WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Fishery Survey Report for Magnor Lake, Polk County, Wisconsin 2019

WATERBODY IDENTIFICATION CODE: 2624600

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Introduction

Magnor Lake was surveyed in 2019 to assess the status of the fishery. We conducted a population estimate for adult Walleye and indexed the catch rates of Largemouth Bass, Smallmouth Bass, Northern Pike and panfish species. We assessed general population characteristics, size structure (when possible) and growth of all species. Recent management activities on Magnor Lake have focused on Walleye stocking, public outreach and education.

LAKE CHARACTERISTICS

Magnor Lake is a fairly shallow and fertile lake (Tables 1 & 2) that experiences heavy algal blooms during summer. More information on water quality and invasive species can be found at the Wisconsin Department of Natural Resources's (DNR) Lake Page for Magnor Lake.

Table 1. Lake and watershed characteristics for Magnor Lake, Polk County, WI.

Size (ac)	*231*
Max depth (ft)	*26*
Mean depth (ft)	*10*
Watershed Area (ac)	*5,710*
Lake class	*Complex-warm-dark*

Table 2. July-August mean Trophic State Index (TSI) values for Magnor Lake, Polk County, WI.

Secchi Disk Visibility	*64*
Total Phosphorus	*63*
Chlorophyll A	*65*

There is one public boat landing on Magnor Lake. There is a public fishing pier available near the landing. Magnor Lake is a popular fishing lake and receives heavy fishing pressure.

STOCKING HISTORY

Walleye have been the only species stocked into Magnor Lake in recent decades (Appendix Table 1). Historic Walleye stocking efforts consisted of small fingerlings. Since 2012, large fingerling Walleye have been stocked by the DNR at a rate of 5 fish/acre during odd-numbered years. In addition, the Richardson Sportsmen Club and Magnor Lake Association have purchased large fingerling Walleyes from a private producer and stocked approximately 1,500 fish each year since 2009.

FISHING REGULATIONS

Magnor Lake does not have any special fishing regulations. All species follow statewide or Ceded territory regulations (Appendix Table 2).

Methods

Magnor Lake was sampled in 2019, following the DNR's comprehensive treaty assessment protocol (Cichosz 2021) to estimate the adult Walleye population abundance and index Northern Pike.

A late spring electrofishing survey (SE2) was done to assess the bass and panfish populations. This survey consisted of 0.5-mile index stations where all gamefish and panfish were captured and 1.5-mile stations where only gamefish were collected. There were two index stations and one gamefish station.

In addition to these surveys, a fall electrofishing survey was done to assess the abundance of age-0 and age-1 Walleye. Fall electrofishing surveys have occurred periodically from 1989 to 2019. Descriptions of standard DNR survey type, gear used, target water temperatures and target species are listed in Appendix Table 3.

Lake Class Standards catch per unit effort (CPUE) was calculated by comparing Magnor Lake CPUEs of each species to the CPUEs of the other 196 complex-warm-dark lakes in Wisconsin (Rypel et al. 2019). When possible, CPUE was also compared to past surveys for these lakes.

Walleye and Largemouth Bass were aged with dorsal spines. Bluegill and Black Crappie were aged with scales. All spines were cut with a Dremel tool and aged under a microscope. Mean length-at-age was compared to the median length at age for complex-warm-dark lakes. Size structure was assessed using the proportional size distribution (PSD) indices (Neumann et al. 2013). The PSD value for a species is the number of fish of a specified length and longer divided by the number of fish of stock length or longer, the result multiplied by 100 (Appendix Table 4).

To assess Walleye stocking survival, an age-length key was used to estimate the abundance of Walleye in each year class, assuming no natural reproduction and that all fish were from stocked origin. Survival was estimated by dividing the population estimate for each age class by the total number of fish stocked for that year and multiplying it by 100. The cost of each stocking event was calculated by multiplying the number of large fingerlings stocked by the average cost per large fingerling ($1.06). The cost per recruit to age 3, age 4, and age 5 were estimated by dividing the cost of each stocking event by the estimated abundance of that year class.

