

Fishery Management Plan
for
Nelson Lake, Sawyer County, Wisconsin
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FOREWORD AND ACKNOWLEDGMENTS

This is a long-term strategic plan that will guide our fishery management efforts at Nelson Lake for many years to come. We believe a good fishery management plan must be based upon a shared vision that can be acquired only after fishery managers and committed stakeholders have discussed angler preferences in light of what each aquatic ecosystem is capable of producing. We believe the goals of a good plan must reflect that shared vision, and that measurable objectives must be set so we know whether chosen strategies have succeeded or failed. We believe in making good tries and learning from failure. Part of that process involves amending strategic plans when failure dictates that we either develop more realistic objectives or change our strategies to achieve them. Hopefully this plan will be updated as needed in the decades that follow.

We call this a “long-term strategic plan” because the goals and objectives are relatively timeless, and because we have neither the wisdom nor the authority to commit DNR or partner resources to a specific multiple-year operational schedule of funding and action. Each year will bring its own fiscal constraints and operational priorities, so we must remain flexible in our implementation of proposed actions. Because there are so many complex and inter-related strategies, we have chosen not to secure higher-level DNR approval at this time. We will do our best to justify actions we believe necessary to realize our shared vision to DNR leaders and the general public as time and circumstances permit. We promise only to consult this plan at least once annually as we allocate our time and resources to the many important projects before us.

We want to thank the Nelson Lake Association for hosting our local stakeholder visioning session at the Veteran’s Hall in Hayward on June 19, 2004. Their continued support for this process and this plan has given us the energy and enthusiasm needed to aggressively pursue implementation and to expand this process to other lakes in Sawyer County and the Upper Chippewa Basin.

We also want to thank the 41 local stakeholders who gave up one of the nicest Saturday afternoons of the summer in order to help us develop the vision that forms the backbone of this plan. We are very pleased to incorporate their input at this appropriate stage in the planning process; and we look forward to their continued support for the actions we believe will be necessary to achieve the shared vision. We can settle for nothing less in an area where the quality of fishing means so much to our livelihoods and our quality of life.

-- Frank Pratt and Dave Neuswanger

BACKGROUND

Habitat Characteristics and Productivity

Nelson Lake is a relatively shallow 2,503-acre drainage impoundment formed by a dam built across the Totogatic River in northwestern Sawyer County in 1937. With a head of 14 feet, the dam normally discharges 30 cubic feet per second while maintaining an average pool depth just under 10 feet (maximum depth 33 feet). At normal pool level, this flowage impounds 24,000 acre-feet of water and creates just over 31 miles of shoreline. A largely forested watershed of almost 53 square miles contributes light brown, tannin-stained water that results in a typical Secchi disk visibility of 4-5 feet.

Habitat in the littoral zone (shallow area near shore) is important in determining spawning, egg incubation, and nursery conditions for most species of fish. The littoral zone of Nelson Lake is highly variable, but lengthy reaches of wild public shoreline and well-managed private shoreline provide overhanging vegetation and a mixture of sand, gravel, and cobble substrate conducive to the successful spawning of species like walleye and smallmouth bass. Shoreland property owners at Nelson Lake have done an especially good job of maintaining a natural condition at the water's edge, resulting in good spawning and nursery habitat for most species. Woody cover is the only habitat element currently in short supply in the littoral zone.

Various water quality parameters suggest that Nelson Lake can be classified as meso-eutrophic, or moderately to highly productive from a fishery management standpoint. Methyl purple alkalinity is less than 25 parts per million, but total phosphorus concentration ranges from 22 parts per billion in spring to 35 parts per billion in mid to late summer, creating favorable conditions for the growth of phytoplankton (algae suspended in open water). Because of seasonal variation in availability of phosphorus, the concentration of chlorophyll *a*, which reflects phytoplankton abundance, varies from 6 parts per billion in spring to 34 parts per billion in mid to late summer. During peaks in phytoplankton abundance, Secchi disk visibility can decline to 2 feet.

