



# Introduction

Spooner Lake was surveyed in 2022 to assess the status of the fishery. We indexed the catch rates for northern pike, largemouth bass and panfish species. We assessed general population characteristics, size structure and growth of all species. Recent management activities have focused on public outreach and education.

## LAKE CHARACTERISTICS

Spooner Lake is a fertile and shallow lake (Tables 1 & 2). More information on water quality and invasive species can be found at the Wisconsin Department of Natural Resources (DNR) Lake Page for [Spooner Lake](#). Spooner Lake is classified as a Simple-Warm-Clear lake (Rypel et al. 2019).

Table 1. Lake and watershed characteristics for Spooner Lake, Washburn County, WI.

Size (ac)	1,132
Max depth (ft)	17
Mean depth (ft)	7
Watershed Area (ac)	7,811
Lake class	Simple-Warm-Clear

Table 2. June – August mean Trophic State Index (TSI) values for Spooner Lake, Washburn County, WI.

Secchi Disk Visibility	52
Total Phosphorus	55
Chlorophyll A	53

There are two public boat landings on Spooner Lake. These landings are located at County Highway H and Mann Rd. Spooner Lake is a popular multi-species fishery located near Spooner, WI. Spooner Lake suffers from periodic partial winterkills, but waterflow from Crystal Brook creates an oxygenated refuge for fish during severe winters. Aquatic plant management and drawdowns have been pursued by the Spooner Lake District to manage abundant aquatic vegetation in Spooner Lake.

## STOCKING HISTORY

Though partial winterkills occur in Spooner Lake, stocking has not usually been needed. Largemouth bass and northern pike are the only species that have been stocked since 1987.

## FISHING REGULATIONS

There are currently no special regulations in Spooner Lake. All species either follow the statewide, regional or county fishing regulations.

## Methods

Spooner Lake was sampled during 2022 following the DNR's assessment protocol (Appendix Table 1) to sample northern pike, largemouth bass and panfish. Sampling began immediately after ice-out on April 22. Northern pike and black crappie were indexed using fyke nets (SN1) from April 22 to April 26. Black crappies were subsampled from fyke nets due to poor weather conditions. A late spring electrofishing survey (SE2) was done on May 24 to assess largemouth bass and panfish populations. This survey consisted of three 0.5-mile index stations where all bass and panfish were captured and three 1.5-mile stations where only largemouth bass were collected.

Lake Class Standards catch per unit effort (CPUE) was calculated by comparing Spooner Lake's CPUE of each species to CPUEs of other lakes listed as Simple-Warm-Clear lakes in Wisconsin. When possible, CPUE was also compared to past surveys for Spooner Lake.

Largemouth bass were aged with scales and dorsal spines. Bluegills were aged with scales only. Spines were cross-sectioned and aged under a microscope. Mean length at age was compared to other Simple-Warm-Clear Wisconsin lakes. Size structure was assessed using the proportional size distribution (PSD) indices (Neumann et al. 2013). The PSD value of 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 2).

## Results and Discussion

### NORTHERN PIKE

There were 475 northern pike collected in spring fyke nets for a catch rate of 23.8 fish/net night. This catch rate was a large increase compared to 2008 (4.3 fish/net night) and was also above the 95<sup>th</sup> percentile for Simple-Warm-Clear lakes in Wisconsin. Northern pike ranged in length from 10.0 to 35.0 inches (Figure 1). The average length was 20.9 inches, lower than in 2008 (21.8 inches) but above the 95<sup>th</sup> percentile for Simple-Warm-Clear lakes. The PSD-21 was 60 and PSD-28 was 1, which were less than 2008 (PSD-21=65; PSD-28=5).

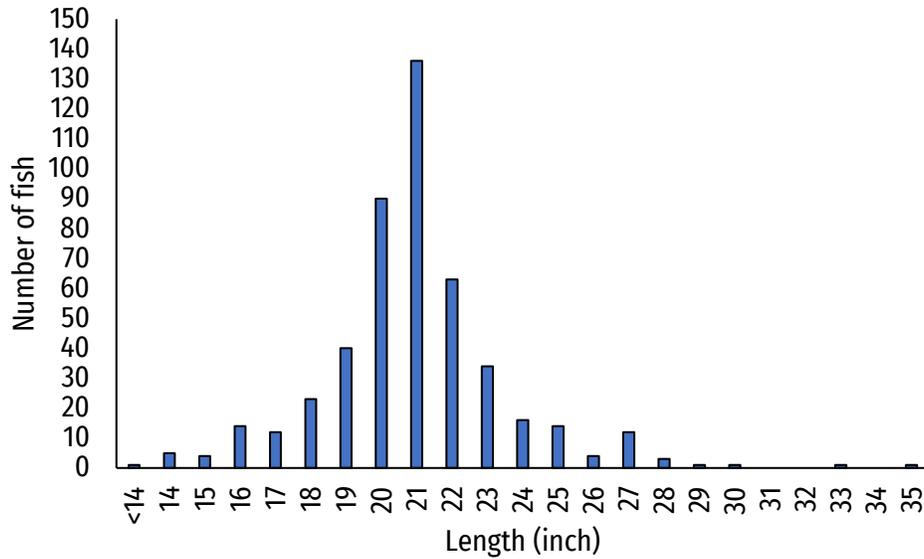


Figure 1. Length frequency of northern pike collected in Spooner Lake during the 2022 SN1 survey (n=475).

