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THREE CENTURIES OF ENVIRONMENTAL HISTORY OF THE ILLINOIS RIVER

BY PAUL F. CRUIKSHANK, JR.

Since the 1670s, many have traveled the Illinois River—observing, enjoying, ignoring, or engineering it, suggesting ways to “improve” it, ruining it, and, finally, developing plans to restore it to its former health. Presented here, the three-century history of Illinois’ major water artery will acquaint the reader with the river’s former health and modern impacts upon that health. We will look at observations and studies by explorers, travelers, engineers and scientists in three historical periods: early exploration, late 18th century to 1848, and after 1848.

At one time, the Illinois may have been the most biologically diverse and productive river in the United States. Almost without current, the annual spring and fall flood pulse made the river what it was. Twice each year, the flood pulse drowned the rich land and then receded, leaving it still richer. Meandering through the general flatness of the floodplain, the slight variations in elevation of the lower reach of the river made the difference between swamp, marsh, bottomland lake, and pond.

Today the Illinois’ degraded state has made it one of three river-floodplain ecosystems named by the National Research Coun-

cil as priorities for restoration. The restoration goal is to reduce siltation, reestablish habitat, reduce flooding, and improve water quality. While we cannot bring the Illinois River back to its early 19th century grandeur, we can improve its modern ecologic and economic health.

Today plans are underway to restore and reestablish an ecological balance between the river and its floodplain. The Wetlands Initiative has begun five restoration demonstration projects along the river (see December 1997 issue of *Wetland Matters*).



HISTORICAL OVERVIEW

The first Europeans to travel in what was to become Illinois were French Jesuit missionaries. The French, and later the British in the 17th and 18th centuries, were explorers and missionaries, not settlers. When settlement began in earnest in the early 19th century, it was primarily in the southern part of the state, including the lower reaches of the Illinois River where steamboats could navigate upstream, and in the lead-rich region in the northwestern corner of the state. By the mid-19th century, two of the most significant events in the river’s history had occurred: the development of the plow by John Deere in 1847 and the completion of the Illinois & Michigan (I & M) Canal in 1848.

The river always had been unequal to the task of washing forward the sediment delivered to it by its headwaters and numerous tributaries. Farming greatly increased the

amount of sediment and, with the construction of dams for navigation, the river's ability to carry sediment down stream was further reduced. As a result, the backwater lakes—those that were not eliminated by levees—rapidly began to fill in. By early in the 20th century, many of the valley's wetlands were drained and floodplain acreage was reduced by 67 percent—from 546,000 acres to 195,000 acres.

In addition, turbidity increased with the advent of barge traffic brought about by the I & M Canal and the introduction of the common carp. The growing urban population in the region—particularly in Chicago—increased the amount of sewage reaching the

Illinois River. The collective impact spelled ecological catastrophe.

EARLY EXPLORATIONS

1673 AND BEYOND

The first explorer to provide a written record of the Illinois River was Father Jacques Marquette in 1673:

We have seen nothing like this river that we enter, as regards its fertility of soil, its prairies and woods; its cattle (buffalo), elk, deer, wildcats, bustards, swans, ducks, parroquets, and even beaver. In the spring

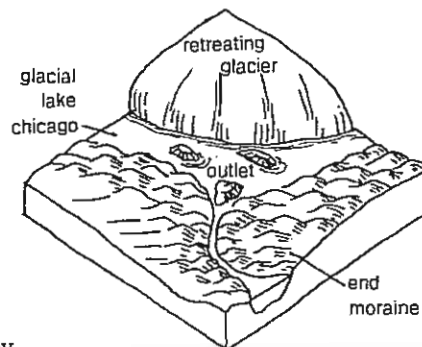
GLACIAL ACTION SHAPES RIVER

The modern, post-Pleistocene Illinois River is the result of two major geological events that created one river with two very different reaches: the east-west (or upper reach), from the river's headwater at the confluence of the Des Plaines and Kankakee rivers; and the north-south (or lower reach), from the "Big Bend" at Hennipen to the town of Grafton where it joins the Mississippi.

