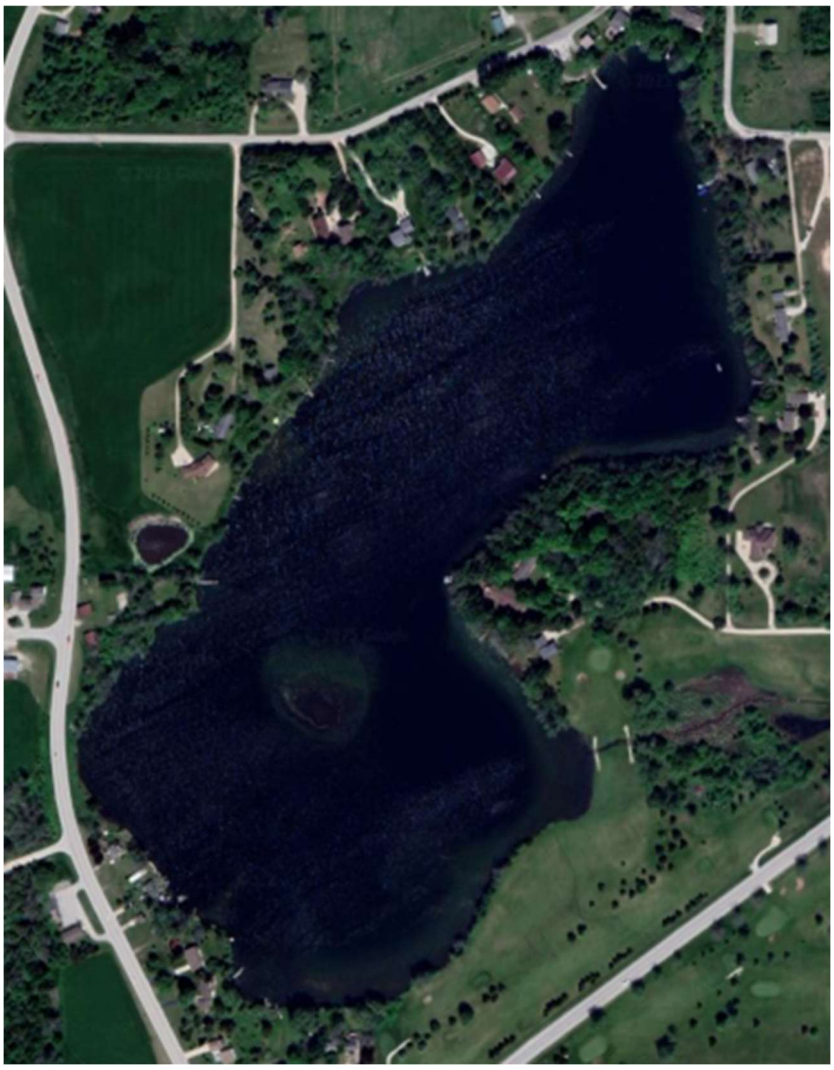
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fish Survey Report for East Alaska Lake

Kewaunee County, Wisconsin 2024 – Waterbody Identification Code 94200



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Executive Summary

East Alaska Lake is a 53-acre seepage lake in Kewaunee County, Wisconsin, that supports a diverse and locally important warmwater fishery. Managed historically for largemouth bass and panfish, the lake has also supported a unique muskellunge population and fishery since the 1950s through stocking. A whole-lake alum treatment in 2011 substantially improved water quality by reducing internal phosphorus loading, providing an important ecological context for evaluating current fish community conditions. As the largest lake in the county with developed public access, East Alaska Lake receives relatively high recreational angling pressure despite its small size.

A spring fisheries survey was conducted in 2024 to assess the status of the fish community, evaluate muskellunge population metrics, determine the need for regulation changes for largemouth bass and panfish, and develop management recommendations. Sampling included late-spring fyke netting and nighttime electrofishing, with analyses of abundance, size structure and growth compared to historical surveys, statewide data and similar complex-cool-clear lakes.

Results indicate that East Alaska Lake supports a productive but predator–prey imbalanced fish community. Largemouth bass are highly abundant, with size structure strongly skewed toward smaller individuals, suggesting density-dependent growth and limited numbers of effective large predators. Bluegills are abundant and dominated by moderate-size fish, with very few individuals reaching preferred lengths, consistent with intense intraspecific competition and constrained growth. Other panfish species (black crappie, yellow perch, rock bass and pumpkinseed) exhibited generally favorable size structures and moderate abundances. The muskellunge population remains a high-quality and distinctive component of the fishery. Adult muskellunge abundance is within expectations for a small seepage lake, growth is strong, and size structure is relatively high.

Overall, survey findings suggest that targeted management actions aimed at reducing densities of small largemouth bass, protecting larger predators, and encouraging appropriate panfish harvest would improve growth rates, size structure and overall balance within the fish community. Continued monitoring is recommended to evaluate the effectiveness of any proposed regulatory changes and ensure long-term sustainability of East Alaska Lake’s fisheries.

Introduction

East Alaska Lake is a seepage lake located in Kewaunee County, Wisconsin. The lake has a surface area of approximately 53 acres, a maximum depth of 50 feet, a mean depth of 17 feet, and is classified as a complex-cool-clear lake (Rypel et al. 2019). The East Alaska Lake watershed is rural, consisting of agricultural land, wooded areas and the shoreline of the lake is moderately developed with residences and a golf course. The predominant bottom composition is muck, with floating and submerged vegetation common. As the largest lake with a developed public access in Kewaunee County, East Alaska Lake provides some popular recreational angling opportunities and receives a fair amount of effort despite its relatively small size.

East Alaska Lake has been primarily managed for largemouth bass and panfish, but stocking of muskellunge and tiger muskellunge (northern pike x muskellunge) starting in the 1950s has provided a locally unique and popular fishery (Table 1). The goals of the stockings were to increase the predator load in East Alaska Lake to increase predation on the overabundant panfish population and provide a unique angling opportunity. With relatively good survival of stocked muskellunge, relatively high muskellunge angling effort, and an increase in panfish size structure in the years following the initial stocking efforts, it was determined to continue the muskellunge stocking efforts (DNR unpublished data). Additional fisheries management activities have primarily consisted of fish community surveys and monitoring as well as habitat evaluations with the most recent fish surveys taking place in 2003, 2009 and 2017 (Hogler 2004, Hogler 2009, Sikora 2022).

Perhaps the most notable management action taken on East Alaska Lake was a whole lake alum application in 2011 in response to concerns about elevated internal phosphorus loading and associated water quality issues. The alum application was carried out to reduce the release of phosphorus from lake sediments and improve water clarity and overall trophic condition. Post-treatment monitoring following alum application on East Alaska Lake have since showed notable improvements in key water quality indicators including a reduction in available phosphorus. Continued water quality changes may influence habitat conditions, fish productivity and community structure, and may provide important context for interpreting future changes in the fish community of East Alaska Lake.

The objectives of this survey were to assess the status of the fish community, evaluate population metrics for muskellunge, evaluate the need for panfish and largemouth bass regulation changes, and provide information for fisheries management recommendations.

Table 1. Stocking summary for East Alaska Lake, Kewaunee County from 1956 to 2024.