Human Development and Public Access

Sawyer County impounded the Totogatic River to create Nelson Lake specifically for recreational purposes. The County still owns, maintains, and operates the dam. A Sawyer County Surface Water Inventory conducted in the late 1960s recorded 21 resorts and 87 private cottages, most used only seasonally. Mirroring a trend in the North Country, many resorts have gone out of business since the 1960s, yielding to the interests of private citizens who have purchased former resort dwellings as condos or built their own homes around the lake. Currently only a handful of resorts remain, including two private campgrounds; and at least half of the private dwellings are year-round residences. Overall, the rate of development at Nelson Lake has been relatively light. Dwellings are concentrated along the south shore. Most of the undeveloped north shore and Big Island are in county or state ownership.

Currently there are four points of public access on Nelson Lake. Those with suitable boat launching ramps include Ettlenger's Access on Sawyer County land at the end of Tag Alder Road, another County access on Lake 25, and a Town of Lenroot access at the end of Gerlach Road. The fourth site is the Sawyer County Park at the dam, which provides parking and unimproved access to anglers fishing from shore. Combined with the numerous points of private access, Nelson Lake is available for all to use and enjoy; and it is one of the most heavily fished lakes in the County. In one past creel survey, fishing pressure was estimated to be above 50 hours per acre per year.

Historical Perspective on the Fishery

DNR survey records indicate three distinct periods in the history of the Nelson Lake fishery. Prior to 1970, Nelson Lake was dominated by largemouth bass and panfish, though stocked walleye contributed to the overall fishery. Between 1970 and 1990, a self-sustaining walleye population dominated the fishery. Estimated density reached an unsustainably high 16 adults per acre during the height of walleye dominance. Excessive numbers led to slow growth and poor size structure. Since 1990 walleye density has declined; and it is widely perceived that largemouth bass abundance has increased dramatically, resulting in an excellent bass fishery. High bass density has probably contributed to low walleye recruitment and continues to keep adult walleye density below 2 per acre.

Nelson Lake has a history of producing very large bluegill, bullheads, largemouth bass and northern pike. It is one of the few lakes in the Upper Midwest with a documented capacity to produce bluegill weighing more than 2 pounds. In 1977, a former state record bluegill was taken from Nelson Lake – a trophy weighing 2 lbs. 5 oz. In 1983, the current 12# line class world record yellow bullhead was taken from Nelson Lake – a trophy weighing 3 lbs. 5 oz. Also in 1983, two largemouth bass caught in Nelson Lake were confirmed to weigh over 8 pounds – rare fish at this latitude. Anecdotal evidence of trophy pike potential can be found among the 1990 fish photos of the Sawyer County Record, where nine northern pike over 20 pounds were reported as taken from Nelson Lake that year alone.

Nelson Lake lies within the Ceded Territory and therefore is shared with Ojibwe tribal harvesters. Despite its close proximity to the Lac Courte Oreilles Reservation, Nelson Lake historically has been speared by the Bad River and Red Cliff tribes. Tribal harvest has ranged from 0 to 1600 fish, averaging slightly fewer than 500 adult walleyes (0.2 per acre) per year. This would comprise less than 10% of the adult walleye population even during low-density years. In most years, this level of tribal harvest has triggered a conservative reduction in the sport fishing daily bag limit from 5 to 2 in order to virtually eliminate any risk of exceeding the estimated safe harvest level of 35% for the combined methods of harvest.

Aquatic Community Overview

A thorough survey of aquatic macrophytes has not been conducted at Nelson Lake. Macrophyte growth is somewhat limited by light penetration in the tannin-stained waters, but when Secchi disk visibility is relatively high (5-7 feet) for long periods of time, extensive beds of macrophytes can develop. Known plant species include large-leaf pondweed, clasping-leaf pondweed, white-stem pondweed, northern water milfoil, elodea, coontail, white water lily, and wild rice.

Aquatic macrophytes have developed sufficiently in most years to facilitate high survival of young largemouth bass. Regulatory protection (spawning season closure and a 14-inch minimum length limit since 1997) and increased largemouth bass recruitment have dramatically affected fish community structure, shifting it from domination by walleye to domination by largemouth bass. The decline in walleye density has led to increased recruitment and density of black crappie and bluegill, neither of which are growing as fast or getting as big as Nelson Lake anglers have come to expect. Abundant crappie combined with largemouth bass may be preying upon young walleye and are probably preventing the restoration of a walleye-dominated fish community. The 2004 appearance of rusty crayfish portends a period of unpredictable change in macrophyte abundance and fish community structure at Nelson Lake.

