Fishery Management Plan

Big Sissabagama Lake
Sawyer County, Wisconsin

November 2025

Prepared by:

Max Wolter, Senior Fisheries Biologist
Wisconsin Department of Natural Resources

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FOREWORD AND ACKNOWLEDGMENTS

This is a long-term strategic plan that will guide our fishery management efforts on Big Sissabagama Lake for many years to come. We believe our fishery management plans should be based upon a shared vision that is developed by combining broad-based survey information and interactive input from local stakeholders. From those sources we determine user preferences considering ecosystem capability. We believe the goals of a good plan must reflect the shared vision between users and managers; and measurable objectives must be set so we know whether selected strategies are succeeding or failing. We believe in making good tries and learning from failure. Part of that process involves amending strategic plans (like this document) when failure dictates that we either develop more realistic objectives or change our strategies to achieve reasonable objectives. This plan should 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 possess neither the wisdom nor the authority to commit DNR or partner resources to a specific 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. We will do our best to justify actions we believe necessary to realize our shared vision to DNR leaders and the public as time and circumstances permit. We promise only to consult this plan annually as we allocate our time and resources to the many important projects before us.

We want to thank the Sissabagama Lake Association for their assistance in organizing and advertising the public feedback session and online survey. While we stress that these waterbodies belong to all people, whether property owners or not, partner groups such as these are critical in undertaking the large meaningful projects needed to advance effective fisheries management.

We also want to thank the 33 stakeholders who gave us an evening of their time to help us develop the vision that forms the backbone of this plan. An additional 162 people offered input through an online survey, which was also appreciated and very useful. We are very pleased to incorporate all input at this appropriate stage in the planning process; and we look forward to 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.

-- Max Wolter and the

Hayward DNR Fish Team

BACKGROUND

PHYSICAL DESCRIPTION OF WATERS

Big Sissabagama Lake (referred to as "Sissabagama Lake" from here on) is 805 acres in surface area. The lake lies just south of Stone Lake in Sawyer County, Wisconsin. Sissabagama Lake is in the Couderay River drainage (212 square miles) which is within the Upper Chippewa River drainage. Sissabagama is the most upstream lake in this portion of the watershed, with Sand Lake, Whitefish Lake and Lac Courte Oreilles lying downstream before water ultimately flows out through the Billy Boy Flowage and the Couderay River. Big Sissabagama Lake has four public (state) islands and is elongated in shape with several large bays. Little Sissabagama Lake is located nearby but is not connected to Big Sissabagama Lake, does not have a public boat ramp, and is not included in the scope of this plan.

The dam that regulates the water level of Big Sissabagama Lake is located on the north side of the lake (Figure 1). The outflow from the dam is "Sissabagama Creek", which flows directly to Sand Lake. The dam is in private ownership and has 2.5 feet of hydraulic head. There is no active water level manipulation resulting from dam operation (flat pool).

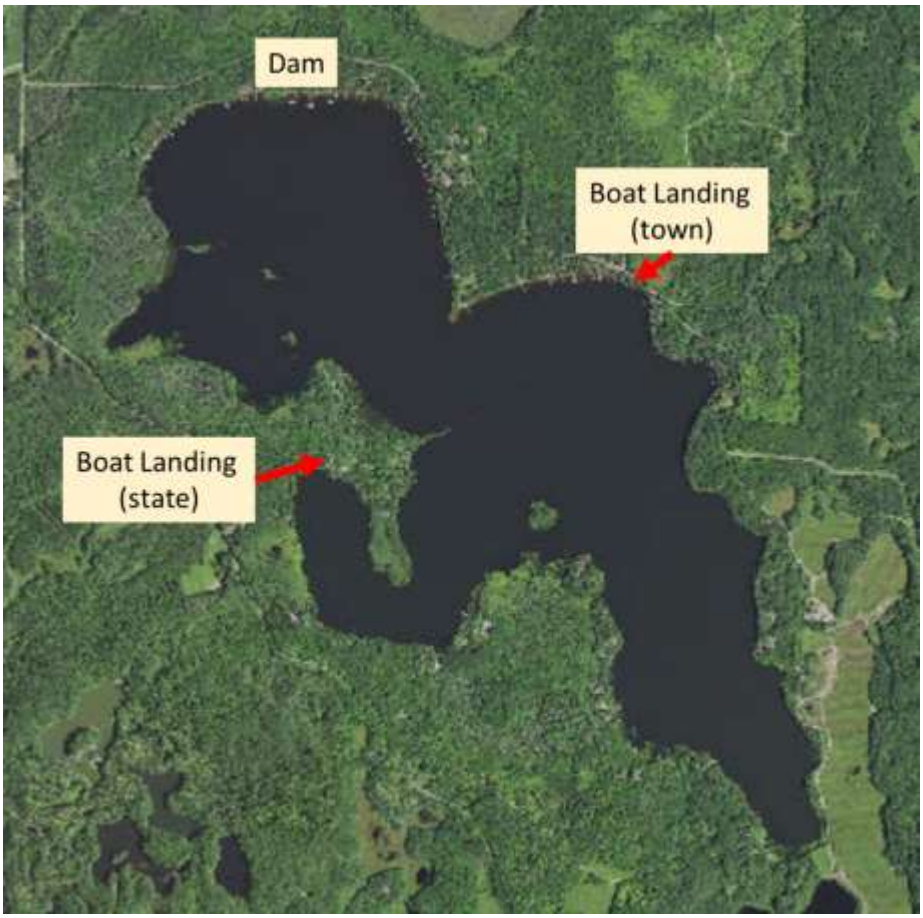

Figure 1. Map of Big Sissabagama Lake with dam and boat landings highlighted.

LAKE AND WATERSHED CHARACTERISTICS AND PRODUCTIVITY

Sissabagama Lake has a maximum depth of 48 feet (Table 1). Bottom substrates consist primarily of sand with some areas of rock and bays with muck bottom. Bogs line portions of the shoreline, while the rest is primarily wooded. The watershed consists of 44% forest and 13% wetland, with an additional 35% being surface waters (lakes). Land used for agriculture accounts for 4% of the watershed, a relatively high percentage for northern Wisconsin. Around 5% of the watershed is developed (Midwest Glacial Lakes Conservation Planner). Very little of the watershed is in a protected conservation status.

Water quality in Sissabagama Lake is good and there are no apparent issues that would limit fishery health. Water clarity has remained consistent through time, with around 10 feet of Secchi Disk visibility on average. Nutrient loading does not appear to be a concern as Trophic State Index values have been steady. Dissolved oxygen is often limited below the thermocline in late summer, based on temperature/dissolved oxygen profiles recorded by volunteer water quality monitors, but this is common for lakes in this area.

Table 1. Physical characteristics and most current (year in parentheses) limnological parameters for Sissabagama Lake in Sawyer County.

Physical Characteristics	**Value**
Surface Area	805 acres
Maximum Depth	48 feet
Shoreline Distance	8.2 miles
Chemistry and Primary Productivity	
pH	8.1 (2001)
Total Phosphorus	13 µg/l (2023)
Chlorophyll *a* (July)	4 µg/l (2024)
Secchi Disk Visibility	5-11 feet (2022-2024)
Trophic State Index	Ranges from 48-54 (2022-2024) – classed as mesotrophic/borderline eutrophic

LAKES CLASSIFICATION

A system was developed in 2019 for classifying Wisconsin lakes. Rypel et al. (2019) analyzed 5,950 lakes statewide and grouped them into 15 lake classes. Lakes were grouped by fish communities, physical characteristics and water quality.

Sissabagama Lake is classed as a “Complex-cool-dark” lake. “Complex” means a lake has four or more species of gamefish and “cool” means it is projected to have cooler (below 50°F) water temperatures more often than other lakes. “Clear” or “dark” indicate whether the water is more or less turbid compared to the baseline for

temperate lakes (Rypel et al. 2019). Goals and objectives developed for each species in this plan were selected based on what is commonly observed for fisheries within the same lake class. This approach will provide more realistic objectives, given the biological potential of the lake.

AQUATIC COMMUNITY OVERVIEW

Rooted aquatic vegetative growth is present throughout Sissabagama Lake and can be quite thick in many of the shallow and mucky areas. Pockets of emergent vegetation are present in many bays and some main-lake shorelines and extend out along the rock bar in the middle of the lake. Only shallow areas with rock or compacted sand bottom are void of vegetation. Submergent vegetation is also present throughout the lake, including a fairly dense ring along most of the shoreline (Figure 2). A 2023 survey by Aquatic Plant and Habitat Services LLC. found a Floristic Quality Index of 40.17, which is "very high quality" and represents a healthy aquatic plant community (https://dnr-wisconsin.shinyapps.io/AquaticPlantExplorer/).

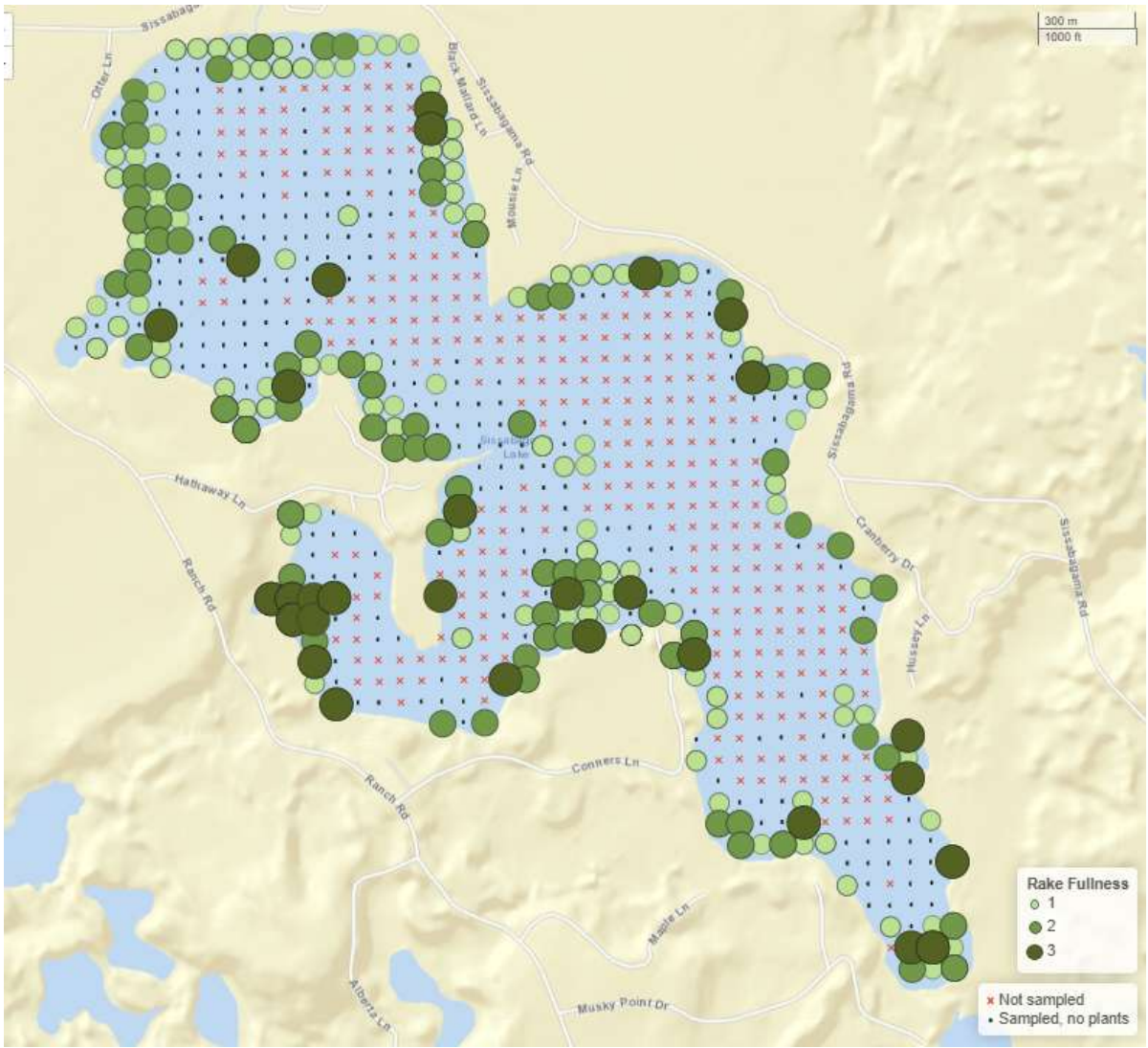

Figure 2. Aquatic plant presence (all species) and density (rake fullness) in Sissabagama Lake during a July 2023 point intercept survey. Source: Wisconsin DNR Aquatic Plant Explorer Shiny App.

However, Eurasian milfoil (*Myriophyllum spicatum*) has been recently documented in Sissabagama Lake and its impact on the greater plant community will be a topic of interest. Many other lakes in the area have Eurasian milfoil and impacts on fisheries are difficult to decipher. Other invasive species present in the system include banded mystery snail (*Viviparus georgianus*) and Chinese mystery snail (*Cipangopaludina chinensis*). Northern pike (*Esox lucius*) could be considered an introduced species, as pike are not believed to be native to the upper Couderay River drainage but are native to other drainages in the area (discussed in more detail on page 34).

The lake supports a variety of wildlife including shorebirds, furbearers, ducks, geese, loons, turtles, crayfish and amphibians.

