AN HISTORICAL REVIEW OF THE KANKAKEE RIVER BASIN DEVELOPMENT

Nani G. Bhowmik and Allen P. Bonini
Illinois State Water Survey, Champaign, Illinois

ABSTRACT

The engineering history of the Kankakee River Basin from the late seventeenth century to the present time is explored. Discussions are presented on reclamation of the marshy areas in and around the Kankakee River Grand Marsh, transportation systems on the river, construction of locks and dams, marsh usage as recreational and hunting grounds, and early attempts to drain the marsh. The channelization of the main marshy areas in Indiana in the early part of the twentieth century, which resulted in the shortening of the river from 250 miles to 80 miles and in an increase in the gradient, is examined. Various other attempts that were made to improve the drainage of the Kankakee basin through 1980 and the probable ecological concerns are also discussed. Finally, conclusions of the Illinois Kankakee River Basin Task Force are summarized.

EARLY HISTORY*

The first Europeans to descend the Kankakee River were the French explorers De La Salle and Father Hennepin in December 1679. The river they found looked far different from the one that exists today. Around the time of De La Salle's expedition, the Kankakee River was inhabited by the Pottawatomi Indians who called the river Ti-yar-ac-ke, "wonderful land." The French had a variety of names for it, including The-a-ki-ki and Quin-que-que. The contemporary name for the river, Kankakee, appears to be an English version of this later French word (Paddock, 1883; Houde and Klasey, 1968).

The French point of entry was near present day South Bend, Indiana. From there, down to what is now Momence, Illinois, De La Salle's party wound its way through more than 240 miles of a marshy, sandy maze of meanders, oxbows, and sloughs teeming with a variety of wildlife. This area would later become known as the "Grand Marsh." Downstream, below a limestone outcropping at Momence, the river had higher gradient and probably appeared much the same as it does today. The present plan view of the river is shown in figure 1.

Soon after the French explorers passed along the Kankakee, the hunters, trappers, and traders began to arrive. These were the first white men to inhabit the area. They lived a life similar to that of the Pottawatomi, spending the winter months harvesting some of the tens of thousands of waterfowl and furbearing animals that inhabited the Grand Marsh. As more frontiersmen began to establish themselves in the Kankakee basin, it became apparent that there would no longer be a place for the Pottawatomi Indians. The Federal Government formalized this transition through the treaties of 1832 and 1836.

* Much of the historical information presented here and in the following section is drawn from accounts by Houde and Klasey (1968), Meyer (1936) and Morrison (1976).

Pioneer settlers began to arrive during the early part of the 1800s. Their presence began to establish the primary features along the Kankakee River as we know them today. Gurdon Hubbard, a fur trader and one of the first to settle along the Kankakee river, established a trail between Chicago and Danville that crossed the Kankakee at a shallow ford about one mile upstream from where Momence is now located. This site was one of two practical places to cross the river at that time. It was called Upper Crossing or Hill's Ford. The other ford site, located about a mile downstream, was called Lower Crossing. The two became centers for traffic joining the northern and southern portions of the basin.

In the 1840s a bridge was built at Upper Crossing, but it was twice destroyed by ice jams. The establishment of the town of Momence at the Lower Crossing and the destruction of the bridge caused the Upper Crossing to disappear.

Momence was only one of a series of settlements that developed along the Kankakee River and the fringes of the Grand Marsh in the early 1800s. At that time they were rugged pioneer settlements inhabited by people who adjusted to the restrictions and limitations of their environment. In addition, the marsh was home to the frontier trapper and hunter as well as a hideout for counterfeiters, outlaws, and horse thieves. The growth of these communities, along with the establishment of the prairie farmer, would have an irreversible impact upon the river.

By the mid-1800s a distinct metamorphosis had occured. A new breed of individual was becoming a dominant force in the area. These people wanted to exploit the lands and natural resources surrounding the Kankakee river and marsh. They were the logger, the sportsman, the stock farmer, and any others who could find something of commercial value on the river or in the marsh.

The first persons to utilize the Kankakee River were those that valued it as a source of power. These individuals built dams and mills for processing grains and cutting timber. Their mills were usually associated with the settlements along the river.

Long before the pioneer settlers arrived, the Kankakee River had been used as a means of transportation. The advent of the railroad and the increasing demand for an inexpensive means of transporting raw materials to the marketplace made riverboat traffic increasingly popular. There were flatboats, sternwheelers, and steamboats. They traveled upstream of Momence and into the marsh, carrying sightseers, hunters, and cargo. They traveled downstream to Kankakee and the railroad, or down to the Illinois and Michigan Canal and to Chicago with their barges loaded with farm products.

The Kankakee Company, formerly known as the Kankakee and Iroquois Navigation and Manufacturing Company, was formed around 1871 to increase and improve riverboat traffic along the Kankakee River. It proposed to open the Kankakee and Iroquois Rivers to boat traffic for 170 miles (70 miles in Indiana). The plan called for building a series of locks and dams that would create a slack water navigational channel with a minimum water depth of 5 feet to connect commercial traffic with the Illinois and Michigan Canal and Chicago. The dams were also to be used to generate water power (Kankakee Company, 1871). The only part of the river where this plan became a reality was a 33-mile stretch upstream from the confluence with the Illinois River. Later, most of these locks and dams were destroyed and never replaced (U.S. House of Representatives, 1916).

