# THE FISHING INDUSTRY OF ILLINOIS RIVER

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Perhaps most of you have heard it remarked that Illinois River is one of the most productive bodies of fresh water in the world. This great productivity is due to the high fertility of the soils in the Illinois drainage basin and to wide areas of bottomland lakes connecting with the river which permit this fertility derived from the soils to be utilized efficiently in the production of fish. A natural chain of biological reactions from the fertile elements of the water to fish takes place. In these basins there is time for the channel water to be transformed into microscopic life, or plankton, which is fed upon by worms, snails, insect larvae, and crustaceans, which in turn are used as food for fishes. The great productivity of the connecting bottomland waters of the Illinois Valley is analagous to the high productivity of the overflow lands of the Nile Valley and is explicable in the same terms—their fertility is periodically renewed from the river itself. In 1908, Illinois River produced 60 per cent of the total fisheries products of the entire state. At that time all of the waters of the state were open to commercial fishing and included fishes taken from the boundary waters of the Mississippi, the Ohio, the Wabash, and the Illinois portion of Lake Michigan; as well as from the Rock, Fox, Sangamon, and Kaskaskia rivers and other lesser streams so numerous within the state.

It may be appropriate at this time to scan the trend of the yield of commercial fishes from Illinois River. At various times from 1896 up until 1922 the Illinois Fishermen's Association, the Illinois Fish Commission, and the U. S. Bureau of Fisheries have taken censuses of the yield of commercial fishes. Beginning in 1896 the yield was 7 million pounds; in 1897, 10 million pounds; in 1899 and 1900 it was 11½ million pounds; in 1907, 15 million pounds; in 1908 two different sets of statistics gave 19 million pounds and 24 million pounds; in 1921, when fishing conditions were poor, 4 million pounds; and in 1922, when conditions were much above normal, 10½ million pounds. Estimates made during 1930 would seem to indicate that the yield has remained near the high figure of 1922. The sharp decline in yield from the peak of 1908 to 1921 and 1922 is due primarily to two causes—

pollution and the appropriation of wide areas of the middle and lower Illinois Valley for agricultural purposes. Following the completion of the Chicago Sanitary Canal in 1900, increasing amounts of organic wastes from the Chicago area seemed to be reflected by increases in the fish yields, but by 1910 and 1912 the amount of these wastes reached a point where the amount of oxygen in the water was depleted and the fishes as far downstream as LaSalle were wiped out. Further increases in the volume of wastes during succeeding years completed the destruction of the commercial fishery in the channel waters down as far as Chillicothe. Whether or not fishes were able to live in the connecting bottomland lakes of that section depended upon whether or not its lakes received channel water at ordinary water levels. Striking reductions were noted in Peoria Lake and in the channel as far southward as Havana. The peak of pollution was reached between 1916 and 1920. Since that time, partly because of reduction in the load of organic matter contributed to the river due to a slackening of wartime industry and to its treatment in sewage disposal plants; and partly because of prolonged periods of high water in which the sewage is so diluted that it is less harmful, such extreme effects of pollution on the fish yield have not been repeated.

Any discussion of the fisheries yield from the Illinois cannot be complete without mentioning the European carp and its place in the Illinois River fishery. The carp first made its appearance in Illinois River about 1885 from a stock brought from Europe and it first became an important item in the fishing industry soon after 1890. By 1898 the Illinois Fishermen's Association reported that the catch of carp exceeded in value that of all other commercial fishes and in 1908 it constituted 64 per cent of the catch, or 15,400,000 pounds. Data gathered by the Natural History Survey in recent years indicate that carp make up about 90 per cent of the entire catch of commercial fishes. The phenomenal success of carp in the Illinois River results from two outstanding facts. The Illinois River and its connecting bottomland lakes provide a habitat better adapted for the growth and multiplication of carp than did its ancestral home in Asia and in Europe. The carp is a close relative of the goldfish and like the goldfish is versatile and hardy. As the Illinois River became heavily polluted it was found that the carp could tolerate these unfavorable conditions with greater success than any of our native fishes. During a few years before and after 1920 when Peoria Lake was quite foul the carp was left in almost complete control.