Northern pike are the top predators in Nelson Lake, exhibiting good growth and the potential to reach memorable size. But pike have declined in abundance in recent years as largemouth bass have become increasingly dominant. Smallmouth bass are present, but rare, despite suitable spawning substrate in many areas. In lakes with abundant littoral zone macrophytes, largemouth bass tend to outcompete smallmouth bass. Muskellunge are extremely rare in Nelson Lake. They do not seem to be reproducing successfully, and they have not been stocked by DNR.

Bluegill and black crappie are the most abundant and sought-after panfish species in Nelson Lake. Other panfish include yellow perch (important as prey for walleye), pumpkinseed, and rock bass. All three species of bullheads (black, yellow, and brown) are present. Non-game fish known to occur in Nelson Lake include log perch, trout-perch, Johnny darter, rainbow darter (rare), white sucker (major prey species), common shiner, golden shiner, bluntnose minnow, rosyface shiner, blacknose minnow (rare), and central mudminnow. Several species present in the Totogatic River are found on rare occasion in the lake itself, including burbot, brook trout, shorthead redhorse, golden redhorse, northern hogsucker, and creek chub.

Aside from the recent appearance of rusty crayfish, exotic plants and animals have been of little concern at Nelson Lake to date. Large Chinese mystery snails (1.75-inch diameter) have existed alongside our native apple snails (1.50-inch diameter) for at least 20 years and do not seem to have caused any problems. A dedicated public awareness effort will be needed to keep other exotic invasive species out of Nelson Lake.

A Vision for the Nelson Lake Fishery

On June 19, 2004, we met with 41 local stakeholders who were willing to volunteer their time to help develop a long-term vision for the Nelson Lake fishery. Objectives of the meeting were to prioritize species of interest, then identify for those species the relative importance of numbers versus size and catch versus harvest. Attention was then focused on identifying the desired conditions (goals and objectives) that appear in this plan. Actual verbiage of goals and objectives was developed by consensus of local stakeholders in consultation with Frank Pratt, who served as technical advisor to the group on what was possible. However, no attention was given to methods for achieving goals and objectives (management strategies such as harvest regulations, fish stockings, and habitat preservation or enhancement). It was understood and agreed that professional fishery managers would select the most appropriate strategies once goals and objectives had been developed by local stakeholders and adjusted to incorporate what is known about statewide angler preference and the capacity of Nelson Lake to produce what is desired.

Detailed results of the visioning session appear in the Appendix. In summary, local stakeholders in the Nelson Lake fishery ranked walleyes first among species of interest, and they were determined to do whatever may be necessary to restore the Nelson Lake walleye fishery to a level of quality enjoyed in times past. This emphasis on walleye is consistent with statewide angler priorities, so efforts to achieve walleye population objectives will assume a prominent role in future management.

There was also clear enthusiasm for creating and maintaining a quality fishery for panfish, especially in light of Nelson Lake's demonstrated capacity to produce large bluegill and black crappie. Management goals and objectives reflect a mutual belief that Nelson Lake can once again produce the preferred and memorable size panfish for which the lake was once known. Special harvest regulations and excellent angler compliance will likely be needed to achieve this vision.

Largemouth bass were not as important to local Nelson Lake stakeholders (or statewide anglers) as walleye, but local and statewide anglers alike have a clear interest in maintaining some type of bass fishery to the extent that it does not interfere with our ability to achieve walleye population objectives. Some local stakeholders were even interested in smallmouth bass, which currently are rare in Nelson Lake but might prove to be less competitive with walleye than largemouth bass. Goals, objectives, and strategies presented herein are consistent with these interests and with our current belief that good fisheries for walleye and largemouth bass are mutually exclusive.

Northern pike were not of high importance to local Nelson Lake stakeholders, but there was sincere interest in the diversity associated with the opportunity to catch a large pike on occasion. Local stakeholders strongly preferred northern pike to muskellunge in the role of top predator at Nelson Lake. Because Nelson Lake has demonstrated the capacity to produce large northern pike, the goals, objectives, and strategies presented in this plan are consistent with local stakeholder desires.

GOAL 1: A walleye population of moderate to high density with a moderate proportion of quality-size fish.

