

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
2025 Mildred Fisheries Survey Report

Waterbody Code: 1004600



Photo Credit: Lakeland Aerial

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Table Of Contents

Introduction	1
Methods	3
Survey effort	3
Data analysis.....	4
Results.....	5
Black crappie	5
Bluegill	3
Largemouth bass	4
Muskellunge	6
Northern pike	8
Smallmouth bass	9
Walleye	10
Yellow perch	13
Survey results.....	13
Other species.....	14
Discussion	14
Recommendations	15
Acknowledgments	15
References.....	16
Appendix A	18

Introduction

Mildred Lake is a 191-acre (L. Eslinger, unpublished data) soft water seepage lake within the Rhinelander Flowage Watershed maintaining excellent water quality supporting aquatic life, wildlife, recreation, public health and welfare. Chinese mystery snail (2011) is the only invasive species noted as being established in Mildred Lake as of 2025. The lake is accessible by the public, tribal members, the 93 property owners, 1 condo complex via the public ramp on the east side off Lake Mildred Road (Figure 1). Additional information on Mildred Lake can be found at the Wisconsin Department of Natural Resources' (DNR) [Lake Page](#).

Mildred Lake is a complex-cool-clear lake featuring a shared fishery utilized by both the public and tribal members ([Rypel et al. 2019](#)). Mildred lake supports a diverse fish community comprised of 14 species and two hybrids. This fishery includes species of various tolerance levels—ranging from intolerant species like the Iowa Darter to tolerant ones like the white sucker—and multiple thermal guilds, including coolwater (walleye, yellow perch) and warmwater (bluegill, largemouth bass). Furthermore, the fishery includes a range of angler interests including highly desired smallmouth bass and walleye.

Information on the fishery in Mildred Lake is relatively sparse ([Kubisiak 2005](#)). No data on angler desires or use has been collected previously. Records show a lack of angling effort through angling tournaments with none being registered since 2008 (N. Lederman, unpublished data). No tribal spring harvest has been recorded since 1985 either (T. Cichosz, unpublished data).

The DNR manages Mildred Lake in consultation with the Mildred Lake Association and the Great Lakes Indian Fish and Wildlife Commission (GLIFWC). Monitoring efforts include water quality tracking by the Citizen Monitoring Program since 2006 and fisheries assessments focused on species of recreational value (Table 1). The lake association has taken an active role in habitat restoration, placing half-logs and fish cribs throughout the lake since 2023. Private stocking appears to support the walleye and muskellunge populations that struggle to be self-sustaining within Mildred Lake (Table 2).

The objectives of the 2025 fishery survey on Mildred Lake were to

1. assess the status of the fish community
2. evaluate walleye and muskellunge stocking effectiveness
3. update fisheries management recommendations

Table 1. Fish surveys from 2005-2025 in Mildred Lake Oneida County, Wisconsin.

YEAR	TYPE	GEAR	TARGET SPECIES	SURVEY PURPOSE
2005	SN 1	fyke net	walleye	relative abundance
2005	SE 1	boom	walleye	mark-recapture
2005	AN	angling	bass	relative abundance
2005	SE 2	boom	bass	mark-recapture
2005	SN 3	fyke net	panfish	relative abundance
2005	SN 3	minnow	all species	relative abundance
2005	FE	boom	all species	juvenile recruitment
2014	SE 2	boom	all species	relative abundance
2025	SN 1	fyke net	walleye	relative abundance
2025	SE 1	boom	walleye	mark-recapture
2025	SE 2	boom	all species	relative abundance

Table 2. Fish stockings from 1934-2025 in Mildred Lake, Oneida County, Wisconsin.

YEAR	SPECIES	AGE CLASS	NUMBER OF FISH	SOURCE TYPE
1934	walleye	unknown	172,440	DNR
1936	bass	unknown	140	DNR
1936	perch	unknown	3,500	DNR
1941	bullhead	adult	2,500	DNR
1941	perch	adult	300	DNR
1941	perch	fingerling	2,700	DNR
1941	shiners	fingerling	1,000	DNR
1941	sucker	adult	2,000	DNR
1941	sunfish	adult	500	DNR
1957	brook trout	fingerling	21,420	DNR
1958	brook trout	fingerling	13,965	DNR
1980	muskellunge	fingerling	400	DNR
2004	muskellunge	large	190	private
2006	muskellunge	large	64	private
2008	muskellunge	large	191	private
2010	muskellunge	large	190	private
2014	muskellunge	large	225	private
2015	muskellunge	yearling	185	private
2016	walleye	large	950	private
2017	muskellunge	large	95	private
2017	walleye	large	950	private
2018	walleye	large	950	private
2019	walleye	large	948	private
2020	walleye	large	950	private
2021	walleye	large	1,138	private
2022	walleye	large	1,150	private
2023	walleye	large	1,150	private
2024	walleye	large	1,150	private
2025	walleye	large	1,150	private

Methods

A comprehensive fishery survey was conducted on Mildred Lake following the treaty protocol ([Cichosz 2021](#)) during 2025. The assessment included early spring netting (SN1) for walleye and northern pike, followed by early (SE 1) targeting walleye and late spring electrofishing (SE2) targeting bass and panfish. Fall electrofishing (FE) was also conducted to evaluate juvenile gamefish levels. To supplement biological data, riparian owners were reached via electronic surveys and anglers provided supplemental muskellunge data.

SURVEY EFFORT

Early spring fyke netting was conducted using 4-foot framed fyke nets. Eight nets were set on April 17 and fished until April 22, 2025. Nets were set in varying habitats (i.e., substrate and vegetation) and water depths targeting spawning adult fish (Figure 1). Nets were checked once every 24 hours.

Early spring electrofishing targeting gamefish was conducted around the entire shoreline of Mildred Lake on April 22, 2025. Late spring electrofishing was conducted throughout Mildred Lake on May 28, 2025 (Figure 1). Two half-mile transects targeting all species were randomly selected and two 1.5-mile transects targeting gamefish stations were randomly selected around Mildred Lake. Fall electrofishing targeting juvenile and all sizes of gamefish was completed on October 7, 2025. Boats sampling during electrofishing runs used AC power, two probes (each with three droppers), and two dippers with nets having 0.375-inch bar mesh netting.

An area guide directed additional muskellunge effort on Mildred Lake. Muskellunge were checked for a PIT tag. If one was not found, a PIT tag was placed internally adjacent to the dorsal fin and released.

Captured gamefish and panfish during all sampling were measured to the nearest 0.1 inch. Largemouth bass, northern pike and walleye were marked with a right ventral fin clip. Muskellunge were checked for a PIT (passive integrated transponder) tag and if one was not found, a PIT tag was placed internally adjacent to the dorsal fin and released. Newly captured adult muskellunge had their first anal fin ray removed for age estimation. Dorsal fin rays were collected from five walleye within every half-inch increment of each sex for age estimation. Otoliths were extracted from five black crappies and five bluegills within every half-inch increment for age estimation (Simonson et al. 2013). Otoliths were extracted from five largemouth bass and smallmouth bass within every inch increment for age estimation. Counts were recorded for all other species.

Perspectives of lake association members were gained through an 11-question electronic survey (Appendix A). A link to the survey was shared with riparian owners and lake users during the Lake Association meeting on May 26, 2025. To encourage participation, a reminder was sent to all members via the association listserv on June 6, 2025. The survey focused on identifying current concerns, use desires and ecological trends of those who live on and use Mildred Lake.

DATA ANALYSIS

Abundance was indexed with a population estimate and quantified to a density estimate (number per acre) by dividing the population estimate number by how acres Mildred Lake is. The walleye population was estimated using the Chapman's version of the Petersen method ([Chapman 1951](#)) as follows

$$N = \frac{(M + 1) * (C + 1)}{(R + 1)}$$

Relative abundance was used as an index of population size for fish where a population estimate was not generated. Bluegill, pumpkinseed and rock bass relative abundance was indexed as the number of individuals per shoreline mile during late spring electrofishing runs collecting all fish. Largemouth and smallmouth bass abundance was indexed as the number of individuals per shoreline mile during late spring electrofishing runs collecting all fish or gamefish. Black crappie, muskellunge, northern pike and yellow perch relative abundance were indexed as the number of individuals per night during early spring netting surveys.

Size structure of fishes were described using length frequencies, descriptive statistics and proportional size distribution (PSD; Gabelhouse 1984a). Quality-sized fish are 36% of the world-record length and preferred-sized fish are 45% of the world-record length representing fish lengths anglers likely enjoy catching (Table 3). The PSD value for a species was calculated as the number of fish of a quality length and longer divided by the number of stock length fish or longer and multiplied by 100. The mean, minimum and maximum length of each fish species was calculated during each sampling year and compared through time.

Table 3. Proportional size distribution lengths of select fish species Mildred Lake, Oneida County, WI.

SPECIES	STOCK SIZE	QUALITY SIZE (IN)	PREFERED SIZE (IN)
Black crappie	5	8	10
Bluegill	3	6	8
Largemouth bass	8	12	15
Muskellunge	20	30	38
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

Growth was quantified by assigning ages to black crappie, bluegill, largemouth bass and smallmouth bass otoliths, muskellunge anal rays, and walleye dorsal spines. Age was assigned to each unaged fish that was measured using an age-length key. Age-length keys were created from the proportion of each age within each inch length group within each species ([Isermann and Knight 2005](#)). Mean length at age was then calculated using the entire sample from assigned ages. Predicated mean maximum length was calculated using Von Bertalanffy's growth equation of:

$$l_t = L_\infty(1 - e^{-K(t-t_0)})$$

Growth equations for black crappie, bluegill, largemouth bass, muskellunge and smallmouth bass were completed by pooling sexes for each year because of data limitations, despite sex-specific growth variation. Growth equations for walleye were calculated for each sex.

Mortality was estimated from a catch curve for each species aging structures were collected. A weighted regression using the natural log of catch at age was determined ([Miranda and Bettoli 2007](#)) for each species. The point where descending ages was adjusted for each species.