Stocking Year	Species	Size	No. Stocked	Avg. Length (in)
2021	MUSKELLUNGE	LARGE FINGERLING	125	10.45
2019	MUSKELLUNGE	LARGE FINGERLING	137	12
2017	MUSKELLUNGE	LARGE FINGERLING	79	10.8
2015	MUSKELLUNGE	LARGE FINGERLING	125	12.7
2013	MUSKELLUNGE	LARGE FINGERLING	125	9.2
2011	MUSKELLUNGE	LARGE FINGERLING	123	9.3
2009	MUSKELLUNGE	LARGE FINGERLING	125	10.6
2007	MUSKELLUNGE	LARGE FINGERLING	83	13
2005	MUSKELLUNGE	LARGE FINGERLING	125	10.6
2003	MUSKELLUNGE	LARGE FINGERLING	125	10.9
2001	TIGER MUSKELLUNGE	LARGE FINGERLING	250	5.9
1999	TIGER MUSKELLUNGE	LARGE FINGERLING	250	5.3
1998	TIGER MUSKELLUNGE	SMALL FINGERLING	265	3.4
1992	MUSKELLUNGE	FINGERLING	100	11
1990	MUSKELLUNGE	FINGERLING	100	9
1989	MUSKELLUNGE	FINGERLING	100	7
1988	TIGER MUSKELLUNGE	FINGERLING	100	8
1987	TIGER MUSKELLUNGE	FINGERLING	300	10
1986	TIGER MUSKELLUNGE	FINGERLING	100	9
1986	MUSKELLUNGE	FINGERLING	100	10
1985	MUSKELLUNGE	FINGERLING	200	9
1985	TIGER MUSKELLUNGE	FINGERLING	100	8
1984	TIGER MUSKELLUNGE	FINGERLING	100	9
1983	TIGER MUSKELLUNGE	FINGERLING	100	9
1982	TIGER MUSKELLUNGE	FINGERLING	200	9
1981	TIGER MUSKELLUNGE	FINGERLING	200	8
1980	TIGER MUSKELLUNGE	FINGERLING	200	12
1979	TIGER MUSKELLUNGE	FINGERLING	200	11
1978	TIGER MUSKELLUNGE	FINGERLING	200	9
1977	TIGER MUSKELLUNGE	FINGERLING	318	11
1976	TIGER MUSKELLUNGE	FINGERLING	200	8
1975	TIGER MUSKELLUNGE	FINGERLING	100	13
1974	TIGER MUSKELLUNGE	FINGERLING	245	9
1973	MUSKELLUNGE	YEARLING	300	15
1970	MUSKELLUNGE	LARGE FINGERLING	225	15
1969	MUSKELLUNGE	LARGE FINGERLING	17	13
1960	MUSKELLUNGE	FRY		
1957	TIGER MUSKELLUNGE			
1956	TIGER MUSKELLUNGE			

Methods

SURVEY

A spring fisheries survey consisting of late spring netting (SN2) targeting muskellunge and late spring electrofishing (SE2) for bass and panfish efforts was conducted on East Alaska Lake between April 15 and May 8, 2024. On April 15, when water temperatures reached ~50°F, pre-spawn or spawning periods for muskellunge, six double-throated fyke nets (3'x6' frames) were set perpendicular to the shoreline in the littoral zone (SN2). Nets were checked daily from April 16 to April 22 for a total effort of 39 net-nights (note: one net was removed on April 19; Figure 1).

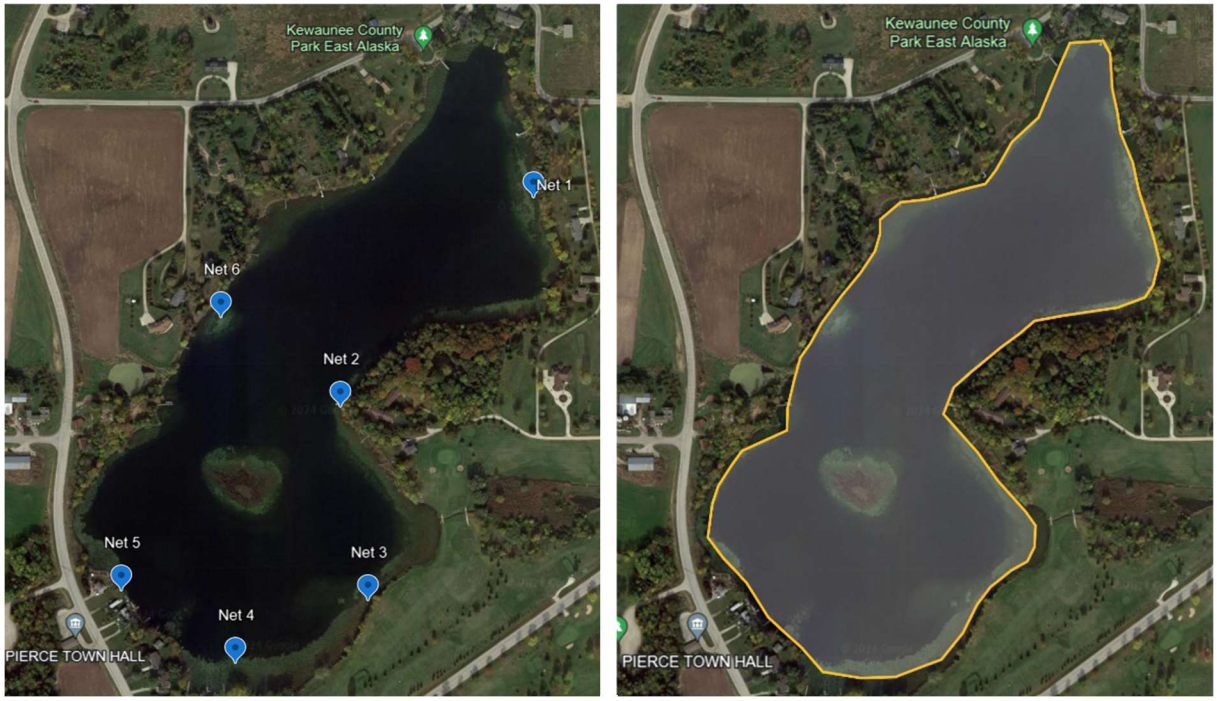

Figure 1. Fyke net locations during the SN2 survey (left, blue) and electrofishing transect during the SE2 survey (right, yellow) on East Alaska Lake, Kewaunee County, WI in 2024.

All fish caught were identified and enumerated by species. Prior to release, all gamefish were measured (TL; mm), given a top caudal clip, and had an aging structure removed (dorsal spine for walleye and largemouth bass; anal fin ray for muskellunge). Muskellunge also received a unique numeric red floy tag in the soft tissue below the dorsal fin for identification during future capture (Figure 2). Recaptured gamefish were tallied daily. A subsample of all panfish caught in each net were measured (TL; mm) a subset of which were sacrificed for otolith extraction for age estimation. Sex and condition were noted for sampled fish if apparent. All other fish captured were enumerated and released.

Figure 2. Red floy tag implanted in the soft tissue below the dorsal fin of a muskellunge during sampling efforts on East Alaska Lake, Kewaunee County, WI during 2024. (Photo credit: Wisconsin DNR)

On May 8, when water temperatures reached ~60°F, a transect following the entire shoreline (1.34 miles of effort) was electrofished after dark using pulsed DC electricity (SE2; targeting bass and panfish prior to peak spawning). All fish were collected when possible. All fish caught were identified and enumerated by species. Prior to release, all gamefish were measured (TL; mm), had an aging structure removed (dorsal spine for largemouth bass; anal fin ray for muskellunge) and muskellunge received a floy tag. Recaptured gamefish were tallied. All panfish caught were measured (TL; mm) and a subset of which were sacrificed for otolith extraction for age estimation if needed. Sex and condition were noted for sampled fish if apparent. All other fish captured were enumerated and released.

In the laboratory, otoliths were removed from sacrificed fish. Both spines and otoliths were cleaned, sectioned, mounted on glass slides and age was estimated by counting annuli under a microscope.

DATA ANALYSIS

Muskellunge abundance was estimated using the Chapman-modified continuous Schnabel method (Chapman 1954, Ricker 1975). Abundance was indexed with a population estimate converted to a density estimate (number per acre) by dividing the population estimate by the surface acreage of East Alaska Lake (53 acres).

Relative abundance was used as an index of population size for fish where a population estimate was not generated. Relative abundances were indexed as the number of individuals per shoreline mile (no./mile) during SE2 electrofishing effort or as the number of individuals per net-night (no./net-night) during SN2 effort. Relative abundance from the SN2 survey was reported but could not be compared to any recent netting surveys on East Alaska Lake as there have not been any.

Size structure of fishes was described using length frequencies, descriptive statistics and proportional size distribution (PSD; Gabelhouse 1984). The PSD value for a species is the number of fish of a specified length and longer divided by the number of fish of stock length or longer, the result multiplied by 100 . Species specific PSD values identified by Gabelhouse (1984) can be found in Table 2. Descriptive statistics including the mean, minimum and maximum length of each fish species was reported for all survey efforts combined. All lengths taken in mm in the field were converted to and reported in inches.

Table 2. Proportional size distribution lengths (inches) from Gabelhouse 1984 of select fish species sampled in in East Alaska Lake, Kewaunee County, WI.