The upper reach was formed as the Wisconsin era glacier repeatedly retreated and advanced up the modern Lake Michigan lake bed. The glacier left behind a series of crescent-shaped moraines which entrapped meltwater. One of these moraines broke out, releasing a torrent of meltwater, cutting the channel of the Illinois River from its headwaters to the Big Bend.

About the same time, the outwash from the upper Mississippi Valley flowed south through the ancient Mississippi River Valley at the Big Bend. When the glacier reached the Big Bend, it diverted the ancient river west into its present channel below Muscatine, Iowa, leaving the ancestral Mississippi River bed to be occupied by the much smaller Illinois River. This completed the creation of the Illinois River as we know it today.

Today the upper reach drops about 60 feet in 57 miles; the lower reach falls about 25 feet over the next 215 miles—a drop of 1.4 inches per mile. Below the Big Bend, the rocky bluffs disappear and the floodplain widens to 2 to 6 miles.



and during part of the summer there is only one portage of half a league (at the Chicago River)... There are many small lakes and rivers. That on which we navigate is wide, deep and still, for 65 leagues (about 180 miles)."¹

Marquette and Father Louis Joliet were charmed by the river, claiming it was the loveliest river they had ever seen. They delighted in the splendid vistas of the broad, gentle river with prairies, woods and low hills beyond. In many places they saw great waving beds of wild rice. Joliet wrote to Father Claudius Dablon, his superior:

The River which we have named the St. Louis (Illinois) and which rises near the lower end of the Lake of the Illinois (Michigan) seemed to me to be the most beautiful and the most suitable for settlement. At the place where we entered the lake is a harbor, very convenient for receiving vessels and giving them shelter from the wind. This river is wide and deep, filled with catfish and sturgeons. Game is there in abundance—oxen, cows, stags, does, turkeys—in much greater numbers than elsewhere.... There are prairies of six, ten and twenty leagues in length and three wide, surrounded by forests of the same extent.¹

Joliet made the first recorded comment about the possibility of building a canal: "It would only be necessary to make a canal by cutting through half a league of prairie to pass from the foot of the lake of the Illinois to the river Saint Louis."¹

About seven years later Rene-Robert La Salle traveled the same area and provided a very different view of the possibilities of a canal. He implied that a canal between the

Chicago River and the Des Plaines would be useless, unless it was long enough to reach Starved Rock. He was proved right in the early 1900s!

The prairies over which communication is maintained are flooded by the great volume of water flowing down from the neighboring hills whenever it rains. It is very difficult to make and maintain a canal that does not immediately fill up with sand and gravel... And, although a canal would be possible with a great deal of expense, it would be useless because the Divine River (Illinois) is unnavigable for forty leagues, the distance to the great village of the Illinois (at Starved Rock).²

In 1682 while La Salle and his party were at the mouth of the Illinois River, they enjoyed the bounty from the river when their provisions ran short. Wrote Henri de


Tonty, "We... were compelled to throw a line into the water for catfish; one we caught was of enormous size, furnishing enough meat for a supper for twenty-two men."³

CLEAR WATERS, FERTILE SOIL

LATE 18TH AND EARLY 19TH CENTURIES

In 1773, Patrick Kennedy traveled up the Illinois in search of copper. While he did not find any, he did provide a good description of the river.

...the land is well timbered and covered with high weeds. There are fine meadows at a little distance from the river, the banks of which do not crumble away as those of the Mississippi do. We


"WE HAVE SEEN NOTHING LIKE THIS RIVER THAT WE ENTER, AS REGARDS ITS FERTILITY OF SOIL, ITS PRAIRIES AND WOODS..."

JACQUES MARQUETTE, 1673



passed some islands, some of them between nine and twelve miles in length and three miles in breadth.

