Fishery Management Plan

Rib Lake, Taylor County, Wisconsin

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Background

Rib Lake is a 320-acre drainage lake in northeastern Taylor County. Decades of sawmill and tannery operations in the late 1800s and early 1900s resulted in deposition of large quantities of organic waste (sawdust, unused trees and slabs, and animal hides and hair) that decreased depth to less than 10 feet throughout most of the lake. As a result, Rib Lake is eutrophic and prone to winter fish kills due to low dissolved oxygen and possibly other water quality problems. For the past several winters, fish kills had been averted by pumping air through seven long diffuser lines powered by a 7.5-HP electric motor. However, in winter 2002/2003 Rib Lake experienced a significant fish kill. Among the dead fish observed by DNR crews on 4/17/03 were 50 muskellunge (all 30"-50") and 150-200 walleye (mostly 16"-22"). DNR crews saw only 5-10 dead largemouth bass (12"-16"), but some experienced local anglers reported seeing over a hundred large bass floating dead at the edge of the receding ice a couple days earlier. All observers concur that very few rough fish, panfish or small game fish were seen dead.

Starting in 1997, management of the Rib Lake walleye fishery shifted from a 15-inch minimum length limit to a 14- to 18-inch protected slot length limit, with only 1 fish daily over 18 inches allowed in the sport harvest. This regulation was based in part upon the rationale that walleye recruitment had been consistently high over the years, leading to a relatively high population of adult fish – an estimated 6.6 walleyes/acre in spring of 1998. These walleyes were thought to be growing fast enough to enter and pass through the protected length range before experiencing significant natural mortality, eventually providing higher numbers of fish over 18 inches long for the sport harvest, though no actual parameter objectives were stipulated that would indicate when success had been achieved. Rib Lake also lies within the Ceded Territory of northern Wisconsin, so the walleye fishery is shared with tribal members who have declared their interest in participating in a safe level of harvest since 1996. Typically their declarations have resulted in a bag limit of 2 walleyes daily during the first month of the sport fishing season, followed by an increase to the statewide bag limit of 5 daily after a limited tribal harvest was completed and reported. From May 30, 2003 through March 1, 2004 the sport fishing bag limit is 3 walleyes daily.

During the past couple years local citizens have become increasingly discontented with the walleye slot length limit because they felt excluded from its development and did not believe it was consistent with a community preference for number over size and harvest over catch. Ensuing discussions among interested citizens, sportsmen's groups, state legislators, DNR administrators and biologists revealed the need for a plan to manage the fishery of Rib Lake. Participants at an October 29, 2002 meeting concurred that Rib Lake should be managed primarily as a "family-oriented fishery" as opposed to a fishery that emphasizes high quality or trophy status for select species. At that meeting, we prioritized species by perceived order of importance to local anglers; and we recorded general preferences regarding the relative importance of number versus size in a manner consistent with the "family fishery" goal. On February 14, 2002 we revised the priority listings with input and approval from leaders of the Rib Lake Fish and Game Association, such that community preferences for numbers and sizes of various fish species became, by order of priority:

1) Bluegill: Moderate density of medium-size (7-8") fish
2) Black Crappie: Moderate density of medium-size (9-12") fish
3) Yellow Perch: Moderate density of medium-size (7-10") fish
4) Walleye: Moderate density of medium-size (12-18") fish, and what is necessary to manage panfish
5) Largemouth Bass: Present in fishery, numbers/sizes necessary to help manage panfish
6) Muskellunge: Fishable number of large (>40") fish
7) Northern Pike: Present in fishery, numbers/sizes necessary to help manage panfish
8) Bullhead: Very low density of quality-size fish

The Plan

We believe Rib Lake is fished primarily by local anglers, and so we are willing to allow local stakeholders a greater degree of influence in establishing goals and objectives than would be appropriate for a lake that supports significant non-local angling pressure. With sensitivity to local stakeholder values, and in light of current fish population status and what lies within the realm of possibility, we have established the following goals and objectives for the Rib Lake fishery. All goals are considered to be of equal importance, but objectives within goals are ranked in order of priority.

