WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fisheries Survey Report for Lake Sherwood, Adams County, Wisconsin

2021

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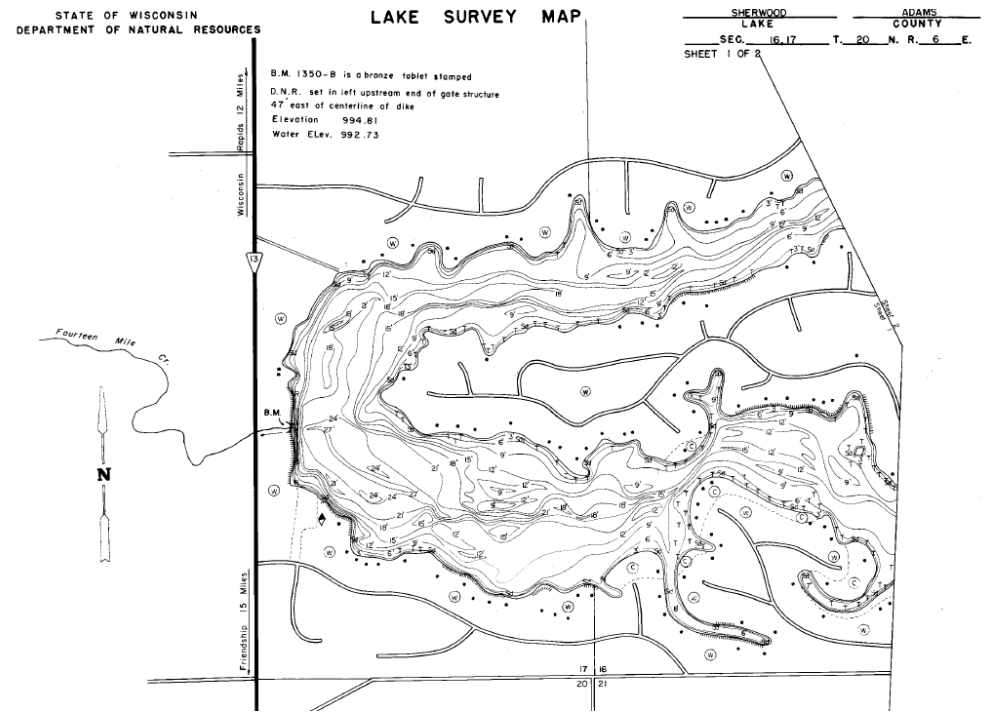

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Executive Summary

Lake Sherwood is a 216-acre reservoir in Adams County, WI and has a fishery that is comprised of largemouth bass, northern pike, walleye and panfish species. A late-spring electrofishing survey took place in 2021 to assess the largemouth bass and panfish populations and evaluate an experimental panfish regulation (25 daily, no more than 10 of any species). Bluegill relative abundance was 102 fish per mile, just below the 50th percentile. Mean length was 5.3 inches, which is the largest mean length observed from previous surveys. 32% of bluegill were 6 inches or larger and 1% were 8 inches or larger. Growth was average and body condition good. Other panfish species collected included pumpkinseed and yellow perch. Pumpkinseed relative abundance was 42 fish per mile, 33% were 6 inches or larger, growth was average and body condition good. Yellow perch relative abundance was 21 fish per mile, which was the greatest compared to past surveys. Mean size was 5.7 inches, growth was average, and body condition poor-good depending on the individual fish. Largemouth bass relative abundance was 46 fish per mile, which is between the 67th-90th percentile and is high. 71% of largemouth bass were 12 inches or larger, 7% were 15 inches or larger, and 24% were 14" or larger. Growth is little below average compared to the average bass, body condition is good. Lake Sherwood is consistently stocked with walleye by the department. Relative abundance of walleye was 7 fish per mile and sizes ranged from 8.4-18.6 inches. Walleye are assessed with early-spring electrofishing and fyke netting. To maintain or improve bluegill and panfish size structure, Lake Sherwood would be a candidate for a 10 daily aggregate panfish bag limit. To maintain or improve the size structure of largemouth bass and allow for the harvest of abundant small largemouth bass, Lake Sherwood would be a candidate for a 14-18-inch protected slot with a daily bag of 5 of which only 1 could be over 18 inches.

Introduction

Lake Sherwood is a 216-acre lake in Adams County, Wisconsin. The lake has 7.8 miles of shoreline, a maximum depth of 27 feet and an average depth of 10 feet (Figure 1). The lake is a man-made lake – a reservoir, the dam is owned by Adams County and was established in 1967.

Fish stocking of black crappie, largemouth bass, northern pike and walleye have occurred (Table 1), some private stockings but most fish, especially walleye were stocked by the department. Walleye over the years were typically 1.0-3.5 inches, but with the Wisconsin Walleye Initiative (The Wisconsin Walleye Initiative 2022) about 2,160 extended growth walleye have been stocked on odd years since 2013. Extended growth walleye are larger in average size (6.5-6.8 inches) and have a better chance of surviving. DNR fisheries staff have conducted fall electrofishing surveys to evaluate the walleye stockings, looking for any signs of natural reproduction and survival of fish stocked in previous years.

Beginning April 1, 2016 a special panfish regulation went into effect (25 panfish in total, but no more than 10 of any given species) on Lake Sherwood and other lakes too (Panfishing in Wisconsin 2022). The objective of this special fishing regulation is to improve size structure of panfish. Research has shown that the only way to improve size structure when growth is good (not stunted), especially for bluegill, is to reduce harvest as anglers selectively remove

larger sizes of panfish. Fishing regulations besides those for panfish are the general statewide regulations.