Results and Discussion

WALLEYE

The adult Walleye population estimate was 3.2 fish/acre (CV = 0.17; Figure 1). The Walleye population increased significantly from the 2007 estimate (0.7 fish/ac) but was considerably less than the 1989 and 1994 estimates. In addition, the 2019

estimate was above the average found in stocked Walleye lakes in the Ceded Territory (2.1 fish/acre; Cichosz 2021).

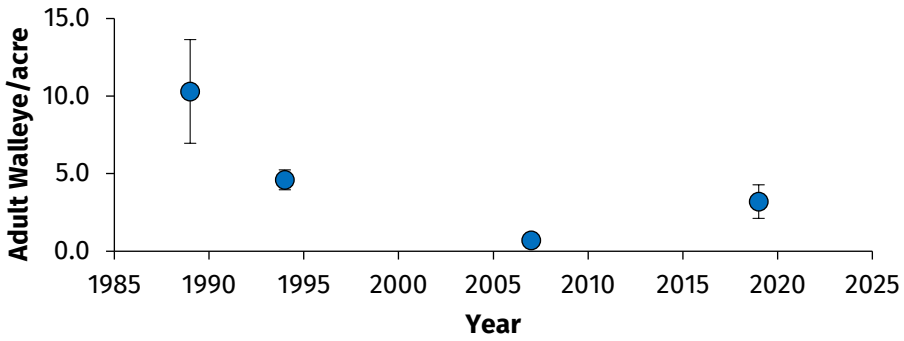

Figure 1. Population estimates for adult Walleye (with 95% confidence intervals) in Magnor Lake, Polk County, WI, 1989-2019.

There were 381 Walleye collected from netting and electrofishing on Magnor Lake (Figure 2). The CPUE was 21.0 fish/net night for netting and 37.7 fish/mile for electrofishing. The netting catch rate approached the 95th percentile (25.0 fish/net night) for complex-warm-dark fisheries in Wisconsin. The high netting catch rate was likely influenced by the late ice out and short spawning season. Walleye ranged in length from 10.0 to 26.1 inches. The mean lengths of male and female Walleye were 16.3 inches and 22.0 inches, respectively. The male to female ratio was 2.9:1. Walleye PSD from fyke netting was 79, and PSD-20 was 21. PSD in 2007 was higher at 100, and PSD-20 was 84, likely due to a lower density and older population.

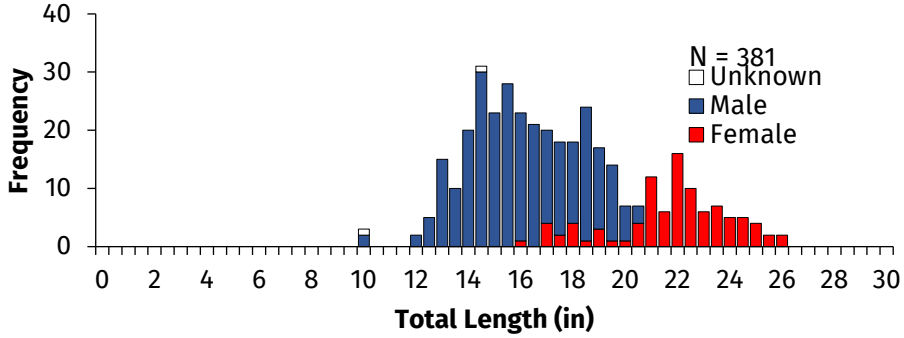

Figure 3. Length frequency of all Walleye captured in Magnor Lake during spring 2019 Walleye population estimate survey.

Walleye had fast growth rates and were well above the median for complex-warm-dark lakes and also greater than the Barron and Polk county averages. Mean length at age for age 2 to 10 Walleye from Magnor Lake averaged 2.3 inches more than the lake class median and 0.6 inches more than the Barron and Polk county averages.

