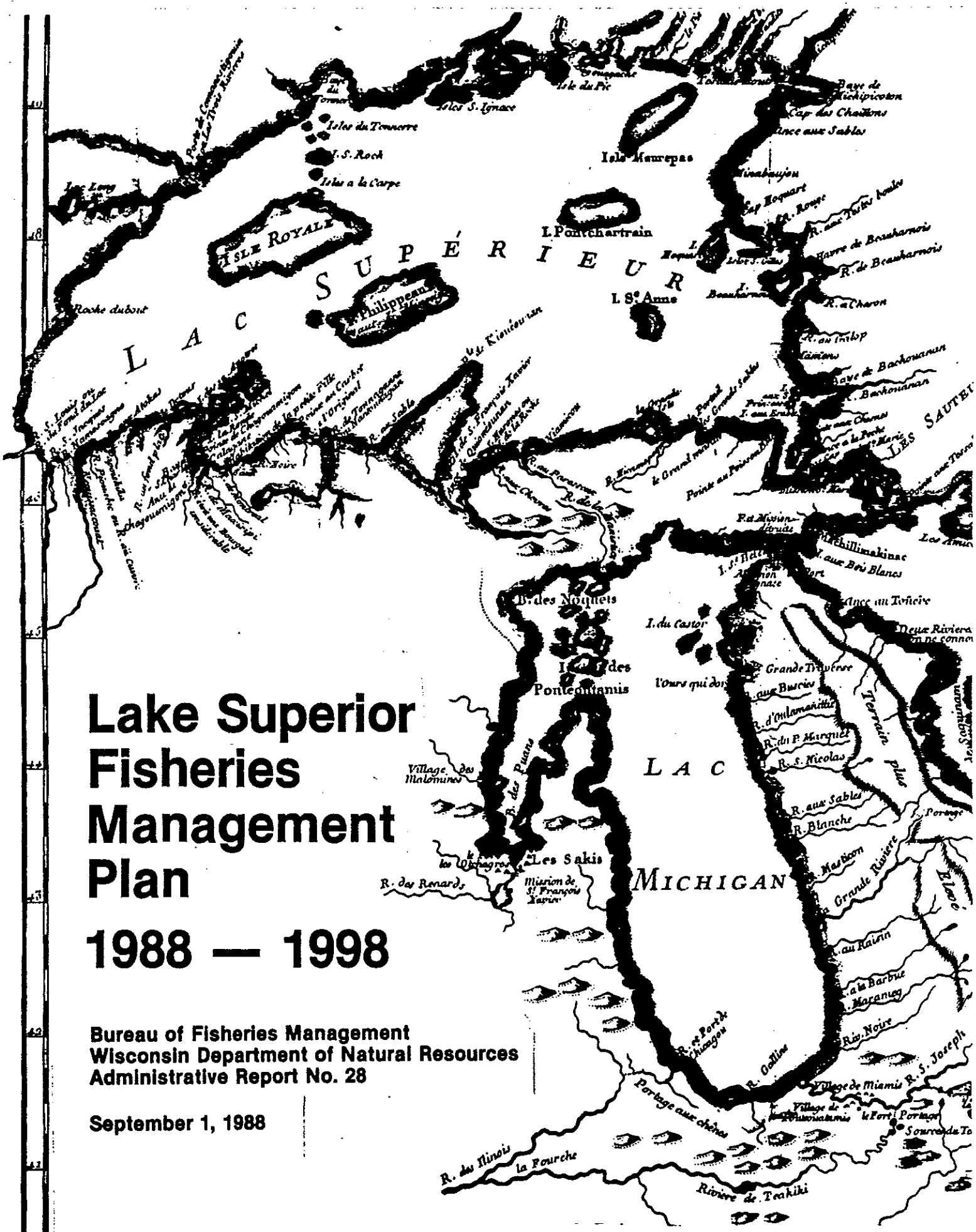
# Lake Superior Fisheries Management Plan

# 1988 — 1998

**Bureau of Fisheries Management**
**Wisconsin Department of Natural Resources**
**Administrative Report No. 28**

**September 1, 1988**



**LAKE SUPERIOR FISHERIES MANAGEMENT PLAN**

by


Wisconsin Department of Natural Resources

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Cooperating Organizations

Apostle Island Sport Fishermen's Association
Apostle Islands National Lakeshore
Brule River Sportsmen's Club
Douglas County Fish and Game League
Lake Superior Charter Captain's Association
Lake Superior Commercial Fishing Board
Lake Superior Management Advisory Board
Lake Superior Steelhead Association
Northern Wisconsin Commercial Fishermen's Association
Northern Wisconsin Rod and Gun Club
St. Louis River Recreation Association
Saxon Harbor Boat Club
Washburn Boat Club
Western Lake Superior and Brule River Coalition
Western Lake Superior Trollers Association
Wisconsin Conservation Congress

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## EXECUTIVE SUMMARY

The Lake Superior Fishery has undergone many dramatic changes during the past 25 years. The state commercial fishery, which flourished beginning in 1850, has encountered three major changes in the past 25 years. First, sea lamprey invaded from the ocean and nearly drove lake trout to extinction. Second, in 1972 the Gurnoe decision of the Wisconsin Supreme Court reaffirmed the treaty rights of the Lake Superior Chippewa to fish commercially. This led to a negotiated agreement with the tribes which allocates 50 percent of the lake trout to the tribal commercial fishery. Third, an expanding sport fishery and tourist-based economy has demanded a larger portion of the state's share of lake trout, leaving even less trout for the state commercial fishery. The future for the state commercial fishery is not bright, but there are options.

Lake Superior's current sport fishery is a combination of open water, ice, and stream fishing. Lake trout dominate the current lake fishery, making up approximately 51 percent of the 1983-85 salmonid catch. There is increasing pressure from sport anglers to improve fishing by increased stocking of other species such as chinook salmon. Any such stocking may have a negative effect on the forage base and on the rest of the fish community.

In 1987, 21 state commercial fishers, 45 tribal commercial fishers, approximately 25,000 sport anglers, and 45 charter boat operators shared the fishery resource of Wisconsin's Lake Superior waters. Competition for fish and space to fish has created allocation problems among these user groups.

In response, the Wisconsin Department of Natural Resources (Department) has worked with citizens who use Lake Superior to develop a Lake Superior Fisheries Management Plan (the Plan) for the rational management of the Lake's fishery resources. This Plan has broad goals with quantified objectives. Obstacles in reaching those objectives are identified along with tactics to overcome problems.

The goals were developed following the mandates given the Department by the legislature and Natural Resources Board and Wisconsin's commitment to federal efforts to re-establish a self-sustaining lake trout population. The objectives were developed by examining historical harvest levels, by scientifically predicting the lake's productive capacity, and by open discussions with appropriate user groups.

Allocation of the fishery resource reflects a policy decision to maximize recreational and economic benefits. Certain objectives had to be moderated when it was determined that their attainment would preclude the accomplishment of other objectives. These

adjustments were the focus of discussion among user groups during the public review period, which began in December 1986. Department fisheries management personnel had five public meetings along the Lake Superior shore. Nearly 130 people attended the meetings.

Suggestions received at each meeting were recorded and evaluated, and many were written into the Plan. Total consensus was not possible; however, the Plan does represent the best possible compromise and is a logical framework for managing the Lake Superior fishery by 1998.

This Plan not only clearly sets management goals and objectives but also has far-reaching policy implications:

1) By establishing maximum harvest figures, the Plan recognizes that Lake Superior fish production is <u>finite</u>, and that although society may demand more fish from its waters, the lake simply may not be capable of producing more.

   This translates into a clear message for both commercial and sport users: a) Commercial fishers must recognize that if more participants enter the fishery, individual quotas may be reduced accordingly; b) Sport anglers must recognize that the numbers of stocked trout and salmon cannot be increased without careful analysis of the impact on the forage base.

2) Although Lake Superior is the least productive of all the Great Lakes, it is also the purest and coldest. It is the one Great Lake that still retains the potential to sustain most of its fish stocks through natural reproduction. The Plan calls for protecting and taking advantage of this quality whenever possible by giving priority to native or naturally reproducing species.

3) The goal for lake trout rehabilitation reflects the Department's commitment to the Great Lakes Fishery Commission and the other lake states to re-establish a self-sustaining lake trout population. Restrictions on lake trout harvest by all user groups will continue along with continued emphasis on lamprey control and lake herring recovery.

4) Lake Superior is one lake. Before the Plan is implemented, each tactic must be evaluated with regard to its potential impact on other states' provincial and tribal programs.

## Lake Superior Management Plan Goals and Objectives

### Goals

THE GOAL OF FISH MANAGEMENT IS TO PROVIDE OPPORTUNITIES FOR THE OPTIMUM USE AND ENJOYMENT OF WISCONSIN'S AQUATIC RESOURCES, BOTH SPORT AND COMMERCIAL. A HEALTHY AND DIVERSE ENVIRONMENT IS ESSENTIAL TO MEET THIS GOAL AND SHALL BE PROVIDED THROUGH MANAGEMENT PROGRAMS, (NR 1.01(2)).

A. Manage for a diverse, multi-species commercial fishery to allow an optimum sustained harvest.

B. Manage for a diverse, year-round, multi-species sport fishery to allow an optimum sustained harvest and to provide a variety of angling opportunities.

C. Manage for a diverse, multi-species tribal home-use fishery to allow an optimum sustained harvest.

D. Manage for fish communities, based on foundations of stable self-sustaining stocks, consistent with the productive capacity of Lake Superior.

E. Develop an economic analysis to assist in management decisions.

F. Maintain, monitor, and enhance habitat quality.

G. Increase control of sea lamprey over present levels.

H. Increase and maintain safe, public fishing boat access.

"Optimum sustained harvest" is defined as the yield that will provide the people of Wisconsin with the greatest overall benefits in recreational, food production, and economic opportunities, taking into account the effects of harvesting on dependent or associated species.

These goals must be achieved without curtailing the opportunities for non-fishery-related user groups.

### Objectives

A. COMMERCIAL FISHERY

1. Manage the lake trout populations at levels that will allow a sustained annual harvest of approximately 160,000 pounds (59,000 fish) and an annual mortality rate conducive to lake trout rehabilitation.

2. Manage the lake whitefish populations at levels that will allow a sustained annual harvest of 290,000 pounds.

3. Manage the round whitefish populations at levels that will allow a sustained annual harvest of 40,000 pounds.

4. Manage the deep water fishery to allow a sustained annual harvest of 300,000 pounds of chubs and 300,000 pounds of siscowet.

5. Allow present lake herring abundances to continue expansion towards Lake Superior's carrying capacity.

6. Promote maximum harvest and utilization of smelt stocks to minimize their impact on lake herring.

7. Manage for a tribal commercial harvest of walleye from the St. Louis River, Kakagon Sloughs, and Bad River stocks consistent with treaty rights.

B. SPORT FISHERY

1. Manage the lake trout fishery to provide an annual harvest of 33,000 fish. Maintain a catch rate of 0.16 fish/hour during June-August.

2. Manage the coho salmon fishery to provide an annual harvest of 15,000 fish. Maintain a catch rate of 0.20 fish/hour during May.

3. Manage the chinook salmon fishery to provide an annual harvest of 12,000 fish. Maintain a catch rate of 0.16 fish/hour during May.

4. Manage the anadromous brown trout fishery to provide an annual harvest of 6,000 fish. Maintain a catch rate of 0.03 fish/hour during the fall spawning run and 0.10 fish/hour during the early-winter ice fishing season.

5. Manage the steelhead trout fishery to provide an annual harvest of 13,000 fish. Maintain a catch rate of .06 fish/hour during the fall run on the Brule River and the spring run on the Sioux River.

6. Manage the splake fishery to provide an annual harvest of 10,000 fish. Maintain a catch rate of 0.15 fish/hour during December and January.

7. Manage walleye for optimum sustained yield on the St. Louis River, Kakagon Sloughs, and Bad River stocks.

8. Improve the size structure of yellow perch populations in Chequamegon Bay.

9. Encourage sport angling for burbot in western Lake Superior.

10. Maintain angling opportunities at the current level for the remaining sport species until their population status can be determined.

11. Produce a limited fishing opportunity for trophy trout and salmon fisheries.

C. TRIBAL HOME-USE FISHERY

1. Recognize the tribal home-use fishery and its impacts on management objectives for commercial and sport fisheries.

D. FISH COMMUNITIES

1. Re-establish depleted stocks of native species including lake trout, brook trout, and lake sturgeon.

2. Establish natural populations of desirable exotic species, including but not limited to grayling, arctic char, atlantic salmon, chum salmon, and sockeye salmon, within the limits of native fish restoration objectives.

3. Monitor existing fisheries for impacts of recently introduced exotics.

E. ECONOMIC ANALYSIS

F. HABITAT QUALITY

G. SEA LAMPREY

1. Reduce the present adult sea lamprey population by 50 percent.

H. PUBLIC BOAT ACCESS

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## INTRODUCTION

### Purpose

The Lake Superior Fisheries Management Plan (the Plan) was prepared by the Wisconsin Department of Natural Resources (Department) for two purposes. First, the goals and objectives established in the Plan will guide practical management of Wisconsin's Lake Superior fisheries so to best benefit the state's citizens within the productive capacity of the resource. The public participated extensively in the making of the Plan so that it would reflect the type of management desired for Lake Superior.

Second, the Plan identifies the obstacles to meeting the established goals and objectives and develops tactics for overcoming these problems. Specific operational projects for Lake Superior fisheries personnel will be developed from these tactics.

As the Plan is put into action, it will promote more efficient, consistent fisheries management, and will fully inform all resource users as to what they can expect from Lake Superior and from the Department.

### Scope

The Plan covers the ten years from 1988 through 1998, when it will be reevaluated and revised. During this interim, the original Plan will be a "living document." Should drastic changes occur in Lake Superior that are not accounted for by the Plan, the Department will, with public input, develop appropriate actions.

### Mandate

Section 23.09 of the Wisconsin Statutes grants the Department authority in conducting fisheries management activities:

1. Section 23.09: Conservation.

    a) Purpose: The purpose of this section is to provide an adequate and flexible system for the protection, development, and use of forests, fish and game, lakes, streams, plant life, flowers, and other outdoor resources in this state.

    b) Departmental Rules, Studies, Surveys, Services, Powers, Long-Range Planning: The Department may make such rules, inaugurate such studies, investigations, and surveys, and establish such services as it deems necessary to carry out the provisions and purposes of this section. The Department shall establish long-range plans, projects, and priorities for conservation.

2. Section 29.085: Department to regulate hunting and fishing in interstate waters.

   a) The Department may regulate hunting and fishing on and in all interstate boundary waters and outlying waters specified in S. 29.09(4). Any act of the Department in so regulating the hunting and fishing on or in such interstate boundary waters and outlying waters shall be valid, all other provisions of the statutes notwithstanding, provided such powers shall be exercised pursuant to and in accordance with SS. 23.09(2) and 29.174.

The Department also receives instruction from the Natural Resources Board through the following Wisconsin Administrative Code:

NR 1.04 Great Lakes fisheries management: The Board endorses a flexible management system for the protection, development, and utilization of the waters and fish populations of the Great Lakes for the maximum public benefit.

1) Management of the Great Lakes is of intrastate, interstate, federal, and international interest; therefore, cooperation with managing agencies shall be sought in developing management objectives and measures for fish stocks of common concern.

2) The Great Lakes fisheries are to be considered part of a diverse community. The Department shall promote efforts to maintain and enhance the quality of this community and its environment.

3) Management of the fishery resources shall be based on a sound understanding of the dynamics of interacting fish stocks. The Department shall conduct research and resource base inventories, and collect harvest and utilization statistics on which to base sound management decisions.

4) The fishery resources of the Great Lakes, though renewable, experience dynamic changes and are limited. The resources will be managed in accordance with sound biological principles to attain optimum sustainable utilization. Management measures may include but are not limited to seasons, bag and quota limits, limitations on the type and amount of fishing gear, limitation as to participation in the fisheries, allocation of allowable harvest among various users, and the establishment of restricted areas.

## DESCRIPTION OF THE RESOURCE AND FISHERIES

### Geographic Description

Lake Superior is the largest freshwater lake in the world in terms of surface acres, it is the deepest of the five Great Lakes and the most infertile. Jurisdiction over Lake Superior's waters is divided among Wisconsin, Michigan, Minnesota, and Ontario, Canada. Wisconsin's portion comprises 1.712 million acres of water and 290 miles of shoreline.

### Fisheries History

Commercial Fishery - The first fishermen on the Wisconsin waters of Lake Superior were Indians. Nets were manufactured from the inner bark of basswood and cedar trees and from the fibers of the nettle.(1) In the early 1800's, organized commercial fishing began around the lake. LaPointe, on Madeline Island, was the center of the Lake Superior fishing industry of the American Fur Company. Whitefish, trout, and siscowet were harvested, salted, packed in barrels, and shipped via schooner to Sault St. Marie. The schooner made five to seven trips from the opening of navigation till the close in early November.

Fishers spent the winter making gill nets. Nets were made of sturgeon twine and were different sizes for each species. Five and one-half inches was the regular size for trout, and six inches for whitefish.(2) The fishery was so successful it became necessary to create a market for the fish.(3) By 1840 money was tight, markets weren't available, and in 1842 the American Fur Company failed. After 1841 there was little commercial fishing on the lake for over a decade.

Fishing began again when European settlers arrived. By 1879 Bayfield had 130 people employed in the fisheries and nearly twice that number in 1880. Gill nets, pound nets, and seines were the primary gears used. About 1,680 gill nets were owned by Bayfield fishers. Each net was about 900 feet long. Bayfield also had 27 pound nets and 17 or 18 seines with an average length of about 1,000 feet. During the winter hook and line fishing was carried on among the islands.

During the late 1850's and early 1860's, whitefish, lake trout, and lake herring were commercially harvested off Superior. During the

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(1) G. L. Nute, Lake Superior (New York: Bobbs Merrill Co., 1944).

(2) Ibid.

(3) Ibid.

same period, the St. Louis River provided especially large harvests during the April to June spawning runs of walleye, sturgeon, and northern pike up to the lower falls.(4)

By 1870 the commercial fishery off Superior was obviously declining as the Superior Times reported in its November 19, 1870, edition: "The lake fisheries in this vicinity have not been very profitable this season; the catch has been barely sufficient to pay expenses."(5) During the 1870's brook trout were harvested on the Brule River during the winter months and taken to Duluth and Ashland.(6)

Around the turn of the century, small sailing vessels were gradually replaced with wooden steamers, and automatic gill net lifters made fishing more efficient.(7) Linen gill nets were replaced with cotton around 1928. Nylon nets were first used about 1954, and finally monofilament nets were developed in the early 1970's. Commercial fish camps were common on many of the islands and also at river mouths along the main shore during the open water season. Fish were picked up from the islands every other day and brought to Bayfield. The present fishery operates from ports along the main shoreline.

In 1940 approximately 90 percent of the total lake trout harvest was taken by the state commercial fishers, with the remainder taken by sport anglers (Fig. 1). At that time, there were approximately 70 licenses, with many part-time fishers. Between 1952 and 1961 lake trout were nearly eliminated due to severe sea lamprey predation. Only 40,000 pounds of lake trout were commercially harvested in 1963, when the sea lamprey impact was at its peak.

Stocking of lake trout replaced natural reproduction in the early 1960's, resulting in a lake trout population mainly composed of hatchery-reared fish through 1970. As a result, the annual harvest rose to approximately 70,000 pounds, of which 40,000 pounds were taken by state-licensed commercial fishers. In 1972 the Lake Superior Chippewas regained treaty fishing rights, and 50 percent of the harvest was allocated to tribal interests. This resulted in a total harvest by 1984 of approximately 276,000 pounds, of which 70,000 pounds were taken by the state commercial fishers.

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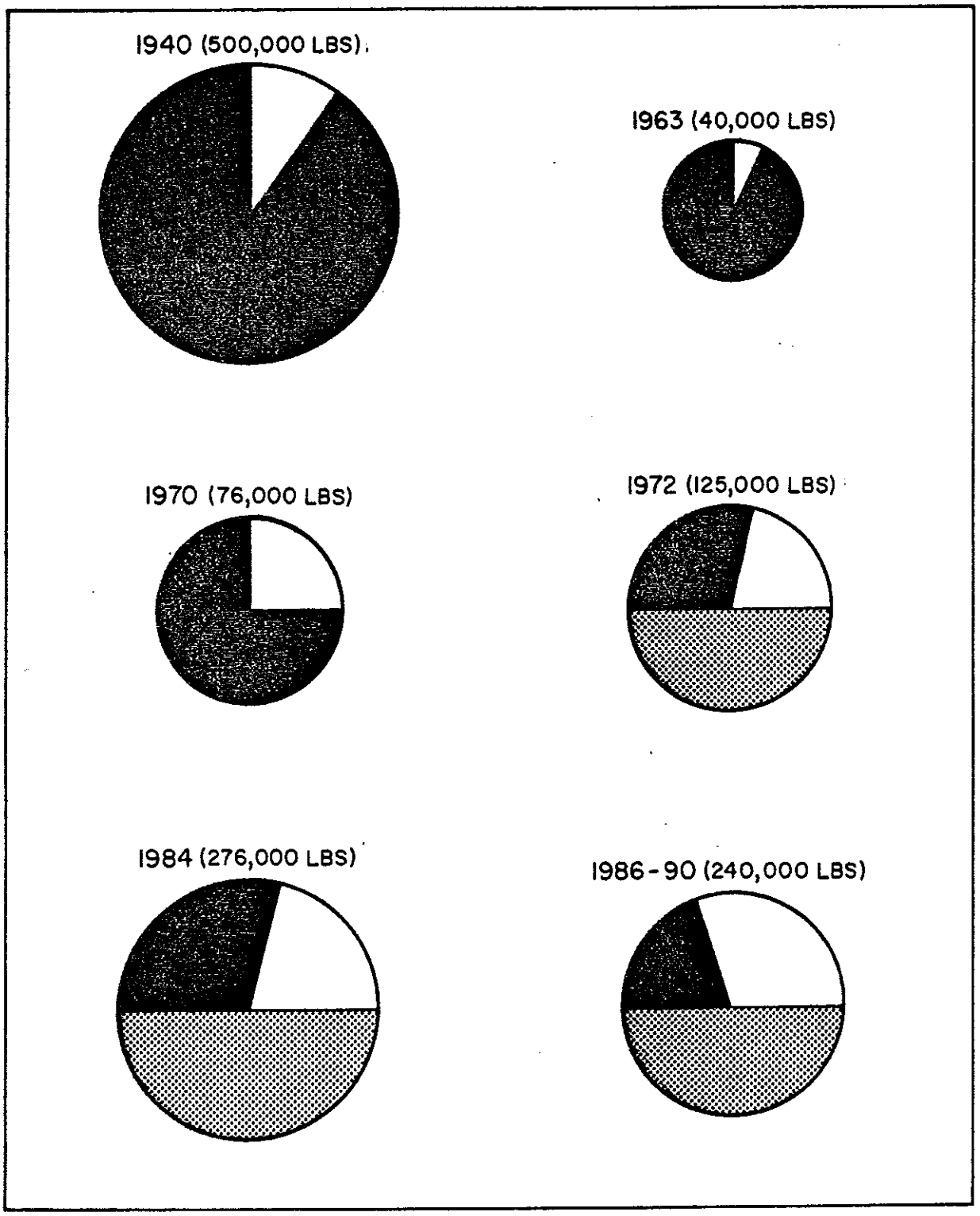
(4) Ibid.