The 1870s marked the arrival of another business dependent upon the river for its product: several companies were organized to harvest the ice that formed on the river. The clear waters of the Kankakee, combined with the usually cold winters, created a layer of clear ice that measured as much as 18 inches thick. At times, more than 60,000 tons of this ice were harvested in a single season.

The thick, clear ice that formed every winter was more than just a source of profit for the ice companies. Every spring it became a potential source of destruction and economic loss. Ice jams and flooding were common occurrences along the Kankakee River. Early settler accounts suggest that during the early 1830s flooding that occurred near the city of Kankakee sent flood waters out to the lower end of the area where the downtown is now located. A series of severe floods occurred in the 1850s, causing some flood stages to rise 18 to 20 feet above the low water level near the mouth of the river (U.S. House of Representatives, 1931). In addition, there are records that indicate that a series of ice jams and floods occurred between 1860 and 1890 that damaged or destroyed several bridges and buildings on the Kankakee and twice flooded the town of Momence in two feet of water.

The Grand Marsh created its own history. By the 1880s its reputation as a "hunter's paradise" had spread to the East Coast and beyond. Presidents Grover Cleveland and Theodore Roosevelt hunted in the Grand Marsh. There was enough interest in the area to cause sportsmen's clubs from New York, Boston, Philadelphia, Washington, and Chicago to build hunting lodges there for their wealthy members. The tens of thousands of waterfowl and other forms of wildlife were also harvested for the commercial markets of Chicago and New York (Mahoney, 1978).

ENGINEERING EFFECTS

Although people had been using the Kankakee River throughout the 1800s, nothing had as great and irreversible an impact upon it as did the efforts of those who wanted to drain the lowlands and the Grand Marsh.

The Grand Marsh was a distinct and natural ecosystem. An account of the area by Meyer (1936) describes it best:

> Marsh prairies of aquatic sedges and grasses, grazing areas; wild rice sloughs, scenes of countless wild geese and ducks; flag ponds, lined with muskrat homes; a narrow but almost uninterrupted swamp forest, full of game, rimming a meandering river teeming with fish; wet prairies made humanly habitable by the interspersion of sandy island oak barrens, many of them surmounting the highest flood waters—such was the general physical set-up of the "natural" Kankakee.

Before channelization the Grand Marsh encompassed approximately 400,000 acres and ranged from 3 to 5 miles in width with a water depth of from 1 to 4 feet for eight or nine months of the year. The marsh plane was only about 85 miles long, but the river course was about 250 miles in length with an average slope of 5 to 6 inches per mile. The nature of the marsh caused the Kankakee River to alter its course continuously, resulting in the formation of a variety of meanders, oxbow lakes, sloughs, and bayous (Meyer, 1936; U.S. Department of Agriculture, 1909). Figure 2 shows the nature of the Grand Marsh before channelization.

Attempts to drain these lands for improved agricultural use took many forms. The early pioneer farmers drained small portions of the land by digging ditches, first by hand and later with the help of oxen and horses. One of the earliest organized efforts to drain swampland was attempted in 1853 by the State of Indiana. Their goal was to drain the 5 by 7 mile Beaver Lake, which was south of the Kankakee River. The ditch they constructed to the river was not very successful in draining the lake, which receded only 100 feet from its original shore. In 1874 this same ditch was deepened by a wealthy landowner named Lemuel Milk, who succeeded in reducing the lake area by only 0.25 square mile.

During the 1860s the Illinois Central Railroad tried to drain portions of its land that were in swampy areas, again with very little success. There appeared to be two factors limiting the successful drainage of the lands. First was the lack of proper equipment for the effective and efficient digging of drainage ditches. Closely related to this were the prohibitive costs of drainage work, due to inadequate technologies.

By the mid-1880s legislation that provided for the formation of drainage districts had been enacted. These districts were given the power to levy taxes for the financing of drainage work. The invention of the steam dredge, which allowed the digging of deep, wide drainage ditches, also helped overcome the previous obstacles to draining the lands. In Illinois and Indiana, most of the drainage work could then be done under the authority of the various drainage districts. In 1866, Singleton Ditch in Indiana (figure 1) became one of the first to be constructed under this new authority. Ackerman, Hayden, and Brown ditches were also built around that time (Division of Waterways, 1954).

Again, this drainage work was only partially successful in reclaiming the swamplands. It was thought that the key to adequate drainage was the lowering or removal of the limestone rock ledge near Momence, Illinois.