The northern pike population was healthy and abundant. The catch rate has increased five-fold compared to 2008. However, the size structure has stayed similar. This suggested pike anglers have ample opportunity to catch and harvest northern pike in Spooner Lake.

### LARGEMOUTH BASS

There were 166 largemouth bass collected during the SE2 survey for a catch rate of 27.6 fish/mile. This catch rate was a decrease from 2008 (32.0 fish/mile) and near the 50<sup>th</sup> percentile for Simple-Warm-Clear lakes. Largemouth bass ranged from 8.5 to 18.5 inches and averaged 14.9 inches (Figure 2), a large increase from 2008 (12.2 inches). This average was above the 95<sup>th</sup> percentile for Simple-Warm-Clear lakes in Wisconsin. The PSD-12 was 95, a large increase from 2008 (61). Largemouth bass had good growth and grew near the lake class average for most ages and was also similar to 2008.

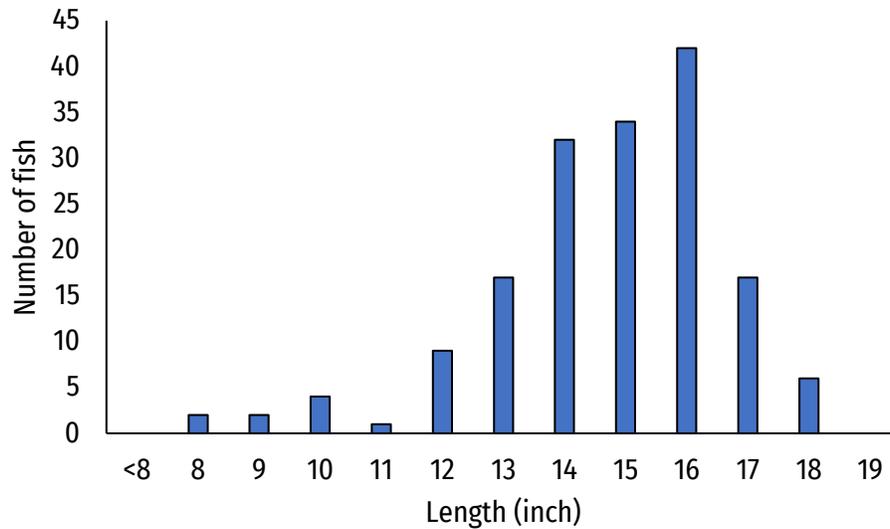


Figure 2. Length frequency of largemouth bass collected in Spooner Lake during the 2022 SE2 survey (n=166).

Largemouth bass abundance dropped slightly while size structure improved since 2008. Overall, the average size and proportion of large bass increased. This change may be related to an increased harvest of small bass. Since 2012, the county-wide regulation has been no minimum size limit, five fish daily bag limit for largemouth bass. The other possibility is the bass population has improved in response to partial winterkills. Either scenario has likely helped create an excellent bass fishery with trophy potential. In addition, Spooner Lake has healthy and abundant aquatic vegetation, which potentially creates better bass size structure by providing good habitat for bluegill.

## PANFISH

There were 597 bluegills collected electrofishing for a catch rate of 398 fish/mile. This catch was a large decrease from 2008 (527.3 fish/mile). This catch is above the 95<sup>th</sup> percentile for Simple-Warm-Clear lakes. Bluegills averaged 5.2 inches, similar to 2008 (5.1 inches) and ranged from 2.6 to 8.8 inches (Figure 3). This average was above the 95<sup>th</sup> percentile for Simple-Warm-Clear lakes. The PSD-6 was 38, a large increase from 14 in 2008. Bluegills grew well below the average for Simple-Warm-Clear lakes; however, this growth was also similar to 2008.

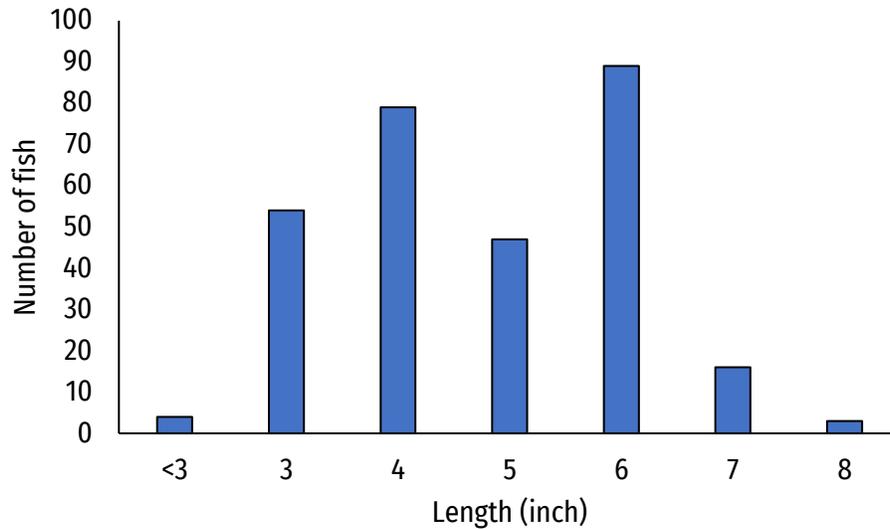


Figure 3. Length frequency of bluegill collected in Spooner Lake during the 2022 SE2 survey (n=292).