We stopped at the Pirias wintering ground (48 miles from the Mississippi). About a quarter of a mile from the river, on the eastern side of it, is a meadow of many miles long and five or six miles broad. In this meadow are many small lakes, communicating with each other and by which there are passages for small boats or canoes and one in particular leads to the Illinois River. The timber in general is very tall oaks. We met with great plenty of Buffalo and Deer... the land is remarkably rich and well watered with small rivulets from the neighboring hills. The banks of the river are high, the water clear, and at the bottom of the river are white Marl and Sand.⁴

When he reached Peoria Lake, he described a lake with no rocks, shoals, or perceivable current. When 255 miles from the Mississippi he wrote, "...we found the water very shallow.... The grass which grows in the interval or meadow ground between the Illinois River and the Rocks is finer than any we have seen and is thicker and higher and more clear from weeds than any of the meadows about Kaskaskias of Fort Chartres..."⁴

In 1809 William Johnston traveled the river, writing, "Between the Chicago and the Illinois Rivers there is a direct water communication.... and in the spring of the year any kind of craft may sail out of the lake to the Mississippi without being unladen....

Thus by digging a canal of nine feet deep, a passage could be got at any season... The canal would be about six miles long through a beautiful prairie."⁵


Jervis Cutler in 1812 thought that the portage would be only two miles between the Des Plaines and the Chicago.

In 1821, Henry Schoolcraft, who became a highly respected writer about his travels in the Midwest, came up the Illinois River, observing mallards, black ducks, teal and geese in great numbers. Schoolcraft wrote:

Chicago creek is eighty yards wide at the garrison (Fort Dearborn) and has a bar at its mouth which prevents shipping from entering but is deep within. It is ascended eleven miles in boats and barges where there is a portage of seven miles across a prairie to the river plain, the main northwestern fork of the Illinois. The difference in the level of the two streams is so little that loaded boats of a small class may pass over the lowest parts of the prairie during the spring and autumnal freshets. But at mid-summer it is necessary

to transport them over land to Mount Juliet a distance of thirty miles.

[The Illinois River] presents to the eye a smooth and sluggish current, bordered on each side by an exuberant growth of aquatic plants, which, in some places, reach nearly across the channel. We soon found the water rapid and unpalatable and oftentimes filled with decomposed vegetation. There is perhaps no stream in America whose current offers so little resistance in the ascent... Both banks are bordered by a dense forest of cotton-


" [THE ILLINOIS RIVER] PRESENTS TO THE EYE A SMOOTH AND SLUGGISH CURRENT, BORDERED ON EACH SIDE BY AN EXUBERANT GROWTH OF AQUATIC PLANTS, WHICH, IN SOME PLACES, REACH NEARLY ACROSS THE CHANNEL. "

HENRY SCHOOLCRAFT, 1821



wood, sycamore and other species common to the best western bottomlands. Of the fertility of the soil no person can for a moment doubt..."⁶

The Secretary of War made a report—sounding much like a Chamber of Commerce press release—to the U.S. Senate concerning a survey of the Kaskaskia and Illinois Rivers on March 7, 1838. He wrote that the Illinois watershed covered "an extent of country unrivaled for the fertility of its soil, perhaps in the world."⁷

The bottomlands extend from one to five miles on each side of the river, seldom rising more than a few feet above the level of the stream in its ordinary stages, and from the fact that they are constantly overflowed by every freshet to a depth varying from one to fifteen feet are now and must ever remain uninhabited. Hence the river presents the appearance of flowing through an ancient, vast and solitary forest, clothed with a foliage rich and luxuriant beyond description.

The Illinois River ... from Peru to its mouth flows with a current so very gentle and uniform as to cause but a few hours difference in the time occupied by steamboats in ascending or descending its stream, an estimated distance of two hundred and fifty miles.... The current of the river is so sluggish that it is believed a velocity could not even by these means (constructing wing dams) be given it sufficient to remove the sand bars entirely..."⁷

According to the report, the sandbars formed very slowly because the current brought unusually small amounts of alluvial material. Therefore, the only answer to the sandbar problem was to excavate channels through the bars.

Although the earliest travelers on the Illinois River recognized the need for the construction of a canal to improve the flow of people and goods along the river, it wasn't

until after Illinois became a state in 1818 that the drive to complete such a canal gained energy. In 1848 the 96-mile I & M Canal opened, uniting the Great Lakes with the Illinois River and the Mississippi.

