POLLUTION PROBLEMS IN THE MISSOURI

RIVER BASIN OF IOWA

Submitted by the
Iowa State Conservation Commission

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Introduction

The public waters of the state of Iowa are heavily used for many purposes. They serve as public water supplies for municipalities, industry and agriculture. In recent years, recreational use has increased tremendously involving fishing, hunting, boating, skiing and swimming. Camping, sight seeing and picnicing along the streams and lake shores are also increasingly important recreational pursuits for Iowans. Outdoor recreation here, as elsewhere, is largely water oriented. All of our suitable major water areas are crowded with recreationists indicating the need for additional or improved sources to fulfill the increasing demand for wholesome outdoor fun and relaxation.

There are many stream areas in Iowa that would satisfy part of this need, were it not for heavy contamination from municipal sewage and industrial wastes. Frequent heavy kills of fish, unsightly appearance, and foul sewage odors eliminate many reaches of rivers from fishing and other recreational uses. Pesticide pollution of waters, has in recent years, added to the cause of fish kills and steps must be taken to further restrict their use.

Since water is recognized as one of our most precious natural resources, there can be no question that its pollution is one of man's greatest crimes against himself.

The Missouri River

The state of Iowa is bounded on about two-thirds of its western border by the Mighty Mo -- the Missouri River, which separates us from our neighbor to the west, Nebraska. Another river, the Big Sioux has

its confluence with the Missouri at Sioux City and forms the balance of our western boundary with the state of South Dakota.

Flowage of the Missouri River through Iowa is normally heavy, averaging about 30,000 C.F.S. (Iowa Geogical Survey Water Supply Bulletin No. 6). Since the stabilization program with the Corps of Engineers, flowage has been regulated and precludes extremes to prevent flood damage and promote navigation and other uses. Through channel modifications, numerous oxbows have been cut off. Some of these have been preserved by diking to create oxbow lakes for multi-use, recreation and waterfowl refuges. There are no major sources of pollution of this main stem of the Missouri on the Iowa side. The cities of Council Bluffs and Sioux City (population 89,159 and 55,641 respectively) have adequate treatment facilities for their municipal and industrial wastes. These two cities had formerly contaminated the river heavily degrading its recreational potential. It is understood that the city of Omaha, Nebraska, has a treatment facility under construction.

These commendable pollution control effects point out the possibilities of, and distinct need for, further extension of the procedures used to accomplish this control to other areas of stream contamination in Iowa.

Fish kills, rarely if ever, have occurred on the main stem of the Missouri River in Iowa. Even though formerly heavily contaminated from Sioux City, Council Bluffs and Omaha, the high flowage provided sufficient dilution to prevent low oxygen tensions and resultant fish losses. Since stabilized flows have occurred and pollution curtailed, fish populations have changed and no reports of gassy or off-flavored fish have been received. Fishes commonly associated with clean water now occur in the main course of the river including sauger, largemouth bass, white bass, crappie and bluegill. Formerly the stream's fish population was primarily

channel and yellow catfish, carp, and others associated with highly turbid waters.

Missouri River Tributaries

Western and much of the southern Iowa watersheds drain to the Missouri River (see map). These streams have been subjected to much abuse by efforts to control floods by channel straightening and severe pollution. These are the significant factors limiting fish populations in the Missouri River drainage. Due to these things, our fisheries conservation work in western Iowa has been quite largely confined to areas where fish live and thrive. As a consequence, we do not have a large backlog of data pertaining to the waters of minor fishery value. We have, however, done enough work in the polluted and straightened areas to learn how these factors have affected the fisheries resources in this region of the state.

The accompanying map shows in a general way the existing fishery in western Iowa streams. In addition, there follows a brief summary of the pertinent information that relates to the past and current status of the various fishes in these streams and what pollution abatement might do to benefit them.

Big Sioux: Channel catfish, carp, and a variety of suckers are the important species living in the Big Sioux. In addition to these species, considerable numbers of walleye, pike, sauger, and crappies also occur. Were it not for pollution, the Big Sioux could provide some of the best stream fishing in the mid-west. This stream abounds with food for fish, daily flows are adequate, and it contains a wide diversity of cover and bottom types. Fish kills of considerable magnitude occur regularly due to low dissolved oxygen under ice cover. Pollution abatement would result in a better species composition. Walleye, pike and sauger would

increase.

Rock River: This is a good fishing river. We have no knowledge of either pollution or of fish kills on this stream.

Floyd River: Channel straightening has nearly eliminated the fishery value of this stream. Channel catfish, carp, and a few bullheads run into the lower reaches of the Floyd and are caught in small numbers during high stages. They drop back into the Missouri with receding waters. As a consequence of insufficient daily flows, lack of cover, and a preponderance of sterile sand bottoms, it becomes doubtful that pollution abatement would accomplish much for the fishery in the Floyd. We have no knowledge of fish kills in the Floyd. This probably results from the fact that there are no fish of consequence in the Floyd during winter or low water periods when fish kills would be expected to occur. Pollution abatement in the Floyd would decrease the pollution load in the Missouri River.

