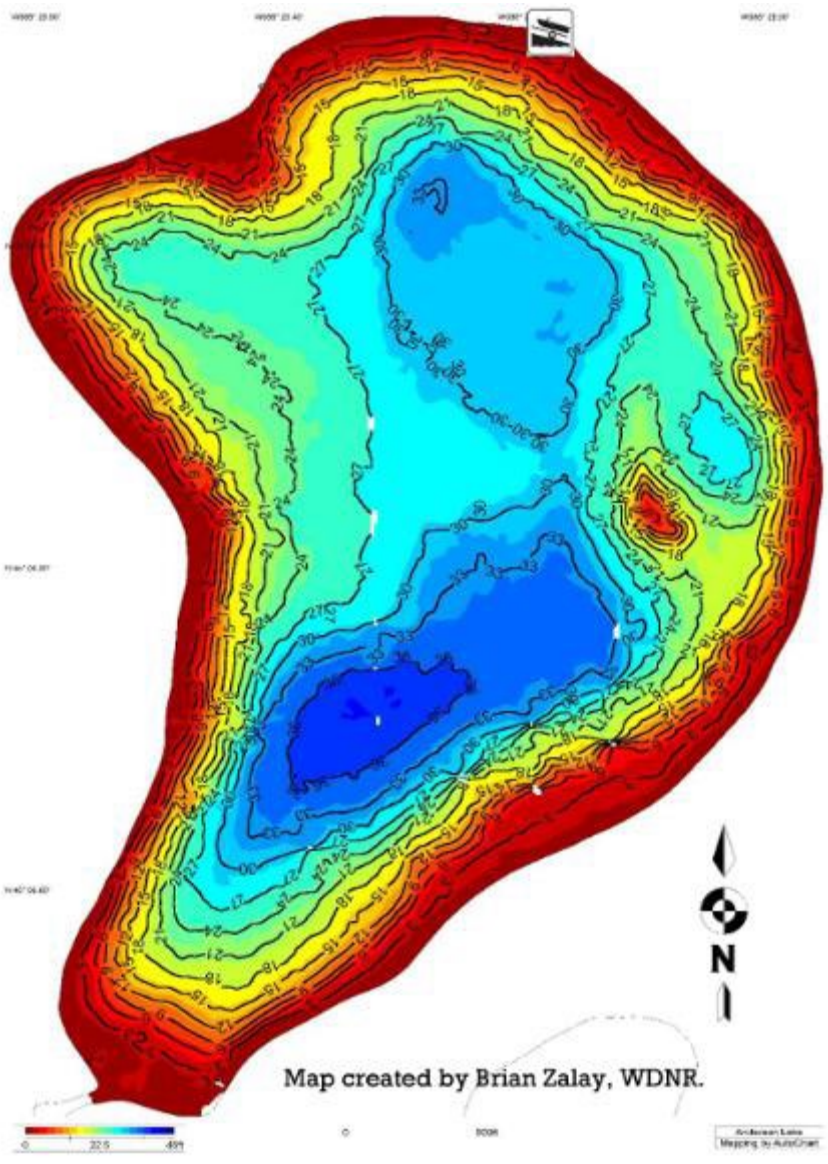
WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Anderson Lake, Oconto County Fisheries Survey Report, 2022

Waterbody Code: 458700



TAMMIE J. PAOLI
DNR FISHERIES BIOLOGIST
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Table Of Contents

Executive Summary

- Overall, 2,869 fish representing 14 species were collected during the 2022 survey. The five most abundant species collected by number were bluegill (36%), yellow bullhead (17%), pumpkinseed (11%), northern pike (11%), and black crappie (10%).

- A total of 273 black crappie were sampled. The average length was 9.2 inches with a range from 4.6 to 15.0 inches. Catch rates during the 2022 ice-out netting survey (SN1) were 1.0 crappie/net night, compared to 3.0/net night in 2012. However, catch rates for crappie during the 2022 May netting survey (SN2) were much improved, at 4.4/net night. This increase in catch is likely due to warmer water temperatures during the SN2 survey compared to the SN1 survey. A SN2 survey was not done in 2012.

- A total of 1,036 bluegill were collected. Bluegill ranged in length from 3.4 to 9.5 inches and averaged 6.6 inches. Bluegill electrofishing catch rate was 34 per mile in 2022 compared to 20 per mile in 2012. Catch rate for bluegill during the 2022 SN2 survey was 19.1/net night.

- There was a total of 77 largemouth bass sampled. Electrofishing catch rates were improved from 8.3/mile in 2012 to 12.4/mile in 2022. Size structure improved slightly with an average length of 14.2 inches, compared to an average length of 13.7 inches in 2012. Over 90% of the adult bass captured in the 2022 electrofishing survey were greater than the 14-inch size limit.

- Anderson Lake has a high density of small northern pike with slow growth rates. There was a total of 308 northern pike sampled, including 71 recaptured fish. Average length was 17.5 inches with a range from 10.4 to 35.3 inches. The population estimate for northern pike was 389 adults (2.1 per acre), compared to 3.2 per acre in 2012. The size structure was poor with only 13% of the fish greater than 21 inches and 1% of fish greater than 28 inches.

- Anderson Lake has a low abundance population of walleye that has good size structure, but slower growth rates. A total of 115 walleye were sampled, including 40 recaptured fish, with an average length of 19.0 inches and a range from 11.5 to 27.7 inches. The population estimate for walleye was 66 adults (0.4 per acre) compared to 1 per acre in 2012. Adult size structure is excellent, with 95% of the fish greater than 15 inches and 37% greater than 20 inches. However, all of the walleye ages corresponded with even-numbered years in which walleye were stocked. This, along with a lack of young-of-year in eight years of fall walleye recruitment surveys, indicates lack of natural recruitment.

- A total of 4 muskellunge were captured in the 2022 survey. Only one of the muskellunge captured was greater than 30 inches. Two of the four fish captured had PIT tags indicating they were from prior stockings.

Introduction

Anderson Lake is a medium hard water drainage lake with an area of 182 acres and a maximum depth of 40 feet. The littoral area on the eastern half of the lake is primarily hard sand while muck is the predominant bottom type on the western half of the lake. It is classified as a complex, warm, clear lake. As a local comparison, this is the same classification as Kelly and Waubee Lakes in Oconto County. A dam owned by Oconto County at the outlet adjacent to the boat landing raises the lake level about two feet. The water level is sometimes drawn down about one foot in the fall, with the intent to prevent ice damage to property. Weso Creek is the inlet to the lake along the south shore. There is one public boat landing owned and maintained by Oconto County on the north shore with limited parking for 1-3 vehicles. About one-quarter of the shoreline is owned by Oconto County and is undeveloped wetlands. The remainder of the shoreline is developed as homes and seasonal cottages. A total of 66 piers were counted on a 2017 aerial photo. The Anderson Lake Association is a non-governmental group that is active in the lake community. In 2023, the Anderson Lake District was formed. A lake district has the ability to tax property within the district and it is a governmental body with statutory responsibilities under Ch. 33 of Wisconsin Statutes.

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, UW - 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 Anderson Lake Management Plan was completed in 2020[1].

Banded mystery snail, Chinese mystery snail, rusty crayfish, and Eurasian watermilfoil (EWM) are known aquatic invasive species present in Anderson Lake. EWM was first found in the lake in 2015. Diver assisted suction harvesting (DASH) was completed in 2019 but EWM continued to trend higher. The Anderson Lake Association has received grant funding for management of that invasive species and is working with a consultant, Onterra. In 2021, pre-treatment monitoring plant surveys were completed. In summer of 2022, a whole-lake herbicide treatment occurred, along with monitoring. In 2023, post-treatment EWM monitoring was completed by Onterra. In that survey, a few occurrences of EWM were detected. Onterra recommends continued monitoring and manual removal to slow the rebound of EWM in the coming years.