HUMAN DEVELOPMENT AND PUBLIC ACCESS

There are approximately 159 individual developed residences and businesses with platted access to the shoreline of Sissabagama Lake according to the Sawyer County online platting resource (February 2022). Undoubtably, there are more off-water residences that have some form of shoreline access through an easement or common use area that are not included in that figure. That comes out to 19 residences and businesses per mile of shoreline, which is fairly average development in comparison to other lakes in the area (17 per mile is the average for large Sawyer County lakes). Very little of the shoreline (<1%, mostly including the islands) is formally protected from development via public ownership or conservation easement. Most undeveloped areas are simply unsuitable for building because they are low-lying. Businesses on and near Sissabagama Lake include restaurants, campgrounds and cabin rentals.

There are two public boat landings on Sissabagama Lake. The larger boat landing and adjacent parking area are owned and maintained by the Wisconsin DNR since 1964. There are about 5 total parking spaces at this boat landing. The other boat landing is a gravel ramp off of Sissabagama Road on the east side of the lake maintained by the Town of Sand Lake. This landing does not have a designated parking area.

FISH HABITAT

The composition of structural fish habitat in Sissabagama Lake includes a mix of aquatic vegetation, wood and rock/sand bars and humps. Both emergent and submergent aquatic plants are present throughout the lake, including several bays where lily pads and other types of plants are very dense. Reed beds are present on some of the main lake bars and shorelines in the northwest portion of the lake, among other scattered locations. Submerged wood is present, primarily along undeveloped shorelines, though the amount is almost certainly much lower than what would have been present historically. Anglers enjoy the bathymetric features of Sissabagama Lake, including islands, humps, bars and deeper holes.

Walleye (*Sander vitreus*) spawning has been most well-documented to occur at points along the eastern shoreline where rock and cobble can be found. These shorelines also receive the prevailing westerly wind and waves, which likely keeps spawning substrates free of detritus and excessive algal growth. Muskellunge (*Esox masquinongy*) spawning

is thought to be more dispersed throughout bays around the lake and is not reliant on rock substrates for success.

Fish cribs have been added to Sissabagama Lake at various points in the past, though records on specific placement locations have not been found. Cribs should not be expected to deliver the same ecological benefits as other naturally occurring habitat types (shoreline wood, aquatic vegetation) and future crib projects will not be a recommendation of this plan.

HISTORICAL PERSPECTIVE ON THE FISHERY AND PAST MANAGEMENT

Sissabagama Lake has a reputation as a fishing destination that defies the lake's relatively small size compared to other waters in the area. Most of that strong reputation was built on walleye and muskellunge fishing (Figure 3), but panfish, bass and pike also offer opportunities to anglers.

Sissabagama has historically been one of the most productive muskellunge (musky) fisheries in the area, based on results from almost 40 years of the Hayward Lakes Fall Musky tournament. The muskellunge population is native but has been supported by a mix of stocking and natural reproduction over the years (Appendix Table A1). Muskellunge evolved as the sole esocid (pike family) species, as northern pike were not present in the Couderay drainage until the mid-20th century (Inskip 1986). Sissabagama has demonstrated trophy musky potential of growing fish over 50 inches, which is impressive for a lake of its size, earning it an A1 (trophy) designation in the DNR's muskellunge waters classification system.


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Denny Aaron, left, and Ed Jeffers, both of Eau Claire and members of Musky Masters Fishing Club, caught these two muskys Saturday evening within 45 minutes of each other on Big Sissabagama Lake. Aaron's was 47-in., 22-lb. caught on a Black Topper; and Jeffers' was 46½-in. 21-lb. caught on a Black Creeper. Each of the 12-member club votes for a campground and lake that they want the group to fish in during their once-a-month tournament. They voted this month to fish out of Lofgren's Campground on Big Sis.

Figure 3. A 1976 photo of anglers showing off two Sissabagama Lake muskellunge.

Sissabagama has at times sustained a high-density walleye population that was still capable of producing large fish (Figure 4). Interestingly, walleye are an introduced species in Sissabagama Lake, like most other lakes in the Couderay River drainage. Several decades of initial stocking in the early 20th century led to a period where walleye reproduced successfully and were the dominant gamefish species from the 1960s through the early 2000s. Warning signs about walleye reproduction faltering began to emerge in the early 2000s. Rehabilitative actions were taken, including stocking and more protective regulations, but meaningful natural reproduction has not returned. This phenomenon has been observed in other lakes in the area, including many of Sissabagama's neighboring lakes like Big Chetac and Lac Courte Oreilles. This issue is discussed more in-depth on pages 18-19. Growth of walleye in Sissabagama has been slow at different points in time, mostly when walleye abundance was very high. In response, the minimum length limit was removed in 1985 to allow anglers to harvest more of the abundant and slow-growing walleye. The slow growth issue went away as the density of walleye dropped. Minimum length limits were reinstated over time. Big Sissabagama was included in the Walleye Stocking Initiative in 2013, leading to more regular stocking of large fingerling walleye as a means to increase walleye abundance and create greater potential for natural reproduction to return.


Oct 5, 1976

CONSIN 54843

These two families from Rockford, Il. had a good time fishing Big Sissabagama Lake last week with Irene Belfield, second from left, holding the 8½-lb. walleye she caught, and Holger Erickson holding the 7½-lb. one he caught. Belfield also caught a 7-lb. walleye earlier. They stayed at Lofgren's Resort.

Figure 4. A 1976 photo of anglers showing off their catch of Sissabagama Lake walleye.

Anglers may also be surprised to learn that black crappie (*Pomoxis nigromaculatus*) are another introduced species (Becker 1983). Like walleye, the introduction of crappie in the early 20th century led to a popular and valued fishery. Crappie have been self-sustaining since their introduction and no stocking has been needed to maintain the population. While walleye and muskellunge get much of the attention, crappie have become the most commonly targeted fish in the lake in recent years (based on creel surveys, see Table 2), largely driven by their popularity during ice season. Sissabagama Lake currently has a 10-fish daily bag limit for crappie, which is lower than the standard statewide limit (25).

Sissabagama Lake has native populations of both largemouth bass (*Micropterus salmoides*) and smallmouth bass (*Micropterus dolomieu*). The diverse habitats available in Sissabagama Lake allow both species to do well. Largemouth tend to prefer the weedier, soft-bottomed bays, while smallmouth are more common on rock, gravel and sandy areas. There have been periods of time when smallmouth bass were caught at a higher rate than largemouth bass. Recently, largemouth bass have been the more abundant species. In fact, largemouth bass abundance got so high in the early 2010s that the minimum length limit was removed to allow anglers to harvest more of the small bass that had become available.

Yellow perch (*Perca flavscens*) have held an important place in the Sissabagama Lake fishery at different points in time. Notably, when walleye were abundant in the 1990s, yellow perch were also caught by anglers at a much higher rate than they are today. The two species are taxonomically related, and some research suggests the same factors that are leading to declines in walleye production may also affect perch (Brandt et al. 2022).

Bluegill (*Lepomis macrochirus*) and pumpkinseed (*Lepomis gibbosus*) are also part of the Sissabagama Lake fishery. Bluegill attract a fair amount of angler attention as another popularly harvested panfish. Bluegill occupy a somewhat different niche than crappie, spending more time in shallow, weedy areas. Pumpkinseed are less abundant than bluegill but are often caught incidentally.

Northern pike are not believed to be native to Sissabagama Lake or the upper Couderay River drainage. Pike were thought to have gotten into Sissabagama Lake through the creek that connects to Sand Lake, where they are also not native. The first reports of northern pike in Sissabagama Lake are from a pair of angler catches in 1972 (similar timing to their appearance in Sand Lake). A 1974 survey was conducted specifically to look for pike, but none were captured in that effort. Northern pike were first recorded in DNR surveys in 1987, and by the time of the 1991 creel survey they were being caught by anglers commonly. Northern pike catch rate for anglers continued to increase over the next several decades (Appendix Table B1). The expansion of northern pike has been met with concern in Sissabagama and other neighboring lakes. Efforts to control pike popped up periodically over the last few decades, but momentum for those efforts was never sustained. Renewed pike

management efforts began in 2017 on Lac Courte Oreilles and quickly expanded to the Chippewa Flowage, Tiger Cat Chain and Spider Chain, all of which have introduced pike.

Other species present in Sissabagama Lake include white sucker (*Catostomus commersonii*), several species of bullhead (*Ameiurus spp.)* and numerous species of minnows and darters. White sucker merit management interest because of their importance as a prey item for many species of gamefish, such as muskellunge, northern pike and walleye. Longnose gar (*Lepisosteus osseus*) are also present in Sissabagama Lake and other lakes in the watershed. Native minnow and darter species are generally too small to be captured by anglers and will not be discussed in this plan outside of the context of maintaining a balanced aquatic ecosystem and sufficient prey for gamefish.

WHAT ANGLERS TARGET, CATCH AND HARVEST

Another way to improve our understanding of the fishery of Sissabagama Lake is to examine data on how anglers spend their time fishing, what they catch and what they harvest. The most recent creel survey (angler interviews) for Sissabagama Lake took place during the 2015 open water season and included the 2015-2016 ice fishing season. Estimated angling effort for the 2015-16 season was 34,723 hours, or 43.1 hours per acre. This is one of the higher recent effort estimates observed for this area (15-20 hours per acre is more typical).

Creel data from 2015 may show signs of an angler population shifting their species focus. Walleye and muskellunge were the primary species for anglers in the past (see Appendix B for historical creel data). The most recent creel data shows shifts towards crappie and bass and changes in patterns of what fish anglers choose to harvest.

In 2015, walleye accounted for just 10% of all angling effort on Sissabagama Lake, a much lower percentage than what had been observed in past creel surveys (Appendix Table B1). A safe assumption would be that anglers fishing Sissabagama have perceived the drop in abundance of walleye and have turned their attention to other species. Very little angler harvest of walleye is believed to have occurred in 2015, with just 86 estimated to be kept by anglers of the 1,202 estimated to be caught. Undoubtedly, the more conservative angling regulation in place at that time (18-inch minimum length limit) played a role in reducing harvest. That is an intent of the regulation which is part of a larger strategy to increase walleye abundance.

Muskellunge accounted for 16% of all angling hours on Sissabagama Lake in 2015, making them the second-most targeted species. Still, this amount of effort is lower than what has been observed in the past and the catch rate for anglers (measured as hours per fish caught) was also lower (i.e., more hours of angling needed to catch a fish) than in the past (Appendix Table B1). Trends in the muskellunge population and contributing factors are discussed more on page 25. No muskellunge harvest was observed by creel clerks in Sissabagama Lake in 2015, the result of a shift towards catch and release by most muskellunge anglers coupled with the effects of restrictive size limits.

Black crappie have been the fastest-rising species in popularity for Sissabagama Lake anglers. Fishing for crappie in 2015 accounted for 26.6% of all angling effort in Sissabagama, a mark that was higher than any previous creel survey in this lake. Anglers were estimated to catch 21,809 crappie, with 62% of those being harvested. These catch and harvest statistics are also much higher than any previous creel survey of the lake. Ice fishing is a popular time for anglers to target crappie in Sissabagama, with 52% of the catch and 57% of the harvest happening in winter months (despite being a shorter time period than the open water season).

Smallmouth bass and largemouth bass account for 9.2% and 14.9% of the fishing effort in Sissabagama Lake, respectively, in 2015. However, it is likely that many bass anglers target both species simultaneously. Largemouth bass have risen in popularity by a considerable amount, even surpassing walleye in total hours fished. Harvest of smallmouth bass was quite rare in 2015, but over 1,000 largemouth were estimated to be kept by anglers, a number that was almost as high as the harvest of bluegill. This phenomenon is likely the result of high largemouth bass abundance during this period of Sissabagama Lake's history coupled with promotion of largemouth bass harvest as a strategy to restore walleye as a dominant species. That strategy has not yielded positive results for the walleye population, but harvest of largemouth bass was, and is still, a viable opportunity for anglers looking to harvest fish from Sissabagama. There may also be benefits to the bass population, which is discussed more later (page 33).

Yellow perch accounted for 4.7% of angling effort in 2015, a large drop from past creel surveys which estimated effort as high as 10.8%. The catch rate for perch was just behind crappie and bluegill, which indicated their abundance was not exceptionally low. Of the perch that were estimated to be caught, just 16.5% were harvested, which suggested anglers were catching a lot of perch that were smaller than they preferred to keep.

Like perch, a large number of bluegill were caught by anglers, but a small percentage of those were estimated to be kept. Size of bluegill in 2015 likely played a role in that pattern, since larger bluegill were relatively rare at that time. Bluegill accounted for 9.3% of angling effort.

Northern pike accounted for 9.5% of angling effort and an estimated 2,474 northern pike were caught by anglers. Creel surveys often show that many pike are caught accidentally by anglers targeting other species. Less than 10% of all pike estimated to be caught were estimated to be kept, which may be a reflection of anglers not catching the size of pike they are looking for or that some anglers are not interested in harvesting pike at all.

Table 2. Fishery characteristics based on on-site, completed-trip interviews during a 2015-2016 DNR creel survey of Sissabagama Lake. Estimated statistics are for one Wisconsin gamefish season (first weekend in May through first weekend in March). Species are shown in the order they were ranked by Sissabagama Lake anglers based on angling interest in the online preference survey conducted during this planning process (see Appendix Table C1).