Objective 1.1: 4 to 8 adult walleye per acre in spring population estimates (Adult walleye are defined by DNR as all fish over 15 inches long and all fish between 12 and 15 inches long for which gender can be determined.)

Objective 1.2: Of all walleye 10 inches and longer captured by fyke netting in early spring, 40-60% should be 15 inches or longer (PSD = 40-60%).

Walleye Status and Management Strategies: Adult walleye density was last estimated in 2002 by GLIFWC biologists to be 1.9 per acre and is likely to be less than 1.0 per acre currently. Natural reproduction and recruitment has been virtually nil in recent years, despite the availability of suitable habitat. Small fingerlings (1.5 inches) stocked in 1993 and 2003 failed to recruit sufficiently to maintain desired adult density, probably because of predation by abundant largemouth bass, black crappie, or both. The Nelson Lake Association and Red Cliff Tribe experimented with rearing and stocking a small number of extended-growth (EG) walleye fingerlings (5-9 inches) in fall of 2002; and they successfully reared and stocked approximately 600 such fingerlings in September 2004. In our opinion, the stocking of EG walleye fingerlings is essential to achieving Objective 1.1 any time in the near future. When balance is restored and other elements of this plan are implemented, the need to stock walleye may diminish or disappear altogether. But for now, Nelson Lake should be stocked with EG walleye fingerlings at a density of 5/acre (12,500 fish) every fall for the next five years (2005 through 2009) or until it becomes clear that Objective 1.1 will be or has been achieved. At a market price of \$1.00 to \$1.50 per fish, this will be very expensive. We suspect the only way to afford this restoration program will be to share the cost among several partners, including but not limited to DNR, Red Cliff and Bad River tribes, Sawyer County, Nelson Lake Association, and Walleyes for Northwest Wisconsin.

The current 15-inch minimum length limit is appropriate for purposes of protecting young walleye during the initial stages of restoration. When walleye density increases, a different regulatory approach (e.g., an 18-inch minimum length limit or 14- to 18-inch slot length limit) may be needed in order to achieve Objective 1.2, depending upon natural recruitment. Chosen regulations must be sensitive to local stakeholder preferences as shown in table A2, which clearly reveals a preference for balance between catching and harvesting walleyes. There is virtually no interest in managing walleye as a trophy species in Nelson Lake; nor is there much interest in exerting maximum sustainable harvest at the expense of achieving the desired size structure (Objective 1.2). For their part, lakeshore landowners and resort owners must strongly encourage their families and guests to comply with the regulations if objectives for walleye and panfish are to be achieved.

Our long-term strategy for walleye is to stop stocking and allow natural recruitment and harvest regulation to maintain desired walleye density and size structure. We believe that is possible, but only if largemouth bass numbers are reduced to the level reflected in Objective 5.1. Liberalizing harvest opportunity for largemouth bass (see Goal 5 strategies) while managing water levels to optimize spawning conditions for walleye are essential components of this long-term strategy. We recommend that DNR, Sawyer County, GLIFWC, and the Nelson Lake Association meet to discuss and approve a periodic winter drawdown (frequency and degree to be negotiated, but probably 1-4 feet) of the Nelson Lake pool. One benefit would be to expose near-shore gravel to the air all winter, providing walleye with the cleanest, firmest substrate possible to spawn upon in early spring after the water level rises to full pool. Another benefit would be to moderate largemouth bass recruitment by controlling macrophytes and concentrating young bass into a pool of reduced volume where they are more vulnerable to predation by walleye during fall and winter. We do not expect a winter drawdown to cause low-oxygen winterkill if initiated prior to ice-up.

Walleye reproductive survival is influenced by many factors, including spring weather conditions. But fishery scientists have documented that high natural reproduction and recruitment of walleye is usually associated with concurrently high reproduction of their primary prey – yellow perch. Nelson Lake has more wild shoreline than most lakes, but not very many trees have fallen into the water where yellow perch might deposit their gelatinous egg masses. Fishery scientists have not tested whether increasing the amount of perch spawning habitat leads to higher egg survival and hatching, but if we were doing everything possible to maximize walleye reproductive survival, we might suggest placing fresh conifer trees every year into shallow areas where yellow perch are likely to spawn. If the Nelson Lake Association wishes to try this technique, we suggest securing structures in water 2-4 feet deep and using fully needled evergreens that would provide intra-structure shade. Yellow perch eggs are very sensitive to ultraviolet light and would be killed if laid in shallow, clear water or even stained water too close to the surface in unshaded areas.