[1] https://www.co.oconto.wi.us/754/Individual-County-Lake-Summary-Reports-S

Various habitat projects were completed on Anderson Lake through the years. A fish stick project was completed in 2009, when 18 northern pin oaks (35 to 50' length) with a diameter of 12-16 inches were anchored along the shoreline. Trees were clustered into bundles of two, and the majority of trees were placed along the west shore on county land. As of 2022, a few of those fish sticks were still intact, but many were gone or broken off and likely pulled out by ice. In 1987, an 80' x 90' walleye spawning reef was created and consisted of a one foot thick layer of four inch rock placed along the east shore. In 2001, the Breed Sportsman's Club constructed a rock reef on Weso Creek near the Weso Creek Road crossing. It is unlikely that walleye are successfully using these areas for spawning. Fall walleye recruitment surveys were completed for eight years from 2014 to 2021 and no young-of-year walleye were documented.

Current fishing regulations follow the general inland regulations with the exception of the muskellunge minimum length (50 inches). That special regulation was enacted in 2012 to protect mature females since Anderson Lake is a Great Lakes spotted muskellunge brood source lake. In order to establish inland brood populations of Great Lakes spotted muskellunge, three inland lakes (Anderson Lake and Archibald Lakes in Oconto County; Big Elkhart Lake in Sheboygan County) were identified as potential brood lakes and stocked with muskellunge beginning in 2009. The long-term goal was to provide a viral hemorrhagic septicemia (VHS)-free source of eggs and provide genetic diversity to the Green Bay musky restoration project. A total of 2,025 musky were stocked in Anderson Lake from 2009 to 2020 (Table 1).

Walleye have been stocked in the lake by private or state hatcheries from 1989 to the time of writing. Beginning in 2014, Anderson Lake became part of the Wisconsin Walleye Initiative. Subsequently, Anderson Lake was selected as a "sentinel", or study lake, which received 20 large fingerling walleye per acre every other year beginning in 2014 (Table 1). Twenty per acre is the highest stocking rate that could be prescribed to lakes as part of the Walleye Initiative, with other stocking rates being 5, 10, or 15 per acre. Being a sentinel lake, annual fall electrofishing surveys were conducted from 2014 to 2021. These surveys were completed prior to stocking during even years, and in September or October in odd years when no walleye were stocked. The objective of the fall surveys was to document any natural reproduction of walleye.

The last comprehensive survey (Spring Netting 1 and Spring Electrofishing II) was conducted in 2012[2].

[2] Paoli, T.J. 2013. Anderson Lake, Oconto County Wisconsin Fisheries Survey Report, 2012. Wisconsin Dept. Natural Resources. https://p.widencdn.net/6xzqyk/Reports_2012AndersonLakeOcontoFishSurvey

Methods

There were two fyke netting periods for the 2022 survey: Spring Netting I (SN1) which targets spawning northern pike and walleye from ice out up to 50F, and Spring Netting II (SN2) which targets spawning muskellunge at water temperatures from 50-55F.

For the Spring Netting I survey, eight 3' x 6' hoop fyke nets with ¾" bar, 1.5" stretch mesh were set as soon as ice conditions allowed on April 21, 2022 (Figure 1). Nets were lifted daily through April 28, 2022, with the exception of April 24 when high winds did not allow for safe working conditions and nets remained tied closed. The total effort was 56 net nights. Water temperature ranged from 43-46F. All fish captured were identified to species and measured to the nearest 0.1 inch. All gamefish were given a top caudal fin clip (for mark recapture population estimate). A pelvic fin ray (northern pike)[3], dorsal spine (walleye, largemouth bass, black crappie >6 inches), anal spine (yellow perch) or scales (black crappie <6 inches) were collected from 5 fish per 0.5 inch group. For walleye and northern pike, aging structures were collected from 5 fish per 0.5 inch group per sex. Otoliths were collected from 10 bluegill in the 6-inch length bin and sex was determined at the time of otolith removal per protocols for bluegill[4]. An additional 250 lengths measured to the nearest 0.1 inch were collected for each species and all additional fish were counted.

For the Spring Netting II musky-focused survey, eight standard 3' x 6' hoop fyke nets with ¾" bar, 1.5" stretch mesh were set on May 5, 2022. One net had extensive damage from muskrats on May 6, so that net location was not set back since there was not another net with a long 100ft lead available. The remaining seven nets were fished until May 12, 2022. The total effort was 49 net nights. Water temperature ranged from 54-67F and coincided with unusually warm (80F) air temperatures in early May.

A DNR standard direct current double anode electrofishing boat was used to sample the entire shoreline (2.17 miles) on the evenings of April 28 and May 17, 2022. Only walleye were collected on April 28 (Spring Electrofishing I; SE1) per protocol. On May 17, all panfish and gamefish were collected for a 0.5 mile transect, and only gamefish were collected for the remaining 1.67 miles of shoreline per protocol (Spring Electrofishing II; SE2). Fish collected were measured to the nearest 0.1 inch, and inspected for a top caudal fin clip. Aging structures were collected during electrofishing surveys if a length bin was not filled for that species. Length frequency results include fish measured during both netting surveys and the spring

[3] Dembkowski, D. et al. 2020. Sampling Protocols for Estimation of Age-Based Northern Pike Population Metrics in Wisconsin. Wisconsin DNR Fish Age Task Group, unpublished.
[4] Isermann, D., et al. 2020. Sampling Protocols for Estimation of Age-Based Bluegill Population Metrics in Wisconsin. Wisconsin DNR Fish Age Task Group, unpublished.

electrofishing survey. 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.

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, within the 0.5 inch length bins. The Peterson population estimation technique was used for walleye and was calculated using fish captured in fyke nets and the SE1 survey.

Results

BLACK CRAPPIE

A total of 273 black crappie were sampled. The average length was 9.2 inches with a range from 4.6 to 15.0 inches. The catch rate was 1.0 per net night for SN1 and 4.4 per net night for SN2 (Table 3). No black crappie were captured during the SE2 survey. The 2022 catch rates for black crappie in the SN1 and SE2 surveys are lower compared to the 2012 survey (3.0 per net night and 8 per mile, respectively). In contrast, higher numbers of black crappie were captured in the May 2022 SN2 survey (4.4 per net night) which occurs during warmer water temperatures. Catch rates suggest that black crappie populations are relatively stable. An SN2 survey was not conducted in 2012 because there were only a few years of musky stocking prior to that. The length frequency distribution indicated a strong mode of fish around 8.5-9.5 inches (Figure 2). Because of this strong cohort of similarly sized fish, 86% of fish were greater than 8 inches (PSD), and 25% of the fish were greater than 10 inches. Growth rates for black crappie from the 2022 survey were above both the northeast Wisconsin average and above the 2012 survey growth rates (Figure 3). The largest black crappie (15.0 inches) was aged at 14 years old.

BLUEGILL

A total of 1036 bluegill were sampled. The average length was 6.6 inches with a range from 3.4 to 9.5 inches (Table 2). The PSD value for bluegill was 77. The catch rate was 1.5 per net night for SN1 and 19.1 per net night for SN2. Electrofishing catch rate (SE2) was 34 bluegill per mile in 2022 compared to 20 per mile in 2012. The electrofishing catch rate remains below the 25th percentile compared to other complex, warm, clear lakes in Wisconsin. The length frequency of bluegill exhibits recruitment of multiple year classes, with 6-7 inch fish being the most abundant (Figure 4). Mean age of 6-6.9 inch female bluegill (n=6) was 5.0 years. This is at the 50th percentile and indicates average growth rates for Wisconsin lakes. Mean age of 6-6.9 inch male bluegill (n=4) was 4.25 years. This is between the 66-75th percentile and indicates moderate growth rates compared to the statewide average.

OTHER PANFISH SPECIES

Pumpkinseed sunfish were the second most abundant panfish species, with a total of 324 sampled. Size structure is good, with an average length of 5.7 inches. Rock bass are also common in the lake, averaging 7.1 inches but some rock bass over 10 inches were sampled. Yellow perch continue to be present in the lake but at low abundances, with a total of 15 sampled. Green sunfish and bluegill hybrids are also present (Table 2).