Species	Stock Size	Quality Size	Preferred Size
Black Crappie	5	8	10
Bluegill	3	6	8
Largemouth Bass	8	12	15
Muskellunge	20	30	38
Pumpkinseed	3	6	8
Rock Bass	4	7	9
Yellow Perch	5	8	10

Relative abundance, mean length, growth and size structure were compared to lakes statewide, other complex-cool-clear lakes within the Wisconsin lake systems (Rypel et al. 2019), and other recent surveys on East Alaska Lake when applicable.

Results

LARGEMOUTH BASS

A total of 129 largemouth bass (38 electrofishing, 91 netting) were captured while sampling East Alaska Lake. Catch rate for largemouth bass was 2.3 per net-night during netting and 28.4 per mile during electrofishing efforts, including recaptures. Largemouth bass catch per mile was just below the 90th percentile for complex-cool-clear lakes (i.e., 10% of similar lakes have higher relative abundance) and the 95th percentile statewide for catch per mile of bass >8 in. Largemouth bass relative abundance declined from the 2009 survey and was less than but near the 2017 survey (Figure 3).

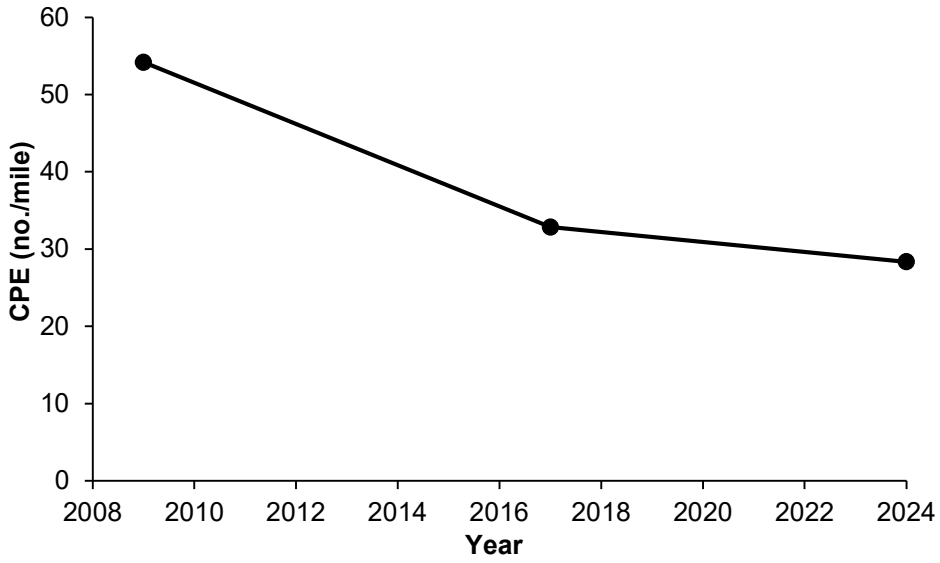

Figure 3. Relative abundance of largemouth bass expressed as CPE (no./mile) from SE2 electrofishing surveys on East Alaska Lake, Kewaunee County, WI during 2009, 2017 and 2024.

Measured largemouth bass lengths ranged from 5.6 to 20.1 inches, with a mean length of 10.7 inches (Figure 4), just below the 75th percentile for complex-cool-clear lakes. Proportional size distribution metrics indicated a PSD-Q of 20 (2nd percentile statewide), PSD-P of 16, and PSD-14" of 17 (28th percentile statewide for lakes <794 acres), reflecting a population dominated by smaller individuals with few fish reaching quality or preferred sizes. Growth of largemouth bass was at or near the statewide average for nearly all sampled fish (Figure 5).

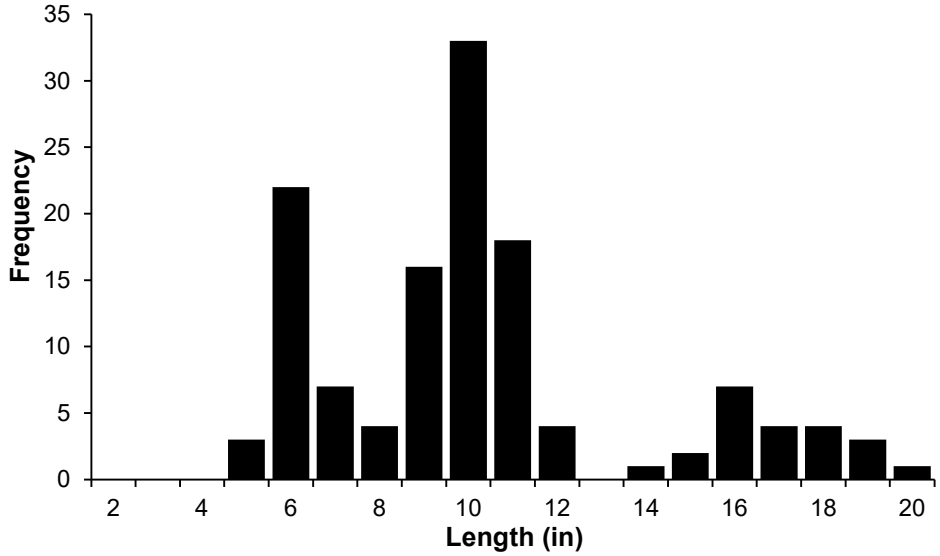

Figure 4. Length frequency of largemouth bass captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling.

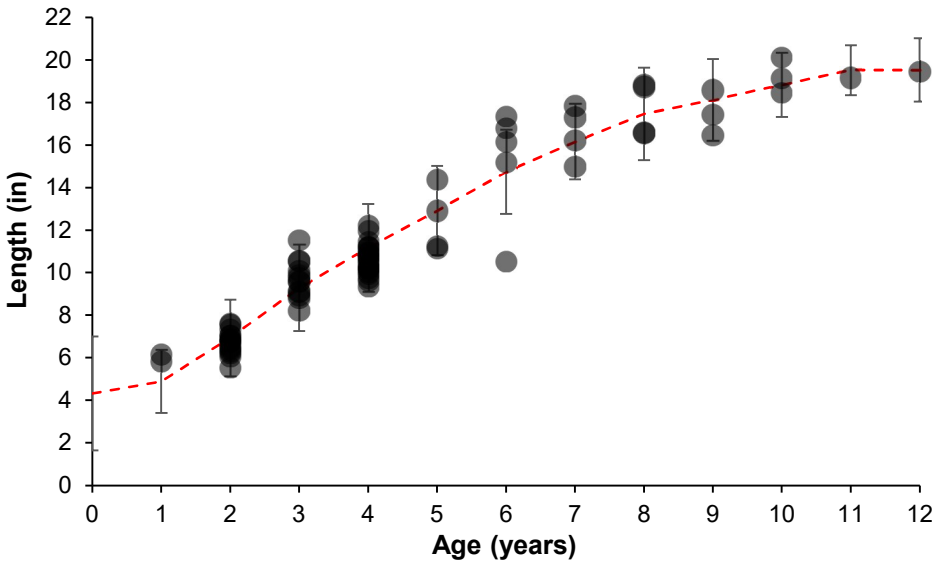

Figure 5. Age-length relationship of largemouth bass captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling (points) and the statewide mean length at age +/-1SD (red dashed line). Darker points represent a higher frequency of individuals sampled at that age-length.

MUSKELLUNGE

A total of 20 individual muskellunge were captured while sampling East Alaska Lake (6 electrofishing, 14 netting). Muskellunge catch rate was 0.4 per net-night during netting and 6.7 per mile during electrofishing efforts, including recaptures. Catch per net-night of muskellunge was at the 50th percentile for complex-cool-clear lakes. Adult muskellunge were estimated at 38 fish (0.5/acre; 95% = 0.23-0.92).

Lengths of muskellunge varied between 27.7 and 40.7 inches with a mean length of 35.7 inches (Figure 6) which is in the 100th percentile for complex-cool-dark lakes. Muskellunge PSD-Q was 95 and PSD-P was 50. Growth of sampled muskellunge was well above the statewide average for young fish <5 years and near the statewide average for older fish (Figure 7).