In 1878 and 1879 the U. S. Army Corps of Engineers conducted a survey of the Kankakee River to analyze the possible improvement of the river for navigation. This work was reported by Major Jared A. Smith, Corps of Engineers (U. S. House of Representatives, 1879; U. S. Senate, 1880). In reporting his findings, Smith made reference to two points of interest. In his first report (U. S. House of Representatives, 1879) he stated that the water was so clear that he was able to see fish swimming in the stream "as well as minute objects on the bottom in a depth of 5 feet. . ." He also commented that although the rock ledge near Momence was considered "a great obstacle to the drainage of the lands in Indiana," he believed that due to the greater than average slope of the river for several miles above the rock ledge, the removal of this ledge "would accomplish little or nothing for the drainage of lands so far above. . ."

Major Smith's second report (U. S. Senate, 1880) seemed to favor the construction of a navigation channel to Momence. He indicated that there were several strong objections to that idea as well as to the idea of rebuilding the dams at Momence for the navigation project.

In 1882 the Indiana Legislature directed Professor John L. Campbell to survey the Kankakee Valley from its source down to Momence to determine an effective method of draining the marsh lands. Campbell suggested the following plan (U. S. House of Representatives, 1916).

First, the construction of a better main channel than now exists for the flow of the river; second, the straightening and deepening of the beds of the streams emptying into the main stream; and third, the digging of a large number of lateral ditches through the swamps to the improved channels.

In 1889 and 1891, the State of Indiana, convinced that the rock ledge was the key to their drainage problems, appropriated a total of $65,000 for the widening and deepening of the channel near Momence. This work, done in 1893, created a channel 8, 649 feet long, 300 feet wide, and 2½ feet deep, and required the removal of 66,447 cubic yards of rock (U. S. Department of Agriculture, 1909; U. S. House of Representatives, 1916 and 1931).

Upon completion of the work at Momence, various public and private groups began to channelize the main river along its uppermost reaches. By 1906, 46 miles of the main channel had been straightened, from its source near South Bend to the west end of Starke County. The work was organized in the following manner: the first 7 miles were built by private landowners without the help of the Indiana drainage laws; the next section, Miller Ditch, was 7.75 miles in length; the third section, 5.5 miles long, was constructed by the Kankakee Improvement Company; the fourth section 9.1 miles long, was called the Place Ditch; the fifth section, constructed by the Kankakee River Reclamation Company, was 16.7 miles long (figure 3). The channel had a bottom width of 8 feet at the upper end and 50 feet at the lower end (U.S. Department of Agriculture, 1909; U.S. House of Representatives, 1916 and 1931).

The U.S. Army Corps of Engineers (U.S. House of Representatives, 1916) reported that the work done on the upper portion of the Kankakee River failed to accomplish its goals adequately and that it created some new problems downstream of the work. The Corps suggested that 1) the design and implementation lacked a comprehensive plan and the cooperation of the interested parties, 2) the resultant successful drainage of about one-third of the acreage did not necessarily justify the amount spent, and 3) the improved channel increased the rate of runoff so as to cause problems of increased discharge and flooding downstream of the drainage works (also USDA, 1909).

It soon became apparent that the only solution to the newly created problems downstream was to continue the straightening of the river. This, along with lateral ditch construction, was expected to reclaim more lands for productive use.

As reported in 1916 (U. S. House of Representives), the U.S. Army Corps of Engineers concluded that the cooperation of the United States in planned improvements of the Kankakee River for drainage and flood protection could not be justified in terms of the benefits to navigation. They did, however, discuss various plans to improve drainage of the remainder of the upper valley. The Corps referred to the three plans for improvement cited in U.S. Department of Agriculture Circular 80 (1909). They agreed that the third plan, as detailed by the USDA, was the most favorable. This plan called for the straightening and enlarging of the present channel from the confluence of the Yellow River to the rock ledge at Momence, without the construction of levees to assist in the control of flow. The Corps also recommended an extensive survey of the area to determine the cost and exact design of the channel. In addition to making this proposal, the Corps stated its opinion that a comprehensive, coordinated plan would need to be devised for this project to accomplish its goals.

It was noted in the Corps' report that the work had already begun in the area. Marble Ditch was being constructed from the west line of Starke County to an area about 7 miles east of the Illinois-Indiana state line. This channel was to follow the line recommended by USDA Circular 80 (1909) and would result in the straightening and deepening of the river. A continuation of Marble Ditch had been proposed to carry the channelized flow to the state line. The only work planned for downstream from the state line was the removal of more of the Momence rock ledge.

It was on this last part of the plan that the Corps received the most input from private landowners. Most of them believed that the removal of the ledge at Momence was important. The approval and cooperation of the State of Illinois was required, but Illinois was not receptive. It was hoped that the Federal Government would become involved for the purpose of improving navigation and would use its authority to remove the rock ledge, but, as has been noted, the United States declined to participate.

In Indiana, the channelization went ahead as planned and was completed in 1917. The old channel, 250 miles of meandering river, had been replaced by a straightened, deepened channel 82 miles long, extending from near South Bend to the Illinois state line (figure 3 and 4). Below this point, except for the work done at the rock ledge at Momence in 1893, the river remained in its natural form. In Indiana, the average slope of the river had been changed from 0.45 foot per mile to 0.83 foot per mile. The improved drainage affected neary 400,000 acres of swamp and 600,000 acres of marginal land at a cost of about $1.2 million (U.S. House of Representatives, 1916 and 1931).