Species	Hours fished (% of total*)	Estimated catch	Hours per catch**	Estimated harvest (#/acre)
Walleye	5,605 (10.0%)	1,202	6.3	86 (0.1)
Black Crappie	14,918 (26.6%)	21,809	0.7	13,488 (17)
Muskellunge	8,690 (15.5%)	214	45	0 (0.0)
Smallmouth Bass	5,135 (9.2%)	1,185	8.7	59 (0.1)
Bluegill	5,203 (9.3%)	12,627	0.6	1,559 (1.9)
Yellow Perch	2,614 (4.7%)	9,202	0.9	1,523 (1.9)
Largemouth Bass	8,365 (14.9%)	7,585	1.7	1,038 (1.3)
Northern Pike	5,338 (9.5%)	2,474	4.4	237 (0.3)

** some anglers target multiple species simultaneously (i.e., largemouth and smallmouth bass) so total % of hours fished by species does not add to 100.*
*** hours per catch includes just targeted effort and catch for a species, while incidental catch is represented in the estimated catch metrics.*

Other species reported to be caught by anglers in the creel include rock bass (*Ambloplites rupestris*, estimated 1,409 caught, 38 harvested) and pumpkinseed (125 caught, 15 harvested).

A Vision for the Fishery of Sissabagama Lake

On January 7, 2025, DNR representatives Max Wolter and Scott Braden met virtually (via Zoom) with 33 local stakeholders who were willing to volunteer their time to help develop a long-term vision for the fisheries of Sissabagama Lake Sawyer County. The DNR staff served as technical advisors to the group, presenting data on past fishery dynamics, current fisheries status and general habitat characteristics. This was a productive meeting filled with many great questions. A passion for maintaining a high-quality Sissabagama Lake fishery was evident among those in attendance. The major theme of this meeting was managing the walleye population in Sissabagama Lake, which has declined in abundance over the last several decades. Concerns about the muskellunge and crappie fisheries were also voiced and participants sounded open to a variety of types of management action. Many attendees asked insightful questions and sought to further their understanding of the fishery and the dynamics at play.

It was understood and generally agreed that professional fishery managers would select the most appropriate strategies once goals and objectives had been developed with help from stakeholders and adjusted to incorporate the capacity of these lakes to produce what is desired. This mirrored the process by which other Sawyer County Fishery Management Plans were developed. This work will be complex and is more likely to succeed with strong collaboration. Specific roles for partners are identified throughout this plan and summarized on page 37.

An online feedback option was included as part of this planning process (similar to recent plan development for Sand Lake and Spider Chain in Sawyer County). The survey was designed to obtain the same type of feedback given at the virtual session and was administered through SurveyMonkey. The survey was activated on January 8, 2025, the day after the virtual session, and remained open until February 12, 2022 (36 days). The link to the online survey was distributed through DNR and lake association distribution lists and posted online to various social media sites. Questions were designed to obtain information on angler preferences for different fishing experiences and management directions. We received 162 responses to the online feedback option, which was higher than the number of stakeholders that attended the virtual session. This undoubtably reflects the relative convenience of taking an electronic survey compared to attending a longer meeting. Inclusion of the online survey option also allowed us to capture feedback from many non-resident stakeholders (54% of those responding were non-residents to Wisconsin). We assume many of these non-residents are seasonal lakeshore owners, resort guests, or anglers who come to Sissabagama Lake to fish for short periods of time. Those responding had a range of experience with Sissabagama Lake, and 38% indicated they had fished the lake for 30 years or more.

Detailed results of the visioning session and online feedback option appear in Appendix C in tables C1 and C2. Feedback received from the in-person session and online option were generally similar, providing confidence that this combined effort accurately captured sentiment of the diverse angling community that enjoys Sissabagama Lake.

The following narrative summarizes comments and online survey results for each species of interest for anglers in Sissabagama Lake.

WALLEYE

The change in walleye fishing (discussed more on pages 18-19) was one of the biggest issues noted by anglers. Indeed, anglers are picking up on a decline in the abundance of walleye that has been driven by changes in reproductive success. This has been a major issue on many lakes in the region and one that has received a lot of research and management attention. Anglers expressed a strong interest in fishing for walleye in Sissabagama Lake, as they were the top ranked species overall. Anglers wanted to see a balance between abundance and size of walleye, and preferred a management approach that allowed a moderate amount of harvest. Anglers also raised questions about the current angling regulations, which are discussed more on page 20.

BLACK CRAPPIE

Black crappie were the second-highest ranked species in the survey, despite being the top species anglers target in creel surveys. The disconnect may be tied to the prestige and rarity of walleye compared to the relative availability and reliability of crappie in the lake. Still, many anglers expressed concern about overharvest of crappie and the perceived harvest practices of other anglers, even under a reduced daily bag limit (10 per day). Anglers expressed interest in a balance between crappie abundance and size, and a preference for moderate harvest opportunities.

MUSKELLUNGE

Sissabagama anglers are concerned about the abundance of muskellunge and shared observations about lower musky angling success as northern pike have become more abundant in the lake. There was strong support for protective measures for muskellunge, including size limits and stocking. Many anglers also expressed support for efforts that might reduce pike abundance, while acknowledging that fully eliminating pike was not feasible (and may not be popular). Sissabagama anglers had a slight preference for managing muskellunge on a trophy basis (emphasis on size over numbers) and a strong preference for catch-and-release as opposed to harvest-oriented management.

SMALLMOUTH BASS

Smallmouth bass were the more popular of the two bass species among Sissabagama anglers. Recently, smallmouth are less common in fisheries surveys and are caught less often by anglers than largemouth (Table 2). Their rarity, perhaps in conjunction with their reputation as a good fighting fish, may contribute to their popularity. Anglers showed a preference for catch-and-release management for smallmouth bass and support was expressed for treating the two bass species separately from an angling regulations standpoint. Anglers also preferred a balance between size and abundance for smallmouth bass.

BLUEGILL

Bluegill were the second-most popular panfish species for Sissabagama anglers. Some commented that bluegill were an important species for occupying young anglers, due to their abundance and being easier to catch than crappie. Anglers preferred a management approach that balanced harvest and catch and release and balanced size versus abundance.

YELLOW PERCH

Yellow perch make up a smaller portion of the angling catch than bluegill or black crappie (Table 2), which may reflect why anglers ranked yellow perch below those two species. Management preferences for yellow perch were largely similar to the other panfish species, with balance between size and abundance and between catch-and-release and harvest being the most popular responses.

LARGEMOUTH BASS

Largemouth bass have been one of the most ecologically successful species in Sissabagama Lake but remain one of the least popular among anglers. A slight majority of anglers indicated an interest in catch-and-release for largemouth bass, but a sizable portion of anglers expressed interest in harvest. There was higher interest in harvesting largemouth than smallmouth bass. Some of these attitudes may be reflective of largemouth bass supplanting walleye as the dominant gamefish species in the lake over the last few decades. Anglers also preferred a balance between size and abundance of largemouth bass.

NORTHERN PIKE

Northern pike were the lowest species of interest for Sissabagama anglers. This likely reflects their status as an “unwanted” introduction for many anglers that prefer targeting the native muskellunge. However, it should be noted that not all anglers look at pike negatively. The survey revealed that 34% of anglers had “high” or “medium” interest in fishing for pike, and 33% preferred catch and release for the species. This indicates that a sizable portion of anglers place some value in the pike fishery. Overall, anglers leaned towards managing pike for size over abundance and a plurality wanted to see an emphasis on harvest-oriented management.

OTHER SPECIES

We asked stakeholders to identify any other species that they had an interest in fishing for in Big Sissabagama Lake. A few comments mentioned rock bass or pumpkinseed as species of interest. These comments were rare enough that we will not be generating specific goals and objectives for those species. We will, however, place an emphasis on a balanced aquatic community that supports a diversity of native species.

OTHER MANAGEMENT TOPICS

Anglers and non-anglers used the survey to mention several other topics that are related to management of the lake and fishery.

Aquatic invasive species were highlighted as a current and future threat to the fishery and water quality of Sissabagama Lake. This planning exercise comes shortly after the discovery of Eurasian watermilfoil (EWM) in Sissabagama Lake. Local fisheries staff will be involved in any plans developed to manage EWM while minimizing impacts to fish and fish habitat. This plan emphasizes the importance of preventing future invasive species introductions while preserving the native ecosystem as a critical measure to providing quality fish habitat.

Enforcement of fishing and boating rules was another common theme among the comments we received. Anglers expressed concerns about compliance with current angling regulations, particularly for crappie and particularly in winter. Similarly, enforcement of boating regulations, especially those related to wake boats, were brought up as a potential risk to shorelines and fish habitat. This plan is not an enforcement document, but it may help conservation wardens prioritize their work on Sissabagama Lake.

Lastly, the survey identified a few issues related to access for lake users. Many felt that the amount of parking at the state boat landing was insufficient, especially during peak recreation season. Concerns were also raised about private access points and whether boats entering and exiting from those points were being monitored for aquatic invasive species. These comments can be used in other areas of lake planning and future access development projects, but this fishery management plan does not have authority to change access policies.

Species Goals and Objectives

GOAL 1: A walleye population that allows for moderate catch rates and low to moderate harvest.

> **Objective 1.1:** Adult walleye abundance of 2-4 per acre in spring population estimates, or a catch rate that is determined to be representative of that abundance.
>
> **Objective 1.2:** 30-50% of adult walleye over 15 inches, and 10-30% over 18 inches.

Walleye are the top species of interest for Sissabagama anglers and have been the de facto species of management focus, even before this plan was created. Most survey effort is targeted at walleye and tens of thousands of walleye have been stocked in the last 20 years (Appendix Table A1). Walleye also have an important role structuring the rest of the fish community by serving as a control on panfish abundance. Continued management attention for walleye is warranted for these reasons, but success in rehabilitating this population to what it has been in the past is far from guaranteed.

The most pressing issue for the walleye population is the lack of successful natural reproduction since the mid-1990s (Figure 5). In Wisconsin, naturally reproducing populations typically have twice the adult abundance of walleye compared to populations supported exclusively by stocking (though there are exceptions). Populations supported by natural reproduction are also far less expensive to maintain than those that require frequent stocking, of course. It is not a coincidence that the period of time when Sissabagama Lake supported strong natural walleye reproduction was also the period with the highest adult walleye abundance. When reproduction faltered around 1996 (Figure 5), the adult walleye abundance began to drop (Figure 6). Stocking and a small amount of natural reproduction in the 2020s have stopped the decline in adult abundance and the 2025 adult walleye estimate actually increased from 2019. These recent data provide some new insights into the potential of this population, though that potential may still be limited by other factors.

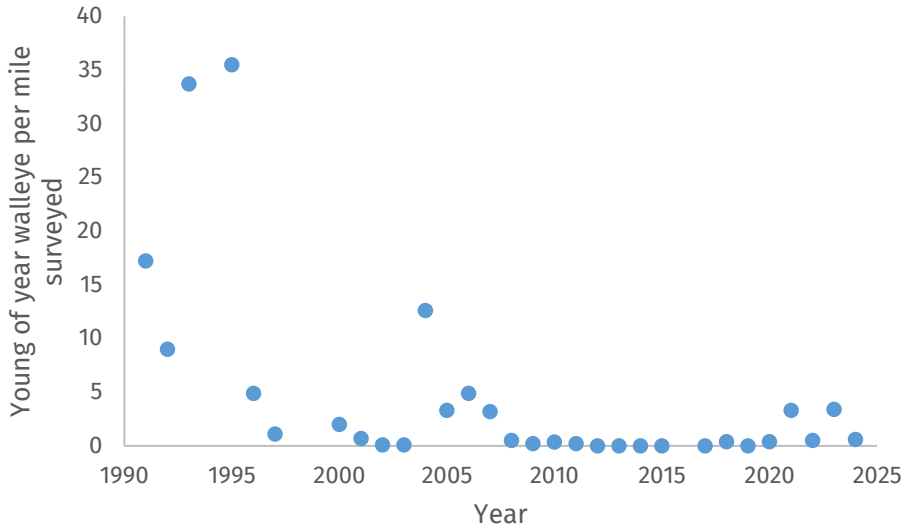

Figure 5. Walleye recruitment history for Sissabagama Lake in Sawyer County, Wisconsin based on young of year walleye per mile during fall electrofishing surveys from 1990-2024. Biologists often consider 15 young of year per mile to be a good year class that will contribute to the fishery.

