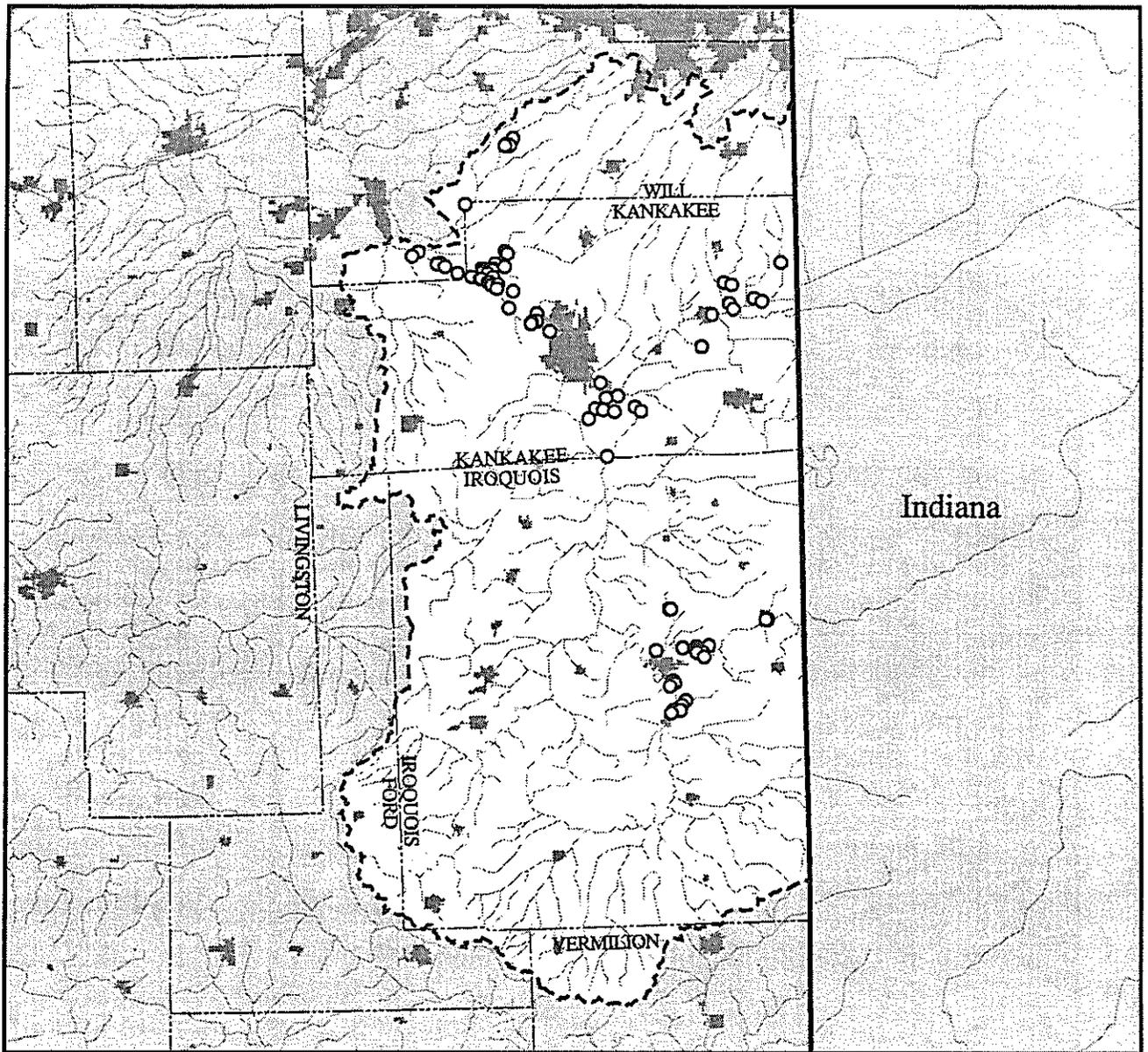


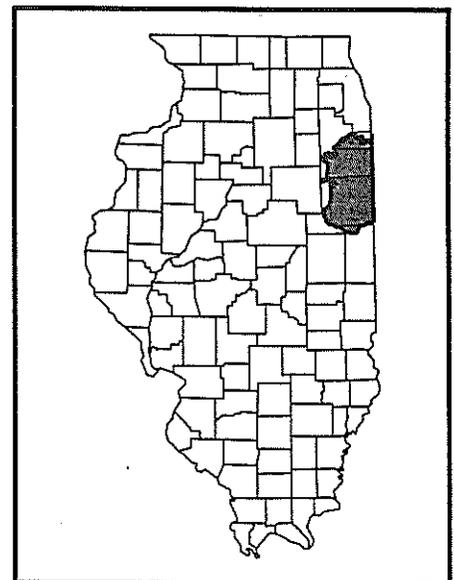
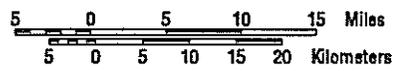
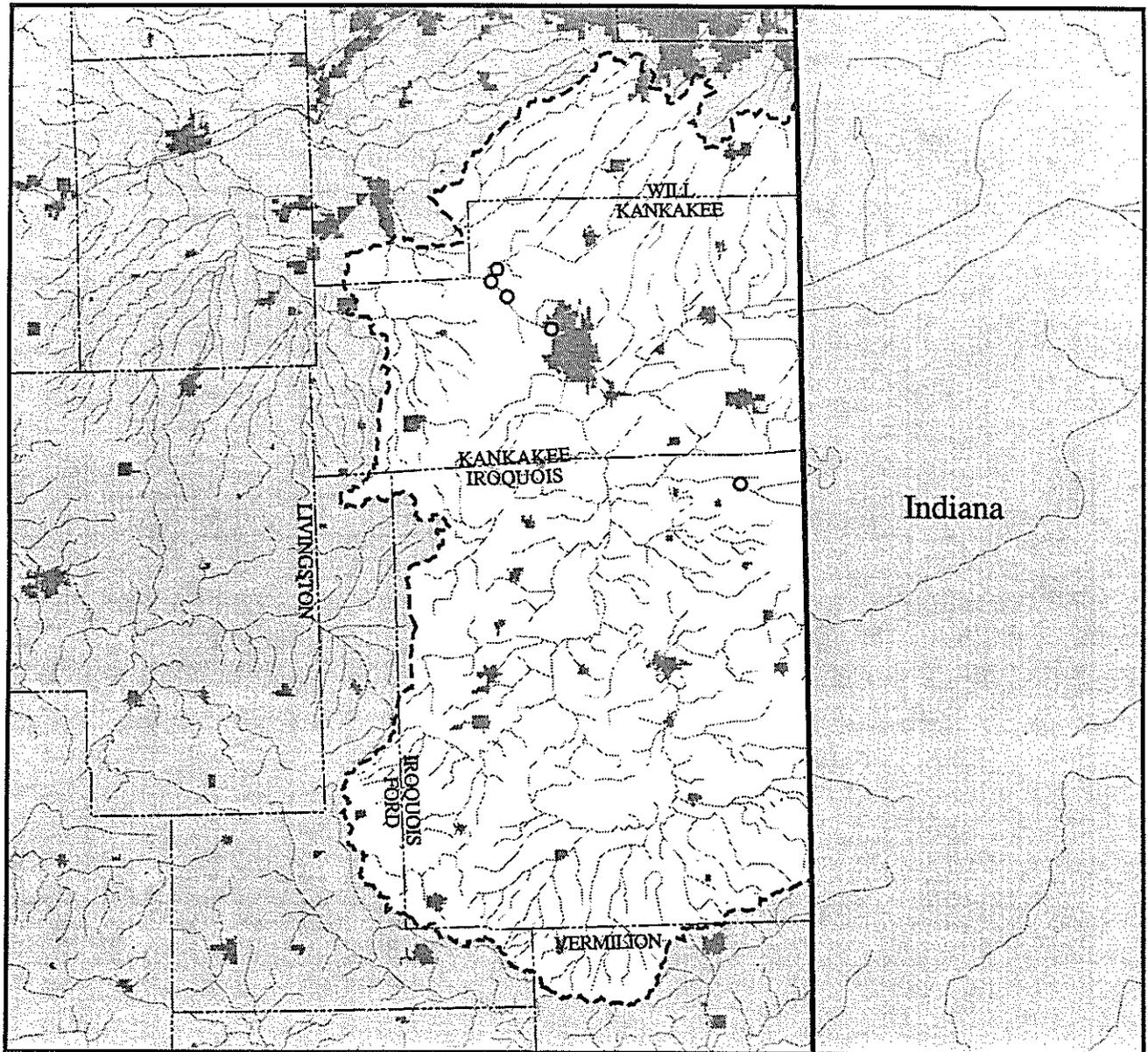
Figure 3-11. Late Woodland archaeological components.