We are concerned that the mathematical model used to predict a safe level of walleye harvest (all methods combined) starting in 2005 will be too liberal by failing to reflect the almost complete lack of walleye recruitment observed in recent years. In light of these concerns, we respectfully suggest that anglers and spearers voluntarily minimize their harvest of adult walleyes over the next three to five years as we work together to restore the kind of walleye population we all desire.

GOAL 2: A bluegill population of moderate density with a moderate to high proportion of preferred-size fish.

Objective 2.1: Currently we lack an effective method to assess the relative abundance of bluegill. For the time being, our broader objective is to find a method by which bluegill density can be indexed accurately and efficiently. Then we will choose parameter values consistent with the above goal.

Objective 2.2: Of all bluegill 3 inches and longer captured by electrofishing or fyke netting sometime during the bluegill spawning season, 20-30% should be 8 inches or longer (RSD-8 = 20-30%).

Bluegill Status and Management Strategies: Scientific data on Nelson Lake bluegill are lacking, but the general consensus among local anglers is that numbers are up and size structure is down, probably because of insufficient predation by walleye on young bluegill (slightly reducing their typically fast growth rate) and overharvest of quality-size bluegill by anglers who do not understand that panfish overharvest is possible. A DNR warden group patrol in spring 2004 resulted in several arrests for over-bagging panfish (primarily bluegill) by anglers who ignored the reduced daily bag limit of 10 panfish. This is happening throughout the region and will diminish only when anglers understand the degree to which large panfish are vulnerable to overharvest.

For Objective 2.1 (moderate bluegill density) to be achieved, we must also increase walleye density by achieving Objective 1.1. For Objective 2.2 to be achieved, we must maintain the reduced daily bag limit of 10 panfish, but we may have to implement a 9-inch or 10-inch minimum length limit for bluegill eventually if anglers harvest too many 7.0- to 8.9-inch fish. If a scientific assessment of bluegill population size structure reveals that we are far from achieving Objective 2.2 even after the walleye population has recovered, we will initiate a rule proposal for a minimum length limit on bluegill and ask for support from those who helped us to craft this plan. We are confident that Nelson Lake, if managed according to this plan, is fully capable of producing moderate numbers of bluegill over 8 inches long, creating one of the most desirable and productive panfish fisheries in the Upper Midwest. Of course, we will need a high level of cooperation from lakeside landowners and resort owners in order to obtain the kind of voluntary angler compliance that will allow this dream to be realized.

GOAL 3: A **black crappie** population of low to moderate density with a moderate proportion of preferred-size fish.

Objective 3.1: Currently we lack an effective method to assess the relative abundance of black crappie. For the time being, our broader objective is to find a method by which crappie density can be indexed accurately and efficiently. Then we will choose parameter values consistent with the above goal.

Objective 3.2: Of all black crappie 5 inches and longer captured by fyke netting in late spring or mid fall, 40-60% should be 10 inches or longer (RSD-10 = 40-60%).

Black Crappie Status and Management Strategies: As with bluegill, scientific data on Nelson Lake crappie are lacking, but the general consensus among local anglers is that numbers currently are very high and size structure is down, probably because of insufficient predation by walleye on young crappie, slightly reducing their typically fast growth rate. We view this to be a short-term condition. Crappie populations tend to be somewhat cyclic because of highly variable recruitment from year to year. It is important that management objectives and strategies recognize and allow for some unavoidable variability in crappie recruitment and density.

