

Wisconsin Department of Natural Resources
Kelly Lake, Oconto County
Fisheries Survey Report, 2025

Waterbody Code: 446600



Photo credit: Tammie Paoli



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Introduction

Kelly Lake in Oconto County, Wisconsin, has an area of 366 acres and maximum depth of 41 feet. It is classified as a complex warm, clear hardwater drainage lake. As a local comparison, this is the same classification as Anderson and Waubesa lakes in Oconto County. The littoral area is primarily sand with limited muck, gravel, and rubble. A small privately owned dam is located at the Kelly Brook outlet. There are five public boat landings. These access locations are owned and maintained by the towns of Spruce and Brazeau. The majority of the shoreline is developed as homes and seasonal cottages. The Kelly Lake Advancement Association (KLAA) and Kelly Lake Sportsman's Club (KLSC) are two organizations that are active in the lake community. Holt Park is owned by the Town of Spruce and has a campground, picnic area, public swimming beach, and fishing pier along the west shore. Fishing regulations for Kelly Lake follow the general inland waters regulations for all species except for bass, which has a special regulation of no minimum size and 5 daily bag limit.

Aquatic invasive species present in Kelly Lake and year first detected include zebra mussel (2015), banded mystery snail (2015), Chinese mystery snail (2015), Eurasian watermilfoil (2012) and hybrid watermilfoil (2015). Since then, various treatments to chemically or physically reduce milfoil have occurred. In 2014, the KLAA received a grant for invasive species management and has been working with a consultant to perform spot treatments and diver assisted suction harvesting.

The Oconto County Lakes Project is a county-wide grant funded project being completed by Oconto County Land Conservation Department, University of Wisconsin Stevens Point, University of Wisconsin Extension and DNR. As part of that process, 60 lakes with public access in Oconto County have or are in the process of having an individual Lake Management Plan developed. The Kelly Lake Management Plan is anticipated to be completed in 2028.

Habitat projects on the lake include the addition of brush shelters in the early 1960's. Fish cribs were installed between 1989 and the early 2000's. A 94 ft rock spawning reef was constructed in 1984 on the west shore adjacent to Holt Park. New rock was added over that reef by KLSC in 2015 to fill in spaces. An additional 100 x 30 ft reef was installed in 2019 to the north of the existing reef. Fish sticks were installed in 2016 along Holt Park.

In 2025, the Department of Natural Resources conducted a comprehensive fish survey of Kelly Lake to provide insight and direction for the future fisheries management of this waterbody. Comprehensive fish surveys included spring fyke netting and spring and fall electrofishing surveys. Primary sampling objectives of these surveys are to characterize species composition, relative abundance, and size structure. The following report is a summary of the activities conducted, general status of fish populations and future management recommendations for Kelly Lake. Prior to 2025,

the most recent comprehensive survey was conducted in 2014. Kelly Lake is on a 10-year rotation for spring netting, with the next survey planned for 2035.

Methods

Kelly Lake was sampled according to spring netting I (SN1), spring electrofishing I (SE1), spring electrofishing II (SE2) and fall electrofishing (FE) DNR Fisheries monitoring protocols. The primary objective for the spring sampling period is to count and measure adult gamefish and panfish. The objective for the fall survey is to measure walleye recruitment and survival of yearling and older walleye.

For the SN1 survey, seven 3' x 6' hoop fyke nets with $\frac{3}{4}$ " bar, 1.5" stretch mesh were set as soon as ice conditions allowed on April 3, 2025 (Figure 1). Nets were lifted daily through April 16, 2025 for a total effort of 89 net nights. Water temperature ranged from 37-49F. All fish captured were identified to species. Up to 250 gamefish and panfish of each species were measured to the nearest 0.1 inch and the remainder counted. Gamefish were given a top caudal fin clip (for mark recapture population estimate).

A pelvic fin ray was collected from 5 northern pike per one inch group per sex. For walleye, a dorsal spine was collected from 5 fish per 0.5 inch group per sex. Additional aging structures included dorsal spines (largemouth bass >10 inches, black crappie >6 inches, bluegill >5 inches), anal spines (yellow perch) or scales (largemouth bass <10 inches, black crappie <6 inches, bluegill <5 inches) from 5 fish per 0.5 inch group. Otoliths were collected from 10 bluegill in the 6-inch length bin.

A DNR standard direct current double anode electrofishing boat was used to sample the entire shoreline (3.7 miles) on the evenings of April 16, May 21 and October 13, 2025. Only walleye were collected on April 16 and October 13 per protocol for SE1 and FE surveys, respectively. On May 21, all panfish and gamefish were collected for two separate 0.5 mile transects, and only gamefish were collected for the remaining 2.7 miles of shoreline per SE2 protocol. Fish collected were measured to the nearest 0.1 inch, and inspected for a top caudal fin clip.

Proportional stock density (PSD) is the ratio of 'quality-length' fish to 'stock-length' fish multiplied by 100. PSD values were calculated for species of interest. Values between 40 and 60 generally indicate a balanced fish population. Relative stock density (RSD) is the ratio of 'preferred-length' fish to 'stock-length' fish multiplied by 100.

Ages were assigned to fish after fish were aged using standard DNR procedures. An age-length key was created to assign ages to un-aged fish based on proportional representation of the known age fish subsample. The modified Schnabel population estimation technique was used for walleye and northern pike.

Results

Black Crappie

A total of 288 black crappie were sampled. The average length was 7.4 inches with a range from 5.2 to 12.0 inches. The catch rate was 3.2 per net night for SN1. This catch rate is higher than the catch rate in the 2014 survey (0.6 per net night). No black crappie were captured during the SE2 survey. The difference in catch between netting and electrofishing highlights the importance of using multiple gears when evaluating panfish populations. The length frequency distribution indicated a strong mode of fish around 7 inches (Figure 2). PSD was low, at 23. Growth rates for black crappie were similar to the lake classification average and the 2014 survey for ages 2 to 4 (Figure 3). Only one black crappie was estimated at age 5 (12.0 inches). However, growth rates of a single fast-growing fish should be interpreted with caution. Only one year class (age-3) was well represented and comprised 94% of the sample. Crappie were stocked by the KLSC annually from 2017 to 2022. Since crappie were age-1 when stocked, the youngest cohort of stocked black crappie in the lake would be age-4 in 2025. Therefore, the majority of crappie captured in this survey (age-3) does not coincide with a stocking event and are likely the result of natural reproduction.

Bluegill

A total of 2,630 bluegill were sampled during netting (n=2,618) and SE2 electrofishing (n=12) surveys (Figure 4). The average length from the gears combined was 6.4 inches with a range from 3.6 to 9.7 inches (Table 2). The PSD value (all gears) for bluegill was 54. Sample size was too low in the SE2 survey to reliably calculate a PSD for electroshocking. The catch rate was 29.4 per net night in 2025 compared to 0.6 in the 2014 SN1 survey. Electrofishing catch rate (SE2) was 12 bluegill per mile in 2025 compared to 27 per mile in 2014. The electrofishing catch rate is below the 25th percentile compared to other complex, warm, clear lakes in Wisconsin. The length frequency of bluegill spans multiple inch bins with better representation of 8 inch and larger bluegill in 2025 compared to 2014 (Figure 5). Mean age of 6-6.9 inch unknown sex bluegill (n=10) was 4.8 years based on otolith ages. This is between the 33-66th percentile and indicates moderate growth rates for bluegill in the 6-inch range. However, when looking at all length bins of bluegill aging structures collected, growth rates of bluegill are generally above average compared to other complex, warm clear lakes (Figure 6).