Survival of stocked walleye was estimated by dividing the population estimate for each age class by the total number of fish stocked for that year and multiplying it by 100. Cost per each stocked adult age group was estimated by multiplying the number stocked by the cost per purchased stocked large fingerling (\$3.00; J. Mladucky; Personal Communication) and dividing by the age-specific population estimate.

Relative abundance indices, mean length and growth were compared to other complex-cool-dark lakes within the Wisconsin lake systems ([Rypel et al. 2019](#)), other Oneida county lakes, and prior surveys within Mildred when appropriate.

Results

BLACK CRAPPIE

A total of 126 black crappies were sampled in Mildred Lake via electrofishing (n = 1) and netting (n = 125). Netting catch rate was 3.1 black crappies per net-night, falling near the 50th percentile for complex-cool-clear lakes. Catch rates have been variable over time, with differing trends observed between gear types (Figure 2). Measured lengths of black crappies varied between 4.1 inches to 12.3 inches with a mean of 10.0 inches (Figure 3). The mean length of black crappies is above the 99th percentile for the lake class. Black crappie PSD has fluctuated historically with the population currently dominated by individuals exceeding eight inches (Figure 4).

Otoliths were collected from 15 black crappies varying between 4.1 to 11.2 inches in Mildred Lake. Assigned ages identified five year classes between age 2 and age 8. Recruitment appears variable, with the 2020 and 2021 year classes absent. Age-3 mean length-at-age is currently on par with the 2005 survey and other complex-cool-clear lakes, age-6 growth trails the 2005 mean by over 1 inch (Figure 5).

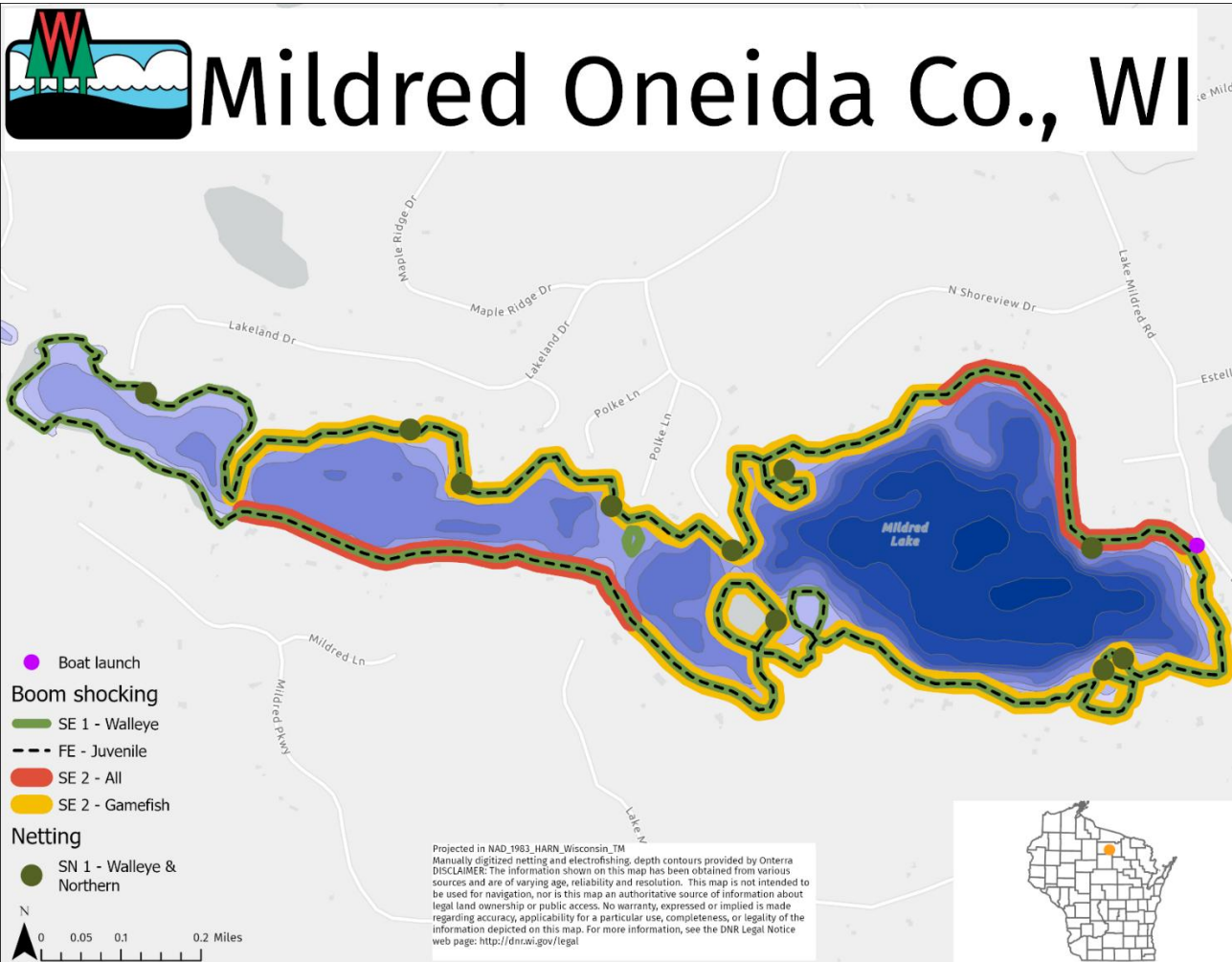


Figure 1. Sampling locations of the various capture gears used during the 2025 Mildred survey in Oneida, County, Wisconsin. Green dots indicate fyke nets targeting walleye. Green line indicates electrofishing survey route targeting walleye. Red and yellow lines indicate transects targeting bass (red) and panfish (yellow) during the second electrofishing survey. Dashed black line indicates the route during the fall electrofishing survey targeting juvenile gamefish. Depth contours are blue colors with darker blue indicating deeper water and lighter blue indicating shallower water. Purple circle indicates where the boat launch which is located on the eastern side of the lake, accessible from Lake Mildred Road.

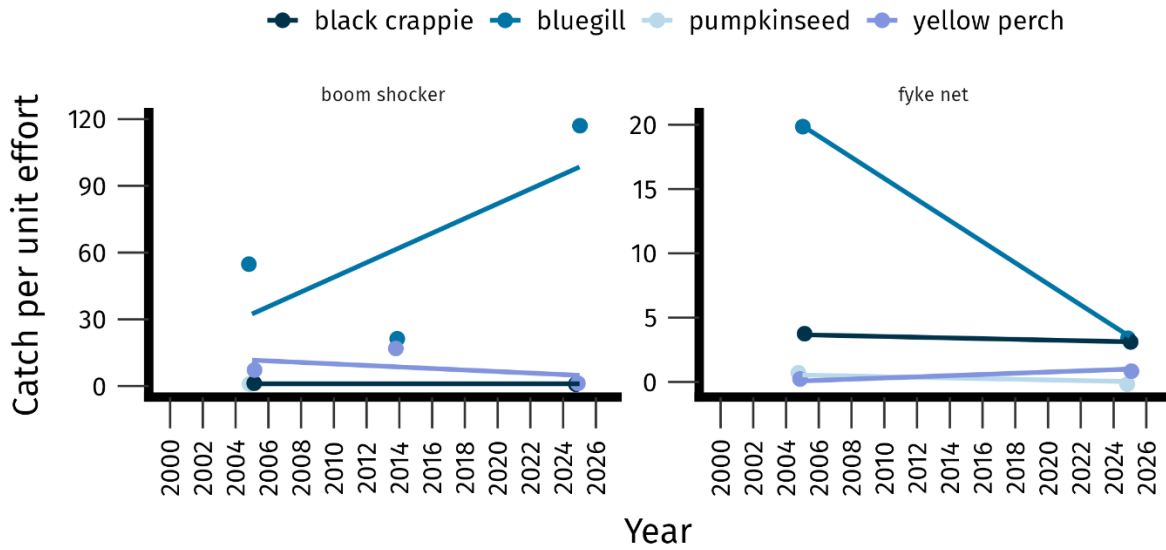


Figure 2. Catch rate of black crappies, bluegills, pumpkinseeds and yellow perch across surveys within Mildred during electrofishing (left; catch per-mile) and netting (right; catch per net-night). Each species is a unique color.

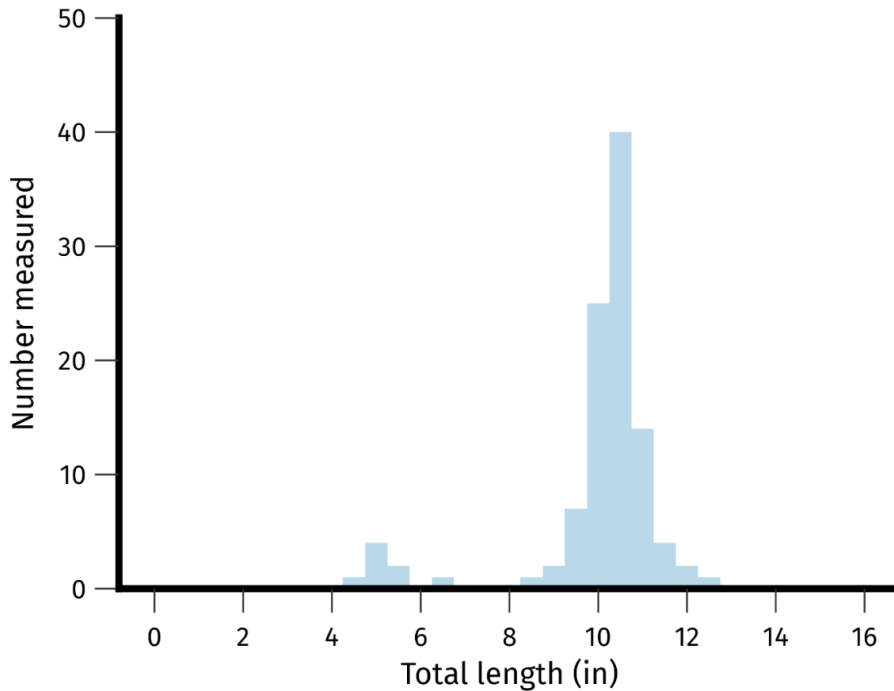


Figure 3. Length frequency of measured black crappies in Mildred Lake Oneida County, WI during the 2025 survey. Length bins are every 0.5 inch.

