

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Comprehensive Fishery Survey of Blackhawk Lake

Iowa County, Wisconsin 2021



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EXECUTIVE SUMMARY

The Wisconsin Department of Natural Resources (DNR) conducted a comprehensive survey of Blackhawk Lake in 2020. The primary focus of this survey was to estimate the abundance and size structure of Walleye and assess the relative abundance and size structure of other gamefish and panfish in the lake.

Spring surveys estimated the Walleye population at 4.6 fish per acre >15 inches with a catch rate of 3.6 per net night. The Northern Pike population was estimated at 1.1 fish per acre, a slight decrease from the population estimate in 2017, where density was estimated at 1.5 fish per acre. Yellow Perch catch rates were very high during spring netting surveys, capturing 1,682 fish (11.52 per net night). Largemouth Bass were also high in abundance, capturing 77.5 fish per mile during spring electrofishing surveys, an increase from 66.4 per mile in 2017. Bluegill catch rates were also higher in 2021, capturing 223 fish per mile, an increase from 203 per mile in 2017. Lastly, 60 Black Crappies were captured during spring electrofishing surveys at a rate of 56.1 fish per mile.

Overall, the fishery in Blackhawk Lake continues to be diverse, with a high abundance of predator species. Management actions will include a continuation of stocking efforts of Walleye and Northern Pike to maintain current densities. The special Largemouth Bass regulation will be maintained and made permanent to allow the harvest of five bass with no minimum length limit. In order to increase the size structure of the Bluegill population and increase the number of moderate/large adults, a special regulation restricting the harvest to 10 panfish total per day is recommended.

LAKE AND LOCATION

Blackhawk Lake, Iowa County
T6N, R2E Sections 5,6,8

PHYSICAL/CHEMICAL ATTRIBUTES

- Morphometry: 212 acres, maximum depth 42 feet
- Watershed: Otter Creek
- Lake type: Drainage, impoundment of Otter Creek
- Water clarity: Low
- Littoral substrate: Sand and silt with large boulders
- Trophic status: Eutrophic
- Aquatic vegetation: Eurasian water milfoil treatment is ongoing
- Invasive species: Chinese Mystery Snail, Curly-Leaf Pondweed, Eurasian Water-Milfoil, Rusty Crayfish.
- Winterkill: Infrequent
- Boat landings: One public boat landing is available
- Other features: Blackhawk Lake is located within the Blackhawk Lake Recreational Area. Camping, fishing, hunting, hiking and biking are permitted within the recreational area, and a public beach and picnic area are provided. Boat, canoe and pontoon rentals are also available.

PURPOSE OF SURVEY

Baseline lake survey Tier 1 assessment.

DATES OF FIELDWORK

SN1 fyke net surveys conducted March 22 through April 7, 2021.

Electrofishing surveys conducted April 8, 2021 (SE 1), May 10 and 11, 2021 (SE2) and Oct. 14, 2021 (FE).

FISHERY

The Blackhawk Lake fishery consists of Bluegill, Black Crappie, Largemouth Bass, Walleye, Yellow Perch and Northern Pike.

Introduction

Blackhawk Lake is a 212-acre impoundment located in Iowa County, Wisconsin that was created in 1972. Blackhawk Lake is a eutrophic, drainage lake with a maximum depth of 42 feet. The main inlet to Blackhawk Lake is Otter Creek, but other tributaries, including Narveson Creek and unnamed tributaries, flow into Blackhawk Lake. Two dams regulate the waterbody on the north side of the lake and flow out to Narveson and Otter Creeks.

The lake has a number of gamefish, including Bluegill (*Lepomis macrochirus*), Black Crappie (*Pomoxis nigromachulatus*), Pumpkinseed (*Lepomis gibbosus*), Green Sunfish (*Lepomis cyanellus*), Yellow Perch (*Perca flavescens*), Largemouth Bass (*Micropterus Salmoides*), Walleye (*Sander vitreus*) and Northern Pike (*Esox Lucius*). Common non-game and forage fish include White Sucker (*Catostomus commersoni*), Brook Silverside (*Labidesthes sicculus*), Fathead Minnow (*Pimephales promelas*), Black Bullhead (*Ameiurus melas*), Brown Bullhead (*Ameiurus nebulosus*) and Common Carp (*Cyprinus carpio*). Invasive species are also present in Blackhawk Lake and include the Chinese Mystery Snail (*Bellamy chinensis*), Rusty Crayfish (*Orconectes rusticus*), Eurasian Water-Milfoil (*Myriophyllum spicatum*) and Curly-Leaf Pondweed (*Potamogeton crispus*).

Angling regulations follow the statewide regulations for most species; however, a few alternate regulations are in place (Table 1). Walleyes, Saugers and any hybrids must be a minimum length of 18 inches with a daily bag limit of three. Bass of any length may be kept, with a daily bag limit of five.

A variety of surveys have been completed on Blackhawk Lake since 1972. These include general surveys, baseline monitoring surveys, special regulation evaluations, as well as standardized fishery assessments. This is the third comprehensive fishery survey conducted on Blackhawk Lake and the second comprehensive fishery survey report. The primary objectives of the survey were to assess the Walleye, Northern Pike, bass and panfish populations.

Management of the fishery in Blackhawk Lake has varied over the years. Gamefish were managed under the statewide regulations up until 1997 when the 18-inch minimum length limit and daily bag limit of three was implemented for Walleyes. This was enacted to improve the size structure of the population and manage for quality fishing opportunities. In 2009, a daily bag limit of five with no minimum length limit regulation was implemented for all bass species. At the time, the bass population in Blackhawk Lake exhibited high densities and slow growth rates leading to reduced size structure. This regulation was enacted to reduce densities, thereby increasing growth and size structure while providing harvest opportunities for anglers. Northern Pike have been managed under the statewide regulation to provide a Northern Pike fishery that produces harvestable fish above 26 inches. Panfish have also been

managed under the statewide regulation to provide a harvest-oriented fishery focused on Bluegill, Black Crappie and Yellow Perch.

Stocking has been common practice in Blackhawk Lake since its construction in 1972. Early stocking events consisted of Walleye and Largemouth Bass during the first 10 years. Since 1983, a variety of game and non-game fish, including Channel Catfish, Northern Pike, Yellow Perch, Black Bullheads, Fathead Minnows and White Suckers, have been stocked. However, recent stocking events have focused mainly on Walleye and Northern Pike (Table 2). Walleyes are typically stocked as large fingerlings at approximately 10 fish/acre (roughly 2100 fish), although in 2013, 150,000 fry were also stocked (Table 2). Northern Pike have also been stocked frequently as large fingerlings at approximately two fish/acre. However, in 2014 multiple size classes were stocked that included a combination of small fingerlings, large fingerlings and yearlings.

Lake habitat projects have been increasing in popularity across the state, and in 2013, a large-scale fish “crib” project was completed on Blackhawk Lake. Fifty-five fish cribs were constructed and placed on the ice during the winter of 2013. These were constructed of trees pulled through concrete culvert tubes 6 feet long and 2 feet in diameter. These structures were dumbbell in shape and roughly 50’x25’x10’. Cribs are scattered across the lakebed where total depths exceed 15 feet. Overall, these are very popular locations to fish among anglers because they attract panfish and result in fishing “hotspots” throughout the lake, making these fish easier to catch and more vulnerable to harvest.

METHODS

Spring sampling began in mid-March 2021 following standard DNR spring netting (SN1) procedures listed in the DNR fish management handbook (Simonson 2015). Between March 22 and April 7, 15 net lifts were conducted at 10 netting locations for 146 net nights to capture, measure and mark adult Northern Pike and Walleye to estimate abundance. All Northern Pike that could be visually sexed as mature individuals were marked with a top caudal fin clip. These fin clips were also collected and preserved for genetic analysis of the population. Additionally, Walleyes that could be visually sexed as mature individuals or were greater than 15 inches were marked with a top caudal fin clip. Fyke nets (standard 4’ x 6’, $\frac{3}{4}$ ” bar mesh) were set at ice-out and lifted daily. Nets were set in locations that have been previously determined as successful capture locations (Figure 1). Immediately after fyke netting was completed, a single, entire shoreline, night boomshocker electrofishing survey was conducted on April 8 (SE1) to recapture Walleyes to estimate abundance.

Following both the SN1 and the SE1 surveys, we conducted a spring electrofishing 2 (SE2) survey targeting centrarchids. The primary objective for this survey was to collect and measure bass and panfish. An entire shoreline, night boomshocker electrofishing survey was split up and conducted on May 10 and 11. Two bass/panfish stations were sampled, and all centrarchids were collected (Figure 2). For the

remainder of the entire shoreline survey, only bass were collected. One boat operator and two experienced technicians, using 3/8" mesh dip nets, conducted the surveys. A minimum of 100 panfish from each species were dipped from the tub and measured. Spines were also collected from a minimum of five fish per 1/2 inch length bin, per species, for aging analysis.

A fall electrofishing survey (FE) was also conducted on Blachawk Lake in 2021. The objective of this survey was to assess fall/juvenile Walleyes recruiting to the population. On Oct. 14, an entire shoreline, nighttime electrofishing survey was completed. All Walleyes, along with other gamefish, were collected to calculate catch per effort (CPE).