(5) Superior Times (November 19, 1870), p. 4.

(6) E. T. Sweet, "1880 Geology of the Western Lake Superior District," Geology of Wisconsin, Vol. III, pp. 321-322.

(7) W. Downs, Fish of Lake Superior (University of Wisconsin Sea Grant, WIS-SG76-124, 1976).

Figure 1. Wisconsin's Lake Superior lake trout harvest 1940 to date. Blackened portion of pie represents state licensed commercial fishermen, white portion represents sport, and shaded portion represents tribal harvest.



From 1986-1990 the total allowable lake trout harvest for all fisheries combined will be reduced to approximately 240,000 pounds, of which only 48-49,000 pounds may be allocated to the state-licensed commercial fishery (2,333 pounds per commercial license). The current commercial harvest (Fig. 2) shows chubs (25%), whitefish (22%), lake trout (16.3%), smelt (15%), and herring (13%) comprising the bulk of the commercial poundage. Values of the present catch are dominated by lake trout (32.1%), chubs (29.1%), and whitefish (25.3%) (Fig. 3).

The state's commercial fishery has encountered three major problems over the past 25 years: 1) sea lamprey; 2) treaty fishing rights; and 3) an expanding sport fishery. The combination of these problems has resulted in a smaller allocation for the state's commercial fishers. Presently, the state's commercial fishery is allowed to harvest approximately the same amount of lake trout that it did when the sea lamprey was at its peak in the early 1960's.

The Plan will give direction and tactics which will address the crisis situation in the state's commercial fishery. The projected commercial harvest of the Plan is significantly different from the 1984-86 fish in total harvest, species composition, and values (Figs. 2 and 3). Commercial fishery growth is being redirected to naturally produced stocks such as the deep water siscowet-chub community.

The annual fish harvest in 1984-86 was slightly over 1 million pounds and the Plan's projected harvest is nearly 1.5 million pounds. This represents a 33 percent increase. The principle changes in the composition are increases of 76 percent for siscowet, 63 percent for menominee, 46 percent for lake herring, 21 percent for whitefish, and 13 percent for chubs. Lake trout was the only fish targeted for a decrease of 4 percent.

The 1996 value of the fishery (given in today's dockside value per pound) is targeted for an approximate 25 percent increase (Fig. 3). Siscowet trout harvest value is targeted for a $114,000 increase, whitefish $43,000, lake herring $28,000, and chubs $26,000. Lake trout harvest value could drop by $11,000. Overall, the dockside value would increase from $632,000 to $840,000. This does not take into account the increasing trend in lake trout values, the lake herring egg market, or walleye harvest east of Bark Point.

<u>Sport Fishery</u> - Records of sport fishing's history are sparse, consisting mostly of occasional references. Most references mention the popularity of deep-sea trolling for lake trout and stream fishing for brook trout. Walleye, perch, and northern pike fishing also drew sport anglers to Chequamegon Bay, where large catches were taken through the 1950's. The walleye population declined in the 1960's and 1970's. Smelt became abundant in the late 1950's and provided a spring dip-net and seine fishery.

Figure 2. Wisconsin's Lake Superior annual average species composition of the 1984-86 commercial fishery harvest and composition projected from the Plan.

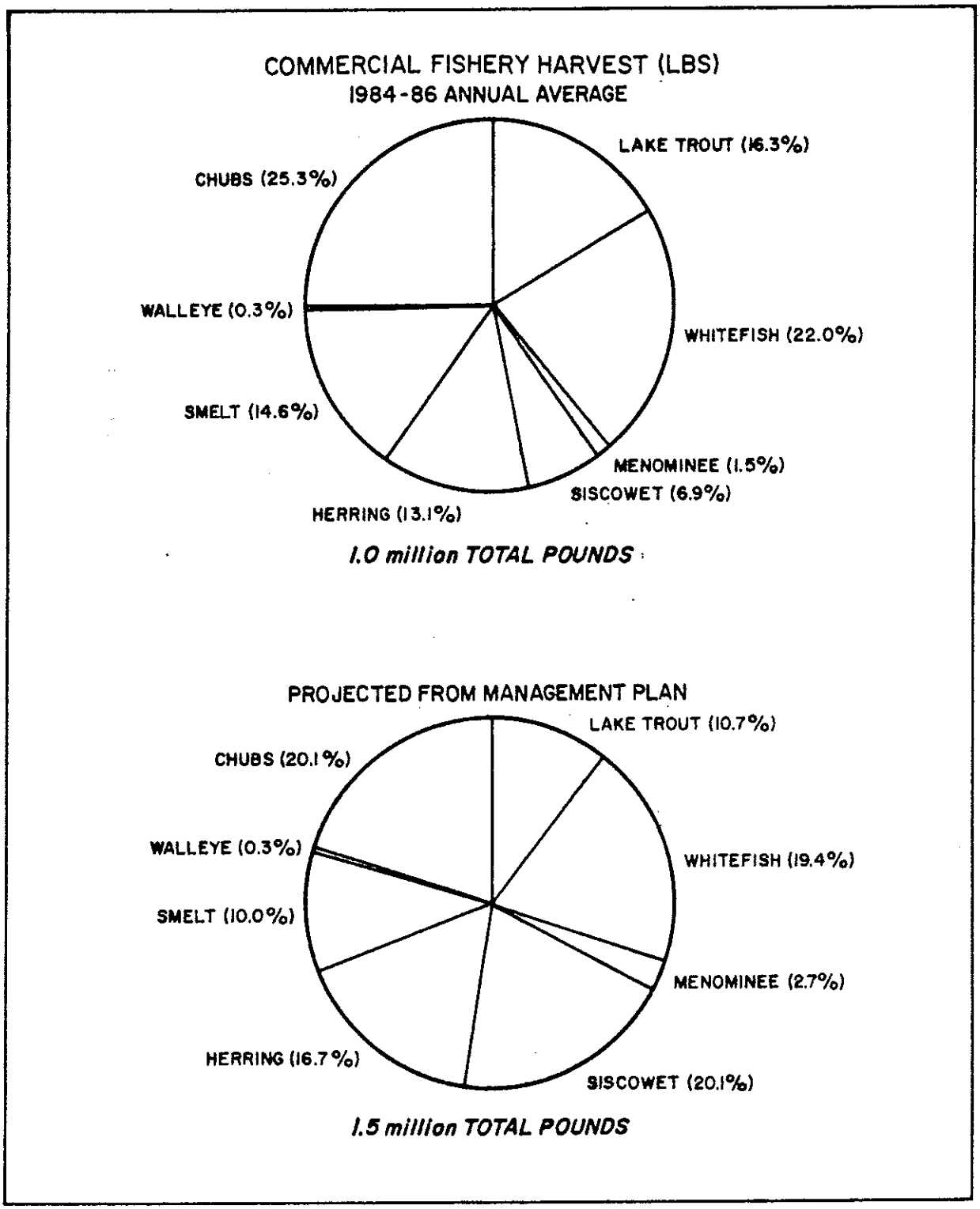
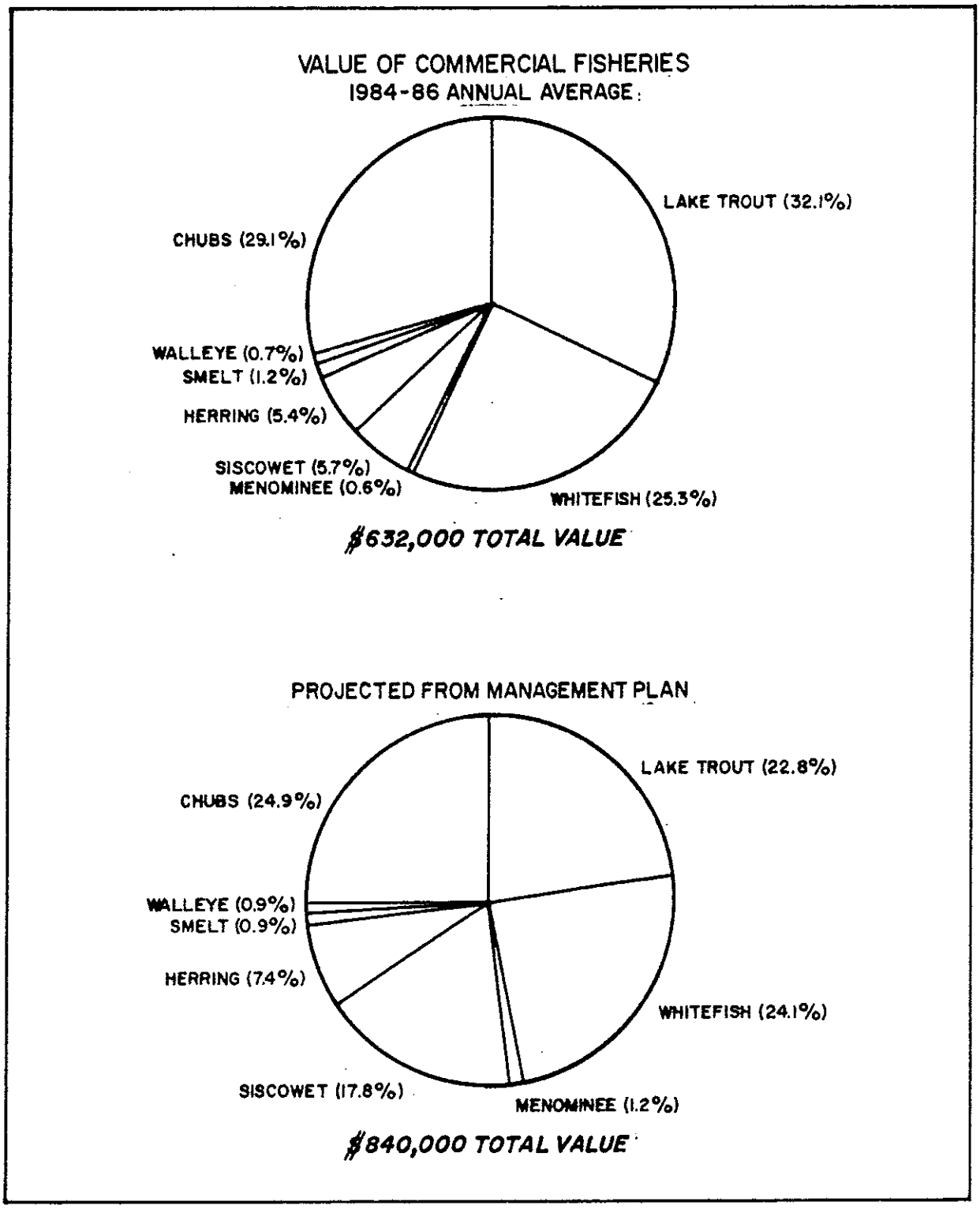


Figure 3. Wisconsin's Lake Superior value composition of the 1984-86 commercial harvest and projected by the management plan.



Smallmouth bass was a popular sport fish in Chequamegon Bay and provided seasonal fishing for near-shore anglers.

The sport charter fishery began in the Apostle Islands in the 1930's. In 1973 legislation was passed requiring a special license for charter fishers on the Great Lakes. In that year 27 licensed charter fishers operated in the Apostle Islands region. Beginning in the early 1980's a productive sport fishery developed between Port Wing and Superior. By 1987 there were 45 charter captains--22 in the Apostle Islands region and 23 in the Port Wing/Superior region. Harvest during the same period has steadily increased, with lake trout dominating the catch. Lake Superior charter trollers should see increases in chinook salmon catches as recent plants begin to enter the fishery in 1988.

Lake Superior's present sport fishery is a combination of open water, ice, and stream fishing. Lake trout dominate the current lake fishery, making up approximately 51 percent of the 1983-85 salmonid catch (Fig. 4), despite 50 percent of the lake trout quota having been allocated to tribal fishers and 50 percent to state commercial and sport fishers. The percentage of native lake trout in the harvest is increasing.

Lake trout bobbing (jigging) provides a popular winter ice fishery around the Apostle Islands. An average bobber takes 7.3 hours to catch a lake trout, with 90 percent stocked fish in the catch. Splake remains the major species caught during the Chequamegon Bay ice fishing season. This fishery is very popular with anglers since access is easy, fish are in shallow water, and the average size is 16-17 inches.

Stream fishing for anadromous salmonids is concentrated on five major Lake Superior tributaries--the Brule, Sioux, Flag, and Cranberry rivers, and Fish Creek. The Brule receives the most pressure, with the Sioux a distant second. Rainbow trout or steelhead are the primary fish caught, and they provide spring and fall fisheries on the Brule and a spring fishery on the other streams. Brown trout, coho salmon, and chinook salmon provide the bulk of the fall run.

A comparison of the current sport fishery with the sport fishery goals of the Plan is illustrated in Figures 5 and 6. Not only is there significant change in composition, but the total fish harvest will also significantly increase.

The proportion of lake trout in the catch will drop from 51 percent to approximately 36 percent, while the salmon (chinook and coho) will increases from 16 percent to nearly 30 percent. Brook trout and splake proportions will increase by approximately 2 percent and 1 1/2 percent, respectively, while brown trout stay the same and rainbow trout will decrease by 2 percent.

Figure 4. Wisconsin's Lake Superior sport fishery species composition, 1983-85 lake harvest and 1978-80 stream harvest and composition project by the Plan.

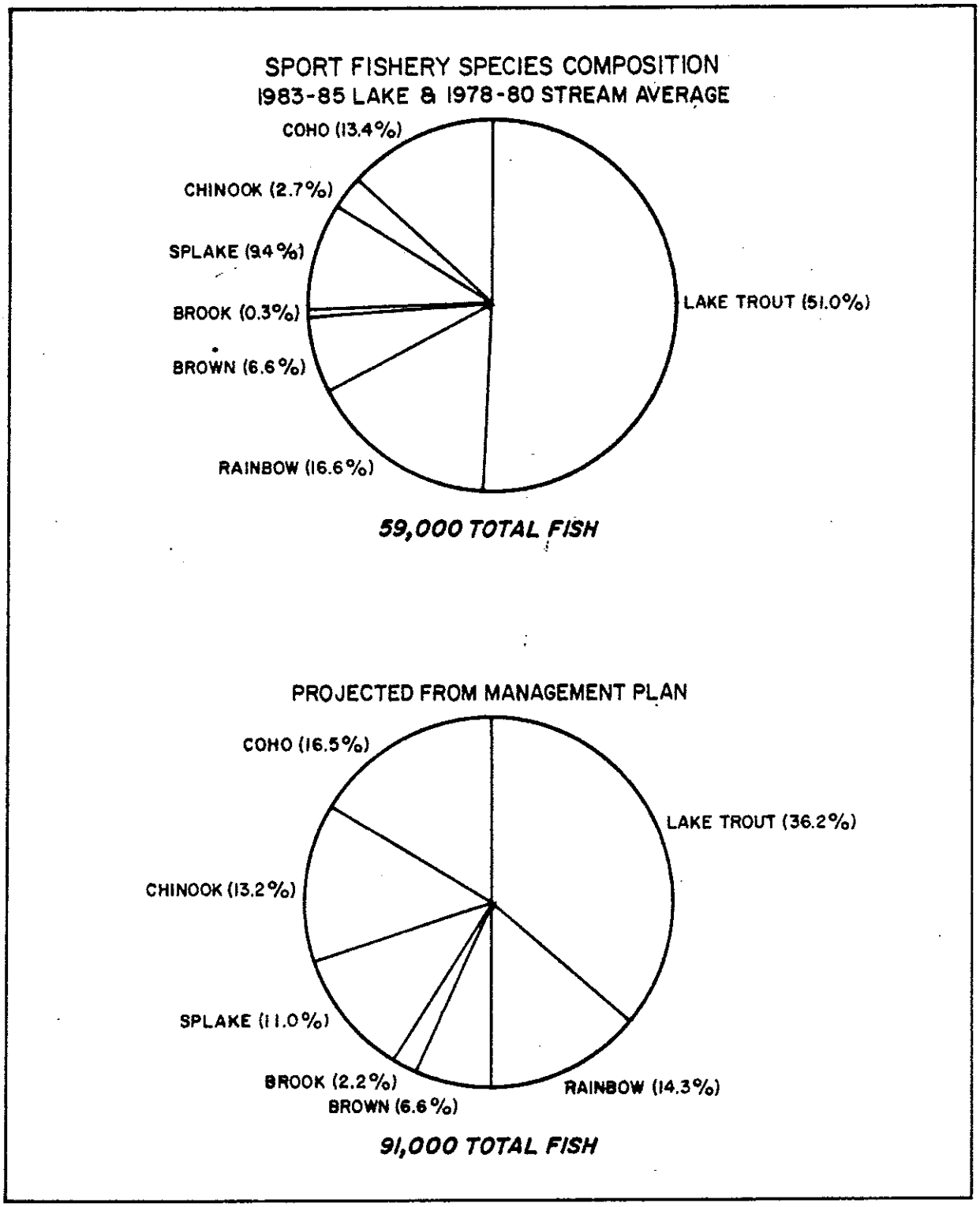


Figure 5. Changes in the relative abundance of lake herring and smelt in Wisconsin waters of Lake Superior, 1930-85.

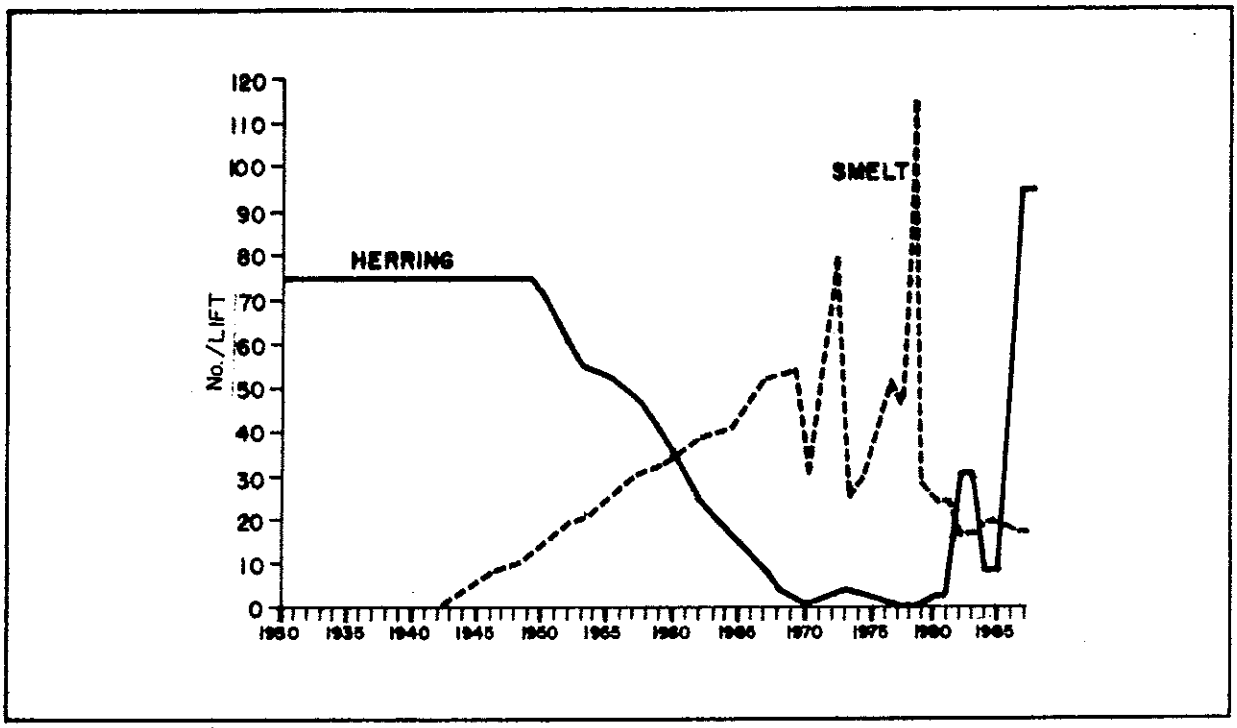
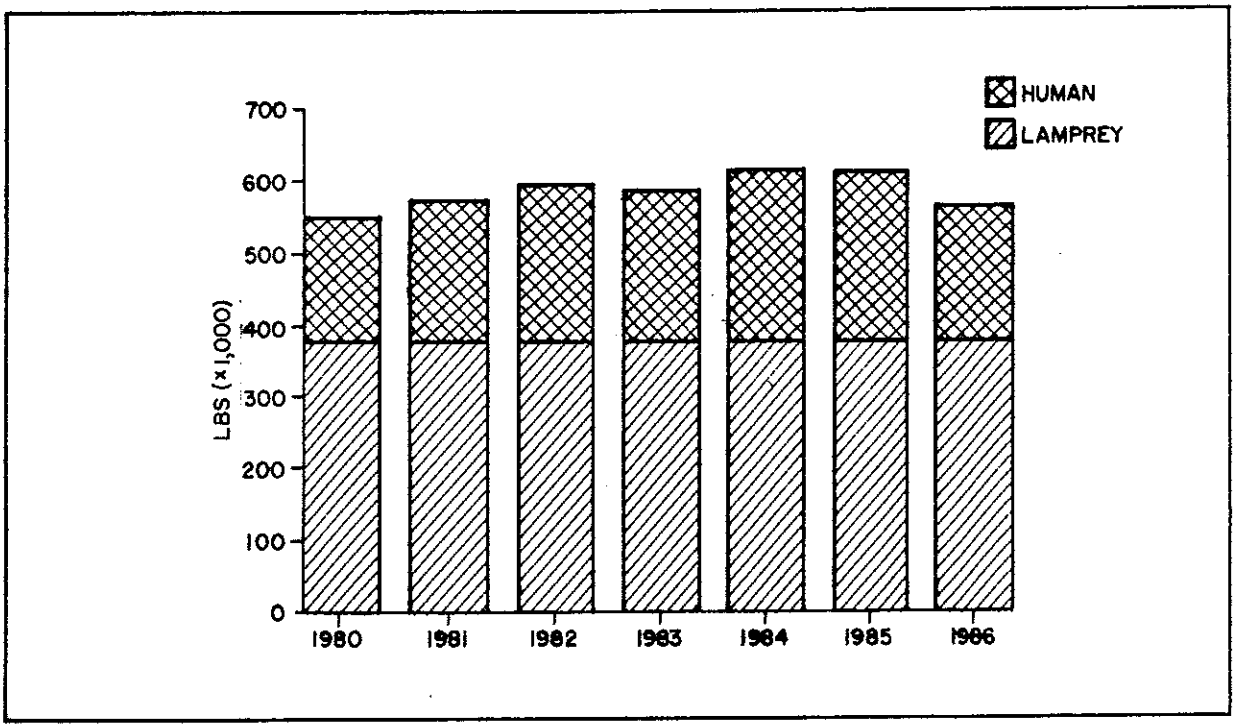



Figure 6. Extraction of lake trout in Wisconsin waters of Lake Superior by sea lamprey and human exploitation 1980-86.