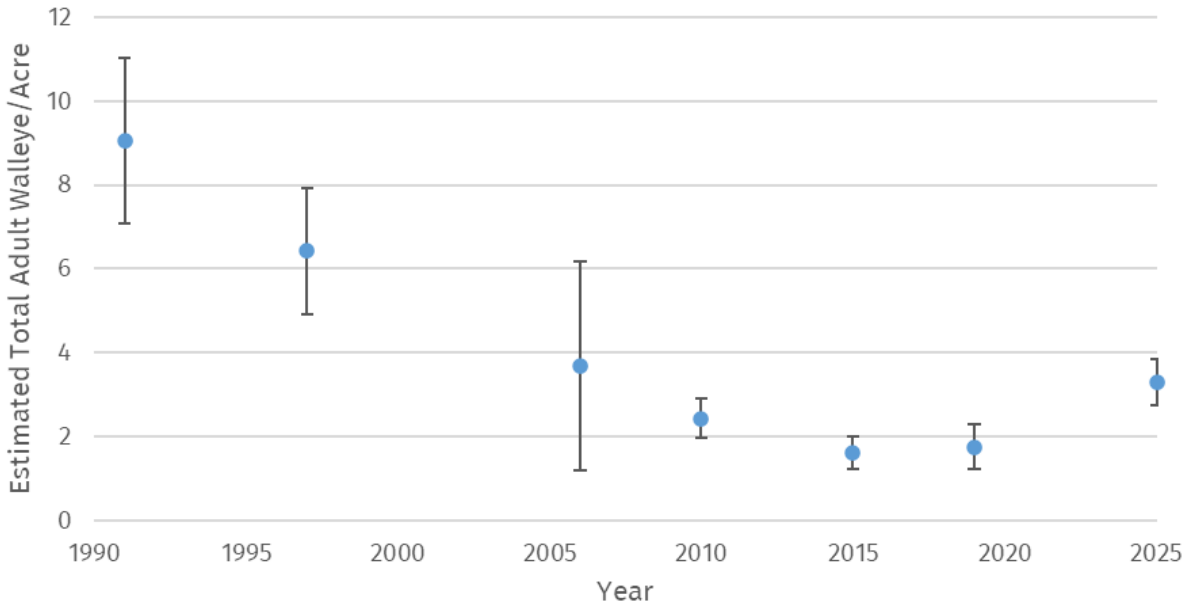

Figure 6. Adult walleye abundance estimates (fish/acre) in Sissabagama Lake in Sawyer County, Wisconsin. Error bars represent 95% confidence intervals for each estimate.

Restoration of walleye natural reproduction in Sissabagama Lake is a worthy but challenging goal. Stocking, more restrictive harvest regulations and habitat protections through zoning and other practices have slowed the decline in adult abundance but have not restored any meaningful natural reproduction to date. Other management actions to attempt to restore natural reproduction are available (habitat enhancements, major fish community manipulations, etc.), but are less certain to deliver direct results and many come with higher associated costs. It is also worth

noting that a wide array of rehabilitative efforts are being made on similar lakes across the state and region. A significant amount of research is being directed to this issue as well. We may learn about relevant future management actions that can be applied on Sissabagama Lake from these efforts happening elsewhere. In the meantime, we propose continuing basic rehabilitative actions like stocking, which has resulted in a fishable walleye population and will maintain at least the potential for future natural reproduction, even if that may not be the expectation.

Managing Sissabagama Lake as a stocked walleye population offers some simplicity and potential for anglers but may require a shift in expectations. The last decade of walleye stocking has provided a picture of what the walleye population will likely look like in the future. Adult abundance has ranged from 1.6-3.3 per acre since 2010, considerably lower than in the past when natural reproduction was driving the population. Objective 1.1 is set to be more in line with a stocked population, but this could be amended should natural reproduction return in the future.

Angling regulations will be an important management consideration, one that will greatly affect the fishing experience. The current 18-inch minimum length limit was designed to increase adult walleye abundance by limiting harvest. The regulation has been only moderately successful in achieving that goal. Harvest has been low, and adult abundance increased to a small degree. This plan is an opportunity to reconsider our approach to harvest regulations for walleye in Sissabagama Lake, with angler preferences built into the process. The trade-offs for different walleye regulation options are very clear at this moment in time. Continuing with the current regulation gives a better chance of maintaining a higher adult walleye abundance, which would translate to higher angler catch rates but lesser harvest. Loosening regulations, perhaps by reverting to the statewide regulation of a 15-inch minimum length limit and 20-24-inch protected slot limit, would open a considerable portion of the population to harvest (see Figure 7). In that scenario we would expect angler harvest to be higher, at least for a period of time, and then adult abundance and angler catch rates would likely drop. The latter option becomes much more palatable if recruitment of new fish into the population (via natural reproduction or stocking) improves from what has been observed recently. However, feedback from this planning effort suggests that loosening regulations may be more in line with angler preferences. **More analysis of walleye regulation options is needed before a proposal for a regulation change should be pursued.**

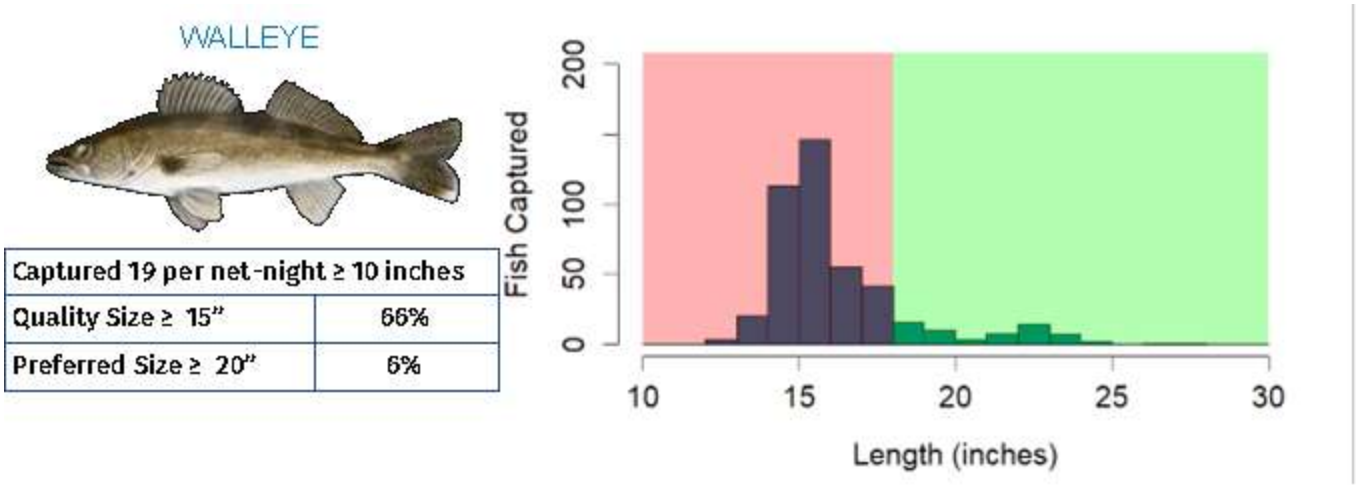

Figure 7. Capture rate, size metrics and size histogram of walleye captured during a spring 2025 netting survey of Sissabagama Lake in Sawyer County, Wisconsin. Red shaded area shows sizes protected from harvest by the current 18-inch minimum length limit and green shaded area shows sizes open to harvest.

Walleye growth in Sissabagama Lake has been close to the regional average in recent years (Figure 8). Growth is often linked with population density, where a more abundant walleye population would be expected to have slower growth. This has been the case in the past in Sissabagama Lake. We believe Objective 1.1 can work in conjunction with the observed growth of Sissabama walleye to deliver on the target size from Objective 1.2, though angling regulations will ultimately have some influence on size structure as well.

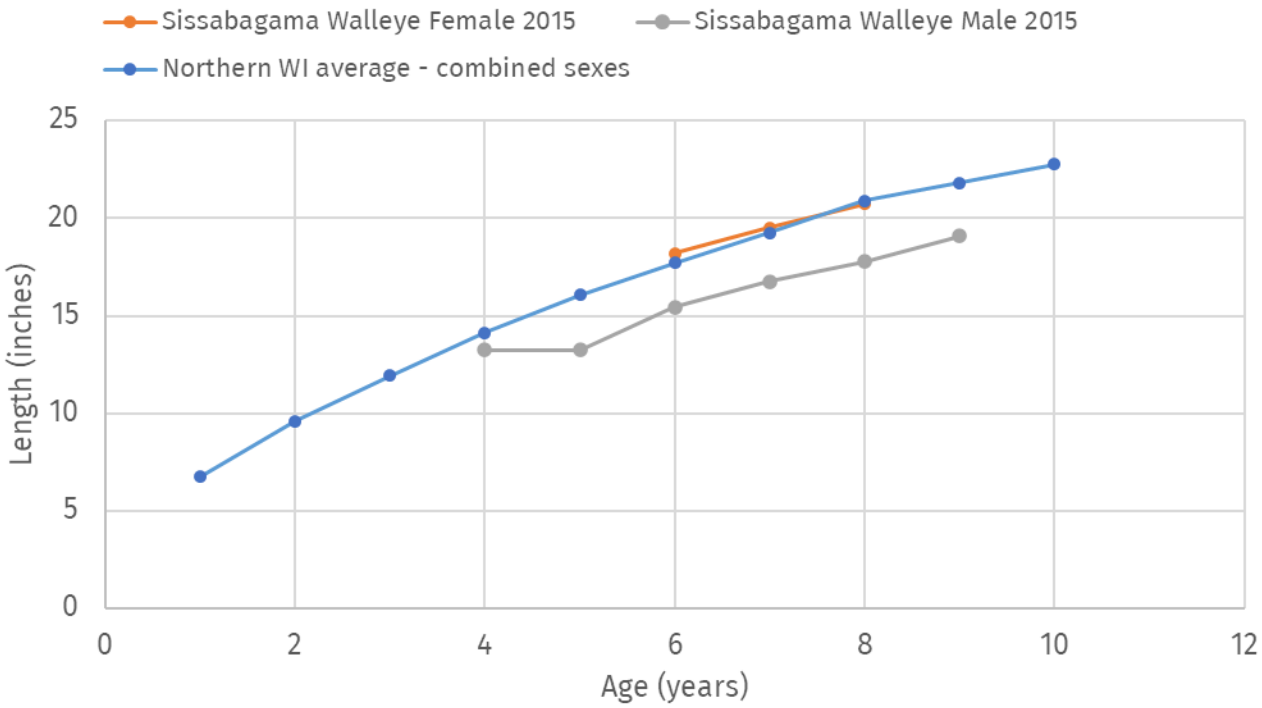

Figure 8. Length at age of male and female walleye captured in 2013 in Sissabagama Lake in Sawyer County, Wisconsin compared to a regional growth average.

GOAL 2: A black crappie population that allows for moderate catch rates and consistent quality size.

Objective 2.1: Black crappie catch rate of 10-20 per net-night in spring netting surveys (~75th percentile for lake class)

Objective 2.2: 40-60% of black crappie over 10 inches, with an additional 5-10% over 12 inches.

The current black crappie population in Sissabagama Lake has been a bright spot and a source of satisfaction among Sissabagama anglers, based on creel surveys and comments received in this planning effort. As a result, much of the purpose of Objectives 2.1 and 2.2 and resulting actions will be to preserve the quality that already exists within the population.

Sissabagama crappie have maintained high-quality size structure for many years, despite other major shifts in the fishery (more abundant pike, less abundant walleye). The percentage of preferred size crappie in Sissabagama Lake (Figure 9) is one of the highest in Sawyer County and is one of the most outstanding characteristics of the entire fishery. Sissabagama crappie grow quickly, reaching 10 inches in about 6 years (Figure 10).

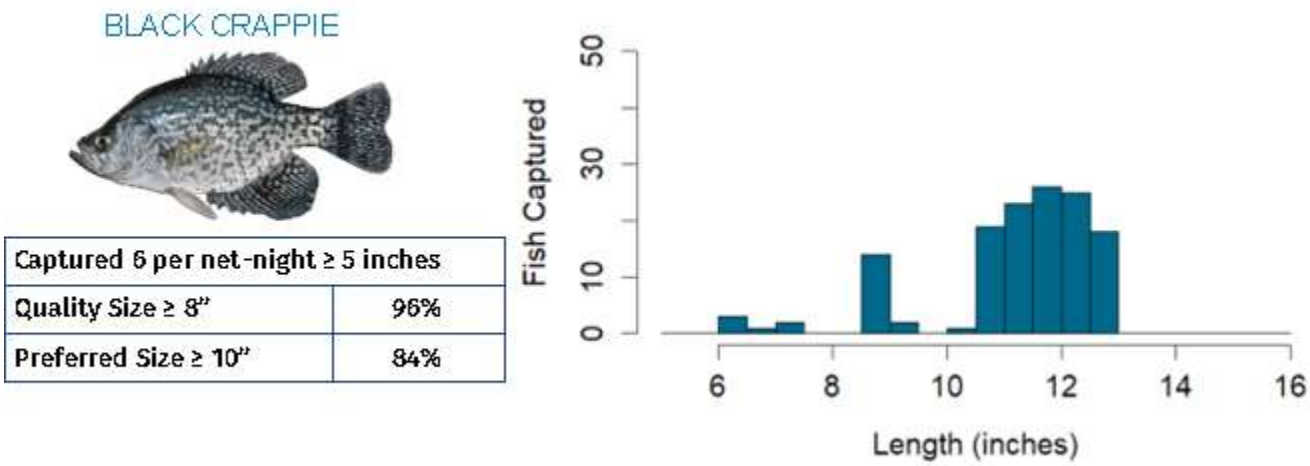

Figure 9. Capture rate, size metrics and size histogram of black crappie captured during a spring 2025 netting survey of Sissabagama Lake in Sawyer County, Wisconsin.

