WISCONSIN DEPARTMENT OF NATURAL RESOURCES

2023 Comprehensive Fisheries Survey Report for Minong Flowage, Douglas/Washburn County, WI

Waterbody Code 2692900

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Executive Summary

Minong Flowage was surveyed in 2023 to assess the status of the fishery. We conducted a population estimate for walleye and indexed the catch rates of northern pike, smallmouth bass, largemouth bass and panfish species. We assessed general population characteristics, size structure and growth of all species.

The Minong Flowage walleye population was lower than its long-term average adult density of 4.1 fish/acre. The adult walleye population has declined since 2016 but remains at a high density (above 3.7 fish/acre for a natural fishery). The overall size structure of adults also increased since 2016. No regulation changes are recommended.

The northern pike population increased in abundance and average size remained the same as the last survey. The population seems to have stabilized since the water level drawdowns in 2013 and 2021. In addition, the catch rates were high compared to other Wisconsin Complex-Cool-Dark lakes. No regulation changes are recommended.

The largemouth and smallmouth bass populations appear healthy. Smallmouth bass catch rates increased since the last survey in 2016 and appear to benefit from drawdowns. Largemouth bass catch rates were the same as the last survey. No regulation changes are recommended.

The bluegill population was similar to 2016. Bluegill size structure was excellent, and abundance increased when compared to other Complex-Cool-Dark lakes in Wisconsin. Other panfish species like black crappie were found in lower numbers, though electrofishing may not be the best gear for those species. No management changes are recommended for panfish.

The first Minong Flowage creel survey was completed during this comprehensive survey. Total angling effort amounted to 17,984 hours or 11.5 hours/acre, less than the Washburn County average (28.3 hours/acre). Effort was highest during May (6,390 hours) and June (3,902 hours). The majority of the total angler effort was directed at walleye (47.7%), black crappie (20.3%) and bluegill (14.2%). Overall, the Minong Flowage provides a healthy fishery for walleye, northern pike, bass and panfish.

Introduction

Minong Flowage was surveyed in 2023 to assess the status of the fishery. We conducted a population estimate for walleye and indexed the catch rates of northern pike, largemouth bass, smallmouth bass and panfish species. We assessed general population characteristics, size structure and growth of all species. We also investigated potential impacts of the most recent winter drawdown that occurred in fall of 2021 to spring of 2022 on the fishery. Recent management activities have focused on regulation changes, public outreach and education.

LAKE CHARACTERISTICS

Minong Flowage is a fertile and shallow impoundment on the Totagatic River (Tables 1 & 2). More information on water quality and invasive species can be found at the Wisconsin Department of Natural Resources (DNR) Lake Page for Minong Flowage. Minong Flowage is classified as a Complex-Cool-Dark Lake (Rypel et al. 2019).

Table 1. Lake and watershed characteristics for Minong Flowage, Washburn/Douglas County, WI.

Size (ac)	1,587
Max depth (ft)	21
Mean depth (ft)	9
Watershed Area (ac)	192,296
Lake class	Complex-Cool-Dark

Table 2. June – August mean Trophic State Index (TSI) values for Minong Flowage, Washburn/Douglas County, WI.

Secchi Disk Visibility	57
Total Phosphorus	56
Chlorophyll A	53

There are three public boat landings on the Minong Flowage. These landings are located off Tota Rd., Flowage Rd. and Smith Bridge Rd. The Minong Flowage is a popular multi-species fishery.

STOCKING HISTORY

Lake sturgeon have been the only species stocked by DNR in the past 25 years. Fingerling lake sturgeon were stocked in 2010 (2,730) and 2011 (828). Prior to those stocking events, stocking has been limited to rainbow trout, walleye and muskellunge. These stockings were all discontinued due to low success or not being needed.

FISHING REGULATIONS

Walleye are managed with a no minimum length limit but one fish over 14-inches, and three fish daily bag limit. All other species either follow the statewide, regional or county fishing regulations.

Methods

Minong Flowage was sampled during 2023, following DNR's Treaty assessment protocol (Cichosz 2024) to sample walleye and northern pike. After ice out, an early spring netting survey (SN1) was conducted from April 18 to April 21. Data were collected on all northern pike and walleye. All walleye were marked with a fin clip as part of the population estimate. Walleye were also collected and marked in the Totagatic River upstream of Minong Flowage using daytime pulsed direct current (DC) electrofishing (SE1) from April 24 to April 29. The final electrofishing run in the Totagatic River was used as a recapture sample for the river. The Minong Flowage was also night electrofished May 2, as a recapture run for the flowage.