LARGEMOUTH BASS

There were a total of 77 largemouth bass sampled. The catch rate was 0.7 per net night for SN1 (Table 3) and was similar to the 2001 and 2012 SN1 surveys (0.5 and 0.7 per net night, respectively). Electrofishing catch rate (SE2) was 12.4 per mile (Table 3), up from 6.5 per mile in 2012, but density is still below the 25th percentile compared to other complex, warm, clear lakes in Wisconsin. The population estimate for largemouth bass was 263 (1.4 per acre). Average length has improved from 13.7 inches in 2012 to 14.2 inches in 2022. Size ranged from 5.6 to 18.4 inches (Table 2). The size structure was excellent with 70% of the fish being 14 inches or greater (legal size). PSD for largemouth bass was 90. Overall size structure of largemouth bass has improved since the 2012 surveys (Figure 5). There appears to be steady recruitment with ten year classes identified. Growth rates for bass age 6 and older in the 2022 survey were below both the northeast Wisconsin average and the 2012 survey (Figure 6).

NORTHERN PIKE

There were a total of 308 northern pike sampled by all gears (this includes 71 recaptured individuals). The catch rate was 4.7 per net night for SN1 in 2022 (Table 3) compared to 3.5 per net night for SN1 in 2012. The population estimate for northern pike was 389 adults (2.1 per acre), compared to 3.2 per acre in 2012. Density is well above the 75th percentile compared to other complex, warm, clear lakes in Wisconsin. Average length was 17.5 inches with a range from 10.4 to 35.3 inches (Table 2). The size structure was poor with only 13% of the fish greater than 21 inches and 1% of fish greater than 28 inches. PSD for northern pike was 14. Poor size structure was also noted in the 2012 and 2001 surveys. The 2022 length distribution was very similar compared to 2012 (Figure 7). Mean age of 18-18.9 inch female northern pike (n=5) was 4.0 years. This is between the 10-25th percentile and indicates slow growth rates. Mean age of 18-18.9 inch male northern pike (n=4) was 5.0 years. This is at the 10th percentile and indicates slow growth rates. Age frequency distribution is dominated slow-growing age 4 and 5 fish, and very few older fish. Growth rates are below both the northeast Wisconsin averages and below the 2012 growth rates (Figure 8), which may be a result of the high population density. It should be noted that scales were used to calculate the northeast Wisconsin averages and the 2012 survey data while pelvic fin rays were used for the 2022 survey. Accuracy of age interpretation is somewhat higher with fin rays, particularly for older pike.

WALLEYE

A total of 115 walleye were sampled (this includes 51 recaptured individuals). The catch rate was 1.6 per net night for SN1 in 2022 (Table 3) compared to 1.8 per net night in 2012. The population estimate for walleye was 66 adults (0.4 per acre) compared to 1 per acre in 2012. Density is between the 25th and 50th percentile compared to other complex, warm, clear lakes in Wisconsin. Average length was 19.0 inches with a range from 8.0 to 27.7 inches (Table 2). Adult size structure is excellent, with 95% of the fish greater than 15 inches and 37% greater than 20 inches (Figure 9), but only four fish under 15 inches were captured which suggests lack of recruitment by stocked or naturally reproduced walleye in recent years. PSD for walleye was 92, primarily due to the lack of smaller fish. All of the walleye ages corresponded with even-numbered years in which walleye were stocked. This, along with a lack of young-of-year in eight years of fall walleye recruitment surveys, suggests lack of natural recruitment. Growth rates for walleye ages 6 through 16 lag below northeast Wisconsin averages (Figure 10).

MUSKELLUNGE

Four muskellunge were captured. Two of the fish (19.0 and 20.8 inches) were stocked as 17.8 inch yearlings in 2020 as indicated by internal PIT tags and right ventral fin clips given to all Great Lakes spotted muskellunge prior to stocking. Two of the muskellunge did not have PIT tags or fin clips. These fish (14.6 and 31.5 inches, respectively) did not have the typical appearance of Great Lakes spotted muskellunge. The 14.6 inch musky was estimated at age 2, while the 31.5 inch fish was estimated at age 7. See appendix for photos.

OTHER SPECIES

Yellow bullheads were the second-most abundant fish species captured, comprising 17% of the total catch by all gear types. Common carp continue to be present in the lake but at a low abundance.

Figure 1. Locations of fyke nets during SN1 (April 21-28, 2022) and SN2 (May 5-12, 2022) netting surveys on Anderson Lake, Oconto County. Note that Net 6 was not fished during the SN2 survey due to extensive muskrat damage.

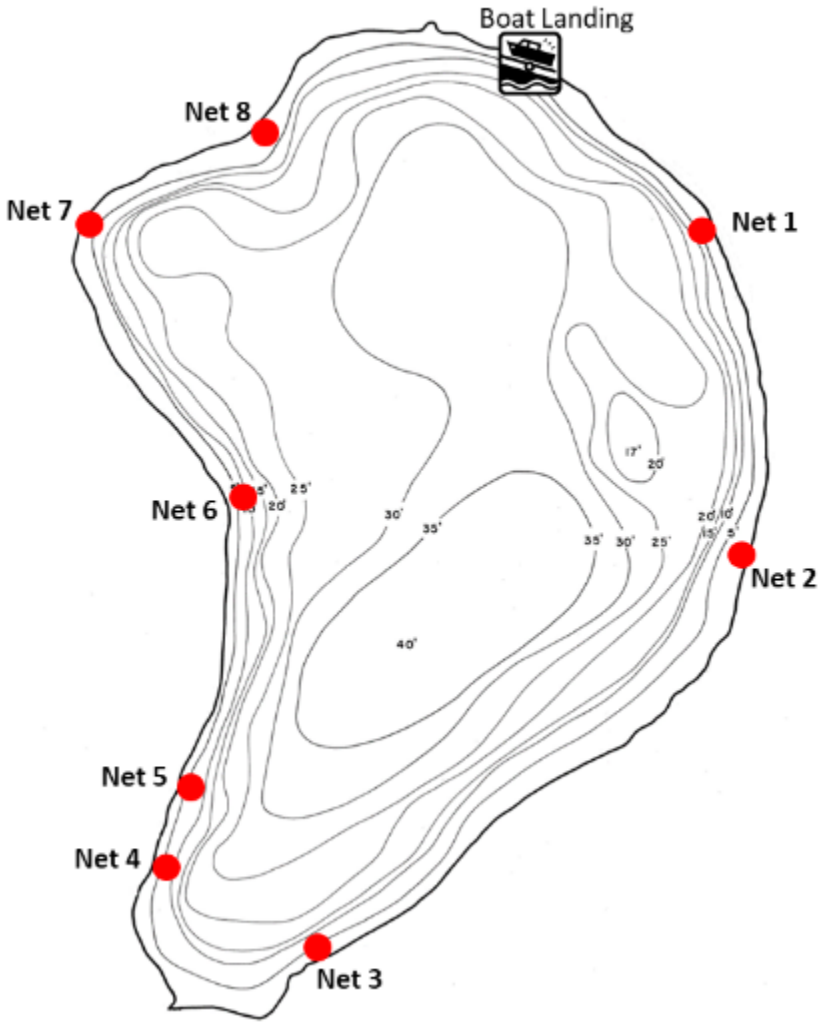

Figure 2. Black crappie length frequency distribution from Anderson Lake in 2022 and 2012 captured during SN1, SN2, and SE2 surveys.