○ Archaeological site (n = 78)

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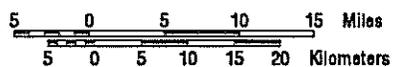
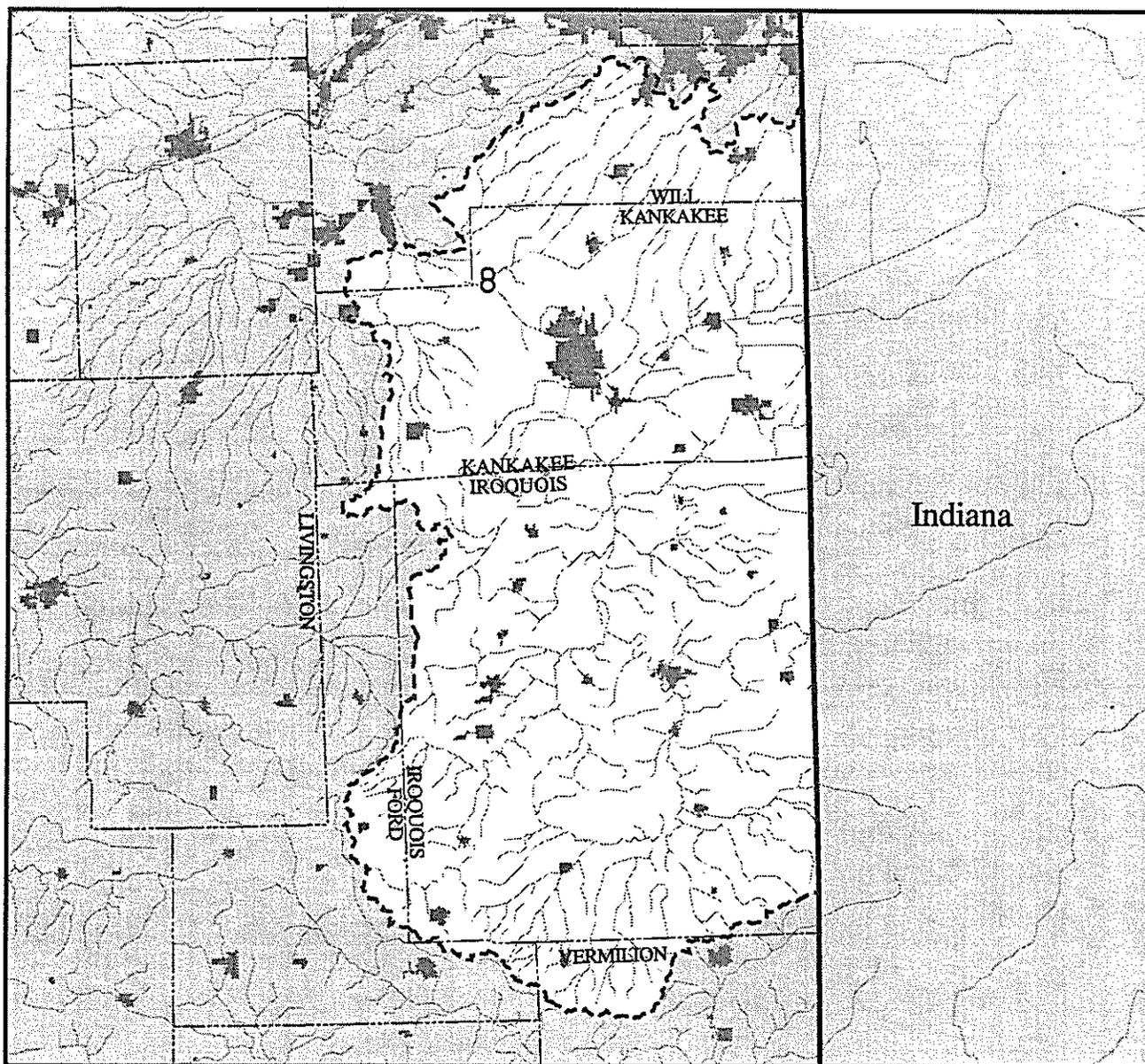
Figure 3-12. Mississippian archaeological components.



○ Archaeological site (n = 5)

IAS Database: June 03, 1997

Figure 3-13. Upper Mississippian archaeological components.