The targeted total fish harvest will increase 35 percent from 58,893 to 91,000 fish. The estimated increase in poundage of sport-caught trout and salmon will also increase 35 percent. Therefore while a proportion doesn't change, the number harvested will change. For example, while the proportion of brown trout will remain 6.6 percent, the number harvested will increase from 4,850 to 6,000.

Tribal Fishery - Fishing for lake trout in the Wisconsin waters of Lake Superior was restricted to state-licensed sport and commercial fishers until the 1972 Gurnoe decision(8) reaffirmed the treaty rights of the Lake Superior Chippewas to fish commercially. From that year to the present, fishing effort has increased substantially, resulting in a generally depleted lake trout stock. In 1980 the Department and the Red Cliff Band of Lake Superior Chippewas jointly developed a Lake Superior fishery management agreement. During development of this agreement, the Bad River Band declined to participate in negotiations since none of its tribal members were active in commercial fishing at that time. Consequently, the Red Cliff Band allocated the entire tribal commercial lake trout quota to its tribal fishers.

Beginning in 1984, however, several Bad River members began to fish commercially for lake trout in Lake Superior, outside of any agreed-upon quota, thus jeopardizing the status of the lake trout population. Negotiations with both Bad River and Red Cliff Bands were initiated early in 1985 to bring the management of the lake trout fishery under a unified agreement and to control the negative impact of over harvest on the lake trout population.

In 1986 an agreement was reached limiting the number of lake trout to be harvested by tribal home-use and commercial fishers to 43,000 during each fishing season. The allocation of this quota between the Red Cliff and Bad River bands will be on a 60/40 basis, respectively, during the 1987-1989 fishing years, and a 50/50 basis until the end of the quota agreement in 1991.

Forage

Historically, lake herring was the major forage fish for lake trout, sustaining a 400,000+ pound annual lake trout harvest. Smelt entered the Wisconsin waters of Lake Superior in the 1940's and reached significant abundance in the mid-1950's (Fig. 5). By the late 1960's lake herring were replaced by smelt as the major forage fish in the lake trout diet. In the late 1970's and early 1980's smelt abundance began to wane, while stronger year classes of lake herring began to appear.

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(8) Gurnoe decision - State vs. Gurnoe, Supreme Court of Wisconsin, 53 Wis. 2d 390, 1972.

Whether lake herring or smelt return to dominance or remain in some combination, this forage base will dictate the amount of trout and salmon that the lake can sustain. Smelt are relatively near shore inhabitants, while lake herring utilize all or most of the lake. Lake herring are capable of converting more of the lake's zooplankton into forage for top order predators. A return of abundant lake herring stocks will allow the lake to support more top level predators for both sport and commercial enterprises. Therefore, commercial lake herring harvest objectives will be low to allow rehabilitation of herring stocks.

The Plan also provides guidelines for forage allocation among predator sport fish. Each top predator species feeds and converts its food at different rates of efficiency. These values, when known, will be used in determining forage division.

Sea Lamprey

Sea lamprey predation represents a major constraint to rehabilitation of lake trout in Lake Superior. In Wisconsin sea lamprey presently consume as much lake trout as is reportedly harvested by state and tribal fisheries combined. Increases in sea lamprey abundance could also affect other species, such as whitefish and siscowet.

Before the sea lamprey invasion, approximately 400,000 pounds of lake trout were harvested annually in Wisconsin's Lake Superior waters. Recent estimates indicate sea lamprey and humans are presently killing or extracting between 550,000 - 600,000 pounds of lake trout annually (Fig. 6).

The reported extraction by humans is approximately 208,000 pounds annually, while sea lamprey kill approximately 377,000 pounds. The estimated sea lamprey kill is derived from the number of lamprey spawning in Wisconsin streams. Some of these lamprey feed in Minnesota and Michigan waters, so their kill in Wisconsin is somewhat less than the estimated 377,000 pounds.

Historically, the Brule and Bad rivers produced approximately 85 percent of the lampreys feeding in our waters. A lamprey barrier constructed on the Brule in 1986 effectively eliminated future spawning above the barrier. Some type of barrier or other control technique on the Bad River would greatly decrease the sea lamprey population in Wisconsin.

Fisheries Management

Management of Lake Superior officially began in 1897 when the Bayfield State Fish Hatchery was built. Most early fisheries management focused on regulating commercial fishing through size limits, mesh restrictions, and seasons. Monthly commercial catch reports were required as of 1936. The first fish manager assigned

to Lake Superior in 1951 concentrated first on monitoring fish stocks and then on sea lamprey control.

A landmark event in Great Lakes management was the 1955 establishment of the Great Lakes Fishery Commission by convention between Canada and the United States. Federal money and power was needed to tackle the sea lamprey problem and begin a lake trout rehabilitation program.

Agreements and Plans

The management of Wisconsin's Lake Superior waters is guided by various signed agreements and plans which influence the Lake Superior Management Plan.

State Tribal Agreement - The agreement (1986) between the Department and the Red Cliff and Bad River bands of Lake Superior Chippewas designates refuges, restrictive use areas, and open fishing zones (Appendix 1). Lake trout quotas are addressed for 1986-90 along with procedures for quota determinations from 1991-1996.

Seasons, tagging, lake trout stocking, walleye quotas, enforcement, home-use fishing, and information exchange are described in the agreement. The agreement terminates on November 17, 1995, if it is not reaffirmed or renegotiated.

Strategic Great Lakes Fisheries Management Plan - A joint Strategic Plan for Management of Great Lakes Fisheries (SGLFMP) was signed and adopted on June 17, 1981. Wisconsin entered into the joint plan along with the seven other Great Lakes states, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Ontario Ministry of Natural Resources, and the Canada Department of Fisheries and Oceans. SGLFMP entails a variety of strategies and procedures to ensure that all agencies are in accord with lake-wide strategies in managing fish community objectives.

In recent years, varied interest groups have become active and influential in determining the uses and environmental management of the Great Lakes. The ecosystem approach to Great Lakes management, accepted by the Great Lakes Fishery Commission, recognizes that any impact on a part of the system may to some degree affect an entire lake, connecting channels, and even the entire basin. Hence, lake-wide and basin-wide perspectives have been recognized as essential to effective management.

To alert all interest groups to fishery resource needs, provincial, state, and federal fishery agencies agreed that a strong, practical, strategic Great Lakes fisheries management plan should be developed. The Plan would ensure that the public's fishery resources receive full recognition and consideration in the present and proposed activities of any user. The Plan should prove

beneficial in coordinating environmental- and fishery-agency Great Lakes management efforts into a complementary process, thus helping to protect and, where possible, enhance Great Lakes fishery resources.

Lake Trout Rehabilitation Plan for Lake Superior - The Plan, approved in March 1986 by the Lake Superior Committee of the Great Lakes Fishery Commission, is designed to rehabilitate self-sustaining lake trout stocks capable of yielding 4-million pounds annually. This plan addresses stocking, exploitation, sea lamprey, forage species, and exotic predators.

Fish Contaminants

The presence of toxic contaminants, many of which bioaccumulate in fish, is a serious environmental problem in the Great Lakes. Many of the same contaminants routinely found in the lower Great Lakes have been found in Lake Superior fish tissue but at significantly lower levels. Only lake trout, siscowet, and walleye have been found to contain chemical contaminants at levels warranting concern.

The Department systematically collects and analyzes samples of fish tissue from Lake Superior and its tributaries. Goals of the monitoring programs include:

1. Monitoring for protection of human health for important sport and commercial species.

2. Evaluation of forage fish to assist in projecting contaminant levels in predator fish and wildlife.

3. Evaluate major trends of toxic compounds in water by monitoring fish tissue.

Patterns and Trends - The Canadian Fisheries Research Branch and the U.S. Environmental Protection Agency (EPA) have identified organic, industrial, and pesticide chemicals in Lake Superior including DDT, toxaphene, chlordane, dioxin, PCB's, and the heavy metal mercury. While many of these compounds can be found in Lake Superior lake trout, only PCB's are at or above levels warranting concern.

Lake trout have large amounts of fat tissue, are long-lived, and accumulate higher levels of organic compounds than short-lived species like the coho salmon. Both species have been exposed to these compounds both through direct uptake as water passes continuously over their gills, and through a steady diet of forage fish which contain trace levels of contaminants.

Traces of dioxins have been identified in lake trout from a totally isolated lake on Isle Royale in Lake Superior. Toxaphene, an

insecticide widely used on cotton crops in the southern United States prior to 1980, is occasionally found in lake trout. These are two examples that suggest that Lake Superior receives the greatest contribution of chemicals that accumulate in fish through long-range atmospheric transport. In many chemicals where use was regulated or discontinued in the 1970's, such as dieldrin, chlordane, PCB's and DDT, lake trout monitoring is reflecting significant declines in contaminant burdens.

While organic chemicals tend to accumulate in fatty fish tissue, heavy metals such as mercury buildup in the muscle. Mercury is the only heavy metal currently known to be of concern in Lake Superior fish. Wisconsin and Minnesota have found elevated levels in large walleyes collected from Lake Superior near the Apostle Islands and the St. Louis River system. Ontario has detected similar levels in some of the walleyes collected from bays along the north shore. The Department has determined through tagging studies that walleye tend to spend part of their life cycle, primarily during spawning season, in a major river system such as the St. Louis River where mercury historically was used in industrial processes.

Industry, the atmosphere, and the natural glacial till and bedrock in the Lake Superior basin all contribute to elevated mercury levels found in Lake Superior walleyes. While a few large lake trout also have mercury concentrations warranting concern, those same fish have high concentrations of PCB's.

Monitoring for Public Health - Contaminant monitoring data have been used for identifying compounds that may be of concern for human health. Only the edible portions of fish are tested (normally a skin-on fillet) when health advisories are the primary focus of the monitoring activities. The Department, in a cooperative effort with the Wisconsin Division of Health, determines whether a sample is significant with regard to public health by comparing analytical results to "action" or tolerance levels used to regulate fish in interstate commerce by the U.S. Food and Drug Administration (Table 1).

Table 1

| | |
|---|---|
| PCB's | 2.0 parts per million |
| Chlordane | 0.3 parts per million |
| DDT | 5.0 parts per million |
| Mercury(9) | 0.5 parts per million |
| Dieldrin | 0.3 parts per million |
| Toxaphene | 5.0 parts per million |
| 2,3,7,8,-TCDD (Dioxin)(10) | 25.0 parts per trillion |

(9) Wisconsin Division of Health trigger level.

(10) Not an official FDA action level; advisory only.

When concentration limits for these chemicals are exceeded, the FDA and Wisconsin Department of Agriculture take action to prevent the commercial sale of the contaminated fish. Sport-caught fish are not legally sold on the market, so they do not have to conform to these same regulations. Therefore, the Wisconsin Division of Health and the Department annually issue consumption advisories when sport fish are found to exceed the same action levels.

Future Monitoring Plans and Management Implications - The Department is committed to working with Minnesota, Michigan, Ontario, and the EPA's Great Lakes National Program office to continue contaminant monitoring in Lake Superior fish, exchange data, and develop future sampling strategies on an annual basis.

The Department's fish contaminant policy, formulated with the Division of Health, will be to continue testing and providing up-to-date information to the sport fishing public and to advise sport anglers of the potential health risks of eating contaminated fish. This will allow informed individuals to make their own choices regarding fish consumption. The Department will continue issuing sport fish health advisories and information pamphlets each April 1 with updates in October (see Append. 2).

## PUBLIC PARTICIPATION

### Rationale

As previously discussed in the introduction, the Department is required to: 1) establish long-range fisheries management plans; provide for both sport and commercial fisheries; 2) manage for maximum public benefit; and 3) coordinate with other states and federal agencies. Why, then, was extensive citizen participation in the development of the Plan necessary?

The ecological realities governing bodies of water such as Lake Superior call for compromise among the lake's users: 1) Lake Superior's productive capacity is limited; in fact, it is the least productive of all the Great Lakes; 2) all of Lake Superior's fisheries components interact with one another; and 3) while diversity of community structure and function is the key to overall fishery stability, the Lake Superior ecosystem is not controllable, and variability should be expected.

Natural resource agencies can provide technical advice as to how many fish Lake Superior is capable of producing, but biologists need to know what kind of fishery people want. The Plan provided a means for citizens to make their needs known and to participate in decision making.

For example, the forage fish (herring, smelt, emerald shiners, sculpin) in Lake Superior can provide food for a certain number of predator fish. Historically, this forage went into lake trout and siscowet populations. Today some of that forage is being utilized by chinook salmon, steelhead, coho salmon, and brown trout. Decisions need to be made as to what portion of the forage base should be allocated to the various species. Some of the catch objectives in the Plan may be mutually exclusive at higher levels, so it was important for the Department to assist the public in selecting realistic objectives that maximized public benefit yet fell within Lake Superior's biological capabilities.

### Plan Development

Various fishery management plans for the rehabilitation of lake trout in Lake Superior have been in existence since the 1960's. With the introduction of other competing salmonids like Pacific salmon, it became clear that a total management plan was necessary to address the entire fish community of Lake Superior.

In early 1986 Department fishery biologists developed draft goals and objectives for the new plan. They based these objectives on scientific data and historical sport and commercial harvest figures. On September 30, 1986, this first draft was sent to all

interested groups with a request for their input to the Plan (see Append. 3).

Public meetings were held in Ashland, Bayfield, Superior, Port Wing and Iron River, between December 2, 1986, and April 2, 1987. Approximately 130 sport anglers, commercial fishers, charter fishers, and interested persons attended these meetings. Organized groups and individuals were encouraged to respond in writing to the Department.

Suggestions received at each meeting were recorded and evaluated along with written comments received by mail. Many of these suggestions and ideas were incorporated into the second draft of the Plan. On August 10, 1987, a summary of the Department's response to public input was sent back to all the original groups along with the revised plan (see Append. 4).

The review process was completed by June 1, 1988. Not all users are satisfied with the Plan. Commercial fishers are unhappy with the harvest objectives for lake trout; they want a larger portion of the allocation. Sport anglers would like to see higher catch objectives for Pacific salmon. Neither the Red Cliff or Bad River tribes responded to requests for input; their position on the Plan is unknown.

The Department believes the Lake Superior Fishery Management Plan represents a reasonable compromise. It is a logical framework on which to direct future management of Lake Superior. The Plan will be reviewed regularly so it accommodates the changing ecology of Lake Superior. If modifications of the plan are required, the Department will take those suggested changes back to the public for review.

## LAKE SUPERIOR FISHERIES MANAGEMENT PLAN

Goals

THE GOAL OF FISH MANAGEMENT IS TO PROVIDE OPPORTUNITIES FOR THE OPTIMUM USE AND ENJOYMENT OF WISCONSIN'S AQUATIC RESOURCES, BOTH SPORT AND COMMERCIAL. A HEALTHY AND DIVERSE ENVIRONMENT IS ESSENTIAL TO MEET THIS GOAL AND SHALL BE PROVIDED THROUGH MANAGEMENT PROGRAMS, (NR 1.01(2)).

A. Manage for a diverse, multi-species commercial fishery to allow an optimum sustained harvest.

B. Manage for a diverse, year-round, multi-species sport fishery to allow an optimum sustained harvest and to provide a variety of angling opportunities.

C. Manage for a diverse, multi-species tribal home-use fishery to allow an optimum sustained harvest.

D. Manage for fish communities, based on foundations of stable self-sustaining stocks, consistent with the productive capacity of Lake Superior.

E. Develop an economic analysis to assist in management decisions.

F. Maintain, monitor, and enhance habitat quality.

G. Increase control of sea lamprey over present levels.

H. Increase and maintain safe public fishing boat access.

"Optimum sustained harvest" is defined as the yield that will provide the people of Wisconsin with the greatest overall benefits in recreational, food production, and economic opportunities, taking into account the effects of harvesting on dependent or associated species.

These goals must be achieved without curtailing the opportunities for non-fishery-related user groups.

Priority Key

(1) Critical problems that should be addressed as soon as possible.

(1a) Critical problems that are already being addressed.

(2) Important problems that need to be addressed in the near future, preferably in 1989-91.

(2a) Important problems that are already being addressed.

(3) Moderately important problems that can be deferred until time and money are available.

(3a) Moderately important problems that are already being addressed.

Objectives

A. COMMERCIAL FISHERY

1. Manage lake trout populations at levels that will allow a sustained annual harvest of approximately 160,000 pounds (59,000 fish) and an annual mortality rate conducive to lake trout rehabilitation.

Refer to D-1 for rationale, problems, and tactics.

2. Manage lake whitefish populations at levels that will allow a sustained annual harvest of 290,000 pounds.

Whitefish stocks have provided some of the most important commercial fisheries in the Apostle Islands area. Production was near 288,000 pounds annually prior to the sea lamprey invasion, then fell off considerably during the 1960's, and rebounded after sea lamprey control. In recent years, harassment by cormorants during the summer pound-net fishery and low market prices have curtailed harvest to an average of 260,000 pounds from 1982 to 1985.

Environmental conditions such as spring and summer water temperatures are thought to control year class strength. Since these conditions are beyond our control, year class strength may fluctuate widely and ultimately dictate harvest rates. Continued control of sea lamprey stocks is imperative in order to reach the 290,000 pound objective.

(1) Problem: Incidental kill of lake trout in large mesh gill nets may be too high.

(1) Tactic: Quantify incidental lake trout mortality.

(1) Tactic: Require entrapment gear when and where possible.

(3) Tactic: Develop gill net gear that is less selective for lake trout and highly selective for whitefish.

(1a) Tactic: Shift gill net effort to areas of low density lake trout and high density whitefish.

(2)Problem: Value of the pound net harvest is greatly reduced by double-crested cormorant harassment.

(2)Tactic: Encourage the use of trap nets.

(2)Tactic: Develop cormorant deterrents.

(3)Tactic: Reduce cormorant abundance.

(2)Problem: Overharvest may result from excessive effort or weak year classes.

(1a)Tactic: Develop and implement regulations to reduce the harvest of spawners.

(1a)Tactic: Evaluate the status of whitefish stocks.

3. Manage round whitefish populations at levels that will allow a sustained annual harvest of 40,000 pounds.

Round whitefish has been of minor importance until recent market expansion. The fishery generally occurs in the fall when the larger, more marketable fish are concentrated, and the lake trout and whitefish seasons are closed. The 1984-86 annual average commercial harvest has been slightly over 15,000 pounds for the past ten years, with fluctuations in harvest associated with market conditions. Available data suggest the fishery may be able to sustain an annual harvest of 40,000 pounds; however, more biological data are needed before a higher catch objective can be established.

(3)Problem: Fluctuating market conditions historically control harvest rate.

(3a)Tactic: Encourage maximum harvest when market conditions are favorable to enhance value of commercial enterprise on local economies.

(3)Tactic: Encourage market enhancement.

(2)Problem: Needed biological data are lacking to establish total allowable catch if necessary.

(2)Tactic: Collect data necessary to determine total allowable catch.

(2)Problem: Incidental harvest of non-target species is not identified.

(2)Tactic: Monitor the commercial fishery to determine incidental mortality of non-target species.

4. Manage the deep water fishery to allow a sustained annual harvest of 300,000 pounds of chubs and 300,000 pounds of siscowet.

Chubs and siscowet are inhabitants of the Lake Superior deep water community. Siscowet, or fat trout, is a race of native lake trout. Both siscowet and chubs inhabit water generally 250-700 feet deep. The fat content of siscowet ranges from 20-80 percent. The annual 1984-86 harvest of chubs and siscowet was 263,000 and 72,000 lbs. respectively. Marketing of smaller siscowet at this time is encouraged because of their low PCB levels. The chub fishery has a high commercial value on the smoked fish market.

Available data suggest siscowet populations could sustain a larger commercial harvest. The increased harvest of siscowet may reduce their predation on chubs, resulting in higher chub abundance. Increased harvest of siscowet is encouraged to drive the chub community to high levels for an increased commercial harvest.

(1)Problem: Inadequate information exists to manage siscowet and chub stocks.

(1)Tactic: Develop assessment techniques to establish dynamics of the chub/siscowet community.

(2)Problem: Lean lake trout are being marketed as siscowet.

(2)Tactic: Improve tagging system.

(2)Tactic: Increase enforcement.

(1)Problem: Contaminant levels may exceed general health guidelines.

(1a)Tactic: Conduct contaminant sampling.

(2a)Tactic: Encourage the development of a fish oil (Omega 3 fatty acids and Oleic acids) processing technique and market for siscowet with PCB removal capabilities.

(2a)Tactic: Encourage the harvest of smaller siscowet fillets which are lower in contaminants and high in Omega 3 fatty acids.

(1)Problem: Incidental mortality of non-target species is unknown.

(1a)Tactic: Monitor the fishery to characterize incidental catch.

5. Prevent excessive exploitation and predation to permit lake herring to continue to expand towards Lake Superior's carrying capacity.

The Wisconsin waters of Lake Superior supported a large commercial herring fishery for many years. The annual harvest from 1940 through 1960 was near 4-million pounds. It is felt that the sequential overexploitation of discrete herring stocks, competition with smelt, and/or predation by smelt caused the subsequent collapse of the fishery.

Stocks have rebounded, and several strong year classes are now present. The 1984 year class appears to be exceptional. Herring used to be the primary forage for lake trout and will be again if stocks continue to increase. The 1984-86 annual commercial herring harvest was 136,000 lbs.

(1) Problem: Harvestable surpluses of lake herring stocks are presently unknown.

(1a) Tactic: Continue monitoring recruitment and adult stock characteristics.

(1) Tactic: Convene a lake herring biological committee to establish stock quotas. A 250,000 lb. annual harvest objective was used to develop Fig. 2 and 3 for relative comparative purposes.

(1) Problem: Predator consumption of herring may inhibit herring population recovery.

(1a) Tactic: Determine forage demand and adjust predator stocking.

(1) Problem: Competition with smelt may limit herring abundance.