POPULATION ASSESSMENT

During the initial netting period, recaptures of Northern Pike in fyke nets were used to estimate the population using the Schnabel estimator (Ricker 1975):

$$N = \frac{\sum_{i=2}^t C_i M_i}{\sum_{i=2}^t R_i},$$

where t = number of sampling trips, C_i refers to the number of fish captured in sample i , M_i refers to the number of marked fish present in the population for the i th sample, and R_i refers to the number of marked fish recaptured in sample i . After this initial netting period, a spring electrofishing recapture event was also conducted for Walleyes. The objective of this recapture run was to collect previously marked Walleyes to estimate abundance using the Chapman's modification of the Peterson mark-recapture estimator (Ricker 1975):

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

where C = number of Walleyes captured in the electrofishing sample, M = number of Walleyes marked during fyke netting, R = number of marked Walleyes observed in the electrofishing sample. During the fyke net surveys, Walleye spines and Northern Pike fin rays were collected at a minimum of ten structures per 1-inch length bin for aging analysis. For all other species where population estimates could not be conducted, CPE in terms of the number of fish per mile was calculated.

Aging analysis was conducted for those structures that were collected during the spring fyke netting and electrofishing events. All structures were placed in individual scale envelopes to identify individual fish. Once dried, fin rays were embedded in epoxy, cross-sectioned using a low-speed diamond blade saw, sanded with 1000 grit sandpaper and, if necessary, polished to achieve maximum clarity. Spines were dried, cut near the base, sanded to achieve maximum clarity and illuminated with a fiber optic light. Two readers then aged each structure until an age was agreed upon. If a discrepancy existed, a third reader was called upon to assist in age agreement.

Size structure and growth rates of individual species were also calculated. Mean length at age was computed based on lengths of individual fish for each species

sampled and compared to statewide averages to determine relative growth rates. Individual fish from each species that had weights associated with lengths were used to calculate relative weights (W_r) using methods provided by Anderson and Neumann (1996). Age length keys were used to assign ages and assess the age structure of the entire sampled population from a subsample of aged fish. Fish within the subsample were assigned an age at their length. These ages were then extrapolated and applied to unaged fish in the whole sample based on the proportion of ages at each length, using 0.5-inch length bins.

RESULTS

Summary of catch rates for gamefish and panfish sampled during 2021 surveys:

| | BLUEGILL | BLACK CRAPPIE | LARGEMOUTH BASS | YELLOW PERCH | NORTHERN PIKE | WALLEYE |
|--------------------|----------|---------------|-----------------|--------------|---------------|---------|
| TOTAL CATCH | | | | | | |
| SN1 | 1062 | 130 | 145 | 1682 | 183 | 542 |
| SN2 | 343 | | | | | |
| SE1 | | | | | | 221 |
| SE2 | 239 | 60 | 355 | 10 | | |
| FE | | | 591 | | 16 | 215 |
| Summer Fyke | 346 | | | | | |

| | BLUEGILL | BLACK CRAPPIE | LARGEMOUTH BASS | YELLOW PERCH | NORTHERN PIKE | WALLEYE |
|------------------------|----------|---------------|-----------------|--------------|---------------|---------|
| CPUE | | | | | | |
| SN1 (number/net night) | 7.0 | 0.9 | 1.0 | 11.52 | 1.2 | 3.6 |
| SN2 (number/net night) | 85.8 | | | | | |
| SE1 (number/mile) | | | | | | 51.5 |
| SE2 (number/mile) | 223.4 | 56.1 | 77.5 | 9.3 | | |
| FE (number/mile) | | | 137.7 | | 3.7 | 50.1 |
| Summer Fyke | 86.5 | | | | | |

SPRING FYKE-NETTING AND SPRING ELECTROFISHING I

WALLEYE

A total of 406 adult (sexually mature) Walleyes were marked during the SN1 surveys, and 222 Walleyes were recaptured during the SE1 survey. These numbers are down slightly from the last survey in 2017, where 564 individual fish were marked during the fyke net surveys. This translates to a current estimated Walleye population of 1,439 fish (6.8 per acre), with 95% CIs [1,175, 1,809] and a CV of 10.6. Population estimates were also calculated for Walleyes over 15 inches, as well as Walleyes greater than the minimum harvest size of 18 inches. These estimates came out to 974 fish (4.6 per acre) with 95% CIs [794, 1235] and 562 fish (2.7 per acre) with 95% CIs [436, 773], respectively. The length of individual Walleyes captured during spring netting surveys ranged from 10.7 to 28.7 inches, with an average of 19.1 (SD = 3.7; Figure 3). Female Walleyes, to no surprise, had a greater mean length averaging 22.2 inches, compared to 17.1 inches for Males. These lengths are nearly identical to those from the 2017 survey, where Females averaged 22.1 inches and Males 17.9 inches. When sex could be determined, males were sampled with greater proportion, sampling 59% males compared to 41% females. Growth rates were above the statewide average according to mean length at ages (Figure 4). Both male and female Walleyes from ages 3-5 dominated the population, with steep declines beyond, presumably due to harvest once fish reach 18 inches (Figure 5). Relative weights of Walleyes sampled during spring fyke netting indicated good condition overall with a mean relative weight of 92 (SD = 9.8; Figure 6). In fact, 93% of the population exhibited relative weights over 80, and 16% of the population was above 100 (Figure 6).

NORTHERN PIKE

During the spring surveys, a total of 175 sexually mature Northern Pike were captured, 127 individuals were marked and 46 fish were recaptured. This is a decrease from 2017, when 245 individual fish were tagged. Using the Schnabel multiple census mark-recapture estimator, the 2021 Northern Pike population was estimated at 229 fish with 95% CIs [175, 332] at a density of 1.1 fish per acre. Population estimates were also calculated for Northern Pike greater than the minimum harvest size of 26 inches. This estimate came out to 94 fish (0.4 per acre) with 95% CIs [53, 300]. The average size of Northern Pike was 24.2 inches (SD = 5.5, with a minimum size of 11.2 and a maximum size of 42.3 (Figure 7). This was a slight decrease from surveys conducted in 2017, where the average size of Northern Pike was 24.6 inches. Mean length at age values also exhibited good growth rates, with values above the statewide averages for Northern Pike (Figure 8). Similar to surveys in 2017, age-3 Northern Pike dominated the fishery in 2021 (Figure 9). Catch rates of Northern Pike declined beyond the age of 4, likely due to natural mortality and harvest once fish reach the minimum length limit of 26 inches, which typically occurs at 5-6 years of age on average. Overall, the Northern Pike sampled during spring fyke netting indicated good condition with a mean relative weight of 96 (SD = 12.8), with 91% of the population exhibiting relative weights over 80 and 34% of the population above 100 (Figure 10).

YELLOW PERCH

A total of 1,682 Yellow Perch were captured during the fyke net surveys in 2021. This translates to a CPE of 11.52 fish per net night. This is extremely high compared to the catch of Yellow Perch in 2017, where only 35 fish were captured. These fish ranged in size from 4.1 to 9.2 inches in length, with an average of 5.68 (SD = 0.69; Figure 18). When sex could be determined, males were sampled with much greater frequency, sampling 92% males and 8% females during the surveys. Age-3 and 4 Yellow Perch dominated the surveys, making up 75% of the total fish sampled. The growth of Yellow Perch in Blackhawk Lake is also slow based on Yellow Perch populations statewide (Figure 19).

SPRING ELECTROFISHING II

LARGEMOUTH BASS

A total of 504 Largemouth Bass were collected during spring fyke netting and electrofishing in 2021. Largemouth Bass CPE during late spring electrofishing was calculated at 77.5 fish per mile, exhibiting an increase from 2017, when CPEs were calculated at 66.4 fish per mile. Blackhawk Lake ranks high compared to other lakes in the warm, dark, complex lake classification. Median catch rates for all other lakes is 17.4 fish per mile, with the 75th percentile at 37.3 fish per mile. The average length of fish captured was 13.1 (SD = 4.2) inches, ranging from 2.8 to 20.8 inches (Figure 11). Even with high catch rates, the growth of Largemouth Bass seems to be good, with mean length at ages at or above statewide averages for all ages (Figure 12). The age-2 and 3 year-classes dominated the fishery with excellent reproductive success occurring in 2019 (Figure 13). Largemouth Bass sampled during spring electrofishing were in excellent condition overall, with a mean relative weight of 105 (SD = 10.4; Figure 14). In fact, 99% of the population exhibited relative weights over 80, and 74% of the population above 100.

BLUEGILL

A total of 239 Bluegill were sampled during the late spring electrofishing surveys in Blackhawk Lake, where CPE was calculated at 223 fish per mile. This was a slight increase from 2017, when the catch rate of Bluegill was 203 fish per mile. Blackhawk Lake ranks high compared to other lakes in the warm, dark, complex lake classification. Median catch rates for all other lakes is 117 fish per mile, with the 75th percentile coming in at 196 fish per mile. The mean length of all sampled Bluegills in the late spring electrofishing effort averaged 5.67 (SD = 1.2) inches, with a minimum of 3.3 inches and a maximum of 8.3 inches (Figure 15). Bluegill showed excellent growth rates in Blackhawk Lake, reaching 7 inches by age-4 on average (Figure 16). Age-3 Bluegill, at approximately 5.6 inches on average, dominated the fishery (Figure 17). However, even with excellent growth rates, the size structure is not meeting its potential for a southern lake, as few fish greater than 8 inches were observed during spring surveys.