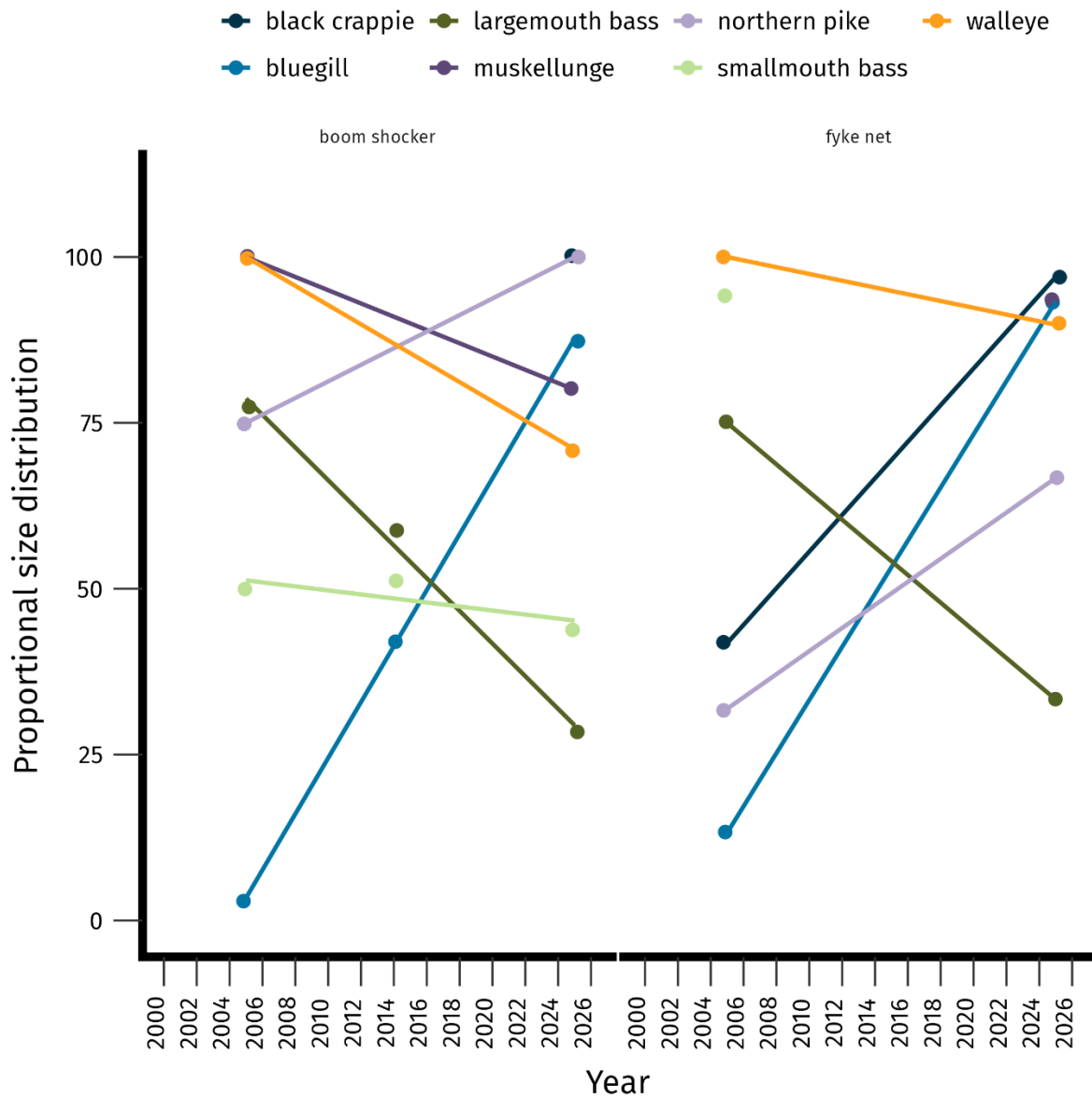


Figure 4. Proportional size distribution of quality length fish from select species captured across surveys during electrofishing (left) and netting (right) within the Mildred Oneida County, WI. Pumpkinseed and yellow perch were excluded due to lack of sample size across years.

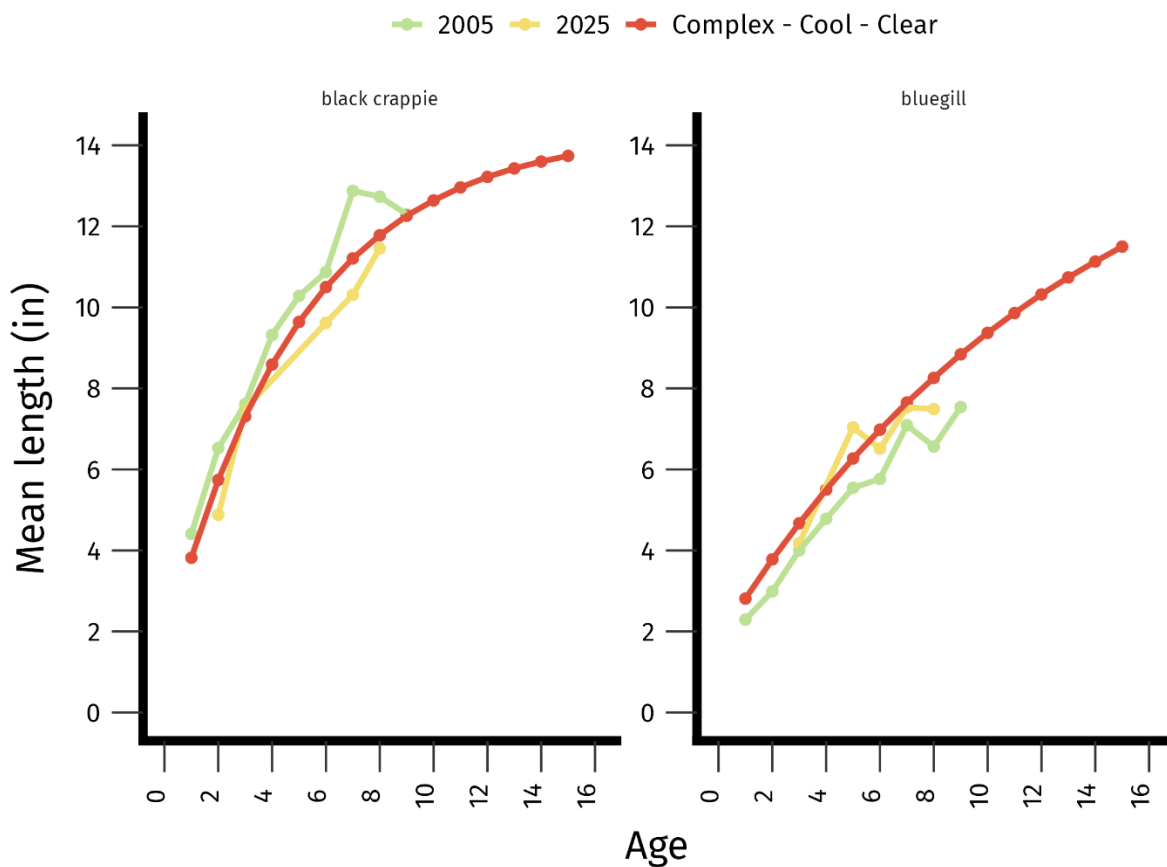


Figure 5. Mean total length at estimated age of black crappie (left) and bluegill (right) within Mildred Lake, Oneida County, WI. Fish were assigned ages by otoliths in 2025 and scales during 2005. Length of individuals with an unknown age were assigned an age with a species and year specific age-length key. Mean length at age for each year and median length at age for complex-cool-dark lake class are represented by unique colors.

BLUEGILL

A total of 259 bluegills were sampled in Mildred Lake via electrofishing ($n = 141$) and netting ($n = 118$). Electrofishing catch rate was 117.0 bluegill per-mile, while netting resulted in 3.5 bluegill per net-night. The electrofishing catch rate of bluegills falls near the 50th percentile for complex-cool-clear lakes showing an increase over time in both gear types (Figure 2). Measured bluegills varied between 1.1 inches and 8.6 inches with a mean length of 6.3 inches (Figure 6). This mean length places Mildred Lake bluegill population above the 99th percentile for complex-cool-clear lakes. The PSD is variable but is consistently characterized by a high frequency of individuals exceeding six inches within Mildred Lake (Figure 4).