(1) Tactic: Quantify the relationship between smelt, herring, and salmonids.

(1a) Tactic: Maintain smelt harvest in the commercial fishery (see Objective 6).

(2) Tactic: Increase predator stocking to control smelt populations.

(2) Problem: Incidental mortality of non-target species is unknown.

(2) Tactic: Monitor the commercial fishery to characterize the incidental harvest of non-target species.

6. Promote maximum utilization of smelt stocks to minimize their impact on lake herring.

Smelt are an exotic introduction into the Great Lakes. They became an important commercial species locally beginning in the early 1950's, with peak production of 619,000 pounds in 1963. Due to reduced abundance of smelt, production averaged 151,000 pounds between 1984-86. Maximum utilization is encouraged to reduce smelt stocks so there is less impact on native forage species.

(1)Problem: Smelt prey on native species (lake herring and possibly lake trout) and do not provide efficient use of forage habitat.

(1a)Tactic: Maintain current levels of commercial and sport harvest of smelt. A 151,000 lb. annual harvest objective was used to develop fig. 2 and 3 for relative comparative purposes.

(1a)Tactic: Allocate remainder of smelt stock to the Pacific salmon-lake trout community.

(1a)Tactic: Continue to monitor smelt abundance.

(2)Problem: Sport anglers and smelt dippers may resist any reduction of the smelt population.

(2)Tactic: Educate the public as to the relative value of smelt vs. herring in the Lake Superior ecosystem.

7. Manage for a tribal commercial harvest of walleye from the St. Louis River, Kakagon Sloughs, and Bad River stocks consistent with treaty rights.

Three major walleye stocks inhabit the Wisconsin waters of Lake Superior: the St. Louis River, Kakagon Sloughs, and Bad River stocks. These stocks (mostly spawners) were harvested commercially and averaged 23,637 pounds annually between 1944-55. The state commercial fishery was closed in 1955. Beginning in 1980 the Red Cliff Band of Lake Superior Chippewas targeted a commercial walleye fishery on the St. Louis River spawning stock. A home-use gill net fishery has been in existence since about 1972. The Bad River and Kakagon Sloughs stocks have been exploited for a tribal commercial and home use fishery since the early 1970's. All three stocks are slow-growing and long-lived, but different harvest levels and lack of data necessitate the management of each stock individually.

The St. Louis River stock inhabits the western end of the lake between Superior and the western Apostle Islands. It is one of

the few remaining stable walleye stocks in the upper Great Lakes. The tribal commercial harvest has averaged 3,039 pounds annually (about 1,000 fish) from 1984-86. At the present harvest rate the stock appears to be stable; however, continued data collection will be used to determine if this rate is a desired optimum. A 5,000 lb. annual harvest objective was used to develop Fig. 2 and 3 for relative comparative purposes. There are little data available on stock dynamics of the Kakagon Sloughs and Bad River stocks. Both stocks are presently being exploited by the Bad River Band of Lake Superior Chippewa.

(1)Problem: Lack of data on abundance and harvest of Kakagon Sloughs and Bad River stocks.

(1)Tactic: Undertake tribal/state cooperative study of each stock.

(1)Problem: Present walleye harvest may exceed optimum sustained yield.

(1a)Tactic: Maintain St. Louis River spawning population size structure and abundance at 1980-82 levels (optimum sustained yield).

(2)Tactic: Implement management strategies to regulate walleye harvest in the Bad River and Kakagon Sloughs for an optimum sustained yield.

B. SPORT FISHERY

Catch rate and total harvest objectives are established for the major salmonid species. Catch rate objectives are established as a goal for maintaining a quality fishery.

1. Manage the lake trout fishery to provide an annual harvest of 33,000 fish. Maintain a catch rate of .16 fish/hour during June-August.

Refer to D-1 for rationale.

2. Manage the coho salmon fishery to provide an annual harvest of 15,000 fish. Maintain a catch rate of 0.20 fish/hour during May.

Coho salmon were first introduced into Lake Superior in 1966 by the Michigan Department of Natural Resources. An active coho salmon fishery developed in Wisconsin by 1967, and mature spawners were found in tributary streams in 1968. The first documented natural reproduction in Wisconsin was the 1969 year class. Coho salmon have never been stocked in Wisconsin waters.

Presently, natural reproduction occurs in 49 tributaries within 18 watersheds. The average estimated sport harvest over the last three years (1983-85) has been 7,250 fish. The 1996 objective was increased based on two factors: 1. numbers of coho produced in streams have stabilized in eastern waters, and 2. the potential for increased production in western tributaries (e.g. Brule River) has yet to be realized.

(1)Problem: Lack of data on the stock-recruitment relationship for coho salmon limits management effectiveness.

(1a)Tactic: Continue conducting surveys and evaluations in spawning tributaries and in Lake Superior to establish a stock-recruitment relationship.

(1)Problem: Recruitment may be insufficient to reach objective.

(3)Tactic: Supplement natural recruitment by stocking smolts in appropriate streams.

(2)Tactic: Improve and maintain present spawning habitat in streams where egg deposition is limited.

(2)Tactic: Improve and maintain present rearing habitat in streams where smolt production is limited.

(1a)Tactic: Remove beaver dams where appropriate to allow access to spawning habitat.

(3)Problem: Competition with other preferred species in Lake Superior and tributaries may limit stock abundance and prevent reaching objective.

(3a)Tactic: Document competition by measuring growth rates, diet overlap, forage demand, and forage availability.

(2)Tactic: Allocate available forage among preferred species to optimize the overall efficiency of forage utilization.

(1)Problem: Incidental mortality in commercial and tribal home-use fisheries is unknown (see commercial fishery objectives).

(1)Tactic: Monitor commercial and tribal home-use fisheries to document incidental mortality.

3. Manage the chinook salmon fishery to provide an annual harvest of 12,000 fish. Maintain a catch rate of 0.16 fish/hour during May.

Chinook salmon have been stocked in Lake Superior since 1967 and in Wisconsin water since 1977. Wisconsin stocked between 35,000-80,000 annually from 1977-85 in the Black River, a tributary to the Nemadji River. The only known naturally reproduced spawning run established in Wisconsin was first documented in Blueberry Creek, a tributary of the Brule River, in 1979.

The three-year average harvest from 1983-85 has been 1,360 fish. Wisconsin stocking was increased in 1986 to just over 400,000, and will remain at that level until impact can be evaluated. Natural reproduction may expand with this increase in density.

(1)Problem: Lack of data on the stock-recruitment relationship for chinook salmon limits management effectiveness.

(1)Tactic: Conduct surveys and evaluations in spawning tributaries and in Lake Superior to establish a stock-recruitment relationship.

(1)Problem: Competition with other preferred species in Lake Superior and tributaries may limit stock abundance and prevent reaching objective.

(1)Tactic: Document competition by measuring growth rates, diet overlap, forage demand, and forage availability of potentially competing species.

(1)Tactic: Allocate available forage among the preferred species to optimize the overall efficiency of forage utilization.

(1)Problem: Recruitment may be insufficient to reach objective.

(1)Tactic: Supplement natural recruitment by stocking smolts in appropriate streams.

(1)Problem: Incidental mortality in commercial and tribal home-use fishery is unknown (see commercial fishery objectives).

(1)Tactic: Monitor commercial and tribal home-use fisheries to document incidental mortality.

4. Manage the anadromous brown trout fishery to provide an annual harvest of 6,000 fish. Maintain a catch rate of 0.03

fish/hour during the fall spawning run on the Brule River and 0.10 fish/hour during the early winter ice fishery.

Brown trout were introduced into Lake Superior in the late 1800's. Since then, natural reproduction has been occurring in all Class I and II watersheds. Native runs in streams have been depressed over the past twenty years for unknown reasons (possibly furunculosis-induced mortality).

Stocked brown trout in Chequamegon Bay have produced poor results to date. Although the lake catch for the 1983-85 period has averaged only 1,711 fish, brown trout remains a very popular sport fish. The bulk of the lake fishery takes place in Chequamegon Bay with the remaining fish harvested in tributary streams.

(1)Problem: Lack of data on the stock-recruitment relationship for brown trout limits management effectiveness.

(1a)Tactic: Conduct surveys and evaluations in spawning tributaries and in Lake Superior to establish a stock-recruitment relationship.

(3)Problem: Competition with other preferred species in Lake Superior may limit stock abundance and prevent reaching objective.

(3)Tactic: Document competition by measuring growth rates, diet overlap, forage demand, and forage availability of potentially competing species.

(2)Tactic: Allocate available forage among the preferred species to optimize the overall efficiency of forage utilization.

(1)Problem: Recruitment may be insufficient to reach objective.

(1a)Tactic: Supplement natural recruitment by stocking yearlings in appropriate streams.

(1)Tactic: Improve spawning habitat in streams where egg deposition is limited.

(1)Tactic: Improve rearing habitat in streams where smolt production is limited.

(1a)Tactic: Remove beaver dams where appropriate to increase access to spawning habitat.

(1)Tactic: Raise the minimum size limit for stream harvest to better protect smolts during their residency.

(1)Problem: Incidental mortality in commercial and tribal home-use fishery is unknown (see commercial fishery objectives).

(1)Tactic: Monitor commercial and tribal home-use fisheries to document incidental mortality.

(3)Problem: Furunculosis (red spot disease) mortality may limit stock abundance and prevent reaching catch objective.

(3)Tactic: Monitor stream populations to document the level of disease.

(3)Tactic: Stock strains that are resistant to furunculosis infection.

(3)Tactic: Vaccinate spawners that are used for propagating smolts for stocking.

(2a)Problem: Genetic structure of native stocks may be jeopardized by stocking domestic strains.

(2a)Tactic: Stock streams with naturalized populations only with smolts that are produced from wild parents captured there.

5. Manage the steelhead fishery both in the lake and in the tributary streams to provide an annual harvest of 13,000 fish. Maintain a catch rate of .06 fish/hour during the fall run on the Brule River and the spring run on the Sioux River.

Steelhead, or lake-run rainbow trout, were first introduced into Lake Superior in the late 1800's. Since then, natural reproduction has been occurring in all Class I and II watersheds. Native runs have increased since sea lamprey control was initiated. Proposed regulations (season, bag limits) are designed to increase the harvest of steelhead 25 inches and longer.

Traditionally, the Brule River provided 65 percent of all native steelhead harvested in Wisconsin. The majority of the harvest takes place in streams or near stream mouths. The goal is established at 16 hours/fish, noting that steelhead fishing is subject to high fluctuations in catch due to water conditions. This goal is aimed at returning to the 1983-85 annual harvest level of 13,000 fish. Presently, the harvest levels have declined to approximately 3,500-4,600 fish harvested in 1986.

(1a)Problem: Lack of data on the stock-recruitment relationship for steelhead limits management effectiveness.

(1a) Tactic: Conduct surveys and evaluations in spawning tributaries and in Lake Superior to establish a stock-recruitment relationship.

(3) Problem: Competition with other preferred species in Lake Superior may limit stock abundance and prevent reaching objective.

(3) Tactic: Document competition by measuring growth rates, diet overlap, forage demand, and forage availability of potentially competing species.

(3) Tactic: Allocate available forage among the preferred species to optimize the overall efficiency of forage utilization.

(1) Problem: Recruitment may be insufficient to reach objective; however, tactics will have to be tailored for each stream.

(1) Tactic: Supplement natural recruitment by stocking yearlings in appropriate streams.

(2) Tactic: Improve spawning habitat in streams where egg deposition is limited.

(2) Tactic: Improve rearing habitat in streams where smolt production is limited (e.g., sand blanket removal).

(1a) Tactic: Remove beaver dams where appropriate to increase access to spawning habitat.

(1a) Tactic: Raise the minimum size limit for stream harvest to better protect smolts during their residency.

(2) Tactic: Develop a fish passage facility at the Iron River dam to permit access to upstream spawning habitat after proper assessment.

(1) Problem: Incidental mortality in sport, commercial, and tribal home-use fishery is unknown (see commercial fishery objectives).

(1) Tactic: Monitor sport, commercial, and tribal home-use fisheries to document incidental mortality.

(1) Problem: Excessive harvest may adversely impact self-reproducing stocks.

(1a) Tactic: Promote catch and release in the steelhead fishery.

(1a) Tactic: Set more conservative size, bag, and season limits to regulate the harvest of spawning adults.

(3) Tactic: Create special fishing zones (e.g., flies only, artificial lures only, or no kill).

(1) Problem: Genetic structure of wild stocks may be jeopardized by stocking exotic strains.

(1) Tactic: Stock streams with naturalized populations only with smolts that are produced from wild parents captured there.

(3) Tactic: Stock streams without naturalized populations with smolts produced from exotic strains.

6. Manage the splake fishery to provide an annual harvest of 10,000 fish. Maintain a catch rate of 0.15 fish/hour during December and January.

Splake is a cross between male brook trout and female lake trout and was first stocked in Chequamegon Bay in 1979. Large scale plants of splake started appearing in the creel of 1980. Since 1980, splake have made a significant contribution to the shallow water ice fishery, and in 1985 made up 75 percent of the salmonid harvest. Angling pressure and success rates have also shown substantial changes since the arrival of splake into the fishery. Total angler trips have increased more than 3-1/2 times from a 1976-79 average of 10,084 to a 1980-85 average of 36,238 . The time required to harvest a salmonid consequently dropped 52 percent, from an average of 13.7 hours/salmonid in 1976-79, to 6.6 hours/salmonid in 1980-85. The 1983-85 average annual harvest has been 4,700 fish.

(1a) Problem: Survival of fingerling plants is very low.

(1a) Tactic: Stock yearling splake.

(3) Problem: Hatchery production may be unable to meet 150,000 yearling stocking quota.

(3) Tactic: Expand or convert lake trout or brook trout hatchery space to splake.

7. Manage the walleye fishery for optimum sustained yield on the St. Louis River, Kakagon Sloughs, and Bad River stocks.

Three major walleye stocks inhabit the Wisconsin waters of Lake Superior: the St. Louis River, Kakagon Sloughs, and Bad River stocks. Over the years, an unknown harvest by the sport fishery has been taking place on all three stocks. Recently, a popular

sport fishery during the spring and summer developed on the St. Louis River stock. In 1981 this spawning stock was estimated to be near 50,000 fish. The Minnesota Department of Natural Resources estimated 24,000 walleyes were harvested that year, although the majority of those were immature fish.

There is little data available on stock dynamics of the Kakagon Sloughs and Bad River stocks. Due to the habitat similarities between these stocks and St. Louis River stock, population data from the St. Louis stock may possibly be used to assist in managing the other stocks. Refer to A-7 for further rationale.

(1a) Problem: Lack of data on abundance and harvest of St. Louis River, Kakagon Sloughs, and Bad River stocks.

(1a) Tactic: Continue the present level of data gathering for St. Louis River stock.

(1) Tactic: Undertake a state/tribal cooperative study of the Kakagon Sloughs walleye stock, including a creel survey.

(3) Tactic: Undertake a state/tribal cooperative study of the Bad River walleye, stock including creel census.

(1) Problem: Increased harvest by numerous jurisdictions may impact management objective.

(1) Tactic: Develop an inter-jurisdictional management plan for walleye stocks.

8. Improve the size structure of the yellow perch populations in Chequamegon Bay.

Yellow perch were an important species in the Chequamegon Bay sport fishery prior to a change in the fish community dynamics. It is thought the decline of the walleye, the major yellow perch predator, contributed to this unbalanced fish community. In 1976, for example, perch comprised nearly 78 percent of the sport harvest. With the primary predator absent, perch became abundant, growth slowed, and anglers began noticing a smaller size in their creel. Beginning in 1980 walleyes have been stocked annually, to increase walleye numbers in the bay, provide a sport fishery, and control suspected perch stunting.

(1) Problem: There is a lack of traditional quality-sized yellow perch over eight inches in Chequamegon Bay.

(1a) Tactic: Stock 200,000 fingerling walleyes annually to reestablish top-level cool water predators for reducing stunted perch stock, and resulting in improved catch rates of larger perch.

(3) Problem: Increased harvest pressure may lead to overexploitation of larger perch.

(3) Tactic: Develop harvest regulations to protect larger perch.

(1a) Problem: Data on perch populations is lacking.

(1a) Tactic: Conduct biological investigations to document population characteristics.

9. Increase the harvest of burbot by sport anglers in western Lake Superior.

Burbot, lean lake trout, and siscowet lake trout were the major deep water predators in Lake Superior prior to the sea lamprey invasion. Historical population data is lacking, though it is thought that stock size decreased following the sea lamprey invasion and increased following sea lamprey control. Current stock size is not known, but netting in the Apostle Islands area has kept numbers of larger burbot down, while the population in western waters has expanded. An increased sport fishery is desirable in the western waters where large numbers of burbot exist and may help to reduce competition on forage stocks.

(2a) Problem: Contaminant levels may exceed general health guidelines.

(2a) Tactic: Conduct contaminant sampling.

(2) Problem: Sport fishing effort is too low in western waters.

(2) Tactic: Encourage increased sport fishing (hook and line, spearing).

10. Maintain angling opportunities at the current level for the remaining sport species until their population status can be determined.

Limited data on species such as smallmouth bass, northern pike, and muskellunge preclude our ability to set meaningful objectives for them. Until further studies on these species are conducted, our objective must be to maintain the angling opportunities for them at current levels. Management alternatives could include the flexibility to stock additional strains with management potential (e.g., Lake St. Claire strain of muskellunge, St. Lawrence River muskellunge, Swedish pike etc.).

(3) Problem: Data on these species is limited.

(3)Tactic: Gather more information on these species.

11. Produce a limited trophy opportunity for trout and salmon fisheries.

(3)Problem: The life cycles and growth rates of some trout and salmon species in Lake Superior prevent them from reaching large sizes.

(3)Tactic: Sterilize a small portion of brown trout, brook trout, steelhead, and chinook salmon plants to provide trophy fishing opportunities without affecting natural reproduction.

(3)Tactic: Stock limited numbers of Alaskan strain (Kenai) chinook, Atlantic salmon, and their hybrids.

C. TRIBAL HOME-USE FISHERY

1. Recognize the tribal home-use fishery and its impacts on commercial and sport fishery management objectives.

In 1972, the Lake Superior Chippewas reaffirmed their tribal fishing rights on Lake Superior. Most home-use fishing by the tribes occurs immediately adjacent to reservation shores. The Bad River Band also fishes walleyes in the Bad and Kakagon rivers. Most of the near-shore home-use catch consists of lake trout and salmon. All Red Cliff fishing is done with gill nets according to the state/Red Cliff home-use agreement of 1980 (Append. 2, Schedule F).

(1a)Problem: Lack of information on Bad River home-use harvest limits management effectiveness.

(1a)Tactic: Encourage Bad River management authorities to document harvest characteristics of their home-use fishing.

(3)Problem: Harvest adjacent to reservations by home-use fishers may negatively impact other management objectives.

(3)Tactic: Encourage tribal management authorities to impose gear restrictions where necessary to prevent overharvest.

(3)Tactic: Stock fish in areas where harvest has occurred to augment home-use harvest.

## D. FISH COMMUNITIES

1. Re-establish depleted stocks of native species including lake trout, brook trout, and lake sturgeon.

Lake Trout - (Refer to A-1 and B-1 for harvest and catch rate objectives). Due to the combined effects of sea lamprey predation and over-exploitation, lake trout stocks were decimated in the 1950's and early 1960's. A massive stocking program by the Department and the U.S. Fish and Wildlife Service was initiated to rehabilitate stocks, but has met with limited success in Wisconsin. Once mature, these stocked lake trout do not congregate on non-used historical spawning reefs. A few surviving remnant native populations are recovering on their own with regulatory protection.

The 1984-86 annual commercial lake trout harvest was 169,000 lbs., while the 1983-85 sport fishery annual harvest was 76,000 lbs. An annual total allowable catch is set by a committee composed of state, tribal, and federal biologists. The 1996 objective allots approximately 69 percent by weight (59,000 fish) for commercial and home use and 31 percent by weight (33,000 fish) for sport. The quota is split so 50 percent of the harvest is allotted for tribal and home use and 50 percent for state use. The state quota is further split so 33 percent by weight (13,000 fish) is allotted for commercial use and 67 percent by weight (33,000 fish) is allotted for sport. This overall quota is approximately 58 percent of the 400,000-lb harvest that historically occurred before the era of the sea lamprey.

These target objectives may have to be reduced due to diseases at the Bayfield hatchery in 1987 and the Iron River hatchery in 1988 (necessitating the elimination of hatchery-held brood stock). This loss of brood stock resulted in reduced yearling stocking rates.

On Gull Island Shoal, the native population doubled over a ten-year period from the mid-1970's to the mid-1980's. Based on this change, we would like to see a doubling of the average 1984-86 spring native lake trout abundance (7.7/1,000') during 1994-96 in the Apostle Islands. Native abundance in the Superior to Bark Point area should also double from the 1987-89 average by 1994-96. We believe these are achievable objectives due to: 1) the 50% total annual mortality rate goal and 2) the positive effects of the Brule River sea lamprey barrier.

If the Gull Island Shoal stock-recruitment relationship reaches equilibrium, the committee of biologists will develop an optimum sustained yield for the population. Stocking of eggs and sac fry on two large historical spawning reefs (Devils Island Shoal and Eagle Island) should initiate self-sustaining native populations.

(1a)Problem: Stocking of yearling lake trout is ineffective because hatchery fish lack homing instinct.

(1a)Tactic: Stock eggs and fry directly on spawning reefs and shoals.

(1a)Tactic: Stock eggs and/or fry that are derived from wild parents captured during spawning on reefs and shoals.

(1a)Tactic: Stock fingerlings or yearlings that are imprinted to morpholine and subsequently lure returning adults to unrehabilitated reefs and shoals using morpholine drippers.

(1a)Problem: Total annual mortality of hatchery-reared lake trout currently exceeds 50 percent, the maximum level that allows adequate survival to maturity to provide spawning stocks for increased natural reproduction.

(2)Tactic: Use biological comparatives to establish quotas.

(1)Tactic: Reduce mortality in the commercial fishery by:

- Encouraging release of unclipped fish.
- Setting restrictive tagging quotas.
- Creating restricted fishing and refuge areas.
- Reducing the use of entanglement gear.
- Shifting effort to areas of low lake trout density.
- Stocking areas away from the fishery.
- Improving enforcement.
- Encouraging legislature to appoint a committee to evaluate the potential for a total or partial buy-out of the inshore gill net fishery.

(1)Tactic: Reduce mortality in the sport fishery by:

- Encouraging release of unclipped fish.
- Setting restrictive regulations (e.g., season, bag limit, size limit).
- Creating restrictive fishing and refuge areas.
- Eliminating the use of wire lines.
- Issuing tags.
- Closing the season.
- Stocking away from the fishery.
- Improving enforcement.
- Introducing new and/or increasing stocking of alternate species to redirect impact away from

lake trout consistent with forage availability.