Little Sioux: This is currently the best fishing stream draining Iowa into the Missouri. The lower reach (approximately 30 miles) has been straightened; however, and fish living in this area are for all practical purposes limited to channel catfish. They are caught in large numbers during high flows but vacate much of the straightened area during low stages. Channel catfish abound in the unstraightened reaches of the Little Sioux and game fish including walleye and northern pike are found in sizeable populations from Cherokee upstream to the vicinity of the lakes region in Dickinson County. Pollution from Spencer has been a chronic spot for vast fish losses. Fish losses resulting from pollution at Spencer occur during winter. Due to ice cover, accurate counts of dead fish have generally been impossible. Estimates, however, have amounted to many thousands of pounds of channel catfish for a single kill. Pollution abatement at this source would enhance fish populations

and the species composition in the Little Sioux.

It is understood that a new packing plant is planned or is being constructed at Cherokee. Unless highly efficient treatment facilities are provided (90% or better) we can expect higher B.O.D.'s, and consequent heavy losses of valuable catfish and other game species below this region.

Maple River: This stream supports a good channel catfish and carp fishery during the spring and early summer while stream flows are adequate. These species drop back into the Little Sioux and then possibly into the Missouri River with the onset of falling water levels. The bottoms of the Maple are largely composed of fine shifting sand which quickly fill holes scoured by high water. Because fish are absent during the winter and the months of low stages, it is doubtful that pollution abatement would influence the fishery of the Maple River. It would, however, reduce the pollution load in the Little Sioux and Missouri. We have no record of fish kills in the Maple River.

Boyer River: Much of the length of the Boyer has been straightened. The bottom is made up of fine shifting sand. For these reasons cover is limited and water depths are insufficient to provide suitable habitat for fish. Our surveys on the Boyer have demonstrated minimum fisheries values between the Crawford-Sac County line and Missouri Valley. The Boyer is heavily polluted, and could be improved considerably for bait species if pollution were eliminated. We have investigated fish kills below Denison, which were attributed to pollution. These kills occurred in summer during low water and involved only forage fish. We have no knowledge of winter kills which we suspect is due to the fact that there are no fish present in polluted areas during that season.

Nishnabotna and Nodaway River Systems: These drainages are made up of the East and West Nishnabotnas, Keg, Silver, Walnut, Seven-Mile Creeks, the Nodaway and the East Nodaway Rivers. These streams were straightened prior to 1920, and fish populations in these streams were largely devastated by that work. Following the channelization, these streams began to cut laterally and over a fifty year period they have again developed irregular meandering courses. Trees have been felled into these streams by undercutting the banks, the holes scoured in the bends during high water persist as deep water areas throughout the year. This has improved cover conditions for channel catfish, and by the early 1950's the species developed into a valuable fishery. Pollution kills are not common in these watersheds. Those that have occurred have been the result of the accidental dumpage of toxic materials. Precaution should be taken to safe guard this valuable partially rehabilitated fishing resource.

Grand River: The Grand is the most important fishing stream in south-central Iowa. Channel catfish and carp are the chief species sought by anglers. Flathead catfish are present, but in small numbers. Forage fish abound in the stream, and are an important source of supply for anglers and commercial dealers as well. We do not know of pollution in this stream in Iowa. There was, however, a serious fish loss several years ago, but this was determined to have resulted from the illegal use of rotenone.

Chariton River: In Iowa, only that reach of the Chariton flowing through Appanoose County is important as a fishing stream. Channel catfish and carp are the significant species. Flathead catfish are abundant below Highway #2 and are caught in large numbers by anglers specializ-

ing in fishing for this particular species. We have no knowledge of man-made pollution entering the Chariton River. Nonetheless, low dissolved oxygen occurs in the upper reaches. This is attributed to excessive accumulation of tree leaves in the stream together with a low volume of flow. Fish killed by low dissolved oxygen under ice cover includes a variety of minnows and a few sunfish.

Conclusion

The economy of Iowa is rapidly changing from predominatly agricultural to an increasingly important industrial state. Much emphasis has recently been directed toward enticing new industry into Iowa and due to several favorable factors some notable success has attended these efforts. Ample water supplies along the major rivers especially the Mississippi, has been a factor in this inducement. Heavy fish kills have resulted from some of these industries, especially the chemical companies. An estimated 200,000 pounds were killed in January, 1964, by one concern and our Commission has a civil suit pending on this case.

Small cheese factories and creameries have discharged whey and other pollutants into streams causing heavy fish mortalities this year. One instance caused the loss of all our Big Springs Hatchery's trout last December -- a $50,000 loss to the Commission.

Recently there has been a decentralization of some of the large packing plants, resulting in many smaller, more strategically located plants. Some of these are located on small streams where low dilution factors exist. These put a terrifically high burden on the dissolved oxygen content and often cause extensive fish kills.

Our contention is that cities must realize that there are limiting factors to their continued expansion in population. They should, of

necessity, gear this expansion to their available water supply and the ability of the stream to accomodate without pollution, the wastes to be discharged. The cost of complete treatment must be borne if expansion exceeds the limiting factor of pollution. As Secretary Udall stated recently "our environment should have parity with payrolls and profits".

Pollution which eliminates fishing, swimming, skiing, and other forms of outdoor recreation for Iowa people is affecting the welfare of this sovereign state, and we earnestly solicit every aid in correcting present and preventing future pollution.

Respectfully submitted

Iowa State Conservation Commission
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