OTHER PANFISH

Relatively few other panfish were sampled during the late spring electrofishing surveys. The most abundant panfish other than Bluegill was Black Crappie, with a total of 60 fish, an increase from the seven fish surveyed in 2017. Fish ranged from 6.5-9.7 inches, with an average length of 8.2 (SD = 0.8) inches. A total of 10 Yellow Perch were sampled in 2021 at 9.3 fish per mile, exhibiting a decrease from the 39 fish per mile in 2017. The mean length was 5.9 (SD = 1.5) inches, with a minimum of 4.3 and a maximum of 9.0 inches (Figure 18). Only two Pumpkinseeds were sampled at 7.1 and 7.4 inches in length.

FALL ELECTROFISHING

YOUNG-OF-YEAR WALLEYE

The catch rate of young-of-year (YOY) Walleye was 10.5 fish per mile. These fish represent fish that were recently stocked in Blackhawk Lake, as this lake receives stocked fish on an annual basis.

DISCUSSION

Overall, the Blackhawk Lake fishery is diverse, with high-density predator populations. Even with these abundant populations, size structure still remains high, with good growth rates apparent for most species. This fishery continues to provide opportunities for all anglers fishing Blackhawk Lake, including both trophy and harvest opportunities. The habitat is also diverse, with miles of undeveloped shoreline, a healthy aquatic plant community and fish cribs located throughout the system. Few water quality issues exist in Blackhawk Lake, and treatments are conducted to reduce and control invasive aquatic species that are present. The diverse fishery, plentiful habitat and good water quality make Blackhawk Lake an excellent waterbody for recreation.

The Walleye fishery is dependent on stocking in Blackhawk Lake and stocking will likely continue for the foreseeable future. The DNR stocks Walleyes at a rate of 10 fish per acre every other year (odd years). On the even years, Blackhawk Lake Commission stocks an additional 10 fish per acre. This is actually twice the recommended stocking frequency based on DNR standards and may be necessary to maintain the moderate-high density population. Walleye in Blackhawk Lake are managed for quality fishing opportunities, and therefore, maintaining this population and growth above and beyond 15 inches is crucial for its success. Based on the survey in 2017, previous management objectives included maintaining at least six Walleye per acre greater than 15 inches. However, this is extremely high based on other Walleye fisheries statewide. Current population levels at 4.6 fish per acre greater than 15 inches are likely more manageable and allow greater growth opportunities, especially considering the competition among other gamefish in Blackhawk Lake. Currently, the mean age at length for 18-inch Walleyes (harvestable size) is six years, which has increased since the 2017 surveys. This indicates that growth has slowed slightly and may be due to higher-than-normal stocking rates and competition from other top-

tier predator species, such as Largemouth Bass. However, despite these changes, growth is still higher than average compared to other Walleye fisheries statewide. We will continue to monitor for healthy conditions and average to above-average growth rates; however, if these growth rates slow down, we may need to re-evaluate stocking densities in the future. At this point, we will continue to manage under the same stocking regime and regulations currently in place for Walleyes.

The Northern Pike fishery in Blackhawk Lake is within our current management objective of 1-2 fish per acre. The majority of these fish are between 18 and 28 inches in length. As these fish approach 30 inches, numbers of Northern Pike decline, presumably due to harvest, given that ice anglers are abundant during the winter months. The healthy population of 1.1 fish per acre provides a fishery for both open water and ice fishermen throughout the year. Stocking has been a common practice in Blackhawk Lake since 2012. Preliminary results from the parentage analysis project, where we collected fin clips for genetic analysis, indicated that 85 percent of the current population is provided through natural reproduction, and only 15% is being contributed through stocking efforts. These results show that the Northern Pike population in Blackhawk Lake is naturally reproducing, and the fish are recruiting to the fishery. Therefore, stocking of Northern Pike will be discontinued at this time, and the population will be monitored in the future to maintain the 1-2 fish per acre management goal.

Largemouth Bass continue to produce an abundant population in Blackhawk Lake with good growth and size structure overall. As stated before, catch rates are well above the 75th percentile for warm-dark-complex lakes statewide, and trophy opportunities exist in Blackhawk Lake. Given the high abundance, these fish may be competing with Walleyes for resources since the Walleye population seems to be reduced and growth rates have also slowed down. However, this abundant population of Largemouth Bass may benefit the Bluegill population by keeping recruitment to a level that improves growth and size structure. The current management of this Largemouth Bass fishery also seems to be successful under the no minimum length limit regulation, and this will be maintained. Overall, the Largemouth Bass fishery in Blackhawk Lake is one worth pursuing, based on our visual observations of increased fishing pressure during the new early catch and release bass season, and we can expect this to continue in the future.

The number of Bluegill sampled increased slightly from surveys in 2017. Bluegill size structure increased slightly from 5.4 inches in 2017 to 5.67 inches in 2021. However, the maximum length decreased in 2021 as the largest fish captured was only 8.3 inches. This could be due to high angler pressure and the harvest of larger fish, especially during the COVID-19 pandemic, where the DNR experienced record license sales. This promoted fishing opportunities, and the extra angler pressure was evident throughout Wisconsin. The growth rate of Bluegill is still above the statewide average in Blackhawk Lake. High growth rates should yield larger fish at younger ages. However, the larger size classes aren't as common in Blackhawk Lake as they once

were. Under current management regulations, the harvest-oriented fishery will continue to provide fish for anglers; however, growth overfishing may continue to take place. Therefore, the implementation of a special regulation for panfish is recommended. The suggested regulation is a daily bag limit of 10 panfish to promote increases in the number of moderate to large adults. This regulation will allow for the management of a quality panfish fishery by increasing the size structure through reductions in the overall harvest. This regulation change was presented at a public meeting in September 2022 and was supported by meeting participants.

MANAGEMENT RECOMMENDATIONS

- 1) **Goal:** Maintain current Walleye population density.
Objective: Maintain density of Walleyes >15 inches at 2-4 Walleyes per acre.
Strategy: Maintain stocking of Walleyes at 10 large fingerlings per acre every year. Maintain the current regulation of 18-inch minimum length limit and daily bag limit of three fish.
- 2) **Goal:** Maintain current Northern Pike population density.
Objective: Maintain between 1-2 fish per acre
Strategy: Discontinue stocking large fingerling Northern Pike. Maintain the 26-inch minimum length limit and daily bag limit of two fish.
- 3) **Goal:** Increase catch rates of preferred size Bluegill in Blackhawk Lake.
Objective: Increase catch rates of >8-inch fish during SE 2 surveys to 10 fish per mile.
Strategy: Implement a special regulation of 10 panfish per day.

REFERENCES

- Anderson, R. O and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 *in* B. R. Murphy and D. W. Willis, editors. Fisheries Techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.
- Ricker, W. E. 1975. Computation and interpretation of biological statistics of fish populations. Fisheries Research Board of Canada, Bulletin 191.
- Simonson, T. 2015. Surveys and Investigations – Inland Fisheries Surveys. Fish Management Handbook Chapter 510, Wisconsin Department of Natural Resources internal publication. Madison, Wisconsin.



Figure 1. 2021 spring fyke netting locations on Blackhawk Lake.



Figure 2. SE2 survey stations sampled in 2021. Blue line refers to bass/panfish stations, while red line refers to bass-only stations.

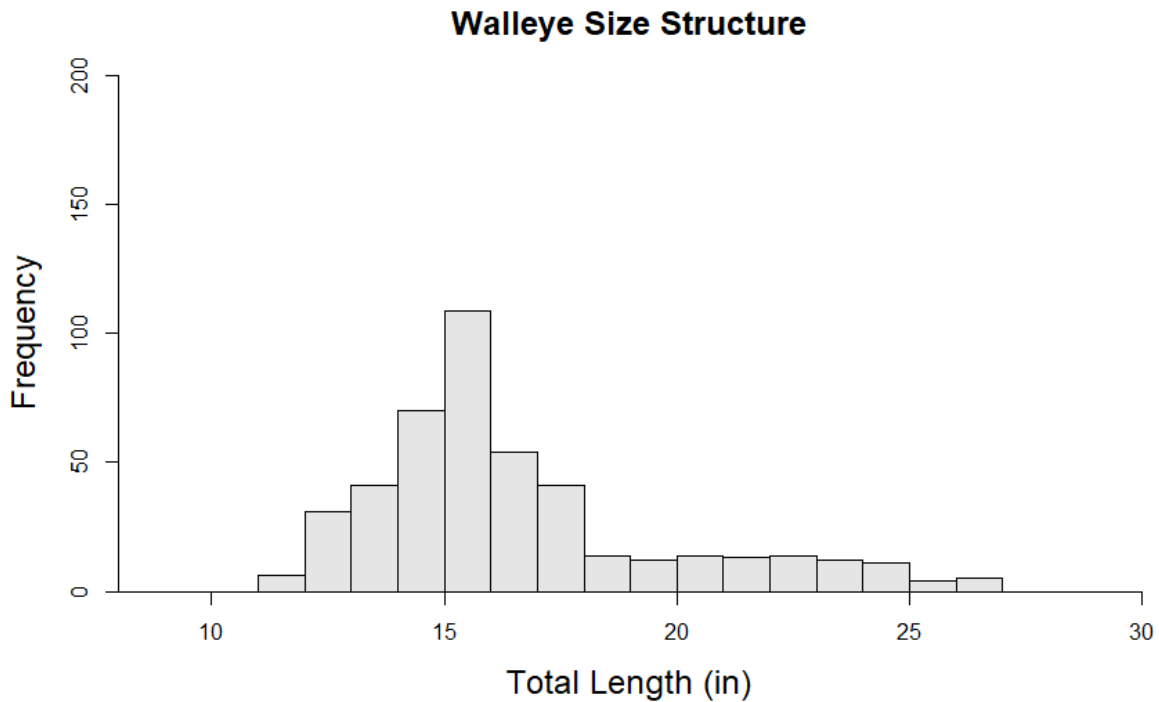


Figure 3. Walleye size structure from individual fish captured during spring fyke netting surveys.