For Objective 3.1 (low to moderate crappie density) to be achieved, we must also increase walleye density by achieving Objective 1.1. While maintaining a healthy walleye population does not guarantee crappie recruitment, it virtually ensures that crappie recruitment will not be excessive. For Objective 3.2 to be achieved, we must maintain the reduced daily bag limit of 10 panfish, and we may have to implement a 10-inch or 12-inch minimum length limit for crappie eventually if anglers harvest too many 8.0- to 9.9-inch fish. We also reserve the option to suggest managing panfish species individually if that should become necessary to achieve the objectives in this plan. If a scientific assessment of crappie population size structure reveals that we are far from achieving Objective 2.2 even after the walleye population has recovered, we will initiate a rule proposal for a minimum length limit on crappie and ask for support from those who helped us to craft this plan. We are confident that Nelson Lake, if managed according to this plan, is fully capable of consistently producing crappie over 10 inches long, contributing to what may become one of the most desirable and productive panfish fisheries in the Upper Midwest. Again, we will need a high level of cooperation from lakeside landowners and resort owners in order to obtain the kind of angler compliance that will allow this dream to be realized.

GOAL 4: A **northern pike** population of low to moderate density with a high proportion of preferred-size fish, providing a semi-trophy aspect to the overall fishery and serving in the role of top predator in the intentional absence of muskellunge.

Objective 4.1: Currently we lack an effective method to assess the relative abundance of northern pike. For the time being, our broader objective is to find a method by which pike density can be indexed accurately and efficiently. Then we will choose parameter values consistent with the above goal.

Objective 4.2: Of all northern pike 14 inches and longer captured by fyke netting in early spring, 10-20% should be 28 inches or longer (RSD-28 = 10-20%).

Northern Pike Status and Management Strategies: Anecdotal evidence suggests that northern pike in Nelson Lake are less abundant than in times past, probably because largemouth bass, which are known to prey effectively upon young esocids, have become so prevalent. But the Sawyer County Record continues to publish photographs almost every week of large northern pike that have been reported as caught in Nelson Lake. Most shallow flowages in the Upper Chippewa Basin do not produce large northern pike, presumably because of sub-optimal thermal conditions for pike summer feeding activity. It would be interesting to know if there are sub-surface thermal refuges (springs) in Nelson Lake that facilitate the growth and survival of large northern pike.

Adult largemouth bass eat young northern pike occasionally. For Objective 4.1 to be achieved, a reduction in the relative abundance of largemouth bass may be necessary. Liberalizing harvest opportunity for largemouth bass (see Goal 5 strategies) may be an important component of this long-term strategy. There are very few places in Sawyer County and the Upper Chippewa Basin where anglers can expect to catch a preferred-size northern pike. Nelson Lake can continue to be one of those special places, but even better. For Objective 4.2 to be achieved, we should implement a 32-inch minimum length limit for northern pike, with reduced daily bag limit of 1.

GOAL 5: A largemouth bass population of low density with a moderate proportion of preferred-size fish.

Objective 5.1: Electrofishing capture rates for 8-inch and longer largemouth bass of 10-20 per hour during the bass spawning season.

Objective 5.2: Of all largemouth bass 8 inches and longer captured by electrofishing during the bass spawning season, 20-40% should be 15 inches or longer (RSD-15 = 20-40%).

Largemouth Bass Status and Management Strategies: We do not have all the data we would like to have on the Nelson Lake largemouth bass population, but anecdotal reports and existing data suggest that largemouth bass are thriving and bass fishing is excellent. Though not the most preferred species in Nelson Lake, largemouth bass are of moderate interest to many local stakeholders and have been the main target of local club tournaments. Our strategy, then, is to reduce the density of largemouth bass sufficiently to allow higher priority objectives for walleye, panfish, and northern pike to be achieved without eliminating the bass fishery altogether. In order to achieve Objective 5.1, we must exempt largemouth bass from the current statewide minimum length limit of 14 inches. The Nelson Lake Association and resort owners should encourage their families and guests to harvest some largemouth bass of all sizes. We suspect that many bass anglers will choose to voluntarily release enough largemouth bass to maintain the desired density and size structure. If we overshoot objectives in reducing largemouth bass density, we reserve the option to return to more restrictive angling regulations. It would also be in the best interest of the Nelson Lake fishery to eliminate the “catch-and-release-only” season for bass from May 1 to mid June. Such action may be difficult to accomplish considering the region-wide implications and law enforcement issues associated with opening up harvest on one lake amid others that are closed; therefore, we do not propose such action at this time. A statewide review of this seasonal bass harvest restriction may be warranted.

