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Kankakee River Basin Partnership

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by J.R. Black

THE KANKAKEE RIVER

GENERAL PHYSICAL AND HISTORICAL CHARACTERISTICS

The general geomorphology of the Kankakee River Basin was established during the melting of the last continental glaciers when numerous moraines were formed 13,000 to 16,000 years ago.

The Kankakee River rises as a small stream out of Mud Lake located in St. Joseph County, Indiana near South Bend. The Kankakee River originally began as a large marsh and flowed in a southwesterly direction to the southern boundry line of LaPorte County, Indiana and then more westerly crossing the Indiana - Illinois State Line in southern Lake County, Indiana. The Kankakee River then flows a little south of west to within a few miles of Kankakee, Illinois where it receives the Iroquois River from the south, thence it proceeds almost due northwest to near the northeast corner of Grundy County, Illinois where it unites with the Des Plaines River to form the Illinois River. The Kankakee River flows to the Des Plaines, the Illinois, the Mississippi and finally to the Gulf of Mexico.

The Kankakee River's name came from Indian vintage when the Potawatomes called her the AU-KI-KI meaning beautiful river. A French explorer and map maker, Siegnelay placed several pronunciations on the name and finally settled on the name Kankakee as the river is known today. The Kankakee River was originally 309 miles in length prior to channelization in Indiana. The Kankakee River had a flow length of 250 miles in Indiana and 59 miles in Illinois. The 250 miles of flow in Indiana was channeled into a 90 mile ditch beginning in the late 1800's. The original 250 miles in Indiana meandered as the Illinois protion of the River does today. During that period of time the Indiana protion of the Kankakee River was said to have 2000 bends and oxbows throughout her 250 mile Indiana journey.

The Kankakee River drains approximately 3125 square miles in Indiana and 2155 square miles in Illinois. It directly affects eight counties in Indiana including St. Joseph, Marshall, LaPorte, Starks, Porter, Jasper, Lake and Newton plus basically three counties in Illinois, including Kankakee, Iroquois and Will. Actually the mouth is located at the corner of Grundy County in Illinois. The Kankakee River fell approximately 1.3 feet per mile in Indiana to the Illinois border until straightened and now falls approximately 5 inches per mile. In Illinois, the Kankakee River falls 25 feet from Momence to the Iroquois River. From this point to the Des Plaines it falls 103 feet which is an average of 3 feet per mile including large drops at Altorf and Wilmington. Drops in these areas have been stated to be as much as 20 feet.

The underlying bedrock in the basin is made up primarily of

Devonian Shale and Silurian Dolomite. Most of the soil in Indiana is composed of sand but the landscape in Illinois is more complex. Surface materials in Illinois include silt and clay glacial tills, lacustrine sediment, exposed bedrock and sand. Approximately 85 percent of the Kankakee River Basin in Indiana is underlain by Devonian rocks, most of which are Ellsworth Shale, Antrim Shale and New Albany Shale. The southwestern portion of the basin in Indiana is composed of Mississippian limestone, while the northeastern portion bordering Illinois is composed of Silurian Limestone and Dolomite of the Wabash Formation, Louisville Limestone, Waldron Formation and Salamonie Dolomite. These Silurian rocks generally correspond with the Racine and Joliet Formations in Illinois.

Most of the underlying bedrock within the drainage basin in Illinois is Silurian Dolomite of the Racine Formation. The southern portion of the basin comprises a complex of Devonian, Pennsylvanian, and Mississippian Limestones, Shales, Sandstones and Dolomites. The extreme northwestern portion in western Kankakee and Will Counties is composed of Ordovician Shale and Pennsylvanian Rocks of mixed lithologies.