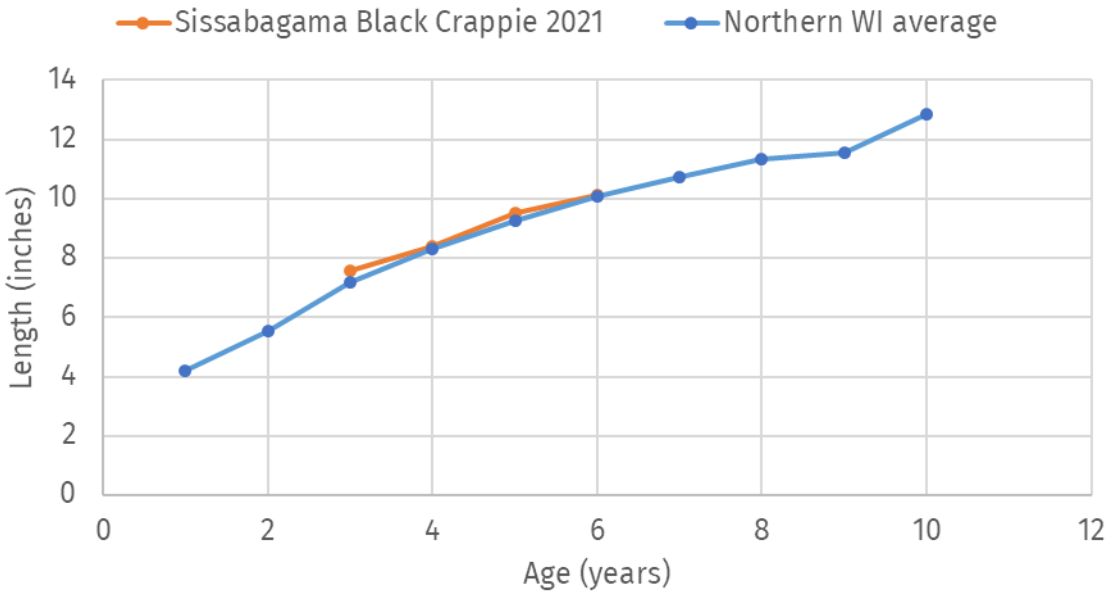

Figure 10. Length at age of black crappie captured in 2021 in Sissabagama Lake in Sawyer County, Wisconsin compared to a regional growth average.

Generally speaking, crappie in Sissabagama will benefit from some management practices that are already in place and from other goals within this plan. The current reduced daily bag limit (10 panfish per day) is a good fit for heavily fished crappie populations, which Sissabagama Lake undoubtedly is in recent years. If anything, bag limits could be further reduced in the future if surveys demonstrate a need to lower exploitation below current levels to maintain or improve quality size (objective 2.2).

Maintaining a strong predator abundance is also important for crappie management, though that may seem counterintuitive to some. Predation helps keep crappie (and other panfish) abundance at moderated levels, typically resulting in better conditions for growth. This may be a challenge in Sissabagama Lake, where the predator community has been in flux as walleye become less abundant overall. Ideally, increased or at least steady walleye abundance (Objective 1.1) would occur and would provide the necessary predation on panfish since walleye have been shown to be an effective predator on black crappie (McKeown and Mooradian 2002). Monitoring of both the crappie and walleye populations will be important to better understand the linkage between the two species. Understanding the role of other species as crappie predators, such as largemouth bass and northern pike, will also be beneficial.

Managing angler harvest will continue to be an important component of our overall management strategy for crappie in Sissabagama. The lake already has a reduced daily bag limit of 10 panfish per day (all species combined), yet concerns continue to exist about panfish overharvest. To be clear, harvest is very unlikely to significantly impact overall abundance of crappie in a lake like Sissabagama. However, impacts on size structure and availability of quality-size and trophy-size crappie could certainly be impacted by harvest and likely already are, to some degree. In the 2015 creel, 18% of anglers harvested a full 10-fish daily bag limit of crappie with the average harvest

across all anglers being 4 crappie per day (33% of anglers targeting crappie harvested 0 crappie). Anglers fishing through the ice harvested full limits more often (27% of angling trips) than anglers fishing open water (8% of angling trips). A quick analysis of the 2015 creel data indicates that a further reduced bag limit of 5 crappie per angler per day would force about 35% of anglers to release one or more crappie that they would have otherwise harvested and would result in an estimated reduction in overall harvest of about 32%. These numbers are significant and worth factoring into future discussions about panfish regulations, particularly if objectives 2.1 and 2.2 are not achieved with the current bag limit. **We will continue to monitor the crappie population and will consider further reductions in the bag limit for panfish (or crappie specifically) if Objectives 2.1 and 2.2 are not consistently being met.**

Enforcement of existing regulations is an important component of fish management and was a frequent concern for Sissabagama anglers. However, the reality of conservation law enforcement in a resource-rich area like Sawyer County is that wardens cannot have a constant presence on any single waterbody. Fortunately, compliance with the current panfish bag limit appears to be high. Only 1.5% of angling parties contacted by the creel clerk in 2015 were in violation of the 10-fish daily bag limit and none of the offenses were egregious (highest harvest was 18 crappie for one individual). **Fisheries staff will continue to convey the importance of the crappie fishery to local conservation law enforcement, with a specific emphasis on angler checks in winter when harvest activity is higher.**

Survival of crappie that anglers intend to release, particularly during ice fishing season, is another valid concern. Anglers may attempt to "sort" and keep only the larger fish they catch, while releasing smaller fish. Some anglers may be strictly catch and release or may continue catching and releasing crappie even after taking their 10 fish into possession. These scenarios create the opportunity for "catch and release mortality" which is functionally the same as increased harvest (but without the benefit of those fish being consumed). One of the specific reasons fish can die when angled from depth is a phenomenon known a "barotrauma", where the change in pressure from deep water to the surface can cause injury to fish and/or make it difficult for them to swim back down to deeper water. Ongoing research in Minnesota on this topic may shed light on the likelihood of mortality for winter-released crappie and what strategies may minimize that mortality. **In the meantime, this plan advocates for several common-sense measures that anglers can adopt and share within their angling circles and can be shared via signage, newsletters and other means** (PARTNERSHIP OPPORTUNITY)**:**

1. Plan to harvest the first fish you catch (i.e., do not sort). Most Sissabagama crappie are an acceptable size for harvest
2. Target fish that are higher in the water column when possible, this will result in less catch and release mortality from barotrauma if you do need to release one (too small to fillet)
3. Stop fishing crappie when you get your bag limit or hit the number of fish you intend to take home. Switch to targeting pike or other species.

There are very few levers of control for crappie in a lake like Sissabagama. The quality of the population will in many ways depend on decisions made by anglers and shoreline owners. Leaving fallen wood (or in some cases adding wood) may also benefit crappie by providing places for them to spawn and feed.

GOAL 3: A muskellunge population that allows for moderate catch rates, quality size and occasional trophy fish.

> **Objective 3.1:** Adult muskellunge abundance of 0.2-0.4 per acre in spring population estimates, or a catch rate that is determined to be representative.
>
> **Objective 3.2:** 20-40% of adult muskellunge over 42 inches, and 5-10% over 48 inches.

As a native muskellunge lake, Sissabagama historically supported enough natural recruitment of muskellunge to sustain the population. Even after European colonization of the area and early development around Sissabagama Lake, muskellunge recruitment remained steady throughout much of the 1970s and 1980s. Some stocking still occurred during this period (Appendix Table A1), as was common practice even in lakes where reproduction was likely adequate.

There have only been two estimates of adult muskellunge abundance in Sissabagama Lake. In 2001 there were an estimated 198 adult muskellunge (0.25/acre). In 2010 there were an estimated 64 adult muskellunge (0.08/acre). Objective 3.1 is set to manage muskellunge at an abundance that is similar to 2001, if possible. An updated muskellunge population estimate would be very useful for gauging where the population is at today and understanding the effectiveness of recent management strategies. It may also be possible to use other metrics, such as fyke net catch per effort or angling catch rates, to obtain at least a rough idea of muskellunge abundance. This may be particularly important if population estimates prove to be difficult to complete or if time or funding limit how often they can be done.

A muskellunge tagging program is already underway in Sissabagama Lake, but there are opportunities to ramp up this effort. Passive Integrated Transponder (PIT) tags are a device that can be implanted into a muskellunge to give it a unique identifying number. Tags can only be detected when a muskellunge is captured, and a handheld scanner is used to identify the number. Since 2014, 92 muskellunge in Sissabagama Lake have been given a PIT tag. Additionally, there have been 12 instances of a tagged muskellunge being “recaptured” with a tag. Each of these recapture events gives us insights into muskellunge growth and movement throughout the lake. Additional tag capture data may also allow us to learn more about stocking success and muskellunge abundance, possibly including estimates of the total number of muskellunge in the lake. Increasing survey effort to capture and tag muskellunge will be useful. Anglers may also have a role to play in scanning muskies for tags in partnership with DNR (PARTNERSHIP OPPORTUNITY). Several local fishing guides are already carrying scanners and checking muskies for tags.

Muskellunge reproduction can be difficult to document in standard fisheries surveys due to natural low densities of both adults and offspring. Still, we feel confident saying that muskellunge reproduction in Sissabagama Lake is currently low. Natural born muskellunge have been captured in recent fall surveys, but at low rates and not in every year. This indicates a need for supplemental sources of recruitment (stocking) to maintain a population that would deliver desirable angler catch rates and meet Objective 3.1. **Stocking should be continued at current rates and frequencies using genetically appropriate fish.**

Still, stocking is an ongoing action that has not been fully successful at improving angler catch rates (see declining angler catch rate in creel surveys in Appendix Table B1), suggesting the population abundance is lower than our target. As such, it will be important to find strategies to maximize muskellunge stocking survival. This will require applying research and findings from muskellunge stocking events in Sissabagama Lake and other similar waterbodies to determine the most effective stocking size, rate, timing and other factors to create successful stockings in the future. Fortunately, we have excellent local partners to assist in stocking. The Hayward Lakes Chapter of Muskies Inc. and the Sissabagama Lake Association may have roles to play in future muskellunge stocking in Sissabagama Lake (PARTNERSHIP OPPORTUNITY).

Even with regular stocking occurring, the population will benefit immensely from maintaining, and ideally increasing, natural reproduction of muskellunge. Successful natural reproduction is highly dependent on the quality of habitat types needed at various life stages. Muskellunge deposit eggs over areas with sparse aquatic vegetation, some wood and minimal wind and wave action. Still, more specific information is needed on specific spawning locations that are preferred by adult muskellunge in Sissabagama Lake so those habitats can be protected and in some cases possibly enhanced. **A collaborative inventory and mapping of musky spawning areas would benefit management and habitat planning efforts** (PARTNERSHIP OPPORTUNITY). Juvenile muskellunge rely heavily on aquatic plants for cover and foraging areas. These areas can be limited in many waters but are fairly common in Sissabagama Lake. **Large stands of emergent vegetation should be protected.**

Northern pike are another important and recent factor and undoubtedly influences recruitment of muskellunge into Sissabagama Lake. As discussed in other sections of this plan, northern pike are not native to Sissabagama Lake and represent a new challenge for the muskellunge population as a competitor for habitat and prey. Northern pike may also prey directly on young muskellunge, though it has not been possible to determine how common that may be. It is intuitive that less pike are better than more pike for a muskellunge population that adapted as the only esocid species in the lake. Efforts to manage pike abundance are discussed more in the section for that species (page 34).

Muskellunge size (Objective 3.2) is also important to anglers. Here, the muskellunge population in Sissabagama is likely meeting objective levels. Sissabagama has shown that it can consistently produce 45+ inch and even some 50+ inch muskellunge (Figure 11 and 12), which is impressive for a lake of this size. The prey base (including suckers,

perch and other panfish and even pike) has been adequate to allow muskies to reach this size. High-quality prey species, including white sucker, need to be protected to ensure that muskellunge will have the energy sources needed to reach large sizes. If size potential can be maintained at current levels, management effort can focus on increasing musky abundance to satisfactory levels.

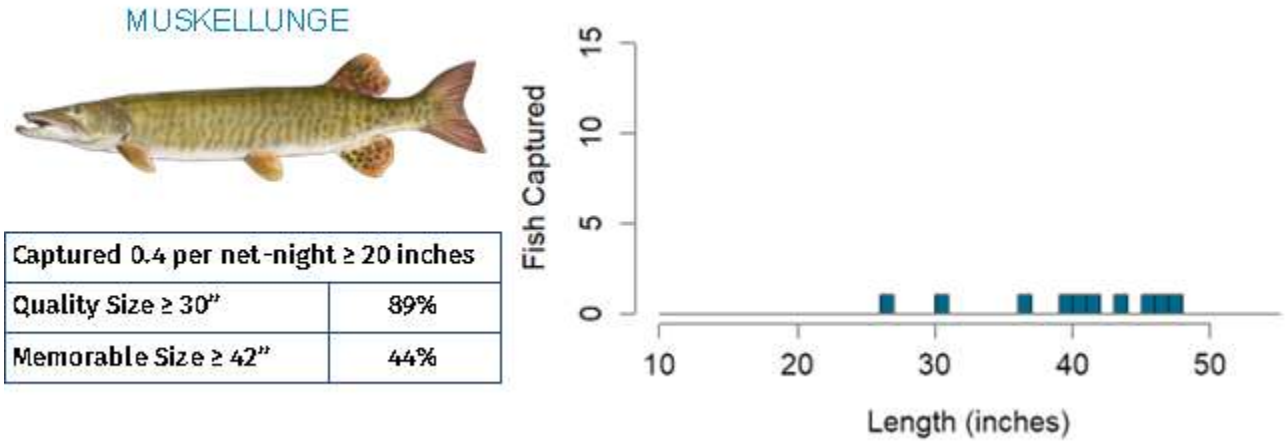

Figure 11. Capture rate, size metrics and size histogram of muskellunge captured during a spring 2025 netting survey of Sissabagama Lake in Sawyer County, Wisconsin.