A late spring electrofishing survey (SE2) was done May 25 to assess the largemouth bass, smallmouth bass and panfish populations. This survey consisted of three 0.5-mile stations where all bass and panfish were collected, and three 1.5-mile stations where only bass were collected. In addition to these surveys, a fall electrofishing survey (FE) was completed to assess the abundance of age-0 and age-1 walleye. Appendix Table 1 lists descriptions of standard DNR survey types, gear used and target water temperatures.

Lake Class Standards catch per unit effort (CPUE) were calculated by comparing Minong Flowage's CPUE of each species to CPUEs of the other Complex-Cool-Dark lakes in Wisconsin. When possible, CPUE was also compared to past surveys for Minong Flowage.

Walleye, largemouth bass and smallmouth bass were aged with scales and dorsal spines. Bluegill were aged with scales only. Spines were cross-sectioned and aged under a microscope. Mean length at age was compared to other Complex-Cool-Dark Wisconsin lakes and the northwest Wisconsin averages for walleye. Size structure was assessed using proportional size distribution (PSD) indices (Neumann et al. 2013). The PSD value of a species is the number of fish of a specified length or longer divided by the number of fish stock length or longer, the result multiplied by 100 (Appendix Table 2).

A creel survey was conducted on Minong Flowage to assess recreational fishing pressure and harvest. The creel survey began the first Saturday in May and went through October. Creel survey methods followed a stratified random design as described by Rasmussen et al. (1998). The directed effort, catch, harvest, specific harvest rate and mean length of harvested fish were evaluated for each species during the creel survey. Harvest trends for each species were determined by calculating the relative harvest level each month.

Results

WALLEYE

The adult walleye population was estimated to be 4.1 fish/acre (Figure 1; CV=.17). This estimate was less than the 2016 estimate (5.7 fish/acre) and similar to the 2021 Ceded Territory average for lakes with natural reproduction at 4.4 fish/acre (Cichosz 2024).

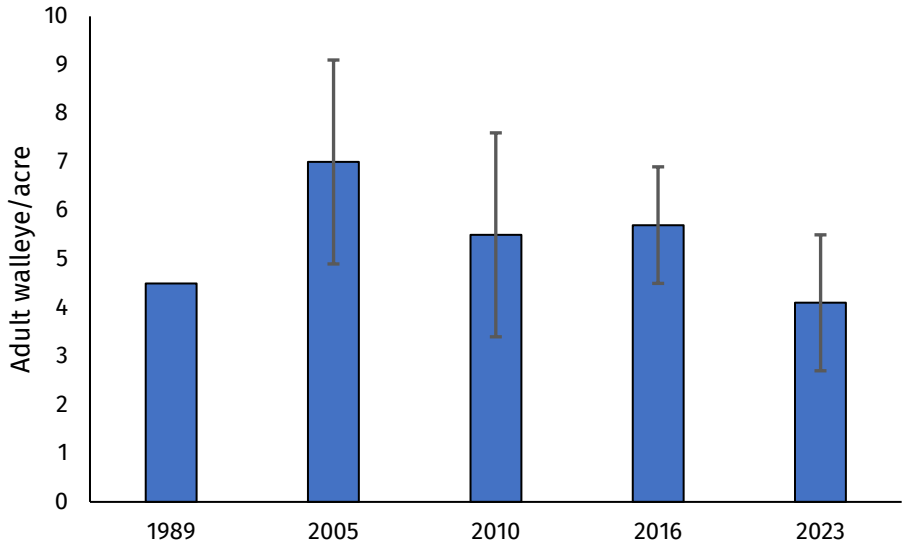

Figure 1. Walleye population estimates by year from 1989 – 2023 for Minong Flowage, Washburn County, WI.