Age structure of Walleye was well represented across all year classes stocked with large fingerlings (Age 2 to 10). The survival to age 3 was 9.7% and the cost per age-3 Walleye was estimated at $10.91. Age-3 females were not fully mature and therefore not fully represented in this survey. The survival rate was likely higher and the cost per recruit lower than estimated for age-3 Walleye. The survival to age 4 was 6.7 %, and the cost per age-4 Walleye was estimated at $15.88. The survival to age 5 was 6.4%, and the cost per age-5 Walleye was estimated at $16.53. By age 5, Walleye in Magnor Lake were of legal size (15 inches) for 1 to 2 years; therefore, angler harvest likely reduced the year class.

No age-0 or age-1 Walleye were collected during the fall electrofishing survey, therefore the catch rate for both age classes was 0/mile. Considering the high survival observed during the survival to recruit analyses, the age-1 Walleye catch rate was likely underestimated.

The Walleye population in Magnor Lake is dependent on stocking with minimal natural reproduction in recent years. Large fingerling Walleye have had high survival and have successfully returned a fishable stocked Walleye fishery into Magnor Lake. Large fingerlings have outperformed the small fingerlings that were previously stocked on Magnor Lake. Historically, Magnor Lake had Walleye natural reproduction. With a respectable adult density back in Magnor Lake hopefully measurable natural reproduction returns to Magnor Lake.

Walleye ages ranged from age 2 to 10. The current population appears to be driven by large fingerling stockings, especially considering the population was relatively young and the oldest fish we aged (age 10) corresponded with the first large fingerling stocking event (2009).

NORTHERN PIKE

There were 71 Northern Pike collected netting from Magnor Lake and their lengths ranged from 12.8 inches to 32.1 inches (Figure 5). The average length was 20.6 inches, above the 75th percentile (18.3 inches) for complex-warm-dark lakes. The CPUE for Northern Pike was 3.7 fish/net night, an increase from 2007 (1.6 fish/net night). The netting catch rate was at the 75th percentile (3.7 fish/net night) for complex-warm-dark fisheries in Wisconsin.

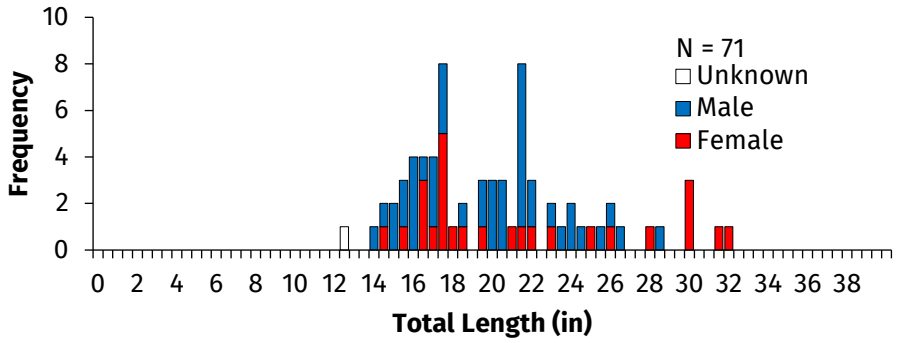

Figure 5. Length frequency of Northern Pike captured during spring 2019 fyke netting survey.

Based on the habitat characteristics of Magnor Lake, the Northern Pike population is likely to remain at a moderate density, with respectable size structure.

LARGEMOUTH BASS

There were 116 Largemouth Bass collected during the SE2 survey, and their lengths ranged from 9.2 to 18.7 inches (Figure 6). PSD was 67. The mean length was 13.5 inches, which was near the 99th percentile (13.6 inches) for complex-warm-dark Wisconsin lakes. The electrofishing catch rate was 46.4 fish/mile, which was greater than the 2007 catch rate (26.2 fish/mile) and above the 75th percentile (37.3 fish/mile) for complex-warm-dark fisheries in Wisconsin.