An additional approach to expediting restoration of walleye dominance at Nelson Lake would be to ask our tribal neighbors to spear largemouth bass until plan objectives are reached. Replacing walleye with largemouth bass in the spearing harvest during the next few years may expedite the recovery of walleye without loss of the spearing tradition. Spearing bass could be difficult in some years when water clarity is sub-optimal. We would encourage tribal harvesters to do their best to distinguish between largemouth and smallmouth bass, and avoid spearing smallmouths if possible.

GOAL 6: A **smallmouth bass** population of low to moderate density with a moderate proportion of preferred-size fish.

Objective 6.1: Electrofishing capture rates for 7-inch and longer smallmouth bass of 20-30 per hour during the bass spawning season.

Objective 6.2: Of all smallmouth bass 7 inches and longer captured by electrofishing during the bass spawning season, 20-40% should be 14 inches or longer (RSD-14 = 20-40%).

Smallmouth Bass Status and Management Strategies: Smallmouth bass are relatively rare in Nelson Lake currently, probably due to competition with abundant largemouth bass. Yet excellent spawning substrate and moderate angler interest suggests that smallmouth bass could play a more important role in the Nelson Lake fishery. Both species of bass eat crayfish, but no species is more focused on crayfish or more adept at capturing and eating crayfish than smallmouth bass. With the 2004 appearance of rusty crayfish in Nelson Lake, our strategy will be to sustain a bass fishery and minimize rusty crayfish impacts by shifting the dominant bass species from largemouth bass to smallmouth bass. In order to accomplish this, we must implement an 18-inch minimum length limit on smallmouth bass with a daily bag limit of 1, while concurrently encouraging harvest of largemouth bass of all sizes. This will be the first lake in Wisconsin where smallmouth and largemouth bass are managed under different regulations. Numerous people with whom we have discussed this issue have assured us that most anglers can distinguish between these species, and those who cannot can “play it safe” by simply releasing all their bass under 18 inches long. Our current understanding is that smallmouth bass are less likely than largemouth bass to eat young walleye, probably because smallmouths are so focused on eating crayfish when available. Good populations of walleye and smallmouth bass coexist across the Canadian Shield. This cannot be said of walleye and largemouth bass.

Spawning conditions for smallmouth bass in Nelson Lake could be improved by creating tree drops or installing half-log structures at depths of 2-3 feet in semi-protected areas with small gravel substrate. We believe that construction of smallmouth bass spawning structures would be an excellent use of the time and resources of conservation-minded members of the Nelson Lake Association over the next several years.

As largemouth bass density declines and smallmouth bass spawning habitat improves, recruitment of smallmouth bass should improve naturally. However, we must catalyze this process by stocking large (4-6 inch) smallmouth bass fingerlings at a density of 5 per acre (12,500 fish) on a one-time basis after a couple years of increased largemouth bass harvest under no length limit. The pooled financial resources of several partners may be needed to produce and/or purchase such a high number of smallmouth bass fingerlings. Waiting until some of the largemouths are removed will probably improve survival of this one-time “shot-in-the-arm” stocking of smallmouths.

General Habitat Strategies: Introduction of invasive exotic species should be discouraged by the Nelson Lake Association via their newsletter and appropriate signing at resorts and public access areas. Continued focus on good shoreland management will help maintain a moderate level of primary productivity in Nelson Lake. Diligence in maintaining wild shorelines and wide buffer strips between managed lawns and the lake will be rewarded with the high quality fishery envisioned in this plan. The less phosphorus and nitrogen that reaches the lake, the more favorable conditions will be for maintenance of a fish community dominated by walleye. Wild shorelines can exist on well-managed private properties as well as public lands. But the more undeveloped land that can be purchased and placed into public ownership, the greater the likelihood that Nelson Lake will remain a special place for our children’s children.