(1a)Tactic: Reduce the present adult sea lamprey population 50 percent by building mechanical barriers on major spawning tributaries, refining estuary control techniques, and continuing chemical control on remaining spawning tributaries.

(3)Tactic: Abandon rehabilitation and manage for a put-grow-take fishery.

(1a)Problem: Diseases in federal and state hatcheries have limited the availability of lake trout for stocking.

(3)Tactic: Increase the state production of lake trout.

(3)Tactic: Delay implementation of attaining 50 percent mortality rate goal.

(1a)Tactic: Obtain needed lake trout from other sources.

(3)Tactic: Defer rehabilitation.

Brook Trout - Manage the coaster brook trout fishery to provide an annual harvest of 2,000 fish. This is an experimental program and no catch rate objective is applicable.

Coaster brook trout were indigenous in Lake Superior but have been reduced to extremely small numbers. Limited historical data is available, however, we assume coaster brook trout provided a fishery along the shoreline and in all high quality trout streams. It is felt that competition with brown and rainbow trout and/or loss of suitable habitat reduced numbers.

Plants of coasters had success in the late 1960's and early 1970's, but plants since then have had poor survival. The Nipigon strain of brook trout has been stocked in Chequamegon Bay since 1984. Results of this program are still inconclusive. The 1983-85 average annual harvest is estimated at 200 fish.

(1)Problem: Survival rates of stocked brook trout seem very low.

(1a)Tactic: Stock larger yearling Nipigon brook trout.

(3)Tactic: Stock stream spawning strains of brook trout instead of shoal spawning strains.

Lake Sturgeon - Historically, lake sturgeon were common in the Wisconsin waters of Lake Superior, but overexploitation at the turn of the century, loss of spawning habitat, and deteriorating

water quality all contributed to reducing stocks to very low numbers. The only remaining stock was the one found in Chequamegon Bay/Bad River.

From 1982 to 1986 lake sturgeon were stocked in the St. Louis River in an attempt to re-establish the species. Results to date have indicated good survival and growth. Re-established sturgeon may play a role in sea lamprey suppression by feeding on ammocoetes.

Very little data is available on the lake sturgeon stock in Chequamegon Bay. Lake sturgeon are occasionally caught during the winter ice fishery. Continued data collection will help determine the status of this stock.

(1a) Problem: There is no adult spawning population in the St. Louis River and the status of the Bad River/Chequamegon Bay stock is unknown.

(1a) Tactic: Protect the existing populations by setting and enforcing restrictive harvest regulations (e.g., raising the minimum size limit to 50 inches).

(1a) Tactic: Continue stocking and evaluating lake sturgeon (preferably stock the anadromous Great Lakes strain) in the St. Louis River to develop a spawning stock.

(1a) Problem: Available information regarding these populations is inadequate.

(1a) Tactic: Conduct biological investigations to document important population characteristics.

(1a) Tactic: Monitor sport and tribal home-use fisheries to document harvest.

2. Establish natural populations of desirable exotic species, including but not limited to grayling, arctic char, atlantic salmon, chum salmon, and sockeye salmon, within the limits of native fish restoration objectives.

(3) Problem: Availability of these species may be limited by Great Lakes fish disease control policies restricting the importation of eggs from outside the basin.

(3) Tactic: Obtain eggs of these species from disease-free sources.

(3) Tactic: Quarantine all eggs obtained to ensure that they are free of all exotic diseases.

(3) Problem: Culturing may be a problem (e.g., space, technology, funds).

(1a) Tactic: Use both departmental and external technology and funding.

3. Monitor existing fisheries for impacts of recently introduced exotics.

In 1987, the Department captured and identified the European member of the perch family, the ruffe, Gymnocephalus cernua, from the St. Louis river. This fish was undoubtedly transported here in an ocean-going ship's ballast tank from an unknown European port and then flushed into the harbor while loading. The white perch, Morone americana, was also first captured in the St. Louis river in 1986. The effects these new fish introductions will have on established fisheries are unknown.

(2) Problem: Data on the current status and distribution of Eurasian ruffe and white perch is lacking.

(1a) Tactic: Conduct fishery surveys to investigate the distribution and abundance of ruffe and white perch.

## E. ECONOMIC ANALYSIS

The fisheries of Wisconsin's Lake Superior waters and its tributaries provide a variety of recreational and commercial opportunities. Each has different economic impacts on the coastal region in Wisconsin. The goal of the Plan is to use economic guidelines in developing management opportunities for the use of the limited aquatic resources.

There are major groupings of sport anglers, including stream, lake, ice, and charter. Commercial groups include tribal and state licensed. Each of these groups provides varying values to local economies; some compliment each other while others compete.

The present and potential value that each group contributes to local and regional economies should be analyzed. This will provide public, local and state authorities, analysis direction in maintaining and expanding opportunities for the optimum use and enjoyment of Wisconsin's aquatic resources by all groups.

Information on consumer needs and desires, both sport and commercial, will provide coastal businesses with goals and direction in maintaining and/or expanding their investments.

(3) Problem: The economic value of sport and commercial fisheries is unknown.

(3)Tactic: Conduct an independent economic study of the Lake Superior fisheries.

## F. HABITAT QUALITY

Water Quality - The general water quality of Lake Superior remains very good. The lake is characterized as oligotrophic and has few problems when compared to some of the lower Great Lakes or other large lakes in more populated areas.

There are, however, some areas of concern on the lake, such as low levels of some toxic contaminants in fish and impaired water quality of localized near-shore areas. Also, because of the oligotrophic nature of the lake it is probable that small changes in the input to the lake could result in dramatic changes in the lakes water quality and/or ecology.

The fragile nature of this unique and tremendous natural resource would seem to dictate the prudent course of a monitoring strategy to detect subtle changes in the lake environment before problems or irreversible impacts occur.

The establishment of monitoring stations at representative areas within the Wisconsin portion of Lake Superior would be used to document current, base-line conditions. Periodic sampling at these stations for water chemistry, physical properties, plankton and benthos would establish a data base which could be used to detect trends over a long period of time.

Cultural Impact Areas - Activities in harbors, cities, shipping lanes, etc., have tremendous potential to impact the water quality and biosphere of Lake Superior. Dredging, mining, mineral and/or oil exploration, municipal or industrial wastewater treatment and shipping practices are examples of activities which have (or could have) detrimental effects on the lake.

Individual monitoring programs should be implemented in areas where problems and/or potential problems exist. Background data are essential when trying to respond to proposed activities which may impact the Lake Superior ecosystem.

Toxic Contamination - One of the most insidious types of pollution is toxic contamination of our aquatic life or wildlife. Not-as-yet-understood mechanisms are resulting in contamination of fish, sea birds, eagles, etc., with PCB's, mercury, DDT, toxaphene and perhaps some yet-to-be-discovered substances. An ongoing program of monitoring fish and wildlife in and around Lake Superior is essential to document the scope of this problem and identify trends. It is of great importance to dovetail this monitoring program into an aggressive research study to determine the sources, transport mechanisms and solutions to this problem.

Air Quality - The atmosphere comprises a major portion of the biogeochemical cycle. It receives emissions from man and nature and is a source of substances delivered to land and water surfaces related to air quality concerns for Lake Superior are the transport and deposition of acid materials (acid rain) and toxics from the atmosphere to the lake and lake watershed. In many cases the source of the material is far from Lake Superior.

Acid Deposition - Acid deposition is the best known example of atmospheric inputs to lake ecosystems. While Lake Superior itself has not shown signs of the effects of acid deposition, there is more immediate concern for the effects on headwater streams in the watershed.

Toxics Deposition - Toxic pollutants of concern are organic compounds (PCB's, dioxin, organochlorine pesticides) and trace metals (copper, cadmium, lead, zinc, mercury). It is likely that a majority of the PCB's in Lake Superior arrived via atmospheric deposition. Toxaphene is an organochlorine biocide which is used in the southeastern United States and has been found in Lake Superior fish.

(1a) Problem: There is a lack of data on the impacts of acid deposition on headwater streams.

(1a) Tactic: Maintain a network of acid deposition monitoring in the state that includes northern sites near Lake Superior.

(1a) Tactic: Perform a study of the impact of spring snow melt on the pH of headwater streams.

(1a) Problem: Deposition of toxic air pollutants to Lake Superior watershed.

(1a) Tactic: Develop and implement rules to regulate toxic pollution.

(2a) Tactic: Continue mercury deposition research and monitor the deposition of toxics that bioaccumulate.

(1a) Tactic: Review food chain effects of toxics which bioaccumulate.

G. SEA LAMPREY

1. Reduce the present adult sea lamprey population by 50 percent.

Sea lamprey first entered Lake Superior in the late 1930's and adversely affected fish stocks in the mid 1950's. Control efforts started in the late 1950's with the installation of electrical barriers on major spawning streams and treatment of streams with the lampricide TFM.

In 1983 a permanent lamprey barrier was constructed on the Middle River and a combination barrier/fishway was constructed on the Brule River in 1985. Over 7,000 lampreys were trapped and removed during the 1986 spawning run. A population of 57,000 adult sea lampreys was estimated to be at large on the U.S. side of Lake Superior in 1986.

Sea lampreys in Wisconsin waters presently kill as many lake trout as the sport and commercial fisheries combined. Continuation of lamprey control programs is imperative to maintaining the present sport and commercial fishery. Continued development of innovative lamprey control measures at the state and federal level is strongly encouraged.

(1)Problem: Sea lamprey production persists in several tributaries.

(1)Tactic: Determine the feasibility of building a barrier with trap on the Bad River and/or stocking sterile male lamprey as a biological control.

(1a)Tactic: Refine and/or develop chemical and biological control techniques for estuarine populations (e.g., St. Louis River).

(1)Tactic: Increase the present level of chemical control on remaining rivers.

(3)Tactic: Encourage removal of spawning adults at barriers through use of traps.

## H. PUBLIC BOAT ACCESS

The Lake Superior sport fishery is presently growing, providing a needed economic boost to its coastal communities. Trailered-boat access is a key to realizing the lake's sport fishing potential.

Since the signing of a management agreement between the Department and the Red Cliff and Bad River bands of Lake Superior Chippewas, a zone management concept is in effect. Development of accesses should be directed toward areas near or adjacent to restrictive use areas (RUA) sport fishing only is permitted.

The RUA between Port Wing and the Michigan border has adequate public access except in the vicinity of the mouth of the Sioux River.

The 33-mile RUA, between Port Wing Harbor and Barkers Island Marina in the city of Superior, is without access except for two very marginal sites at the mouths of the Brule and Iron rivers. Sport fishing effort for trout and salmon has increased dramatically in this region since 1979. Most boats must enter this thirty-three-mile wide RUA at either end, Port Wing or Barkers Island. This large gap leaves much of the area unavailable to smaller boats, since no protection exists for boats to get off the lake in the event of sudden foul weather.

In an effort to provide trailered-boat access to this large area, three locations are being reviewed for development: Brule Point, Middle River mouth, and the mouth of Pearson Creek. The goal of this Plan is to develop at least one and possibly two of these sites for trailered-boats.

(1a) Problem: Basic engineering data, designs, and cost estimates are lacking.

(1a) Tactic: Develop engineering plans, designs, and cost estimates.

(1a) Problem: Funding for development is lacking.

(1a) Tactic: Pursue funding from both Department and outside sources.

APPENDIX 2

AGREEMENT

Final Draft for Ratification

4/7/86

WHEREAS the State of Wisconsin Department of Natural Resources (hereafter referred to as the Department), the Bad River Band of Lake Superior Tribe of Chippewa Indians (hereafter referred to as the Bad River Tribe) and the Red Cliff Band of Lake Superior Chippewas (hereafter referred to as the Red Cliff Tribe, and collectively as the Tribes) agree that the Lake Superior fishery is an important resource which must be carefully managed, and

WHEREAS the Department and the Tribes agree that the management of the resource can best be handled on a cooperative basis, and

WHEREAS after extensive negotiations the Department and the Tribes have agreed on a Comprehensive Plan for the cooperative management of the Lake Superior fishery, and

WHEREAS it is the desire of the Department and the Tribes to reduce this agreement to writing:

NOW THEREFORE the Department and the Tribes agree as follows:

1. Commercial licensees of the Tribes shall be free to fish the Wisconsin waters of Lake Superior, except as otherwise provided in this agreement, and except as the Tribes may otherwise from time to time prescribe within the framework of this agreement.

Quotas

2. The total harvest of lean lake trout from WS2 by all users shall be limited to the following quotas for the coming five fishing years:

1986 fishing year: 52,000 fish
1987 through 1990: 80,000 fish per fishing year

2a. The aforesaid quotas are to be allocated as between all state users and all tribal users as follows:

| Fishing Year | State | Tribe |
|---|---|---|
| 1986 | 23,000 | 29,000 |
| 1987 through 1990 | 37,000 | 43,000 |

The state quota encompasses all state users, including sport fishers. The tribal quota encompasses all tribal users, including home use fishers.

2b. As used in this Agreement 'WS1' and 'WS2" refer to Wisconsin Statistical Districts 1 and 2 as defined in the Draft Lake Trout Management Plan of the Lake Superior Lake Trout Technical Committee of the Lake Superior Committee of the Great Lakes Fishery Commission. The line between the districts extends straight north from the northernmost tip of Bark Point.

2c. The Tribes shall allocate the tribal quota inter partes. Should mutual agreement be unavailing, the Tribes agree to resolve the issue by binding arbitration. The Tribes shall promptly notify the State of the allocation arrived at.

2d. Beginning with the 1991 fishing year on November 28, 1990, the lean lake trout quota shall be calculated in such way as to obtain a total annual mortality rate not to exceed .5 on planted fish. The parties agree to meet annually to discuss the progress and implementation of the management plan, and to initiate discussions no later than November, 1989 on the establishment of the new quota.

2e. State users shall harvest no more than 6,000 lean lake trout in WS1 except that this number may be increased by a comparable reduction in the WS2 quota. Any lake trout harvest by tribal fishers in WS1 shall count against the tribal quota set forth in par. 2a above.

2f. As used herein the 1986 fishing year shall refer to a period beginning November 28, 1985 and terminating on September 30, 1986. Subsequent fishing years shall begin and end on November 28 and September 30, respectively. A 'fishing day' shall be any day within the fishing year. The State will seek legislation to coincide its license years with the afore-described fishing years.

Seasons

3. Except for fish harvested for tribal home use in conformity with the Memorandum of Understanding, Appendix F, the fishing season for lean lake trout and whitefish shall open on November 28 and close on September 30 of the subsequent year. No nets shall be set for lean lake trout and whitefish prior to the opening date. Fish harvested pursuant to the aforementioned Memorandum of Understanding shall not be sold.

Tagging

4. That portion of the state and tribal quotas allocated to commercial fishing shall be enforced by the use of tags, distributed by the Department and the Tribes respectively.

4a. On or before November 1 of each fishing year each party shall notify the others of the proportion of the quota they intend to devote to non-commercial fishing, and shall reduce the amount of tags available to commercial users by the amount so allocated.

4b. At a time to be mutually agreed, assessment fisheries for the coming fishing year shall be reviewed by members of the Technical Committee in the interest of promoting cooperation and efficient efforts. Assessment information shall be exchanged according to the schedule in Appendix G.

4c. The Tribes shall monitor the non-commercial harvest of lake trout, notify the State of the methods of monitoring employed and provide information on the harvest, according to the schedule in Appendix G.

4d. The Memorandum of Understanding known as the "Home Use Agreement" is incorporated as part of this agreement as Appendix F and its provisions agreed to by all members.

4e. The State shall similarly monitor the sport harvest of lake trout, keep the Tribes apprised of the methods of monitoring employed and provide information on the harvest, according to the schedule in Appendix G.

4f. Should monitoring reveal that either the sport or home use fisheries have exceeded or are likely to exceed the amount allocated the responsible party agrees to take emergency measures to prevent the excess harvest. Should such measures be unavailable the excess shall be deducted from the allocation of the responsible party in the next fishing year.

4g. The regulation of the tagging of the commercial harvest of lake trout shall be as provided in Appendix D, attached to this agreement and herein incorporated.

4h. Except for the species enumerated in this paragraph, there shall be no restriction on the sale to non-Indians of any species of fish taken in open Wisconsin waters of Lake Superior by Red Cliff and Bad River tribal commercial fishers.

Species not to be sold: brown, brook and rainbow trout; splake; coho, chinook and Atlantic salmon; lake sturgeon; smallmouth bass; perch, except those harvested pursuant to paragraph 10d; northern pike and panfish.

Refuges

5. In the interest of strengthening and re-establishing self-sustaining stocks of lean lake trout, the parties agree to establish the following refuges, closed to all fishing except as provided under paragraph 6 below.

5a. The Gull Island Shoals Refuge, as amended to remove the strip below the 46°40' meridian, more particularly described in Appendix A, attached to this agreement and herein incorporated.

5b. The Devils Island Refuge, as amended to add certain waters to the southwest and west on and after November 28, 1986, more particularly described in Appendix A.

5c The Cat Island Seasonal Refuge, closed from September 1 through November 27, more particularly described in Appendix A.

6. The following fisheries shall be allowed:

6a. For menominee, employing nets of mesh size no greater than 2 3/4 inch stretch measure, within 7 fathoms of water adjoining Michigan Island, from November 5 through december 5.

6b. For herring, employing nets of of mesh size no greater than 3 inch stretch measure, south of a line running northwesterly from the northern tip of Devils Island, from November 15 through January 15.

7. The Department and the Tribes shall regularly review the progress of rehabilitation within the Devils Island Refuge. On the basis of such evidence as the Department adduces, the parties shall evaluate the value of the refuge prior to the beginning of the 1991 fishing year. The continuance of the refuge beyond that date shall be determined by that evaluation of the tendency toward success or failure.

8. The Department and the Tribes shall undertake and/or continue studies to determine the conditions and procedures under which the Gull Island Shoals Refuge shall be opened for harvest.

Restricted Sport Fishing Areas

9. The parties agree to establish the following restricted areas, closed to net fishing except as provided in paragraph 10 below:

9a. The Minnesota - Iron River Area, out to a depth of 35 fathoms, more particularly described in Appendix B, paragraph 5.

9b. The Iron River - Cranberry River Area, out to a depth of 15 fathoms, more particularly described in Appendix B, paragraph 4.

9c. The Cranberry River - Quarry Point Area, out to a depth of 12 fathoms, more particularly described in Appendix B, paragraph 3.

9d. Siskiwit Bay, from Quarry Point to Squaw Point, more particularly described in Appendix B, paragraph 1.

9e. The Port Superior Area, out to a depth of 9 fathoms, from August 16 though May 31, more particularly described in Appendix B, paragraph 6.

9f. The Chequamegon Bay Area, more particularly described in Appendix B, paragraph 10.

9g. The Hagens Beach Area, from June 1 through August 31, more particularly described in Appendix B, paragraph 8.

9h. The Saxon Harbor Area, more particularly described in Appendix B, paragraph 9.

9i. The Bark Bay Area, more particularly described in Appendix B, paragraph 2.

9j. The Sand Cut Area, more particularly described in Appendix B, paragraph 7.

10. The restrictions in paragraph 9 above are subject to the following exceptions:

10a. Bark Bay shall be open from April 1 though May 31.

10b. Nets of mesh size no greater than 3 inch stretch measure shall be allowed in waters greater than 15 fathoms, between the mouth of the Brule River and the mouth of the Iron River, from November 15 through December 31.

10c. Red Cliff fishers may harvest 5,000 pounds round

weight of walleye annually within the restricted areas west of Bark Point and east of a point one mile west of Port Wing.

10d. Bad River small boat fishers shall have a harvest of perch and walleye within a mile offshore the reservation, beginning at the westernmost boundary of the reservation and extending northeasterly along the shoreline to Chequamegon Point, pursuant to an assessment project to be jointly developed by Department and Bad River biologists.

10e. Bad River fishers to harvest within a 1 1/2 mile strip off Bad River reservation borders, from Chequamegon Point eastward to the eastern border of the reservation.

10f. The Saxon Harbor Area to be open to tribal fishers from ice out to Friday of Memorial Day weekend. In addition, a herring fishery, employing nets no less than 2 1/2 and no greater than 3 inch stretch measure, at 14 fathoms and below, from November 15 through December 15, for tribal fishers and, at the option of the Department, to other fishers.

Notwithstanding the stated terminus of the tribal spring fishery, once a tribe's harvest of lean lake trout reaches 731 fish its fishers shall withdraw from the Area.

10g. Nets may be fished under permit for the taking of rough or detrimental fish only.

Stocking

11. The parties understand and agree that the ability to reach agreement on the management provisions elsewhere in this document is predicated upon federal lake trout stocking support of a minimum of 387,000 yearling lake trout annually, as recommended by the Lake Superior Lake Trout technical Committee Report. The State will stock Wisconsin's entire annual allocation of federally produced lean lake trout, or its equivalent, in the Apostle Islands area.

11a. To the extent of its hatchery resources the State will make up deficits in the federal lake trout stocking program out of state produced lake trout stocks, up to 50,000 yearlings annually.

11b. The State will remove no more than 200,000 lake trout eggs annually from the Gull Island refuge for the purpose of producing splake.

Enforcement

12. The Department agrees to enact the various restrictions of this Agreement as administrative regulations enforceable against non-Indian fishers. Violations by non-Indians shall be prosecuted exclusively in state courts.

13. The Tribes agree to enact the various restrictions of this Agreement as ordinances enforceable against tribal members. Violations by tribal members shall be prosecuted exclusively in tribal courts.

14. The further respective enforcement powers and responsibilities of the parties shall be as stated in Appendix C, attached to this agreement and herein incorporated.

14a. The regulation of tribally licensed fish wholesalers operating off the reservation shall be as set out in Appendix E, attached to this agreement and herein incorporated.

14b. The Department and the Tribes agree to provide one another with copies of the regulations enacted pursuant to paragraphs 12 and 13 above within 10 days of their effective dates.

15. Because of the mutual concern for fair and effective enforcement, the parties agree to meet within 10 days of a request by either party to discuss concerns relating to enforcement of the terms of this agreement.

Duration

16. This agreement, if not reaffirmed or renegotiated, will terminate on November 27, 1995.

17. This agreement may be cancelled by either party upon 60 days notice. Such notice shall be in writing, and subscribed by the respective signatory to this agreement, or his/her succesor. However, the parties agree to exercise good faith in apprising each other of such grievances and problems in implementing this agreement as may arise, and to cooperate to resolve such matters to the greatest extent possible.

Waiver

18. While the parties agree to abide by the terms of this agreement, nothing in this agreement shall be construed as a waiver by any party of its rights in the Lake Superior fishery.