Yellow Perch

A total of 40 yellow perch were sampled during fyke netting. Catch rate (0.4 per net night) of yellow perch was low and below the 25th percentile for the lake class despite annual stocking of age-1 perch by KLSC from 2011 to 2022. The majority of the perch sampled were age-3 (35%) and age-4 (44%) fish in the 6-to-7-inch range (Figure 7). Growth rates of yellow perch are average (Figure 8). The youngest age of stocked perch at the time of this survey is age-4 (perch stocked in 2022). Therefore, the age-3

perch are the result of natural reproduction. Hundreds of small (<3 inch) yellow perch were observed but not netted during the SE1 survey, further indicating natural reproduction of yellow perch.

Largemouth Bass

A regulation change for largemouth bass was recommended following the 2014 survey. In 2018, the bass regulation was adjusted from a 14-inch minimum, 5 daily bag limit to a no minimum length, 5 daily bag limit. The management goal was to improve bass growth and size structure. Objectives were to reduce largemouth bass abundance to <15/mile for SE2 surveys and increase RSD14 to 25.

There were a total of 97 largemouth bass sampled (this includes three recaptured individuals). Average length improved from 11.9 inches in 2014 to 12.3 inches in 2025 with a size range from 4.4 to 18.5 inches (Figure 9; Table 2). Electrofishing catch rate (SE2) was 15.7 per mile, down from 42.2 per mile in 2014. Density is at the 25th percentile compared to other complex, warm clear lakes in Wisconsin. A population estimate was not generated due to only three fish recaptured. Overall size structure of largemouth bass has improved since the 2014 survey (Figure 10). Since 2014, PSD for largemouth bass improved from 50 to 64 and RSD14 improved from 16 to 47. There appears to be steady recruitment with 12 age classes identified. Growth rates for bass ages 3 to 8 were above the lake class average and above growth rates in 2014 (Figure 11).

Northern Pike

There were a total of 224 northern pike sampled by all gears (Table 2; this includes 39 recaptured individuals). The catch rate was 2.5 per net night for SN1. The population estimate for northern pike was 433 adults (1.2 per acre), compared to 2.1 per acre in 2014. Density is moderate and between the 50-75th percentile compared to other complex, warm clear lakes in Wisconsin. Average length was 21.7 inches with a range from 9.9 to 37.0 inches (Table 2). A low density of memorable size pike are present in the lake (Figure 12). Length distribution and size structure were much improved compared to 2014 (Figure 13). Size structure was good with PSD at 55 (within the acceptable range of 30-60). Northern pike exhibit sexual dimorphism where females typically grow larger and faster than males (Figure 14). Growth rates are near average for the lake class for both males and females (Figures 15 & 16). Eight age classes were identified in the survey, suggesting steady recruitment of pike.

Walleye

From 2004 to 2013 (with the exception of 2010), KLSC stocked large fingerling walleye annually at an approximate rate of 5 per acre. Walleye stocked in 2012 and 2013 by KLSC were given different fin clips by DNR to evaluate survival, growth, and natural reproduction prior to the 2014 survey. In the 2014 fall electrofishing survey, only 3 walleye were captured, all in the 12-inch range with an RV clip indicating they were

stocked in 2013. No unclipped small walleye were captured in 2014, suggesting that natural reproduction was negligible at that time.

Wisconsin DNR stocked walleye large fingerlings in even-numbered years in Kelly Lake from 2014 to 2024 at a rate of 20 per acre, the highest stocking rate available through the Wisconsin Walleye Initiative. Kelly Lake was one of four lakes in a one-year paired stocking study done by Wild Rose Hatchery in 2020. Half of the walleye stocked in the experimental lakes were finished on minnows and given a left ventral (LV) fin clip. The other half were fed pellets and given a right ventral (RV) fin clip. A total of 4 LV clipped walleye were captured in the 2025 SN1 survey, and no RV clipped walleye were captured. It is difficult to draw meaningful conclusions with this low sample size, but the results suggest better survival of stocked walleye that were finished on minnows in this case.

In the 2025 survey, 783 walleye were sampled (this includes 437 recaptured individuals). The catch rate was 8.3 per net night for SN1 in 2025 compared to 1.9 per net night in 2014. The majority of walleye were caught in either Net 7 (48%) or Net 2 (20%). Net 2 was set on the walleye spawning reef, while Net 7 had limited rock near shore. The population estimate for walleye was 267 adults (1.0 per acre) compared to 65 adults (0.2 per acre) in 2014. Average length was 18.5 inches with a range from 13.9 to 27.8 inches (Table 2). Adult size structure is excellent (Figure 17), with a PSD of 97. This is common in walleye fisheries that are dependent on stocking. Length distribution and size structure were much improved compared to 2014 (Figure 18). Age-3 and age-7 males comprised 60% of the walleye catches, including recaptures. Walleye exhibit sexual dimorphism where females typically grow larger and faster than males (Figure 19). Growth rates for walleye were at or above the lake class average (Figure 20). All but 4 of the 132 walleye spines taken for aging corresponded with even-numbered years in which walleye were stocked by DNR. Three adult walleye and no young of year walleye were captured in the fall electrofishing survey. This, along with the aging data, suggests that natural reproduction is negligible.

Although the walleye population increased since the 2014 survey, it fell short of reaching the benchmarks set by the Statewide DNR Walleye Team. As a result, walleye stocking by DNR will be discontinued due to the lake not meeting criteria in the DNR stocking guidance (>1.5 per acre). Private walleye stocking permit applications will be considered based on stocking and genetic management guidelines.

Other Species

Rock bass were common in the survey, with a total of 109 sampled. Size structure is good, with an average length of 6.9 inches. Pumpkinseed sunfish, yellow bullheads, brown bullheads, and white suckers were present in the survey but at low abundance (Table 2).

Figures

Figure 1. Locations of fyke nets during SN1 (April 3-16, 2025) netting survey on Kelly Lake, Oconto County.