◦ Archaeological site (n = 2)

IAS Database: June 03, 1997

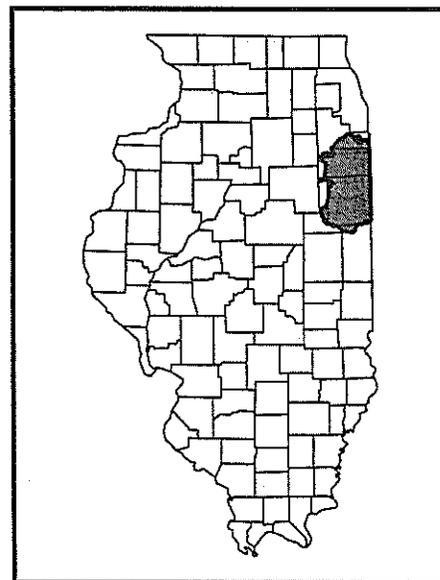
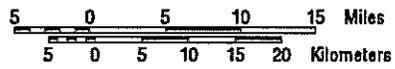
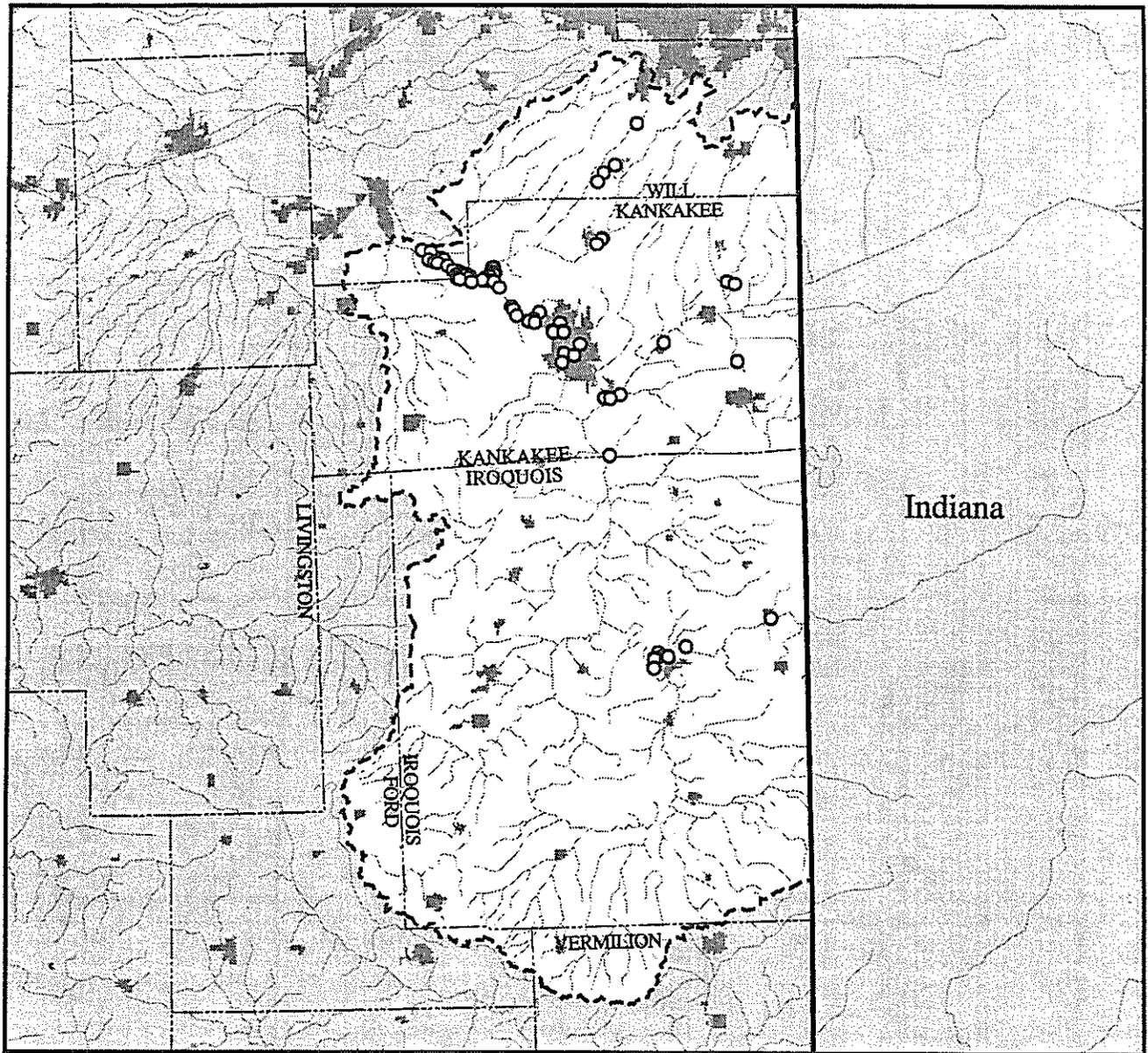


Figure 3-14. Protohistoric archaeological components.



○ Archaeological site (n = 75)