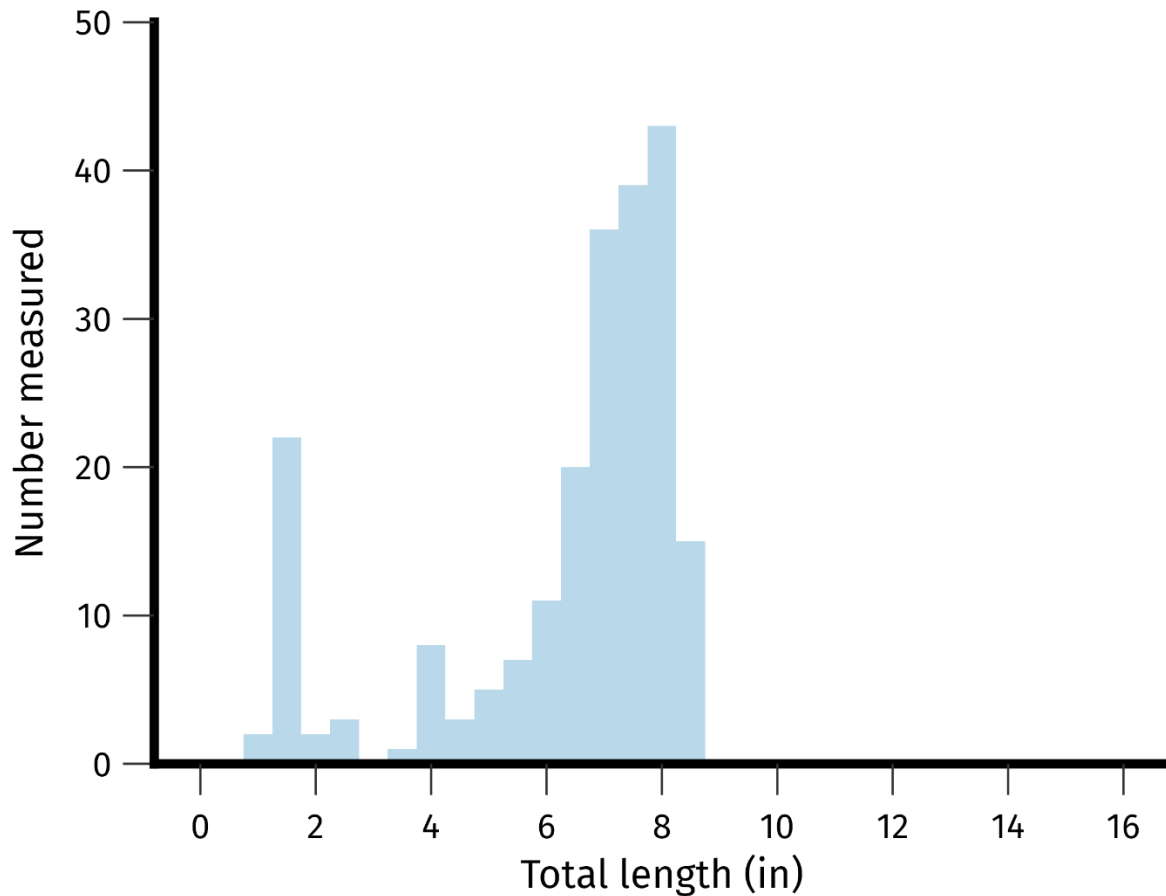


Figure 6. Length frequency of measured bluegills in Mildred Lake Oneida County, WI during the 2025 survey. Length bins are every 0.5 inch.

Otoliths were collected from 15 bluegills ranging from 3.9 to 8.3 inches in Mildred Lake. Assigned ages represented seven unique year classes between age 2 and age 9. Recruitment appears relatively consistent, with age 8 being the only missing year class among individuals recruited to the sampling gear. Mean length-at-age remains slightly below the average for the complex-cool-clear lake class and consistent with growth rates observed in 2005 (Figure 5).

LARGEMOUTH BASS

A total of 68 largemouth bass were captured in Mildred Lake via electrofishing (n = 63) and netting (n = 5). The lack of recaptured marked largemouth bass within Mildred Lake prevented a reliable population estimate from being calculated. Largemouth bass catch rate was 0.12 individuals per net-night during netting and 6.5 individuals per-mile during electrofishing in Mildred Lake. Largemouth bass electrofishing catch rate falls near the 50th percentile for complex-cool-clear lakes, though catch rates are variable across historical surveys (Figure 7). Measured largemouth bass lengths varied between 3.0 inches to 16.5 inches with a mean of 11.0 inches (Figure 8), placing largemouth bass mean length near the 75th percentile for complex-cool-clear lakes.

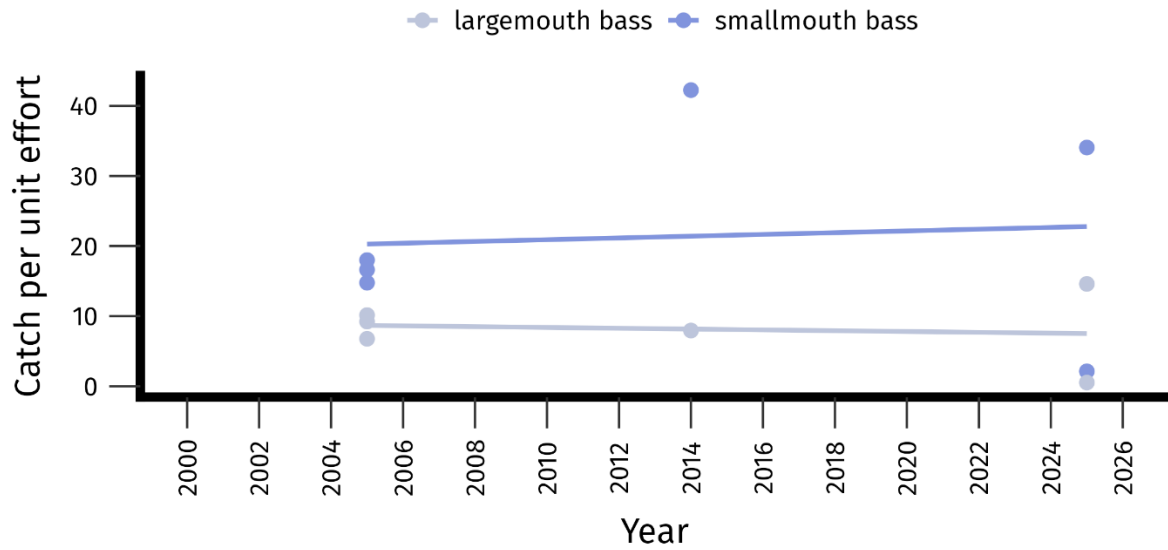


Figure 7. Catch per-mile of largemouth bass and smallmouth bass with boom shocking among spring surveys within Mildred during electrofishing. Each species is a unique color.

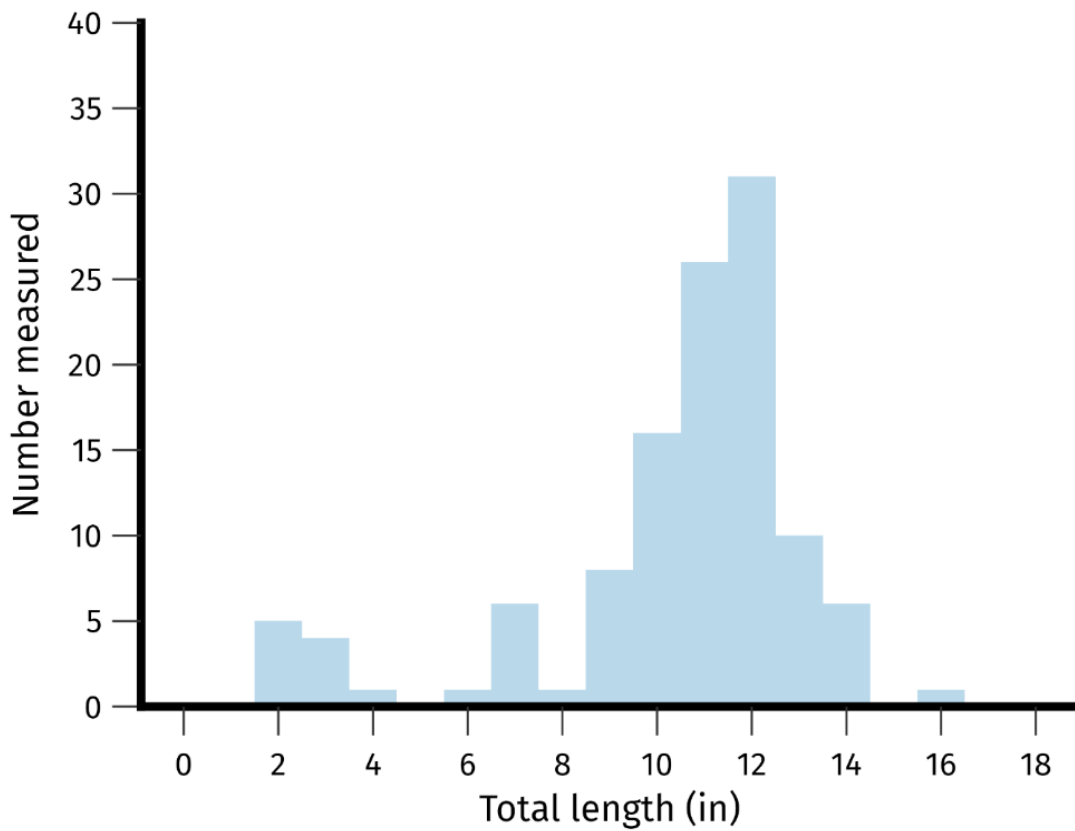


Figure 8. Length frequency of measured largemouth bass in Mildred Lake Oneida County, WI during the 2025 survey. Length bins are every 1.0 inch.

Otoliths were collected from 20 largemouth bass ranging from 6.3 inches to 14.2 inches in Mildred Lake. Assigned ages identified five unique year classes between age 3 and age 8. Recruitment appears relatively consistent, with age 4 being the only missing year class among individuals recruited to the sampling gear. Mean length-at-age remains lower compared to other complex-cool-clear lakes, consistent with observations from the 2005 survey (Figure 9).