There were 1,193 walleye collected during the SN1 and SE1 surveys (Figure 2). The electrofishing catch rate in the Totagatic River was 118.0 fish/mile, an increase from 2016 (95.5 fish/mile). Catch rates were not calculated for night electrofishing in the flowage and netting since those samples accounted for 26% of the overall sample. The mean lengths of male and female walleye were 14.9 inches and 16.8 inches, respectively (Figure 2). These averages increased slightly compared to 2016 (Male = 14.6 inches, Female = 16.6 inches). The overall average length was 14.7 inches, which was similar to 2016 (14.9 inches). The male to female ratio was 2.5:1. The PSD-14 was 83 and PSD-20 was 0.9. The PSD-14 increased from 2016 (63), while the PSD-20 was similar to 2016 (1). Both male and female walleye generally grew below average rates for most ages when compared to northwest Wisconsin averages.

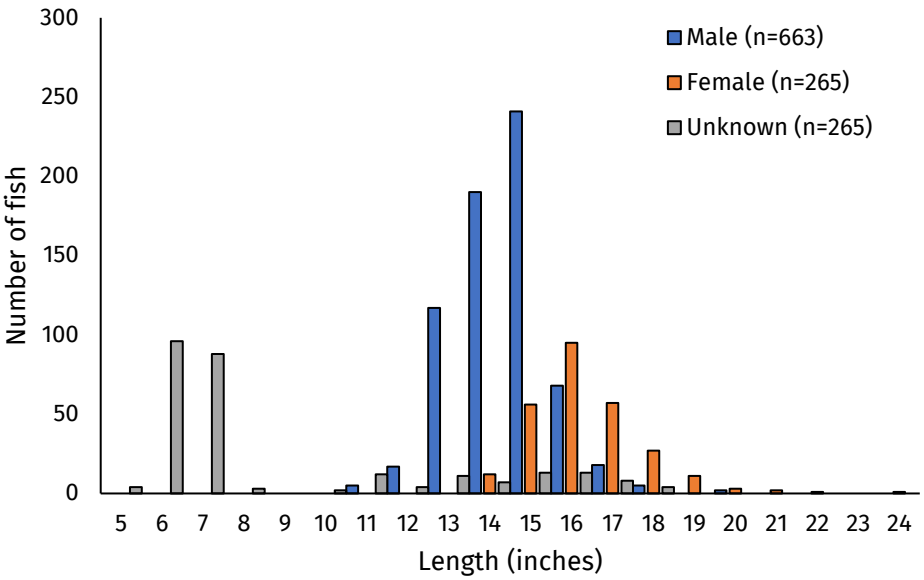

Figure 2. Length frequency of walleye by gender collected in Minong Flowage, Douglas/Washburn County, WI during the 2023 SN1 and SE1 surveys.

There were 457 age-0 walleyes collected in the 2023 fall electrofishing survey and the catch rate was 91.4 fish/mile, which was above the average age-0 catch rate for Minong Flowage (73.7 fish/mile, Figure 3.). There were 218 age-1 walleyes collected in 2023 and the catch rate was 43.6 fish/mile, which was above the average age-1 catch rate for Minong Flowage (13.9 fish/mile). Minong Flowage has high walleye natural recruitment. The average age-0 catch rate for Minong Flowage (73.7 fish/mile) was much higher than the 2021 Ceded Territory average of 19.1 fish/mile for lakes with natural reproduction (Cichosz 2024).