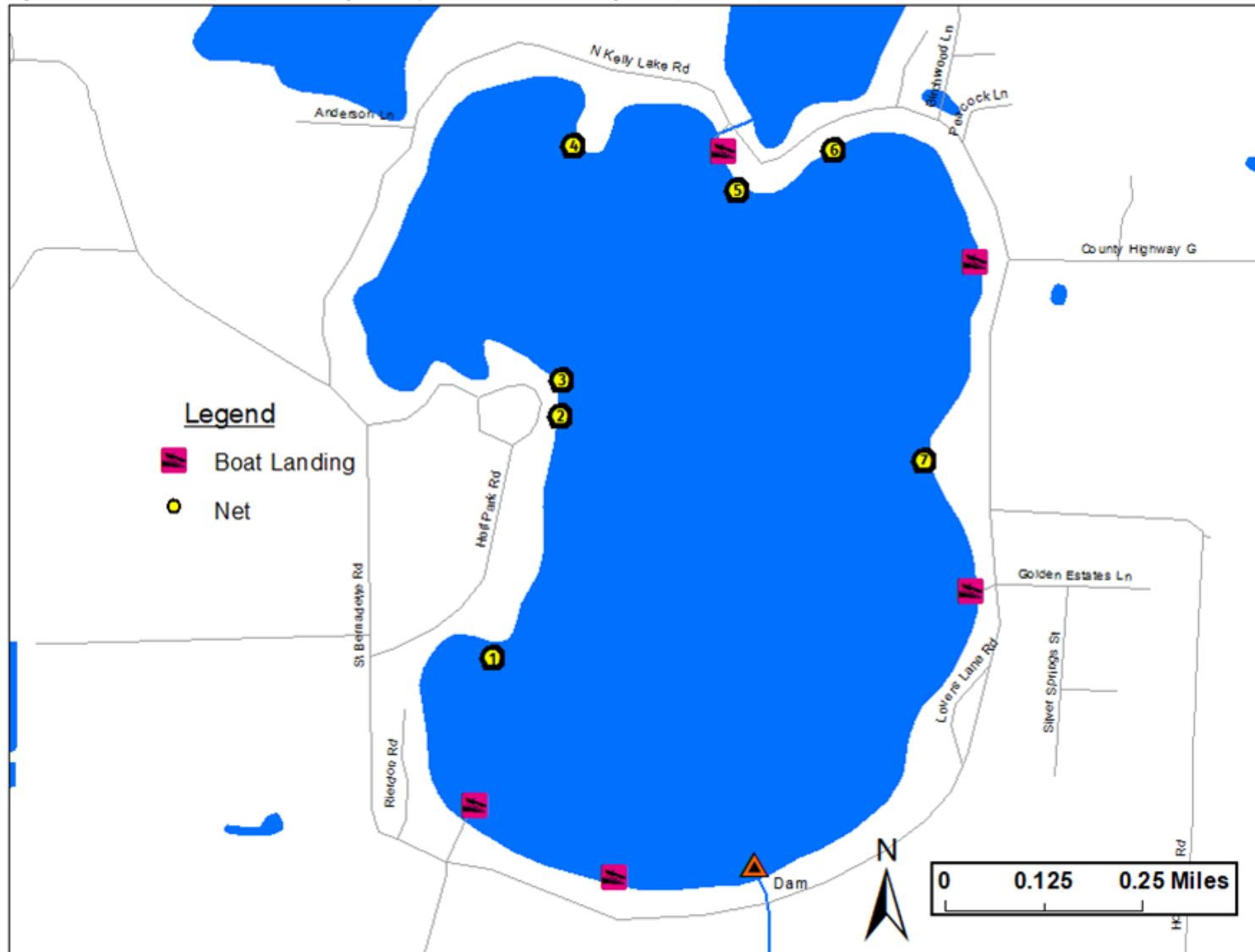


Figure 2. Black crappie length frequency distribution sampled during fyke netting from Kelly Lake, 2014 and 2025.

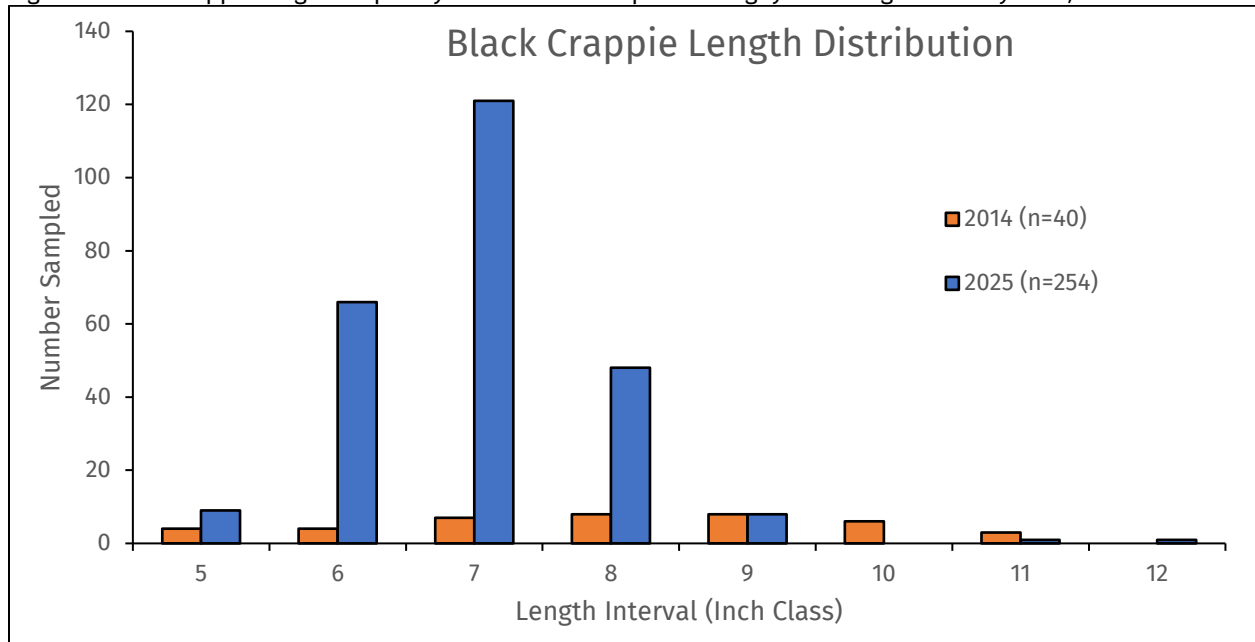


Figure 3. Black crappie mean length at age, Kelly Lake, 2014 and 2025, compared to Wisconsin lakes of the same classification.

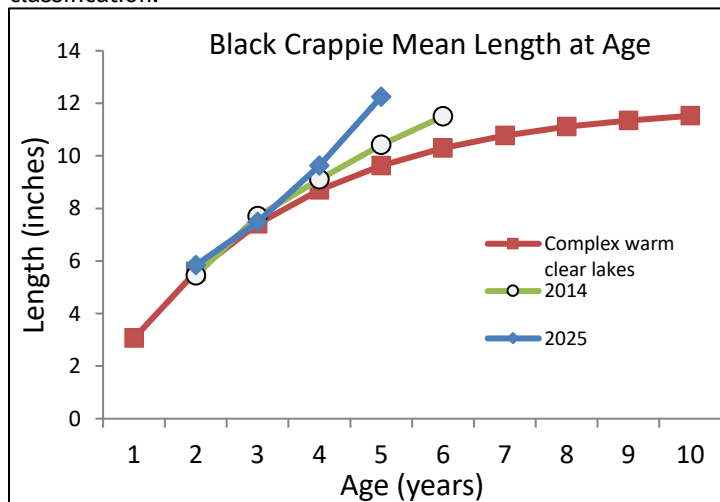


Figure 4. Bluegill length frequency distribution sampled by gear type, 2025.

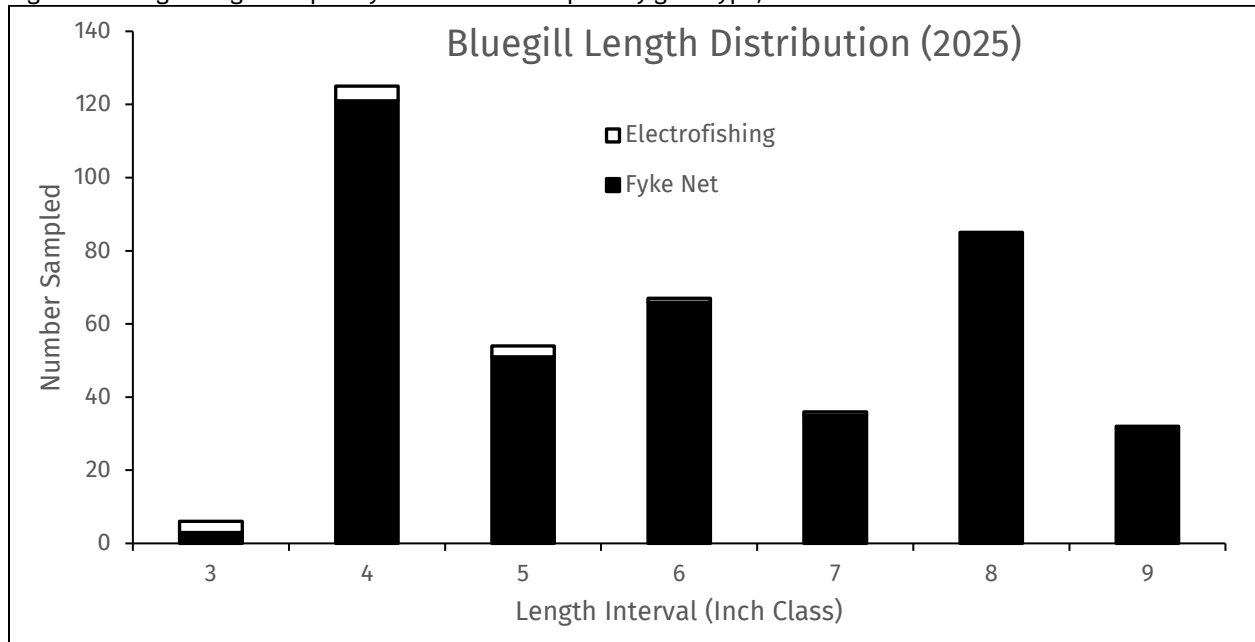


Figure 5. Bluegill length frequency distribution sampled during fyke netting and electrofishing from Kelly Lake, 2014 and 2025.