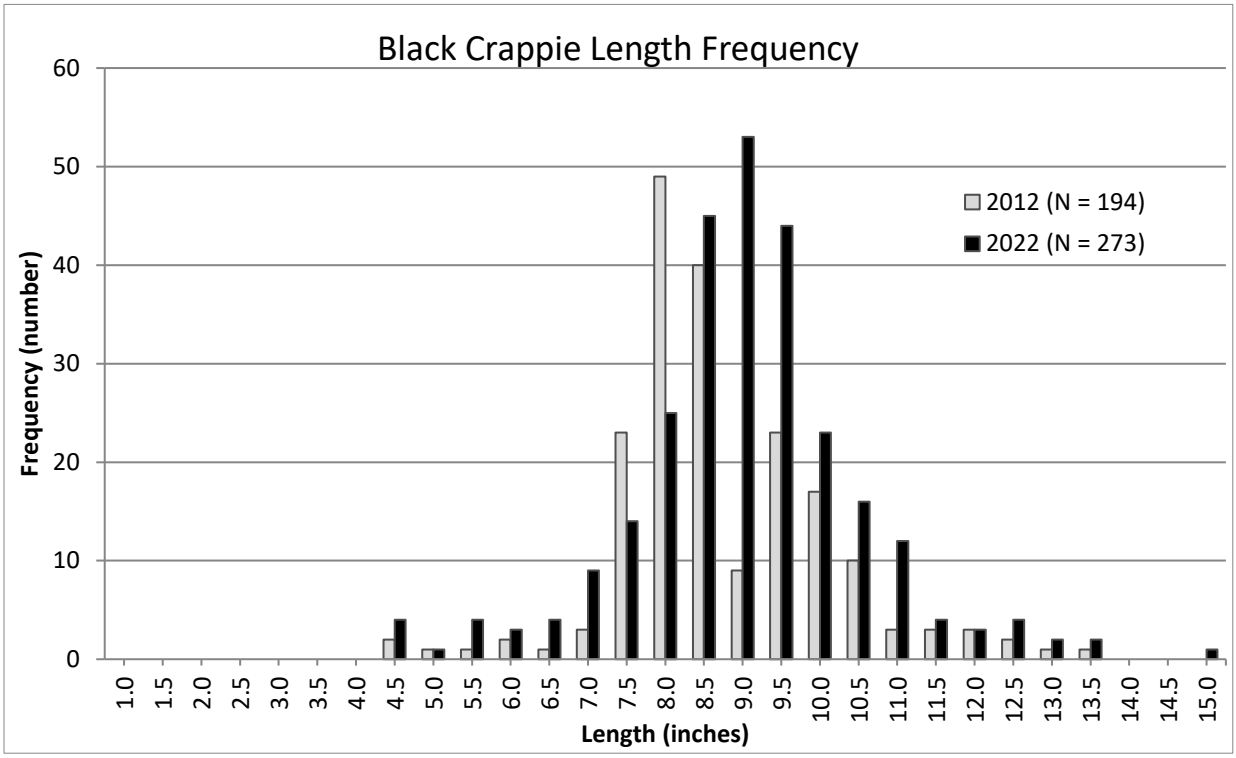

Figure 3. Black crappie mean length at age, Anderson Lake, 2022 and 2012, compared to northeast Wisconsin (NER) averages.

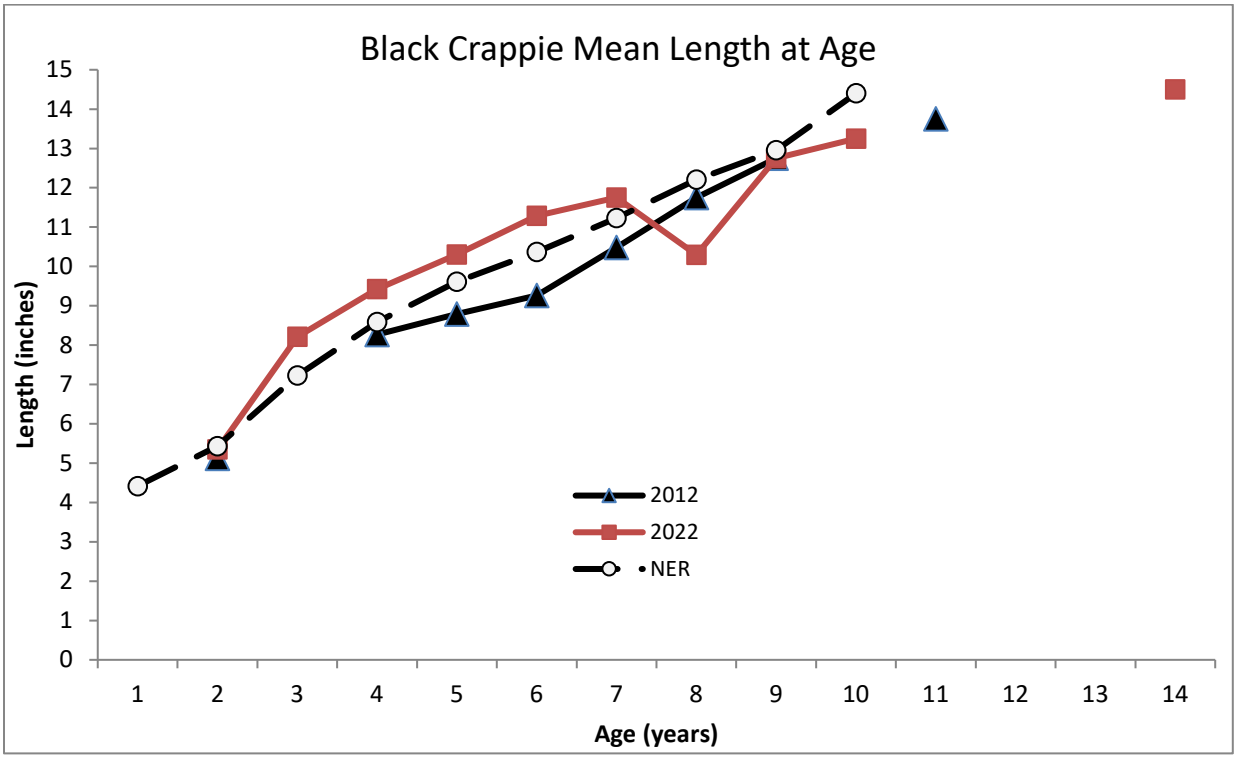

Figure 4. Bluegill length frequency distribution from Anderson Lake in 2022 and 2012 captured during SN1, SN2, and SE2 surveys.