IAS Database: June 03, 1997

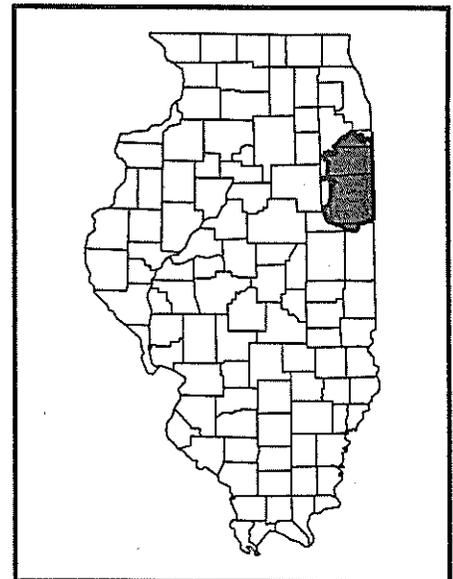
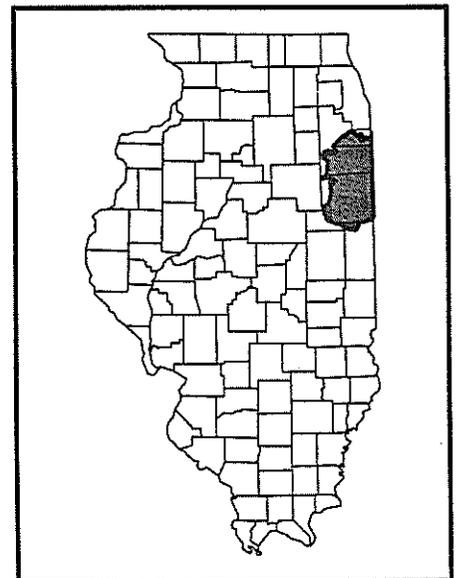
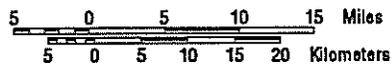
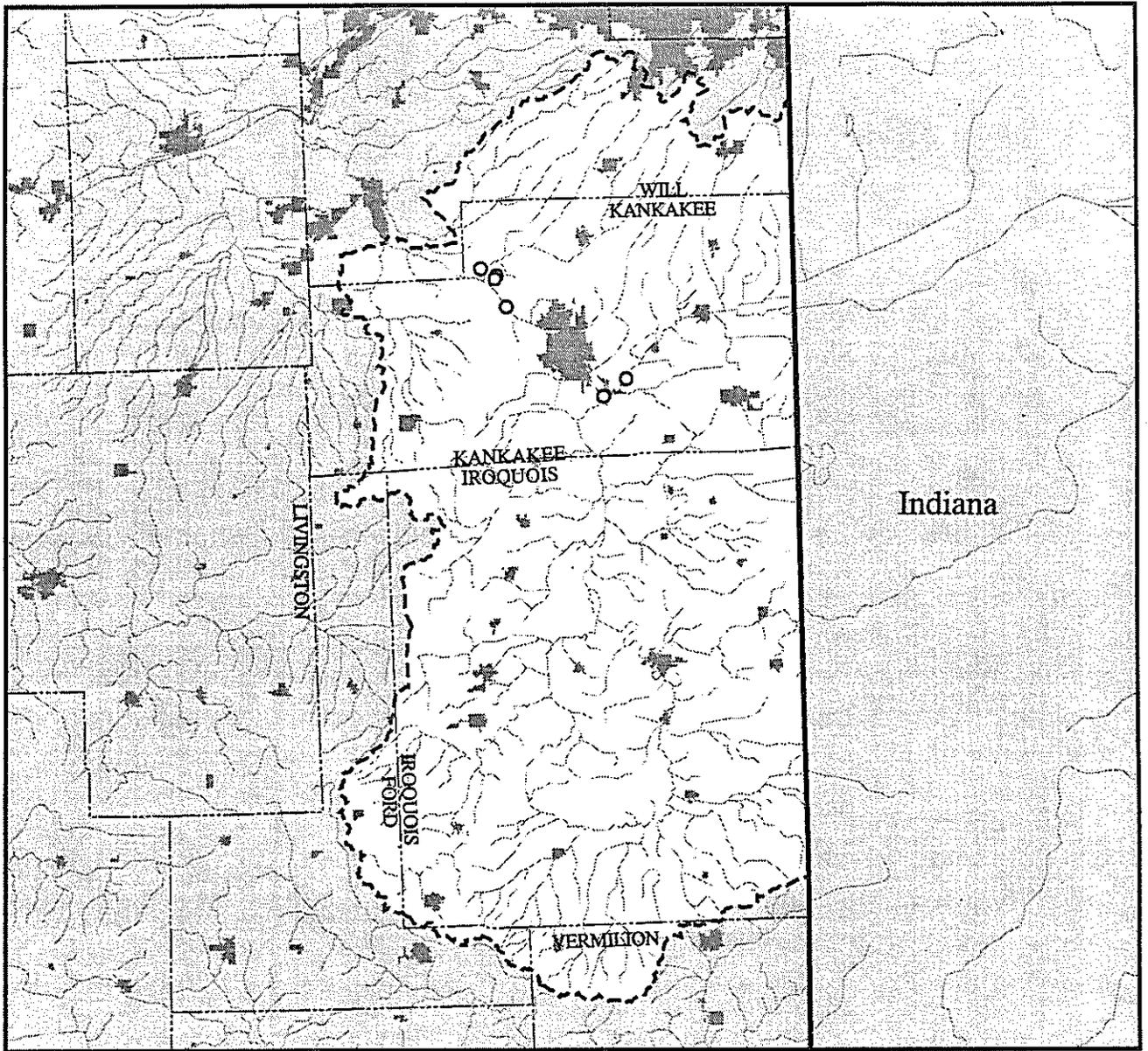


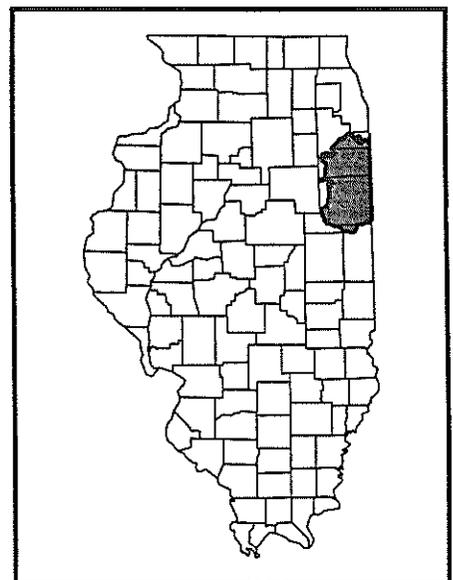
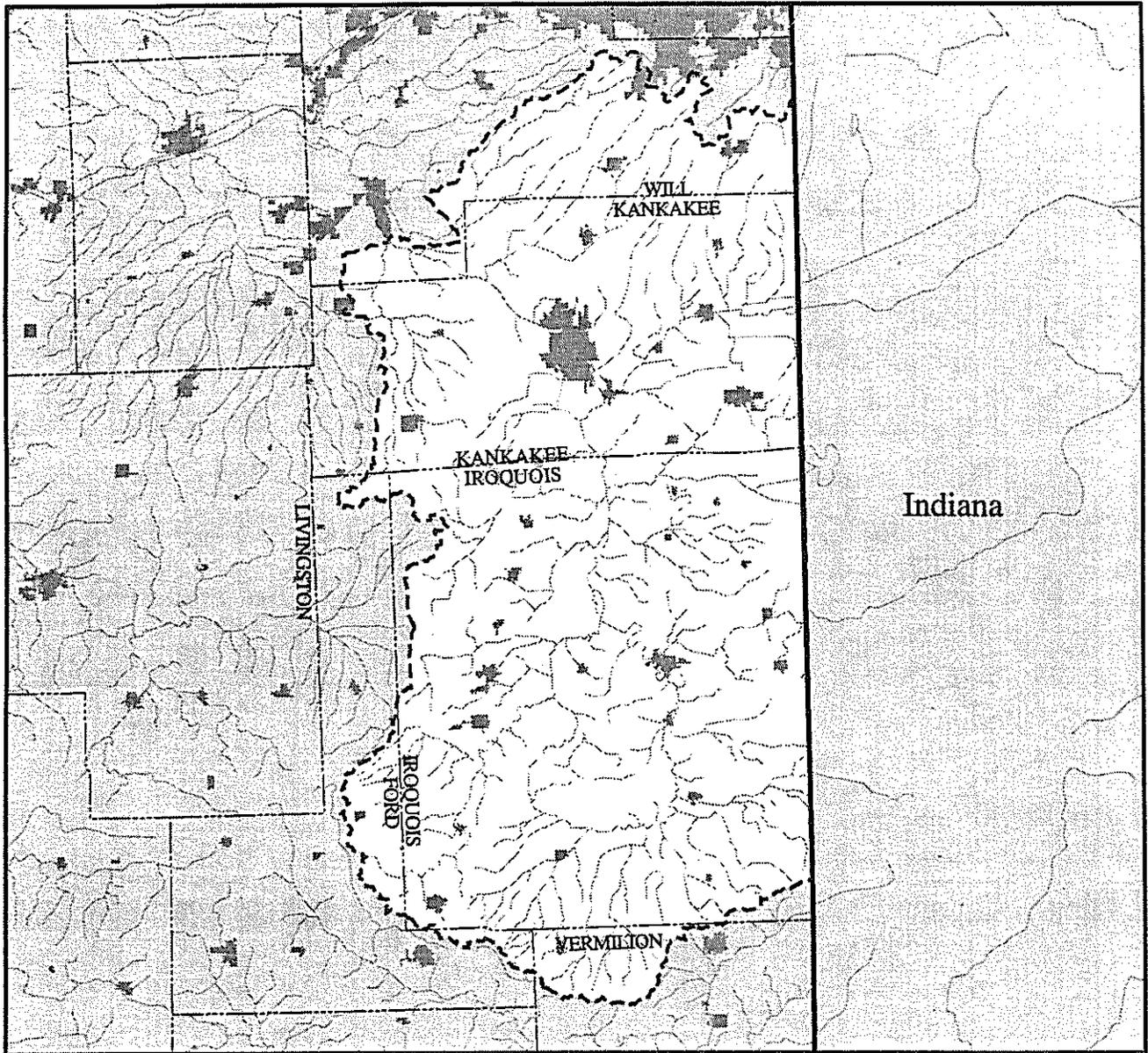
Figure 3-15. Unidentified Historic archaeological components.