SURVEY EFFORT

Wisconsin Rapids Fisheries staff conducted a late-spring electrofishing survey in 2021 to assess the largemouth bass and panfish populations. While the survey targeted largemouth bass, all gamefish species were collected too. Past spring fisheries surveys for Lake Sherwood took place in 2000, 2002, 2005 and 2016

Methods

A DNR standard late-spring electrofishing survey took place on the nights of May 24 and 26, 2021. Water temperature was 70.3° F. Late-spring electrofishing surveys for largemouth bass and panfish take place when the fish are on their spawning beds along the shoreline. In total, 5 miles of shoreline was surveyed. Two dippers collected fish. Fish were collected for two hours and 24 minutes, this does not include processing time for measuring fish. Panfish were collected for two miles and largemouth bass and other gamefish were collected for five miles of the shoreline. Pulsed direct current was used with a pulse rate of 50%, duty cycle of 25, energy output of 200 volts and 17-17.5 Amperes.

All fish captured were measured to the nearest 0.1 inch. Aging structures were collected for bluegill, yellow perch and largemouth bass. Otoliths were used to estimate age, five bluegill and five yellow perch per half inch group were sacrificed, largemouth bass were sacrificed between 13-14.9 inches. Sacrificed fish were also weighed to the nearest 0.1 gram.

Relative abundance, size structure and growth were evaluated. Relative abundance was indexed using catch per unit of effort (CPUE) which is the number of fish captured per unit of effort (miles). For largemouth bass, CPUE is indexed for those fish equal to or greater than 8 inches and for bluegill those equal to or greater than 3 inches. These CPUE values are compared to values for lakes that are like Lake Sherwood. Proportional Stock Density (PSD) is an index used to describe size structure of fish (Neumann et al 2012). PSD is calculated by dividing the number of quality or preferred size fish by the number of stock size fish for a given species. For largemouth bass, stock size = 8 inches; quality length = 12 inches; and preferred size = 15 inches. 14 inches for largemouth bass is a common length for evaluating size structure too, Proportional Stock Density of 14-inch fish (PSD-14). Bluegill stock length = 3 inches, quality size = 6 inches, preferred size = 8 inches, and memorable size = 10 inches. Growth was evaluated by examining the age a fish was for a given length and compared to statewide growth information for that species. Relative weight was calculated for subsampled bluegill, pumpkinseed, yellow perch and largemouth bass where weights were measured. Relative weight assesses the weight of an individual fish to a standard weight of a given length for that species. If the weight of the fish divided by the weight standard is 100, then the fish is in good condition. If relative weight is below 100, problems may exist in food or feeding conditions. When values are well above 100, fish may not be making the best use of surplus prey.

Results

A total of 603 fish of seven different species were collected during the survey (Table 2). Bluegill and largemouth bass were the most caught species. Other fish species observed during the survey but not collected were indexed as present, common or abundant. Golden shiner and yellow bullhead were noted as present and white sucker was noted as common. Three common carp were counted.

BLUEGILL

During the 2021 survey, 209 bluegill were caught. The relative abundance of 3-inch and larger bluegills was 102 per mile. CPUE for 6-inch and larger bluegills was 33 per mile. Compared to past surveys, these CPUEs were the highest observed (Table 3) and is just below the 50th percentile compared to similar lakes. Bluegill ranged in length from 1.4-8.2 inches with a mean length of 5.3 inches, the most often caught bluegill was 4.6 inches. Average size is the largest observed over the years yet is not significantly different than 2016 (Table 4; Figure 2). Size structure has improved since 2016 with 32% of all bluegills caught being 6 inches or greater and 1% being 8 inches or greater (Table 4). Growth rate of bluegill is within one standard deviation of the average bluegill in Wisconsin (Figure 3) yet a bit slower than the average bluegill. Growth slows after age-6, which could be due to angler harvest. Typically, anglers harvest the faster growing and larger fish of an age class. Body condition of individual fish range from poor to excellent, yet overall average body condition was good. Average relative weight by inch group is close to 100 meaning overall good condition. Fish are growing isometric (b=3.0), where shape of the fish does not change as they grow.

LARGEMOUTH BASS

During the 2021 survey, 228 largemouth bass were caught with a CPUE of 46 per mile. The relative abundance of 8-inch and larger bass was 38 per mile. These CPUE values are the greatest observed compared to past years (Table 3). Compared to similar lakes the catch rate of 8-inch and larger bass is high and within the 67th-90th percentile, previous years catch rates were “normal” and in the 34th-66th percentile. Largemouth bass ranged in size from 6.6-17.0 inches with a mean length of 11.8 inches, the most often observed length was 13.8 inches (Table 5 and Figure 5). Average size is greater than 2016 yet is not different than 2000 and 2002. 71% of the largemouth bass caught were 12 inches and greater, which is the most observed compared to past surveys (Table 5). 7% of bass were 15 inches or greater which is more than 2016 (2%) yet less than 2000 and 2002. In 2000 and 2002, 20% and 23% of the bass were 15 inches or greater respectively. In 2021, 24% of largemouth bass were 14 inches or greater, which is greater than 2016 (8%) yet less than what was observed in 2000 and 2002 (29% and 33%; Table 5). 2000 was the only year a memorable size (20-inch) bass was caught. Mean length-at-age 7 was 14.7 inches and is within one standard deviation of the statewide average largemouth bass (Figure 5) yet a bit slower than the average largemouth bass. For warm turbid lakes, normal mean length of largemouth bass ranges from 13.8-14.6 inches at age-6. Age-6 largemouth bass were not sacrificed for otoliths in 2021. Growth tapers off below the state average after age 7. Smaller largemouth bass appear to be in better body condition than larger ones, but overall body condition is good. Bass are growing plumper with length (b=3.2).