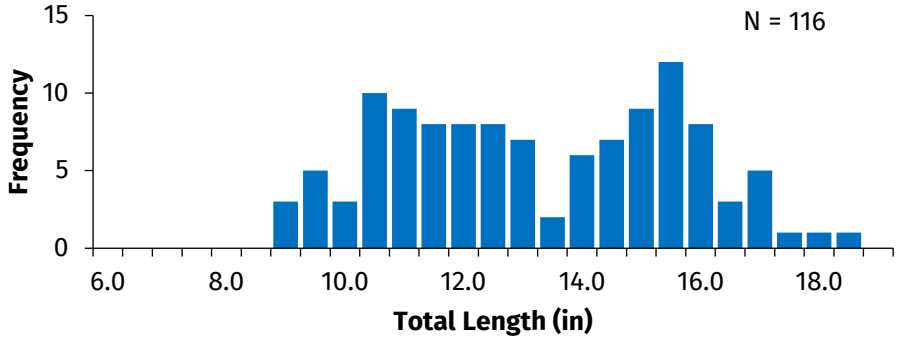

Figure 6. Length frequency of Largemouth Bass captured from Magnor Lake during late spring electrofishing survey.

Largemouth Bass growth was well above average when compared to complex-warm-dark lakes and also the Barron and Polk County averages. Mean length at age for age 2 to 10 Largemouth Bass from Magnor Lake averaged 2.4 inches more than the lake class median and 3.1 inches more than the Barron and Polk county averages. Magnor Lake has a robust Largemouth Bass population in terms of both size and numbers. Even with greater abundance, larger bass are still present.

BLUEGILL

There were 183 Bluegill collected during the SE2 survey, and their lengths ranged from 4.6 to 9.6 inches (Figure 8). The mean length was 6.7 inches, which was above the 99th percentile (6.1 inches) for complex-warm-dark lakes. Bluegill CPUE was 183 fish/mile, which was just below the 75th percentile (195.9 fish/mile) for complex-warm-dark lakes. Bluegill PSD was 88, and PSD-8 was 3. Bluegill growth was average when compared to complex-warm-dark lakes and the Barron and Polk County averages.

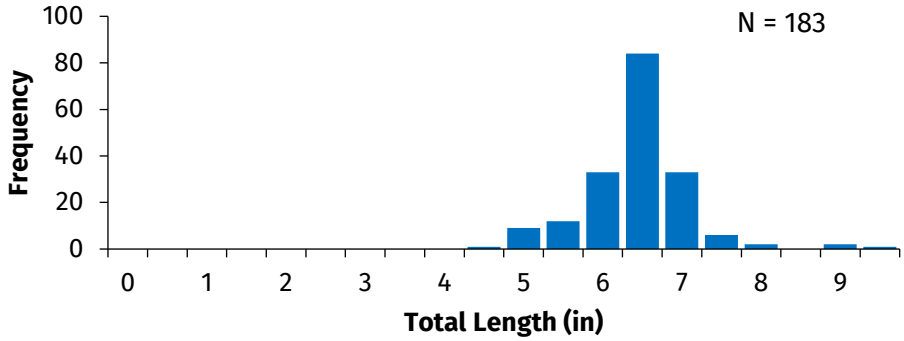

Figure 8. Length frequency of Bluegill captured from Magnor Lake during late spring electrofishing survey.