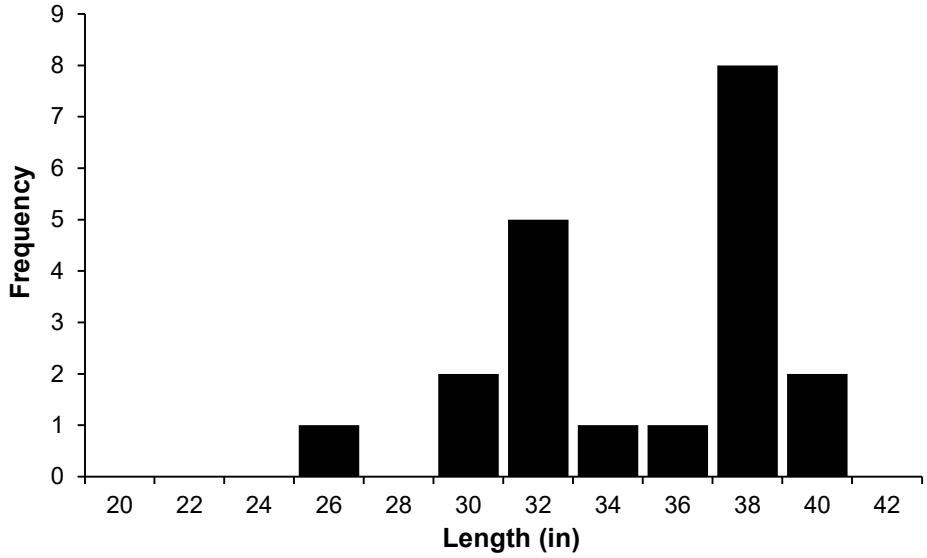

Figure 6. Length frequency of muskellunge captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling.

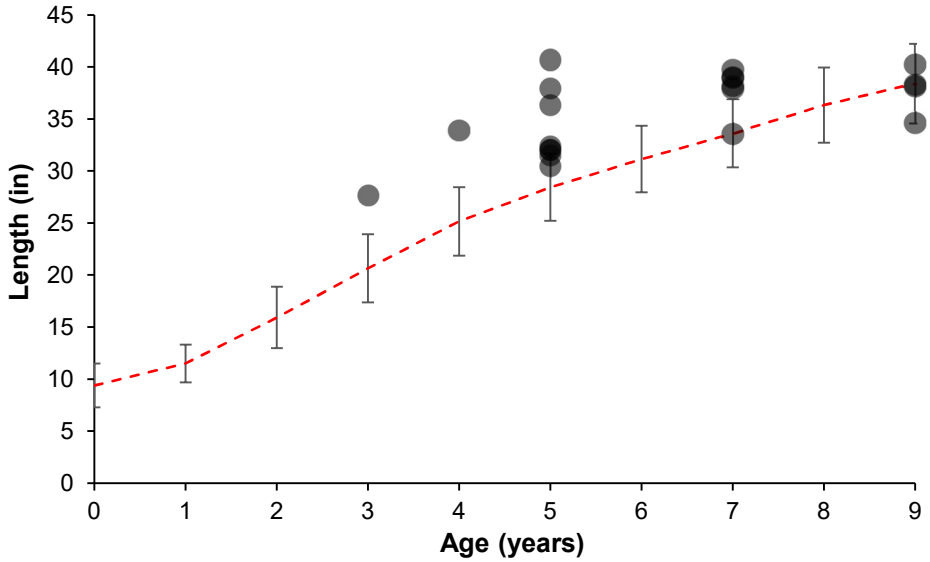

Figure 7. Age-length relationship of muskellunge captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling (points) and the statewide mean length at age +/-1SD (red dashed line). Darker points represent a higher frequency of individuals sampled at that age-length.

WALLEYE

A total of 6 individual walleye were sampled in netting efforts on East Alaska Lake (1 recapture electrofishing). Walleye catch rate was 0.2 per net-night during netting and

0.7 per mile during electrofishing efforts, including recaptures. Walleye catch per net-night was in the 1st percentile for complex-cool-clear lakes.

Lengths of captured walleye in East Alaska Lake varied between 21.5 and 28.3 inches with a mean length of 25.1 inches, which is in the 100th percentile for complex-cool-clear lakes (Figure 8). Growth of sampled walleye was well above the statewide average (Figure 9).

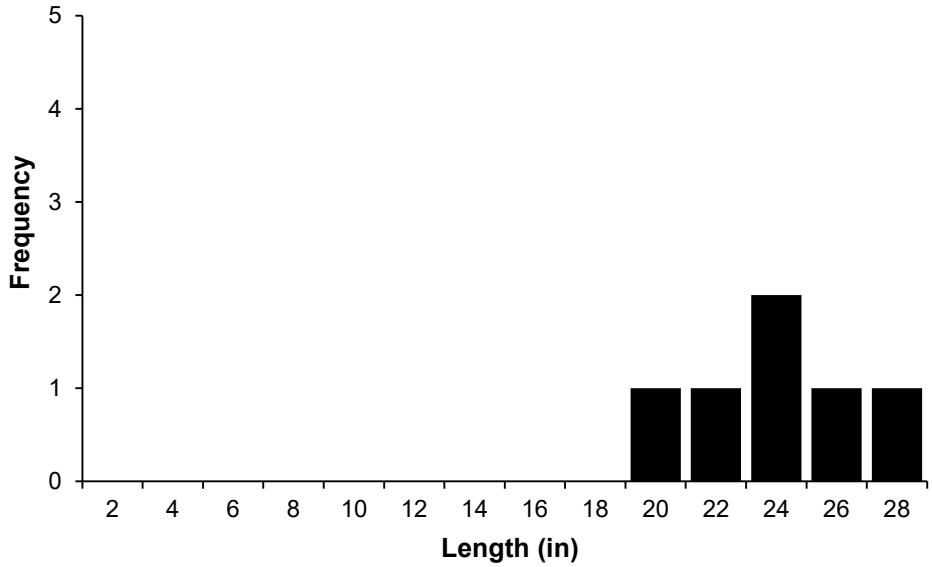

Figure 8. Length frequency of walleye captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling.

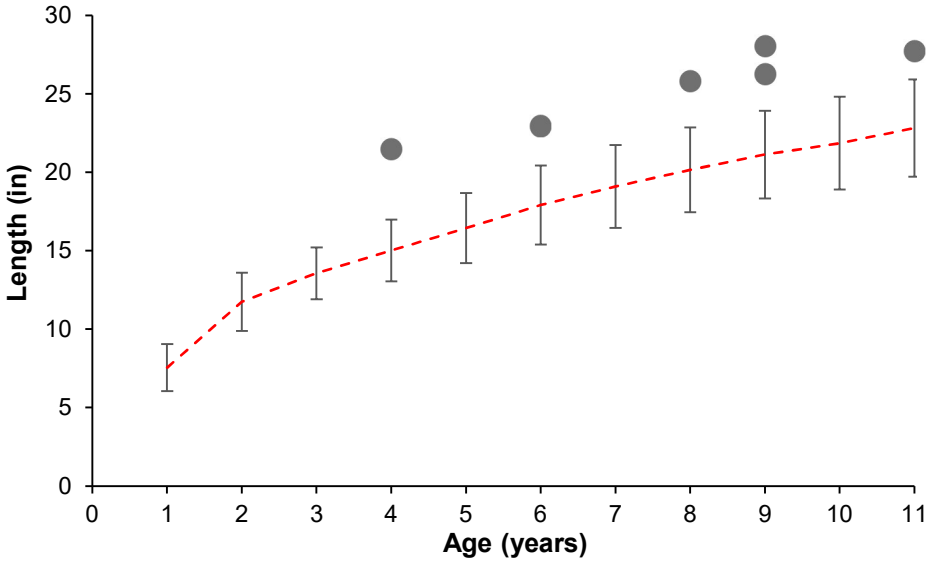

Figure 9. Age-length relationship of walleye captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling (points) and the statewide mean length at age +/-1SD (red dashed line). Darker points represent a higher frequency of individuals sampled at that age-length.

BLUEGILL

A total of 1,829 bluegills (247 electrofishing, 1,582 netting) were captured while sampling East Alaska Lake. Bluegill catch rate was 40.6 per net-night during netting and 184.3 per mile during electrofishing efforts. Bluegill catch per mile was just above the 77th percentile statewide and 75th percentile for complex-cool-clear lakes. Bluegill relative abundance declined from the 2017 survey but was higher than the 2009 survey (Figure 10).