The Grand Marsh had finally been "reclaimed." However, the accomplishment was not greeted with enthusiasm by everyone. There was concern in Illinois about the impact of the change on the downstream reaches of the river. For years many have questioned the wisdom of destroying this vast natural ecosystem. As early as 1920, this was pointed out when Reed (1920) wrote:

> Fields of corn and wheat stretch over the reclaimed acres, for the utilitarian has triumphed over beauty and nature's providence for his wild creatures. The destruction of one of the most valuable bird refuges on the continent has almost been completed, for the sake of immediate wealth. The realization of this great economic wrong must be left to future generations.

Soon after the channelization was completed, it became apparent that the drainage problem had not been completely solved. Severe flooding still occurred east of the Momence rock ledge, and the removal of additional rock was discussed. In 1927 the Momence and Yellowhead Drainage District removed boulders that obstructed flow from an area just upstream of the rock ledge (U. S. Army Corps of Engineers, 1979). This was the only work done on the main channel. The focus of the work in the Kankakee basin after the channelization of 1917 was directed toward the construction of levees to contain the flood water and toward the improvement of lateral ditches for increased drainage (U. S. Army Corps of Engineers, 1979).

There was one study done by the Corps of Engineers in 1931 that focused its attention on the main channel. The purpose of this study (U.S. House of Representatives, 1931) was to assess the benefits of any additional work done on the river for improving navigation, flood control, power development, and irrigation. The

Corps concluded that the Federal Government could not justify its involvement in terms of making improvements to benefit the areas reviewed.

The Corps did make recommendations for anyone interested in controlling floods, reclaiming marshlands, and improving drainage. They first noted that most of the drainage and severe flood problems occurred upstream of Momence. The suggested improvements included: the rebuilding or lengthening of 14 bridges in Indiana that obstructed flow in the main channel and the floodplain, the construction of levees in Indiana between Shelby Bridge and Baums Bridge, the enlarging of the channel through Momence and the rock ledge, and the enlarging and improving of the main channel for 58 miles upstream of Momence in order to benefit land in Indiana. The Corps noted that the last two improvements would need to be done in combination or the desired beneficial effect of improved drainage would not be achieved (U. S. House of Representatives, 1931).

The analysis of the proposed improvements did not discuss the potential impact, if any, upon the lower reaches of the river. The Corps did point out that the previous channelization in Indiana had increased the flow so that sand and silt were being carried downstream into Illinois, depositing among trees, and creating numerous sand bars in the river bed. The straightened channel in Indiana had little effect below Momence because of the increased slope downstream (U, S. House of Representives, 1931).

There appears to have been continued interest in the Kankakee River in the mid-1900s. In 1941, the Corps of Engineers conducted a study (U.S. Army Corps of Engineers, 1941) that reviewed the improvements that would be necessary to control flooding along the Kankakee River. These improvements included lowering the rock ledge at Momence, constructing a movable dam to maintain low flow levels, cleaning the river of sand bars, opening the outlets of sloughs, and enlarging and straightening portions of the river from Momence to the state line.

The Corps analyzed these proposed improvements and concluded that the work should not be done. It was estimated that the costs far exceeded any possible benefits.

While making their assessment, the Corps made note of two points of interest. First, large quantities of sand had been deposited between the state line and Momence due to channel erosion upstream. The increased silting had reduced low flow depths to less than 1 foot between the state line and Momence. However, the rate of siltation below the state line had since decreased. This, according to the Corps, indicated that the straightened channel in Indiana was stabilizing (U.S. Army Corps of Engineers, 1941).

In addition, the report noted that the removal of the rock ledge at Momemce could have an adverse effect upon the river by increasing siltation downstream, although no important damage was likely to occur. The Corps' unfavorable review resulted in the abandonment of the proposed improvements.

In 1947, the Illinois Department of Transportation, Division of Water Resources, investigated the possibility of replacing the collapsed dam at Aroma Park to restore the recreational channel up to Momence (Kankakee River Basin Task Force, 1978). This plan was never implemented.

In 1955, a move was also under way in Illinois to form the Momence Conservancy District with the power to levy taxes and protect the river. Plans were made to remove some of the sand from the river, but this goal was never realized because of lack of interest and funds. Through the mid-1960s there appears to be

no record of any major studies to reduce flooding or improve drainage along the main channel.

In 1967, the Illinois Department of Public Works and Buildings, Division of Waterways, published a comprehensive report on the Kankakee River Basin in Illinois (Division of Waterways, 1967). This study reviewed several areas, including water supply, water-oriented recreation, water quality control, flood damage control, and agricultural drainage.

General recommendations and conclusions were made for all the areas reviewed. In particular, it was suggested that the rock ledge through Momence be lowered, which would serve two purposes: 1) it would increase the length of the recreational waterway, and 2) the excavated channel would improve drainage and reduce flooding upstream of Momence. It was noted that the channel work could not be economically justified for the purpose of improved drainage and flood control.