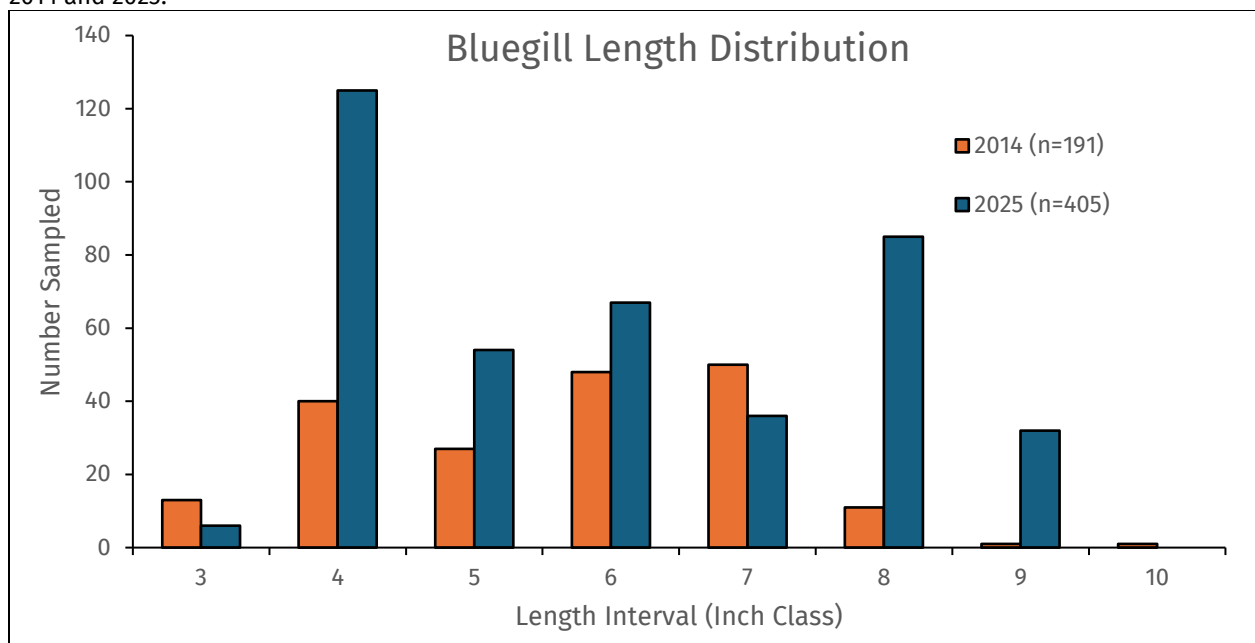


Figure 6. Bluegill mean length at age, Kelly Lake, 2014 and 2025, compared to Wisconsin lakes of the same classification.

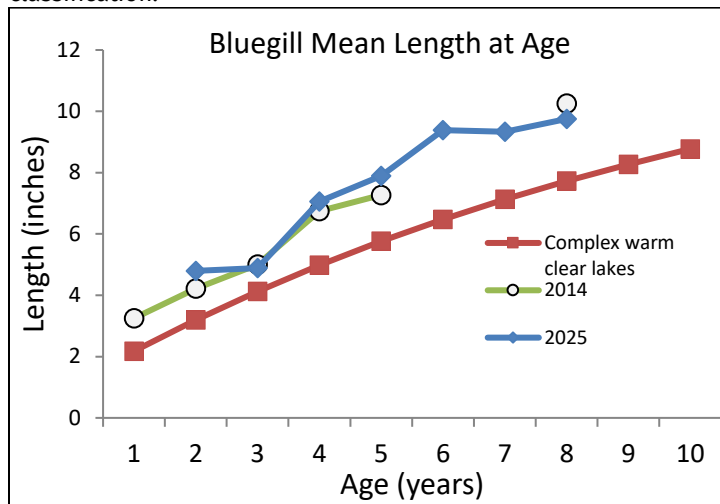


Figure 7. Yellow perch length frequency distribution from Kelly Lake, 2014 and 2025.

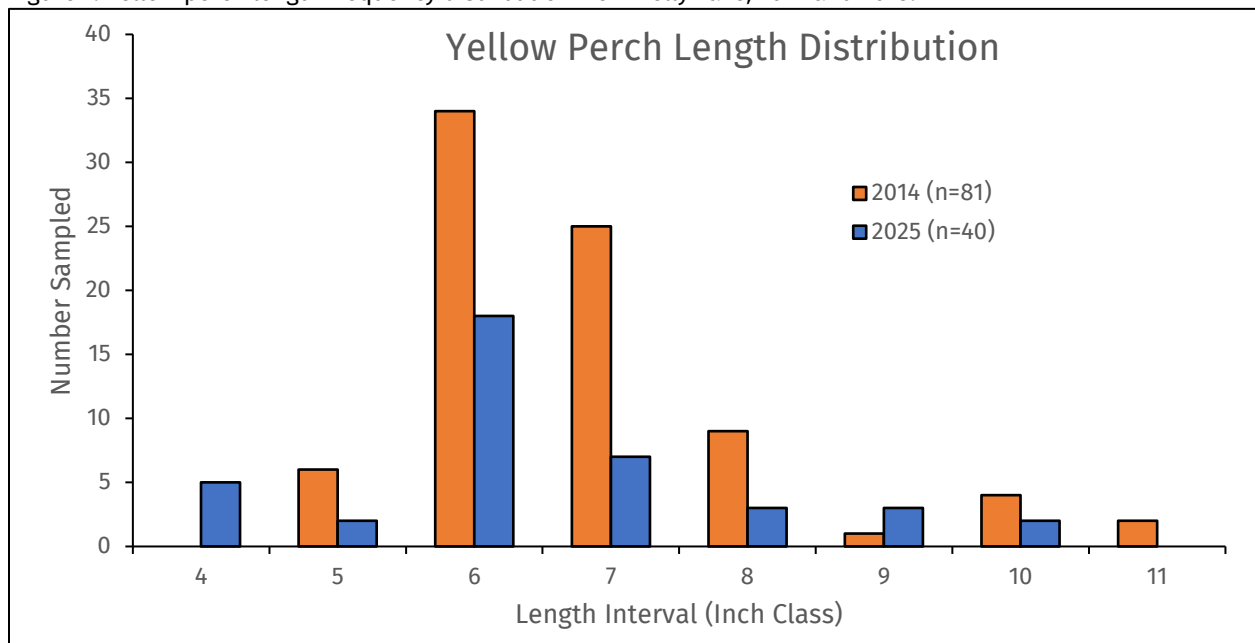


Figure 8. Yellow perch mean length at age, Kelly Lake, 2014 and 2025. Complex, warm, clear lakes statewide data for yellow perch is not available so complex, warm dark lakes were used as a comparison.