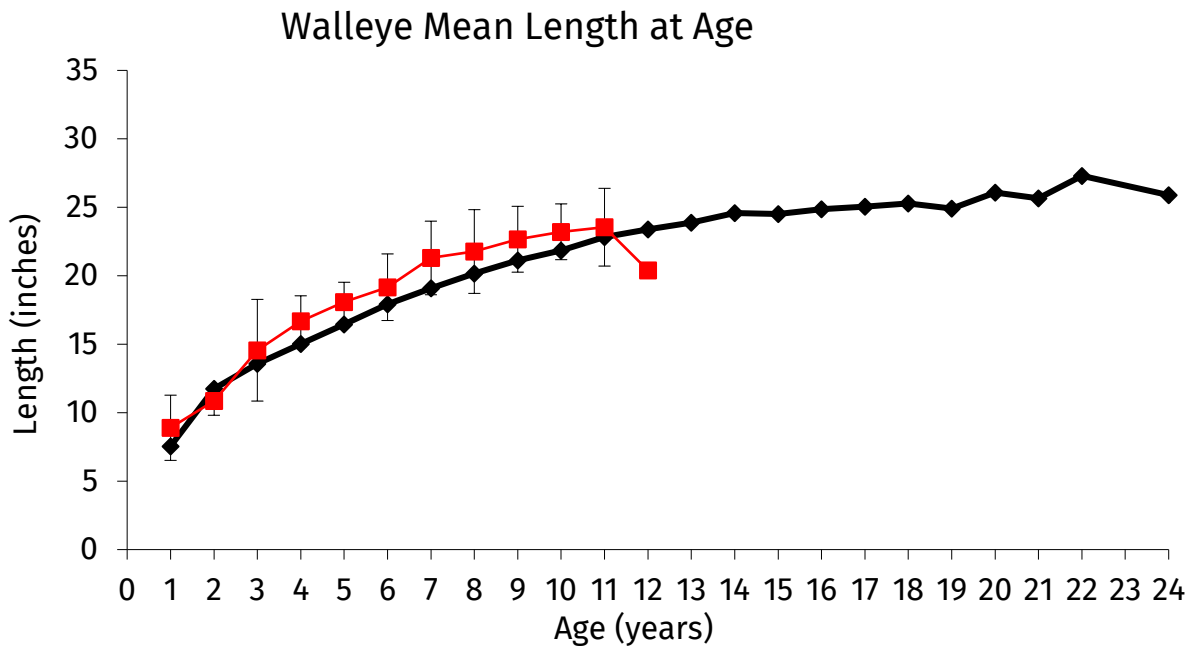


Figure 4. Walleye growth rates in comparison to statewide averages. Blackhawk Lake values are shown in red (± 1 SD); statewide averages are shown in black.

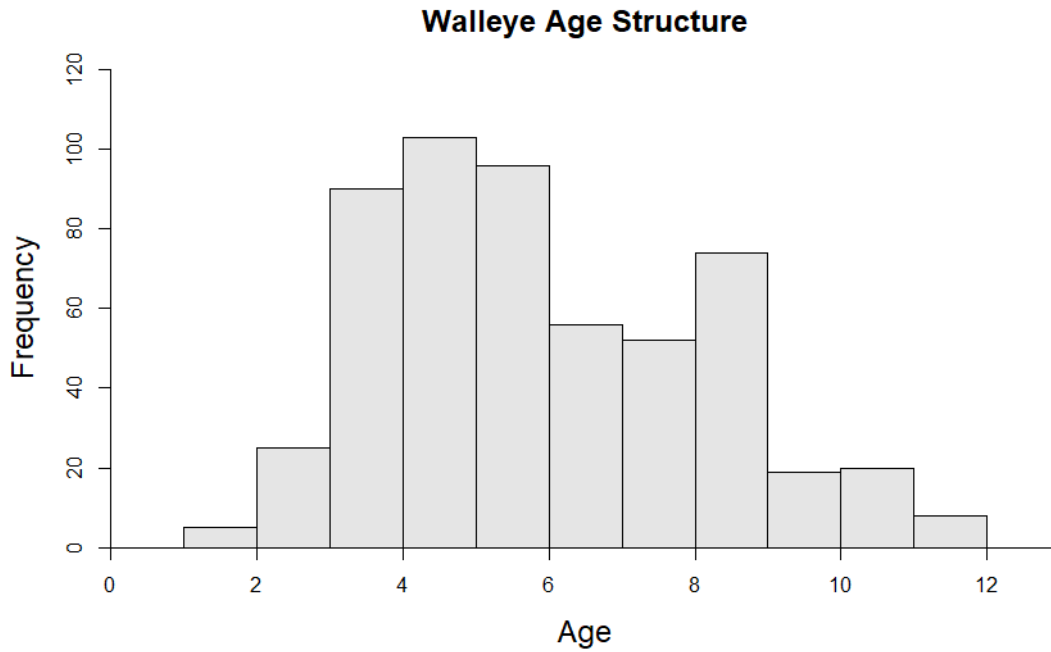


Figure 5. Age structure of all Walleye collected during spring sampling in Blackhawk Lake. Lengths from aged fish were extrapolated and applied to unaged fish using age-length keys.

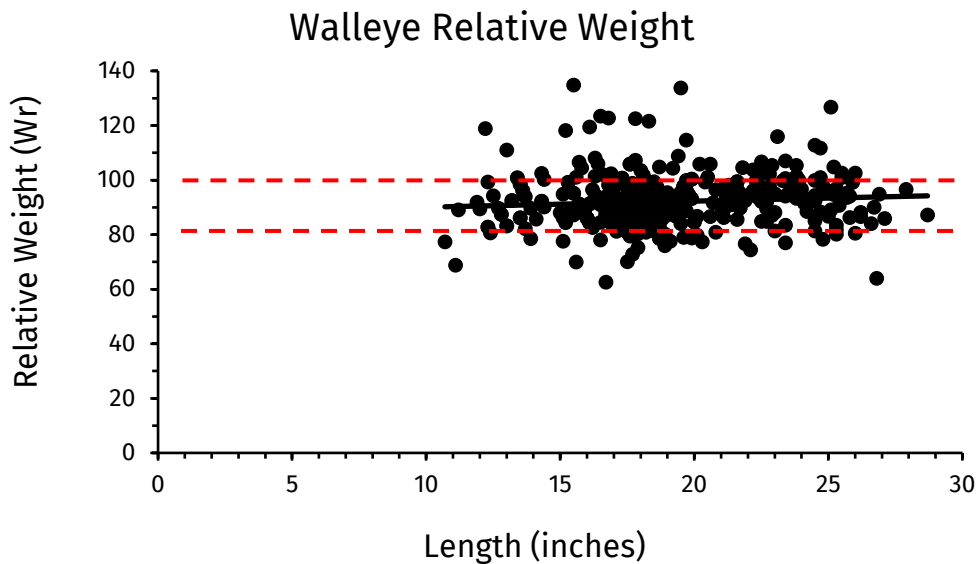


Figure 6. Relative weights of all Walleye sampled during spring fyke netting surveys. Fish between 75 and 100 (designated by red dashed lines) are considered to be within the normal range.

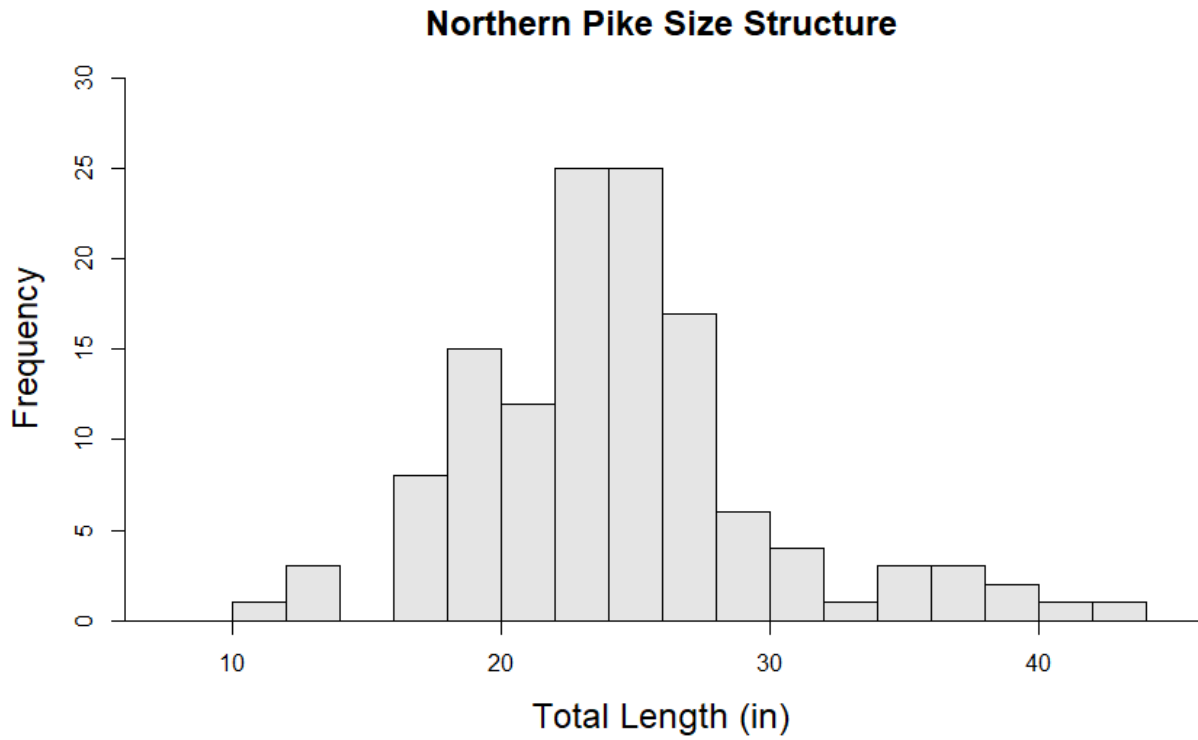


Figure 7. Northern Pike size structure from individual fish captured during spring fyke netting surveys.