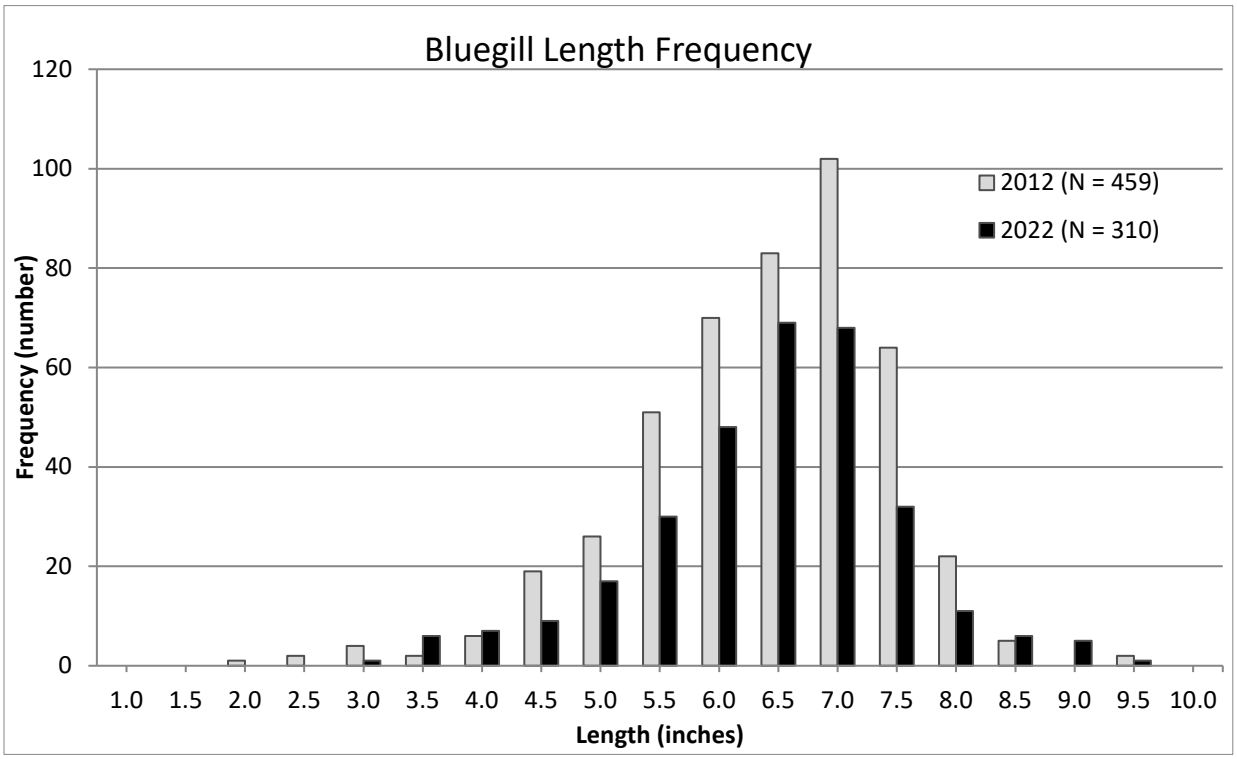

Figure 5. Largemouth bass length frequency distribution from Anderson Lake in 2022 and 2012 captured during SN1, SN2, and SE2 surveys.

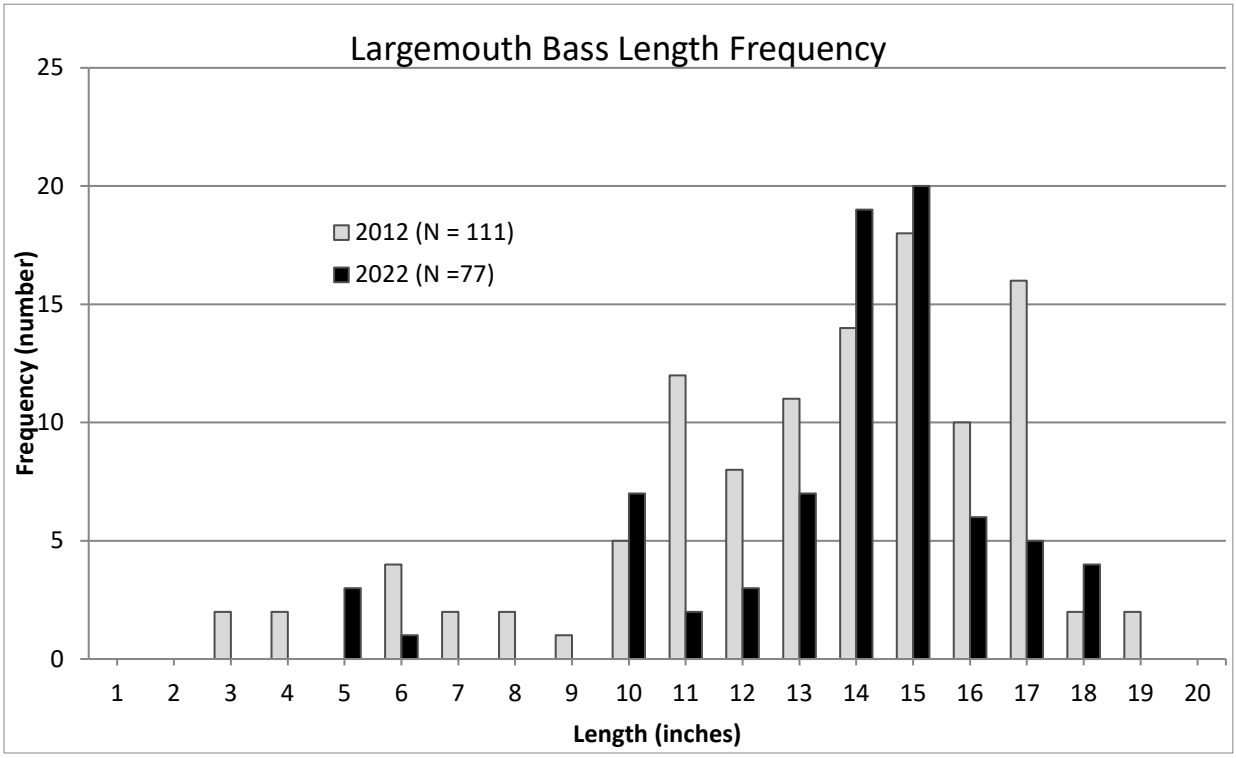

Figure 6. Largemouth bass mean length at age, Anderson Lake, 2022 and 2012, compared to northeast Wisconsin (NER) averages.

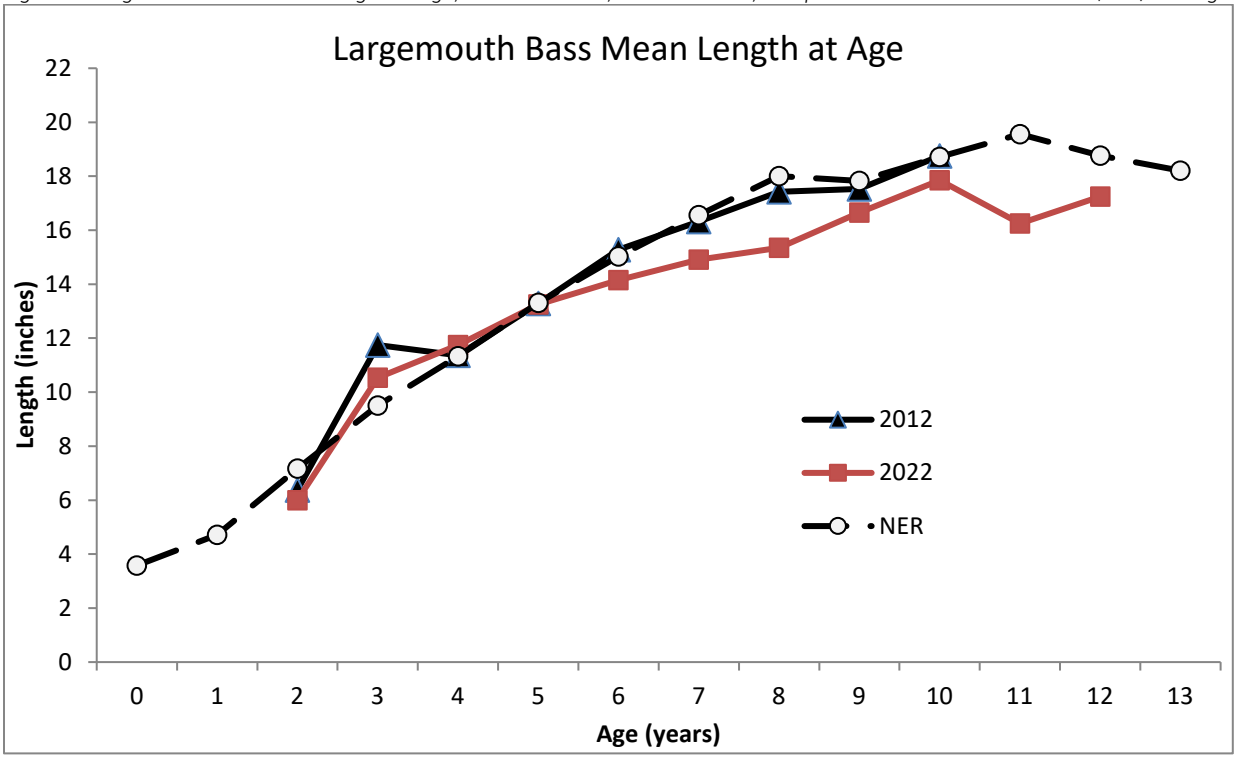

Figure 7. Northern pike length frequency distribution from Anderson Lake in 2022 and 2012 captured during SN1 surveys. Recaptured fish are not included.