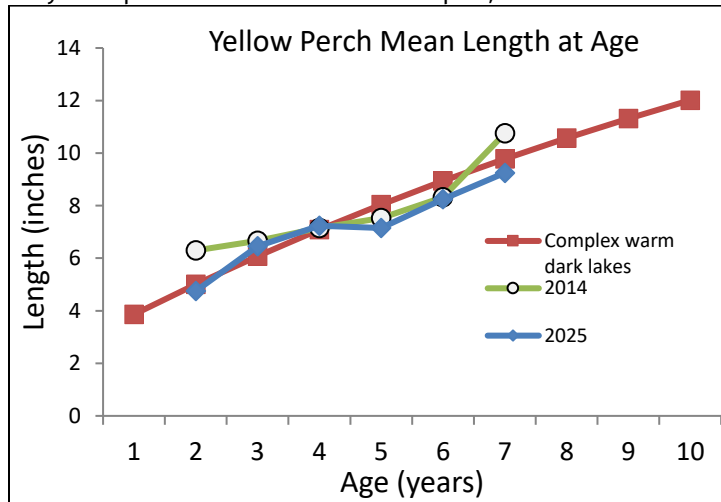


Figure 9. Largemouth bass length frequency distribution from Kelly Lake by gear type, 2025. Recaptured fish are not included.

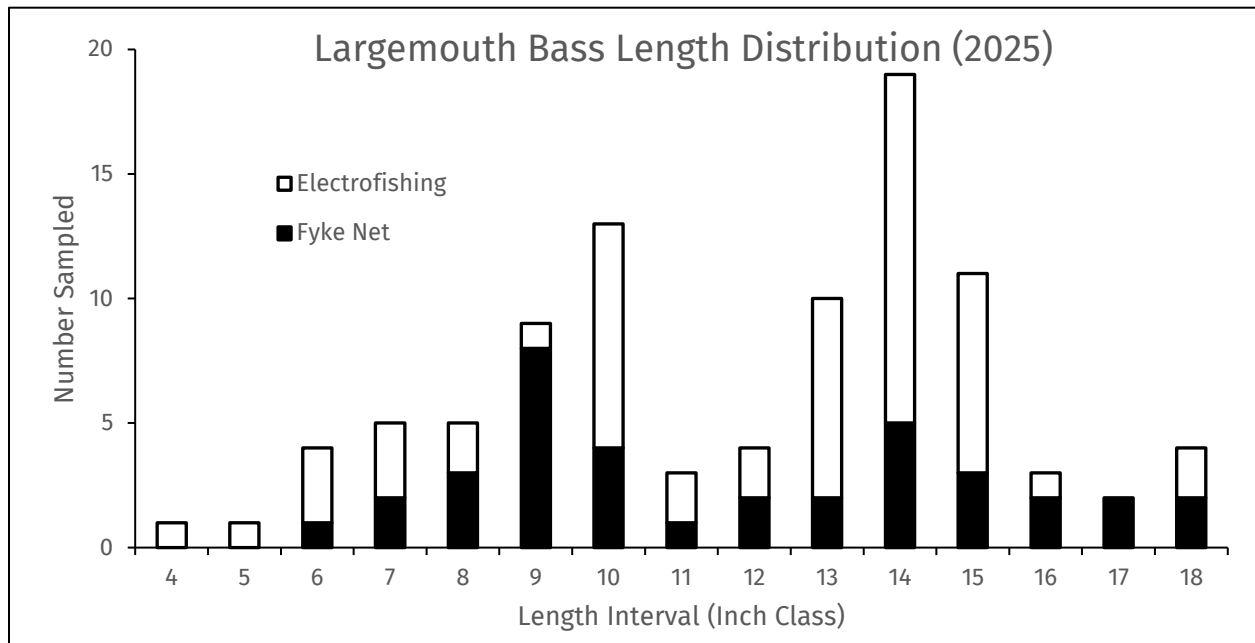


Figure 10. Largemouth bass length frequency distribution from Kelly Lake, 2014 and 2025. Recaptured fish are not included.

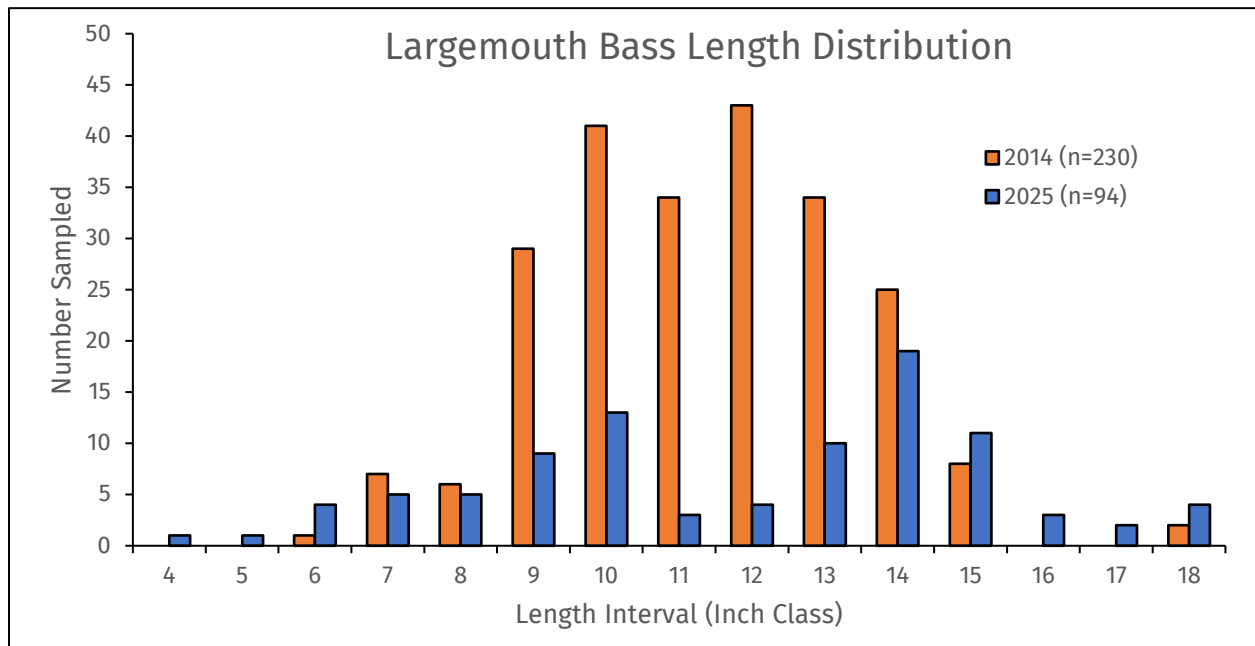


Figure 11. Largemouth bass mean length at age, Kelly Lake, 2014 and 2025, compared to Wisconsin lakes of the same classification.

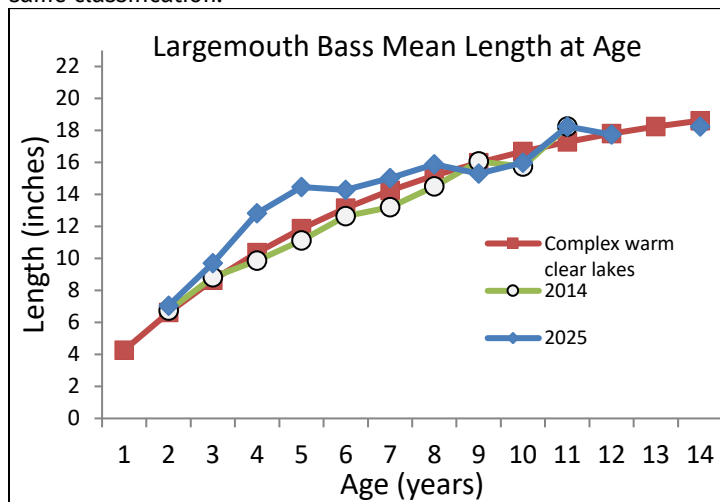


Figure 12. Northern pike length frequency distribution from Kelly Lake by sex, 2025. Recaptured fish are not included.