○ Archaeological site (n = 6)

IAS Database: June 03, 1997

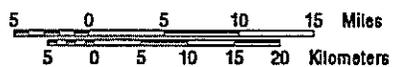
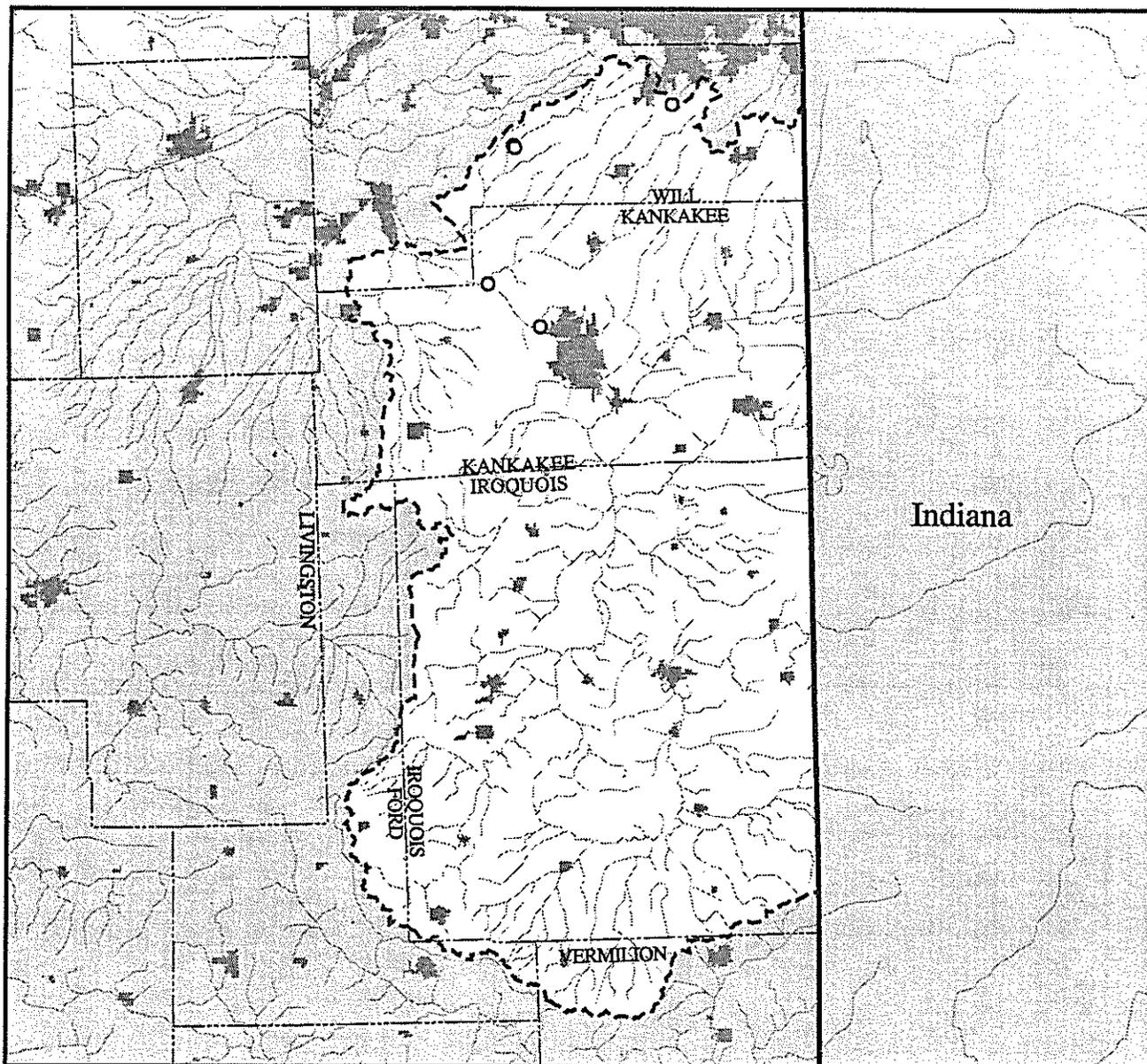
Figure 3-16. Historic Native American archaeological components.



○ Archaeological site (n = 0)

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Figure 3-17. Historic Colonial archaeological components.