Summary of Recommendations and Action Items

- DNR and various partners should strive to stock extended-growth (5-7 inch) walleye fingerlings at a density of 5/acre (12,500 fish) every fall for the next five years (2005 through 2009) or until it becomes clear that our walleye density objective will be or has been achieved.
- Maintain the current statewide 15-inch minimum length limit for walleye during the initial stages of walleye population restoration. The Nelson Lake Association and resort owners should encourage compliance.
- DNR should meet with Sawyer County, GLIFWC, and the Nelson Lake Association to discuss and approve a periodic winter drawdown (frequency and degree to be negotiated, but probably 1-4 feet) of the Nelson Lake pool.
- The Nelson Lake Association should consider placing fresh conifer trees every year into shallow areas where yellow perch are likely to spawn.
- We respectfully ask that anglers and spearers voluntarily minimize their harvest of adult walleyes over the next three to five years as we work together to restore a walleye population that meets our objectives. (We suggest that our tribal neighbors maintain their spearing tradition by targeting largemouth bass instead of walleye during the walleye population recovery period.) Success of this voluntary effort will hinge upon the commitment and cooperation of the Nelson Lake Association, resort owners, GLIFWC and the tribes they serve.
- Maintain the reduced daily bag limit of 10 panfish, but implement a 9-inch or 10-inch minimum length limit for bluegill and a 10-inch or 12-inch minimum length limit for black crappie eventually if anglers harvest too many young adult panfish under the 10-bag limit. The Nelson Lake Association and resort owners will be instrumental in encouraging compliance.
- Implement a 32-inch minimum length limit for northern pike, with reduced daily bag limit of 1.
- Exempt largemouth bass from the current statewide minimum length limit of 14 inches. The Nelson Lake Association, resort owners, and tribes should encourage their families and guests to harvest some largemouth bass of all sizes.
- Implement an 18-inch minimum length limit on smallmouth bass with a daily bag limit of 1, while concurrently encouraging harvest of largemouth bass of all sizes.
- The Nelson Lake Association could improve spawning conditions for smallmouth bass by creating tree drops or installing half-log structures at depths of 2-3 feet in semi-protected areas with small gravel substrate. Operations would be facilitated by an overwinter drawdown.
- DNR and various partners should strive to stock large (4-6 inch) smallmouth bass fingerlings at a density of 5 per acre (12,500 fish) on a one-time basis after a couple years of increased largemouth bass harvest under the proposed length limit exemption.
- Nelson Lake property owners and the Nelson Lake Association should continue their exemplary efforts to protect wild shorelines, enhance shoreland buffers, and reduce nutrient input (particularly phosphorus) into Nelson Lake in order to control aquatic plant growth and favor walleye over largemouth bass.

APPENDIX

Results of Visioning Session for Stakeholders in the Fishery of Nelson Lake in Sawyer County, Wisconsin

Date: June 19, 2004

Time: 1:00 p.m. to 5:00 p.m.

Place: Veterans Hall in Hayward, Wisconsin

Facilitator: Dave Neuswanger, Fisheries Supervisor, Upper Chippewa Basin, WDNR

Technical Advisor: Frank Pratt, Senior Fisheries Biologist, Sawyer County, WDNR

Profile of 41 Participants:

Lakeside Landowners – 32

Hayward Area Anglers – 5

Fishing Guides – 0

Business Owners – 3, including President of the Nelson Lake Resort Owners Association

Special – President of Walleyes for Northwest Wisconsin

Table A1. Levels of sport fishing interest among visioning session participants in Nelson Lake fish species nominated for consideration.

Fish Species Nominated	Level of Participant Fishing Interest			
	High	Medium	Low	None
Walleye	31	6	0	0
Bluegill	20	12	2	0
Black Crappie	18	10	5	0
Northern Pike	2	15	15	1
Largemouth Bass	1	13	16	1
Smallmouth Bass	1	8	12	5
Yellow Perch	0	9	14	6
Pumpkinseed	2	2	9	13
Muskellunge	0	6	6	18
Brook Trout*	8	4	3	14

*Brook trout occur in low numbers seasonally as they migrate to and from tributary streams.

Table A2. Preferences for numbers versus size and catch versus harvest among visioning session participants for fish species perceived to be most important at Nelson Lake.

Important Fish Species	Preference for Numbers versus Size			Preference for Catch-and-Release versus Harvest		
	Emphasis on Number over Size	Prefer Balance	Emphasis on Size over Number	Emphasis on Catch and Release	Prefer Balance	Emphasis on Maximum Sustainable Harvest
Walleye	6	28	2	1	28	2
Bluegill	0	22	10	3	28	1
Black Crappie	0	17	14	0	26	2
Northern Pike	0	9	18	7	13	2
Largemouth Bass	0	11	14	9	15	3