RAPID CHANGES

LATE 19TH AND EARLY 20TH CENTURIES

With the completion of the I & M Canal, change came rapidly to the Illinois River valley as the population dramatically increased. Prairies were farmed, levees built, towns and cities grew, industries and people dumped their waste into the river, navigation improved with deeper channels and dams, and varying quantities of Lake Michigan water—laced with large doses of Chicago sewage—moved down the river. The population of the counties which were all, or in part, drained by the Illinois River grew from about 500,000 in 1850 to 1,629,900 in 1870.

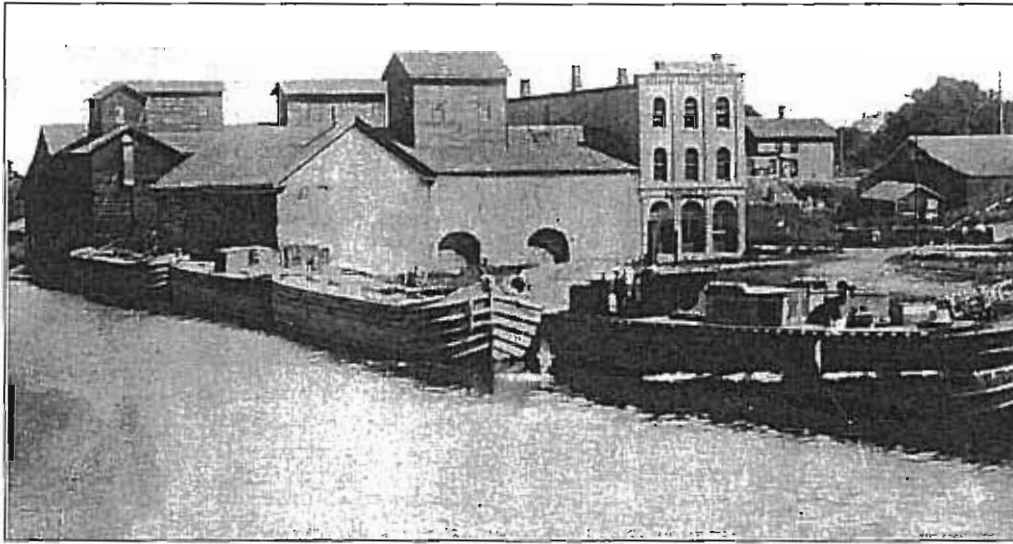
In order to improve navigation and to keep Chicago's sewage from flowing into Lake Michigan, the canal was deepened in 1871, causing a gravity-driven flow away from Lake Michigan and into the Illinois River. While the canal was classified as a success, there were periods—even after pumps were installed at Bridgeport in 1884 to supplement the water supply in the canal—when the amount of water available was not adequate for either navigation or sewage disposal purposes.

In 1900, when the Sanitary and Ship Canal was completed, more substantial volumes of Lake Michigan water and Chicago sewage began entering the Illinois River. Only the State of Missouri fought against the creation of the sanitary canal. Its fight, however, was unsuccessful. Justice Oliver Wendell Holmes in a 1905 decision supporting the canal wrote:

It is proved that the great volume of pure water from Lake Michigan which is mixed

with the sewage at the start has improved the Illinois River in these respects to a noticeable extent. Formerly it was sluggish and ill smelling. Now it is a comparatively clear stream to which edible fish have returned. Its water is drunk by fishermen, it is said without evil results.

We had in July and August what may be called septic conditions for 26 miles of the course of the Illinois from its origin to the Marseilles dam. At Morris, which is on the middle part of this section, the water, on July 15, was grayish and sloppy, with foul, privy odors distin-



The 96-mile I & M Canal, completed in 1848, brought an explosion in population and commerce to the region, increasing the sewage and pollution that soon began to reach the Illinois River. (Photo courtesy of the Canal Corridor Association)

But Holmes proved to be too optimistic. Although at first the annual catch on the Illinois River increased from about 6 million pounds in 1894 to 24 million pounds in 1908, in subsequent years the catch decreased dramatically. There had been 2,500 people employed in commercial fishing in 1908; there were none in 1997. The great increase in fish harvested up to 1908 was primarily the result of the introduction of carp into the Illinois in 1879, and, temporarily, because of increased elevation of the river caused by the diversion of the Chicago River into the Illinois.