○ Archaeological site (n = 5)

IAS Database: June 03, 1997

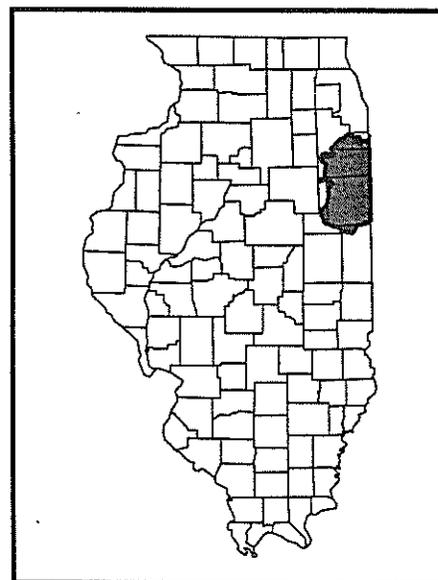
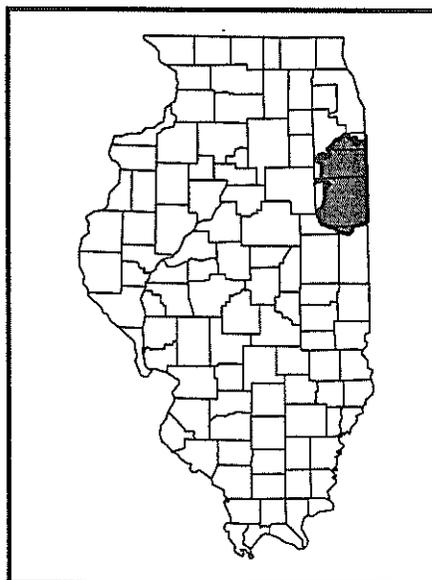
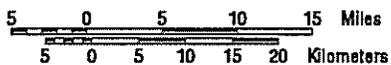
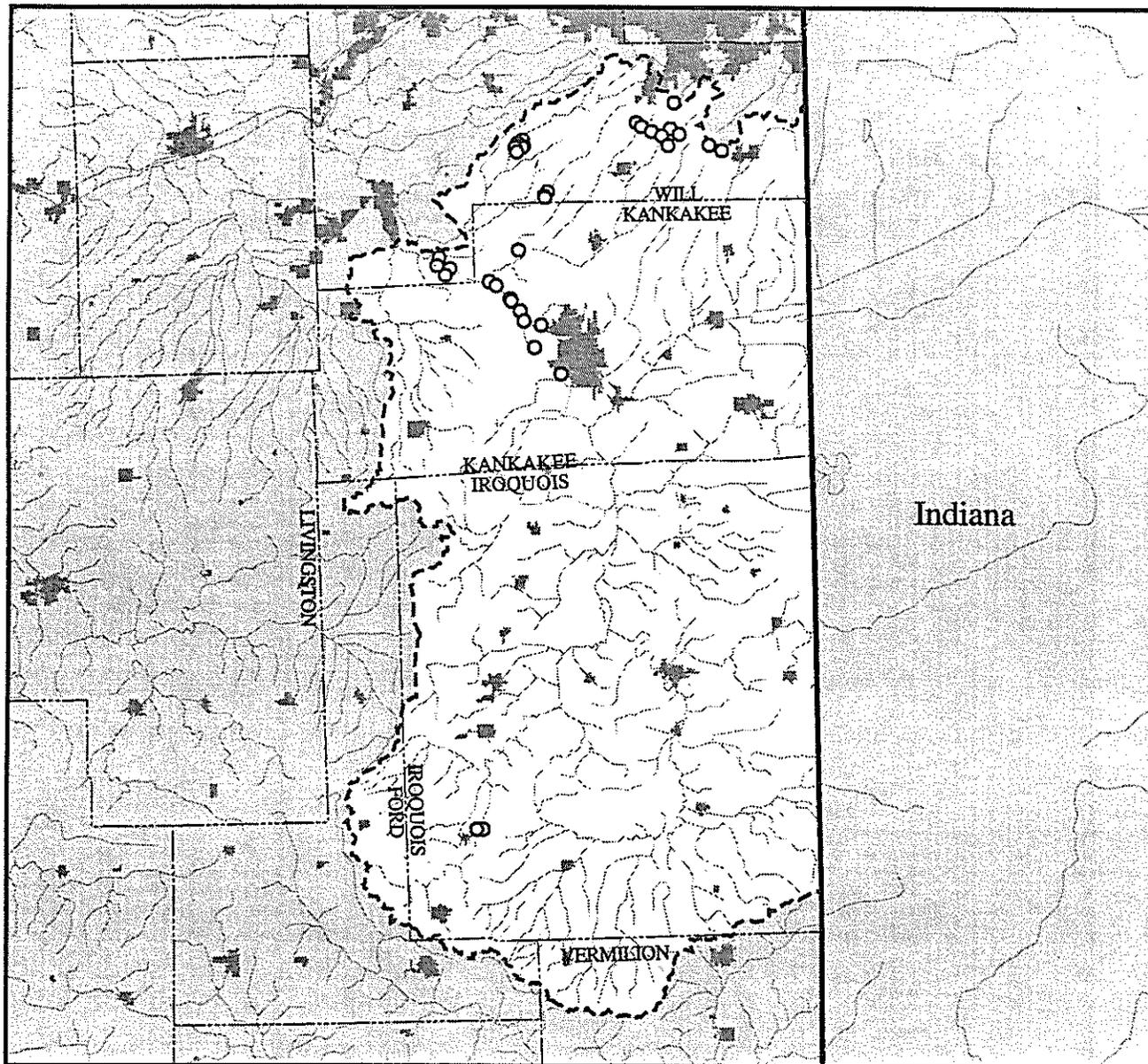