PUMPKINSEED

Pumpkinseed were the third most numerous fish species caught (n=83) and ranged in size from 3.5-7.4 inches with a mean length of 5.7 inches (Table 2; Figure 6). PSD was 33, so 33 percent of pumpkinseed were greater than 6 inches. CPUE for 3-inch and larger pumpkinseed was 42 per mile and 14 per mile for 6 inch and larger fish. Compared to past years, pumpkinseed were found to be most numerous in 2021 (Table 3). Growth was found to be average (mean length at age-2= 3.9"; age-3 = 5.3"; age-4= 6.0"; age-5= 6.9"; age-6= 7.1"). Overall body condition was good, average relative weight was above 100 and fish were growing plumper with length (*b*=3.7).

YELLOW PERCH

Yellow perch were the fourth most caught species (n=42) with a CPUE of 21 per mile. Compared to past years, 2021 had the highest CPUE (Table 3). They ranged in length from 2.7-10.8 inches, mean length was 5.7 inches (Table 2; Figure 7). 29 yellow perch were sacrificed for otoliths to examine growth with mean length-at-age, growth was found to be slower yet within 1 standard deviation of the growth of an average yellow perch in Wisconsin (age 2= 4.5", age 3= 5.5" and age 8= 10.7"). In 2016, growth of yellow perch was a bit faster and considered the same as the average yellow perch. Relative weights of yellow perch were above and below 100, poor to excellent. Average relative weight by inch group generally fell below 100, indicating poorer body condition. Yellow perch were growing plumper with length (*b*=3.2).

WALLEYE

Walleye were the fifth most caught species (n=37) with a CPUE of 7 per mile. This CPUE value is in the range of what was caught in the past surveys (Table 3). Walleye ranged in length from 8.4-18.6 inches and mean length was 11.7 inches (Figure 8). Based on the length frequencies, these fish were likely from the 2015, 2017 and 2019 fish stockings.

Fisheries staff completed fall electrofishing surveys in 2014, 2015, 2017, 2018 and 2019 before the stocking of extended growth walleye, looking for any signs of natural reproduction and survival of stocked walleye. The walleye caught in 2014 and 2015 that were likely from previous stockings of small fingerling walleye. Survival of the extended growth fingerling walleye was apparent (Table 6). During the 2019 fall survey, staff indexed fish species as being present, common or abundant. Black crappie were present. Bluegill, pumpkinseed, yellow perch and minnow species were abundant.

Discussion and Recommendations

Bluegill and pumpkinseed are panfish species in the same family (Centrarchidae), both species were more numerous compared to past survey years. The greatest percentage of 6-inch and larger bluegill and pumpkinseed was observed compared to past years. Growth of bluegill was a bit faster in 2021 compared to 2016, yet in general growth is a bit slower than the average bluegill. Growth was average for pumpkinseed. Bluegill ranged from poor-excellent body condition, yet overall are in good condition and growth is isometric. Pumpkinseed are in excellent body condition and growing plumper with length. Bluegill PSD for a "balanced" largemouth bass-bluegill fishery ranges from 20-60 and a PSD-P of 5-20. The bluegill population is currently outside the range of PSD-P values (PSD-P= 1). Historically

though, the bluegill population has never had the numbers of 8-inch fish to be within this PSD-P range. PSD was within the 20-60 range in 2000 (PSD=28) and 2021 (PSD= 32). Bluegill had poor size structure and good/average growth in previous surveys, which made Lake Sherwood a candidate for the special panfish regulation. The objective of the special regulation was to improve the size structure of the bluegill population. We don't know how much angler harvest changed for bluegill after the implementation of the special panfish regulation going from a daily bag limit of 25 total to no more than 10 of each species. Bluegill size structure has improved whether this is due to reduced angler harvest, population dynamics, or predation by the abundant largemouth bass population is uncertain.

The special panfish regulation currently in place will sunset in 2026 and revert to the statewide daily bag limit of 25. When stunting (slow growth) is not an issue, the only way to improve size structure of panfish is to reduce harvest. The special regulation that is currently in place will not be an option in 2026. Lake Sherwood would be a candidate for a of 10 panfish daily bag limit.

A greater percentage of largemouth bass ≥ 15 inches were found in 2000 and 2002 and growing faster compared to 2021, yet average length is not significantly different. There could be multiple reasons for the change, not just a single reason. Different structures (dorsal spines and scales) were used to estimate age of bass in previous years. Those structures tend to underestimate the age of the fish; therefore, fish may have been older and growing slower. Although, largemouth bass may truly be growing slower in 2021. Growth rates of age-3 bass are the same as the state average largemouth bass and what was observed in the past, yet growth seems to taper off after age-7 and falls below the state average largemouth bass. Overall body condition is good, and bass are growing plumper with length. Largemouth bass are the most numerous they've ever been. For "balanced" largemouth bass-bluegill fisheries, PSD values for largemouth bass range from 40-70, PSD-P 10-40, and PSD-M 0-10. Largemouth bass PSD values did fall within PSD ranges in 2000 (PSD=56; PSD-P=20) and 2002 (PSD=52; PSD-P=23). The largemouth bass PSD value for 2021 is just above the upper range (PSD=71) and just falls short of the PSD-P range (PSD-P=7), close to being "balanced".

