

Fishery Resources of Northern Wisconsin

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North in the 1980's

supplementary paper

THE NORTH IN THE '80s: fishery resources of northern Wisconsin

by

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The Original Resource

Fishing represents a most important recreational activity and a significant commercial enterprise in northern Wisconsin.

The quality of the original resource is best defined from the writings of early travelers on Lake Superior. The early Jesuit relation of 1669-1671 noted that a single native could catch 20 sturgeon, or 150 whitefish, or 800 herring in one net. Another observer, the Reverend Fullerton, stated in 1843 that two natives, one with a dip net and the other paddling, could fill a two-fathom canoe with fish (presumably walleye) in one hour during the spring run on the St. Louis River (Kaups 1978).

Information on inland fisheries is less precise; however, discussions with longtime inhabitants of the area suggest that fish were plentiful, and it was quite common for men using hook and line to catch enough fish to support their families during winter months.

Modification by Man

Although available evidence supports a conclusion that fish were plentiful, a further look shows that several species were absent. We enjoy fishing for some of them today and we consider others major pests. The original resource did not include rainbow trout, brown trout, smelt or carp. The distributions of walleye, musky, northern pike, and smallmouth bass were more restricted.

The descriptions of Lake Superior's abundant fish led to the concept that the resource was "inexhaustible." Both land speculators and politicians were quick to publicize this idea in an effort to promote profit and settlement of the region (Kaups 1978).

By 1837 the American Fur Company had established commercial fishing stations at LaPointe, Wisconsin, and several other locations. The harvest in 1839 was 1 million pounds of salt-packed lake trout and whitefish (Lawrie and Rahrer 1973). Growth of the fisheries was limited until the 1970s when steam power and improved transportation routes promoted expansion. During the years of expansion, production of lake trout and whitefish climbed to over 4 million pounds (2 million of each species) in Wisconsin waters. Substantial quantities of sturgeon, walleye and herring were also taken by the commercial fishery. However, by 1920 sturgeon had all but disappeared from the catches and production of whitefish had declined to approximately one-tenth of the former level. Destruction of inshore spawning and nursery habitat associated with logging, dam construction and sewage disposal probably represents the primary cause for the decline in whitefish abundance and undoubtedly played a role in the disappearance of sturgeon. Overexploitation of sturgeon and several herring-like fish is suspected to be the primary cause for their decline (Lawrie and Rahrer 1973). Similar impacts probably occurred in many inland lakes and rivers because of uncontrolled fishing and the waste of the logging era. Production of whitefish from Lake Superior increased significantly after 1920, an apparent response to the end of the logging era and its effects on inshore habitat.

Production of lake trout from Wisconsin waters of Lake Superior averaged around one-half million pounds until 1959, when the stock and catch declined drastically in response

to the attacks of the sea lamprey. These parasites entered the lake through the same canals which promoted shipment of fish and other products from the region to eastern markets. Catches of lake herring also declined from an average of between 1 and 3 million pounds prior to 1962 to an average of less than 300 thousand pounds in the 1970s (King and Swanson 1974). Although some authorities attribute the loss to overfishing, most evidence supports the conclusion that the herring decline resulted from interaction with smelt, which were introduced into the Great Lakes around the turn of the century and became abundant in Wisconsin waters of Lake Superior in the mid-1940s (Anderson and Smith 1971; Swenson 1978). The sequential decline of lake trout and the lake herring stocks during the 1950s and '60s marked an end to the era dominated by commercial fishing on the lake.

Current Use and Problems

Rehabilitation of the lake trout stocks in Lake Superior in recent years has resulted in some improvements in commercial fishing. However, emphasis has been on development of an expanded sport fishery. Although sport fishing played a limited role in the catches and economy of the area prior to the decline of lake trout in the 1950s, sport fishermen are now estimated to take approximately 20 to 40 percent of the 80,000 pounds harvested by the licensed Wisconsin fishery on Lake Superior.¹ In addition to the harvest by licensed fishermen, an Indian Treaty Fishery has developed in Wisconsin in recent years. Although accurate figures are not available, the catch of the Treaty Fishery probably exceeds that of the licensed fishermen.

Analyses of chemical contaminants in Great Lakes trout suggest the market and value of Lake Superior lake trout will expand. Data gathered by the U. S. Food and Drug Administration show lake trout from Lake Superior do not contain more than 2 ppm PCB's and probably would be marketable under newly proposed regulation to limit PCB levels in fish to 2 ppm.²

Without question, future use of Lake Superior trout depends on the ability of management agencies to maintain the stock in the presence of the continuing threat from lamprey and under the pressure applied by the three major user groups. The commercial interest and treaty fishery must cooperate so that the stock can be maintained at the level required to promote good sport fishing and the support of the sport fishermen for management efforts. Without the support of the sportsmen, funds required to control lamprey or rear hatchery fish would not be available, and the resource could be lost.

In addition to lake trout, the commercial fishery relies upon catches of whitefish, chubs and smelt -- species not sought by sportsmen -- to recover part of the loss associated with decline of the lake-herring stocks. Further expansion of commercial fishing will depend on efforts to increase catches of these species, and to develop markets for under-exploited fish such as burbot and suckers. Lack of information on under-utilized species in the lake has hampered development of the resource. Predicting the return that could be gained from investments directed at harvesting under-utilized or unexploited species isn't presently possible.