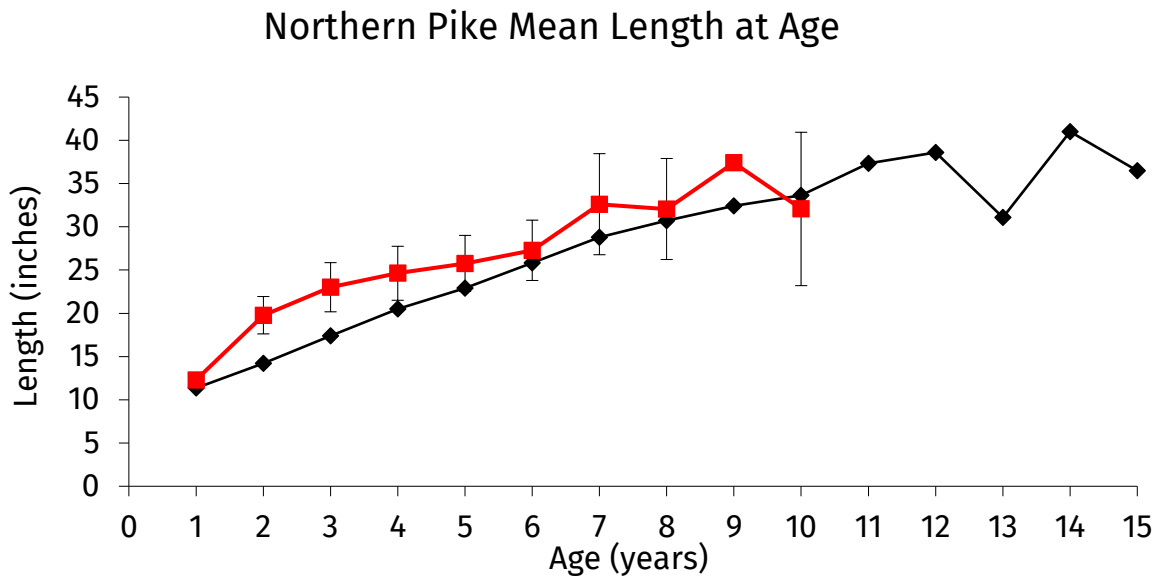


Figure 8. Northern Pike growth rates in comparison to statewide averages. Blackhawk Lake values are shown in red (± 1 SD); statewide averages are shown in black.

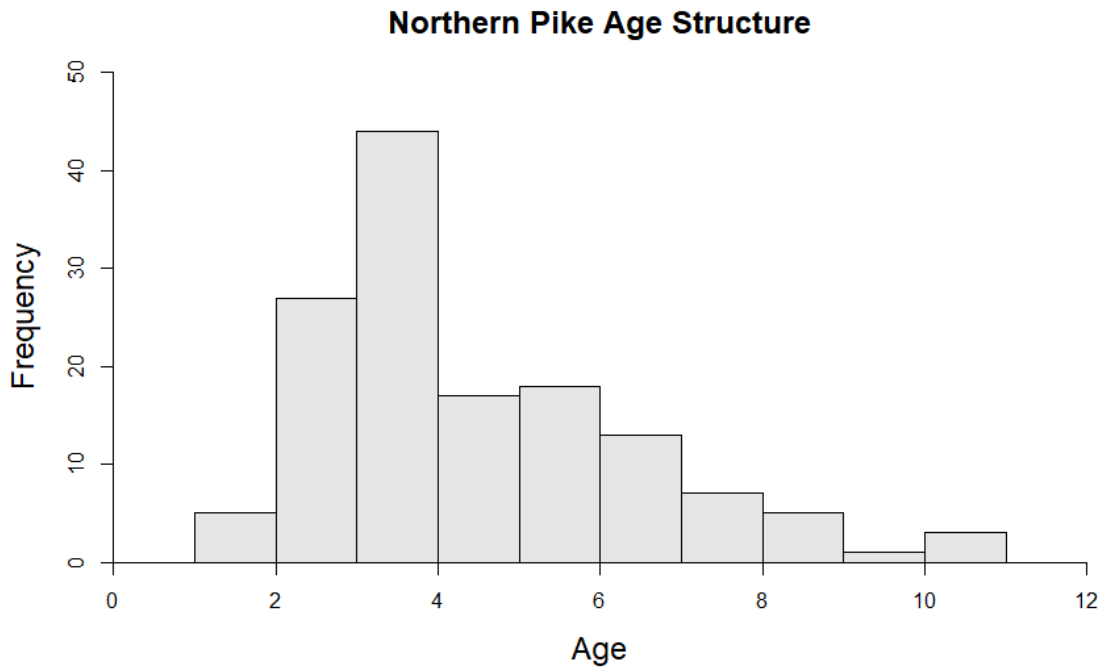


Figure 9. Age structure of all Northern Pike collected during spring sampling in Blackhawk Lake. Lengths from aged fish were extrapolated and applied to unaged fish using age-length keys.

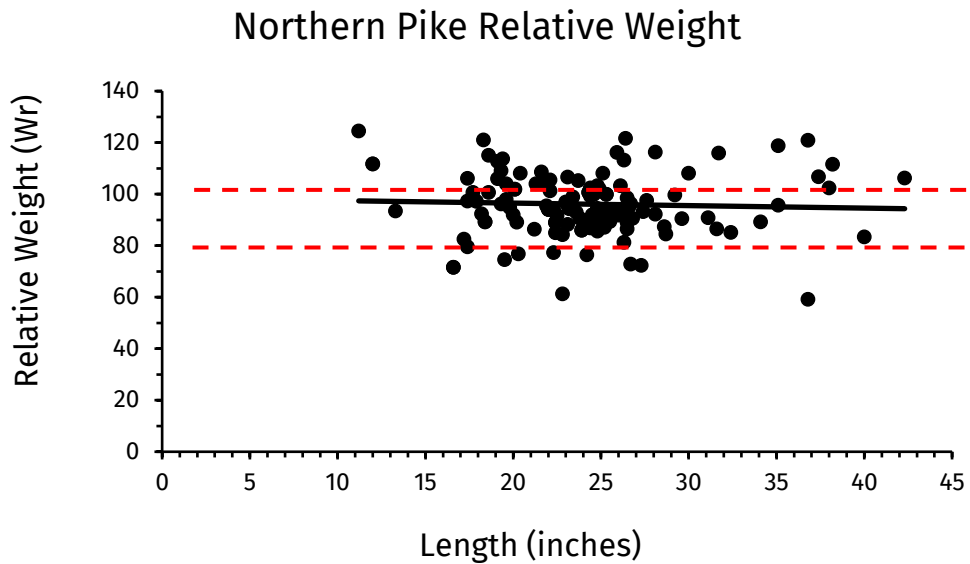


Figure 10. Relative weights of all Northern Pike sampled during spring fyke netting surveys. Fish between 75 and 100 (designated by red dashed lines) are considered to be within the normal range.