GOAL 1: Establish and maintain a family-oriented fishery with primary emphasis on sustainable harvest of moderate numbers of medium-sized panfish. In order of priority, our panfish objectives are:

Objective 1.1: A bluegill population from which we capture stock-size (≥3") fish at a rate of 100-150 per hour during spring/fall electrofishing surveys, with a PSD of 40-60% and RSD-7 of 25-35%. *Interpretation: Of all bluegill 3" or longer in our samples, 40-60% should be 6" or longer and 25-35% should be 7" or longer.*

Objective 1.2: A black crappie population from which we capture stock-size (≥5") fish at a rate of 50-80 per hour during spring/fall electrofishing surveys, with a PSD of 30-50% and RSD-10 of 5-15%. *Interpretation: Of all black crappies 5" or longer in our samples, 30-50% should be 8" or longer and 5-15% should be 10" or longer.*

Objective 1.3: A yellow perch population from which we capture stock-size (≥5") fish at a rate of 50-90 per hour during spring/fall electrofishing surveys, with a PSD of 20-40% and RSD-9 of 5-10%. *Interpretation: Of all yellow perch 5" or longer in our samples, 20-40% should be 8" or longer and 5-10% should be 9" or longer.*

Objective 1.4: A very low-density population of bullheads, as reflected by capture rates of <10 stock-size (≥6") fish per hour during spring/fall electrofishing surveys, with an RSD-12 of ≥50%. *Interpretation: Of all bullheads 6" or longer in our samples, at least half should be 12" or longer.*

PANFISH POPULATION STATUS AND MANAGEMENT STRATEGY: We have very little reliable data on the status of most panfish species, but the general feeling is that preferred-size bluegill, crappie, and perch are relatively scarce. Fall electrofishing data for yellow perch support this assessment (Table 1). To manage panfish effectively, we must manage their predators, both fish and human. The most immediate strategy we can employ involves changing the length limits for walleye and muskellunge (see those sections). If restructuring the predator populations does not ultimately improve panfish populations, we may need to consider more restrictive harvest regulations, including reduced daily bags (currently an option) but also minimum length limits (not currently an option). We recommend waiting on any panfish regulation changes until we see what can be accomplished through predator management. We further encourage the Rib Lake Fish and Game Association to continue removing abundant bullheads by fyke net along developed shores of the lake.

GOAL 2: Sustain a family-oriented fishery by maintaining gamefish populations at levels that will provide a variety of opportunities for catch and harvest while maintaining optimal, size-selective predatory control over panfish to achieve population objectives under Goal 1. In order of priority within this goal, our objectives are:

Objective 2.1: A moderate-density population of medium-size walleyes, as reflected by population estimates of 5-10 stock-size (≥10") walleyes/acre or capture rates of 50-80 stock-size (≥10") fish per hour during spring electrofishing surveys, with a PSD of 20-40% and RSD-18 of 5-10%. *Interpretation: Of all walleyes 10" or longer in our spring samples, 20-40% should be 15" or longer and 5-10% should be 18" or longer.*

WALLEYE STATUS AND MANAGEMENT STRATEGY: Walleyes are viewed as the most important predator in maintaining effective control over panfish and therefore allowing us to achieve several objectives under Goal 1. In the wake of the 2002/2003 winterkill, the walleye population is characterized by a somewhat lower-than-desired capture rate of stock-size fish (49/hour on 4/22/03 and 27/hour on 5/13/03) and a far higher proportion of quality-size and larger fish than is actually desired. (On 4/22/03 PSD was 88% and RSD-18 was 19%; and on 5/13/03 PSD was 85% and RSD-18 was 30%). Fall electrofishing surveys conducted over the past four years have produced moderately high capture rates of adult walleyes – the vast majority over 14 inches long (Table 1) – which is consistent with our spring 2003 observations minus losses due to winterkill. Natural walleye reproduction (reflected by late September capture rates) has been consistently high (Table 1), vindicating somewhat the rationale for establishing a slot length limit in 1997. This natural reproduction has been supplemented by annual stockings in early October of 800 to 1500 6- to 9-inch walleye fingerlings reared in nearby ponds by the Rib Lake Fish and Game Association. However, recruitment of all these young fish to stock size and beyond was alarmingly low for both the 1999 and 2000 year classes when captured as yearling and age 2+ fish in subsequent years (color-coded in Table 1). The jury is still out on recruitment of the apparently large 2001 year class, but they at least survived in high numbers to become 8.5-inch yearlings.

Table 1. Fall nighttime electrofishing capture rates (number per hour) and estimated mean lengths (inches) of select fishes in 320-acre Rib Lake, Taylor County, 1999-2002.