The study also recommended that a lock and dam be constructed just upstream of the confluence of Yellowhead-Singleton Ditch. The purpose of this dam was to maintain the water level up to the state line at the same level as that before any excavation had occurred downstream (Division of Waterways, 1967). Conservation and environmental groups strongly objected to these proposals, and the project was subsequently dropped from consideration (Kankakee River Basin Task Force, 1978).

By the mid-1970s attention was again focused on the Kankakee River and the drainage of its surrounding lands. The Indiana Department of Natural Resources, in cooperation with the U.S. Soil Conservation Service, published a report on the Kankakee River Basin in 1976 (Indiana Department of Natural Resources, 1976). The report identified the problems and needs of the basin, including land use and management for agriculture, flooding, soil erosion, adequate drainage systems, increased land-based recreational opportunities, and protection and maintenance of natural water areas and prime wetlands.

Five alternative solutions were developed and presented. None of these alternative plans received the consensus approval of the public. A combination of the various plans was formulated and presented as the "Suggested Plan," which contained 15 elements, including the following recommendations (from Indiana Department of Natural Resources, 1976):

Channel work on 26 miles of the Kankakee River from Indiana Route 223 in St. Joseph County to U.S. Route 30, and 49 miles of wide levees (with no channel work) along the Kankakee River from U.S. Route 30 to U.S. Route 41, for flood prevention and drainage.

Channel work on 13 selected tributaries of the Kankakee River in Indiana for flood prevention and drainage.

Accelerated land treatment program, which includes installation of conservation measures to reduce and adequately treat 426,400 acres.

Accelerated land treatment program, which includes installations of on-farm resource management systems to adequately treat 247,500 acres of cropland for drainage.

Change of about 12,650 acres of erosion and drought hazard cropland to non-cropland for reduction of erosion and sedimentation, and for adequate treatment of land within its capability (in addition to the land treatment program).

Protection of about 5,000 acres of existing classified wetland.

Amendment or adoption of flood plan zoning ordinances, building codes, and similar regulations for all identified flood prone areas in the basin, and allowance of eligibility for flood insurance.

In 1977, in response to continued flooding problems on the Kankakee River, the Indiana General Assembly created a 24-member Kankakee River Basin Commission to coordinate a comprehensive development plan for the basin. This commission was given a small operating budget and had no authority to implement its plan (Kankakee River Basin Task Force, 1978). The commission relied upon the Indiana report of 1976, and in particular used the "Suggested Plan" as a basis for formulating its plan (U.S. Army Corps of Engineers, 1979; Mahoney, 1978).

Increased public concern in Illinois over the impact of the proposed work in Indiana, as well as the creation of the commission in Indiana, prompted Illinois Governor James R. Thompson to appoint the Illinois Kankakee River Basin Task Force in June 1977 (Kankakee River Basin Task Force, 1978).

The Illinois Task Force conducted public hearings to collect information from the residents of the basin and reported its findings and recommendations based on input from the hearings and technical information received from various state agencies (Kankakee River Basin Task Force, 1978).

In general, the Task Force recommended that the State of Illinois "maintain the Kankakee River as a low density recreation and scenic river" by keeping it "in the most natural condition possible." The Task Force believed that Indiana's plan to manage the basin for improved agricultural drainage was in conflict with the policy goals of Illinois. The Task Force also warned that a cautious approach must be taken in any plans to modify the Kankakee River in Illinois physically, due to the limited amount of information available.

The Task Force made recommendations in 10 areas of interest, including sediment and sedimentation in the Kankakee, River Basin, water quality, flooding and flood control, natural areas, and outdoor recreation. The first area, sediment and sedimentation, was of major concern to the citizens of the Kankakee River Basin. There was special concern about the present and future impact of sediment in the Kankakee River and about the effect of proposed work in Indiana on this problem.

The Task Force noted that there was a question of the magnitude and source of the sediment problem in Illinois and that there was a need to better understand the mechanism of sediment transport in the Kankakee River Basin. The Task Force recommended that "the Illinois State Water Survey begin immediately to monitor sediment and bed load movement at the state line and elsewhere in the Basin."

The Task Force also recommended that the State Water Survey analyze the monitoring data and the hydrology of the Kankakee River system and "suggest alternative remedial strategies." Finally, the Task Force suggested that the State Water Survey receive input from citizens of the Kankakee Basin while making its investigation.

In summer 1978, the then Illinois Institute for Environmental Quality, which is presently within the Illinois Department of Energy and Natural Resources, funded the State Water Survey for a 2-year research project on the Kankakee River. It was postulated that basic data would be collected for a period of one year

and that these data would then be analyzed and the results reported to the public. This report has been published (Bhowmik et al., 1980) and includes a background analysis, description of data collection measures, data analyses, and suggestions for preventive and remedial measures that can be initiated to reduce the sediment load in the river.

ACKNOWLEDGEMENTS

Avinash Nafday, a graduate student in the Civil Engineering Department at the University of Illinois, helped in the preparation of this article.

REFERENCES

Bhowmik, Nani G., Allen P. Bonini, William C. Bogner, and Richard P. Byrne. 1980. *Hydraulics of flow and sediment transport in the Kankakee River in Illinois.* Illinois State Water Survey Report of Investigation 98 Champaign, Illinois.