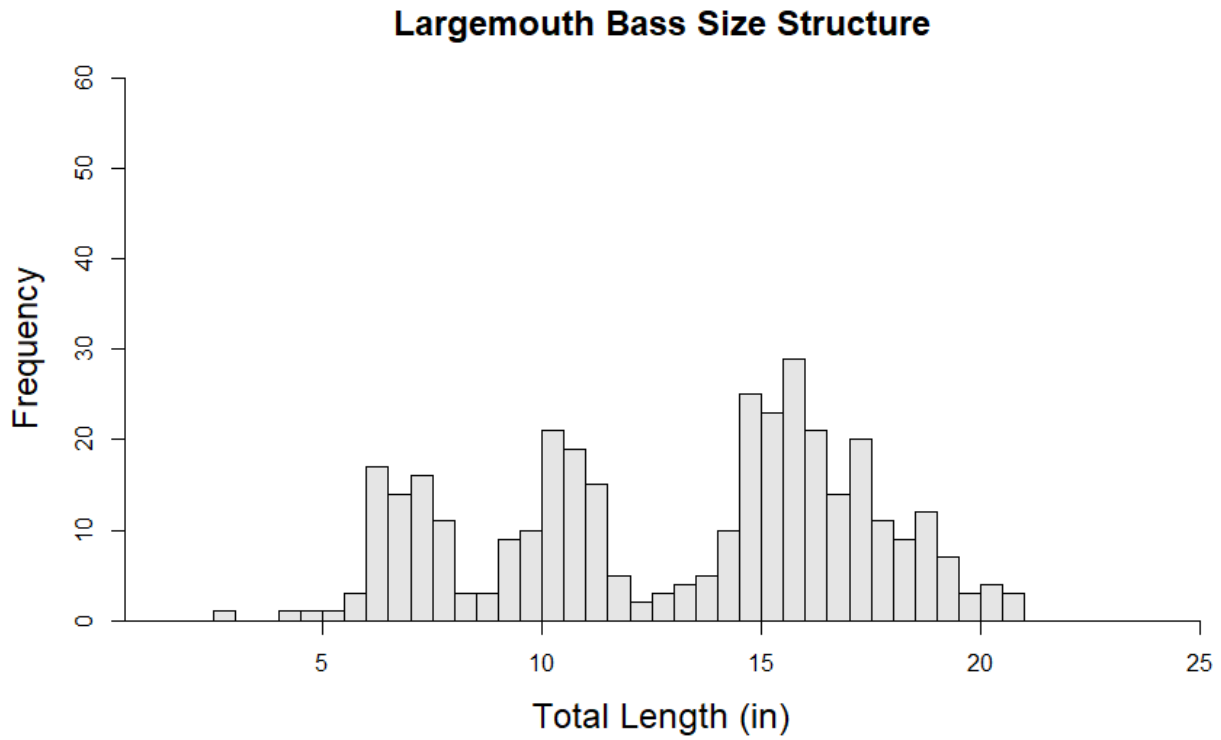


Figure 11. Largemouth Bass size structure from individual fish captured during spring electrofishing surveys.

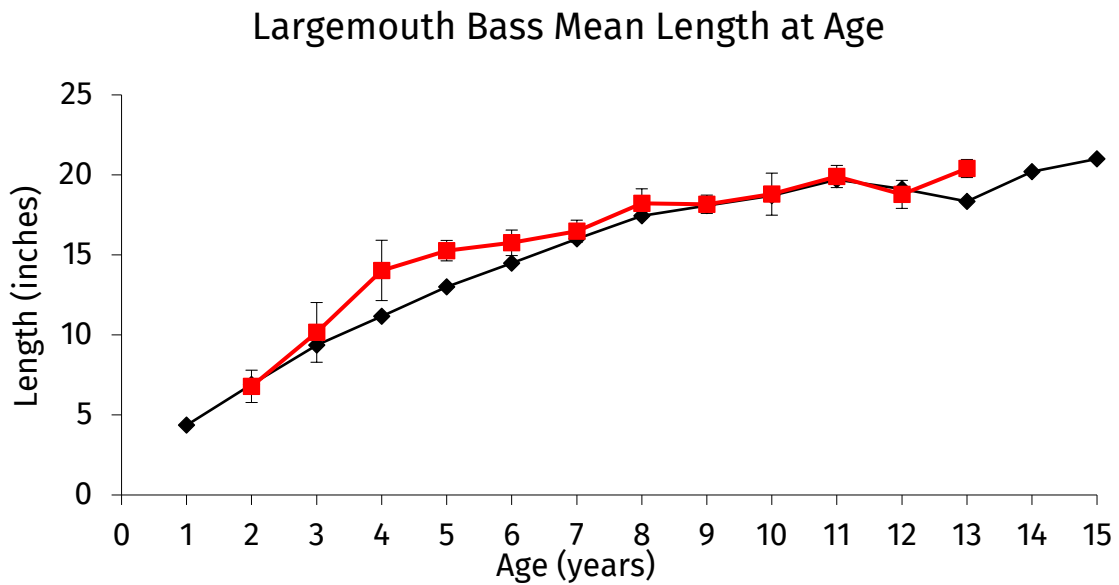


Figure 12. Largemouth Bass growth rates in comparison to statewide averages. Blackhawk Lake values are shown in red (± 1 SD); statewide averages are shown in black.

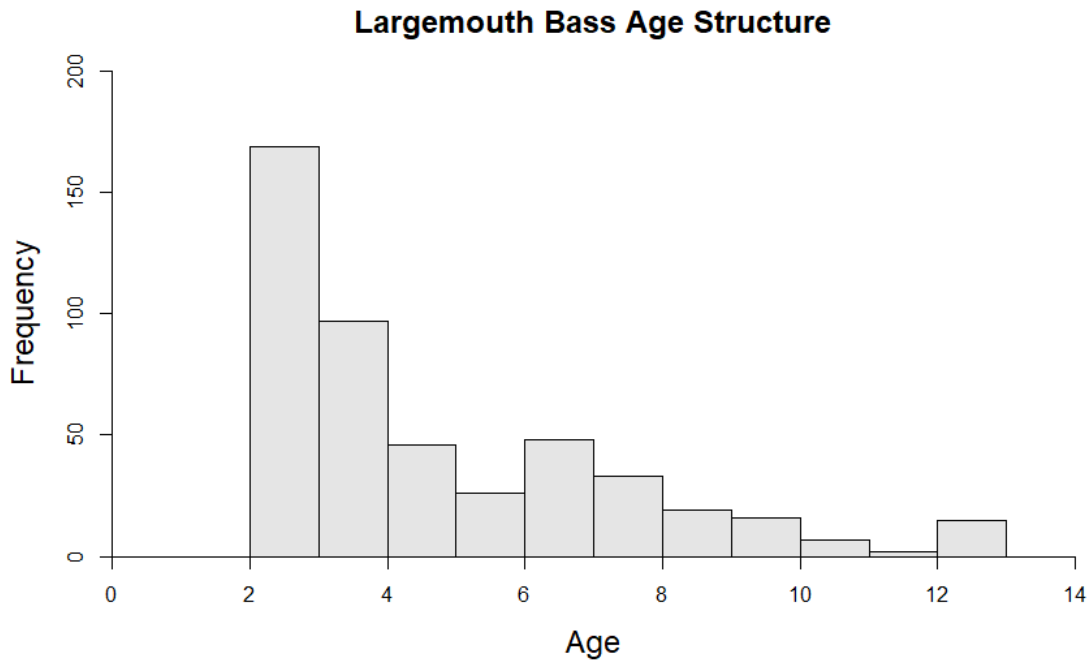


Figure 13. Age structure of Largemouth Bass collected during spring sampling in Blackhawk Lake. Lengths from aged fish were extrapolated and applied to unaged fish using age-length keys.

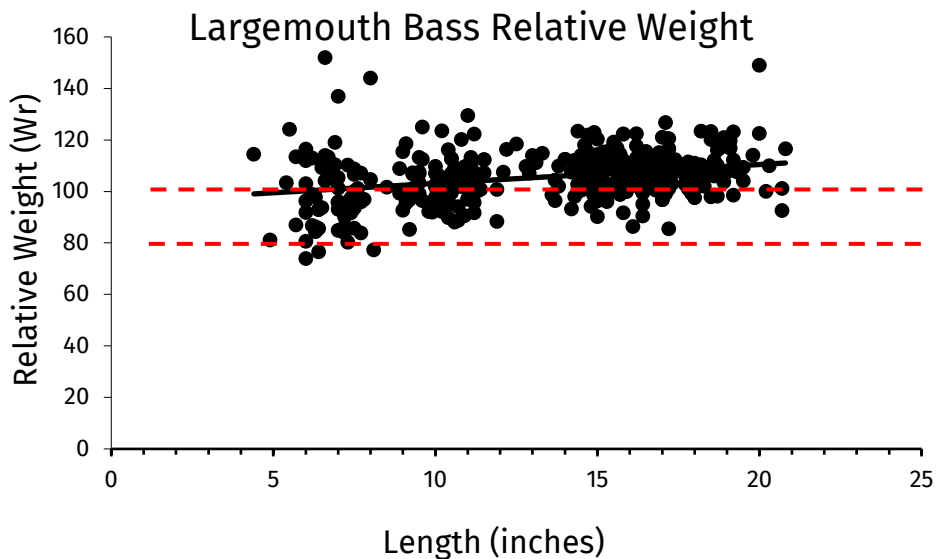


Figure 14. Relative weights of all Largemouth Bass sampled during spring electrofishing surveys. Fish between 75 and 100 (designated by red dashed lines) are considered to be within the normal range.