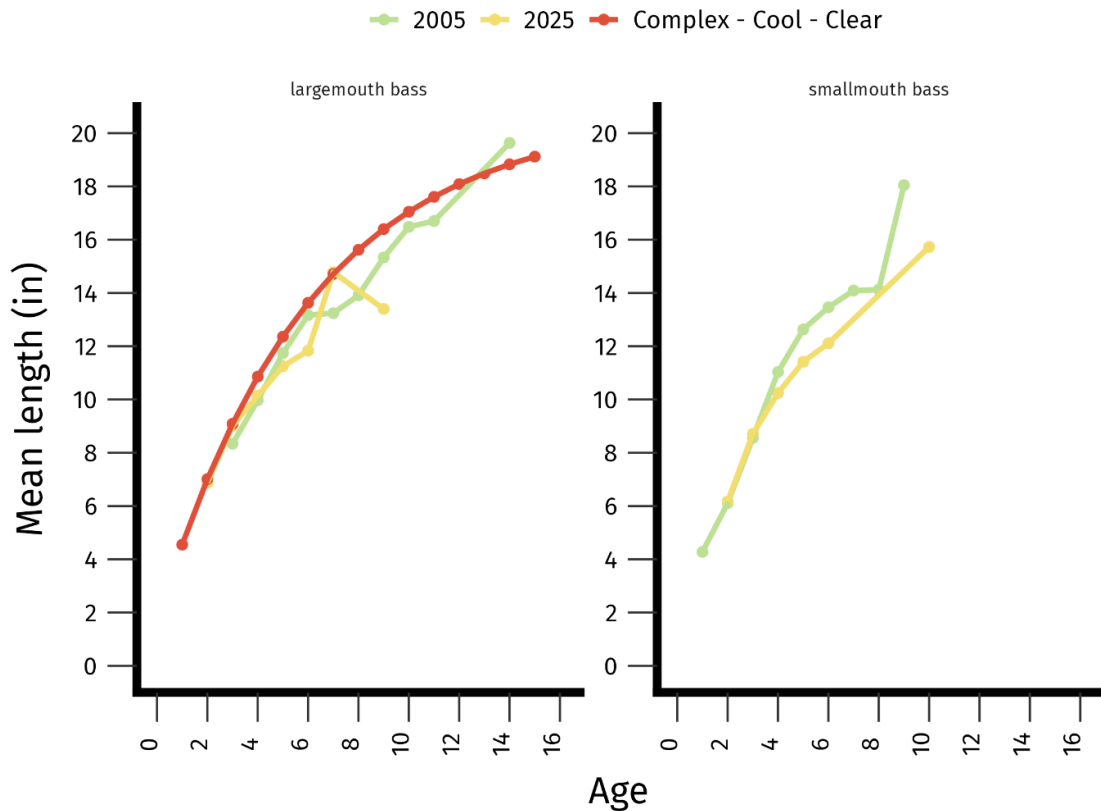


Figure 9. Mean total length at estimated age of largemouth bass (left) and smallmouth bass (right) within Mildred Lake, Oneida County, WI. Fish were assigned ages by otoliths in 2025 and scales during 2005. Length of individuals with an unknown age were assigned an age with a species and year specific age-length key. Mean length at age for each year and median length at age for complex-cool-dark lake class are represented by unique colors. The samples size of smallmouth bass was too small to generate growth trends for the lake class.

MUSKELLUNGE

A total of 28 muskellunge were sampled in Mildred Lake via electrofishing (n = 8), netting (n = 16) and angling (n = 4). Muskellunge netting catch rate was 0.4 fish per net-night, while electrofishing was 0.5 fish per-mile. Muskellunge catch rates within Mildred Lake fall near the 50th percentile for complex-cool-clear lakes. Measured lengths of muskellunge varied between 33.3 inches to 44.5 inches with a mean of 38.0 inches (Figure 10), placing the mean length within Mildred Lake above the 100th percentile for complex-cool-clear lakes.

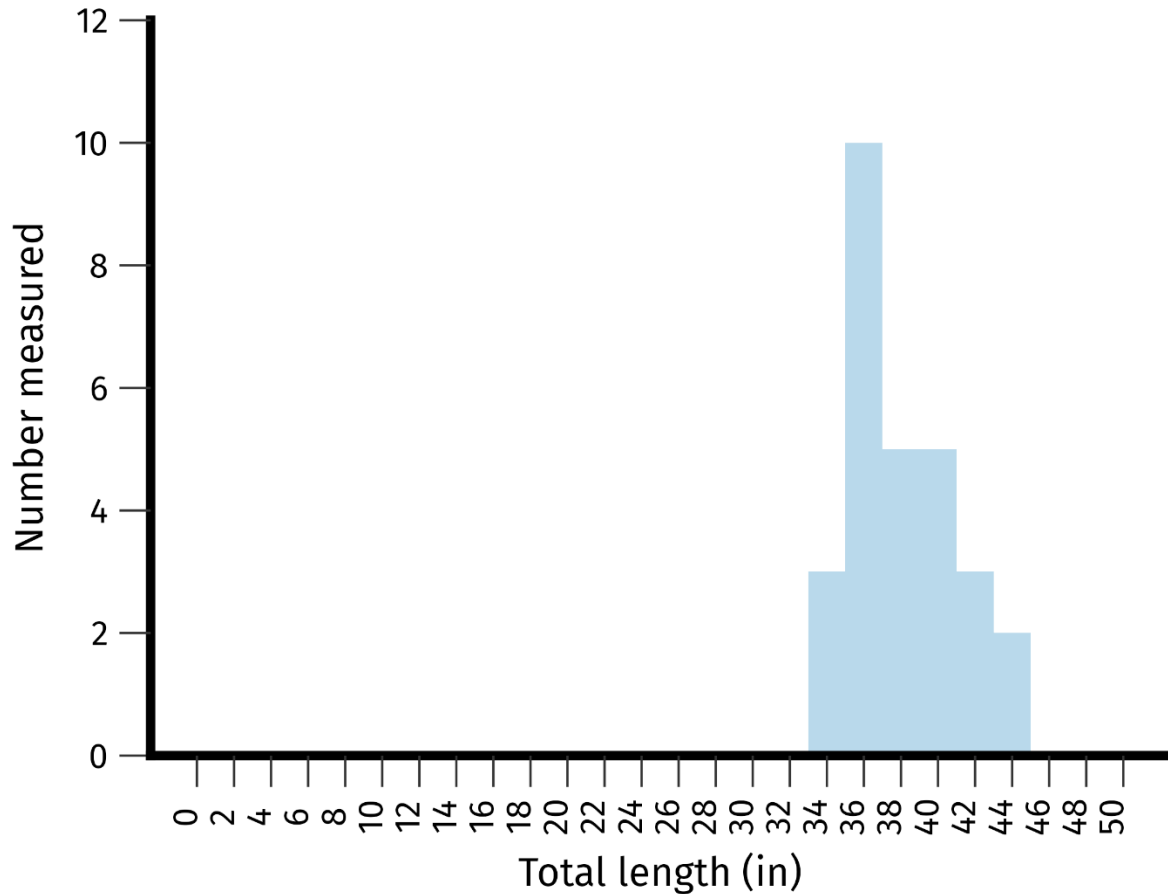


Figure 10. Length frequency of measured muskellunge in Mildred Lake Oneida County, WI during the 2025 survey. Length bins are every 2.0 inch.

The 2025 muskellunge sample consisted of age-8 through age-11 fish. Mean length-at-age of muskellunge trailed other complex-cool-clear lakes by 1 inch (Figure 11). Five recaptured muskellunge showed an average growth of 0.1 inches over periods 1 to 172 days. Furthermore, 76% of aged fish corresponded with known stocking events, indicating that the majority of the current population is likely of hatchery origin.

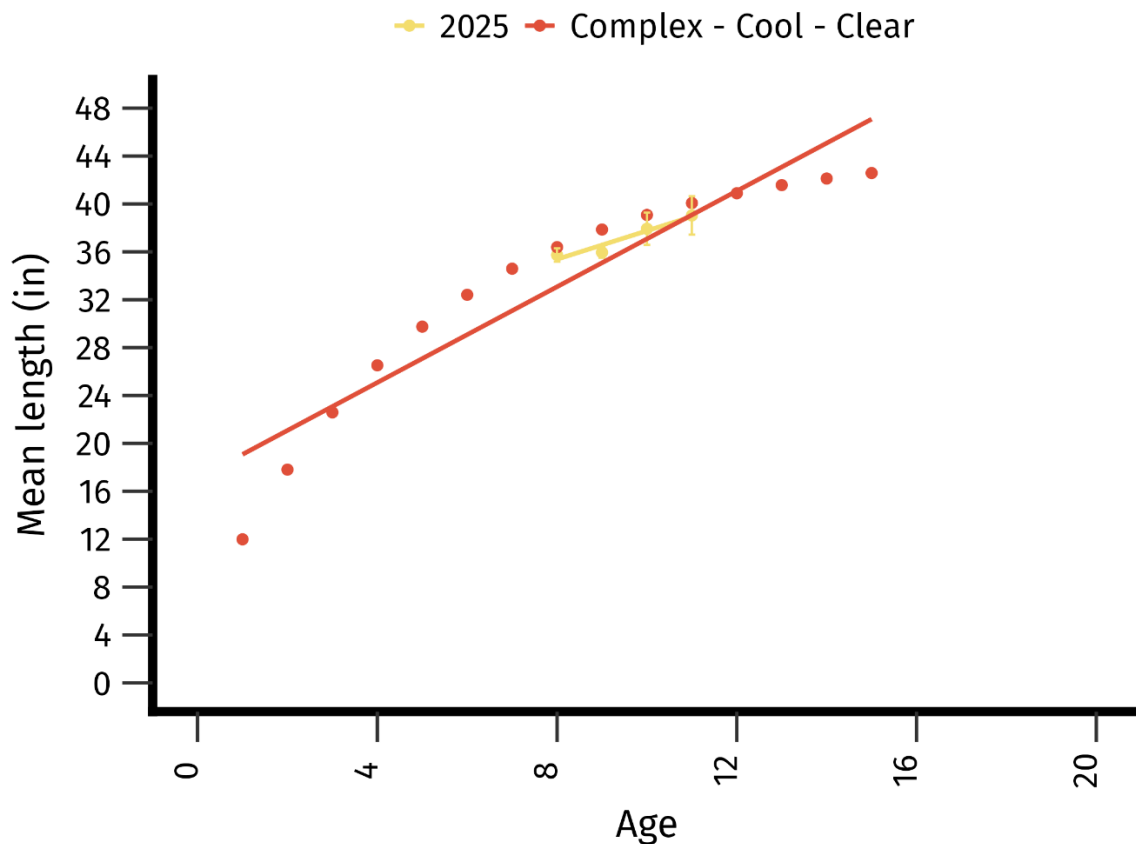


Figure 11. Mean total length (± 1 standard error) at estimated age of muskellunge within Mildred Lake. Muskellunge ages were assigned using anal fin rays in 2025. Mean length at age for each year and median length at age for complex-cool-clear lake class are represented by unique colors.