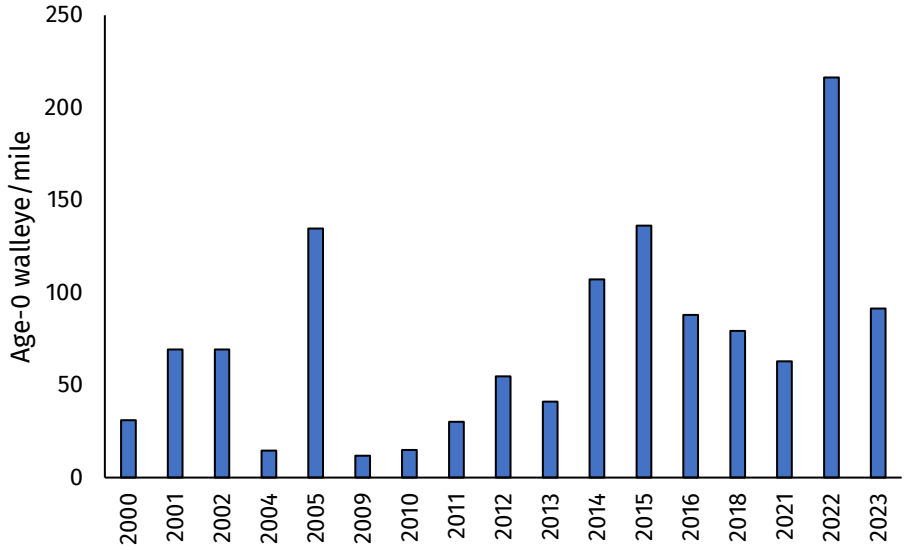

Figure 3. Catch of age-0 walleye/mile of shoreline for Minong Flowage, Douglas/Washburn County, WI collected during FE surveys.

NORTHERN PIKE

There were 164 northern pike collected during the SN1 survey for a catch rate of 10.9 fish/net-night. This catch rate was higher than 2016 (3.0 fish/net-night) and above the 95th percentile (9.2 fish/net-night) for Complex-Cool-Dark lakes. The mean lengths of male and female northern pike were 17.7 inches and 21.6 inches, respectively. Mean length of adult northern pike remained the same as 2016 at 19.7 inches (Figure 4). This mean length was also equal to the 75th percentile for Complex-Cool-Dark lakes. The PSD was 30 and PSD-28 was 14, lower than 2016 (PSD=45, PSD-28=23).

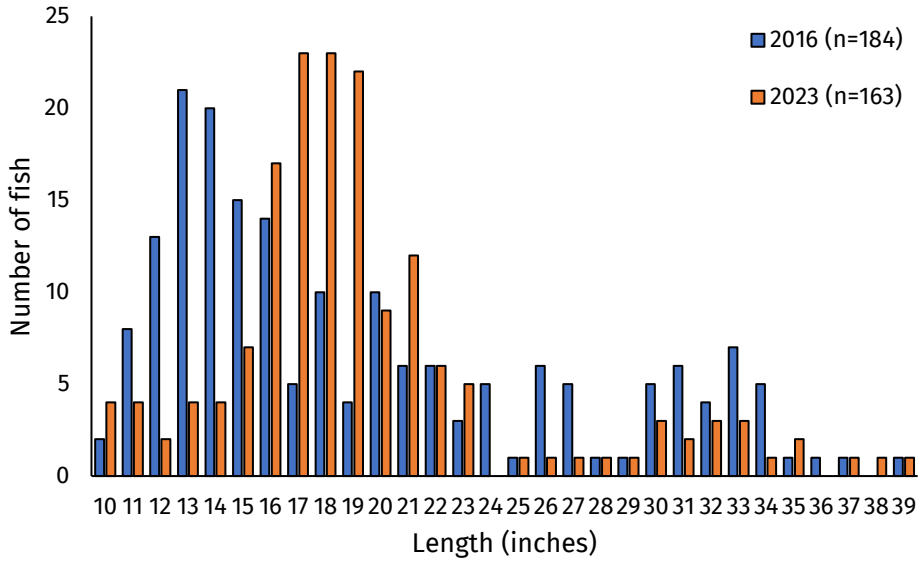

Figure 4. Length frequency of northern pike collected in Minong Flowage, Douglas/Washburn County, WI during the 2016 and 2023 SN1 surveys.

MUSKELLUNGE

No muskellunge were captured during the spring netting and electrofishing surveys compared with one fish collected during the 2016 survey. One muskellunge (≥30 inches) was observed but not captured during fall electrofishing.

SMALLMOUTH AND LARGEMOUTH BASS

There were 96 smallmouth bass collected during the SE2 survey for a catch rate of 16.0 fish/mile. This catch rate is higher than 2016 (7.7 fish/mile) and above the 90th percentile for Complex-Cool-Dark lakes. The mean length of smallmouth bass was 12.3 inches, which was greater than 2016 (10.9 inches) and above the 95th percentile for Complex-Cool-Dark lakes (Figure 5). The PSD was 72. Smallmouth bass grew above average except for ages 6-8.