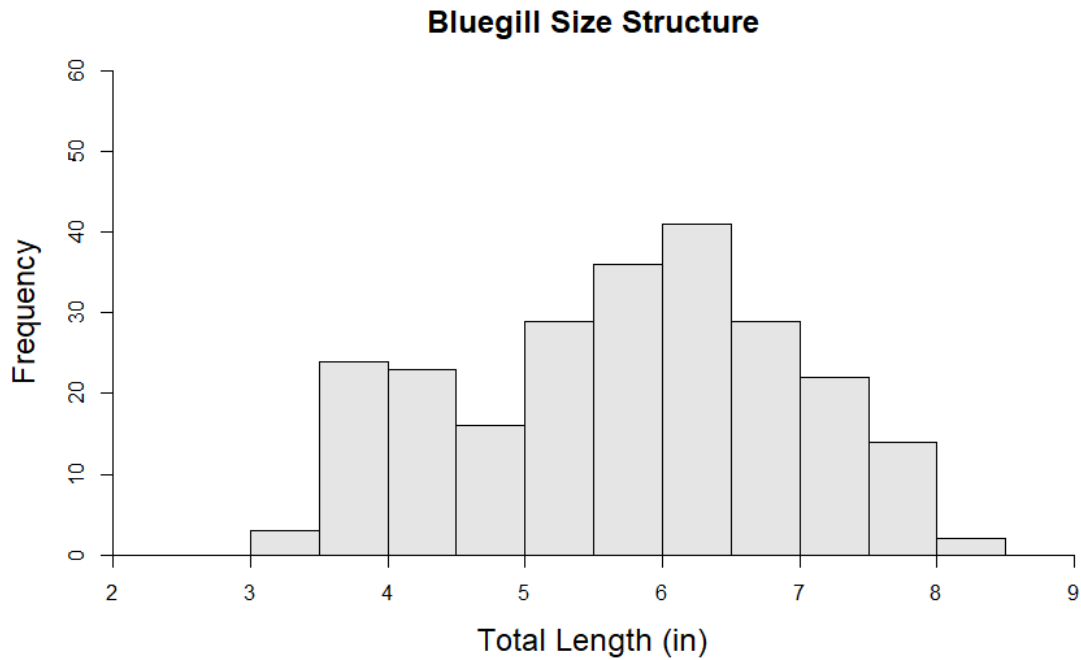


Figure 15. Bluegill size structure from individual fish captured during spring electrofishing surveys.

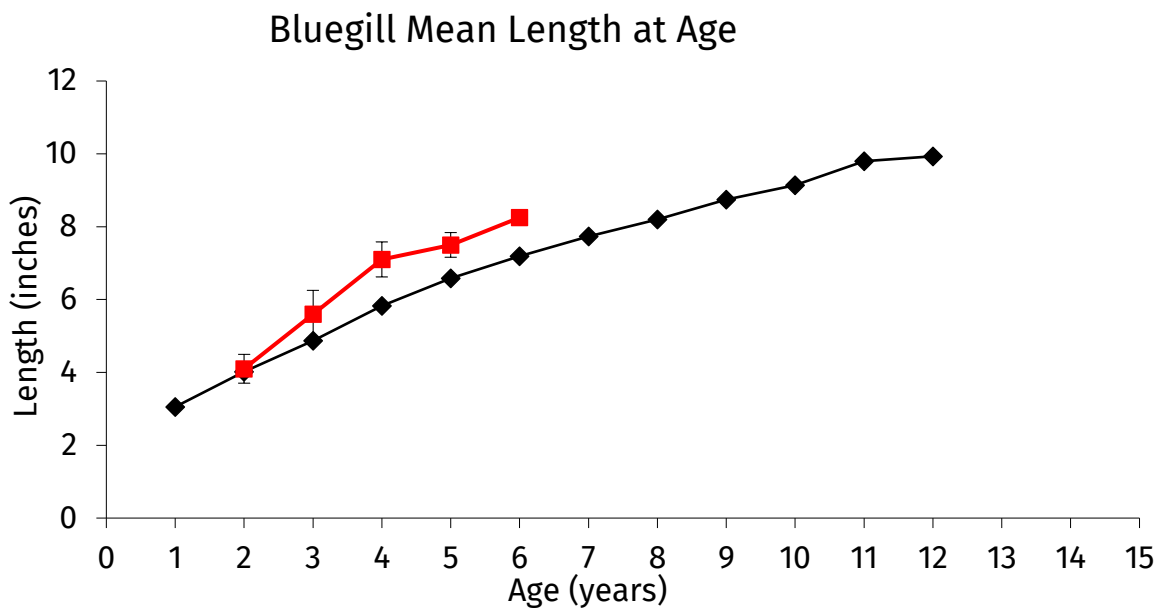


Figure 16. Bluegill growth rates in comparison to statewide averages. Blackhawk Lake values are shown in red (± 1 SD); statewide averages are shown in black.

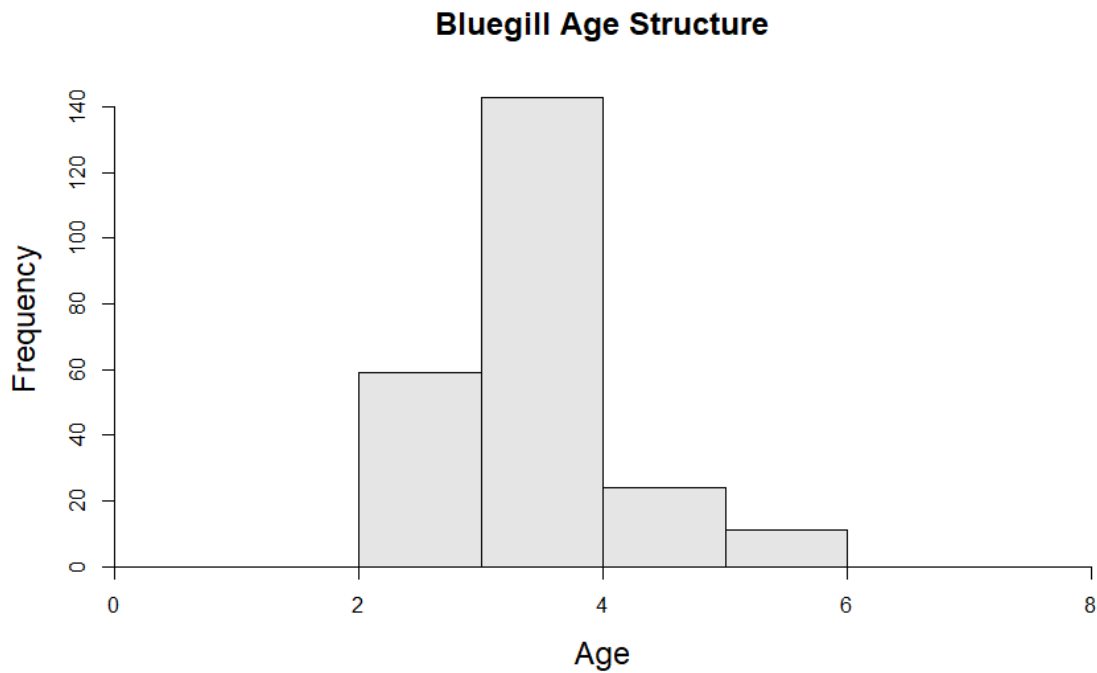


Figure 17. Age structure of Bluegill collected during spring sampling in Blackhawk Lake. Lengths from aged fish were extrapolated and applied to unaged fish using age-length keys.

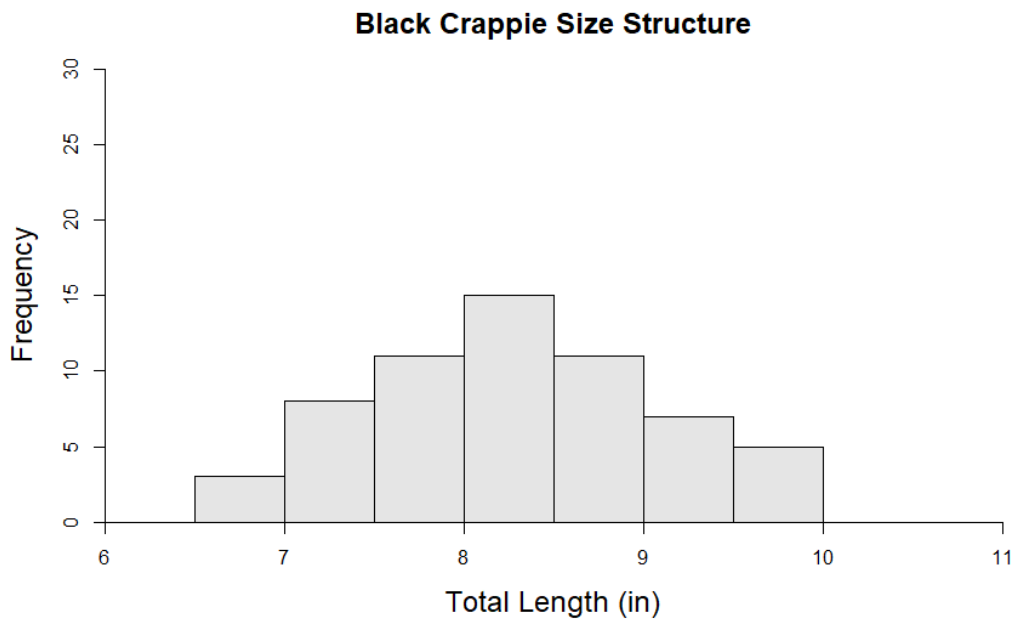


Figure 15. Black Crappie size structure from individual fish captured during spring electrofishing surveys.