This agreement to take effect upon being subscribed by the parties.

The Red Cliff Band of Lake Superior Chippewa

By Richard L. Gurnoe RLG-9/18/86 Dated: 9/18/86
Richard Gurnoe, Chairman

The Bad River Band of Lake Superior Tribe of Chippewa Indians

By Robert Bender Dated: 9-18-86
Robert Bender, Chairman

The Wisconsin Department of Natural Resources

By Carroll D. Besadny Dated: Sept. 18, 1986
Carroll D. Besadny, Secretary

## Appendix A - Refuges

1. Gull Island Refuge defined as all waters bounded by a line from the southernmost point of Outer Island in a straight line and a southerly direction to the Gull Island light and then south to the northernmost point of Michigan Island proceeding in a southerly direction following the shoreline of Michigan Island to the Michigan Island light, thence southerly towards the center of the mouth of the Bad River in Ashland County to latitude 46° 40', thence due east to the Michigan state line; thence northerly along the state line to a point due east of the southerly tip of Outer Island; from that point due west to the southernmost point of Outer Island, the place of beginning excluding those waters within two miles of Outer Island; except that licensed commercial fishers may fish all that area within these external boundaries wherein the lake bottom lies at a depth of 35 fathoms (210 feet) or more; and except in those included waters less than 7 fathoms in depth which immediately adjoin Michigan Island gill nets with a mesh size of 2-3/4" or less stretch measure may be used from November 5 to December 5 for the taking of Menominee whitefish.

2. Devils Island Refuge defined as all waters wherein the bottom lies at a depth of less than 35 fathoms northerly from a line beginning two miles north of the Outer Island light and extending westerly to the north end of North Twin Island, thence along the shoreline to the south end of North Twin Island, thence southwesterly to the north end of South Twin Island, thence northerly to the north end of Rocky Island, thence along the north shoreline to the northwest point of Rocky Island, thence northwesterly to the south end of Devils Island, thence along the shoreline to the north end of Devils Island, thence westerly to a point 2.5 Statute miles north of the York Island Shoal bell buoy.

3. Cat Island Seasonal Refuge defined as all waters bounded by a line extending from a point two miles north of the Outer Island light to the northern end of North Twin Island, along the shoreline to the southernmost end of North Twin Island, thence southwest to the north end of South Twin Island, along the shoreline to the southernmost end of South Twin Island, thence easterly to the north end of Cat Island, thence along the shoreline to the easternmost point of Cat Island, thence northeasterly to the Outer Island light, thence due north to the place of beginning, September 1 to November 28.

## Appendix B - Restricted Areas

1. All waters of Siskiwit Bay bounded by the shoreline and a line extending from Roman Point to Squaw Point.

2. All waters of Bark Bay bounded by the shoreline and a line extending from Roman Point to Bark Point, except from April 1 through May 31.

3. All waters from a line extending due north from the mouth of the Cranberry River at Herbster, easterly to the Bark Point - Roman Point line wherein the bottom lies at a depth of less than 12 fathoms.

4. All waters from a line extending due north from the mouth of the Iron River, easterly to a line extending due north from the mouth of the Cranberry River at Herbster, wherein the bottom lies at a depth of less than 15 fathoms.

5. All waters from a line extending due north from the mouth of the Iron River, westerly to the Wisconsin-Minnesota state line wherein the bottom lies at a depth of less than 35 fathoms, except that from November 15 through December 31 gill nets of 3" or less stretch measure may be used in that portion greater than 15 fathoms in depth, east of a line extending due north from the mouth of the Brule River.

6. All waters from a line extending due east from the breakwall light at Port Superior, southerly along the shoreline to Houghton Point, wherein the bottom lies at a depth of less than 9 fathoms, and those waters within one mile of the mouth of any stream along this shoreline except from June 1 through August 15.

7. All waters bounded by a line beginning at the Chequamegon Point light on the western end of Long Island extending northeasterly to the southernmost point of Madeline Island, thence due east to the western boundary of Gull Island Shoals refuge, thence southerly along the refuge boundary to latitude 46° 40', thence due west to the mainland shoreline, thence northwesterly along the shoreline to the place of beginning, except within one and one-half mile of the mainland shoreline in Ashland County.

8. All waters east of Madeline Island between a line extending due east from the southernmost tip of Madeline Island to the western boundary of the Gull Island Shoals refuge and a line extending from the east end of Hagen Road to the western boundary of the Gull Island Shoals refuge from June 1 through August 31.

9. Saxon Harbor area defined as all waters bounded by a line beginning at the mouth of Graveyard Creek extending due north to the southern boundary of the Gull Island Shoals refuge, thence due east to the Wisconsin-Michigan State line, thence southwesterly along the Wisconsin-Michigan State line to the mouth of the Montreal River, thence westerly along the mainland shoreline to the place of beginning.

10. All waters of Chequamegon Bay bounded by the shoreline and a line extending from the easterly most tip of Houghton Point, Bayfield County, to the Chequamegon Point light on the western tip of Long Island, Ashland County.

## APPENDIX C - Enforcement

1. As used herein 'inspect' and 'inspection' shall refer to such enforcement inspections as are not required to satisfy the probable cause and warrant requirements of the Fourth and Fourteenth Amendments.

2. As used herein 'search' shall refer to such enforcement inspections as are required to satisfy the probable cause and warrant requirements of the Fourth and Fourteenth Amendments.

Inspections

3. The Tribes and their wardens shall have sole and exclusive authority to inspect tribal fishermen.

4. The Tribes agree that inspections are an important tool of law enforcement. The Tribes undertake to conduct at least 15 such inspections in the 1986 fishing year, and 25 in each fishing year thereafter, in an effective, unannounced manner, with due consideration given to state recommendations and specific tips. The tribes hall exchange inspection reports with the Department on a bi-monthly basis, whether or not inspections are conducted during such period.

5. State wardens will on occasion, by agreement, accompany tribal wardens during inspections and searches at landings and at sea. The Tribes shall provide at least 7 such inspections or searches during the fishing year.

6. The Tribes shall cooperate with state proposals to assure that these accompanied inspections and searches are carried out in a secure and unannounced manner. The Tribes will provide the state with schedules, telephone numbers, contact persons and other information to facilitate action on short notice, provided that action is consistent with tribal guidelines on inspection hours and procedures and provided further that the state provide reciprocal information to the tribes.

7. In addition to other penalties, failure to allow an inspection or search authorized by this agreement shall be punishable by license suspension. A second violation shall be punished by a suspension for not less than 30 fishing days.

Searches

8. State wardens, having probable cause to believe that a tribal fishing violation has occurred that day or is

occurring on Lake Superior, may stop and contact the violators on the water in the following manner:

(a) Upon observing the violation state wardens shall immediately notify tribal law enforcement authorities. Notice shall be given to the Tribe's designated representative, and shall include the nature of the observed violation and the location of the violator and state boat.

(b) State wardens shall use their best efforts to establish contact, including direct radio contact with the Tribe, radio and telephone contact through the sheriff's office or any other communications resource. A log shall be kept of all attempted contacts.

(c) State wardens may request permission from said violators to submit to a search of their vessel and its contents, provided that they inform the violator of their reasons for believing that a violation has occurred and apprise the violator of their efforts to contact tribal authorities. Suspects may refuse such search but shall then remain on site until a tribal warden arrives to conduct an inspection.

(d) If state wardens cannot establish contact with tribal law enforcement authorities within 1/2 hour, they shall apprise the violator of that fact and may then board and search the tribal boat for evidence of a suspected violation.

(e) If the tribal law enforcement boat can reach the location within 1 1/2 hours of the time that notice is given, the violator and the state boat shall proceed in the direction of a rendevous, or, if it is deemed essential to establish the locus, or the violator refuses to proceed, shall remain at the location until tribal law enforcement arrives.

(f) Upon arrival of the tribal boat, boarding and inspection of the violator's vessel will be initiated by tribal law enforcement authorities. State law enforcement officers may assist.

(g) If tribal law enforcement authorities request and if the location of a tribal boat in violation is within 2 hours of a suitable port, the violator will proceed to that location accompanied by the state boat. Boarding and inspection will occur as in paragraph (f) above.

(h) Should tribal authorities be unable to arrive within 1 1/2 hours of contact, or should they fail to arrive within 30 minutes of the violator's arrival in port pursuant to paragraph (g) above, boarding and search by state wardens may take place as in paragraph (d) above.

(i) Should a search be conducted under paragraphs (d) or (h) above, state wardens shall promptly provide the Tribe with a report summarizing the procedures and results of such search.

9. State wardens, having observed a tribal violation during fishing on the Lake Superior ice, and that evidence of a violation is present, may conduct a search on the ice and seize evidence of the violation, provided that they first inform the violator of their reasons for believing that a violation has occurred, and provided also that wardens are unable to contact and secure tribal authorities to conduct the search.

10. State wardens, having probable cause to believe that a tribal fishing violation has occurred and that evidence of the violation is to be found in a tribal fisher's vehicle off the reservation, may stop such vehicle, and thereafter conduct a search and seize evidence of a violation; provided that they first inform the violator of their reasons for believing that a violation has occurred, and provided also that the stop occurs at such distance and time of day that it is not feasible to contact and secure tribal authorities to conduct the search.

Seizure

11. The state may seize tribal fishing gear set in areas closed to tribal fishing pursuant to this Agreement.

12. In any search authorized by this agreement, the state may seize evidence of a suspected violation.

13. State wardens shall promptly notify tribal authorities of a seizure and turn over the seized items to tribal authorities.

14. Items seized for evidence shall be held by tribal authorities where pertinent, except that fishing gear shall be returned to tribal fishermen upon stipulation as to ownership and physical description.

15. Fish seized and determined by the court to be contraband shall not be returned to the defendant, his

agents or immediate family members. Should the fish be sold, the proceeds shall not be paid to the defendant, his agents or immediate family members.

Identification

16. At the beginning of each fishing year the Tribes shall provide the state with a list of licensed fishermen and their license numbers.

17. Tribal nets shall be marked in such way as to designate the fisher's license number and tribe, specifically including the initials 'RC' or 'BR'.

18. State wardens may approach a tribal fishing boat when necessary for the purpose of obtaining the identification of occupants of the boat, previously unknown to the wardens, who are apparently engaged in fishing activities. Tribal fishermen, upon showing of proper authority, shall stop and cooperate with such inquiries.

19. State wardens may similarly approach a tribal fishing operation on the ice for the purpose of obtaining identification of persons, previously unknown to the wardens, apparently engaged in fishing activities. Tribal fishermen, upon showing of proper authority, shall cooperate with such inquiries.

Exchange of Information, Incident and Disposition Reports

20. In the interest of assuring the effective enforcement necessary for the success of the management plan, the parties agree to promptly exchange incident reports and other information bearing on violations and the disposition of reported commercial fishing cases.

21. Upon receipt of an incident report from state wardens, tribal authorities shall notify the state within 10 working days of whether a citation is to be issued.

22. Upon final disposition of such a case the tribe shall notify the state of such disposition within 10 working days.

23. The Tribes shall provide state witnesses with notice of pertinent hearings and such witnesses shall cooperate in case development.

24. Upon receipt of an incident report from tribal wardens involving non-tribal members, the state shall give the same notification as required of a tribe in paragraphs

21 and 22 above.

25. The tribal attorney, or such other person as may be specifically designated, shall be responsible for providing the notification required in paragraphs 21 and 22 above. Notification under paragraph 24, and inquiries as to the current status of any case, shall be directed to this person.

26. The DNR staff attorney responsible for Indian fishing matters, or such other person as may be specifically designated, shall be responsible for providing the notification required under paragraph 24. Notification under paragraphs 21 and 22, and inquiries as to the status of any case, shall be directed to this person.

27. At least once a year, on the 1st of February, the persons designated in paragraphs 25 and 26 above shall provide each other with summaries of all cases within the last calendar year in their respective jurisdictions dealing with Lake Superior fishing.

## APPENDIX D - Tagging

1. The State and the Tribes shall enact and maintain secure systems for the tagging of lean lake trout. Such systems shall employ serially numbered, once-lockable tags, identifying the issuing party, to be issued in fixed numbers to individual fishers pursuant to applicable quotas, and so recorded. Such systems shall further require lean lake trout harvested on open waters to be tagged, i.e., a tag affixed to the fish and securely locked, before docking, and lake trout harvested on the ice to be similarly tagged before being transported.

2. Such tags are to be valid only for the fishing year of issuance and are to be color coded so as to distinguish between any two consecutive fishing years, after 1987. Additional costs borne by the Tribes in maintaining a color coded system are to be compensated by the Department.

3. On or before November 15th of each year, each party to inform the others in writing of the number, serial numbers and physical type of tag to be used in the coming fishing year.

4. To the extent tribal tagging regulations recognize an inclement weather exception, the regulations shall be construed to place the burden on the fisher to prove that inclement weather or similar dangers prevented the timely tagging of the fish. Failure to use available means of notifying tribal wardens in advance, and the fact that fish were dressed, shall constitute prima facie evidence that the failure to tag was not due to inclement weather.

5. Prior to November 28, 1986 the Tribes shall adopt regulations on the tagging of lake trout fillets which substantially conform to current state regulations, or shall adopt an alternative system for assuring the tagging of fillets, acceptable to the Department.

6. No lake trout harvested in Michigan shall be docked in Wisconsin unless they are tagged in conformity with a tagging system assuring the secure issuance of a limited number of tags. If the tags involved are furnished by Michigan tribal sources, the Tribes shall furnish the Department with the details and text of the regulations regulating the amount of tags and the methods of their issuance. If a secure system of limited tag issuance is not otherwise in place the Tribes agree to provide such a tagging system themselves, prescribed and enforced by their own ordinances.

7. No combined catch of Wisconsin and Michigan lake

trout shall be docked in Wisconsin. Nor shall any fisher lift nets in Wisconsin with Michigan lake trout aboard.

8. Tribal fishers fishing in the Saxon Harbor area shall not have tags for Michigan lake trout in their possession.

## APPENDIX E - Tribal Wholesalers

1. The Tribes shall adopt and enforce regulations substantially similar to state regulations, requiring periodic reports and inspections from tribally licensed fish wholesalers.

2. Tribally licensed wholesalers, engaged solely in the purchase of fish from tribal fishers, shall be governed by paragraphs 13 and 14 of this agreement.

3. Tribal authorities shall promptly report to the Department all wholesale purchases from state licensees reported to the Tribes.

4. Nothing herein is intended to prevent purchase of fish from state licensees by tribal wholesalers. Wholesalers wishing to purchase fish from state licensees shall so indicate to tribal authorities, who shall promptly notify the Department. The status of wholesalers so signifying shall be governed by applicable law, outside this agreement.

5. The purchase of fish from state licensees by a wholesaler who has not declared his intent to purchase from state licensees, shall be punishable by license suspension in addition to other penalties. A second violation shall be punished by a 30 day suspension, in addition to other penalties.

SCHEDULE F

MEMORANDUM

OF

UNDERSTANDING

Memorandum of Understanding entered into by the Red Cliff Band of the Lake Superior Chippewa (hereinafter "The Tribe") and the State of Wisconsin by the Department of Natural Resources (hereinafter "The Department").

Subject: Subsistence Fishing Rights

The above-name parties agree as follows:

1. For subsistence fishing purposes, the Tribe will limit the use of gill nets to mesh sizes of 2 3/4" (stretch measure) or smaller, and 4 1/2" (stretch measure) or larger.

2. During the open season for lake trout, the Tribe agrees to limit the length of subsistence fishing nets to a total of 800 feet per fisherman. During the closed season for lake trout, the Tribe agrees to limit the length of such nets to a total of 500 feet per fisherman. At all times, said nets will be marked by at least one buoy at the lakeward end of the net and said buoy will contain information required by tribal regulations.

3. During the closed season for lake trout, the Tribe agrees to restrict gill net placement so that no part of any net extends beyond 1,320 feet from the shoreline into waters adjacent to the Reservation.

4. The Tribe will provide quarterly subsistence fishing harvest information on forms supplied by the Department. The Tribe will affix authorized tags to all species of game fish taken. The Tribe agrees to review the reporting and enforcement systems with the Department at six month intervals after the effective date of this agreement. The Department will compensate the Tribe for the actual costs of reporting and tagging.

5. For purposes of enforcing these provisions, the Department will refer all detected violations of this agreement to Tribal enforcement authorities. The Tribal police director will provide the Department with records of dispositions in such cases. Department and Tribal enforcement personnel will endeavor to work cooperatively.

6. Currently, pending in Bayfield County Circuit Court are actions arising out of assertion of treaty-protected subsistence fishing rights: (See attached copies of citations). The Department will recommend dismissal of those actions.

7. The action, Red Cliff Band of Lake Superior Chippewa Indians, et al vs. Wisconsin Department of Natural Resources, 78-CV-1993, is pending in Dane County Circuit Court. Pursuant to this agreement, the Tribe will move for dismissal of that action without prejudice.

8. This agreement shall terminate on December 31, 1981. The agreement shall be automatically renewed for a one year period, unless either party shall give written notice of a contrary intention at least 45 days prior to the termination date. The same provision for automatic renewal shall apply to each renewed agreement. In addition, this agreement may be cancelled, by mutual consent at any time, provided that such cancellation shall be in writing, subscribed in the manner of this agreement, and provided also, that 30 days notice shall be given to individuals affected by the agreement. The parties agree to exercise good faith in apprising each other of such grievances and problems in implementing this agreement as may arise, and to cooperate to resolve such matters to the greatest extent possible.

This Memorandum of Understanding is entered into on the 25th day June, 1980.

By the Red Cliff Band of Lake Superior Chippewa

Thomas J. Gordon
Tribal Council Chairman

By the Wisconsin Department of Natural Resources

Anthony S. Earl
Secretary

# SCHEDULE G

STATE REPORTS AND INFORMATION TO BE FURNISHED TO RED CLIFF FISHERIES DEPT. AND BAD RIVER FISHERIES DEPT.

| Annual or Quasiannual Report | Annual Due Date |
|---|---|
| Lake Trout Spawning Assessment | May 1 |
| Creel Census | May 1 |
| Summer Index Station Assessment (June-October) | May 1 |
| Whitefish Spawning Assessment | When available |
| Commercial Statistics | May 1 |
| General Cruise Schedule | May 1 |
| Lake Herring Spawning Assessment | When available |
| Spring Lake Trout Abundance Assessment (Note: Aging is available through the U.S. Fish & Wildlife Service as a commissioned report) | May 1 |
| Stocking - All species stocked and proposed to be stocked | May 1 |

| Information Requested | Due Date |
|---|---|
| Yellow Perch in Chequamegon Bay; summer electrofishing data; small mesh gill net data (copy of field data) | When available |
| One spring yellow perch spawning survey (copy of field data) | When available |
| Whitefish distribution in S. Madeline Island area; includes spring and summer index. | When available |
| Catch in confiscated nets from 12/81; includes Lake trout/ whitefish ratio. | When available |
| Whitefish abundance west of Bark Point from summer index | When available |
| Devils Island Refuge report (upcoming published rebort by C. Krueger, J. Selgeby, and B. Swanson) | May 1, 1985 |

TRIBAL FISHERIES REPORTS TO FURNISHED TO WISCONSIN DEPT. OF NATURAL RESOURCES

| Report | Due Date | |
|---|---|---|
| | Red Cliff | Bad River |
| Commercial Catch Statistics | May 1 | May 1 |
| Home Use Catch Statistics | May 1 | May 1 |
| General Cruise or Sampling Schedule | May 1 | May 1 |
| Lake Trout Spawning Assessment | May 1 | May 1 |
| Characteristics of Saxon Harbor Catch (grid 1511) | July 1 | * |
| Lake Herring Assessment | When Available | N/A |
| First Lake Trout Food & Growth Study | 5/85 | N/A |
| Second Lake Trout Food & Growth Study | 5/86 | N/A |
| Summer Walleye Assessment Study | May 1 | N/A |
| Walleye Spawning Study | N/A | May 1 |
| Catch Statistics for Michigan waters of Lake Superior (grids 1511-1316) | May 1** | May 1 |
| Annual Bad River and Kakagon Slough Stocking | N/A | Sept. 1 |

* Reported in annual catch statistics on May 1

** Subject to Tribal Council approval

JOINT REPORTS

A. To be completed by Wis. Dept. of Natural Resources, Red Cliff Fisheries Department, and Bad River Fisheries Department.

| Report | Completion Date |
|---|---|
| 1. Progress Report on Devils Island Refuge | 6/30/85 |
| 2. Second Progress Report on Devils Island Refuge | 6/30/87 |
| 3. Third Progress Report on Devils Island Refuge | 6/30/89 |

B. To be completed by Wis. Dept. of Natural Resources, Red Cliff Fisheries Department, Bad River Fisheries Department, and U.S. Fish and Wildlife Service (Ashland)

| Report | Completion Date |
|---|---|
| 1. Review of Gull Island Refuge (Follow-up report on 1983 report) | 1986 |

C. SUBJECT TO APPROVAL BY NEGOTIATING COMMITTEE: To be completed by Wis. Dept. of Natural Resources, Red Cliff Fisheries Department, and Bad River Fisheries Department.

| Report | Completion Date |
|---|---|
| 1. Report on Tagging Systems and Distribution of tags. | 1985 |
| 2. Report on South Shore Walleye stocks, Wisconsin/Minnesota line to Western Apostle Islands, Lake Superior | 1985 |

SUPPLEMENT TO THE 1986 STATE/TRIBAL AGREEMENT ON THE COOPERATIVE MANAGEMENT OF THE LAKE SUPERIOR FISHERY

SEP 11 1986

The Red Cliff Band of Lake Superior Chippewas (hereafter referred to as the Red Cliff Tribe), and the Bad River Band of Lake Superior Tribe of Chippewa Indians (hereafter referred to as the Bad River Tribe), hereby stipulate and agree, in replacement of Paragraph 2c of the 1986 State/Tribal Agreement On The Cooperative Management of the Lake Superior Fishery, as follows:

For the 1987 fishing year, beginning on November 28, 1986, and for the 1988 and 1989 fishing years thereafter, the total tribal lean lake trout harvest shall be allocated on a 60/40 basis between the Red Cliff and the Bad River tribes respectively; and that beginning with the 1990 fishing year, and continuing during the pendency of the aforesaid agreement, the aforesaid tribal harvest shall be allocated on a 50/50 basis between the two tribes.