NORTHERN PIKE

A total of 14 northern pike were captured while surveying Mildred Lake via electrofishing ($n = 2$) and netting ($n = 12$). A low number of marked individuals and no recaptures prevented the calculation of a reliable population estimate. Northern pike catch rate was 0.3 per net-night during netting and 0.1 per-mile during electrofishing. Catch per net-night of northern pike was around the 25th percentile for complex-cool-clear lakes. Lengths of measured northern pike varied between 15.0 to 28.7 inches with a mean length of 23.1 inches within Mildred Lake (Figure 12). Mean length of northern pike was around the 95th percentile for complex-cool-clear lakes. Further size structure comparisons should be avoided due to limited sample size (< 75 individuals; [Miranda 2007](#)).

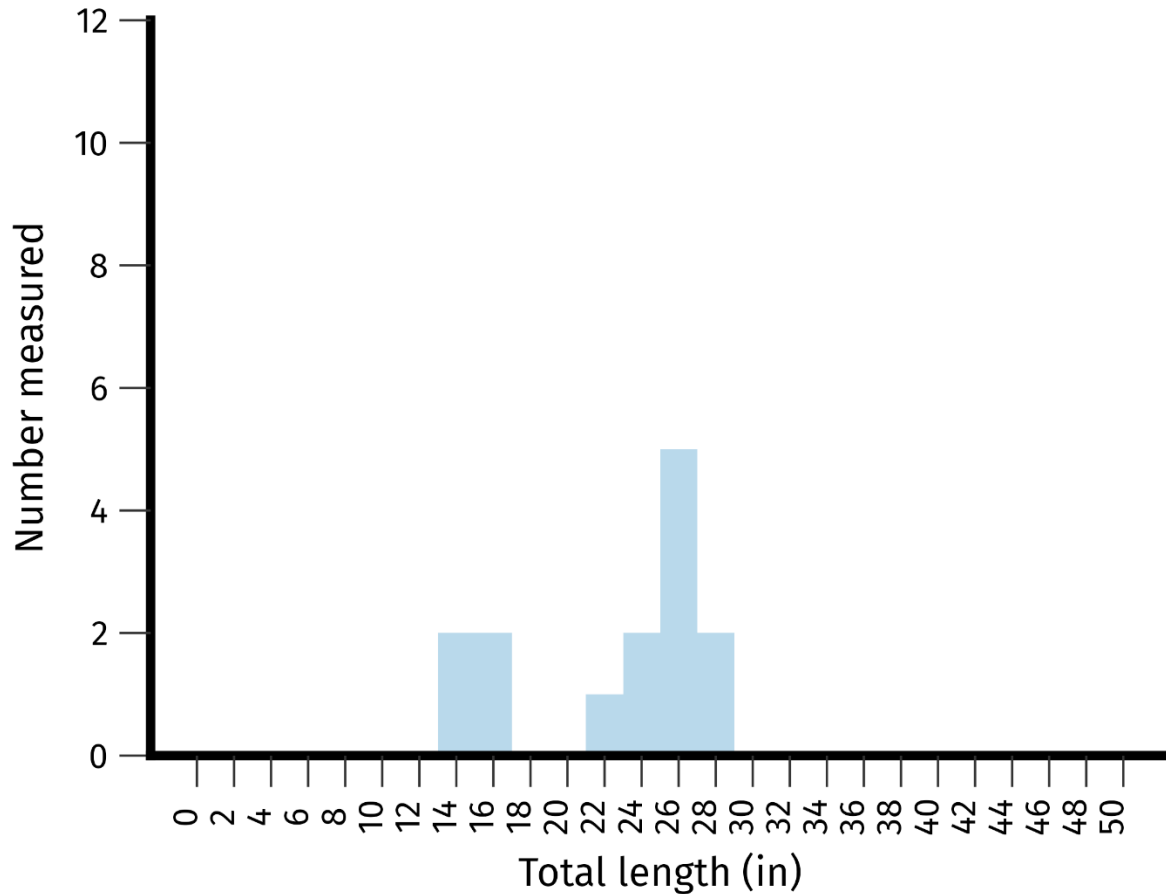


Figure 12. Length frequency of measured northern pike in the Mildred Lake Oneida County, WI during the 2025 survey. Length bins are every 2.0 inch.

SMALLMOUTH BASS

A total of 183 smallmouth bass were captured while surveying Mildred Lake via electrofishing (n = 183) and netting (n = 0). Smallmouth bass catch rate was 0.0 individuals per net-night during netting and 12.31 individuals per-mile during electrofishing in Mildred Lake. Smallmouth bass catch per-mile in Mildred Lake was around the 75th percentile per-mile for complex-cool-clear lakes. Lengths of measured smallmouth bass varied between 2.6 to 16.2 inches with a mean length of 10.5 (Figure 13). Mean length of smallmouth bass was around the 75th percentile for complex-cool-clear lakes. Otoliths were collected from 23 smallmouth bass between 5.7 inches to 15.7 inches within Mildred Lake. Assigned smallmouth bass ages represented six unique year classes between 2 years old and 10 years old. Relatively consistent recruitment has been occurring at ages 2 to 6 present with a gap till age-10. Mean lengths at age of individuals 3 and younger were similar between 2005 and 2025. Starting at age 4, 2025 mean length at age was less than what was found in 2005.

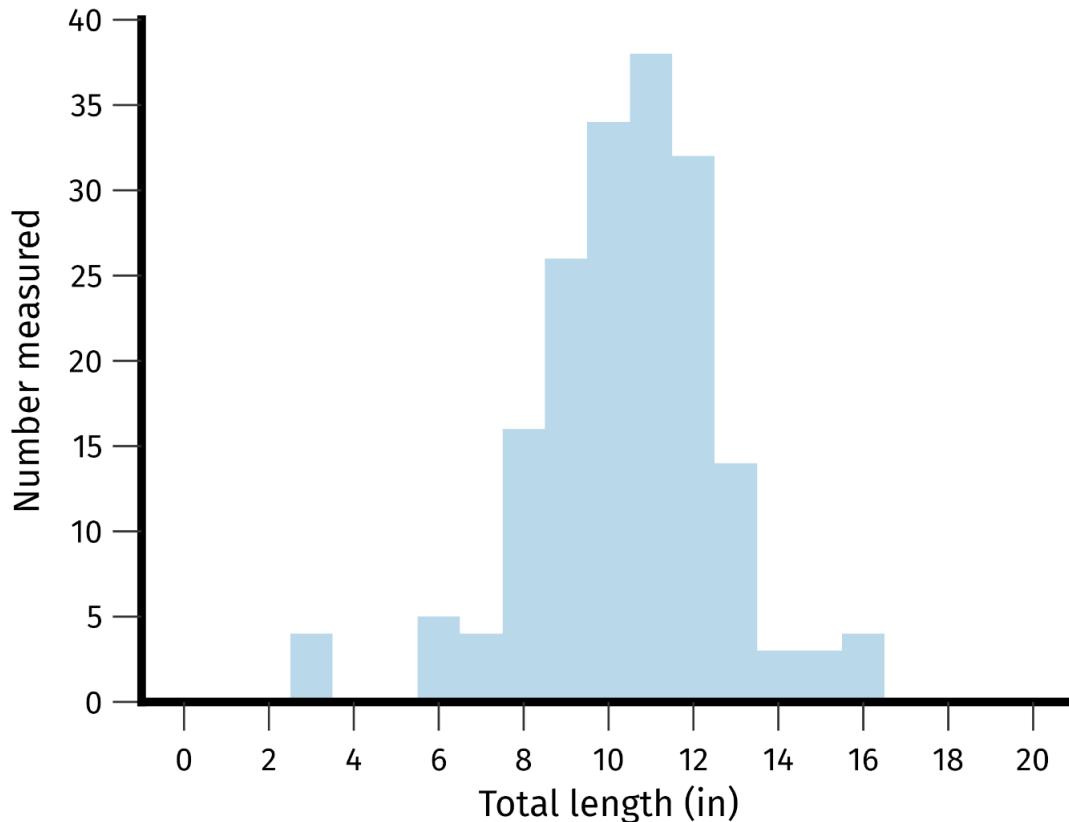


Figure 13. Length frequency of measured smallmouth bass in Mildred Lake Oneida County, WI during the 2025 survey. Length bins are every 1.0 inch.

WALLEYE

A total of 256 walleye were captured in Mildred Lake via electrofishing ($n = 53$) and netting ($n = 203$), with a male to female ratio of 2.5:1. There were 156 unique and 31 previously marked individuals captured during population estimate sampling resulting in an adult population estimate of 193 ± 34 fish (1.0 per acre; $CV = 0.09$). This adult abundance represents a slight increase from the 2005 estimate of 154 ± 42 fish (0.8 per acre; $CV = 0.14$). An additional 69 walleyes were handled outside the population estimate sampling or were less than 15 inches. The walleye electrofishing (3.6 per-mile) and netting (5.1 per net-night) catch rate near the 50th percentile for complex-cool-clear lakes. Lengths of walleye varied between 8.0 inches and 28.0 inches with a mean length of 17.4 inches, which is around the 75th percentile for complex-cool-clear lakes (Figure 14). Female walleyes tended to be larger than male walleyes (Figure 14). Walleye PSD-15 was 86, and PSD-20 was 1 in 2025, decreasing from the PSD-15 of 100 and PSD-20 of 30 observed during the 2005 survey. Walleye PSD-20 of 1 is slightly below the suggested balanced population (PSD-20 = 10-20; [Pedersen 2020](#)), while PSD-15 of 86 is higher (30-60 [Anderson and Weithman 1978](#)).