Figure 12. These two large muskellunge (both over 48 inches) were captured within a few feet of each other during a spring 2025 electrofishing survey.

Minimizing mortality is also important to meeting objective 3.2. Large muskellunge are almost always very old muskellunge, meaning that efforts must be made to allow muskellunge to survive in the lake as long as possible once reaching adulthood. Responsible harvest regulations and minimizing catch and release mortality are both important factors for muskellunge longevity. We believe harvest of muskellunge by anglers is very minimal, because of restrictive regulations and a widespread catch-and-release ethic. Educating anglers on the methods for safe release of muskellunge (i.e., right equipment, handling time, etc.) and the conditions in which to avoid fishing for muskellunge (i.e., elevated water temperature, catching fish from depth) can pay dividends when it comes to muskellunge survival. This is an excellent opportunity for partner groups to amplify and distribute messaging (PARTNERSHIP OPPORTUNITY).

GOAL 4: A smallmouth bass population that allows for moderate catch rates and consistent quality size.

Objective 4.1: Smallmouth bass catch rate of 5-15 per mile in spring electrofishing surveys (-90th percentile for lake class)

Objective 4.2: 20-50% of smallmouth bass over 14 inches, and 5-15% over 17 inches.

Smallmouth bass have been more prevalent than largemouth bass in Sissabagama Lake at different points in time (based on creel data). Angler input to this plan expressed a preference for that status and recent surveys suggest it may be attainable. In 2025, smallmouth bass relative abundance barely edged out largemouth bass relative abundance for the first time in many years (Figure 13). Smallmouth abundance has not increased demonstrably, rather, the shift in the fishery has been the result in a notable decline in largemouth abundance. This coincides roughly with when the minimum size limit and early season harvest restrictions for largemouth were removed, though we have no indication that actual angler harvest would be high enough to truly affect the population in such a meaningful way. Instead, we believe the shift in the fishery is the result of largemouth bass abundance being unsustainably high around 2010, with the abundance from 2015-2025 appearing to be more stable. .

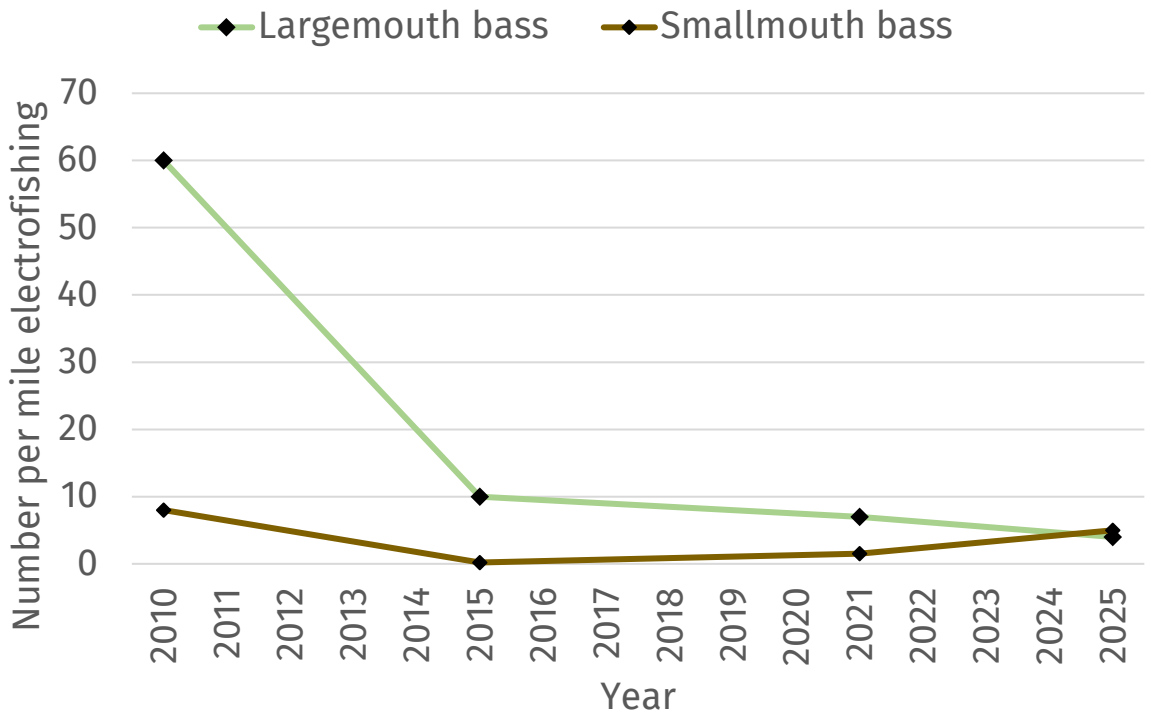

Figure 13. Relative abundance of largemouth bass and smallmouth bass in spring electrofishing surveys in Sissabagama Lake, Sawyer County, Wisconsin, between 2010 and 2025. Survey years are shown with black dots.

We believe a more abundant smallmouth population is compatible with other important objectives in this plan, including those for walleye, crappie and muskellunge, based on experiences and data from other nearby lakes. Smallmouth are not known to prey heavily on other gamefish species and most of their diet consists of crayfish, when available (Frey et al. 2003).

Smallmouth size in Sissabagama Lake has historically lagged behind other top smallmouth bass fisheries in the area like Round Lake or Grindstone Lake where 20-inch smallmouth are relatively common. **An analysis of smallmouth bass growth rates in Sissabagama Lake should be conducted to further understand any limitations to size structure.** But with little smallmouth harvest happening there are few options to further manipulate size structure. Anglers may have to be satisfied with a population that has a lot of quality size fish but limited trophy potential (Figure 14).

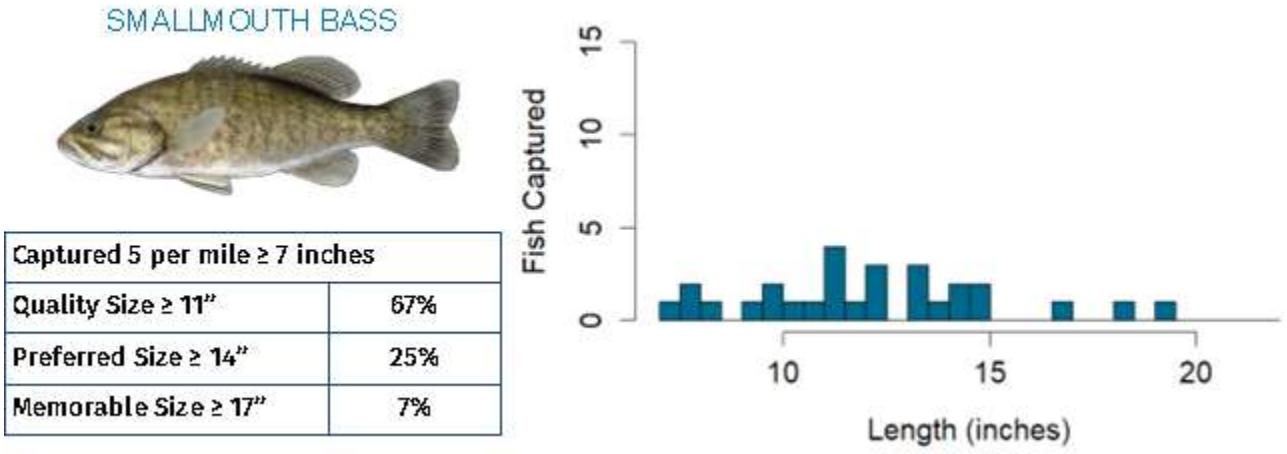

Figure 14. Capture rate, size metrics and size histogram of smallmouth bass captured during a spring 2025 electrofishing survey of Sissabagama Lake in Sawyer County, Wisconsin.

GOAL 5: A bluegill population that allows for angling opportunities and supports other elements of the fishery.

Objective 5.1: Bluegill catch rate of 50-150 per mile in spring electrofishing surveys (~25th-75th percentile for lake class)

Objective 5.2: 5-10% of bluegill over 8 inches in spring surveys

Anglers target bluegill at a lower rate and harvest of bluegill is less common in comparison to crappie. In 2015, anglers targeting bluegill exclusively harvested just 0.4 bluegill per angler and no angling parties in the creel survey harvested a full bag limit of 10 bluegill. This provides clear evidence that harvest is not a limiting factor for bluegill size or abundance. Rather, the bluegill population in Sissabagama Lake is more likely structured by habitat, predator abundance and resulting bluegill growth rates. Each are discussed more below.

Bluegill are an adaptive species with relatively non-specific habitat needs. Sissabagama provides ample habitat to support bluegill, including a diversity of plant

types and some amount of shoreline wood. Limiting bluegill abundance, at least to some degree, is an important management consideration when trying to grow larger bluegill. Maintaining a moderated amount of predation pressure on bluegill prevents overabundance and tends to allow for better growth and ultimate size (Anderson 1978). The fluctuating predator populations in Sissabagama in the 21st century (walleye and bass fluctuating up and down) led to generally poor bluegill size, with fish over 8 inches being very rare in the 2010, 2015 and 2021 surveys. A snapshot of bluegill growth conducted in 2021 found Sissabagama bluegill were growing a little slower than the regional average (Figure 15).

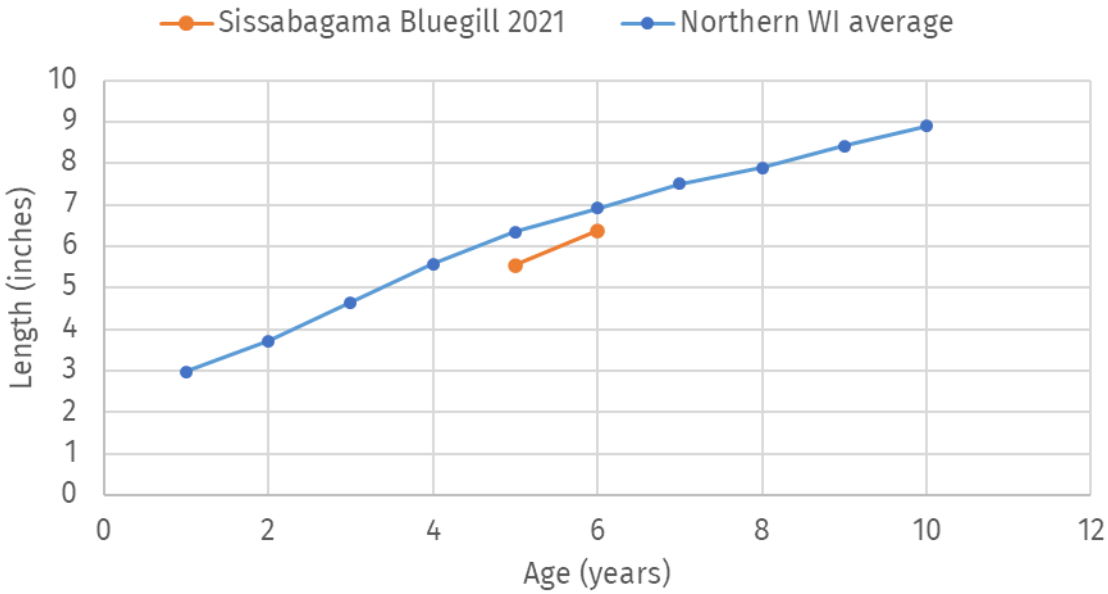

Figure 15. Length at age of bluegill captured in 2021 in Sissabagama Lake in Sawyer County, Wisconsin compared to a regional growth average.

However, the most recent (2025) survey of bluegill in Sissabagama told a very different story. Surprisingly, 18% of the bluegill catch was over 8 inches (Figure 16), a mark that far outpaced what had been observed in previous surveys. We don't fully understand the factors that led to this improvement in bluegill size, but the current status of the population is desirable and even slightly above Objective 5.2.

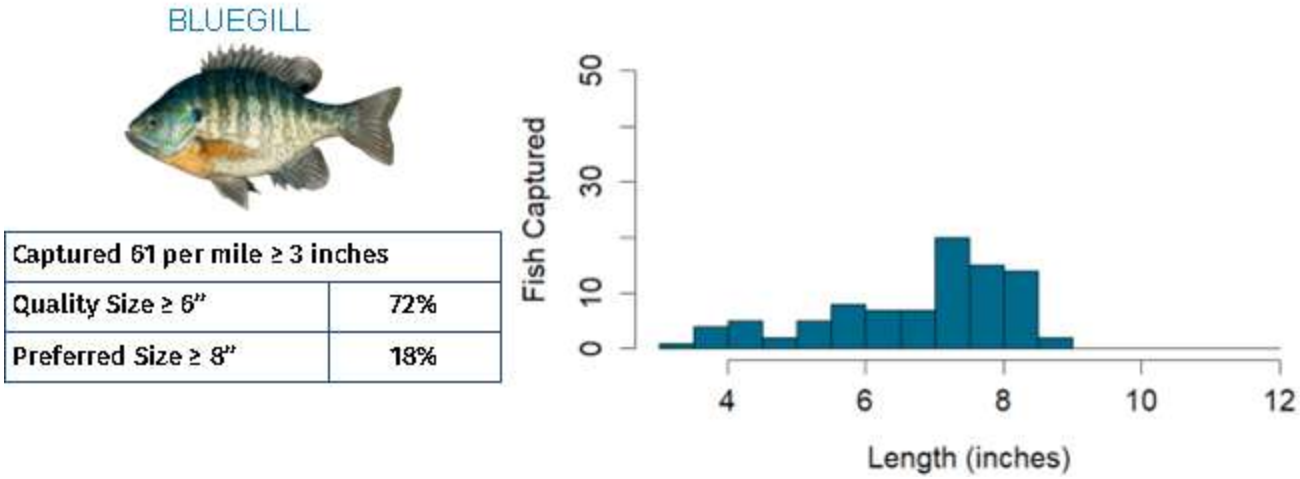

Figure 16. Capture rate, size metrics and size histogram of bluegill captured during a spring 2025 electrofishing survey of Sissabagama Lake in Sawyer County, Wisconsin.