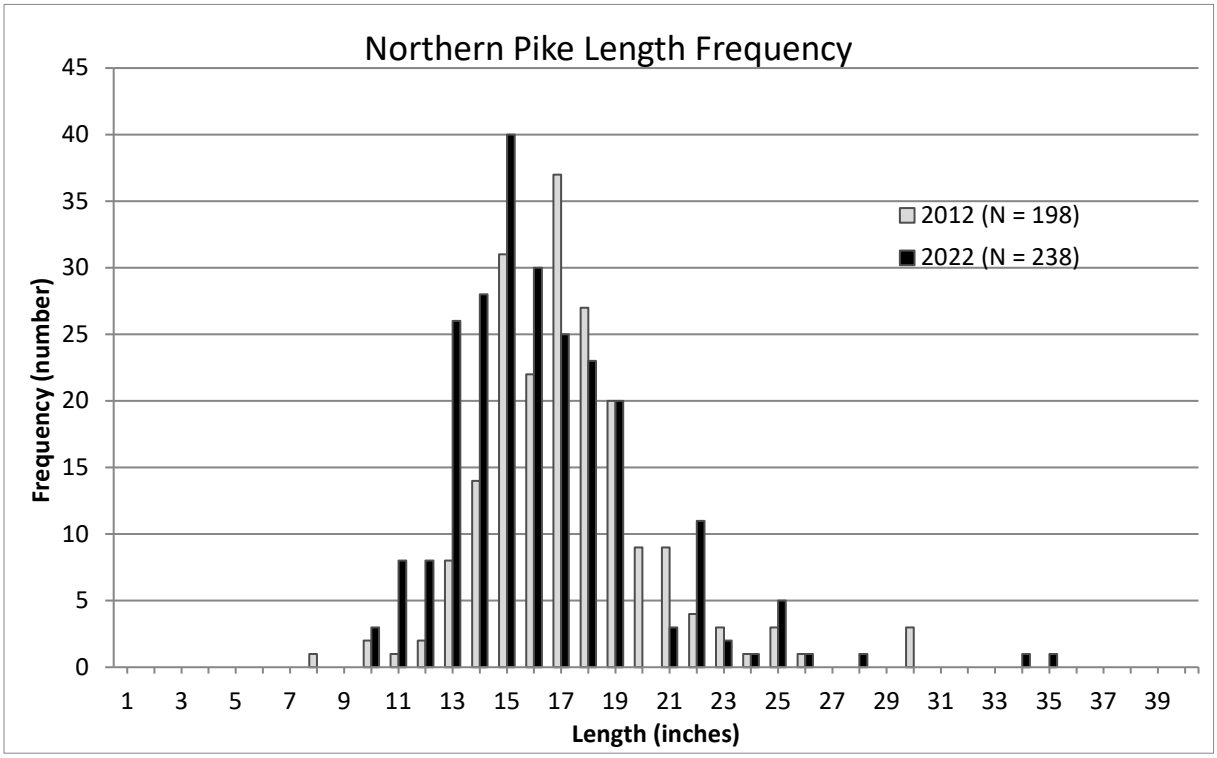

Figure 8. Northern pike mean length at age, Anderson Lake, 2022 and 2012, compared to northeast Wisconsin (NER) averages.

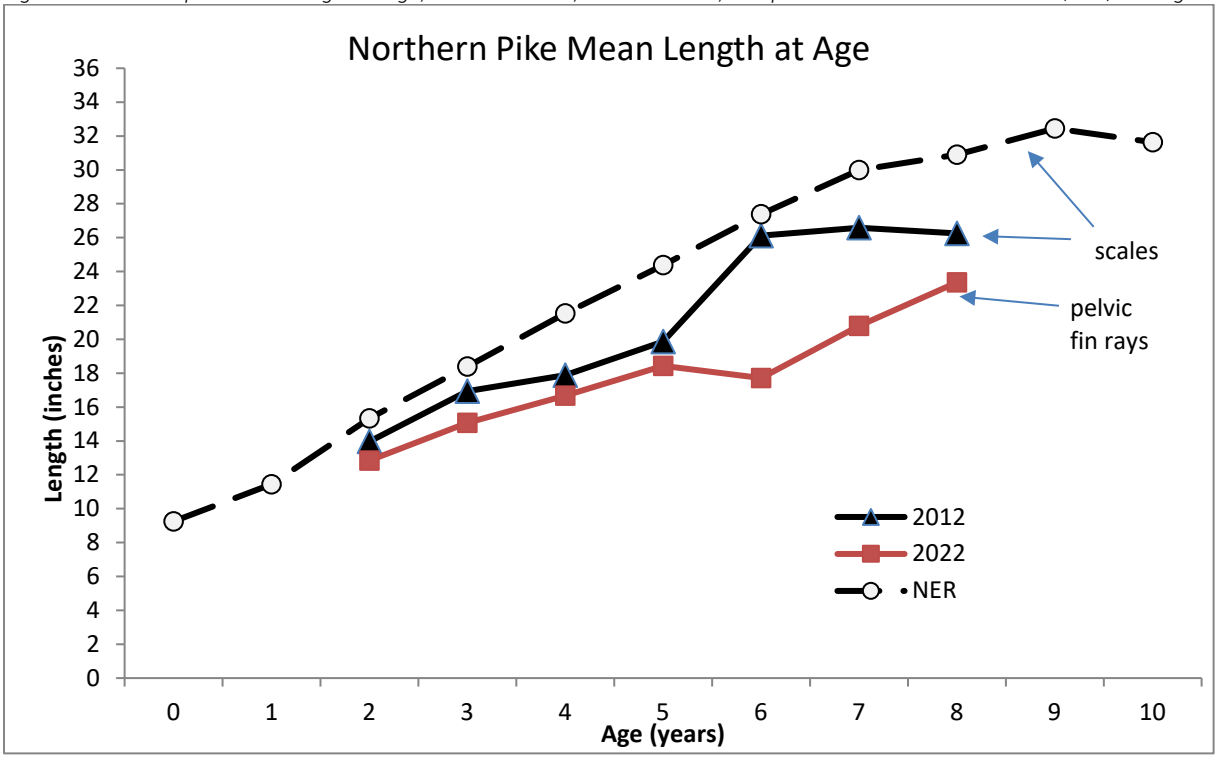

Figure 9. Walleye length frequency distribution from Anderson Lake in 2022 and 2012 captured in SN1 surveys. Recaptured fish are not included.