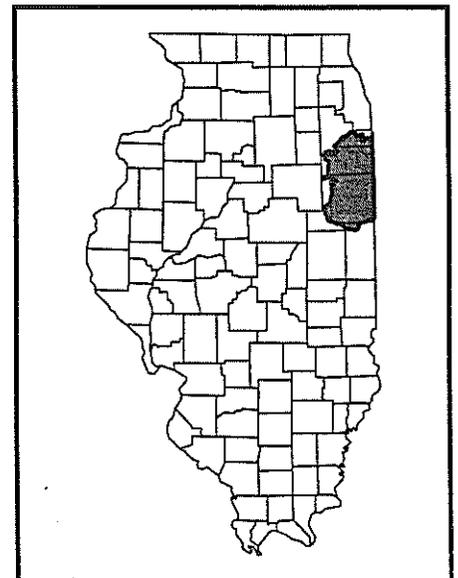
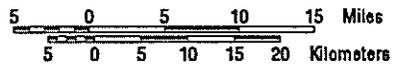
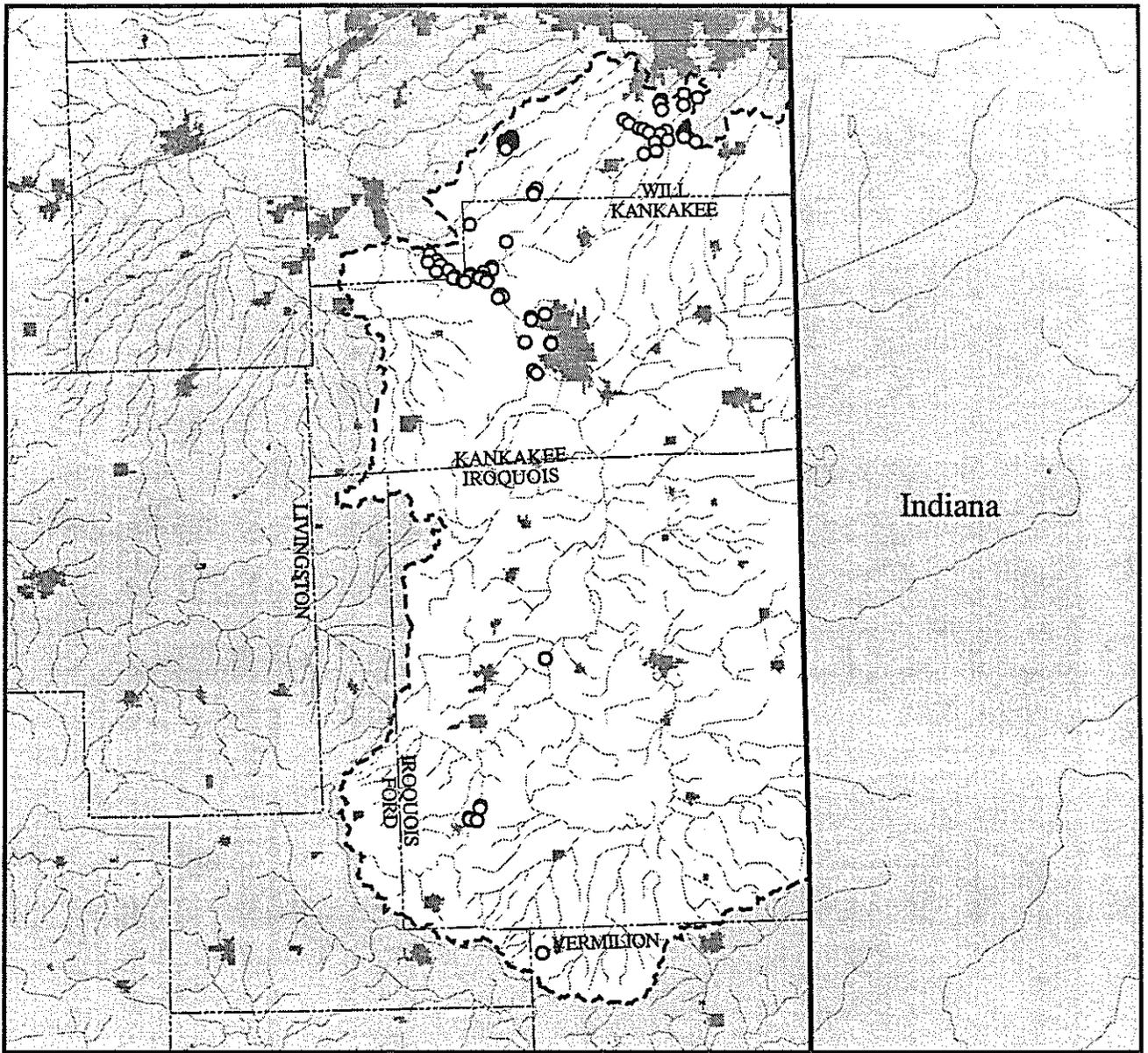
Figure 3-18. Historic Pioneer archaeological components.



○ Archaeological site (n = 39)

IAS Database: June 03, 1997

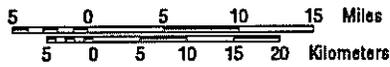
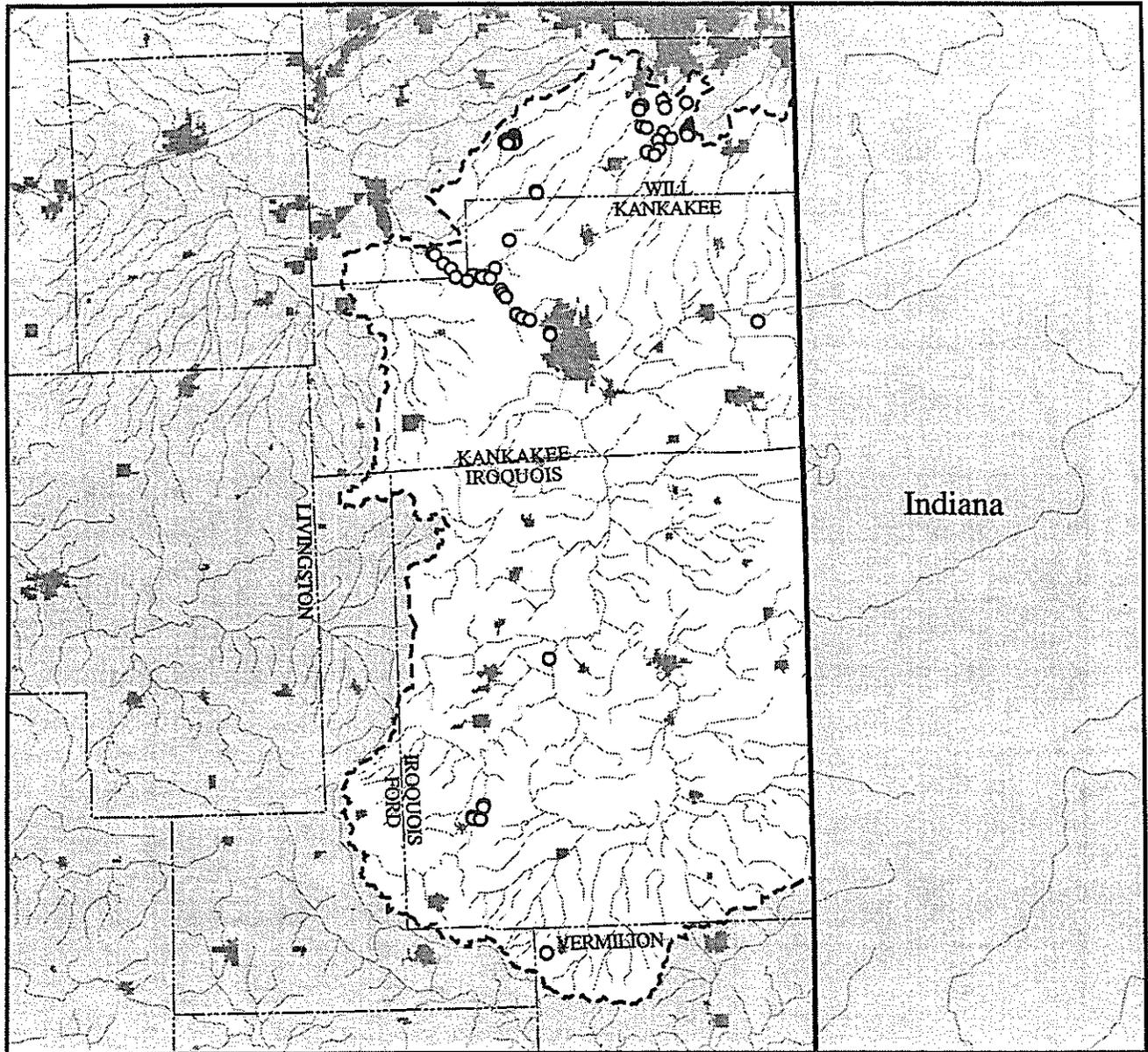
Figure 3-19. Historic Frontier archaeological components.