The main geological events that are responsible for the surficial deposits in the basin occurred over a one or two thousand year period. The retreat of the continental glaciers to their respective basins and more importantly the Kankakee Flood caused by the ice melt. The spoils from the glacier retreat to the north and east deposited poorly sorted sands, gravel, boulders and cobbles. The Kankakee Flood caused a depositing of sandy sediments extending from west of the city of Kankakee in Illinois to South Bend, Indiana. This belt is about 20 to 25 miles in width throughout eastern Kankakee and Iroquois Counties in Illinois and Newton, Lake, Jasper and Porter Counties in Indiana. This belt widened to more than 30 miles in Starke and LaPorte Counties in Indiana. This extensive sandy deposit is a primary source area for the sediments now residing in the Kankakee River. As the Kankakee Flood lowered and the flow became more concentrated to the Kankakee River Valley, the river scoured broad areas down to bedrock. Bedrock is at the surface downstream from the city of Kankakee. The erosive force of the currents deposited numerous bars of angular, bouldery rubble as well as relatively flat lying bouldery material, some of which may be lag deposit. The latter occurred in restricted areas west of Momence, Illinois and south and southwest of Kankakee, Illinois.

The final events shaping the character of the geological materials in the basin is the modern deposition of silt, sand and gravel adjacent to the Kankakee River and its tributaries. This transported material rests on the bedrock and glacial deposits. In general, the original Kankakee River flowed over a bed of sand and fine gravel in Indiana, but at Momence it begins to flow over limestone and from that point to its mouth, it flows over a rock bottom.

The upper portion of the Kankakee River formed the Grand Marsh which covered approximately 500,000 acres within the Valley of

Kankakee. Estimates have been written for coverage of as much as 625,000 acers. The Grand Marsh resembled an immense sponge slowly absorbing the water during the wet season and as slowly giving forth during the dry season so as to regulate the flow throughout the year on a quite regular and uniform basis. The marsh held for some eight or nine months of the year from one to four feet of water for as far as five miles either side of the main channel. The Grand Marsh was considered a "Sportsman's Paradise" and a "Scenic Wonderland". Once nationally famous for it's natural charm, for fishing, for hunting, for boating and for trapping. The pressures of agriculture came to bear and the marsh began to lose it's identity.

An Act of Congress in 1850 gave the Grand Marsh to the State of Indiana. Shortly after receiving the property, the Indiana State Legislature past measures to sell the land and use the proceeds to drain the marsh. In their words, "this would improve the River in Indiana". A member of the Indiana State Game Commission, Gene Shireman, strongly protested the program but his efforts were thwarted by a large agriculture lobby. The first drainage ditch was hand dug in 1858 and by 1884 several lateral ditches were dug from the funds generated by land sales. An additional \$60,000 was appropriated to break the limestone outcrop at Momence. This rock ledge aided in holding the marsh waters in tact. All Northwest Indiana began reaping the harvest of it's folly in destruction of this natural wonderland through the reclamation projects, ill conceived drainage and deforestation. The major deforestation began in 1907 by the Chicago Furniture Company. Most of the logs they cut were floated downstream and eventually tied to the banks where they settled to the bottom. Historians state the timbers are still located in the original channel beneath 20 or more feet of silt and sand.

The Kankakee Reclamation Company was formed in 1902 to deepen, widen and straighten the Kankakee River from South Bend, Indiana to the Illinois State Line. Their project was well underway by 1909 with considerable work accomplished by 1917. The date of 1929 is used as the completion date for both draining of the marsh and straightening of the Indiana portion of the Kankakee River. This drainage effort drained one half million acers of the Grand Marsh and straightened the Kankakee River in Indiana from it's original 250 miles to 83 or 90 miles depending on your source of reference. The U.S.G.S. in their 1992 study of the Kankakee River state that the straightened length of the Indiana portion of the River is 80 miles. The stated cost of the drainage project was one and a quarter million dollars. The completed project resulted in a deeply trenched ditch with high banks and approximately a chain or two in width. The current was rapid as was the load of sand which had little to offer in the form of scenery or sport. The dredged Kankakee of today seems only popular for bathing where the current is not to swift.

It is apparent that management practices of the Kankakee River vary greatly between Illinois and Indiana. In Indiana the river system

has been constructed and managed as an agricultural drainage project successfully draining the wetlands and converting them into farmland. The intent of the management has been based on the economics of agricultural production. In Illinois, especially in Kankakee County, the River has been used as a scenic, cultural and recreational resource.