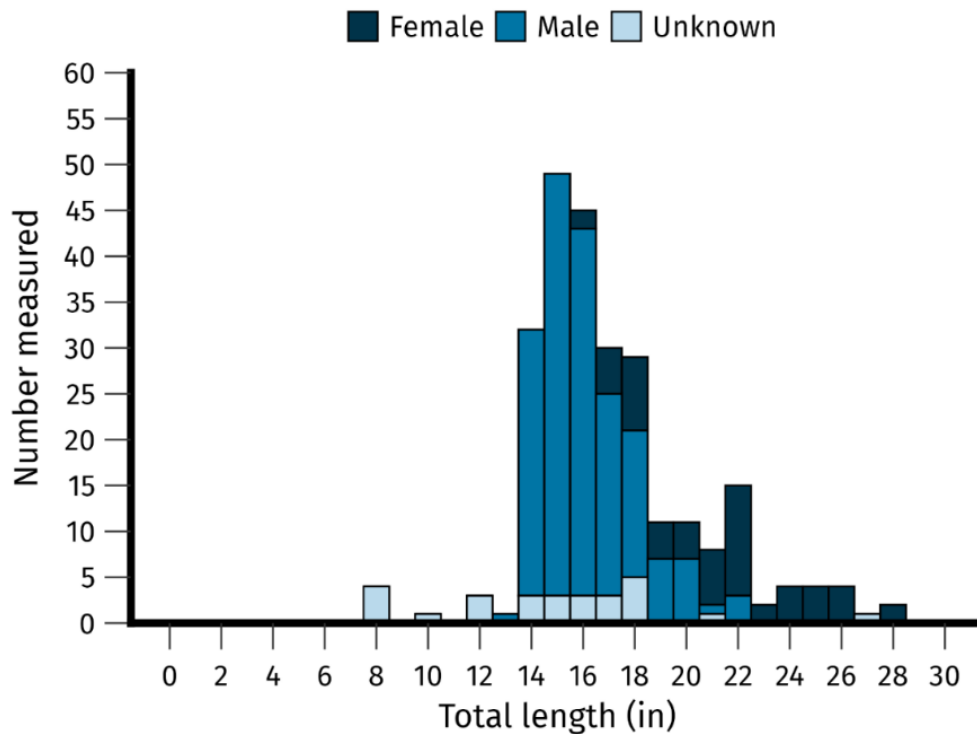


Figure 14. Length frequency of measured walleye in Mildred Lake Oneida County, WI during the 2025 survey. Length bins are every 1.0 inch.

Walleye were represented by 10 age classes (ages 4–13) in 2025, a decrease from the 12 age classes (ages 5–16) observed in 2005. Male length-at-age was similar to what was found in 2005 data and other complex-cool-clear lakes until age 6, after which growth rates decreased below expected averages (Figure 15). Female length-at-age exceeded both 2005 levels and regional expectations (Figure 15). The predicated theoretical mean maximum length from the von Bertalanffy growth model was unable to converge for males and was 25.7 inches (95% confidence interval; 24.5–28.2) for females. The von Bertalanffy growth model predicted a theoretical mean maximum length (L_{∞}) of 25.7 inches (95% CI: 24.5–28.2) for females. The model failed to converge for males. Total annual mortality for adult walleye, estimated via catch-curve regression, decreased from 2005 levels (females: 33%, 95% CI: -26–64%; males: 35%, 95% CI: 22–46%) to 2025 levels (females: 18%, 95% CI: 2–31%; males: 16%, 95% CI: -20–40%; Figure 16).

Survival of stocked walleye recruited to the adult fishery ranged from 2.2% (age 9) to 6.3% (age 6). This survival rate translates to a cost-per-fish to the fishery, varying from \$47.40 for the age-6 cohort to \$135.70 for the age-9 cohort. Recruitment of the 2024 stocking class appears poor, as no age-1 individuals were captured during the fall 2025 electrofishing survey. Natural recruitment appears limited with no age-0 walleye being sampled during the 2005 or 2025 fall surveys.

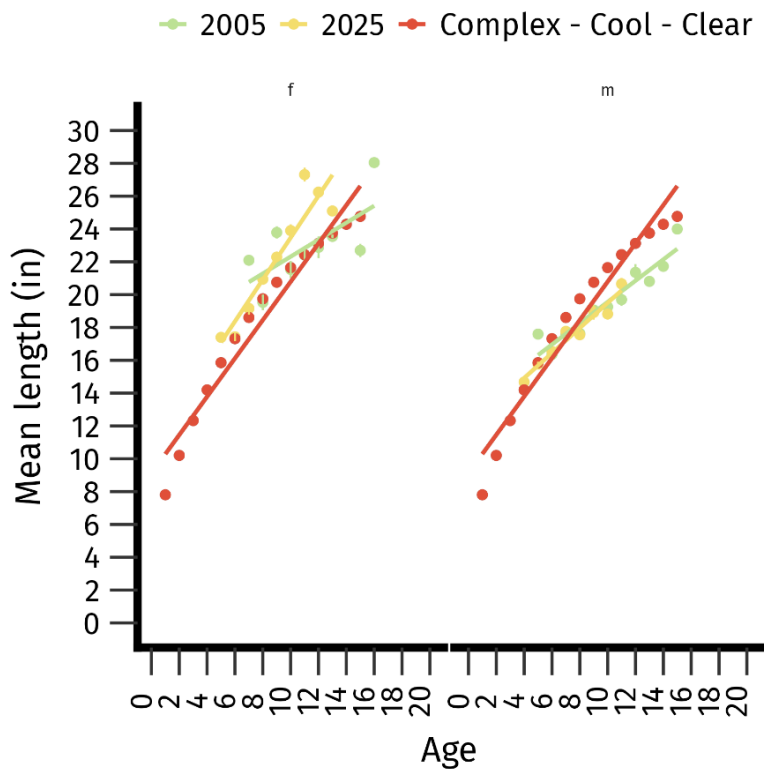


Figure 15. Mean total length (± 1 standard error) at estimated age of walleye within Mildred Lake for female (left) and male (right). Walleye ages were assigned using dorsal fin rays in 2025 and scales in 2005. Length of individuals with an unknown age were assigned an age with a sex specific age-length key. Mean length at age for each year and median length at age for complex-cool-dark lake class are represented by unique colors.

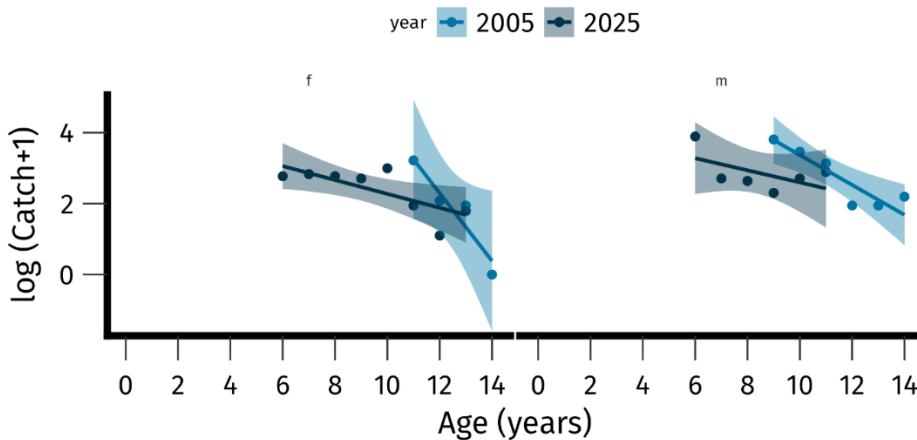


Figure 16. Catch curve of walleye within Mildred Lake, Oneida county, WI. Ages were assigned from dorsal spines in 2025 and 2005. Each year is represented by a unique color. Best fit line fit assigned based of linear model to fully vulnerable ages for each year and sex combination where the catch curve started descending with the associated 95% confidence interval of the estimate.

YELLOW PERCH

A total of 41 yellow perch were captured while surveying Mildred Lake via electrofishing (n = 1) and netting (n = 40). Catch rates of yellow perch were 1.0 fish per net-night and 1.0 fish per mile falling around the 25th percentile for complex-cool-clear lakes. Measured lengths of yellow perch varied from 2.8 inches to 8.4 inches with a mean of 6.7 inches (Figure 17). Further size structure comparisons were avoided due to limited sample size (< 75 individuals; [Miranda 2007](#)).

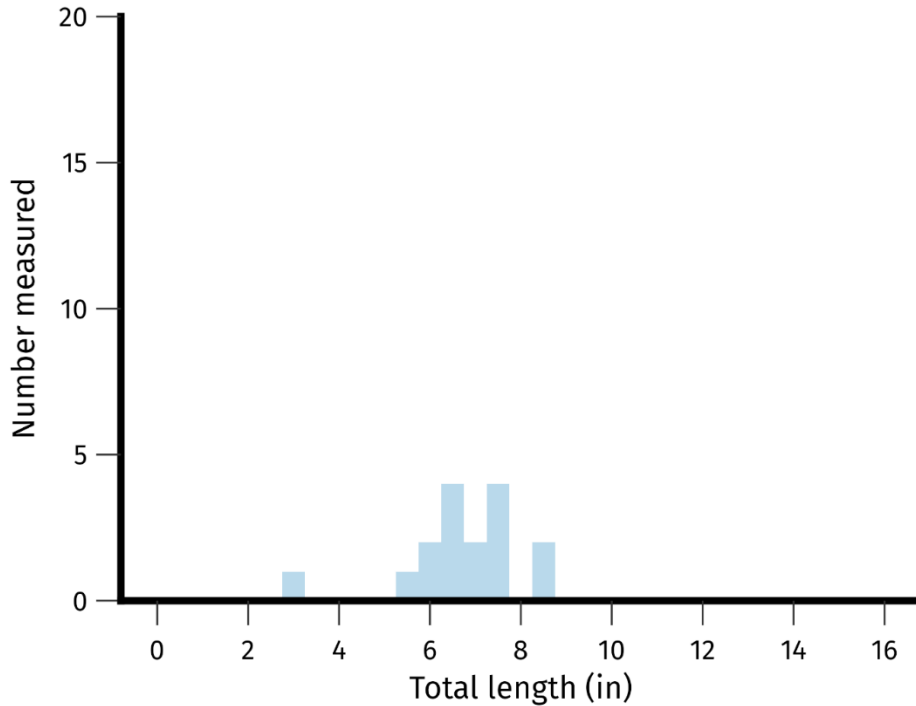


Figure 17. Length frequency of measured yellow perch in Mildred Lake Oneida County, WI during the 2025 survey. Length bins are every 0.5 inch.