¹ George King, Lake Superior Fish Management Supervisor, Wisconsin Department of Natural Resources, Bayfield, Wisconsin, personal communication.

² Robert Snell, U. S. Food and Drug Administration, Minneapolis, Minnesota, personal communication.

Northern Wisconsin's inland waters provide quality fishing for a wide variety of fish for individuals from throughout the state. Sport fishing in northern Wisconsin lakes is considered a significant recreational activity, with 93 percent of lake-property owners participating in the sport (Klessig and Yanggen 1973). Wisconsin Department of Natural Resources surveys suggest that more fishing trips are made for panfish than for all other species combined. Walleye fishing ranks second in importance statewide (Table 1). The DNR Statewide Management plan shows that over 80 percent of muskellunge waters and half of the walleye and large-mouth bass waters are in northern Wisconsin, where most of the fishing for these species also occurs. Projections indicate that demands for these and other species, for which the prime waters are also concentrated in the northern part of the state, will grow in the 1980s.

Because inland lakes in northern Wisconsin have not been threatened by industrial development, the prospect remains positive for growth of sport fishing. However, development of lake property has resulted in some habitat alterations and changes in water quality. For the most part, the effects of these changes on fish populations and fishing have not been well documented. Available information suggests that where development destroys critical habitat directly (such as inshore spawning areas) major changes in the fish species complex of a lake can be anticipated. Less dramatic changes include increased abundance and distribution of rooted aquatic vegetation which tends to favor development of a northern pike-panfish dominated lake over one dominated by a walleye-yellow perch association (Forney 1977; Swenson 1977).

Table 1. Percent occurrence of the fish resource and fishing effort occurring in northern Wisconsin (Northcentral and Northwestern Department of Natural Resource Districts) with estimated statewide angler trips for major types of fish.

Type of Fish	% of Resource	% of Effort	Statewide Angler Trips (millions)
Stream Trout	35	42	1.6
Musky	83	77	1.4
Northern Pike	42	54	5.1
Walleye	50	54	5.5
Largemouth Bass	51	34	3.3
Smallmouth Bass	33	24	1.7
Sunfish	37	38	20.4

Considerable evidence demonstrates that the introduction of new kinds of fish into our inland waters can result in problems comparable to those associated with the introduction of sea lamprey and smelt into Lake Superior. Although carp are not widely distributed in northern

Wisconsin, their introduction to certain lakes and waterways has resulted in habitat changes detrimental to other fish. Less obvious are the effects of stocking walleye or northern pike in certain lakes. Evidence from Minnesota studies suggests that excessive planting of northern pike in lakes with yellow perch and walleye can totally upset the system and fishery. Predation by northern pike on larger perch reduces the reproductive capacity of the perch population and the number of young perch available to walleye as food. These conditions result in slower growth of walleye, increased predation by northern pike on young walleye and walleye cannibalism. The effect of these changes is lower fish production.³ Evidence also shows that heavy plantings of walleye can result in destruction of sunfish populations and the fishery which relies upon them (Kempinger et al. 1975).

Although evidence suggests that fish stocking can have detrimental as well as beneficial effects, Wisconsin lake property owners, in a recent survey, identified fish stocking as the management technique most important to improving their lake (Klessig and Yanggen 1973). These results suggest that many Wisconsin fishermen believe that where more fish and more kinds of fish are placed in a lake, fishing will improve. This concept of how to improve fishing is similar to farming under the concept that placing more animals on a pasture will increase production. Both are true to a point. That is, production increases with the number of animals until the number of animals feeding exceeds the ability of the system to produce food. Beyond this point the system's ability to produce is drastically reduced and production falls off sharply. With both farm animals and fish, overstocking results in slow growth, increased disease, higher mortality and extremely poor yields. The solution to this problem is certainly not to place more or new kinds of fish (or farm animals) on the land or in the lake, but to take the loss and allow the system to recover its capacity to produce food energy. Public pressure to plant more fish has made it difficult to approach management in this manner.

Educational Challenges

It is important that the fishing public understand the factors which control fish production in lakes in order to promote efficient management and the higher fish production required to meet the growing demand for quality recreational fishing in the north.

Education must also play a major role in promoting commercial utilization of northern Wisconsin's fishery resources. Programs to train fishermen, to use better harvesting methods, and to develop products and markets will be important in developing the under-utilized fisheries of Lake Superior and in stimulating more efficient use of rough fish from our inland waters.

As demands for natural resources from northern Wisconsin grow, education must play a larger role in insuring that various user groups recognize each other's needs. Information on how a specific use of a resource influences other uses, production of the specific resource and other independent resources must be obtained. Wisconsin educators must insure that land-owners who till the soil or harvest trees are aware of the impacts of their activities on fisheries and other resources. Sport fishermen must be made aware of the importance of commercial fishing to creation of a balanced resource. The real challenge for educators will be to broaden themselves in order to fill this critical role.

³ Dennis Schuppe, Fish Research Biologist, Minnesota Department of Natural Resources, Brainerd, Minnesota.

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