Maintaining, or at some point rehabilitating, high quality bluegill size will rely on a combination of strategies. First, as was highlighted earlier, an effective predator population should be maintained (Objective 1.1). Second, angler harvest should be moderated to keep larger panfish in the system longer. The current 10-fish daily bag limit is an effective regulation to that end (Rypel et al. 2015). Lastly, it is important to maintain habitats that support panfish survival and growth. That will include a diverse native plant community and shoreline wood. With these three things in place, bluegill may be able to contribute more towards the quality panfishing that has historically been provided by crappie in Sissabagama.

GOAL 6: A yellow perch population that allows for angling opportunities and supports other elements of the fishery.

Objective 6.1: Yellow perch catch rate of 10-20 per net-night in spring surveys (~50th percentile for lake class)

Objective 6.2: 10-30% of yellow perch over 8 inches in spring surveys

Angler interest in yellow perch may be ahead of our current understanding of the population. Creel surveys estimate that annual perch harvest has varied from 4,919 to 24,408 over time. This may be one of our best metrics on the perch population since perch have never been a main target of any fishery surveys on Sissabagama Lake (they are captured incidentally in surveys targeting walleye, muskellunge, bass, etc.). Recent survey data indicates a perch population that has lower abundance and offers some limited opportunities for anglers (Figure 17).

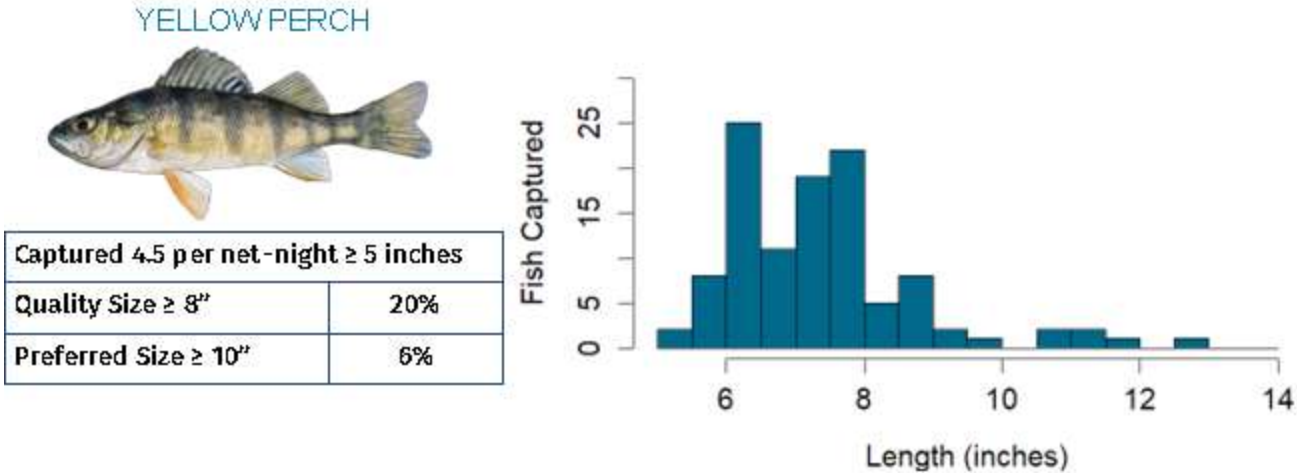

Figure 17. Capture rate, size metrics and size histogram of bluegill captured during a spring 2025 netting survey of Sissabagama Lake in Sawyer County, Wisconsin.

Conducting an analysis of perch age and growth in Sissabagama Lake will be an easy and inexpensive way to increase our understanding of the population without sacrificing survey effort towards higher priority species. **Age samples should be collected at the next available opportunity.** Results of this analysis will give insights into the strategies to achieve Objectives 6.1 and 6.2 and may even tell us if they are feasible or need to be reconfigured in the future.

We expect yellow perch abundance to be limited, especially for adults that are of a harvestable size for anglers. As a result, we believe the current reduced daily bag limit for panfish of 10 per day is appropriate. Lower bag limits could be considered in the future if perch exploitation is still shown to exceed what the lake is believed to be able to support.

Yellow perch are known to benefit from complex shoreline habitat, such as trees in the water (Sass et al. 2006). Additions of wood into appropriate areas may help maintain yellow perch abundance and help achieve Objective 6.1 (PARTNERSHIP OPPORTUNITY).

GOAL 7: A largemouth bass population that allows for quality size

Objective 7.1: Largemouth bass catch rate of 5-10 per mile in spring surveys (~50th percentile for lake class)

Objective 7.2: 30-60% of largemouth bass over 15 inches in spring surveys

Largemouth bass occupy a somewhat dubious role in the Sissabagama fishery They are native to the lake, but they are also seen as the fish that supplanted walleye as the dominant species in the 21st century. That understanding may have contributed to the relatively low interest rating for largemouth among Sissabagama anglers (7th ranked species). Still, largemouth bass are expected to be one of the more durable species going forward and can provide quality opportunities for anglers of all ages with relatively little direct management action or cost (i.e., no stocking is needed).

We believe a lower density largemouth bass population, as described in Objective 7.1, will give the best chance of having high quality largemouth size while also being compatible with objectives for other species. This level is significantly lower than when largemouth abundance peaked in 2010 (Figure 13). But as abundance decreased over the last 15 years, size has improved (Figure 18), lending support for the level at which Objective 7.1 is set in this plan. Keeping largemouth bass abundance at this lower level will likely require a combination of predation on juvenile largemouth bass from other gamefish and angler harvest of smaller adult largemouth. Environmental conditions can certainly influence largemouth abundance as well, and may in fact be the most powerful determinant, however, those conditions are largely outside of our direct control.

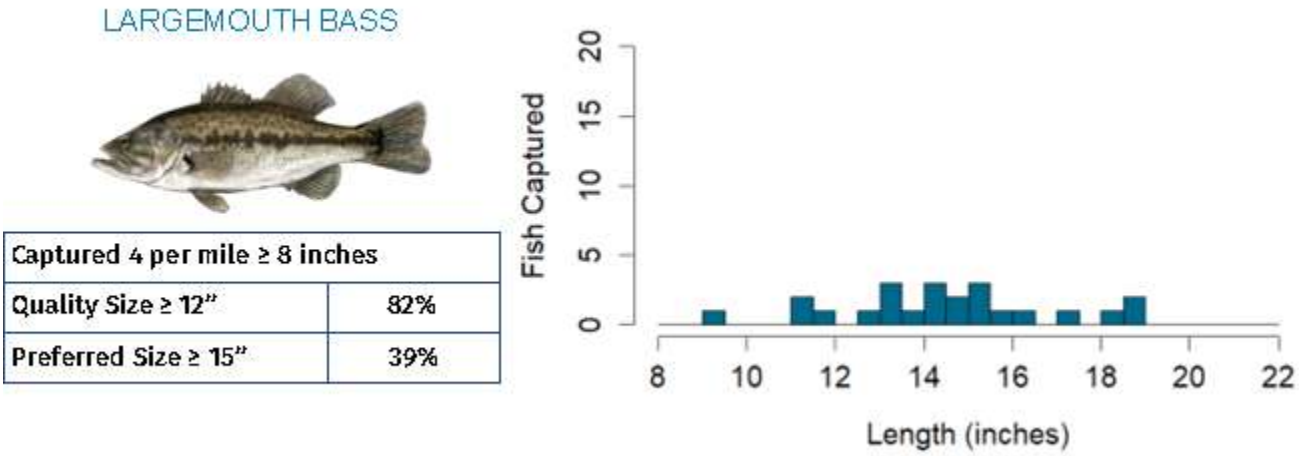

Figure 18. Capture rate, size metrics and size histogram of largemouth bass captured during a spring 2025 electrofishing survey of Sissabagama Lake in Sawyer County, Wisconsin.

Maintaining the current "no minimum" length limit for largemouth bass appears to be wise, considering the positive changes in the bass population (better size) since it was implemented in 2011. Other regulatory options could be considered in the future, including slot limits, but any potential candidate regulations should continue to allow for the harvest of small bass, which appears to be critical to managing abundance and size structure. Small bass are also healthier to eat and focusing harvest on smaller-sized bass allows higher-quality bass to remain in the system for catch-and-release angling.

Largemouth bass in Sissabagama enjoy expansive areas of aquatic plants, which provide excellent habitat. Promoting shoreline wood can also benefit bass and some research has shown better bass growth rates when wood is available (Sass et al 2006).

GOAL 8: A low-density northern pike population that allows for quality size

Objective 6.1: Northern pike catch rate of of 1-5 per net-night in spring surveys (50^{th}-90^{th} percentile for lake class)

Objective 6.2: 50-80% of northern pike over 21 inches in spring surveys

Northern pike are unique in their status as an introduced and generally unpopular species in Sissabagama Lake. Anglers ranked northern pike below all other commonly targeted species in the lake. However, we cannot simply ignore or dismiss northern pike, considering the influences they are believed to have on the rest of the fish community. Some anglers are fans of northern pike, and they are going to be a commonly caught species going forward. Our goals for northern pike are to minimize their influence on higher-priority species while providing more quality size fish for those targeting pike or catching them incidentally.

Other neighboring lakes provide useful case studies that will inform our management of pike in Sissabagama Lake. Repeated netting removals of northern pike in Lac Courte Oreilles have led to improved pike size structure and possibly greater musky stocking survival and overall recruitment. This provides “proof of concept” that thinning pike abundance can lead to better pike size. However, netting removals are not feasible on most waterbodies, including Sissabagama Lake. Angler harvest of pike has been promoted in numerous area lakes over the last few decades, with early efforts focusing on Sand Lake and more recent efforts on the Chippewa Flowage, Tiger Cat Chain and Spider Chain. The lesson from these efforts is that anglers can have an impact on a pike population and incentives and harvest promotion can convince anglers to harvest smaller pike and more pike than they would otherwise take. The challenge is that both netting and angling strategies need to be perennial. There does not appear to be a “tipping point” where a pike population collapses, and their consistent recruitment means that new pike are always coming up in the system. Carving out a safe operating space for muskellunge in the presence of introduced pike will continue to be a challenge for both Sissabagama and other lakes in the area. But lessons learned from one waterbody can be applied to others.

Pike in Sissabagama Lake have growth rates that are behind the regional average (Figure 19). Size structure of pike is fair, at best, with just 34% of the population meeting the definition of “quality size (21 inches, Figure 20). These two pieces of data indicate competition among pike for prey resources and suggest that reducing pike abundance could lead to better growth and improved size structure.

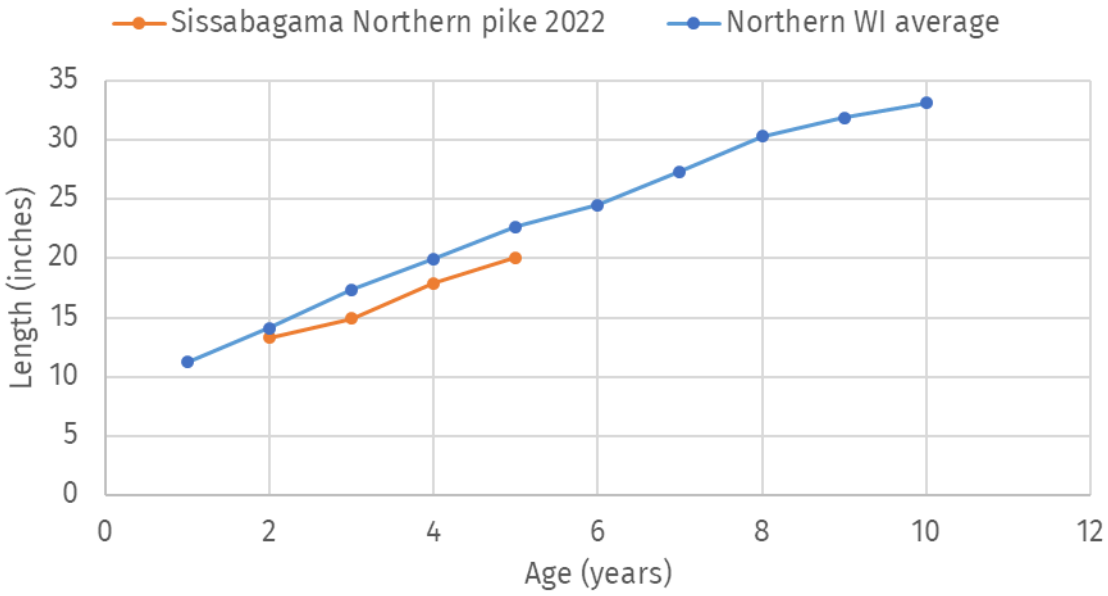

Figure 19. Length at age of northern pike captured in 2022 in Sissabagama Lake in Sawyer County, Wisconsin compared to a regional growth average.