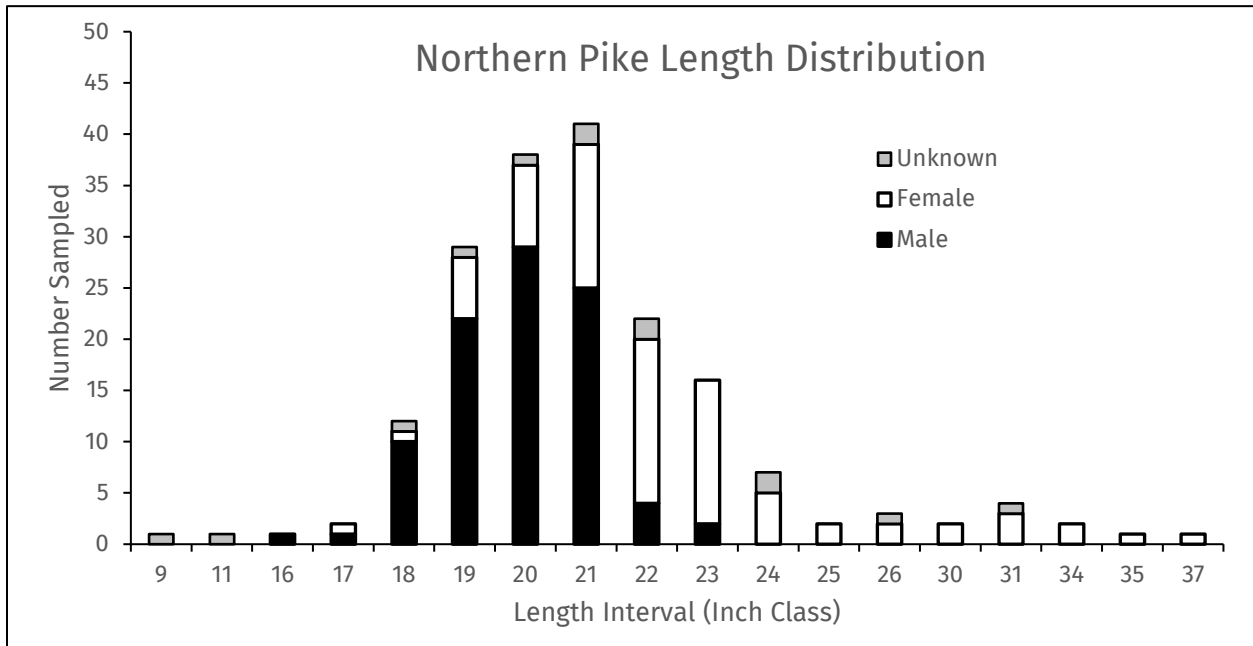


Figure 13. Northern pike length frequency distribution from Kelly Lake, 2014 and 2025. Recaptured fish are not included.

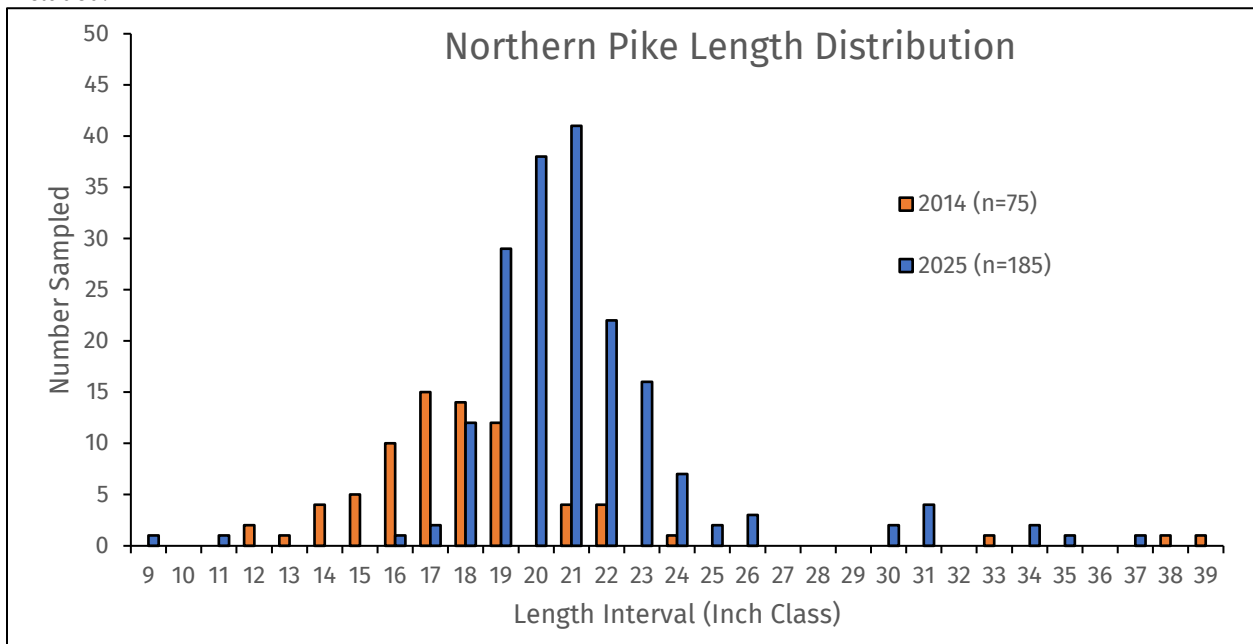


Figure 14. Northern pike mean length at age by sex, Kelly Lake 2025.

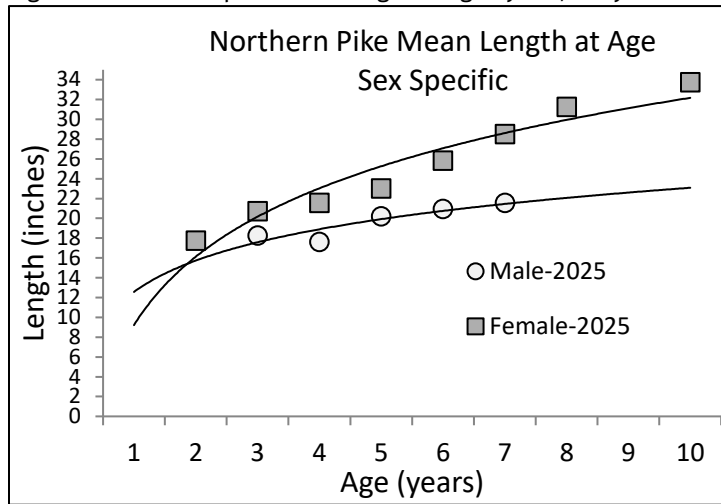


Figure 15. Male northern pike mean length at age, Kelly Lake 2025 compared to Wisconsin lakes of the same classification.

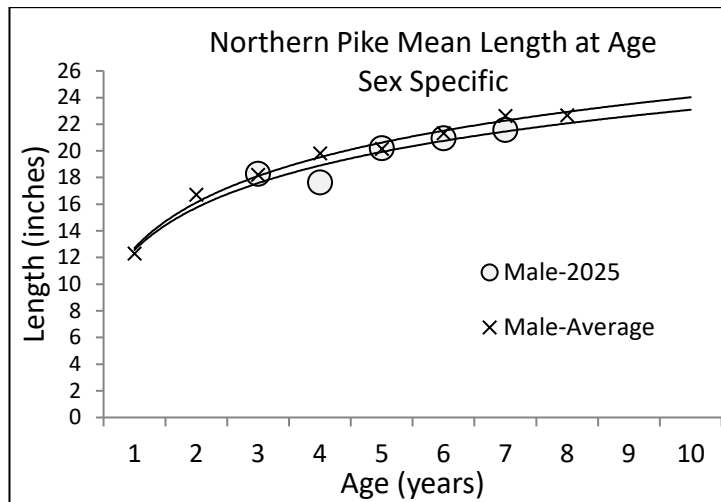


Figure 16. Female northern pike mean length at age, Kelly Lake 2025 compared to Wisconsin lakes of the same classification.