SURVEY RESULTS

A total of 37 lake association members responded to the survey, representing a 44% response rate (Appendix A). Respondents have mostly owned property for over 25 years (range: 1–72 years). Riparian owners primarily utilized Mildred Lake for relaxation, swimming, and open-water fishing, while kayaking and ice fishing were the least common activities. Among respondents, 43% fish the lake regularly and 37% fish occasionally. Of those who fish, 56% believe the fishery has remained stable or improved over time, while 28% perceive a decline in quality. Overall, 81% of anglers rated the fishing quality as "average" to "good." Largemouth bass, smallmouth bass, and walleye were the most sought-after species, followed by black crappie, bluegill, and yellow perch. Most respondents prefer balanced regulations but there was a notable desire for more conservative management of muskellunge (64%) and northern pike (32%) and more liberal regulations for rock bass (35%). Open ended comments focused on a perceived decrease in the size of bass species and northern pike, as well as a desire for improved shoreline and aquatic plant management.

Other species

Other species captured during the Mildred Lake survey included green sunfish (11), green sunfish x bluegill hybrid (6), johnny darter (2), pumpkinseed (1), pumpkinseed x bluegill hybrid (1) and white sucker (1).

Discussion

Mildred Lake was found to be a multiple use resource with a mixed fishery. Nearly all species had catch rates around average for the lake class with size structure exceeding the 75th percentile. Stakeholders express a high level of satisfaction with a desire to maintain the balanced fishery. Concerns focused on habitat preservation and shoreline protection. Several biological bottlenecks regarding recruitment and growth rates should be given future management considerations.

Mildred Lake had a large size structure highlighted by panfish mean lengths in the 99th percentile and muskellunge in 100th percentile. Growth information indicates that these fisheries are sustained by long-lived individuals rather than rapid growth. This makes the fishery susceptible to over-exploitation. This can be observed as bluegill numbers drop significantly beyond the 8-inch mark ([Jennings et al 2001](#)). Implementing a more restrictive 10-fish daily bag limit for panfish could maintain this high-quality size structure despite slow growth rates, balancing user desires for harvest opportunities with long-term population stability ([Jacobson 2005](#)).

A walleye fishery is a priority for stakeholders but the population within Mildred Lake continues to fall short of density benchmarks (1.4–1.5 adults/acre; unpublished data; T. Cichosz Wisconsin Department of Natural Resources, [Donofrio et al. 2022](#)). Natural reproduction appears negligible, making the fishery dependent on stocking. However, source assignment is complicated by the inherent biases of using dorsal spines for aging larger fish (>18 inches; [Koenigs et al. 2013](#)) and a history of unpermitted stocking ([Kubisiak 2006](#)). Thus, the high social desire for walleye must be weighed by managers and the lake association against the economic cost, which exceeds \$47.00 per individual recruited to the adult population.

The muskellunge fishery in Mildred Lake is characterized by large old individuals at levels comparable to other complex-cool-clear systems. This fishery appears entirely dependent on stocking, as most assigned ages aligned with documented stocking years. The absence of juvenile and smaller muskellunge following the cessation of stocking in 2017 supports the idea that muskellunge are not reproducing within Mildred Lake. The muskellunge fishery will likely undergo a slow decline and disappear over the next decade without any additional stocking. This fish community shift may align with stakeholder priorities, as survey results indicated that lake association members have limited interest in muskellunge angling opportunities.

Largemouth bass and smallmouth bass remain a top management priority within Mildred Lake. Anglers have noted a decrease in lengths of bass. This decrease is likely

driven by the lake's low productivity and crowding effect, where increased bass abundance would lead to increased competition and reduced growth ([Beamesderfer and North 1995](#)). The presence of stocked walleye further stresses the available food web. Management should prioritize habitat enhancements, such as coarse wood additions ([Preul-Stimetz et al. 2025](#), [Fenstermacher et al. 2024](#)) and shoreline buffer restoration, to increase natural productivity. Additionally, a protected slot limit may restructure the population, encourage faster growth rates, and improve the availability of larger, individuals ([Wilde 1997](#); [Keplinger et al. 2023](#)).

Ecosystem health is a top priority for the Mildred Lake community. Habitat complexity above and below the water line directs the health of the fisheries meaning riparian can play a vital role in conservation. [Healthy Lakes and Rivers](#) outlines actions residents can implement for shoreland improvements such as rain gardens, native plantings, and fish sticks. These proactive steps on individual properties can help reduce runoff, improve water quality, and foster a more robust environment for the fish populations within Mildred Lake.

Recommendations

1. **Enhance habitat complexity:** Riparian owners should complete various healthy lakes and river best practices in addition to the half logs and fish cribs actions the lakes association has completed. These efforts are critical for improving the overall productivity and ecological resilience of the system.
2. **Protect panfish quality:** Consider implementing a more restrictive 10-bag on panfish ensuring a balanced fishery exists for anglers and predator fish have sufficient forage.
3. **Restructure bass population:** A 14-to 18-inch protected slot with a 5 daily bag on largemouth and smallmouth bass may direct harvest towards smaller more abundant individuals, reducing competition and potentially improving size structure and growth of the remaining population.
4. **Evaluate stocking desires:** Continued stocking of walleye and muskellunge will be required to maintain those fisheries and the high cost should be weighed against social desires.

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Appendix A

Appendix 1. Mildred Lake user input questions and answered administered via SurveyMonkey.

Question 1

How many total years have you owned property on Mildred Lake.

- Answered 37, Skipped 0
- Open ended no summary provided here. See results for summary. Contact authors for detailed results.

Questions 2

Rate the following activities based on how often you do them on Mildred Lake?

- Answered 37, Skipped 0

Table A.1 How Mildred Lake is used by users who responded to the survey.

USE	NEVER	RARELY	OCASSIONALY	OFTEN	VERY OFTEN
Pleasure boating	1	5	12	14	5
Open water fishing	3	8	14	9	3
Ice fishing	18	8	10	1	0
Kayaking	1	5	16	12	3
Swimming	3	1	12	13	8
Relaxing/entertaining	0	0	8	16	12
Snowmobiling	27	4	5	1	0

Question 3

What is your top concern regarding Mildred Lake?

- Answered 36, Skipped 1
- Open ended no summary provided here. See results for summary. Contact authors for detailed results.

Question 4

How often do you fish on Mildred Lake? If you've never fished Mildred Lake, you're done. Please skip to the end and submit the survey.

- Answered 35, Skipped 2.

Table A.2 How much users fish on Mildred Lake of those who responded to the survey.

ANWSER CHOICE	RESPONSES
Never	3
Rarely	4
Occasionally	13
Often	12
Very often	3

Question 5

How has the fishery changed since you have been fishing Mildred Lake?

- Answered 32, Skipped 5.

Table A.3 How users feel the fishery on Mildred Lake has changed over time.

ANSWER CHOICE	RESPONSES
Improved	5
About the same	13
Worse	9
Unsure	5

Question 6

How often do you fish using the following methods on Mildred Lake?

- Answered 32, Skipped 5.

Table A.4 How users' fish on Mildred Lake.

USE	NEVER	RARELY	OCCASSIONALY	OFTEN	VERY OFTEN
Trolling	23	6	3	0	0
Fish from dock or shore	3	6	8	8	7
Fish from nonmotorized watercraft	9	8	10	4	1
Use minnow while fishing	10	10	10	1	1
Use worms while fishing	2	5	15	7	3

Question 7

What species of fish do you target while fishing Mildred Lake?

- Answered 30, Skipped 5.
- Open ended no summary provided here. See results for summary. Contact authors for detailed results.

Question 8

How would you describe the current quality of fishing on Mildred Lake?

- Answered 32, Skipped 5.

Table A.5 How users' feel the quality of fishing on Mildred Lake is.

ANSWER CHOICE	RESPONSES
Great	0
Good	10
Average	16
Poor	6

Question 9

Please indicate your level of interest in fishing for the following species specifically on Mildred Lake. Feel free to add a species if it does not appear in the list.

- Answered 32, Skipped 5.

Table A.4 Level of fishing interest of users among fish species within Mildred Lake.

FISH SPECIES	HIGH	MEDIUM	LOW	NONE
Black crappie	8	15	3	4
Bluegill	9	13	9	1
Largemouth bass	12	14	5	0
Muskellunge	1	18	7	5
Northern pike	1	12	11	6
Rock bass	0	7	6	18
Smallmouth bass	12	12	5	2
Walleye	12	16	2	1
Yellow perch	8	17	5	1

Question 10

Fish can be managed with more restrictive regulations that promote more release or less restrictive regulations that allow more harvest. What kind of fishing opportunities would you like to have on Mildred Lake for each of the following species. Please note: A harvest-based management approach is still designed to create a sustainable population.

- Answered 31, Skipped 6.

Table A.4 Preferences for numbers versus size, balanced or harvest among fish species in Mildred Lake.

FISH SPECIES	CATCH AND RELEASE	BALANCED	SUSTAINABLE HARVEST
Black crappie	2	24	5
Bluegill	2	23	6
Largemouth bass	9	19	3
Muskellunge	20	9	2
Northern pike	13	13	5
Rock bass	5	15	11
Smallmouth bass	10	17	4
Walleye	13	13	3
Yellow perch	8	20	3

Question 11

Feel free to provide any additional comments about Mildred Lake.

- Answered 14, Skipped 23.
- Open ended no summary provided here. See results for summary. Contact authors for detailed results.