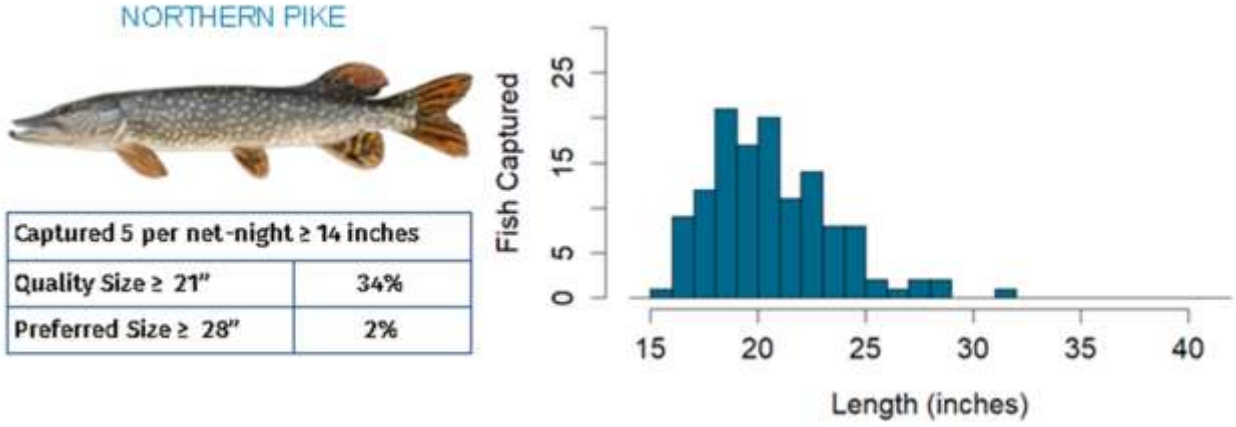

Figure 20. Capture rate, size metrics and size histogram of northern pike captured during a spring 2025 netting survey of Sissabagama Lake in Sawyer County, Wisconsin.

The work of actually reducing pike abundance is challenging and complex. As noted earlier, several lakes with similar introduced pike populations have a head start on programs to incentivize angler harvest of pike. Some are showing promising signs, but there are no overnight success stories. More intensive pike harvest/removals coupled with muskellunge stocking has the most intuitive appeal and has shown some success on Lac Courte Oreilles. Enhanced messaging or a more organized project to increase angler harvest of pike in musky stocking years is worth pursuing but will require a high level of outreach and angler coordination (PARTNERSHIP OPPORTUNITY). We will rely on partners within the lake association to help get such a project going. The key messages to convey to anglers about harvesting pike are:

1. Harvest needs to include smaller pike. Harvesting only large pike is not useful and can even be counter-productive.
2. Pike need to be legally harvested (i.e., leave the lake with the angler) and cannot be killed and left in the water or along the shore. This is illegal and can result in citations.
3. Pike harvest needs to be an ongoing action, not something that is done on one fishing trip or in one year. We expect strong pike reproduction annually in a lake like Sissabagama.
4. Pike are an excellent eating fish, and turning more anglers on to this harvest opportunity is a worthwhile goal in and of itself.

GOAL 9: A diverse native fish community that experiences no net loss of native fish species and provides adequate forage for sport fish populations.

Objective 9.1: No net loss of native fish or other aquatic species in either lake, as documented by periodic baseline monitoring surveys.

Objective 9.2: Adequate forage, as reflected by satisfactory growth rates and condition factors of sport fish populations.

Adequate year-round water quality is vital to maintain sport fish populations with acceptable growth rates and size structures. Support for good shoreland management along privately-owned shorelines would help to prevent excessive input of nutrients. Maintaining wild shorelines and wide buffer strips between managed lawns and the lake will be helpful in achieving the goals and objectives of this Plan. Wild shorelines can exist on well-managed private properties as well as public lands. Addition of woody habitat to help the lakes support a healthier ecosystem.

Preventing introduction of more invasive exotic species is an important priority shared by DNR and local partners. Lake Association and local resorts can support this mission via direct communications to their membership and guests via appropriate signing at local businesses and access areas (PARTNERSHIP OPPORTUNITY). This may be particularly important at private boat ramps on Sissabagama Lake that do not get signage posted by DNR. There are several DNR grants available to partner groups to aid in invasive species prevention and management.

SUMMARY OF MANAGEMENT RECOMMENDATIONS AND ACTIONS

The following management actions are included in this plan (page references included):

- Further analyze walleye angling regulation options to determine if a change in regulations should be proposed (page 20)
- Continue stocking walleye (as available from DNR hatcheries), unless natural reproduction returns (page 20)
- Continue to closely monitor the crappie population to determine if further reductions in panfish bag limits are necessary to maintain quality (page 23)
- Work with local conservation law enforcement staff to enforce panfishing harvest regulations, particularly during winter (Page 24)
- Complete muskellunge population estimate (if possible, page 25)
- Continue muskellunge stocking and analyze stocking rates and methods (page 26)
- Analyze growth rates for smallmouth bass (page 29) and yellow perch (page 32)

The following partner opportunities are identified in this plan (page references included):

FUNDING

- Support potential future muskellunge stocking efforts (pages 26)

VOLUNTEER AND OUTREACH OPPORTUNITIES

- Educating anglers on barotrauma and responsible methods for fishing crappie in winter and at depth (page 24)
- Educating muskellunge anglers on methods to reduce hooking mortality (page 27)
- Promoting harvest of northern pike among anglers (page 35)
- Continued Aquatic Invasive Species prevention efforts, including participation from private ramps (page 36)

HABITAT

- Help map muskellunge spawning areas (Page 26)
- Maintain healthy shorelines, including allowing wood to remain in water (or adding where possible, page 36), planting native vegetation, protecting walleye spawning areas and leaving other shoreline features including aquatic plants intact (page 36)

APPENDIX A

A summary of available stocking data for Sissabagama Lake in Sawyer County, going back to the earliest records that were kept. The stocking numbers reflect a mix of State, Tribal and private-funded stocking events. It is believed that stocking occurred prior to 1989 (including the introduction of walleye and crappie) based on language in past reports, but those specific stocking records have not been found.

Table A1. Stocking history for Sissabagama Lake in Sawyer County, Wisconsin.

Stocking Year	Species	Size Class	Number Fish Stocked	Average Fish Length (inches)
2024	MUSKELLUNGE	LARGE FINGERLING	2,393	7.3
2024	WALLEYE	LARGE FINGERLING	7,567	7.1
2022	WALLEYE	LARGE FINGERLING	8,054	6.9
2021	MUSKELLUNGE	LARGE FINGERLING	121	13.9
2020	WALLEYE	LARGE FINGERLING	8,047	6.67
2018	WALLEYE	LARGE FINGERLING	8,044	6.3
2017	MUSKELLUNGE	LARGE FINGERLING	211	12.3
2016	WALLEYE	LARGE FINGERLING	8,054	8.05
2014	MUSKELLUNGE	LARGE FINGERLING	360	11.4
2014	WALLEYE	LARGE FINGERLING	8,054	6.2
2013	WALLEYE	LARGE FINGERLING	3,595	6.8
2012	WALLEYE	LARGE FINGERLING	3,595	7.5
2011	WALLEYE	LARGE FINGERLING	4,151	7.4
2011	MUSKELLUNGE	LARGE FINGERLING	719	10.1
2009	MUSKELLUNGE	LARGE FINGERLING	359	10.2
2009	WALLEYE	SMALL FINGERLING	25,481	1.75
2008	WALLEYE	SMALL FINGERLING	25,374	1.6
2007	MUSKELLUNGE	LARGE FINGERLING	240	12.4
2005	MUSKELLUNGE	LARGE FINGERLING	359	11.2
2003	MUSKELLUNGE	LARGE FINGERLING	358	12
2001	MUSKELLUNGE	LARGE FINGERLING	359	10.5
2000	MUSKELLUNGE	LARGE FINGERLING	360	11.5
1998	WALLEYE	FRY	650,000	0.3
1998	MUSKELLUNGE	LARGE FINGERLING	172	12.6
1998	MUSKELLUNGE	FRY	100,000	0.5
1997	MUSKELLUNGE	LARGE FINGERLING	364	12.1
1996	MUSKELLUNGE	FINGERLING	719	11.8
1993	MUSKELLUNGE	FINGERLING	668	11.9
1992	MUSKELLUNGE	FINGERLING	619	9.33
1991	MUSKELLUNGE	FINGERLING	1,000	11
1989	MUSKELLUNGE	FINGERLING	485	10
1972	MUSKELLUNGE	FINGERLING	264	9

APPENDIX B

Table B1. Historical creel data collected from Sissabagama Lake at three points in time.

1991

Species	Hours fished (% of total*)	Estimated catch	Hours per catch**	Estimated harvest (#/acre)
Walleye	14,552 (24.8)	3,603	4.2	1,675 (2.1)
Muskellunge	18,134 (30.9)	776	25	33 (<0.1)
Black Crappie	5,512 (9.4)	1,257	4.5	1,061 (1.3)
Smallmouth Bass	1,944 (3.3)	2,411	3.2	15 (<0.1)
Yellow Perch	6,322 (10.8)	7,945	1.1	2,495 (3.1)
Bluegill	7,547 (12.8)	11,646	0.7	6,246 (7.8)
Largemouth Bass	1,493 (2.5)	757	4.8	31 (<0.1)
Northern Pike	1,251	286	100	81 (0.1)

1997

Species	Hours fished (% of total*)	Estimated catch	Hours per catch**	Estimated harvest (#/acre)
Walleye	13,495 (25.7)	7,242	1.9	2,320 (2.9)
Muskellunge	16,048 (30.6)	706	25	33 (<0.1)
Black Crappie	4,711 (9.0)	3,726	1.5	2,839 (3.5)
Smallmouth Bass	2,292 (4.4)	5,834	1.0	111 (0.1)
Yellow Perch	5,342 (10.2)	24,408	0.5	4,819 (6.0)
Bluegill	6,840 (13.0)	12,496	0.6	3,293 (4.1)
Largemouth Bass	1,046 (2.0)	409	4.3	20 (<0.1)
Northern Pike	1,801 (3.4)	1,529	10	237 (0.3)

2010

Species	Hours fished (% of total*)	Estimated catch	Hours per catch**	Estimated harvest (#/acre)
Walleye	6,306 (18.1)	1,715	4.2	622 (0.8)
Muskellunge	12,054 (24.9)	299	50	0 (0)
Black Crappie	8,746 (18.1)	5,747	1.5	3,848 (4.8)
Smallmouth Bass	2,664 (5.5)	1,149	11	0 (0)
Yellow Perch	1,923 (4.0)	4,919	1.3	897 (1.1)
Bluegill	6,032 (12.5)	20,431	0.4	3,072 (3.8)
Largemouth Bass	7,306 (15.1)	11,105	1.3	386 (0.5)
Northern Pike	3,078 (6.4)	2,461	6.3	266 (0.3)

** some anglers target multiple species simultaneously (i.e., largemouth and smallmouth bass) so total % of hours fished by species does not add to 100.*

*** hours per catch includes just targeted effort and catch for a species, while incidental catch is represented in the estimated catch metrics.*

APPENDIX C

Results of Stakeholders Input on the Fisheries of Sissabagama Lake in Sawyer County

Virtual Visioning Session
Date: January 7, 2025
Time: 5:30PM
Place: Zoom
Facilitators: Max Wolter (DNR)
Technical Advisors: Scott Braden (DNR)
Total attendees: 33

Online Feedback
Survey host: SurveyMonkey
Survey open period: January 8 – February 12, 2025
Profile of 162 Participants (more than one affiliation possible per person):

Lakeside Landowners – 126
Area Anglers – 36 (people who fish on these lakes but do not own property on them)
Fishing Guides – 1

Table C1. Levels of sport fishing interest among visioning session participants for fish species nominated for consideration in Sissabagama Lake. Weighted Score is calculated for each species as ((# high interest responses x 3) + (# moderate interest responses x 2) + # low interest responses) / total stakeholders providing feedback). If a stakeholder chose not to provide feedback for a given species their interest level was considered to be none.

Fish Species Nominated	Level of Participant Fishing Interest				Weighted Score
	High	Medium	Low	None	
Walleye	113	23	14	5	**2.57**
Black Crappie	93	36	20	4	**2.42**
Muskellunge	79	27	36	15	**2.08**
Smallmouth Bass	47	62	33	11	**1.95**
Bluegill	50	41	50	8	**1.89**
Yellow Perch	32	52	50	16	**1.67**
Largemouth Bass	36	47	50	19	**1.66**
Northern Pike	28	40	55	30	**1.43**

Table C2. Preferences for numbers versus size and catch versus harvest among visioning session participants for fish species perceived to be most important in Sissabagama Lake. Most popular response within each section is bolded for each species.

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	44	**96**	11	23	**91**	40
Black Crappie	31	**106**	12	26	**89**	38
Muskellunge	17	58	**76**	**145**	8	2
Smallmouth Bass	12	**91**	44	**87**	38	28
Bluegill	31	**95**	21	27	**75**	48
Yellow Perch	27	**99**	18	30	**71**	50
Largemouth Bass	18	**80**	50	**70**	36	46
Northern Pike	15	**67**	65	51	38	**63**

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