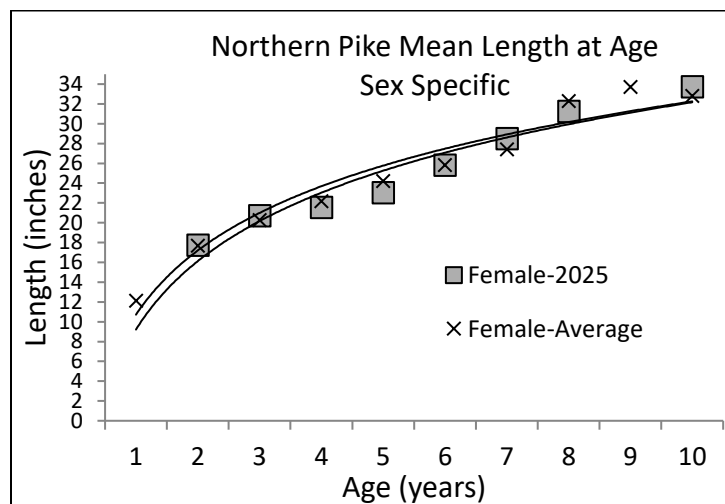


Figure 17. Walleye length frequency distribution from Kelly Lake by sex, 2025. Recaptured fish are not included.

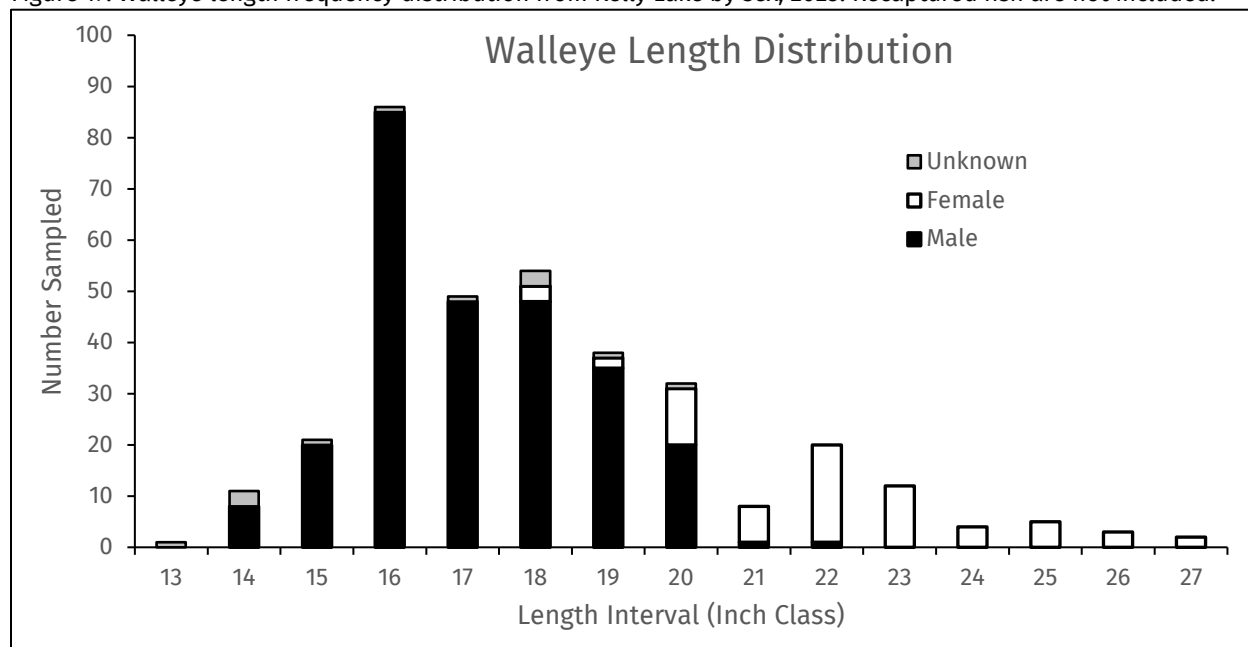


Figure 18. Walleye length frequency distribution from Kelly Lake, 2014 and 2025. Recaptured fish are not included.

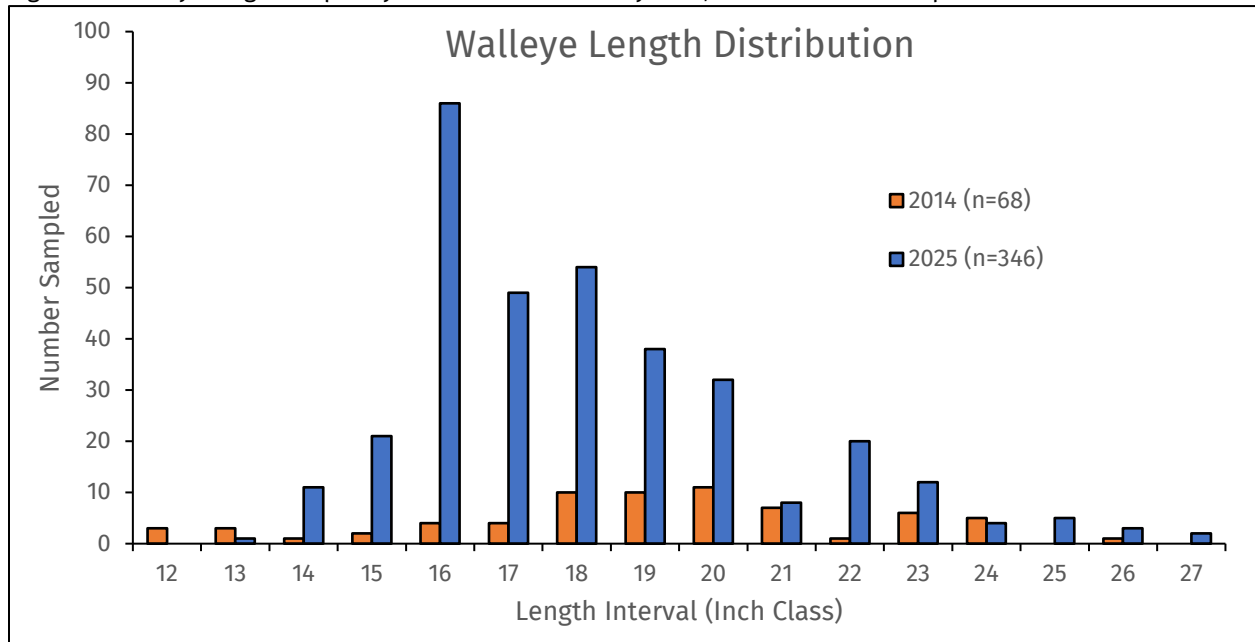


Figure 19. Walleye mean length at age by sex, Kelly Lake 2025.

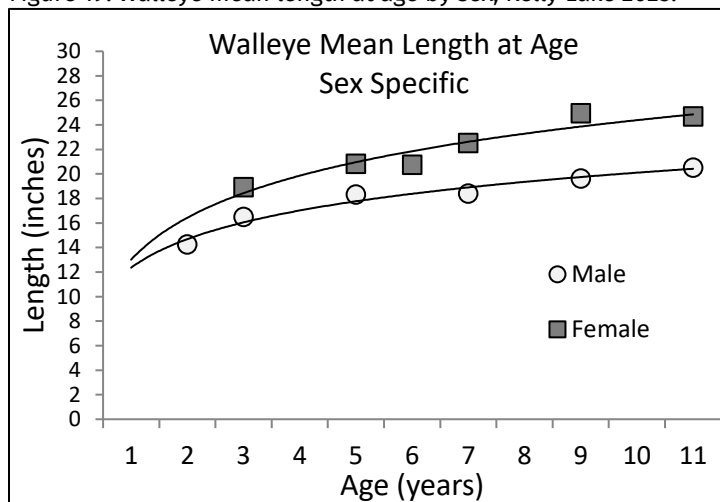
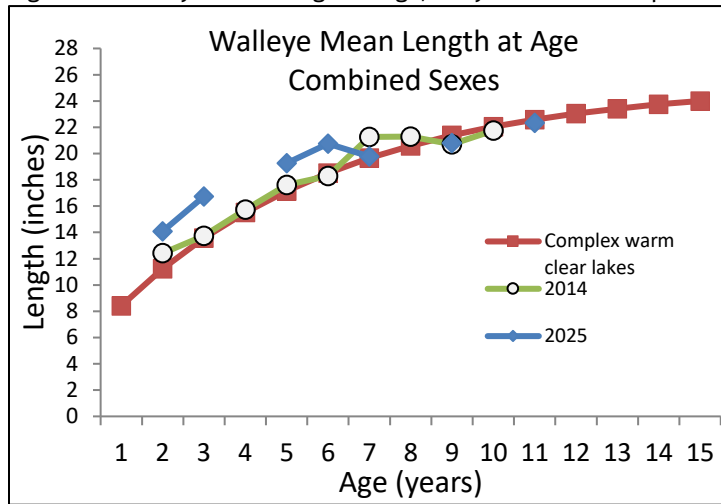