The outcropping at Momence was invaded in 1893 to aid in the drainage of the Grand Marsh. The \$60,000 appropriated by the Indiana State Legislature financed the project. Approximately two and one-half feet was removed from an area 300 feet wide and 8649 feet long. It was found that the boulders above this area continued to hold back a portion of the flow of the Kankakee River and the Momence Drainage District appropriated \$5,000 to remove these boulders in 1927. All of the afore mentioned efforts permanently changed the configuration of the Kankakee River in Indiana. It's waters move faster and they pick up and carry several times more sediment (perdominately sand) than a meandering stream would carry. The water seems to rush at Illinois in a torrent. At the State Line, it immediately hits a rocky ledge and a series of hairpin curves, slowing the speed so abruptly that the River begins to drop it's burder of sand. Undoubtedly the channelization added to the bulk of the sedimentation. At the present, due to the drainage of the Grand Marsh, the water flows off the lands much sooner after it falls and consequently the River is higher during autum and spring floods and lower during other seasons than formerly was the norm. The U.S.G.S. has noted an increase in steam flow since the early 1900's. They state that this could be due to several variables including quantity, duration and intensity of rainfall, land use practices, urbanization and changes in channel geometry such as straightening or dredging of the channel. Certainly the draining of the Grand Marsh decreased the prime storage capacity of the Kankakee River due to loss of space and the natural bogs that served as a sponge to absorb water during the wet seasons. Kwak, in his study, pointed to studies indicating trends of increased peak and average flows from 1930 to 1979. He further pointed out that an analysis of precipitation data for the upstream portion of the watershed found that no corresponding increases in percipitation occurred during the study period indicating that factors related to human activity are responsible for the observed changes in discharge over time. Ivens and associates in 1981 suggested that clearing natural cover, urban development, decrease in the natural infiltration rate and changes in the river regime (channelization) among other factors may be contributing causes to the trend.

During the channelization and dredging operations in Indiana, sands, silts and clays were released and made available for transport in the channel. As a consequence of such activity, the sand would be expected to start it's migration downstream as bedload, but the silts and clays as suspended sediment probably moved through the system rather quickly.

The Kankakee River today is approximately 150 miles long

channelized straight in Indiana and continuing it's natural meandering way throughout Illinois until it's point of discharge into the Illinois River. The largest portion of the Kankakee River lies in Indiana, approximately 90 miles (depending on the source) and approximately 60 miles flowing within the borders of Illinois. Investigation into the River by Ivens and associates in 1931 and 1941 demonstrated that large quantities of sand had been deposited in Illinois from upstream channel erosion in Indiana. Today much of the River in Illinois flows through sand deposits overlying bedrock and deep sand bars along the channel are common. The River channel upstream of Momence meanders through thick sand deposits and resemble the River in Indiana before channelization. Most of the Kankakee River downstream of Momence flows over bedrock except for an impounded area near the city of Kankakee where thick deposits of sand are found. Aerial photos between 1939 and 1954 revealed increasing sedimentation in the form of accretion of beaches and islands in the Kankakee River Basin in Illinois. This supports the long held contention that dredging of the Kankakee River in Indiana has caused increased sedimentation and sand choking downstream in the natural Illinois portion of the Kankakee. This sand that has entered the system in a huge volume over the years has a serious degrading affect on the River. Some of the sand has come from the Iroquois River and other tributaries, bank erosion, construction projects, road work and row cropping on the Illinois side of the State Line but the bulk is from the channelized portion in Indiana. The sand avalanche has meant that the Kankakee River Basin is economically hurt as well as ecologically damaged. The Kankakee River has become shallower and it's water holding capacity and flooding reduction capabilities have declined. Local concerns have increased in recent years with the evidence of sand bed load ever increasing to the point of being discovered by the average layman. They are becoming aware that boat traffic patterns are being altered, stream mouths are being choked, sand bars are appearing frequently let alone the destruction to the ecological status of the Kankakee River that is noted more by the trained and concerned eye. Sand bed load is now appearing below the man made barrier of the Kankakee Dam and seriously threatens the rock bottom portion of the downstream Kankakee River. All of this information lends support to Bell's statement in his 1981 publication when he stated "some wetlands are worth more for flood control than for agriculture and never should have been drained." Local constituents certainly agree with Gore and associates in their belief that river restoration techniques to stabilize banks and restore portions of the Kankakee River channel to a natural flow pattern should be applied and evaluated. Restoring the Kankakee River to it's historical pattern or a modified natural flow would result in a variety of ecological and economic long term benefits.