The fishing regulation for largemouth bass has remain unchanged and is the statewide regulation – minimum length limit is 14" and the daily bag limit is 5 (Season is the first Saturday in May until December 31st). Bass anglers typically practice catch-and-release, yet angler harvest is unknown and could reduce the number of large bass in a population and lower the PSD-P values. Largemouth bass recruitment/production may be better than past years lowering PSD-P values too, with more small fish in the population. Overall, the largemouth bass fishery has improved since 2016 with more bass in system and better size structure. There are many bass (24%) ≥ 14 inches available for harvest. If angler satisfaction is low and more larger bass are desired, efforts to increase the amount of large woody structure would be beneficial to the fishery. The department's Fisheries Management Program has a regulation in our toolbox that includes a regulation to utilize self-sustained, high density, slow-growing bass populations, provides angler harvest opportunity and is expected to reduce predation/competition. This regulation is a 14-inch to 18-inch protected slot with a daily bag limit of 5 per day only 1 can be over 18 inches. This regulation may increase the number of larger bass in the system with the protected slot but relies on anglers harvesting smaller bass to reduce their numbers and help improve growth. The current

fishing regulation is providing a quality fishing opportunity that will sustain or increase densities and is expected to maintain the current conditions.

While the survey did not target northern pike, walleye, crappie or yellow perch anglers do enjoy fishing them and some nice ones were caught during the survey. The Fisheries Management Program targets these species earlier in the spring with netting and electrofishing surveys. Compared to past surveys, yellow perch numbers were higher. Yellow perch growth is a bit slower and body condition is poorer. Walleye relative abundance is consistent with the past surveys of 2000 and 2002. Stocked walleye are surviving and providing a fishery for anglers. The fishing regulation for walleye is the general inland walleye regulation. Only a couple northern pike and black crappie were caught. Based on survey work in 2016, northern pike had above average to average growth and ranged in size from 18 inches to 32 inches. In 2016, black crappie size structure was poor with few over 8 inches and growth was significantly slower than the average black crappie in Wisconsin.

Acknowledgements

The data collected for this report would not have been possible without many DNR staff over the years. Colton Wolosek and Jake Thompson (Advanced Fisheries Technician) processed fish sampled and estimated age from all the otoliths collected for the 2021 survey.