As early as 1911, urban pollution began to be observed in the upper river. Stephen Forbes, who investigated the chemical and biological situation in the river in midsummer 1911, wrote:

guishable in hot weather.... Putrescent masses of soft, grayish or blackish, slimy matter, loosely held together by threads of fungi and densely covered with bell animalcules, were floating down stream; chunks of this material, from the size of a walnut to that of a milk pan, occasionally rose to the surface, evidently borne up by the gases developing beneath them."⁸

It wasn't just the canals that degraded the Illinois; other engineering activities left their mark on the river's quality. Navigation dams created new riverine lakes, but destroyed important waterfowl marshes. From 1909 to 1922, enough drainage and levee districts were built to drain almost half of the existing bottomland lakes and cut off half of the floodplain from inundation by the river, eliminating additional fish and waterfowl

habitat. As a result, the rate of sediment deposition in the remaining lakes and unveeved floodplain increased, as did flood heights and frequencies.

After 1900, pollution from municipal wastewater treatment plants and excess nutrients from farm chemicals caused frequent periods of low oxygen and high ammonia levels. This condition prevented some fish species from surviving in large numbers; those that did survive in the upper portion of the river often contained too much mercury, DDT, or PCBs to be safe for human consumption.

In the early 20th century, erosion of the surrounding farmlands and tributary streambanks became a primary problem. Towboats traversing the Illinois resuspended the sediments, adding to turbidity and sedimentation in the bottomland lakes.

The results of this sedimentation were long-lasting. In 1965 Starret and Fritz wrote:

Today Quiver Lake is devoid of aquatic plants. The formerly deep basin of the lake has been filled in with four- to eight-foot deposits of silt. Turbid water at depths of over three feet and a soft flocculent bottom prevent the establishment of aquatic plants in the lake. Conditions in Quiver Lake are duplicated in many other floodplain lakes of the Illinois River; that is in the past 35 years the siltation has greatly changed the ecology of these lakes.⁹

MODERN RIVER

ON THE ROAD TO RECOVERY

In the last half of the 20th century, conditions upstream from Peoria have improved greatly. This is due to the construction of Chicago sewage treatment plants begun in 1922, the adoption of more effective state and federal water pollution laws, and improved agricultural practices.

Population growth and development, however, continue to imperil the health of

the river ecosystem. As more land in north-eastern Illinois is developed, stormwater runoff increases. In addition, each year approximately 14 million tons of soil is washed from the Illinois River basin. Of that load, approximately 8 million tons is deposited into the Illinois River, its backwater lakes and tributaries; the remainder reaches the Mississippi River and the Gulf of Mexico. With the loss of backwater lakes and their capacity to store floodwater and absorb sediments and related pollutants, water quality will remain degraded and flood damages will continue to rise.

The Illinois River is in a state of ecological disrepair, but it is not beyond restoration. Future issues of *Wetland Matters* will report on steps that TWI is taking to bring about long overdue change.

ACKNOWLEDGMENTS

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THE WETLANDS INITIATIVE

53 WEST JACKSON BOULEVARD, SUITE 1015
CHICAGO, ILLINOIS 60604-3703
PHONE (312) 922-0777
Fax (312) 922-1823
email: twi@wetlands-initiative.org

The Wetlands Initiative is a nonprofit corporation dedicated to restoring the wetland resources of the Midwest to reduce flood damages, improve water quality, and increase wildlife habitat and biodiversity. Our mission is to promote restoration in ways that provide environmental and economic benefits to society and the landowner. Through research, education, public policy analysis, and large-scale demonstration projects, TWI aims to restore one million acres by the year 2010. While this number may seem large, it represents only 2 percent of the wetlands lost in the Midwest.

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