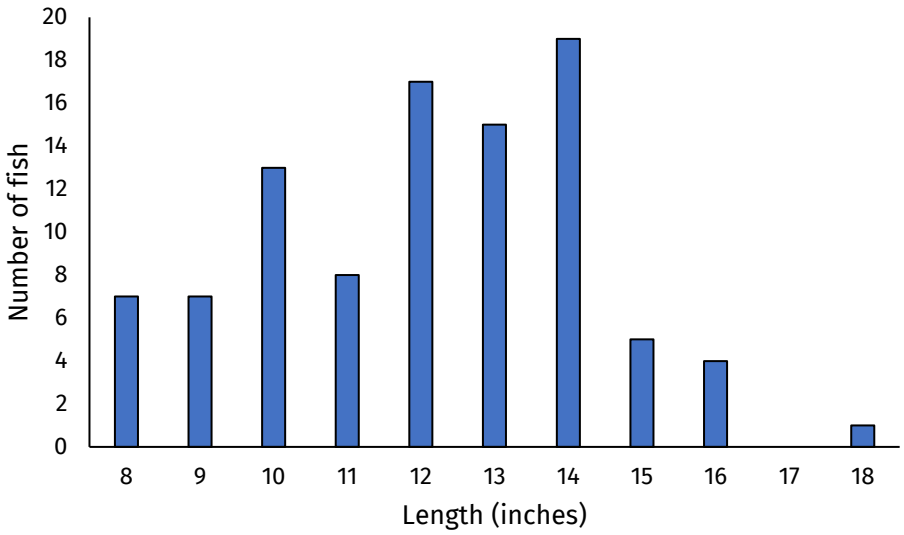

Figure 5. Length frequency of smallmouth bass collected in Minong Flowage, Douglas/Washburn County, WI during the 2023 SE2 surveys (n=96).

There were 35 largemouth bass collected during the SE2 survey for a catch rate of 5.8 fish/mile. This catch rate was the same as 2016 and slightly above the 50th percentile for Complex-Cool-Dark lakes. The mean length of largemouth bass was 14.4 inches, which was similar to 2016 (14.7 inches) and above the 95th percentile for Complex-Cool-Dark lakes (Figure 6). The PSD was not calculated due to small sample size. Largemouth bass grew at or above average for all ages represented.

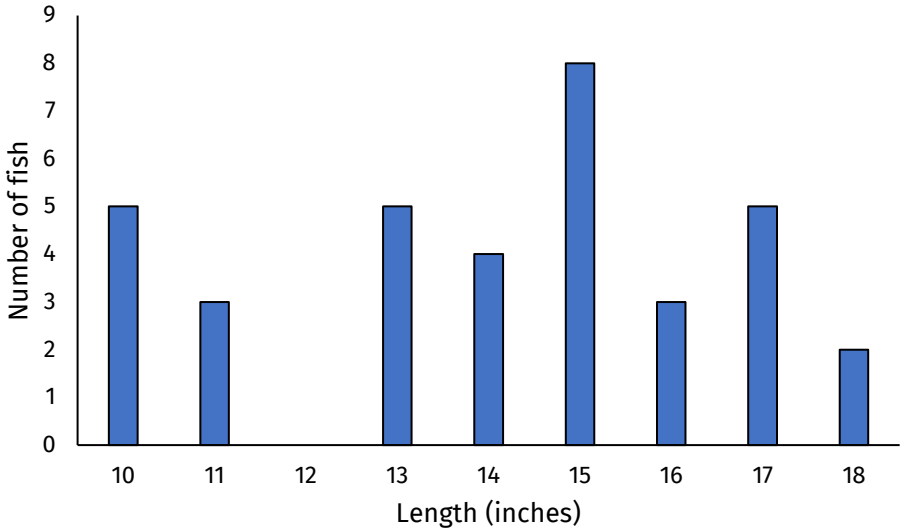

Figure 6. Length frequency of largemouth bass collected in Minong Flowage, Douglas/Washburn County, WI during the 2023 SE2 surveys (n=35).

PANFISH

There were 118 bluegills collected during the SE2 survey for a catch rate of 78.7 fish/mile. This rate increased from 2016 (54.0 fish/mile) and was below the 50th percentile for Complex-Cool-Dark lakes. The mean length of bluegill was 7.2 inches, which was the same as 2016 and above the 95th percentile for Complex-Cool-Dark lakes (Figure 7). The PSD was 97, which was similar to 2016 (96). Bluegill grew at or above average for all age classes represented.