Division of Waterways. 1954. *Report on Illinois-Indiana interstate drainage, Yellowhead-Singleton Ditch system, June 1, 1954.* Illinois Department of Public Works and Buildings, prepared by authority of House Joint Resolution 50, 68th General Assembly.

Division of Waterways. 1967. *Kankakee River Basin study.* Illinois Department of Public Works and Buildings, prepared by authority of House Bill 2227, 74th General Assembly.

Houde, Mary Jean, and John Klasey. 1968. *Of the people, a popular history of Kankakee County.* The General Printing Company, Chicago, Illinois.

Indiana Department of Natural Resources. 1976. *Kankakee River Basin, Indiana.* In cooperation with the U.S. Department of Agriculturee and the U.S. Department of Interior.

Kankakee Company, The. 1871. *Prospectus of the Kankakee Company.* W. F. Brown and Company, Boston, Massachusetts.

Kankakee River Basin Task Force. 1978. *Final report to the Governor.* State of Illinois, Springfield, Illinois.

Mahoney, Mike. 1978. *The Kankakee. In* Illinois Times, October 27-November 2, 1978, Illinois Times, Inc., Springfield, Illinois.

Meyer, Alfred H. 1936. *The Kankakee "Marsh" of Northern Indiana and Illinois.* Papers of the Michigan Academy of Science. Arts and Letters v. XXI.

Morrison, Elizabeth B. 1976. *Memories of Momence Township.* Project of the Kankakee Bicentennial Commission.

Paddock, Daniel. 1883. *Atlas of Kankakee County, Illinois.* J. H. Beers and Company, Chicago, Illinois.

Reed, Earl H. 1920. *Tales of a vanishing river.* John Lane Company, New York, New York.

U.S. Army Corps of Engineers, 1941. *Review report of the Kankakee River, Illinois and Indiana, for flood control.* Chicago District, July 1941

U.S. Army Corps of Engineers, 1979. *Kankakee River, Indiana, Levee study.* Chicago District, December 1979.

U.S. Department of Agriculture. 1909. *A report upon the drainage of agricultural lands in the Kankakee River Valley, Indiana.* Office of Experiment Stations, Circular 80, Government Printing Office, Washington, D.C.

U.S. House of Representatives. 1879. *Kankakee River, letter from the Secretary of War.* 45th Congress, 3rd Session, Executive Document 73.

U.S. House of Representatives. 1916. *Kankakee River, Illinois and Indiana, letter from the Secretary of War.* 64th Congress, 1st Session, Document 931.

U.S. House of Representatives. 1931. *Kankakee River, Illinois and Indiana, letter from the Secretary of War.* 71st Congress, 3rd Session, Document 784.

U.S. Senate. 1880. *Survey of Kankakee River, in Indiana and Illinois, letter from the Secretary of War.* 46th Congress, 2nd Session, Executive Document 107.