In 1923 I noticed that many of the carp in the fishermen's catch showed abnormally formed heads. More complete studies made in 1926

and 1927 showed that this abnormality was closely akin to what we know as rickets in man and other higher, warm blooded animals. At that time it was found that 50 to 90 per cent of all the carp between LaSalle and Pekin showed this abnormality. When the rate of growth of these abnormal carp was compared with the rate of growth of normal carp found farther downstream it was found that the latter grew at a rate about twice that of the rachitic carp. Further studies seemed to indicate that the stunted condition of carp in the upper and middle river was due to the destruction of the green algae by pollution, and to substitution in its stead of blue-green algae and protozoa which cannot provide young carp with as complete a diet as does the green algae.

Estimates of the yield of fishes made about 1910 by the Natural History Survey showed that many of these bottomland lakes have annual yields as high as 150 to 300 pounds per acre. These yields are as high as those obtained from fish ponds under good cultivation in Germany. I might mention here that the area of the river channel between LaSalle and Grafton at the gage 10 feet Beardstown, which is about an average stage of water since 1910, is 45 square miles. The area of connecting bottomland lakes at this same stage of water is 201 square miles.

Formerly all fishes were fair game for the commercial fishermen and could be marketed at all times. Within recent years the State has regulated commercial fishing on the Illinois River by closed seasons, by prohibiting the sale of bass, crappies, and sunfishes at any time, and by placing minimum length limits on carp, buffalo, and catfish which make up 99 per cent of the commercial catch. In the beginning of the fishing industry on Illinois River the catch was sold locally in summer with shipments to the larger cities of the middle west in winter. Following that time ice came into general use and fishes were shipped as far as the eastern seaboard at all seasons. Still more recently live-cars have come into wide use for the shipment of live carp and buffalo to the New York and Philadelphia markets.

In recent years there has been a great deal of complaint about the table qualities of the fishes handled commercially from Illinois River. This disagreeable quality has been described as a taste or smell resembling carbolic acid, kerosene, or coal tar, and is commonly referred to by fishermen as the "gassy" taste. It seems quite certain that this "gassy" taste is caused by decomposition products of sludge and sewage absorbed by the flesh of the fish. During the past winter the price of Illinois River fish has been unusually low, largely because of the difficulties in selling "gassy" fish. The "gassy" taste seems to affect carp, buffalo, catfish, and sheepshead, all common commercial fishes. The commercial fishermen at a number of places between Peoria and Meredosia get rid of

some of this "gassy" taste by holding their fish in ponds of fresh water with clean bottom for a few weeks or months before they are sold.

The past fifteen years have been depressing ones to the commercial fishermen of Illinois River. They have seen the fishing industry wiped out of large areas of the upper and middle Illinois River by pollution from the Chicago area and to a lesser degree from Peoria and Pekin. The carp which makes up 90 per cent of the catch in the middle Illinois River has been stunted until it grows at only one-half the normal rate. Throughout the length of the river all kinds of commercial fishes have been rendered unpalatable by flavors absorbed from sludge and products of the decomposition of sewage. During this same period many of these highly productive bottomland lakes have been levied and emptied of their water and converted to agricultural uses. The outlook was indeed gloomy, but I think there are several reasons to expect the fishing industry of the Illinois to come back. The Chicago area, and Peoria as well, is committed to a program of sewage disposal plant construction which will lessen the load of organic matter thrown on the river. It seems likely that the amount of Lake Michigan diversion will be reduced so that there will be more time for the natural purification to take place before it reaches the productive fishing waters. Also the completion of the deep waterway will involve the construction of several dams between Lockport and Utica which will impound large volumes of water, and these will act as huge settling basins to diminish further the hazard of pollution to the Illinois River fishery. There is also some indication that many of the drainage districts of the Illinois Valley are proving unprofitable and will be abandoned as agricultural projects and will again be productive of fishes.