The Red Cliff Band of
Lake Superior Chippewas

Date: 9/10/86

By Richard L. Gurnoe
Richard Gurnoe, Chairman

The Bad River Band of
Lake Superior Tribe of
Chippewa Indians

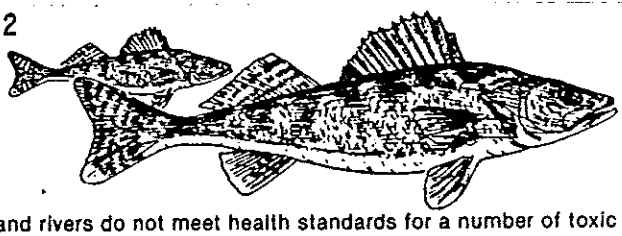
Date: 9/10/86

By Robert Bender
Robert Bender, Chairman

APPENDIX 2

# Health advisory for people who eat sport fish from Wisconsin waters

April 1988



This publication explains which sport fish species in Wisconsin lakes and rivers do not meet health standards for a number of toxic pollutants. It describes health precautions you should consider before you decide to eat fish you've caught from waters where contaminants pose a problem.

It's important to note that this guide features two different sets of health advice: one for fish contaminated with PCBs and pesticides (pages 1 and 2), and another for fish contaminated with mercury (pages 3 through 8). Generally, people who should take the most precautions are children aged 18 or less, women in their child-bearing years, and women who are pregnant or breastfeeding.

## PCB and pesticide contamination in fish

| | **Group 1**<br>These fish pose the lowest health risk. | **Group 2**<br>Women and children should not eat these fish. | **Group 3**<br>No one should eat these fish. |
|---|---|---|---|
| | See page 2 for specific health advice on each group of fish. | | |
| LAKE MICHIGAN | Lake trout up to 20"<br>Coho salmon up to 26"<br>Chinook salmon up to 21"<br>Brook trout<br>Rainbow trout<br>Pink salmon<br>Smelt<br>Perch | Lake trout 20 to 23"<br>Coho salmon over 26"<br>Chinook salmon 21 to 32"<br>Brown trout up to 23" | Lake trout over 23"*<br>Chinook salmon 32 to 35"<br>Chinook salmon over 35"*<br>Brown trout over 23"<br>Carp<br>Catfish |
| **GREEN BAY** south of Marinette and its tributaries (except the Lower Fox River), including the **Menominee, Oconto, and Peshtigo Rivers,** from their mouths up to the first dam | Rainbow trout up to 22"<br>Chinook salmon up to 25"<br>Brook trout up to 15"<br>Smallmouth bass<br>Northern pike up to 28"<br>Perch<br>Walleye up to 20"<br>Brown trout up to 12"<br>Bullhead | Splake up to 16" | Rainbow trout over 22"<br>Chinook salmon over 25"<br>Brown trout over 12"<br>Brook trout over 15"<br>Carp*<br>Splake over 16"<br>Northern pike over 28"<br>Walleye over 20"*<br>White suckers<br>White bass |
| **LOWER FOX RIVER** from its mouth at Green Bay up to the DePere Dam | | Northern pike | White bass*<br>Walleye<br>Carp*<br>White sucker<br>Drum*<br>Channel catfish* |
| **LOWER FOX RIVER** from the DePere Dam up to the Neenah-Menasha Dam | White bass<br>Walleye up to 15"<br>Northern pike<br>Perch<br>White sucker | Walleyes over 15"<br>Bullheads | Carp over 17" |
| **EAST AND WEST TWIN RIVERS** from their mouths up to the first dam | Perch<br>Northern pike<br>Crappie<br>Smallmouth bass | | Carp<br>Catfish* |
| | NOTE: Follow Lake Michigan advisory above for trout and salmon. | | |
| **MANITOWOC RIVER** from its mouth up to the first dam | NOTE: Follow Lake Michigan advisory above for trout and salmon. | | Catfish* |
| **SHEBOYGAN RIVER** in Sheboygan County from the dam at Sheboygan Falls to the Coast Guard station in the City of Sheboygan, including **Greendale and Weedens Creeks** | Coho salmon up to 26"<br>Chinook salmon up to 21" | Rainbow trout<br>Brook trout<br>Coho salmon over 26"<br>Chinook salmon 21 to 32" | Rock bass*<br>Carp*<br>Smallmouth bass*<br>Walleye*<br>Northern pike*<br>Brown trout<br>Catfish*<br>Chinook salmon 32 to 35"<br>Chinook salmon over 35"* |
| **MILWAUKEE RIVER** in Milwaukee County (includes **Milwaukee Harbor**) from its mouth up to the North Avenue dam, including the **Kinnickinnic and Menomonee Rivers** | Perch<br>NOTE: Follow Lake Michigan advisory above for trout and salmon. | | Crappie<br>Northern pike<br>Carp*<br>Redhorse<br>Smallmouth bass |
| **MILWAUKEE RIVER** from the North Avenue dam in Milwaukee County upstream to the Lime Kiln Dam at Grafton (Ozaukee County) | Rock bass up to 8.5"<br>Largemouth bass up to 13" | Redhorse | Northern pike<br>Carp |
| **CEDAR CREEK** from the Milwaukee River up to Bridge Road in the Village of Cedarburg | | | All species* |

# PCB and pesticide contamination in fish

| | Group 1<br>These fish pose the lowest health risk. | Group 2<br>Women and children should not eat these fish. | Group 3<br>No one should eat these fish. |
|---|---|---|---|
| | See bottom of page for specific health advice on each group of fish. | | |
| **ROOT RIVER** in Racine County from its mouth upstream to the Horlick Dam in the City of Racine | Carp up to 21" | | Carp over 21"* |
| | NOTE: Follow Lake Michigan advisory on previous page for trout and salmon. | | |
| **PIKE RIVER** in Kenosha County from its mouth up to Carthage College in the City of Kenosha | | | Carp |
| | NOTE: Follow Lake Michigan advisory on previous page for trout and salmon. | | |
| **LAKE SUPERIOR** | Lake trout up to 30"<br>Walleye up to 18"** | Walleye 18 to 26"** | Lake trout over 30"<br>Walleye over 26"** |
| | **See advice for mercury-contaminated fish in the St. Louis River, Douglas County on page 4. | | |
| **UPPER FOX RIVER** above Swan Lake in Columbia County downstream to Portage | | | Carp |
| **UPPER FOX RIVER** from Portage in Columbia County north to but not including Buffalo Lake | Northern pike | Crappies<br>Bullhead | Largemouth bass<br>Carp |
| **BIG GREEN LAKE** in Green Lake County | Lake trout under 32"<br>Carp | | Lake trout over 32" |
| **WISCONSIN RIVER** from the Nekoosa Dam to the Petenwell Dam (Petenwell Flowage) | | | Carp |
| | See advice on mercury-contaminated fish in the Wisconsin River on pages 3 through 7 under Adams, Juneau, Lincoln, and Wood Counties. | | |
| **ST. CROIX RIVER** from Stillwater, Minnesota, to the Mississippi River at Prescott, Wisconsin | Channel catfish under under 21"<br>Drum<br>Flathead catfish under 29"<br>Sauger<br>Smallmouth bass<br>Carp under 23"<br>Walleye under 22"**<br>White bass | Channel catfish 21 to 24"<br>Walleye 22 to 26"** | Channel catfish over 24"<br>Flathead catfish over 29"<br>Carp over 23"<br>Walleye over 26"** |
| | **See additional advice for mercury-contaminated fish in the St. Croix River under Douglas, Pierce, Polk, and St. Croix Counties on pages 4 through 6. | | |
| **MISSISSIPPI RIVER** off Pierce and Pepin Counties from Prescott down to and including Lake Pepin (Pools 3 and 4). | Drum<br>Walleye<br>Channel catfish up to 17" (Pool 3)<br>Channel catfish up to 21" (Pool 4)<br>Flathead catfish up to 30"<br>White bass up to 13" | Channel catfish 21 to 24" | White bass over 13"<br>Channel catfish over 24"<br>Flathead catfish over 30"<br>Carp over 17" (Pool 3)<br>Carp over 21" (Pool 4) |
| **MISSISSIPPI RIVER** from below the dam at Alma to the dam at Trempealeau (Pools 5, 5A, and 6) | Flathead catfish<br>Carp up to 24"<br>Channel catfish up to 21" | Carp 24 to and 26"<br>Channel catfish 21 to 23" | Carp over 26"<br>Channel catfish over 23" |
| **MISSISSIPPI RIVER** from below the dam at Trempealeau to the dam at Genoa (Pools 7 and 8) | Crappie<br>Flathead catfish<br>Carp<br>Channel catfish up to 23"<br>Walleye<br>White bass | Channel catfish 23 to 27" | Channel catfish over 27" |

**HEALTH ADVICE** for the chart above

**GROUP 1:** Contaminant levels in 10 percent or less of tested Group 1 fish are higher than one or more health standards. EATING GROUP 1 FISH POSES THE LOWEST HEALTH RISK. Trim fat and skin from Group 1 fish before cooking and eating them.

**GROUP 2:** Contaminant levels in more than 10 percent but less than 50 percent of tested Group 2 fish are higher than one or more health standards. CHILDREN UNDER 15, NURSING MOTHERS, PREGNANT WOMEN, AND WOMEN WHO ANTICIPATE BEARING CHILDREN SHOULD NOT EAT GROUP 2 FISH. You should also limit your overall consumption of other Group 2 fish, and trim skin and fat from these fish before cooking and eating them. (NOTE: See specific health advice for mercury-contaminated fish in the Petenwell Flowage and Lake Superior elsewhere in this publication.

**GROUP 3:** Contaminant levels in 50 percent or more of tested Group 3 fish are higher than one or more health standards. NO ONE SHOULD EAT GROUP 3 FISH.

*Ninety percent or more of Group 3 fish marked with an asterisk (*) contain contaminant levels higher than one or more health standards.

**U.S. Food & Drug Administration and Wisconsin Division of Health Standards for Contaminants Commonly Found in Sport Fish**

| | |
|---|---|
| PCBs | 2 parts per million (ppm) |
| DDT | 5 ppm |
| Toxaphene | 5 ppm |
| Chlordane | 0.3 ppm |
| Dieldrin | 0.3 ppm |
| Mercury | 0.5 ppm |
| Dioxin | 50 parts per trillion |

SOURCE: Wisconsin Division of Health and Wisconsin Department of Natural Resources October 1987

# MERCURY CONTAMINATION IN FISH

### *HOW TO USE THE MERCURY ADVISORY*

1. Measure each fish you catch from the tip of its nose to the end of its tail.
2. Look at the list of lakes that begins below, which names all Wisconsin waters that are subject to a health advisory for mercury in fish. See if the lake you caught your fish from is on the list. If it isn't, then DNR hasn't tested fish in your lake, or tested fish meet health standards. (Data on tested lakes is available from water resources staff specialists in DNR district offices.)
3. If your lake *is* on the list, check to see what health advice corresponds to the mercury content of the fish you caught. Do this by finding the number — either 1, 2, 3, or 4 or the symbol "*" — in the list that corresponds to the size and species of your fish and the lake and county in which you caught it. Match that number to the group number below (GROUP 1, GROUP 2, etc.) to find out whether you should eat the fish you caught and how often.

### *HEALTH ADVICE FOR MERCURY CONTAMINATED FISH*

GROUP 1: **Pregnant women should eat no more than one meal a month of Group 1 fish.** *Everyone else may eat unlimited amounts of Group 1 fish.* Skin-on fillet samples average 0.5 ppm mercury or less.

GROUP 2: **Pregnant or breastfeeding women, women who plan to have children, and children under 18 should not eat Group 2 fish.** *Everyone else should eat no more than 26 meals of Group 2 fish a year. Eat no more than 13 of these 26 meals in any one month. Space the remaining 13 meals over the rest of the year at the rate of one or two meals a month.* Skin-on fillet samples average 0.5 to 0.75 ppm mercury.

GROUP 3: **Pregnant or breastfeeding women, women who plan to have children, and children under 18 should not eat Group 3 fish.** *Everyone else should eat no more than 13 meals of Group 3 fish a year. Eat no more than 7 of these 13 meals in any one month, and space the remaining 6 meals over the rest of the year at a rate of one meal a month.* Skin-on fillet samples contain an average of 0.75 to 1.0 ppm mercury.

GROUP 4: **NO ONE SHOULD EAT GROUP 4 FISH.** Skin-on fillet samples contain an average mercury level above 1.0 ppm.

* : This symbol means not enough information on a particular size and species of fish was available to issue health advice.

| County/Water | Fish Species | Fish Length (in inches) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | <10" | 10-12 | 12-15 | 15-18 | 18-22 | 22-26 | 26-30 | >30 |
| **Lake Superior** | **Walleye** | 1 | 1 | 1 | 1 | 3 | 3 | 4 | * |
| **ADAMS CO.** | | | | | | | | | |
| **Wisconsin R.** below Petenwell Dam to Castle Rock Dam (Castle Rock Flowage) See Juneau, Lincoln, and Wood Counties also. | Walleye | 1 | 1 | 1 | 2 | 2 | 3 | * | * |
| **ASHLAND CO.** | | | | | | | | | |
| Bear Lake | Walleye | 1 | 1 | 1 | 2 | 3 | * | * | 2 |
| Day Lake | Musky | * | * | * | * | * | * | * | * |
| **Lake Three** | **LM Bass** | 1 | 1 | 1 | 2 | * | * | * | * |
| *Spillerberg Lake* | *Y Perch* | 2 | * | * | * | * | * | * | * |
| | *Musky* | * | * | * | * | * | * | * | 3 |
| **BARRON CO.** | | | | | | | | | |
| **Bear Lake** | **Walleye** | 1 | 1 | 1 | 1 | 2 | * | * | * |
| *Red Cedar Lake* | *Walleye* | 1 | 1 | 1 | 2 | 2 | * | * | * |
| Scott Lake | Walleye | * | * | * | * | 3 | 3 | * | * |
| **BAYFIELD CO.** | | | | | | | | | |
| Long Lake T48 R5W S6 | LM Bass | * | * | 3 | * | * | * | * | * |
| | *Y Perch* | 1 | 2 | * | * | * | * | * | * |
| Namekagon Lake | Walleye | 1 | 1 | 1 | 1 | 2 | * | * | * |
| Owen Lake | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | * | * |
| Perch Lake T45 R7W S5 | LM Bass | 1 | 1 | 2 | 2 | * | * | * | * |
| Siskiwit Lake | Walleye | 1 | 1 | 1 | 2 | 3 | 4 | * | * |
| Tahkodah Lake | N Pike | * | * | * | * | 2 | 2 | 2 | * |
| | Walleye | * | * | * | 4 | 4 | 4 | * | * |
| Pike Chain of Lakes | Walleye | 1 | 1 | 1 | 1 | 3 | * | * | * |

NOTE: Italicized information indicates new additions or adjustments to advisory since last advisory was issued in October 1987.

LM Bass = Largemouth bass, SM Bass = Smallmouth bass, N Pike = Northern pike, Y Perch = Yellow perch
BL Crappie = Black crappie, CH Catfish = Channel catfish, W Sucker = White sucker

| County/Water | Fish Species | Fish Length (in Inches) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | <10" | 10-12 | 12-15 | 15-18 | 18-22 | 22-26 | 26-30 | >30 |
| **BURNETT CO.** | | | | | | | | | |
| Johnson Lake T40 R16W S23 | LM Bass | 1 | 1 | 2 | 3 | 4 | • | • | • |
| | N Pike | • | • | • | • | 3 | 3 | • | • |
| Round Lake T37 R18W S27 | Walleye | 1 | 1 | 1 | 1 | 2 | • | • | • |
| Yellow Lake | Walleye | 1 | 1 | 1 | 1 | 2 | 2 | • | • |
| **CHIPPEWA CO.** | | | | | | | | | |
| **Chippewa River,** Cornell Flowage | Walleye | 1 | 1 | 1 | 1 | 2 | 3 | • | • |
| **Chippewa River,** Lake Wissota | Walleye | 1 | 1 | 1 | 2 | 2 | 3 | • | • |
| | N Pike | 1 | 1 | 1 | 1 | 1 | 2 | 2 | • |
| | Sturgeon | • | • | • | • | • | • | • | 1 (>50") |
| Hemlock Lake | N Pike | • | • | • | • | • | 2 | 2 | • |
| Horseshoe Lake T31 R8W S33 | Walleye | • | • | • | • | 4 | 4 | • | • |
| N. Shattuck Lake | LM Bass | 1 | 1 | 1 | 2 | • | • | • | • |
| | N Pike | • | • | • | • | • | 2 | 2 | 3 |
| Riley Lake | Walleye | • | • | • | • | • | 2 | 2 | • |
| Round Lake T32 R9W S14 | Walleye | 1 | 1 | 1 | 1 | 3 | 4 | • | • |
| Two Island Lake | LM Bass | • | • | • | 3 | • | • | • | • |
| **CLARK CO.** | | | | | | | | | |
| **Black River** from Hwy. 29/73 bridge south to Lake Arbutus. See Jackson Co. also. | Walleye | • | • | 1 | 3 | 4 | 4 | 4 | • |
| Mead Lake | Walleye | • | • | • | • | 2 | 3 | 4 | • |
| **CRAWFORD CO.** | | | | | | | | | |
| **Kickapoo River** near Steuben | N Pike | 1 | 1 | 1 | 1 | 1 | 2 | 2 | • |
| | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | 3 | • |
| **DANE CO.** | | | | | | | | | |
| Lake Monona | Walleye | 1 | 1 | 1 | 1 | 2 | 3 | 3 | • |
| **DOUGLAS CO.** | | | | | | | | | |
| Amnicon Lake | Walleye | 1 | 1 | 1 | 2 | 2 | 4 | • | • |
| Dowling Lake | Walleye | 1 | 1 | 1 | 2 | 3 | • | • | • |
| Lyman Lake | Walleye | • | • | 3 | 3 | 4 | 4 | • | • |
| Minnesuing Lake | Walleye | 1 | 1 | 1 | 3 | 3 | 3 | • | • |
| Nebagamon Lake | Walleye | • | • | • | 2 | 3 | • | • | • |
| St. Croix Flowage | BL Crappie | 1 | 1 | 2 | • | • | • | • | • |
| | LM Bass | 1 | 1 | 1 | 1 | 3 | • | • | • |
| **St. Louis River** including Superior Harbor | Walleye | • | • | • | • | 4 | 4 | 4 | • |
| *Upper St. Croix Lake* | *Walleye* | 1 | 1 | 1 | 1 | 2 | 2 | • | • |
| | *N Pike* | 1 | 1 | 1 | 1 | 1 | 1 | 2 | • |
| **DUNN CO.** | | | | | | | | | |
| Tainter Lake | Walleye | • | • | • | • | 3 | • | • | • |
| **FLORENCE CO.** | | | | | | | | | |
| **Brule River** at Paint River Pond | Walleye | 1 | 1 | 2 | 3 | 4 | 4 | • | • |
| ***Emily Lake*** | ***Walleye*** | 1 | 1 | 1 | 1 | 1 | 2 | • | • |
| ~~**Sand Lake T38 R15E S21**~~ | ~~**Walleye**~~ | ~~1~~ | ~~1~~ | ~~1~~ | ~~3~~ | ~~4~~ | ~~4~~ | ~~4~~ | ~~•~~ |
| *Sealion Lake* | *Walleye* | • | • | • | • | 3 | 3 | 3 | • |
| **FOND DU LAC CO.** | | | | | | | | | |
| Long Lake | Walleye | • | • | • | • | 2 | • | • | • |
| **FOREST CO.** | | | | | | | | | |
| ~~**Deep Hole Lake**~~ | ~~**Walleye**~~ | ~~•~~ | ~~•~~ | ~~•~~ | ~~•~~ | ~~4~~ | ~~•~~ | ~~•~~ | ~~•~~ |
| Little Sand Lake | LM Bass | • | 2 | 3 | • | • | • | • | • |
| | N Pike | • | • | • | • | • | 3 | 3 | 4 |
| | ***Walleye*** | • | • | • | • | • | 4 | 4 | • |
| Pine Lake | Walleye | 1 | 1 | 1 | 2 | 3 | 3 | • | • |
| **Van Zile Lake** | N Pike | • | • | • | • | • | 4 | 4 | • |
| **IRON CO.** | | | | | | | | | |
| **Gile Flowage** | Walleye | • | • | • | 3 | 4 | • | • | • |
| North Bass Lake | LM Bass | 2 | 2 | 3 | 4 | • | • | • | • |
| Owl Lake | Walleye | • | 2 | 3 | 4 | 4 | 4 | • | • |
| Six Lake | Rock Bass | 2 | • | • | • | • | • | • | • |
| | Y Perch | 3 | 3 | • | • | • | • | • | • |
| Turtle-Flambeau Flowage | Walleye | 1 | 1 | 1 | 1 | 2 | 3 | • | • |
| **JACKSON CO.** | | | | | | | | | |
| Lake Arbutus and backwaters | CH Catfish | • | • | • | • | • | • | 4 | 4 |
| | N Pike | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| | SM Bass | 1 | 2 | 2 | 3 | 4 | • | • | • |
| | Walleye | • | • | • | 2 | 3 | • | • | • |
| | BL Crappie | 1 | 2 | • | • | • | • | • | • |
| Potter's Flowage | LM Bass | • | • | 2 | 2 | 3 | • | • | • |
| | Musky | • | • | • | • | • | • | • | 3 |
| Robert's Flowage | LM Bass | 1 | 1 | 2 | 2 | 4 | • | • | • |
| | N Pike | • | • | • | • | • | • | 2 | 3 |