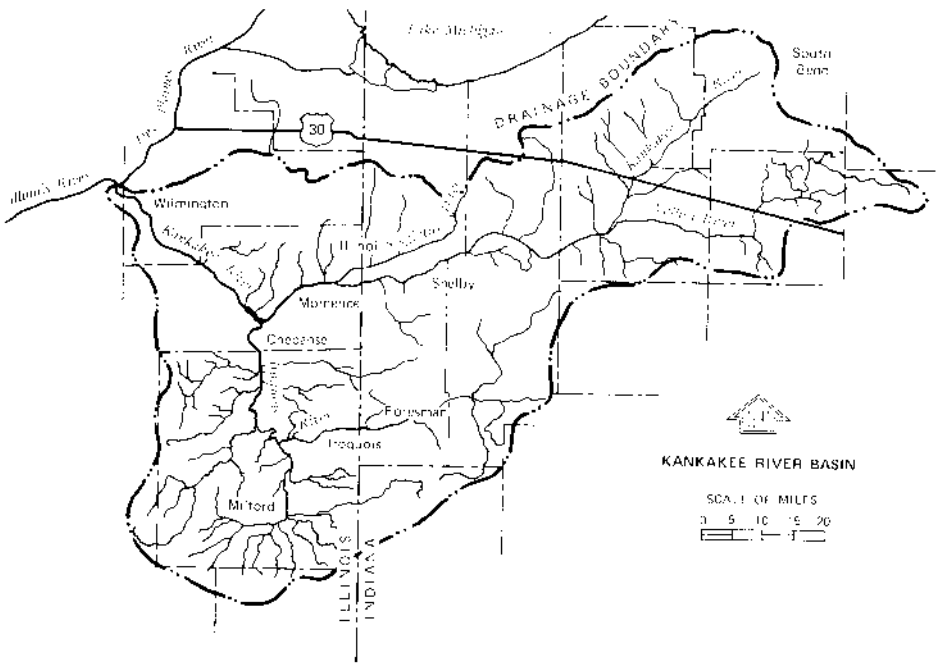

Figure 1. Kankakee River Basin

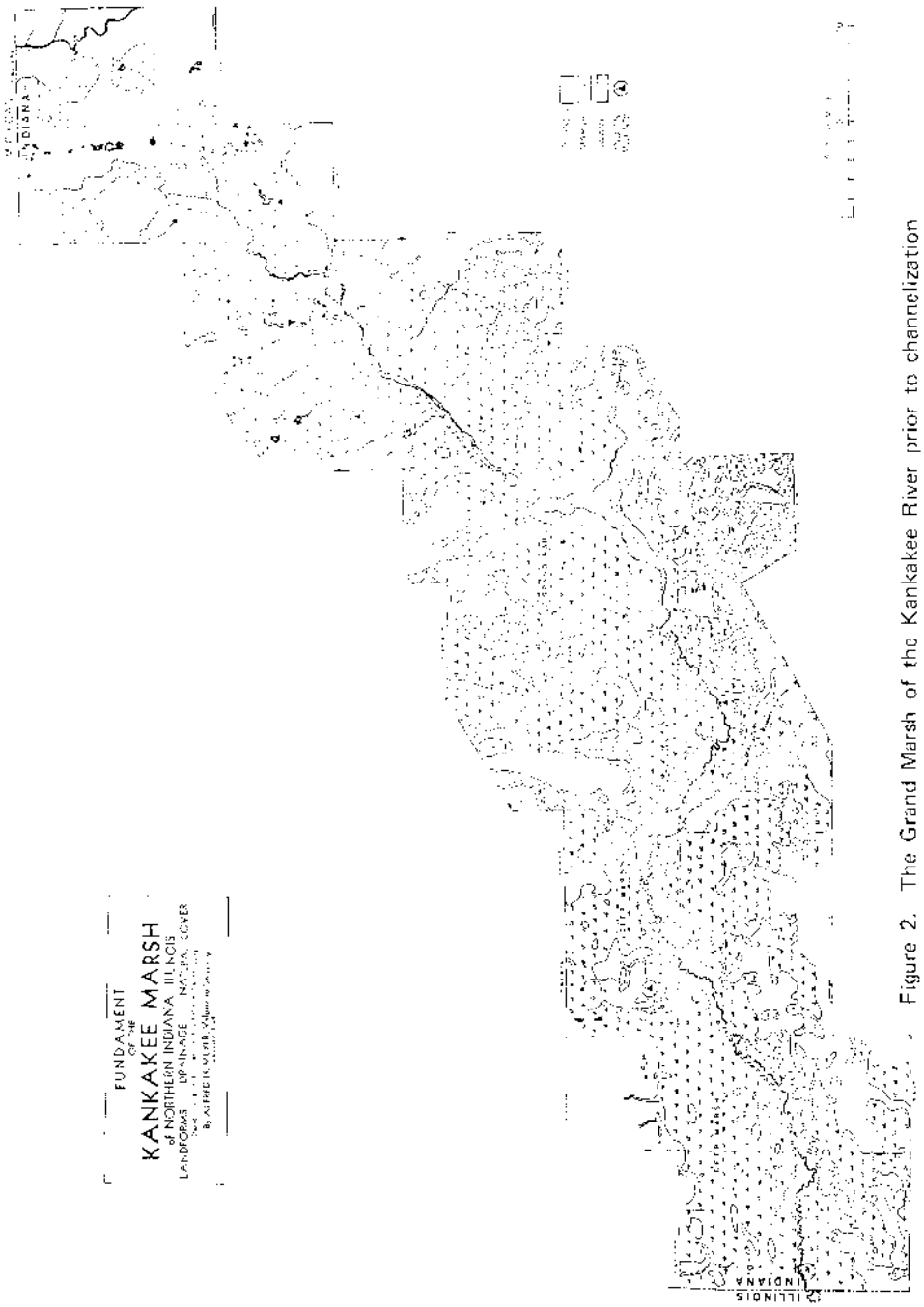

Figure 2. The Grand Marsh of the Kankakee River prior to channelization

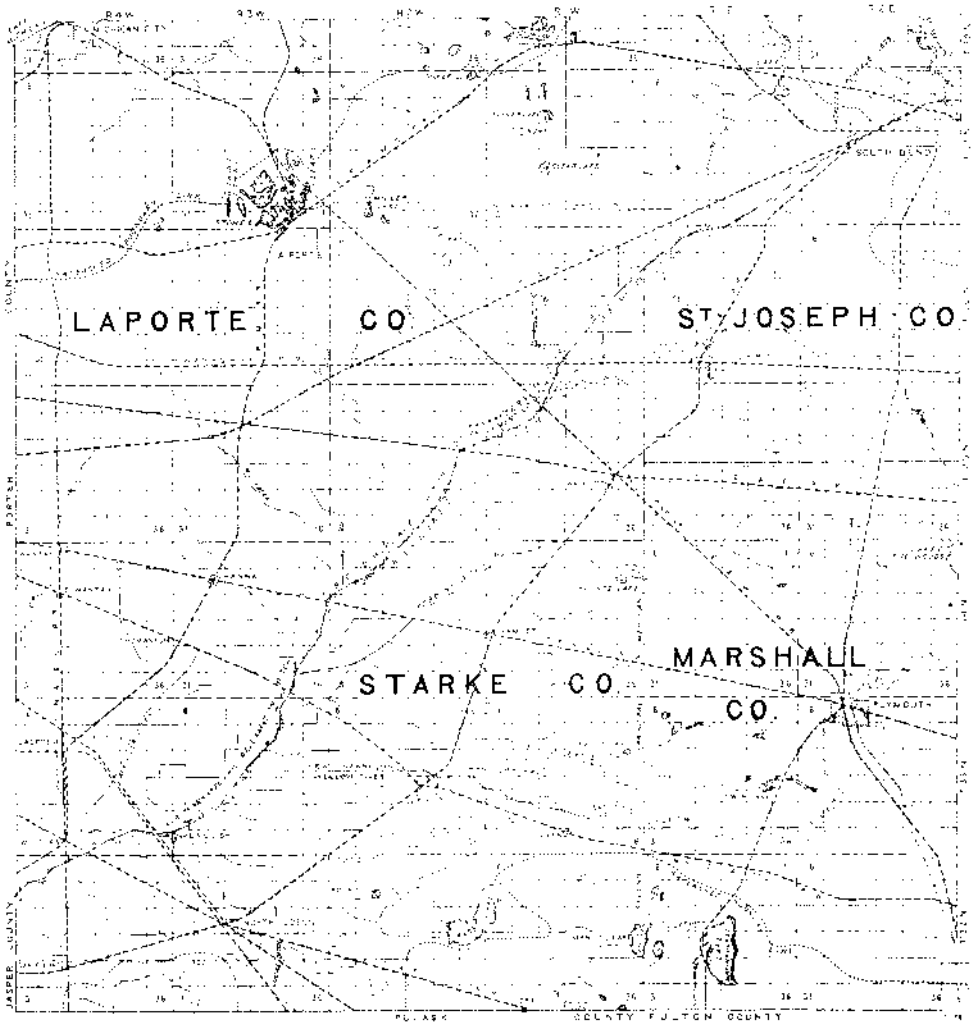