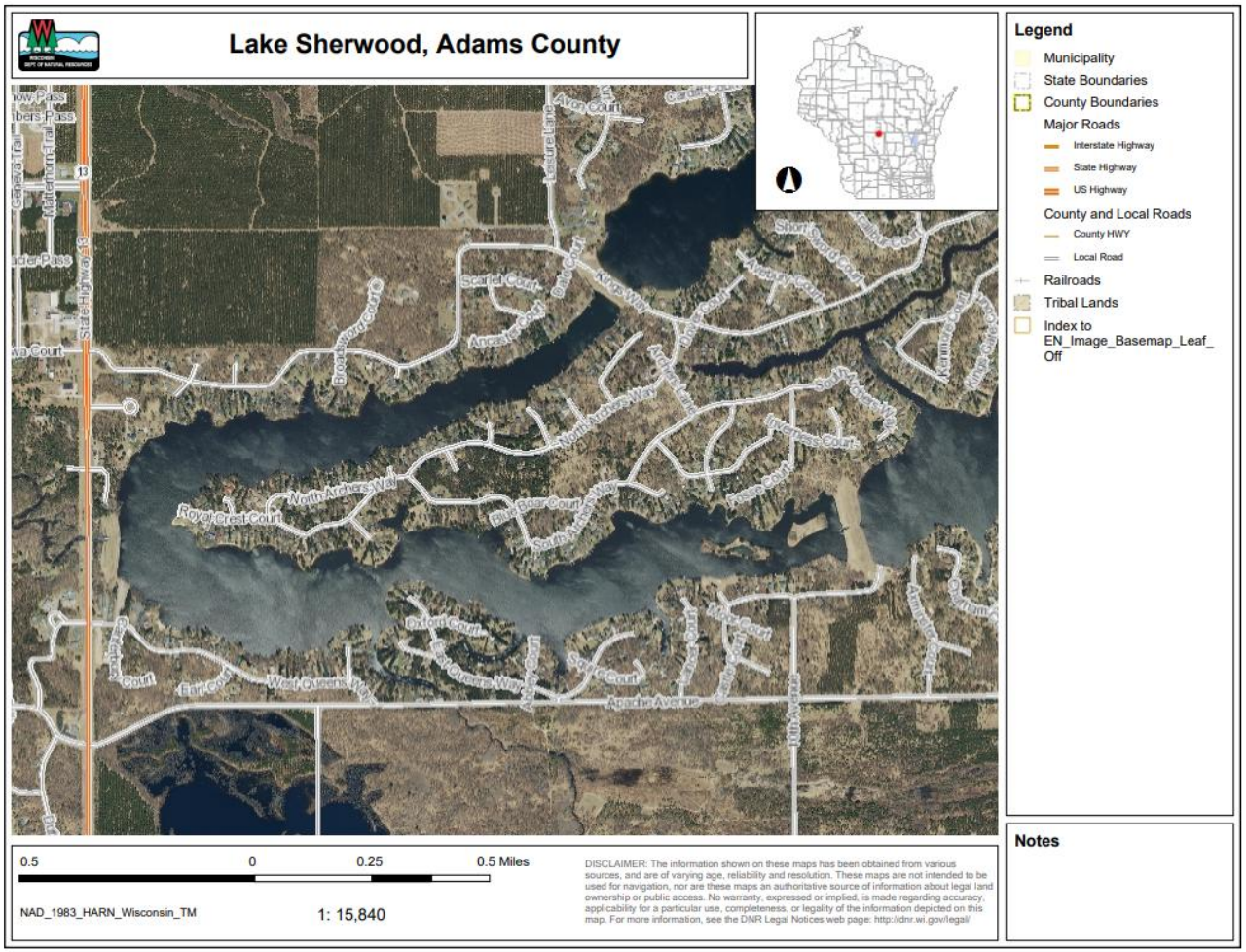

Figure 1. Map of Lake Sherwood, Adams County, Wisconsin.

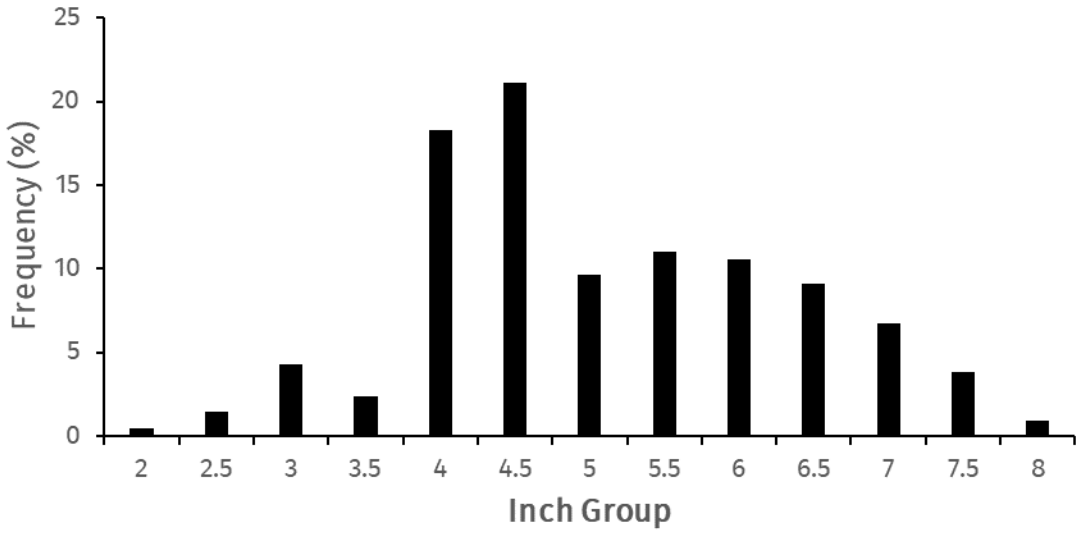

Figure 2. – Length frequency of bluegill captured in Lake Sherwood, 2021 (n=209).

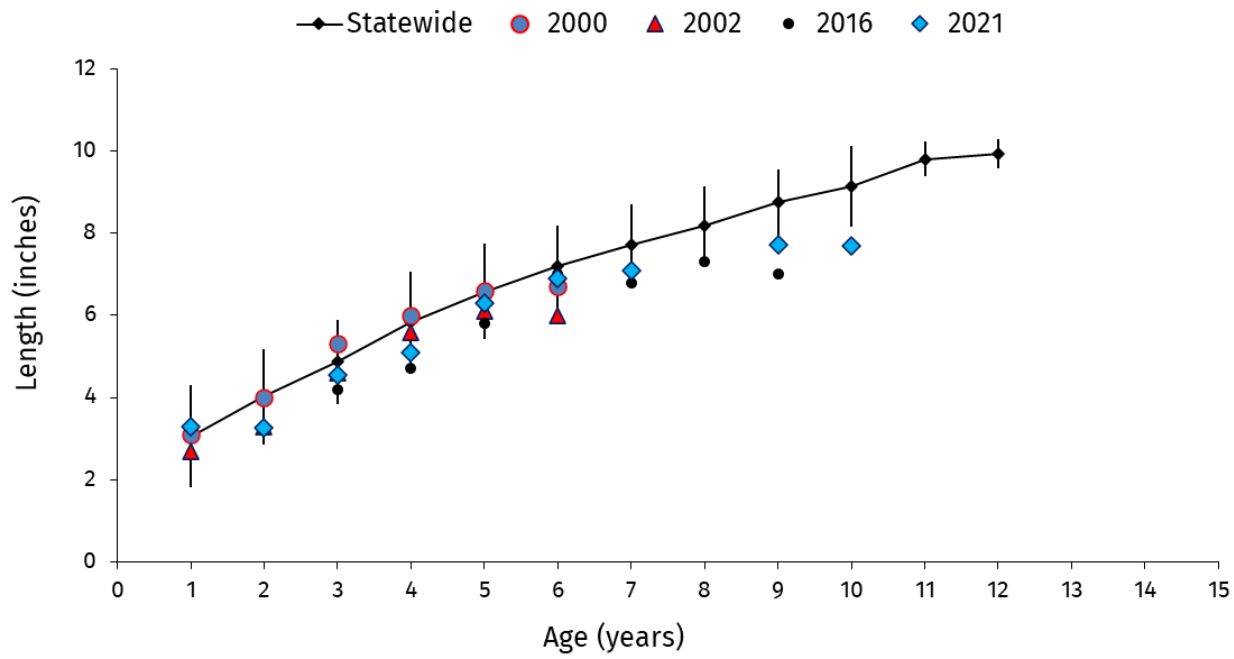

Figure 3. – Mean length at age of bluegill captured in Lake Sherwood in 2000, 2002, 2016 and 2021 compared to the statewide average bluegill (±1 standard deviation).