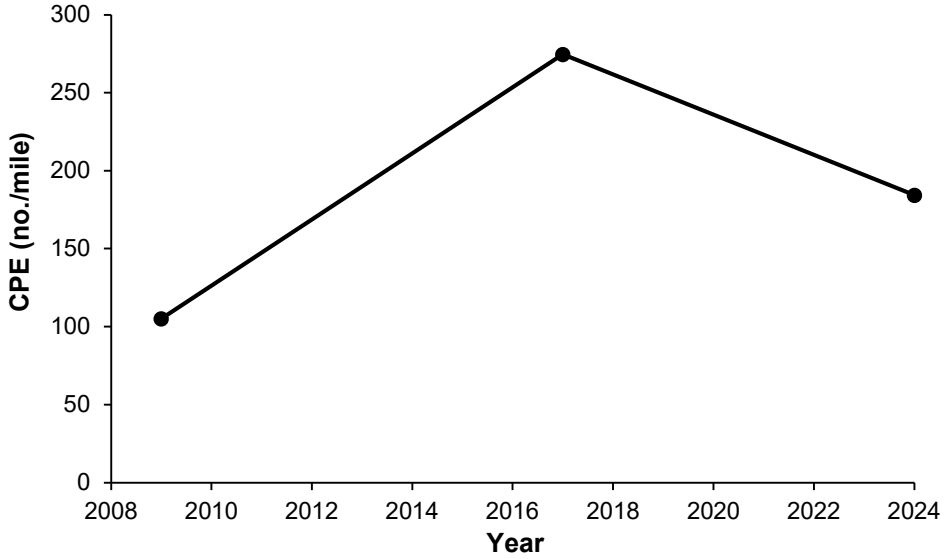

Figure 10. Relative abundance of bluegill expressed as CPE (no./mile) from SE2 electrofishing surveys on East Alaska Lake, Kewaunee County, WI during 2009, 2017 and 2024.

Measured bluegill lengths ranged from 3.5 to 8.2 inches, with a mean length of 6.2 inches (Figure 11), just below the 99th percentile for complex-cool-clear lakes. Proportional size distribution metrics were PSD-S = 100, PSD-Q = 67 (24th percentile statewide), and PSD-P <1, indicating that most bluegill were quality-size but very few reached preferred length. Growth of sampled bluegills was at or near the statewide average (Figure 12).

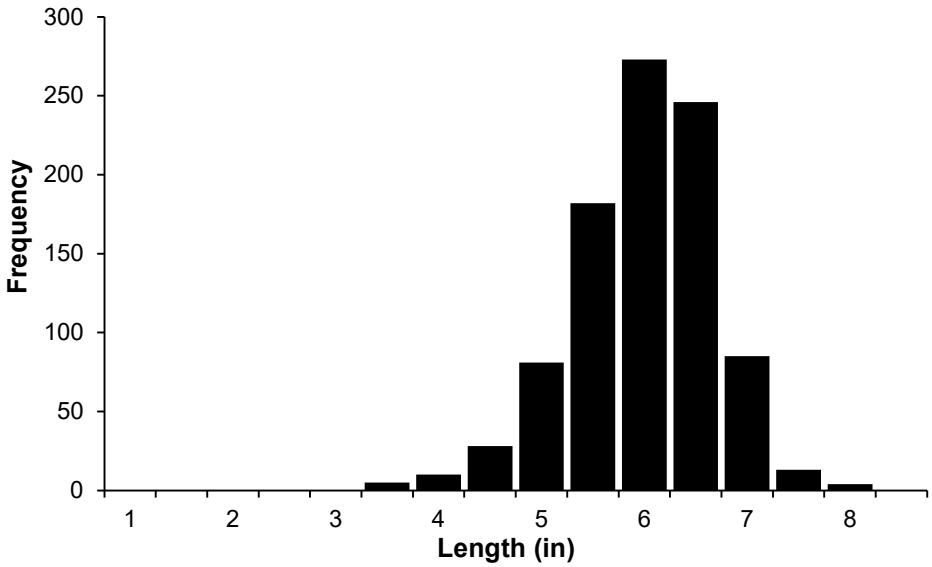

Figure 11. Length frequency of bluegills captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling.

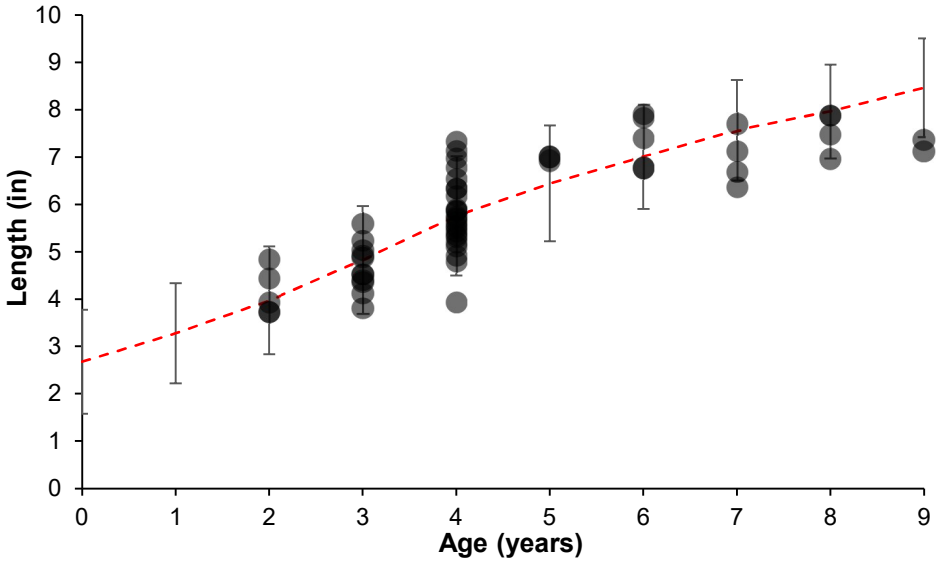

Figure 12. Age-length relationship of bluegills captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling (points) and the statewide mean length at age +/-1SD (red dashed line). Darker points represent a higher frequency of individuals sampled at that age-length.

BLACK CRAPPIE

A total of 513 black crappies (10 electrofishing, 503 netting) were captured while surveying East Alaska Lake. Black crappie catch rate was 12.9 per net-night during

netting and 7.5 per mile during electrofishing efforts. Black crappie catch per net-night was just below the 90th percentile for complex-cool-clear lakes and catch per mile was in the 47th percentile statewide. Black crappie relative abundance increased from the 2017 survey and was less than the 2009 survey (Figure 13).

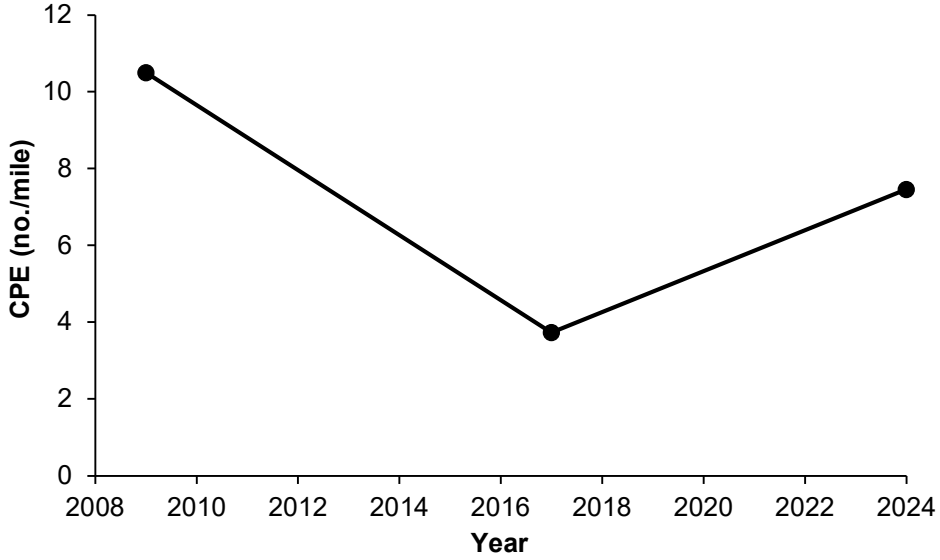

Figure 13. Relative abundance of black crappies expressed as CPE (no./mile) from SE2 electrofishing surveys on East Alaska Lake, Kewaunee County, WI during 2009, 2017 and 2024.

Measured black crappie lengths ranged from 4.9 to 12.6 inches, with a mean length of 7.7 inches (Figure 14), just below the 90th percentile for complex-cool-clear lakes. Proportional size distribution metrics were PSD-S = 99, PSD-Q = 52 (37th percentile statewide), and PSD-P = 5, indicating that most crappies were stock or quality-size, with relatively few reaching preferred length. Growth of sampled black crappies was at or near the statewide average (Figure 15).