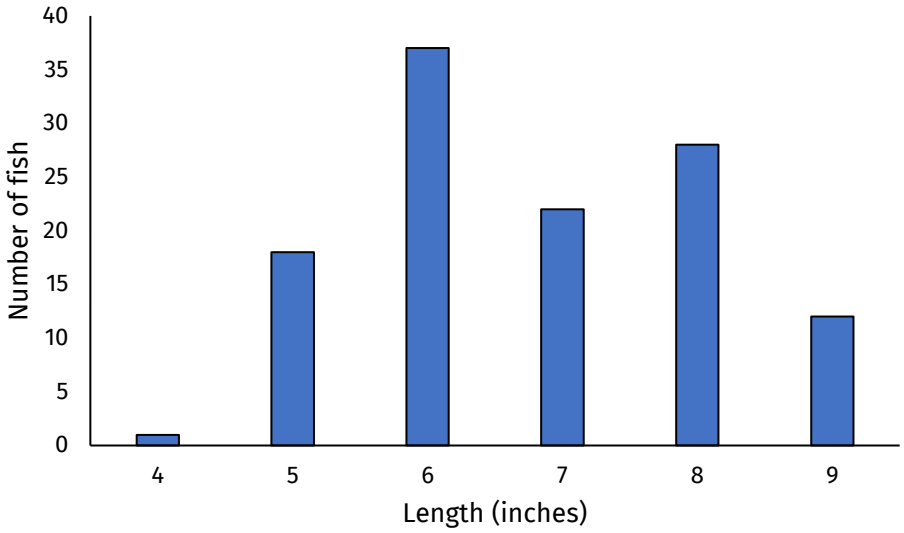

Figure 7. Length frequency of bluegill collected in Minong Flowage, Douglas/Washburn County, WI during the 2023 SE2 surveys (n=118).

Rock bass were the second most abundant panfish species with 14 collected. Rock bass averaged 7.3 inches and ranged in length from 5.3 to 9.8 inches. Other panfish collected at lower numbers included yellow perch and black crappie.

COMMON CARP

Only two common carp were observed during the FE survey.

RECREATIONAL CREEL AND TRIBAL HARVEST

Total angling effort amounted to 17,984 hours or 11.5 hours/acre, which was less than the Washburn County average (28.3 hours/acre). Effort was highest during May (6,390 hours) and June (3,902 hours). The majority of the total angler effort was directed at walleye (47.7%), black crappie (20.3%) and bluegill (14.2%). These three species accounted for 82% of the overall effort on Minong Flowage. Northern pike, largemouth bass and smallmouth bass accounted for 16% of the total effort. Other species including muskellunge rounded out the rest of the fishing effort in Minong Flowage. Bluegill were the most harvested fish (3,112 fish; 2.0/ac) and the average length of harvested bluegill was 8.2 inches. An estimated 2,317 walleye were harvested (1.5 fish/acre) and the average length of harvested walleye was 13.8 inches.

The third most harvested species was black crappie (2,305: 1.5 fish/acre) and the average length of harvested black crappie was 10.7 inches.

Angling exploitation was calculated at 15%. Tribal exploitation was calculated at 0%. No tribal harvest for any fish species occurred in Minong Flowage in 2023. Tribal harvest has been sporadic in Minong Flowage. The flowage has only been harvested seven times in since 1985.

Discussion

Minong Flowage remains an excellent fishery with healthy populations of both gamefish and panfish. On average, the fishery receives less fishing pressure compared to other lakes in Washburn County and Northern Wisconsin (Wisconsin DNR Treaty program unpublished data).

WALLEYE

The Minong Flowage walleye population remains excellent since the last survey in 2016. The current population was similar to the population that was estimated in 1989 (4.5 fish/acre). Though the population density has dropped since 2016 (5.7 fish/acre), growth remains slower. However, younger adult walleye continue to show better growth for ages 2 – 4.

Natural reproduction remains excellent for walleye. The flowage continues to produce young walleye at a high rate. In 2022 (the year after winter-drawdown), Minong produced its highest recorded age-0 catch rate at 216 fish/mile. This large year class suggests that production of young walleye does benefit from a temporary drawdown in the Minong Flowage. Survival to age-1 also remains excellent, with that year class showing up at 44 fish/mile. This level of natural reproduction helps the walleye fishery be resilient and continue to be an excellent fishery.