○ Archaeological site (n = 82)

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Figure 3-20. Historic Early Industrial archaeological components.



○ Archaeological site (n = 68)

IAS Database: June 03, 1997

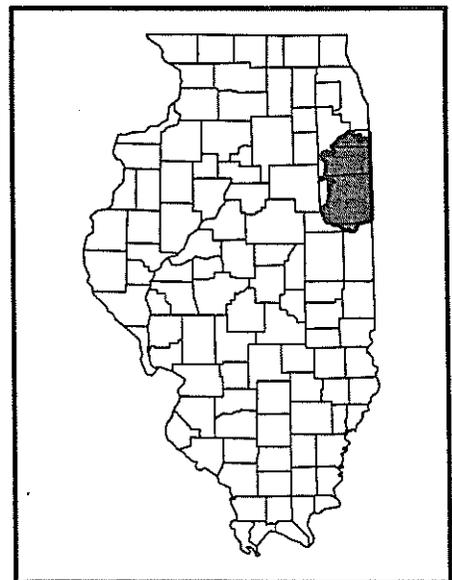
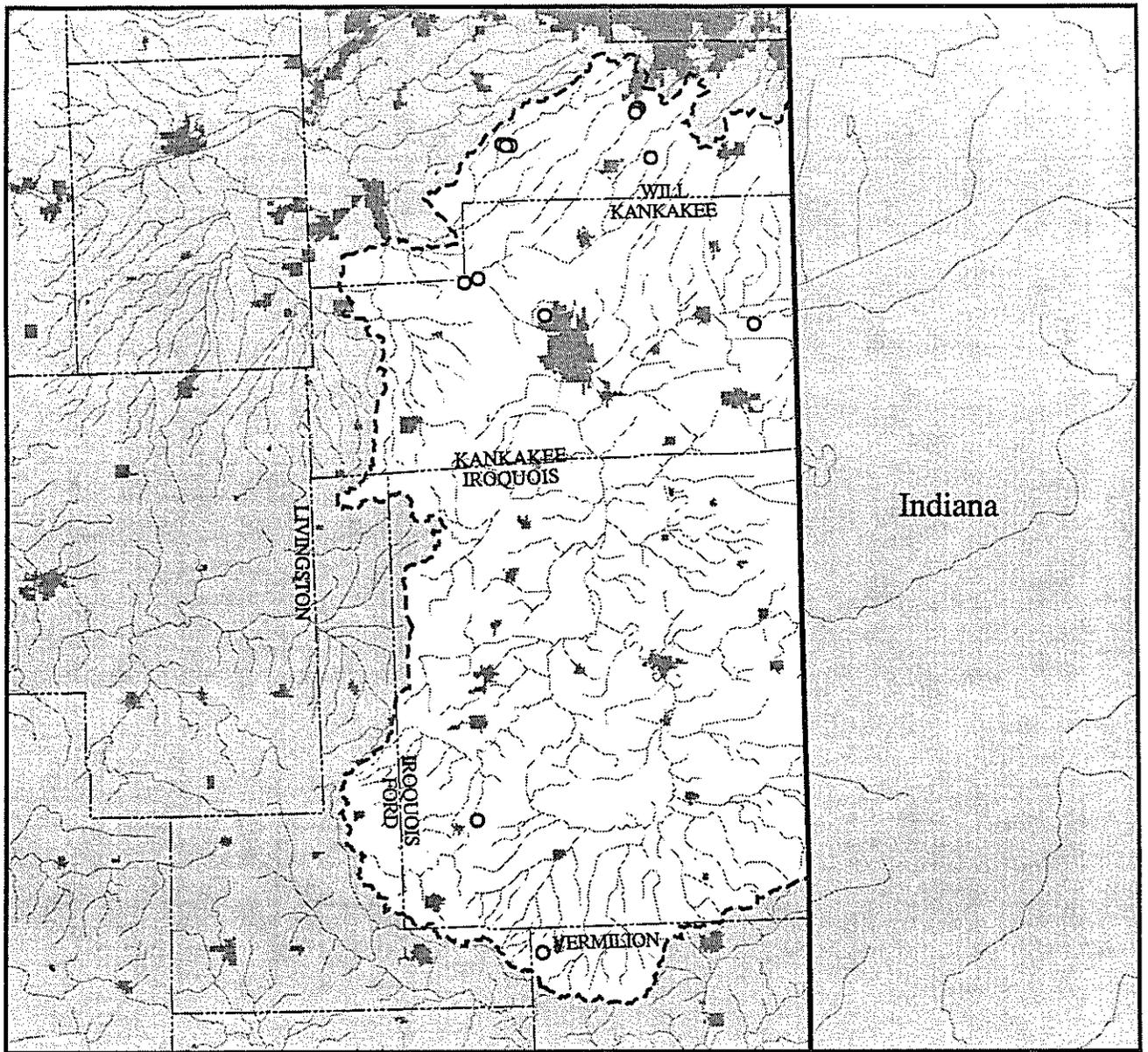


Figure 3-21. Historic Urban Industrial archaeological components.



○ Archaeological site (n = 18)

IAS Database: June 03, 1997

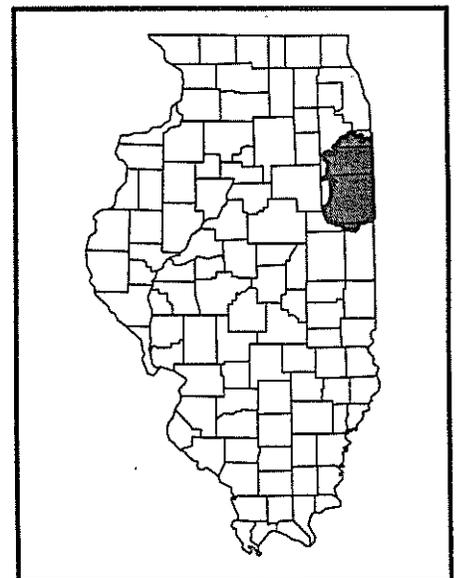


Figure 3-22. Historic Postwar archaeological components.

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