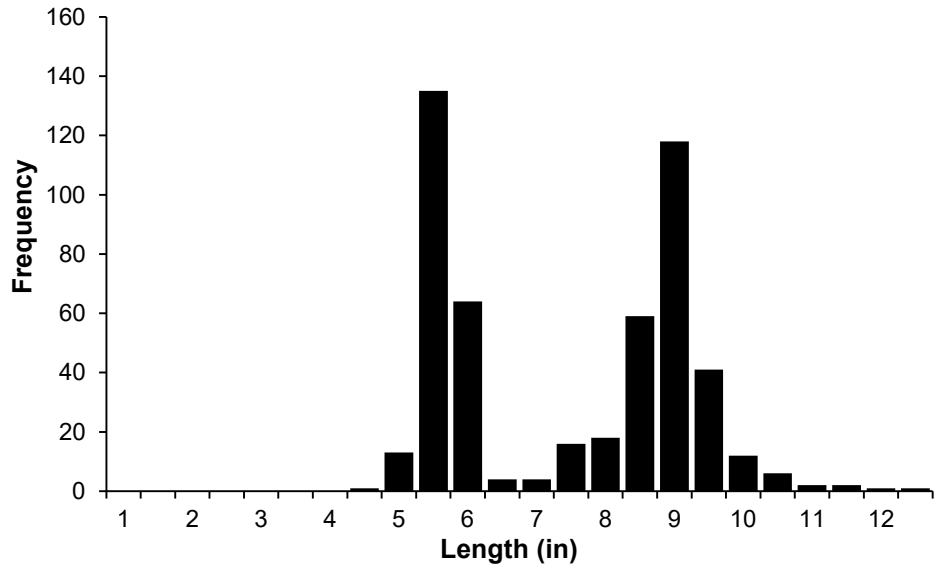

Figure 14. Length frequency of black crappies captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling.

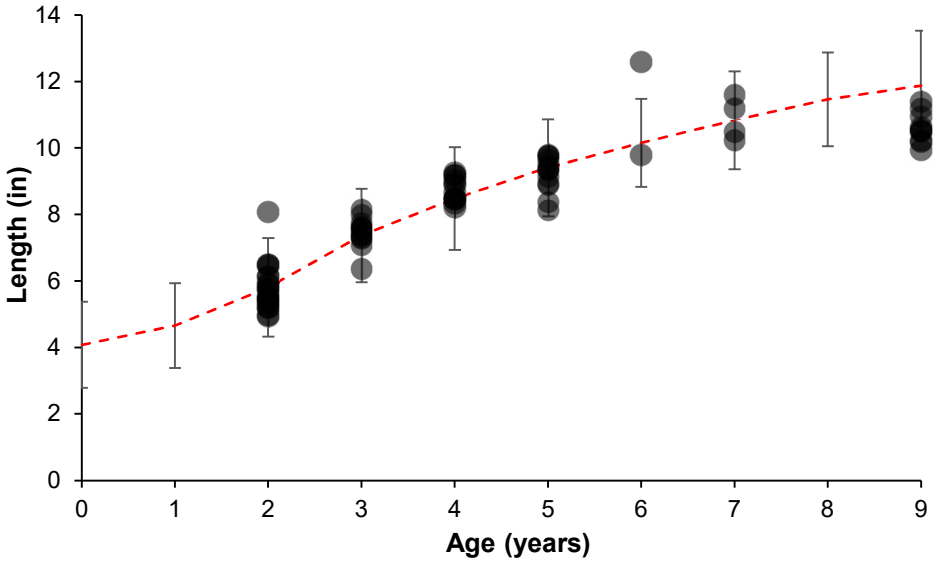

Figure 15. Age-length relationship of black crappies captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling (points) and the statewide mean length at age +/-1SD (red dashed line). Darker points represent a higher frequency of individuals sampled at that age-length.

YELLOW PERCH

A total of 1,021 yellow perch (27 electrofishing, 994 netting) were captured while sampling East Alaska Lake. Yellow perch catch rate was 25.5 individuals per net-night during netting and 20.1 individuals per mile during electrofishing efforts. Yellow perch catch per net-night was above the 75th percentile for complex-cool-clear lakes and catch per mile was in the 74th percentile statewide. Yellow perch relative abundance declined slightly from the 2009 and 2017 surveys (Figure 16).

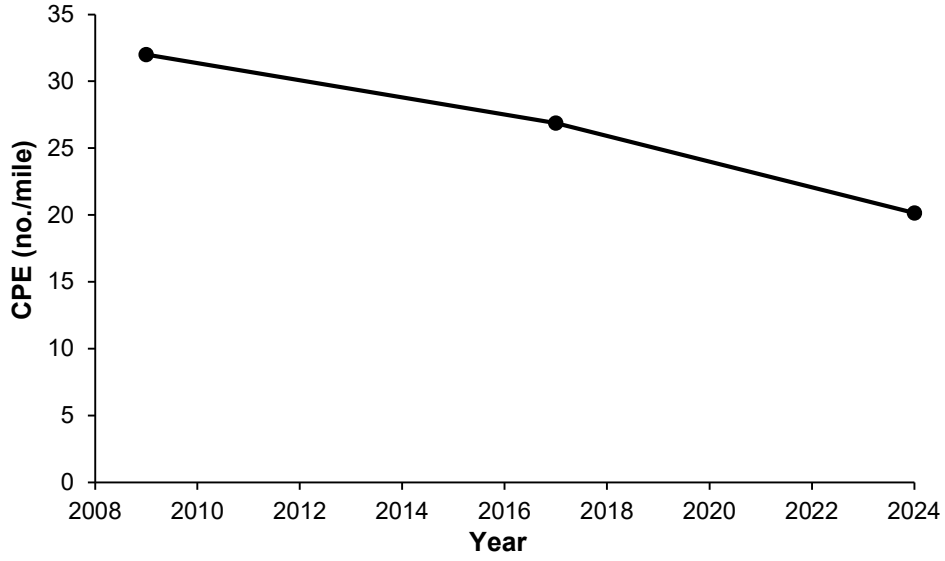

Figure 16. Relative abundance of yellow perch expressed as CPE (no./mile) from SE2 electrofishing surveys on East Alaska Lake, Kewaunee County, WI during 2009, 2017and 2024.

Measured yellow perch lengths ranged from 4.0 to 9.2 inches, with a mean length of 7.1 inches (Figure 17), above the 95th percentile for complex-cool-clear lakes. Proportional size distribution metrics were PSD-S = 99 and PSD-Q = 12 (15th percentile statewide), indicating that nearly all yellow perch were at or above stock size, while few reached quality size. Growth of sampled yellow perch was at or near the statewide average (Figure 18).

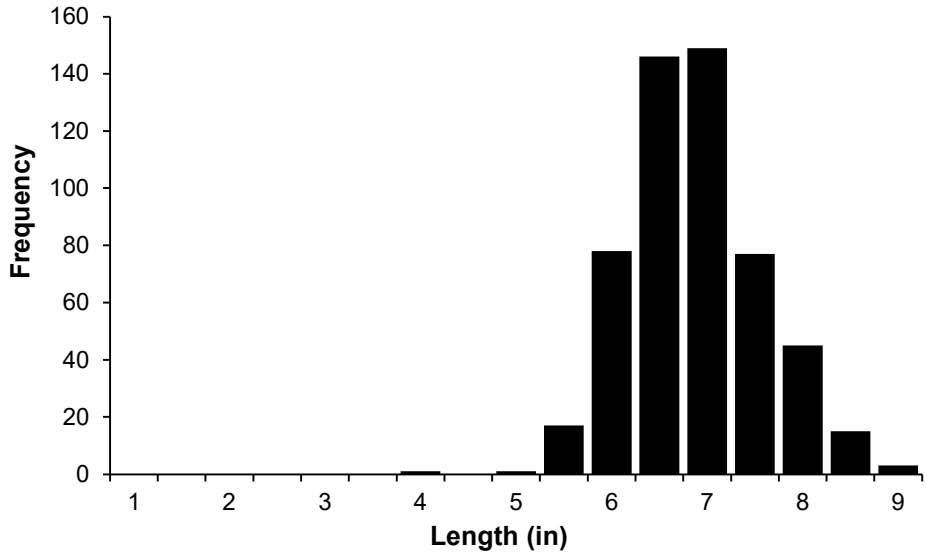

Figure 17. Length frequency of yellow perch captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling.