Figure 3. Channelization of the upper reaches of the Grand Marsh (USDA, 1909)

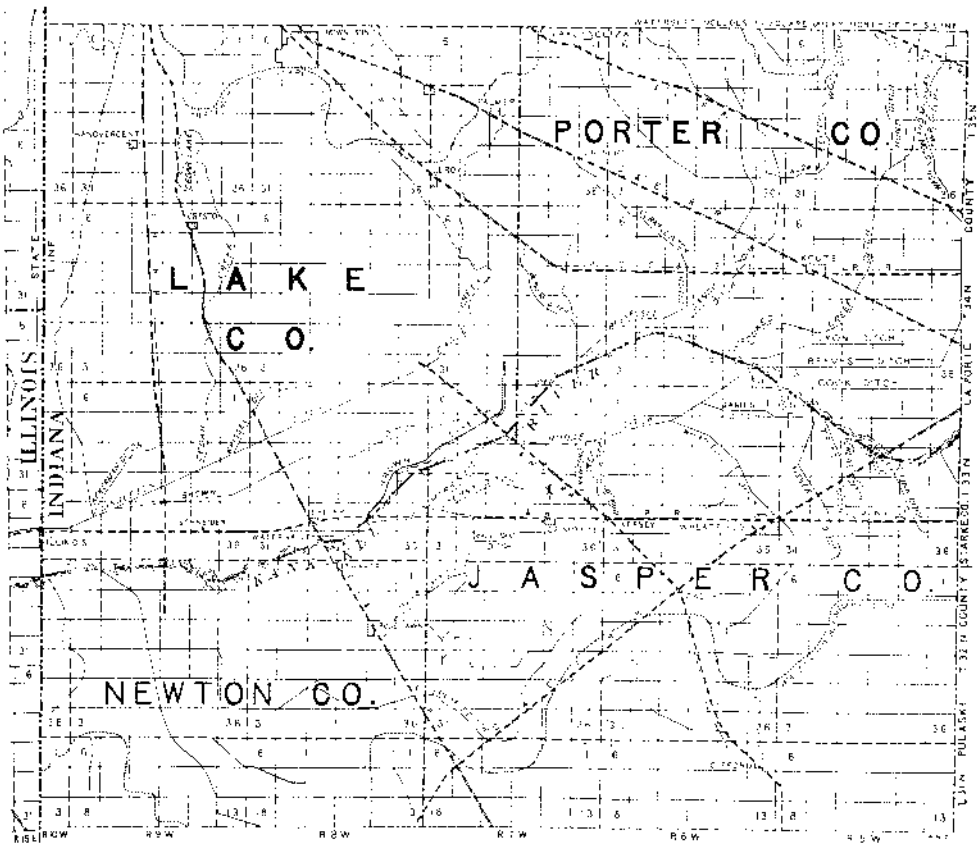

Figure 4. Proposed channelization of the lower reaches of the Grand Marsh (USDA, 1909)