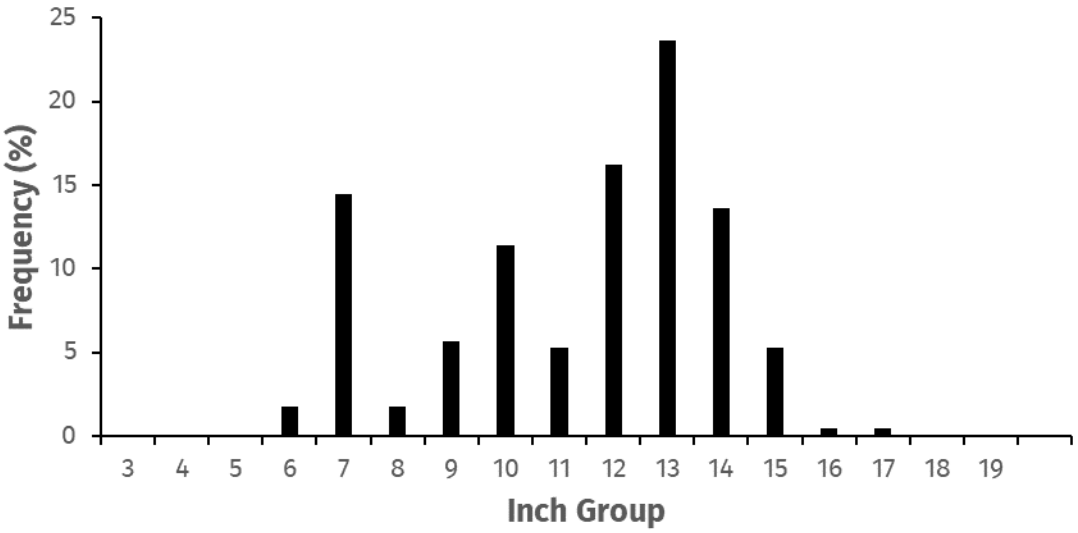

Figure 4. - Length frequency of largemouth bass captured in Lake Sherwood, 2021 (n=228)

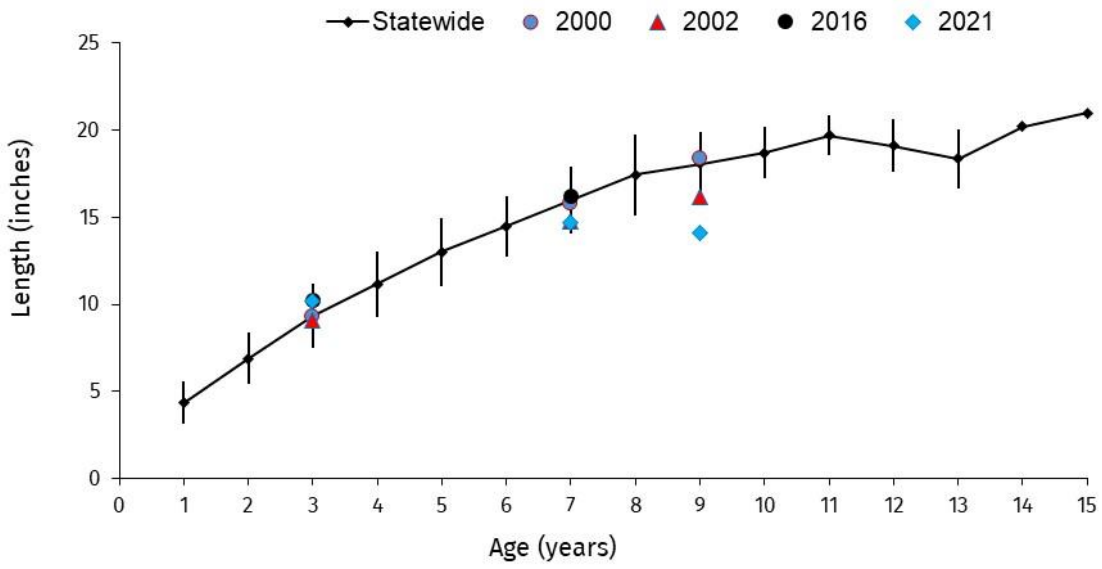

Figure 5. – Mean length at age of largemouth bass captured in Sherwood Lake in 2000, 2002, 2016 and 2021 compared to the statewide average largemouth bass.