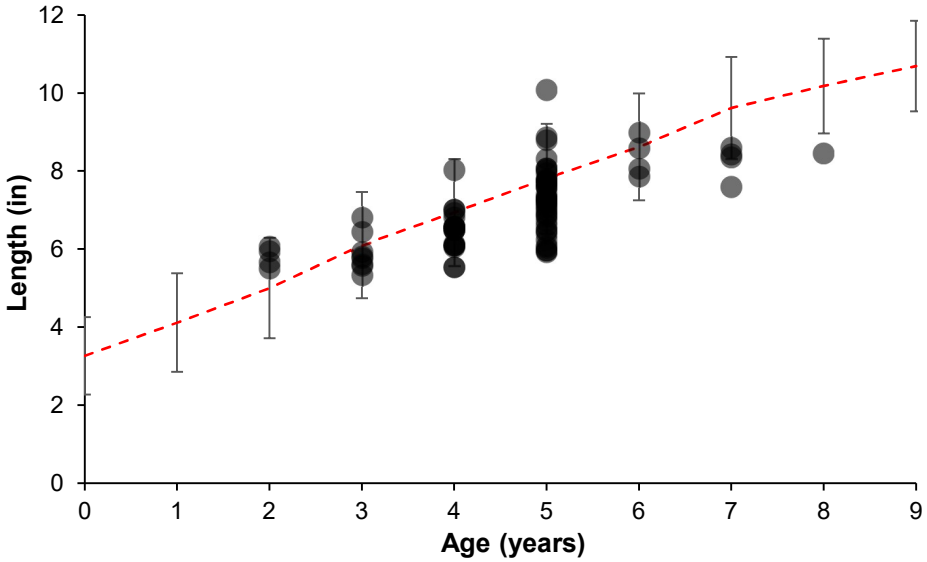

Figure 18. Age-length relationship of yellow perch captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling (points) and the statewide mean length at age +/-1SD (red dashed line). Darker points represent a higher frequency of individuals sampled at that age-length.

ROCK BASS

A total of 277 rock bass (50 electrofishing, 227 netting) were captured while sampling East Alaska Lake. Rock bass catch rate was 5.8 per net-night during netting and 37.3 per mile during electrofishing efforts. Catch per mile of rock bass was just below the

90th percentile per mile for complex-cool-clear lakes. Rock Bass relative abundance increased from the 2009 and 2017 surveys (Figure 19).

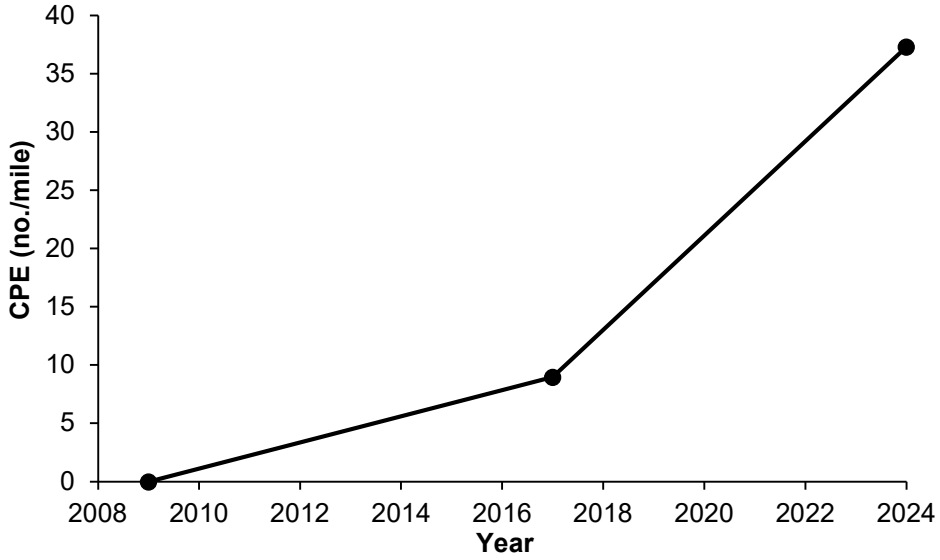

Figure 19. Relative abundance of rock bass expressed as CPE (no./mile) from SE2 electrofishing surveys on East Alaska Lake, Kewaunee County, WI during 2009, 2017 and 2024.

Measured rock bass lengths ranged from 4.0 to 10.1 inches, with a mean length of 6.6 inches (Figure 20), near the 95th percentile for complex-cool-clear lakes. Proportional size distribution metrics were PSD-S = 100, PSD-Q = 28, and PSD-P = 5, indicating that nearly all individuals were at or above stock size, with relatively few reaching quality or preferred size.

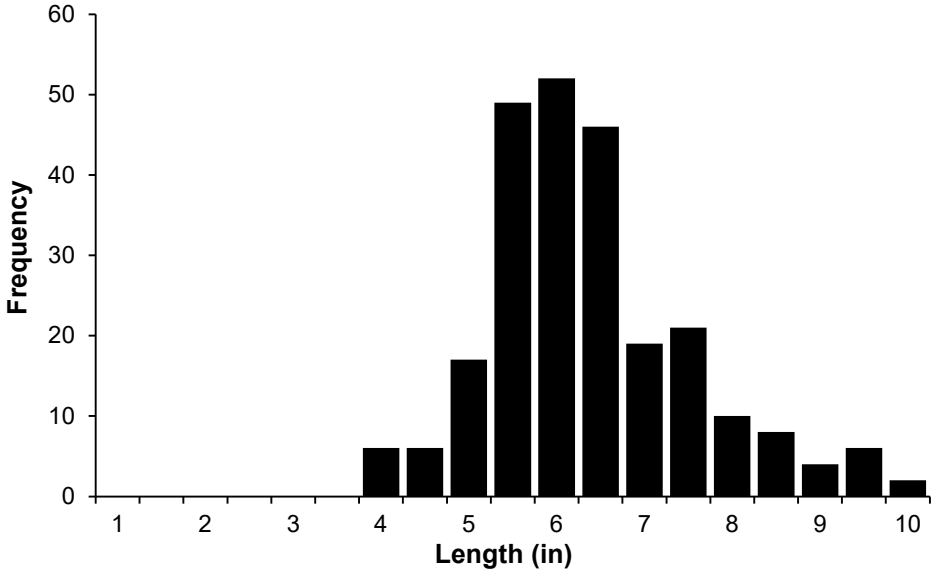

Figure 20. Length frequency of rock bass captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling.

PUMPKINSEED

A total of 166 pumpkinseeds (38 electrofishing, 128 netting) were captured while sampling East Alaska Lake. Pumpkinseed catch rate was 3.3 per net-night during netting and 28.4 per mile during electrofishing efforts. Pumpkinseed catch per mile was just below the 90th percentile per mile for complex-cool-clear lakes. Pumpkinseed relative abundance increased from the 2009 and 2017 surveys (Figure 21).

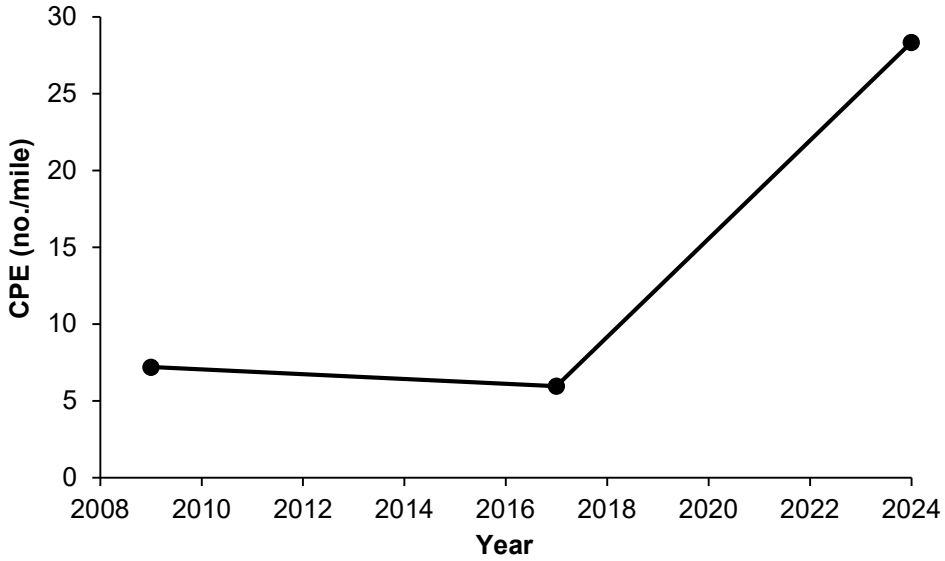

Figure 21. Relative abundance of pumpkinseed expressed as CPE (no./mile) from SE2 electrofishing surveys on East Alaska Lake, Kewaunee County, WI during 2009, 2017 and 2024.