Figure 20. Walleye mean length at age, Kelly Lake 2025 compared to Wisconsin lakes of the same classification.



Tables

Table 1. Stocking history of Kelly Lake from 2011 to 2024.

Year	Species	Age Class	Number Stocked	Average Length (Inches)	Marks Given/Notes	Hatchery Source
2024	Walleye	Large Fingerling	7333	7		DNR Wild Rose Hatchery
2022	Walleye	Large Fingerling	5935	8.2		DNR Wild Rose Hatchery
2020	Walleye	Large Fingerling	3668	7.1	RV-Pellet fed	DNR Wild Rose Hatchery
2020	Walleye	Large Fingerling	3652	8.2	LV-Minnow fed	DNR Wild Rose Hatchery
2018	Walleye	Large Fingerling	7141	7.9	OTC	DNR Art Oehmcke Hatchery
2016	Walleye	Large Fingerling	7337	7.9		DNR Wild Rose Hatchery
2014	Walleye	Large Fingerling	7334	7.2		DNR Wild Rose Hatchery
2013	Walleye	Large Fingerling	1450	8.5	RV	Private funds
2012	Walleye	Large Fingerling	950	8	LV	Private funds
2011	Walleye	Large Fingerling	1027	7		Private funds
2022	Yellow Perch	Adult	2000	7		Private funds
2021	Yellow Perch	Adult	3696	6.5		Private funds
2019	Yellow Perch	Adult	5000	7		Private funds
2018	Yellow Perch	Adult	4998	6		Private funds
2017	Yellow Perch	Adult	4993	6.5		Private funds
2016	Yellow Perch	Adult	5050	7		Private funds
2015	Yellow Perch	Adult	4998	7		Private funds
2014	Yellow Perch	Adult	5000	7		Private funds
2013	Yellow Perch	Adult	3475	7		Private funds
2012	Yellow Perch	Adult	2742	7		Private funds
2011	Yellow Perch	Adult	2030	7		Private funds
2022	Black Crappie	Adult	1999	6		Private funds
2021	Black Crappie	Adult	1993	5.5		Private funds
2019	Black Crappie	Adult	1990	7		Private funds
2018	Black Crappie	Adult	982	6		Private funds
2017	Black Crappie	Adult	1000	6		Private funds

Table 2. Species and relative abundance of fish collected by all gear types in Kelly Lake, 2025. Recaptures are included in totals.

Common Name	Total Number Collected	Percent	Average Length (Inches)	Number Collected (SN1)	Number Collected (SE1)	Number Collected (SE2)	Number Collected (FE)
Bluegill	2630	62%	6.4	2618		12	
Walleye	783	18%	18.5	741	35	4	3
Black crappie	288	7%	7.4	288		0	
Northern pike	224	5%	21.7	219		5	
Rock bass	109	3%	6.9	97		12	
Largemouth bass	97	2%	12.3	39		58	
Yellow bullhead	86	2%	--	77		9	
Yellow perch	40	1%	6.9	35		5	
Pumpkinseed	10	0.2%	5.9	8		2	
White Sucker	8	0.2%	--	8			
Brown Bullhead	1	0.02%	--	1			
TOTALS	4,276			4,131	35	107	3

Discussion

Kelly Lake is on a 10-year rotation survey, with 2020 being a gap year when spring surveys did not occur. The 2025 survey was an opportunity to evaluate the DNR Wisconsin Walleye Initiative stocking and to evaluate the more liberal bass regulation that went into effect in 2018. The next comprehensive survey of Kelly Lake is planned for 2035.

In the 2014 survey, population density of largemouth bass was high while size structure was poor. At that time, only 16% of the largemouth bass sampled were 14 inches or greater. A regulation change for largemouth bass went into effect in 2018 from 5 per day, 14 inch minimum size to 5 per day, no minimum size. Seven years after the regulation change, positive results for both bass and bluegill are documented. The catch rate of largemouth bass is now near the 15 per mile objective. Growth rates of bass have improved for the year classes since the regulation change went into effect.

Size structure of bluegill improved with better representation of 8 inch and larger bluegill in 2025 compared to 2014. The catch rate improved from 0.6 per net night in 2014 to 29.4 per net night in 2025.

Regular private stocking of black crappie and yellow perch does not appear to be noticeably improving those populations. Natural reproduction of those species is occurring.

Walleye large fingerlings were stocked by DNR every other year at a rate of 20 per acre from 2014 until 2024. That is the highest stocking rate available for large fingerling walleye through the Wisconsin Walleye Initiative. The 2025 age frequency distribution of walleye is primarily represented by year classes in which stocking of walleye occurred. Although the population estimate of walleye increased from 0.2 per acre in 2014 to 1.0 per acre in 2025, it does not meet the minimum benchmark (1.5 per acre) required to continue DNR stocking.

Kelly Lake supports a good fishery for bluegill and bass. Management of the lake should focus on maintaining the quality fishing opportunities present for those species but private stocking of walleye will be considered.

Recommendations

1. Discontinue DNR stocking walleye in Kelly Lake. After intensive DNR stocking of large fingerlings at a rate of 20 per acre over a decade, walleye population estimates continue to be low at 1.0 per acre. Although stocking may provide a minor fishery, it does not appear that Kelly Lake has suitable habitat conditions to effectively maintain and become a destination walleye fishery.

2. Manage the lake for largemouth bass and panfish. Largemouth bass in Kelly Lake provide quality and consumptive fishing opportunities. It is one of a few lakes in southern Oconto County with very good size structure of largemouth bass.
3. Continue to maintain a low density northern pike population with consumptive harvest opportunities and memorable size potential under the current no minimum size and 5 daily bag limit regulation.
4. Encourage landowners to leave woody habitat in the water and continue to explore opportunities to add fish sticks along private shorelines when feasible.
5. Retain the current fishing regulations and re-evaluate the fishery with a comprehensive survey in 10 years.

Acknowledgements

The following DNR staff assisted in various aspects of this survey: Ronald Rhode, Jenna Brandl, Colton Sime, Adam Nickel and Tammie Paoli.

Appendix-Photos



Photo: A fyke net set along an undeveloped area of the shoreline in Kelly Lake. Photo credit: T. Paoli



Photo: Tammie Paoli with an 18.2 inch largemouth bass. Photo credit: R. Rhode



Photo: A 9.7 inch bluegill from Kelly Lake. Photo credit T. Paoli



Photo: The lead of fyke net number 2, set on the spawning reef off Holt Park. Photo credit T. Paoli



Photo: Ron Rhode with a 37-inch female northern pike captured in the 2025 Kelly Lake fyke netting survey. This fish was later estimated as age-7. Photo credit: T. Paoli



Photo: Jenna Brandl with a largemouth bass captured during the SE2 electrofishing survey on Kelly Lake. Photo credit: T. Paoli