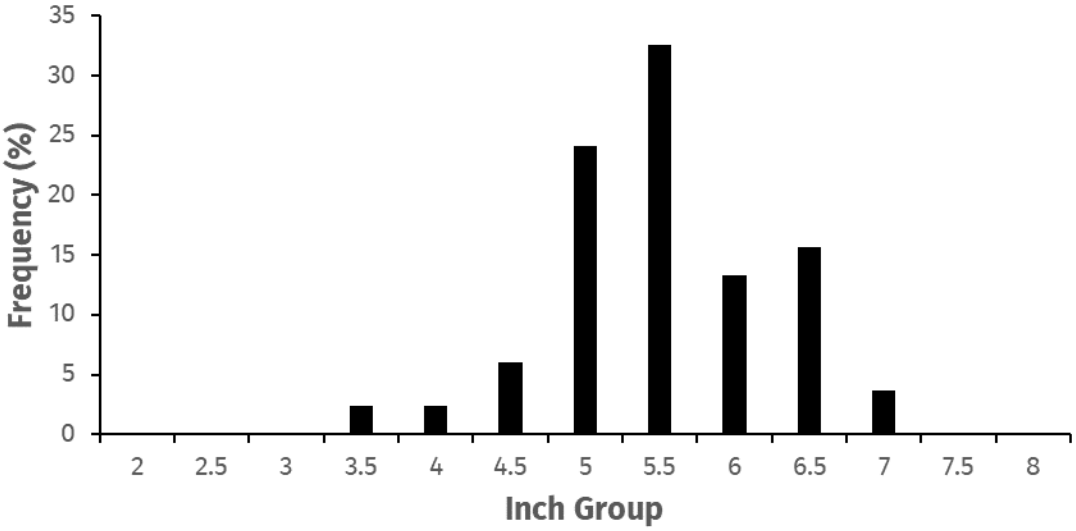

Figure 6. Length frequency of pumpkinseed captured in Lake Sherwood, 2021 (n=83).

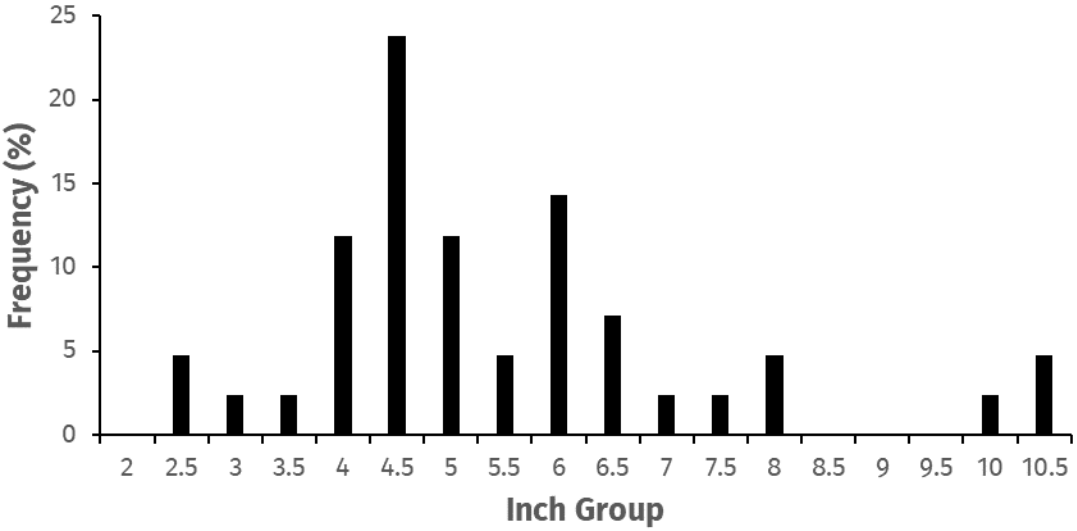

Figure 7. Length frequency of yellow perch captured in Lake Sherwood, 2021 (n=42).

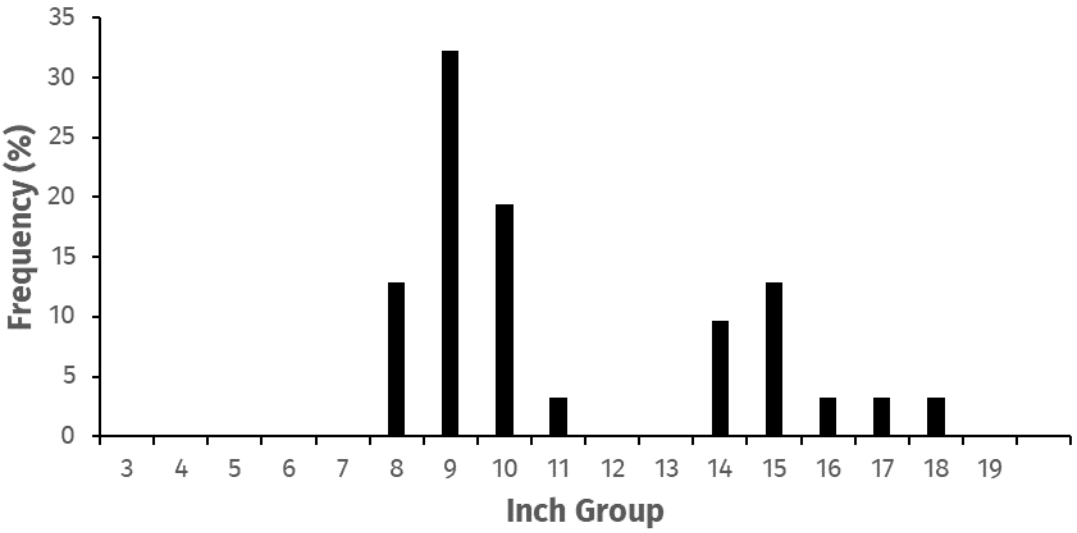

Figure 8. Length frequency of walleye captured in Lake Sherwood, 2021 (n=31).

Table 1. – Fish stocking records for Lake Sherwood, Adams County, Wisconsin.