BLACK CRAPPIE

There were 49 Black Crappie collected during the SE2 survey and their lengths ranged from 7.4 to 10.5 inches (Figure 10). The mean length was 8.9 inches, which matched the 99th percentile for complex-warm-dark lakes. Black Crappie CPUE was 49.0 fish/mile. Black Crappie PSD was 92 and PSD-10 was 2. Magnor Lake crappies had decent growth rates and averaged 0.3 inches more when compared to age 3 to 5 crappies from other complex-warm-dark lakes

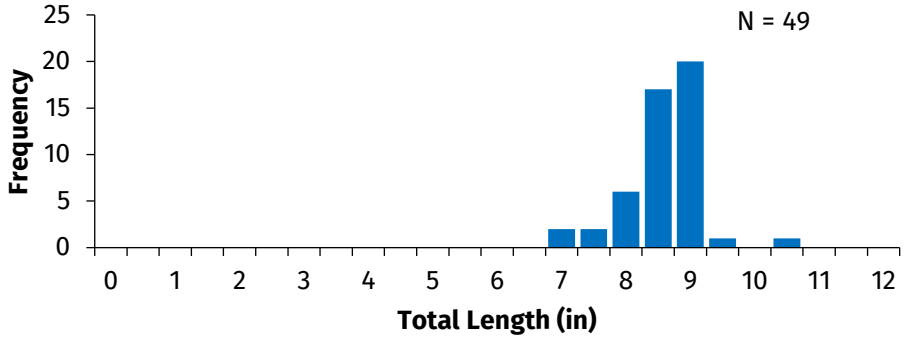

Figure 10. Length frequency of Black Crappie captured from Magnor Lake during late spring electrofishing survey.

YELLOW PERCH

Only two Yellow Perch were collected during the late spring electrofishing survey, but they were present in fair numbers during the fyke netting survey. The Yellow Perch population likely serves an important role as prey fish for the Walleye population.

Management Recommendations

1.) Large fingerling Walleye stockings have been successful in Magnor Lake. Due to the success of these large fingerling stockings and the history of natural reproduction in Magnor Lake, the stocking regime should be changed to an alternate year basis. The DNR will increase the stocking rate to 10/ac and the private groups have agreed to refrain from stocking. Stocking on an alternate year basis will enable us to evaluate natural reproduction better. The Walleye population should be maintained at 2-4 fish/ac through stocking and could reach higher levels if natural reproduction returned.

2.) Magnor Lake offers a very well-rounded and popular fishery for several species. Largemouth Bass, Northern Pike, Bluegill and Black Crappie populations have above average abundances and size structures compared to other complex-warm-dark Wisconsin lakes. No management actions are necessary for these species.

3.) The next comprehensive survey is planned for 2029. The success of the large fingerling stocking should be further evaluated during that survey by assessing the abundance, age structure, population demographics and stocking survival of the Walleye population. Due to the importance of the panfish fishery, the size structure and abundance of the panfish populations should continue to be closely monitored as well.

4.) Efforts to increase habitat complexity in Magnor Lake should also be encouraged where applicable. Inputs of coarse woody debris, protection/promotion of aquatic vegetation and maintenance/restoration of vegetative buffers would be beneficial to Magnor Lake. This website healthylakeswi.com is a great resource to learn about this recommendation.

5.) Invasive species monitoring and control programs should continue. Efforts to keep aquatic invasive species out of a waterbody are much more effective than controlling invasive species once they are established.

Acknowledgments

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References

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Rypel, A.L., T.D. Simonson, D.L. Oele, J.D. Griffin, T.P. Parks, D. Seibel, C.M. Roberts, S. Toshner, L. Tate, and J. Lyons. 2019. Flexible classification of Wisconsin lakes for improved fisheries conversation and management. Fisheries. Doi:10.002/fsh.10228.

Appendix Table 1. Fish stocking records for Magnor Lake, 1990 – 2019.