Parameter	9/29/99	9/18/00	9/26/01	9/30/02
Age 0+ (YOY) Walleye	79	21	82	53
Mean Length Age 0+	6.9	6.2	4.6	5.0
Age 1+ (Yearling) Walleye	0	0	1	74
Mean Length Age 1+	--	--	7.0	8.5
Age 2+ Walleye	?	13	0	2
Mean Length Age 2+	--	11.9	--	12.1
Walleye ≥ 14"	30	38	21	47
Yellow Perch ≥ 5"	"Abundant"	12	"Present"	11
Yellow Perch ≥ 8"	?	4	?	<1
Muskellunge ≥ 30"	2.5	8.3	5.3	3.7
Effort (Hours)	1.6	1.8	1.7	1.9
Water Temperature (F)	56	66	56	58

Slot length limits are most appropriate when reproduction and recruitment are so high that some harvest of sub-slot fish is needed to stimulate growth of surviving fish into and through the protected length range. Because walleye recruitment has been low in recent years, Management Plan objectives are not being met and will not likely be met unless the harvest strategy is changed. Growth rates of Rib Lake walleye have always been at or above statewide averages in this productive system (attached Figures 1 and 2), suggesting that a 15-inch minimum length limit would not result in high natural mortality prior to attainment of legal size. The most appropriate harvest regulation available at this time in our suite of options for walleye is the 15-inch minimum length limit, which we recommend be implemented as soon as possible. A 15-inch minimum length limit should do the following: 1) protect relatively scarce new recruits from harvest; 2) increase predatory control by small walleyes on young-of-year and yearling panfish, but possibly allow more panfish to recruit once they reach stock size (Note the relative scarcity of stock-size and larger yellow perch in Table 1.); 3) promote harvest of moderate numbers of walleyes over 15 inches long before they succumb to whatever conditions caused the 2002/2003 winterkill; and 4) possibly reduce cannibalism by numerous large walleyes on younger recruits. These outcomes should increase our chances of achieving population objectives for both walleye and panfish.

DNR stocking of walleyes into Rib Lake should not be necessary. Spawning is occurring along natural shorelines and may be enhanced by the artificial mid-lake spawning reef . Rib Lake Fish and Game Association is encouraged to continue rearing and stocking ~1,000 extended growth walleye fingerlings (3 per acre) every fall from one of their cooperative rearing ponds, not because stocking is necessary to meet walleye population objectives most of the time, but because this low density of stocked fish may contribute to recruitment stability after years when natural reproduction is low for weather-related reasons. Stocked fish are expected to contribute significantly to recruitment only in years when natural reproduction is very low. In other words, annual low-level stocking may "smooth out the bumps" without harming the rest of the fish community.

Objective 2.2: A moderate-density population of medium-size largemouth bass, as reflected by capture rates of 20-40 stock-size (≥8") fish per hour during late spring electrofishing surveys, with a PSD of 40-60% and RSD-15 of 10-20%. *Interpretation: Of all largemouth bass 8" or longer in our samples, 40-60% should be 12" or longer and 10-20% should be 15" or longer.*

LARGEMOUTH BASS STATUS AND MANAGEMENT STRATEGY: Largemouth bass can be important as predators on bullheads, bluegill, yellow perch, and black crappie, probably in that order of effectiveness. Because bass will likely play a role in maintaining fish community balance in Rib Lake, we were greatly concerned to see zero largemouth bass in a 5/13/03 electrofishing survey when water temperature was 58 F. Some fish should have been on-shore and vulnerable to our gear, and the fact that we caught none suggests that the 2002/2003 winterkill may have taken a heavy toll on the bass population. Largemouth bass survive poorly in cold, shallow water in winter. The unusually long, relatively snow-free period of thick ice cover last winter may have caused their demise.

To rebuild the bass population, we should maintain the statewide 14-inch minimum length limit and consider using one of the cooperative rearing ponds to produce some 4- to 6-inch fish for fall stocking. Rib Lake Fish and Game Association is encouraged to rear and stock ~1,000 extended growth largemouth bass fingerlings (3 per acre) from one of their cooperative rearing ponds every fall until the bass population has been rebuilt to the point where natural recruitment resumes.