Walleye were the most pursued and harvested gamefish based on our creel survey. This is not a surprise since it remains the best lake for walleye in Washburn County. Anglers showed that they are willing to harvest smaller walleye as well. This harvest remains sustainable since the flowage has a very healthy walleye population.

NORTHERN PIKE

The relative abundance of northern pike increased since 2016 while average size remained the same at 19.7 inches. This abundance was also similar to what was observed in 2005 and likely reflects the normal abundance for the lake. Based on this recent survey, it appears that there was no impact of the winter drawdown on northern pike.

SMALLMOUTH AND LARGEMOUTH BASS

Smallmouth bass relative abundance has continued to improve since 2016. The catch rate for smallmouth bass has doubled while the average size improved. Some of these changes may be tied to the drawdowns that have occurred. Also, there may be habitat changes which are benefitting smallmouth bass. Largemouth bass remain a low density gamefish in the lake. The catch rate and average size were nearly identical to 2016, suggesting no big changes in that population.

PANFISH

Bluegill remain the most abundant panfish captured in our survey. Their relative abundance increased since 2016 and the average size stayed the same. This is likely due to the high density of walleye in the flowage. Their presence has kept bluegill density lower and created a high average size. Overall, the flowage boasts a very healthy bluegill fishery with great average size. Anglers harvested an excellent average size of bluegill at 8.2 inches during the DNR creel survey. Other panfish species like black crappie were found in lower numbers, though electrofishing may not be the best gear for those species. However, the creel survey found black crappie to be the third most harvested species. It is likely that black crappie were much more abundant than our survey suggests due to survey timing and gear susceptibility.

Management Recommendations

1. The walleye population remains healthy and abundant in Minong Flowage. There are no management changes recommended.
2. The northern pike population has increased since 2016. There are no management changes recommended.
3. Largemouth bass remain a low-density fish in the Minong Flowage. The size regulation is likely not a driver in this population. Instead, the habitat in the flowage plays a bigger role (turbidity, vegetation, habitat). No management changes are recommended.
4. The smallmouth bass population continues to increase in Minong Flowage. Smallmouth bass appear to benefit from drawdowns. No management changes are recommended.
5. Muskellunge are present in Minong Flowage. Future surveys should sample for muskellunge (if time allows for it).
6. The overall bluegill density increased since 2016. Bluegill should be evaluated again during the next general survey. Preserving good numbers of this species may be important for preventing the common carp population from increasing in the flowage. No regulation changes are recommended.
7. Timing and frequency of future drawdowns remain important for reducing potential impacts to centrarchids. DNR fisheries management should be involved in future drawdown plans to address any centrarchid concerns for Minong Flowage.

8. Prevention and monitoring of invasive species should continue in the lake and at boat launches/accesses. Establishment of future invasive species could be detrimental to the system.
9. Efforts to increase habitat complexity should continue to be strongly encouraged in main lake littoral areas. Input of coarse woody habitat, protection/promotion of aquatic vegetation, and maintenance or restoration of 35 ft. vegetative buffers are some examples of work that can increase habitat complexity.

Acknowledgements

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Appendix

Appendix Table 1. Survey types, gear used, target water temperature and target species.

Survey Type	Gear Used	Target Water Temperature (°F)	Target Species
Spring Netting 1 (SN1)	Fyke Net	~45	Walleye, northern pike
Spring Electrofishing 1 (SE1)	Boat Electrofishing	45-50	Walleye
Spring Netting 2 (SN2)	Fyke Net	50-55	Muskellunge, black crappie, yellow perch
Spring Electrofishing 2 (SE2)	Boat Electrofishing	55-70	Largemouth bass, smallmouth bass, bluegill and other panfish, non-game species
Spring Netting 3 (SN3)	Fyke Net	65-80	Bluegill, black crappie
Fall Electrofishing (FE)	Boat Electrofishing	50-60	Juvenile walleye and muskellunge

Appendix Table 2. Proportional size distribution values.

Species	Stock Size (in)	Quality Size (in)	Preferred Size (in)
Black crappie	5	8	10
Bluegill	3	6	8
Largemouth bass	8	12	15
Northern pike	14	21	28
Pumpkinseed	3	6	8
Rock bass	4	7	9
Smallmouth bass	7	11	14
Walleye	10	15	20
Yellow perch	5	8	10