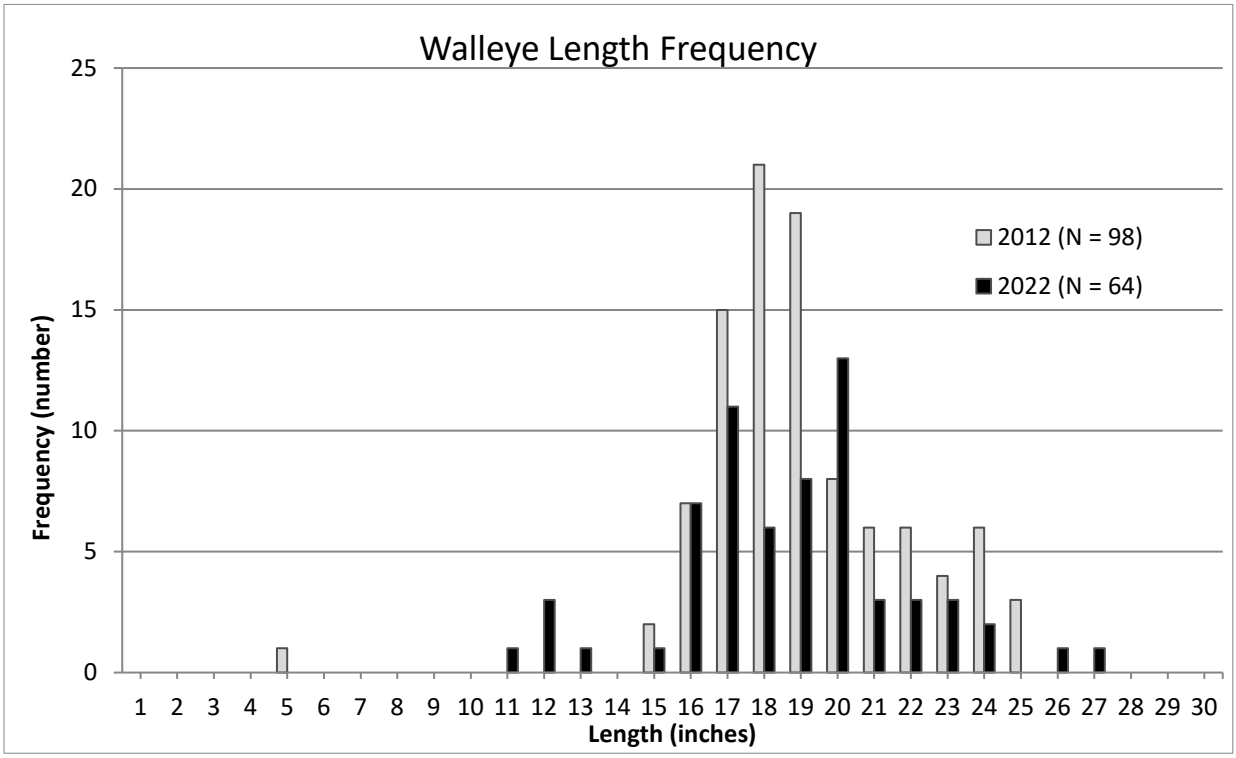

Figure 10. Walleye mean length at age, Anderson Lake, 2022 and 2012, compared to northeast Wisconsin (NER) averages.

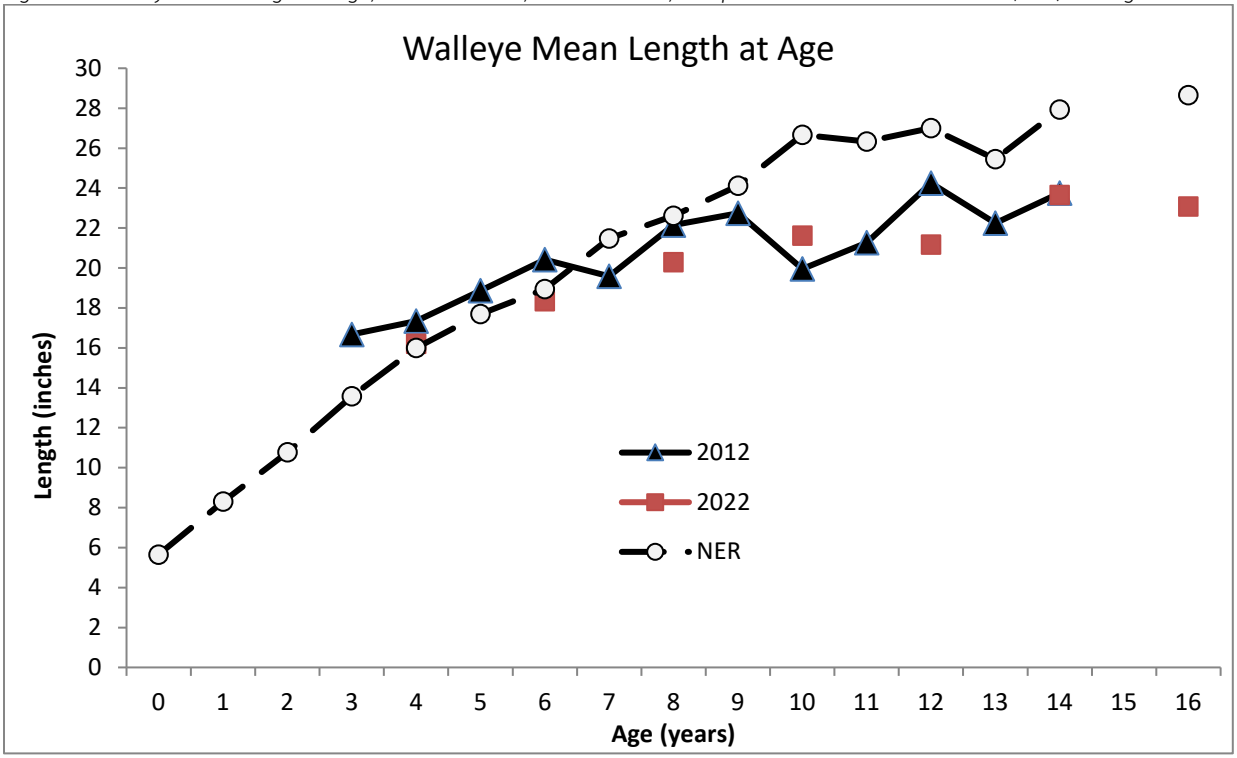

Table 1. Stocking history of Anderson Lake from 2000 to 2022.

DATE	SPECIES	AGE CLASS	NUMBER STOCKED	AVERAGE LENGTH (IN.)	SOURCE
4-Oct-2022	Walleye	Large Fingerling	3546	7.6	Chippewa Mole Lake Tribal Hatchery
29-Sep-2020	Walleye	Large Fingerling	3573	8.1	DNR Wild Rose Hatchery
26-Sep-2018	Walleye	Large Fingerling	1251	7.5	DNR Art Oehmcke Hatchery
25-Sep-2018	Walleye	Large Fingerling	2286	7.9	DNR Art Oehmcke Hatchery
29-Sep-2016	Walleye	Large Fingerling	3566	7.9	DNR Wild Rose Hatchery
17-Sep-2014	Walleye	Large Fingerling	3544	7.3	DNR Wild Rose Hatchery
11-Jun-2012	Walleye	Small Fingerling	6297	1.6	DNR Art Oehmcke Hatchery
07-Jun-2010	Walleye	Small Fingerling	6300	1.4	DNR Art Oehmcke Hatchery
26-Jun-2008	Walleye	Small Fingerling	6364	1.4	DNR Gov. Thompson Hatchery
09-Jun-2006	Walleye	Small Fingerling	6355	1.4	DNR Art Oehmcke Hatchery
08-Jul-2004	Walleye	Small Fingerling	8980	2.0	DNR Gov. Thompson Hatchery
13-Jun-2000	Walleye	Small Fingerling	9000	1.7	DNR Art Oehmcke Hatchery
08-Sep-2020	Muskellunge	Yearling	364	16.4	DNR Wild Rose Hatchery
07-Aug-2019	Muskellunge	Yearling	181	14.5	DNR Wild Rose Hatchery
14-Sep-2017	Muskellunge	Yearling	300	17.0	DNR Wild Rose Hatchery
03-Aug-2016	Muskellunge	Fall Yearling	200	13.9	DNR Wild Rose Hatchery
28-Jul-2015	Muskellunge	Fall Yearling	532	13.6	DNR Wild Rose Hatchery
13-Aug-2013	Muskellunge	Fall Yearling	135	13.3	DNR Wild Rose Hatchery

29-Jun-2010	Muskellunge	Yearling	56	10.8	DNR Westfield Hatchery
09-Apr-2009	Muskellunge	Yearling	257	9.0	Flemming College, Ontario

Table 2. Species and relative abundance of fish collected by all gear types in Anderson Lake, 2022.