Measured pumpkinseed lengths ranged from 3.9 to 6.7 inches, with a mean length of 5.6 inches (Figure 22), just above the 90th percentile for complex-cool-clear lakes. Proportional size distribution metrics were PSD-S = 100 and PSD-Q = 25, indicating that all individuals were at or above stock size, while relatively few reached quality size.

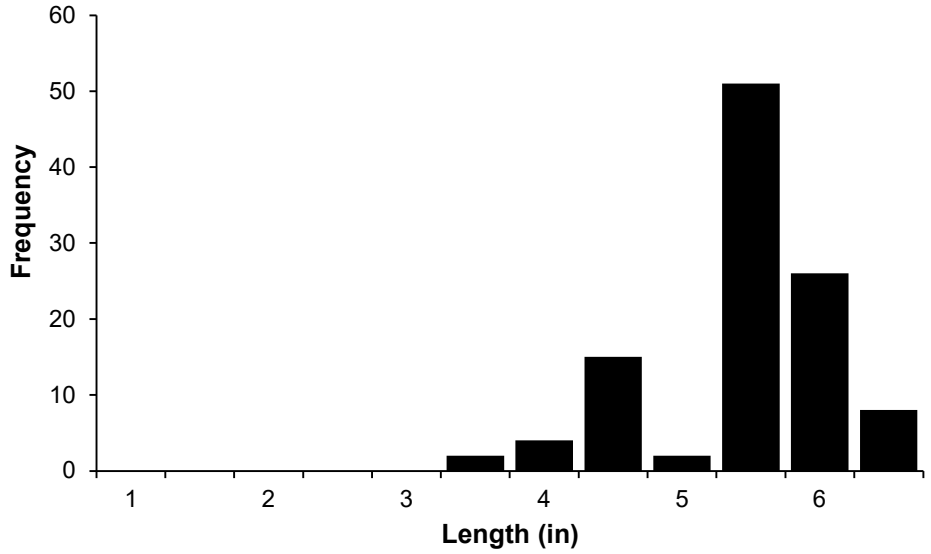

Figure 22. Length frequency of pumpkinseed captured in East Alaska Lake, Kewaunee County, WI during spring 2024 sampling.

Discussion

Results from the 2024 spring fisheries survey indicate that East Alaska Lake supports a diverse fish community but exhibited characteristics of unbalanced largemouth bass and bluegill populations. While several species displayed favorable size structure, population metrics for largemouth bass and bluegill suggest density-dependent growth limitations and reduced effectiveness of predation by larger individuals.

Largemouth bass relative abundance in 2024 remained high relative to complex-cool-clear lakes in Wisconsin, despite a slight decline from previous surveys. Catch rates approached the upper percentiles statewide, indicating a dense bass population. Size structure metrics reveal a population strongly skewed toward smaller individuals (PSD = 20). This pattern is characteristic of bass-crowded systems, where high intraspecific competition limits growth and few individuals recruit into quality-size classes (Gabelhouse 1984; Anderson and Neumann 1996). Although largemouth bass growth rates appear comparable to statewide averages and the population can produce large individuals, density-dependent competition likely restricts growth of small to mid-sized bass. The resulting size structure suggests a shortage of larger predators, reducing the population's ability to regulate prey populations, particularly adult panfish (Anderson and Neumann 1996). Predatory pressure is therefore primarily exerted by numerous small bass that effectively suppress juvenile bluegill but are limited in their capacity to control larger prey. A regulation change that protects quality-size bass while allowing harvest of smaller fish may help reduce bass density, promote survival of larger predators, and improve overall size structure and predatory effectiveness (DNR Bass Team 2018).

Bluegill relative abundance in East Alaska Lake remained high, with catch rates exceeding 184 fish/mile and ranking >75th percentile for comparable systems. Size structure is dominated by quality-size individuals (PSD = 67); however, the extremely low proportion of preferred-size fish (PSD-P <1) indicates that few bluegills grow beyond ~6.5 inches. This size structure is consistent with density-dependent growth suppression, where high adult bluegill abundance leads to intense competition for limited forage resources and slowed growth at larger sizes (Gabelhouse 1984, Willis et al. 1993). Recruitment of small bluegill also appears limited, likely due to sustained predation pressure from abundant small largemouth bass. Collectively, these dynamics result in a bluegill population concentrated in the 5–7 inch size range, with limited production of larger individuals. Encouraging harvest of mid-size bluegill may reduce competition for forage and improve growth potential for remaining individuals.

Other panfish species, including black crappie, yellow perch, rock bass and pumpkinseed, exhibited generally favorable size structure and moderate abundances. The overall size structure of the panfish community may benefit from improved predator size structure and abundance through predatory effectiveness aiding in density-dependent growth issues.

The muskellunge population in East Alaska Lake continues to represent a unique and quality component of the fishery. Estimated adult abundance (0.5 fish/acre) is within expectations for a small seepage lake, and size structure metrics were strong, with high proportions of quality- and preferred-length fish. Mean length was exceptionally high relative to comparable systems, indicating good growth and survival, however, low recruitment due to no stocking events after 2021 skews the size structure metrics. Survival of stocked muskellunge in East Alaska Lake appears to be high relative to other stocked populations within the DNR Fisheries Management Program's East District (personal communication; G. Matzke, DNR). This high stocking survival likely reflects favorable habitat conditions with adequate forage availability and low exploitation. While muskellunge likely contribute to predation on larger prey, their relatively low density limits their ability to substantially influence overall community dynamics at the low population densities that they are managed for.

Sampled walleyes were present at very low abundance and are not expected to play a significant ecological role in the system. While the origin of the walleyes in East Alaska Lake is unclear and they have not shown up in surveys for >25 years, walleye showed up in low abundances in DNR surveys dating all the way back to the 1950's (DNR unpublished data). All walleyes sampled were adults exhibiting very high growth rates, suggesting that reproductive potential is likely low but survival and growth in adulthood is likely high.

Overall, East Alaska Lake supports a productive but predator–prey imbalanced fish community, characterized by an overabundance of small largemouth bass and a bluegill population dominated by moderate-size individuals with limited growth beyond quality length. Management actions that reduce densities of small bass, protect larger bass,

promotes other predatory fish, and encourage moderate harvest of mid-size bluegill and other panfish are expected to improve growth rates, size structure and overall balance within the fish community. Continued monitoring will be important to evaluate responses to any regulatory or management changes and to ensure long-term fishery goals are met.

Recommendations

1. **Implement a regulation of no minimum length limit with a 14–18 inch protected slot and daily bag limit of five but only 1 >18 inches for largemouth bass.**
   This regulation is intended to encourage harvest of smaller bass to reduce overall bass density while protecting quality-size individuals. Reducing abundance of small bass and increasing survival of larger bass is expected to improve growth rates, enhance predator effectiveness, and promote a more balanced predator–prey structure.
2. **Maintain the current daily bag limit of 25 panfish.**
   Continued harvest of panfish, particularly mid-size bluegill, is encouraged to reduce intraspecific competition and improve growth potential. At this time, no additional panfish regulation changes are recommended.
3. **Continue muskellunge stocking through DNR or approved private stocking efforts.**
   Muskellunge survival in East Alaska Lake appears high relative to other stocked populations in the region and supports a locally unique and popular fishery. Continued stocking is recommended to maintain this opportunity and preserve the existing population structure.
4. **Consider private stocking of walleye in coordination with the Kewaunee County Lake Association.**
   Although walleye occur at low abundance, survey data indicate that stocked individuals can survive and grow well in East Alaska Lake. Supplemental stocking may provide an additional locally unique angling opportunity and contribute modestly to predator–prey balance. Any stocking efforts should be evaluated through continued monitoring to assess survival, growth and ecological effects.

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