Objective 2.3: A moderate-density population of muskellunge, as reflected by capture rates of 2-4 stock-size (≥20") fish per hour during spring/fall electrofishing surveys, with a PSD of 40-60% and RSD-40 of 15-25%. *Interpretation: Of all muskies 20" or longer in our samples, 40-60% should be 30" or longer and 15-25% should be 40 inches or longer.*

MUSKELLUNGE STATUS AND MANAGEMENT STRATEGY: Muskellunge are important as predators on yellow perch and suckers. We have captured muskellunge at a relatively high rate in fall electrofishing samples over the past four years (Table 1), even after the 2002/2003 winterkill left 50 large fish visibly dead. The fact that yellow perch have been relatively scarce, and that perch size structure is poor considering the high productivity of the system, raises questions about the potential impact of muskellunge on quality-size perch. One might raise the same concerns relative to walleye recruitment, because walleye year classes have been disappearing, but only at age 2 when they would begin to comprise an energy-efficient ration for muskellunge. Because muskellunge fishing and trophy muskellunge in particular are not high-priority objectives for Rib Lake, we should act cautiously by not stocking any muskellunge in the foreseeable future and by maintaining the statewide minimum length limit of 34 inches (i.e., not protecting more fish with a higher size limit). This strategy should begin to negate the potentially negative impact of excessive numbers of muskellunge at Rib Lake on the size structure of yellow perch and the recruitment of walleye, both of which we wish to improve. Natural reproduction of muskellunge should continue to provide the recruits necessary to maintain a respectable muskie fishery and overall fish community balance. Keeping the minimum length limit at 34 inches should allow harvest opportunity for the few "family-type" anglers who may occasionally enjoy keeping a muskie; and such harvest might even be encouraged in a system where we now know that many large muskies can succumb to winterkill even with a functional aeration system in operation.

Objective 2.4: A low-density population of medium-size northern pike, as reflected by capture rates of 5-10 stock-size (≥14") fish per hour during spring electrofishing surveys, with a PSD of 25-35% and RSD-24 of 10-20%. *Interpretation: Of all northern pike 14" or longer in our samples, 25-35% should be 21" or longer and 10-20% should be 24" or longer.*

NORTHERN PIKE STATUS AND MANGEMENT STRATEGY: Northern pike can be important as predators on yellow perch and suckers, but there have been so few pike in Rib Lake (<2/hour during spring electrofishing surveys) that they have had no impact on the ecosystem. We recommend maintaining statewide regulations and not stocking northern pike.

GOAL 3: Maintain water quality conditions that promote attainment of fish population goals while allowing anglers to fish in an aesthetically pleasing environment.

Objective 3.1: Maintain sufficient dissolved oxygen to avoid winterkills altogether (>2 ppm) and to promote optimal growth rates of all species throughout the growing season (>5 ppm).

Objective 3.2: Maintain water clarity that promotes effective predation on panfish and facilitates angler catch rates as reflected by Secchi disk transparencies of 2-6 feet throughout the year.

Objective 3.3: Maintain visually appealing shorelines with natural habitats that promote the reproductive survival and growth of young fishes near shore.

Objective 3.4: Maintain access for public recreation consistent with family fishing, developed with minimal impact to visual appeal and shoreland habitat quality.

HABITAT STATUS AND MANAGEMENT STRATEGY: We are uncertain why so many large predatory fish died during winter 2002/2003. One of the aerator pumps failed early in the season, but was repaired before any significant depletion of dissolved oxygen in the lake, which remained above 5 mg/l at monitoring stations throughout the winter. If time permits, we should increase the scope of oxygen monitoring to determine if there are "dead spots" in the lake, despite its uniform bottom contour, where dissolved oxygen can fall to zero and result in a localized fish kill. If that is not happening, we need to investigate other potential causes of fish death under the ice in Rib Lake.

It is readily apparent to anyone who conducts an electrofishing survey at Rib Lake that gamefish are using natural littoral zone areas almost entirely. Fish are few and far between along highly developed and manicured shorelines. Additionally, algae blooms that develop in the lake can be exacerbated by the application of phosphorus-containing fertilizers on lawns within the lake drainage basin; and the annual decay of abundant algae may contribute to biological oxygen demand in mid winter. We support and encourage efforts by the Rib Lake Fish and Game Association to preserve natural shorelines, restore developed shorelines to natural conditions, and persuade lake area homeowners not to apply phosphorus-containing fertilizers on their lawns.