Year	Species	Age Class	Number Stocked	Hatchery Source
1990	Walleye	Small Fingerling	11,520	DNR
1992	Walleye	Small Fingerling	11,500	DNR
1994	Walleye	Small Fingerling	13,308	DNR
1996	Walleye	Small Fingerling	11,500	DNR
1997	Walleye	Small Fingerling	2,286	DNR
1998	Walleye	Small Fingerling	5,337	Tribal
2000	Walleye	Small Fingerling	11,200	DNR
2002	Walleye	Small Fingerling	11,190	DNR
2004	Walleye	Small Fingerling	11,265	DNR
2005	Walleye	Fry	800,000	DNR
2006	Walleye	Small Fingerling	11,452	DNR
2008	Walleye	Small Fingerling	7,837	DNR
2009	Walleye	Large Fingerling	3,000	Private
2010	Walleye	Large Fingerling	1,497	Private
2010	Walleye	Small Fingerling	8,012	DNR
2011	Walleye	Large Fingerling	1,500	Private
2012	Walleye	Large Fingerling	1,145	DNR
2012	Walleye	Large Fingerling	1,499	Private
2013	Walleye	Large Fingerling	1,500	Private
2014	Walleye	Large Fingerling	1,500	Private
2015	Walleye	Large Fingerling	1,147	DNR
2015	Walleye	Large Fingerling	1,500	Private
2016	Walleye	Large Fingerling	1,495	Private
2017	Walleye	Large Fingerling	1,271	DNR
2017	Walleye	Large Fingerling	1,500	Private
2018	Walleye	Large Fingerling	1,500	Private
2019	Walleye	Large Fingerling	1,147	DNR
2019	Walleye	Large Fingerling	1,500	Private

*Appendix Table 2. Regulation history for Magnor Lake, Polk County from 1980 to 2019. * A sliding bag limit for Walleye (1–5 fish) was in place from 1986 to 2015. ** After 2015, the Ceded Territory Walleye base regulation was 15" minimum length limit (MLL), 20-24" protected, and one fish over 24" may be taken and three fish bag limit.*

<table>
<tr><th>Species</th><th>1980</th><th>1985</th><th>1990</th><th>1995</th><th>2000</th><th>2005</th><th>2010</th><th>2015</th></tr>
<tr><td>Walleye</td><td colspan="3">No MLL, 5 fish daily bag limit*</td><td colspan="4">15" MLL, 5 fish daily bag limit*</td><td>CT base*** *</td></tr>
<tr><td>Northern Pike</td><td colspan="8">No MLL, 5 fish daily bag limit</td></tr>
<tr><td>Bass</td><td colspan="2">No MLL, 5 daily bag limit</td><td colspan="6">14" MLL, 5 fish daily bag limit</td></tr>
<tr><td>Panfish</td><td colspan="4">No MLL, 50 fish daily bag limit</td><td colspan="4">No MLL, 25 fish daily bag limit</td></tr>
</table>

Appendix Table 3. Survey types, gear used, target water temperature and target species.

Survey Type	Gear Used	Target Water Temperature (°F)	Target Species
Spring Netting 1 (SN1)	Fyke Net	~45	Walleye, Northern Pike
Spring Electrofishing 1 (SE1)	Boat Electrofishing	45-50	Walleye
Spring Netting 2 (SN2)	Fyke Net	50-55	Muskellunge, Black Crappie, Yellow Perch
Spring Electrofishing 2 (SE2)	Boat Electrofishing	55-70	Largemouth Bass, Smallmouth Bass, Bluegill and other panfish, non-game species
Spring Netting 3 (SN3)	Fyke Net	65-80	Bluegill, Black Crappie
Fall Electrofishing (FE)	Boat Electrofishing	50-60	Juvenile Walleye and Muskellunge

A DNR Technician lifting a fyke net

A DNR electrofishing boat

Appendix Table 4. Proportional and relative stock density values.

Species	Stock Size (in)	Quality Size (in)	Preferred Size (in)
Black Crappie	5	8	10
Bluegill	3	6	8
Largemouth Bass	8	12	15
Northern Pike	14	21	28
Pumpkinseed	3	6	8
Rock Bass	4	7	9
Smallmouth Bass	7	11	14
Walleye	10	15	20
Yellow Perch	5	8	10