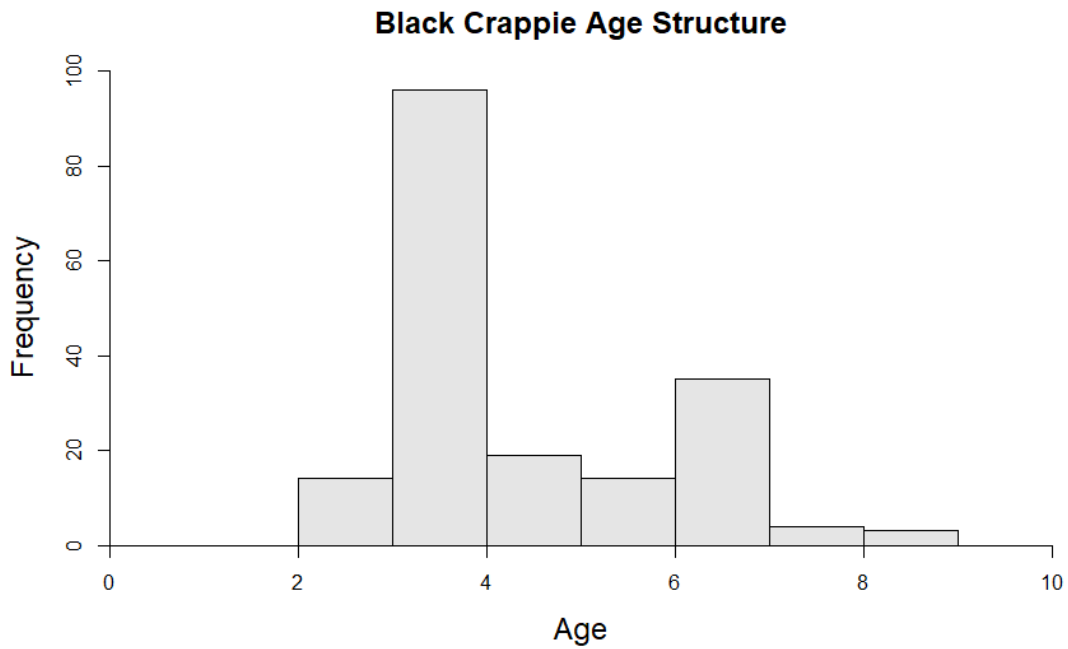


Figure 16. Age structure of Black Crappie collected during spring sampling in Blackhawk Lake. Lengths from aged fish were extrapolated and applied to unaged fish using age-length keys.

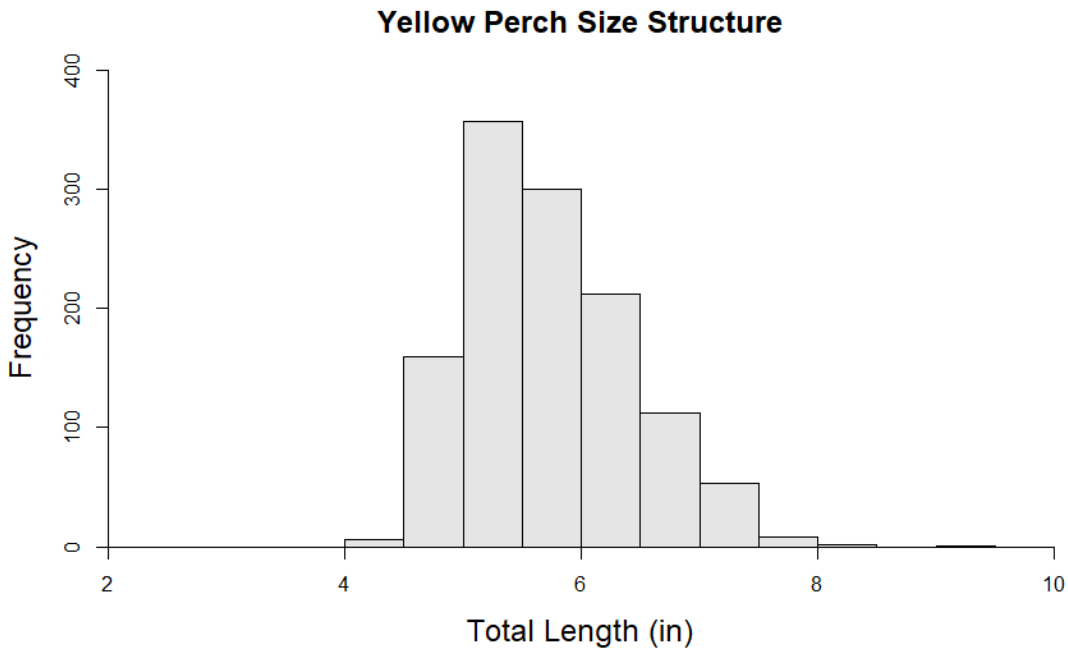


Figure 18. Yellow Perch size structure from all fish captured during spring fyke netting surveys.

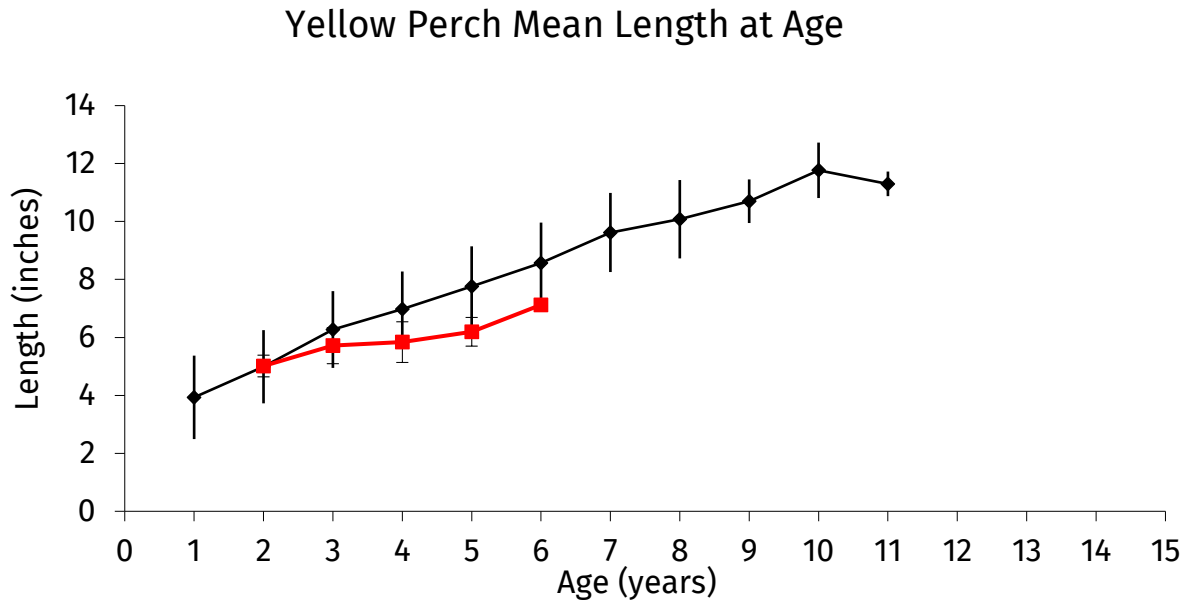


Figure 19. Yellow Perch growth rates in comparison to statewide averages. Blackhawk Lake values are shown in red (± 1 SD); statewide averages are shown in black.

Table 1. Current hook and line fishing regulations for gamefish and panfish on Blackhawk Lake.

| SPECIES | OPEN SEASON | DAILY LIMIT | MINIMUM LENGTH |
|-----------------------------|--------------------|--------------------|-----------------------|
| Largemouth Bass | May 5 - March 3 | 5 | None |
| Panfish | Open All Year | 25 | None |
| Channel Catfish | Open All Year | 10 | None |
| Northern Pike | May 5 - March 3 | 2 | 26 inches |
| Walleye, Saugers or Hybrids | May 5 - March 3 | 3 | 18 inches |

Table 2. Fish stocking records for Blackhawk Lake, Iowa County, Wisconsin since 2012.

| YEAR | SPECIES | AGE CLASS | NUMBER FISH STOCKED |
|-------------|-----------------|------------------|----------------------------|
| 2012 | Northern Pike | Large Fingerling | 425 |
| 2012 | Walleye | Large Fingerling | 2200 |
| 2013 | Walleye | Fry | 150000 |
| 2013 | Walleye | Large Fingerling | 2200 |
| 2013 | Channel Catfish | Large Fingerling | 485 |
| 2013 | Northern Pike | Large Fingerling | 348 |
| 2014 | Channel Catfish | Large Fingerling | 440 |
| 2014 | Walleye | Large Fingerling | 2200 |
| 2014 | Northern Pike | Yearling | 150 |
| 2014 | Northern Pike | Large Fingerling | 200 |
| 2014 | Northern Pike | Small Fingerling | 440 |
| 2014 | Northern Pike | Large Fingerling | 880 |
| 2015 | Channel Catfish | Large Fingerling | 440 |
| 2015 | Walleye | Large Fingerling | 2125 |
| 2016 | Northern Pike | Large Fingerling | 440 |
| 2016 | Walleye | Large Fingerling | 2200 |
| 2017 | Northern Pike | Large Fingerling | 396 |
| 2017 | Walleye | Large Fingerling | 2125 |
| 2018 | Northern Pike | Large Fingerling | 440 |
| 2018 | Walleye | Large Fingerling | 2200 |
| 2019 | Northern Pike | Large Fingerling | 484 |
| 2019 | Walleye | Large Fingerling | 2125 |
| 2020 | Walleye | Large Fingerling | 2200 |
| 2020 | Walleye | Large Fingerling | 600 |
| 2021 | Northern Pike | Large Fingerling | 440 |
| 2021 | Walleye | Large Fingerling | 2328 |