SPECIES	NUMBER	PERCENT	AVERAGE LENGTH (IN.)	LENGTH RANGE (IN.)
Black Crappie	273	9.5%	9.2	4.6 - 15.0
Bluegill	1036	36.1%	6.6	3.4 - 9.5
Bluegill Hybrid	1	0.0%	7.8	
Common Carp	4	0.1%		
Green Sunfish	4	0.1%	5.1	4.4 - 5.7
Largemouth Bass	77	2.7%	14.2	5.6 - 18.4
Muskellunge	4	0.1%	21.5	14.6 - 31.5
Northern Pike	308	10.7%	17.5	10.4 - 35.3
Pumpkinseed	324	11.3%	5.7	3.4 - 8.1
Rock Bass	196	6.8%	7.1	4.0 - 10.5
Walleye	115	4.0%	19.0	11.5 - 27.7
White Sucker	29	1.0%		
Yellow Bullhead	483	16.8%		
Yellow Perch	15	0.5%	6.3	2.8 - 9.2
Total	2,869	100.0%		

Table 3. Catch summary for fyke netting (catch per net night) and electrofishing (catch per mile) samples from Anderson Lake, 2022. Totals include recaptured individuals. CPE is catch per net night. See Methods for additional sampling details.

SPECIES	SN1 NETTING		SN2 NETTING		SE1 ELECTROFISHING		SE2 ELECTROFISHING		TOTAL
	Total	CPE	Total	CPE	Total	CPE	Total	CPE	
Black Crappie	56	1.0	217	4.4					273
Bluegill	85	1.5	934	19.1			17	34.0	1036
Bluegill Hybrid	1	0.0							1
Common Carp	4	0.1							4
Green Sunfish			4	0.1					4
Largemouth Bass	27	0.5	23	0.5			27	12.4	77
Muskellunge	2	0.04	2	0.04					4
Northern Pike	262	4.7	39	0.8			7	3.2	308
Pumpkinseed	18	0.3	296	6.0			10	20.0	324
Rock Bass	52	0.9	144	2.9					196
Walleye	89	1.6	11	0.2	6	2.8	9	4.1	115
White Sucker	23	0.4	5	0.1			1	2.0	29
Yellow Bullhead	215	3.8	267	5.4			1	2.0	483
Yellow Perch	4	0.1	7	0.1			4	8.0	15
Total	838		1,949		6		76		2,869

Discussion

Anderson Lake supports a good overall fishery for bass and panfish. Management of the lake should focus on maintaining the quality fishing opportunities present for those species. Public access is adequate for the size and fishing pressure of the lake, with one boat ramp. There is a moderate amount of developed shoreline but large tracts of private and county land also exist on the lake, primarily on the west and south sides.

Bluegill, black crappie, and largemouth bass populations are at low to moderate density but with good size structure. Growth rates for largemouth bass are at or slightly below regional averages. Currently, growth rates for panfish are at or slightly above regional averages which may be related to lower density. Due to the large littoral zone in Anderson Lake, the recent establishment of invasive Eurasian watermilfoil may affect the fish community in the coming years. In lakes where EWM is well established, sometimes panfish abundance increases and size structure and growth rates decrease. Stunted populations of panfish are more common in lakes with abundant vegetation, presumably because panfish are better able to hide from predators in the dense cover. Although EWM was documented in 2015, densities of EWM expanded noticeably between 2019 and 2021[5]. Therefore, any impacts to fish populations and size structure as a result of EWM may not yet be measurable in the 2022 fish survey.

Walleye small fingerlings have been stocked by DNR approximately every other year at a rate of 35 to 50 per acre from prior to 1988 until 2012 (see Table 1 for stocking after 2000). Beginning in 2014, the switch from small to large fingerling walleye stocked every other year occurred at a rate of 20 per acre. That is the highest stocking rate available for large fingerling walleye as part of the Wisconsin Walleye Initiative. In the 1980s and 1990s there was also occasional private and DNR walleye stocking. The 2022 age frequency distribution of walleye shows representation solely of even-numbered ages 4 through 16, coinciding with years in which stocking occurred. The 2022 population estimate of walleye (0.4 per acre) actually decreased since the 2012 survey (1 per acre) despite the change from small to large fingerling walleye beginning in 2014. This, along with a lack of evidence of natural reproduction of walleye after fall electrofishing surveys completed from 2014 to 2021, suggests that despite consistent and high stocking rates, walleye survival is low. It is also possible that stocked fish may by leaving Anderson Lake through the outlet. Management and stocking efforts have failed to increase the adult population and provide a suitable fishery.

A Spring Netting II survey (SN2) targeting muskellunge was conducted in May 2017 as an early glimpse of abundance of stocked musky[6]. The objective of that survey was to

[5] 2021. Onterra. EWM control strategy development report to Anderson Lake Association, Inc.
[6] 2017 Anderson Handout. Unpublished report in WDNR (Peshtigo Office) files for Anderson Lake.

capture musky, measure growth, and determine which areas of the lake they may be utilizing. Unfortunately, we captured zero muskies in 63 net nights in 2017. The first Great Lakes Spotted muskies stocked in 2009 would have been 9 years old during that survey. After the 2017 survey, a decision was made to continue stocking musky and re-evaluate in several years after the 2022 comprehensive survey was completed.

Although two juvenile (stocked in 2020) Great Lakes spotted muskellunge were captured during the survey, no marked or tagged (i.e. known strain) adult Great Lakes spotted muskellunge were captured in the 2022 comprehensive survey. The only adult musky captured was a 31.5 inch untagged, unclipped fish. Since that fish is not a marked, known Great Lakes spotted musky strain, it could not have been used as broodstock. A genetic sample was collected from that fish and sent to UW-Stevens Point for analysis. Genetic markers were similar to muskellunge from the Chippewa and Wisconsin River basins and did not align with the Great Lakes spotted muskellunge strain (J. Homola, pers. comm.). Therefore, it was likely a progeny from historically stocked musky in the lake.

Anglers have occasionally reported catching adult Great Lakes spotted muskellunge over the last several years, so there are undoubtedly some adult fish that exist in the lake. However, after stocking musky since 2009 and capturing zero known adult Great Lakes spotted musky in 2017 and 2022, survival of stocked fish appears to be limited. It is also possible that stocked fish may by leaving Anderson Lake through the outlet. Therefore, it is unlikely that Anderson Lake would be able to support a sizeable Great Lakes musky population to properly designate it as a brood source lake. An ideal brood source lake would need a higher density of adults where gametes could readily be collected for propagation when nets are set on an annual basis.

The next comprehensive survey of Anderson Lake is planned for 2032.

Recommendations

1. Discontinue stocking walleye in Anderson Lake. After regular DNR stocking for over 30 years, along with occasional stocking by the lake association and DNR prior to 2000, walleye population estimates continue to be very low (0.4/acre in 2022). Although stocking may provide a minor fishery, it does not appear that Anderson Lake has suitable habitat conditions to maintain a fishable walleye fishery (> 1.5/acre).

2. Discontinue muskellunge stocking in Anderson Lake. Great Lakes spotted muskellunge were stocked in Anderson Lake sporadically for 13 years for the primary purpose to establish a designated brood stock lake for Great Lakes spotted muskellunge. However, surveys reveal that survival of stocked fish is likely limited and the density of adult Great Lakes spotted muskellunge has

not reached high enough levels for Anderson Lake to meet gamete collection needs as a brood stock lake or provide a significant fishery.

3. Remove the special regulation of a 50-inch minimum length for muskellunge in Anderson Lake. Since the lake will no longer be a designated brood source lake, there is not a need to protect large spawning female muskellunge for egg collection over multiple years. The statewide 40-inch minimum length limit would be a suitable regulation for muskellunge in Anderson Lake.

4. Manage the lake for largemouth bass and panfish. Largemouth bass in Anderson Lake continue to provide quality fishing opportunities. It is one of a few lakes in southern Oconto County with very good size structure of largemouth bass.

Appendix-Photos

A typical catch of black crappie from the SN2 survey.
Photo credit: T. Paoli

Ronald Rhode with a 15-inch black crappie.
Photo credit: T. Paoli

A 31.5 inch muskellunge with no fin clips and no tags. Age estimated at 7 years.
Photo credit: T. Paoli

A 14.6 inch muskellunge with no fin clips and no tags. Age estimated at 2 years.
Photo credit: T. Paoli

North end of Anderson Lake, ice on April 8, 2022.
Photo credit: T. Paoli