| County/Water | Fish Species | Fish Length (in inches) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | <10" | 10-12 | 12-15 | 15-18 | 18-22 | 22-26 | 26-30 | >30 |
| **JUNEAU** | | | | | | | | | |
| **Wisconsin R.** below Petenwell Dam to Castle Rock Dam (Castle Rock Flowage) See Adams, Lincoln, and Wood Counties also. | Walleye | 1 | 1 | 1 | 2 | 2 | 3 | * | * |
| **JEFFERSON CO.** | | | | | | | | | |
| Rock Lake | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | * | * |
| **LANGLADE CO.** | | | | | | | | | |
| Clear Lake | N Pike | * | * | * | * | * | 3 | * | * |
| Deep Wood Lake | LM Bass | * | 2 | 2 | 3 | * | * | * | * |
| | N Pike | * | * | * | * | 3 | 3 | * | * |
| Greater Bass Lake | LM Bass | 2 | 3 | 4 | 4 | 4 | * | * | * |
| Lower Bass Lake | LM Bass | 1 | 2 | 3 | 4 | * | * | * | * |
| Summit Lake | LM Bass | * | 2 | 2 | * | * | * | * | * |
| LINCOLN CO. | | | | | | | | | |
| Clara Lake T35 R7E S14 | LM Bass | 1 | 1 | 1 | 2 | 3 | * | * | * |
| | N Pike | * | * | * | * | 3 | 3 | * | * |
| Spirit River Flowage | BL Crappie | 1 | 2 | * | * | * | * | * | * |
| | Walleye | 1 | 1 | 1 | 2 | 3 | * | * | * |
| **Wisconsin River** at Lake Alice. See Adams, Juneau, and Wood Counties also. | N Pike | 1 | 1 | 1 | 1 | 2 | 2 | * | * |
| **MANITOWOC CO.** | | | | | | | | | |
| Bullhead Lake | Walleye | 1 | 1 | 1 | 1 | 2 | 2 | * | * |
| **MARATHON CO.** | | | | | | | | | |
| Mayflower Lake | Walleye | * | * | * | * | 2 | 2 | * | * |
| **MARINETTE CO.** | | | | | | | | | |
| Lake Noquebay | Walleye | 1 | 1 | 1 | 2 | 4 | 4 | * | * |
| **MARQUETTE CO** | | | | | | | | | |
| Buffalo Lake | N Pike | 1 | 1 | 1 | 1 | 1 | 1 | 2 | * |
| **ONEIDA CO.** | | | | | | | | | |
| Bass Lake T39 R8E S31 | N Pike | * | * | * | 1 | 2 | 3 | 3 | * |
| Big Carr Lake | Walleye | * | * | 2 | 2 | 3 | * | * | * |
| Bird Lake | Walleye | 1 | 1 | 1 | 2 | 2 | 2 | * | * |
| | LM Bass | 1 | 1 | 1 | 2 | 3 | * | * | * |
| *Chain Lake* | *Walleye* | * | * | * | 3 | 4 | * | * | * |
| Currie Lake | Walleye | * | * | 2 | 2 | 4 | * | * | * |
| | LM Bass | * | * | 2 | 2 | * | * | * | * |
| Foster Lake | LM Bass | 1 | 1 | 3 | 4 | * | * | * | * |
| Franklin Lake | LM Bass | 1 | 1 | 2 | 2 | * | * | * | * |
| | SM Bass | 1 | 2 | 2 | 3 | * | * | * | * |
| | Walleye | * | * | * | * | 4 | 4 | * | * |
| **Hodstradt Lake** | **Walleye** | * | * | * | * | * | * | * | * |
| **Long Lake T37 R7E S10** | Walleye | 1 | 1 | 1 | 2 | 3 | 4 | 4 | * |
| McGrath Lake | LM Bass | * | 2 | 3 | 3 | * | * | * | * |
| | Bluegill | 2 | * | * | * | * | * | * | * |
| | Y Perch | 2 | * | * | * | * | * | * | * |
| *North Nokomis Lake* | *Walleye* | * | * | * | * | 3 | 3 | * | * |
| **North Two Lake** | **Walleye** | * | * | * | * | * | * | * | * |
| Rainbow Flowage | Walleye | 1 | 1 | 1 | 1 | 2 | 3 | 4 | * |
| Sand Lake T39 R9E S20 | N Pike | 1 | 1 | 1 | 1 | 1 | 2 | 2 | * |
| | **Walleye** | 1 | 1 | 1 | 2 | 3 | 4 | * | * |
| *Stone Lake* | *Walleye* | 1 | 1 | 1 | 2 | 3 | 4 | * | * |
| **Sugar Camp Lake** | SM Bass | * | * | 3 | 4 | 4 | * | * | * |
| | **Walleye** | * | * | * | 4 | 4 | 4 | * | * |
| | **N Pike** | * | * | * | * | * | 3 | 3 | 4 |
| Tomahawk Lake | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | 2 | * |
| Upper Kaubashine Lake | Walleye | 1 | 1 | 1 | 1 | 2 | * | * | * |
| **PIERCE CO.** | | | | | | | | | |
| **St. Croix River** | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | 3 | * |
| **POLK CO.** | | | | | | | | | |
| Pipe Lake | Walleye | * | * | * | * | 3 | * | * | * |
| **St. Croix River** below St. Croix Falls dam downstream to Mississippi R. | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | 3 | * |
| **PRICE CO.** | | | | | | | | | |
| Bass Lake T40 R2W S15 | Walleye | * | * | 3 | 4 | 4 | * | * | * |
| Butternut Lake | Walleye | * | * | 2 | 2 | 3 | * | * | * |
| Elk Lake | Musky | * | * | * | * | * | * | * | 3 |
| Long Lake | Walleye | 1 | 1 | 1 | 1 | 2 | 2 | * | * |
| Musser Lake | Walleye | 1 | 1 | 1 | 2 | 3 | 4 | * | * |

| County/Water | Fish Species | Fish Length (in inches) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | <10" | 10-12 | 12-15 | 15-18 | 18-22 | 22-26 | 26-30 | >30 |
| **PRICE CO. (cont.)** | | | | | | | | | |
| Newman Lake | LM Bass | * | * | 2 | * | * | * | * | * |
| Pike Lake | Walleye | * | * | 2 | 2 | 2 | * | * | * |
| Pixley Flowage | Walleye | * | * | * | 2 | 2 | * | * | * |
| Solberg Lake | Walleye | 1 | 1 | 2 | 3 | 3 | 4 | 4 | * |
| **RUSK CO.** | | | | | | | | | |
| Dairyland Reservoir | Walleye | * | * | 2 | 3 | 3 | * | * | * |
| Perch Lake | LM Bass | 1 | 1 | 2 | 2 | * | * | * | * |
| **SAUK CO.** | | | | | | | | | |
| Devil's Lake | Walleye | * | 2 | 2 | 2 | 2 | 2 | 3 | * |
| **ST. CROIX CO.** | | | | | | | | | |
| Bass Lake | Walleye | * | * | * | * | * | 3 | 3 | * |
| St. Croix River | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | 3 | * |
| **SAWYER CO.** | | | | | | | | | |
| Black Lake | LM Bass | 1 | 1 | 2 | 2 | * | * | * | * |
| | Musky | * | * | * | * | * | * | * | 4 |
| Fishtrap Lake | LM Bass | 1 | 1 | 2 | 3 | 3 | * | * | * |
| | N Pike | 1 | 1 | 1 | 1 | 1 | 2 | 2 | * |
| Lake Loretta | LM Bass | 1 | 1 | 2 | 3 | 4 | * | * | * |
| Moose Lake | Walleye | 1 | 1 | 3 | * | * | * | * | * |
| Windigo Lake | N Pike | * | * | * | * | 2 | 2 | 3 | * |
| | Walleye | 1 | 1 | 2 | 3 | 3 | * | * | * |
| Winter Lake | LM Bass | 1 | 1 | 1 | 2 | 3 | * | * | * |
| | Musky | * | * | * | * | * | * | * | 2 |
| **SHAWANO CO.** | | | | | | | | | |
| Shawano Lake | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | * | * |
| *Wolf River below Shawano Dam down to State Highway 156* | *Walleye* | * | * | * | 2 | 2 | * | * | * |
| **TAYLOR CO.** | | | | | | | | | |
| Chequamegon Waters | LM Bass | 1 | 1 | 1 | 4 | * | * | * | * |
| Richter Lake | LM Bass | 1 | 1 | 1 | 3 | * | * | * | * |
| **TREMPEALEAU CO.** | | | | | | | | | |
| Marinuka Lake | LM Bass | * | * | * | 2 | 2 | * | * | * |
| **VILAS CO.** | | | | | | | | | |
| Camp Lake | LM Bass | 1 | 1 | 2 | 4 | * | * | * | * |
| Jag Lake | Walleye | 1 | 1 | 1 | 2 | 3 | 4 | * | * |
| | SM Bass | 1 | 1 | 2 | 2 | * | * | * | * |
| North Twin Lake | Walleye | 1 | 1 | 1 | 1 | 2 | * | * | * |
| Shannon Lake | LM Bass | 1 | 1 | 2 | 4 | 4 | * | * | * |
| Trout Lake | Walleye | 1 | 1 | 1 | 1 | 3 | 4 | 4 | 4 |
| White Birch Lake | Walleye | 1 | 1 | 1 | 1 | 3 | 4 | * | * |
| **WASHBURN CO.** | | | | | | | | | |
| Nancon Lake | LM Bass | 1 | 1 | 1 | 2 | * | * | * | * |
| | N Pike | 1 | 1 | 1 | 1 | 2 | 3 | 3 | * |
| Shell Lake | Walleye | 1 | 1 | 1 | 2 | 3 | * | * | * |
| Silver Lake | LM Bass | 1 | 1 | 1 | 2 | * | * | * | * |
| **WASHINGTON CO.** | | | | | | | | | |
| Pike Lake | Walleye | 1 | 1 | 1 | 1 | 1 | 2 | * | * |
| **WAUPACA CO.** | | | | | | | | | |
| Columbia Lake | LM Bass | 1 | 1 | 1 | 1 | 2 | * | * | * |
| ***WAUSHARA CO.*** | | | | | | | | | |
| *Big Hills Lake* | *Walleye* | * | * | * | * | 2 | * | * | * |
| *Kusel Lake* | *Walleye* | * | * | * | 2 | 2 | * | * | * |
| ***WINNEBAGO CO.*** | | | | | | | | | |
| *Lake Winneconne on the Wolf River* | *Walleye* | 1 | 1 | 1 | 1 | 1 | 2 | * | * |
| **WOOD CO.** | | | | | | | | | |
| **Wisconsin River** from Nekoosa Dam to Petenwell Dam (Petenwell Flowage). See Adams, Juneau, and Lincoln Counties also. | Walleye | 1 | 1 | 1 | 1 | 2 | * | * | * |

## *COOKING, CLEANING, AND EATING MERCURY-CONTAMINATED FISH*

Mercury is distributed throughout a fish's muscle tissue (the part you eat) and organs, rather than in fat and skin. **You *cannot* reduce mercury levels by removing fat or skin or by cooking a fish a certain way.**

NOTE: If you catch fish from **both** Groups 2 and 3 in the mercury advisory, use the conversion chart below to figure out how many combined meals of fish from these groups you may eat in one month or one year.

## *COOKING, CLEANING, AND EATING MERCURY-CONTAMINATED FISH (cont.)*

**Monthly Consumption**

| If you eat this many **Group 2** fish meals in one month... | ...eat no more than this many **Group 3** fish meals that same month: |
|---|---|
| 0 | 7 |
| 2 | 6 |
| 4 | 5 |
| 6 | 4 |
| 8 | 3 |
| 10 | 2 |
| 12 | 1 |
| 13 | 0 |

**Annual Consumption**

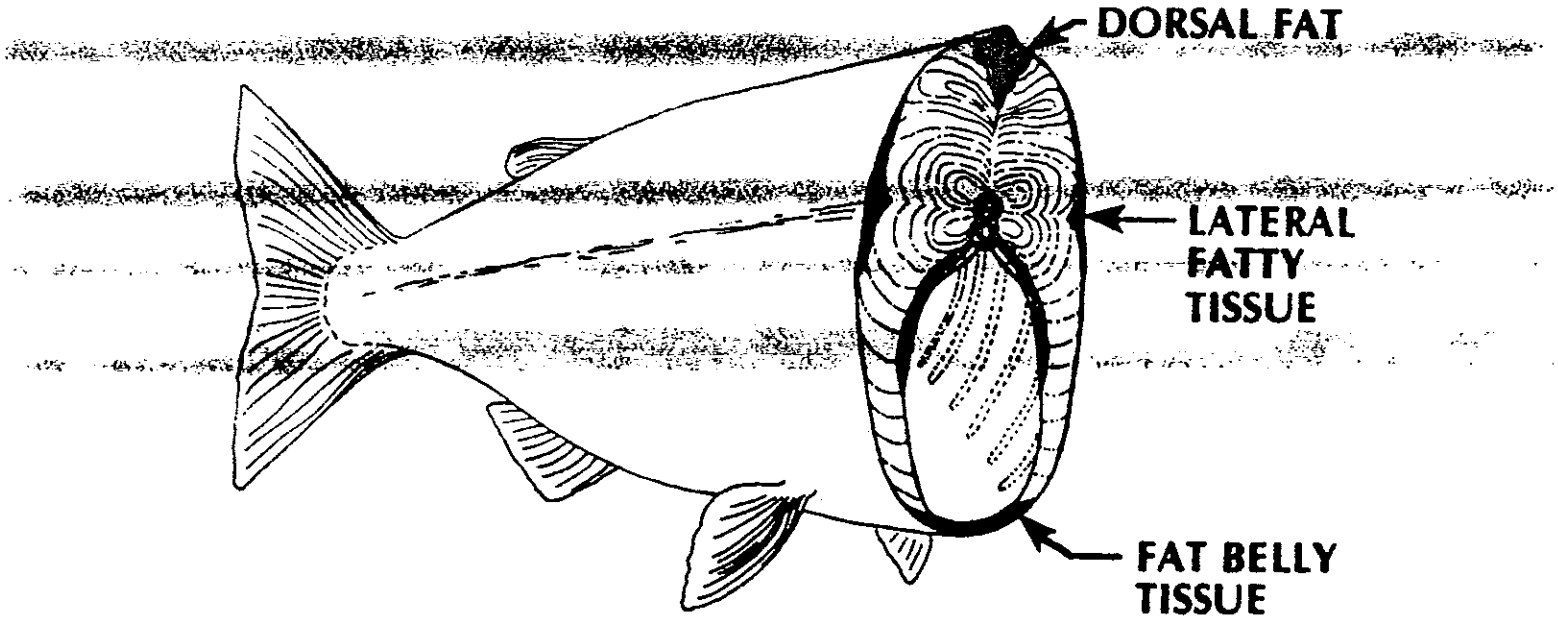
| If you eat this many **Group 2** fish meals in one year... | ...eat no more than this many **Group 3** fish meals that same year: |
|---|---|
| 0 | 13 |
| 2 | 12 |
| 4 | 11 |
| 6 | 10 |
| 8 | 9 |
| 10 | 8 |
| 12 | 7 |
| 14 | 6 |
| 16 | 5 |
| 18 | 4 |
| 20 | 3 |
| 22 | 2 |
| 24 | 1 |
| 26 | 0 |

## *COOKING, CLEANING, AND EATING PCB-CONTAMINATED FISH*

PCBs and many pesticides usually build up in a fish's fat deposits and just underneath the skin rather than in muscle tissue. By removing the fat and skin before you cook and eat these fish (see directions below), you can reduce PCB and pesticide levels, though not always enough to meet health standards.

To reduce PCBs in fish you catch:

- Remove all skin.
- Cut away the dark fat on top of the fish along its backbone.
- Slice off fat belly meat along the bottom of the fish.
- Cut away the dark, V-shaped wedge of fat located along the lateral line on each side of the fish.
- Bake or broil skinned, trimmed fish on a rack or grill so more fat drips off. Discard any drippings. Fish may also be cooked in liquids, but discard the resulting broth.



APPENDIX 3

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

September 30, 1986

3600

File Ref:

TO: Sportsmen Groups
Commercial Fishers
Charter Captains Assoc.
Chambers of Commerce
WI Conservation Congress
Sea Grant
other interested parties

Red Cliff Tribe
Bad River Tribe
N.W. Regional Planning Comm.
U.S. Fish & Wildlife Service
States of MN, MI
Province of Ontario
National Park Service

The Wisconsin Department of Natural Resources is requesting your assistance in the development of a fisheries management plan for Lake Superior. The purpose of this plan is to insure that the future management of Lake Superior fisheries best benefits the state's citizens, and to serve as a working guide for fisheries management.

For almost 30 years lake trout rehabilitation has been a common goal of the states bordering Lake Superior, the Great Lakes Fishery Commission and the U.S. Fish and Wildlife Service. Efforts to achieve this goal have had mixed success. Sea lamprey control has effectively reduced parasitism on lake trout stocks, and we are encouraged by the reproduction of native trout on some reefs, but many more spawning areas have not reestablished natural reproduction.

Meanwhile, many new factors are influencing the fishery. In 1972, a new source of mortality began when the Lake Superior Chippewas began harvesting trout on the basis of a State Supreme Court decision which reaffirmed their fishing rights under the Treaty of 1854. Sportfishing has continued to grow, particularly off Superior/Duluth where the development of new marinas has stimulated the economy. And, there have been some major changes among the other fish populations in the lake that need to be considered. Coho salmon, for example, have established a naturally reproducing population in Wisconsin tributary streams.

Reacting to these changes, those groups who fish Lake Superior are rightfully concerned about the future. What lies ahead for the commercial fishery now that the Chippewas have signed an agreement that allocates 50% of the lake trout to tribal fisheries? Is there room to expand the charter industry to bolster a sagging economy? Should the DNR stock more salmon to enhance sportfishing, or will these fish impact lake trout rehabilitation by competing with lake trout for food? These and dozens of other issues like them need to be addressed in a rational manner as the users of the Lake Superior fishery share the resource.

One way to accomplish this is to create a fishery management plan. The Department of Natural Resources is asking all interested people to assist in the development of such a plan to insure that all groups receive consideration. Enclosed is a copy of the recently completed Lake Michigan Fishery Management Plan to give you an example of what we intend to produce for Lake Superior with your help.

As a first step, DNR fishery biologists have put together the following tentative list of goals and objectives to share with you. The catch objectives are based on what they believe Lake Superior can produce if managed carefully. I emphasize that these suggested goals are presented as a starting point - we expect that through discussion at meetings, we will modify them to better suit what the people of Wisconsin want from Lake Superior. Following the development of the final goals and objectives, fish managers will develop a list of problems and tactics to address them. The tactics will become the basis for work plans at our field stations and hatcheries.

It is essential that input from you and your organizations is received to guide the Department in the decision making process.

Please thoroughly review this material. Your comments are welcomed, but we would prefer you contact our Bayfield office to arrange meetings to discuss the alternatives.

The Department's goal is to meet with your groups this autumn and to ask for written comments to be sent to us by January 1, 1987. The plan will be re-written to reflect the appropriate changes, then sent back to your groups by April 1, 1987, for final review. We expect to have the management plan in effect by June 1, 1987.

The Lake Superior Fishery Management Plan will guide us for the next 10 years; please assist us in making sure that the final product represents a fair and thoughtful approach to the future.

Sincerely,

**James T. Addis**
Director
Bureau of Fish Management

**Contact:**
Bruce Swanson
Dept. of Natural Resources
Box 589
Bayfield, WI 54814
(715) 779-3346

JTA:LTK:pb
enc.

APPENDIX 4

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

August 10, 1987

File Ref: 3600

TO: Sportsmen Groups
Commercial Fishers
Charter Captains Assoc.
Chambers of Commerce
WI Conservation Congress
Sea Grant
other interested parties

Red Cliff Tribe
Bad River Tribe
N. W. Regional Planning Comm.
U. S. Fish & Wildlife Service
States of MN, MI
Province of Ontario
National Park Service

Good progress has been made on the Lake Superior Fisheries Management Plan and the second draft is attached for your review. I want to thank you for your interest and attendance at the public informational meetings. Approximately 130 citizens attended the 5 public meetings at Ashland (12-2-86), Bayfield (12-3-86), Superior (12-10-86), Port Wing (12-11-86) and Iron River (4-2-87). In addition, numerous letters were received regarding the management plan.

A committee of Department of Natural Resources fisheries personnel carefully reviewed the comments recorded at the public meetings along with the suggestions received in the letters. Where possible, these comments were categorized and then examined to determine their suitability for inclusion in the plan. As a result, 7 major changes in the plan are suggested. These changes are listed below along with the Department's explanation:

1. At the Port Wing public meeting, and by letter, Mr. Frank Koehn asked the Department to add a water quality goal to the plan.

   Response: The department agrees with Mr. Koehn and has included a habitat quality goal (Section F) with a narrative on water quality, air quality and toxics contamination.

2. Mr. David Johnson, a commercial fisher from Port Wing, asked at the public meeting to raise the harvest objective for round whitefish from 20,000 to 40,000 pounds annually.

   Response: We recognize that market prices are a very influential factor controlling round whitefish harvest, but agree with Mr. Johnson that a 40,000 pound annual harvest is a reasonable biological goal. See A-3 of the plan. The Department wants to make it clear that harvest objectives are not quotas, but simply targets to aim for during the next 10 years.

3. The Lake Superior Fish Management Advisory Board (Barb Hansen, Chairperson) made suggestions to increase the harvest objectives for siscowet from 200,000 to 300,000 pounds annually. This Advisory Board is a group of citizens who organized themselves to assist the Department in developing the Fisheries Management Plan.

   Response: The Department has limited information on siscowet stocks although it appears they are recovering to pre-lamprey levels. We agree that an increased harvest of siscowet as both small fillets and as omega 3 fatty acids could help the commercial industry and we have included the higher harvest objective as Section A-4 in the plan.

4-5 The Lake Superior Fish Management Advisory Board said the Department was too conservative in its sport harvest objectives for Pacific salmon. The Board requested that the catch objectives be increased for coho and chinook salmon from 9,000 to 30,000 fish per year for each species.

   Response: The Department feels that a 30,000 fish harvest for each species is too high to attain in the next 10 years. Based on previous trends and increases in natural reproduction and stocking (chinooks only) however, we agree that higher catch objectives for coho and chinook are reasonable. We recommended they be increased to 15,000 coho per year and 12,000 chinook per year in sections B-2 and 3. We understand that improvements in fishing techniques and knowledge of salmon habits will be necessary to meet these objectives.

6. At the Ashland public meeting several citizens asked for more emphasis on the Chequamegon Bay fishery, especially with regard to perch and walleye fisheries.

   Response: The Department agrees that Chequamegon Bay does deserve more emphasis. Sections B-8, B-9 and B-11 have been added or expanded to focus on perch and walleye stocks.

7. At both the Iron River and Bayfield public meetings, citizens expressed the need for an economic analysis of the sport and commercial fisheries of Lake Superior to determine its value to the area economy.

   Response: The Department agrees that such a study would be very useful, especially in determining allocation problems between the sport and commercial fisheries. Although the Bureau of Fish Management does not have an economist on staff to carry out such a study, we have identified the need by including it as Section E of the plan. We will work to find a way to see how an economic study can be accomplished.

In addition to the previously listed changes, Draft #2 of the Lake Superior Fisheries Management Plan also contains lists of the problems that must be solved if we are to reach our goals and objectives. Each problem is followed by tactics that will become the guide from which specific operational projects for our Lake Superior biologists and hatcheries will be developed.

Completion of the Lake Superior Fisheries Management Plan has been delayed 6 months to January 1, 1988, to allow for more public participation. Please review Draft #2 and submit your comments in writing to Bruce Swanson at our Bayfield office by October 15, 1987. We will be happy to meet with any group upon request to discuss problem areas until that time.

Following review of final comments and inclusion of appropriate changes, we intend to add sections on geographical descriptions and history of the fisheries. The plan will be taken to DNR Secretary Besadny for approval early in 1988.

Thank you very much for your cooperation to date. I hope you will continue to work with us to complete a thoughtful plan for Lake Superior that we can all support for the next 10 years.

Sincerely,

Jim Addis
JTA

James T. Addis, Director
Bureau of Fish Management

JTA:LK:po