Year	Species	Number	Length (Inches)	Hatchery
2008	Black Crappie	1,000	4.0	Private
2016	Black Crappie	650	5.0	Private
1996	Largemouth Bass	6,000	2.3	DNR
1999	Largemouth Bass	24,600	1.3	DNR
2005	Northern Pike	377	13.5	Private
2008	Northern Pike	250	13.0	Private
2016	Northern Pike	110	8.0	Private
1974	Walleye	15,000	3.0	DNR
1976	Walleye	25,000	1.0	DNR
1978	Walleye	1,548	5.0	DNR
1979	Walleye	25,000	5.0	DNR
1980	Walleye	4,640	5.0	DNR
1983	Walleye	17,500	3.0	DNR
1985	Walleye	12,000	3.0	DNR
1987	Walleye	52,560	2.0	DNR
1989	Walleye	25,270	3.5	DNR
1991	Walleye	12,173	2.0	DNR
1992	Walleye	12,702	2.7	DNR
1995	Walleye	6,254	2.7	DNR
1999	Walleye	42,705	1.5	DNR
2001	Walleye	24,600	1.7	DNR
2003	Walleye	24,550	1.6	DNR
2005	Walleye	24,685	1.6	DNR
2005	Walleye	1085	10.0	Private
2008	Walleye	1000	7.0	Private
2009	Walleye	7,572	1.7	DNR
2011	Walleye	8,498	1.6	DNR
2013	Walleye	7,360	2.0	DNR
2013	Walleye	2,196	6.5	Private/DNR
2015	Walleye	2,182	6.8	Private/DNR
2017	Walleye	2,160	8.0	Private/DNR
2019	Walleye	2,154	6.5	DNR
2021	Walleye	2,160	6.7	DNR
2023	Walleye	2,160	6.9	DNR

Table 2. – Total number of fish caught by species in the 2021 in Lake Sherwood.

	2021			
Common name of fish	Number	Percent	Length Range (Inches)	Average Length (Inches)
Black Crappie	2	0.3	8.1-10.4	-
Bluegill	209	34.7	1.4-8.2	5.3
Largemouth Bass	228	37.8	6.6-17.0	11.8
Northern Pike	2	.3	23.9-24.4	-
Pumpkinseed	83	13.8	3.5-7.4	5.7
Walleye	37	6.1	8.4-18.6	11.7
Yellow Perch	42	7.0	2.7-10.8	5.7
Total		**100.0%**		

Table 3. – Relative abundance (CPUE; number of fish per mile) of bluegill and largemouth bass for Lake Sherwood in 2000, 2002, 2005, 2016, and 2021.

Common name of fish - CPUE	2000	2002	2005	2016	2021
Bluegill (≥ 3 inches; Catch per mile)	94	79	24	59	102
Bluegill (≥ 6 inches; Catch per mile)	14	8	9	9	33
Largemouth Bass (Catch per mile)	14	26	7	23	46
Largemouth Bass (≥ 8 inches; Catch per mile)	13	24	4	19	38
Pumpkinseed (≥ 3 inches; Catch per mile)	3	0.2	2	23	42
Pumpkinseed (≥ 6 inches; Catch per mile)	2	0	0	13	14
Yellow Perch	0.6	14	0	11	21
Walleye	6	7	2	0.3	7

Table 4. – Size Structure of bluegill for Lake Sherwood in 2000, 2002, 2005, 2016, and 2021.
**Sample size of 50 is necessary to represent the population.*

Year Stock, Quality, Preferred (3.0, 6.0, 8.0 Inches)	Total	Average Length	Length Range	PSD - Q	PSD-P
2000	181	5.0±0.2	1.8-8.7	28±9	1
2002	80	4.7±0.2	2.9-6.9	10±8	-
2005*	29	4.9±0.5	2.9-6.9	-	-
2016	90	5.2±0.2	1.7-6.7	15±9	-
2021	209	5.3±0.2	1.4-8.2	32±9	1

Table 5. – Size Structure of largemouth bass for Lake Sherwood in 2000, 2002, 2005, 2016, and 2021.
**Sample size of 50 is necessary to represent the population.*

Stock, Quality, Preferred, Memorable (8.0, 12.0, 15.0, 20.0 Inches)	Total	Average Length	Length Range	PSD-Q	PSD-P	PSD-M	RSD-14"
2000	104	12.3±0.5	4.0-20.0	56±11	20	1	29
2002	104	11.8±0.6	5.6-19.0	52±11	23		33
2005*	29	9.8±1.5	2.5-17.0	-	-	-	-
2016	139	10.8±0.4	3.6-16.2	34±9	2		8
2021	228	11.8 ± 0.3	6.6– 17.0	71±9	7		24

Table 6 – Numbers and sizes (inches) of walleyes caught during fall electrofishing surveys.

Year	Total Number Caught	Numbers and Sizes of Walleye Caught
2014	5	4 ≤ 9.0" and 1 = 26.9"
2015*	2	1 ≤ 9.0" and 1 = 17.9"
2017*	5	1 = 13.3"; 1 = 14.0"; 3 ≤14.0"
2018	19	3 = 8-8.9"; 10 = 9-9.9"; 4 = 10-10.5" and 2 = 14.0".
2019*	7	1 = 11.3"; 2 = 12.5"; 1 = 13.5"; 2 = 14.0"; and 1 = 21.4"

**Walleye were stocked in the fall those years after the nighttime electrofishing surveys took place.*