To illustrate the importance of the Kankakee River and to support the efforts to protect and enhance this resource, it is well to know that the Kankakee is considered and described as pristine, one of the cleanest streams in Illinois, a natural treasure, one of the states finest flowing water environments. The Kankakee River had

the lowest sediment yield rate of all the rivers in the Illinois River Valley when only the suspended solids were considered.

The Kankakee River faces serious problems with the sand bed load but there are other physical factors that adversely affect the basin even though we fair better than many Illinois streams in these categories. Water pollution includes industrial, domestic and agricultural pollutants along with a major siltation problem. Further the demand for water as a resource to be drawn from the Kankakee is on the increase. Presently, the Kankakee metro area and the village of Wilmington use surface water drawn from the Kankakee River for public usage. Joliet has requested to withdraw from the Kankakee River which, if accepted, would greatly increase the demand. The accelerated demand for agriculture with the expansion of irrigation practices has a major impact on the flow during dry seasons since this is the prime growing season for crops. The volume of water withdrawn during dry periods increases dramatically which has a crucial impact on the aquatic biota of the river. Many of these withdrawl practices go unregulated and contribute to the problem of maintaining a proper stream flow.

Although history will point out that the Kankakee River was a navigable stream and was widely used for commerce in the early development of the area, the Kankakee did not become classified as being navigable until the U.S. Army Corps provided that designation in 1980. Portions of the river had been determined navigable prior to this document but final classification came at this point in history.

Some interesting related physical characteristics of the Kankakee River include the building of highways and railroads across the stream. The first bridge was built in 1842 in line with the Chicago Vincennes Trail. There were 68 highways and railroads crossing the Kankakee by the 1980's. The first iron bridge over the Kankakee was built in Illinois at Wilmington in 1883, while the first iron bridge in Indiana was the Dunns Bridge built in 1894 using pieces of the great ferris wheel from the Chicago World's Expo of 1893.

There have been several floods notable on the Kankakee River but the three that seem to be referenced the most are the great floods of 1882, 1957 and 1982. The 1882 flood damaged the dam in Wilmington, the 1957 flood caused considerable damage to property in Kankakee, and the 1982 flood covered 100,000 acers of land.

There have been several dams constructed on the Kankakee River but only two low head dams of any significance remain. One at Kankakee and one at Wilmington. There is also a stone structure called the Mill Race Dam located at the Wilmington Island and a small structure at Momence. Other dams including the first built by the Kankakee Company near Wilmington in 1847 have gone to ruins. There were four additional constructed near Wilmington to aid water flow in the Illinois - Michigan Canal and to improve navigation. One at Aroma Park where the base structure is still visable and one noted

near Custer Park that was destroyed reportedly by farmers in that particular area.

There are several tributaries to the Kankakee River of which some were man made. Various counts range up to 72 based on the size one considers as being a tributary. The most notable is the Iroquois River which flows into the Kankakee near Aroma Park, previously known as Waldron. The Iroquois River drains approximately 2175 square miles. The Iroquois River is 94 miles in length beginning near Rensselaer, Indiana to it's mouth at the joining of the Kankakee. It drops 14 feet in it's final 6 miles which is one half the fall of the first 70 miles. If one counts the tributaries found on most profile maps, they will find approximately 31 listed of which 15 are located in the State of Illinois. The following listing will provide some insight as to the number and location of the many tributaries that are or could be counted depending on the purpose of the count. This is the most extensive listing researched and was referenced in the Northern Illinois Anglers Association files. The listing is referenced by name and county of origin.

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