There were 194 pumpkinseeds collected electrofishing for a catch rate of 129.3 fish/mile. This catch was a large increase from 2008 (36.7 fish/mile). This catch rate was above the 95<sup>th</sup> percentile for Simple-Warm-Clear lakes. Pumpkinseeds averaged 6.4 inches, similar to 2008 (6.0 inches), and ranged from 2.8 to 8.0 inches. This average was above the 95<sup>th</sup> percentile for Simple-Warm-Clear lakes. The PSD-6 was high at 92.

There were 64 black crappies sampled during the SN1 survey. These fish ranged from 5.0 to 12.9 inches and averaged 7.9 inches (Figure 4). This average was above the 90<sup>th</sup> percentile for Simple-Warm-Clear lakes. Of the sample collected, 56% were greater than 8.0 inches. Due to poor weather conditions and low sample size, catch rate and PSD were not calculated. Hybrid sunfish (12), yellow perch (4) and rock bass (1) were also collected in low numbers.

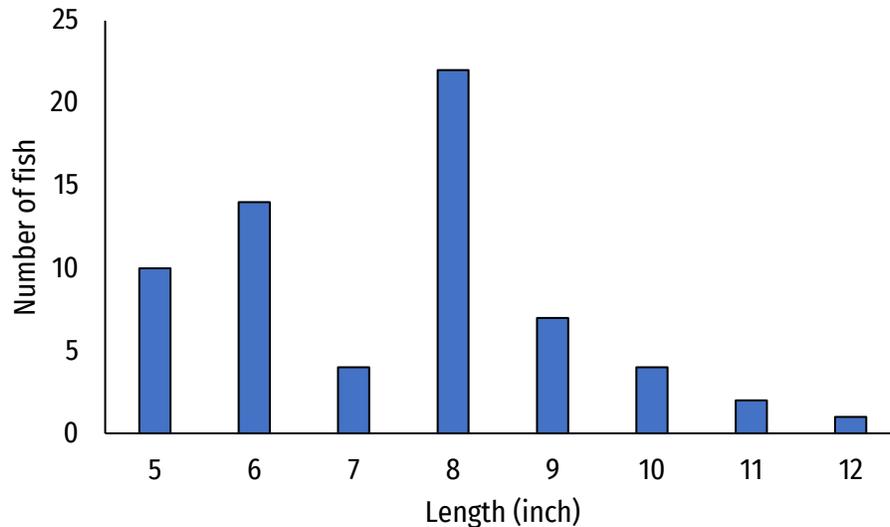


Figure 4. Length frequency of black crappie collected in Spooner Lake during the 2022 SN1 survey (n=64).

Bluegill, pumpkinseed and black crappie are currently the most abundant panfish present in Spooner Lake. Yellow perch were anecdotally found in higher abundances after the most recent winterkill (2013/2014), and winterkills likely drive whether Spooner Lake has a good yellow perch fishery. Bluegill size structure was better than in 2008 but still not at the recommended standards for a panfish fishery (Neumann et al. 2013). Periodic winterkills likely impact the panfish population, with good panfish size structure a few years after the winterkill, followed by overly abundant panfish and smaller average size. However, inducing a winterkill is not a sound fisheries management strategy for creating healthy fish populations.

## Recommendations

1. The northern pike population is healthy and abundant. This population provides a good angling and harvest opportunity, and no management changes are recommended.
2. Largemouth bass have a moderate density with excellent size structure. The no minimum length limit, partial winterkills and aquatic vegetation seem to have helped create this fishery with trophy potential. No management changes are recommended.
3. Bluegills are overabundant in Spooner Lake though size structure has improved since 2008. However, increased harvest is unlikely to improve their size structure. Therefore, no management changes are recommended.
4. Black crappies have a good average size based on our sample. There are no management changes recommended for this species.
5. Yellow perch are present at low densities. This species likely becomes more abundant following a partial winterkill. Due to these circumstances, no management changes are recommended.

6. Drawdowns/winterkills have shown the ability to change the fishery in Spooner Lake, benefitting some species (northern pike and yellow perch) while potentially hurting others (largemouth bass, black crappie and bluegill). This management tool should not be used for fisheries since it would likely further reduce bass densities and potentially create a more unbalanced fishery. Largemouth bass are more susceptible to winterkills, and a severe winterkill created by a drawdown may create long-term imbalances in the whole fishery where bass are at too low of densities and bluegill are smaller and even more abundant.
7. Efforts to increase habitat complexity in the Spooner Lake system should also be encouraged, where applicable. Inputs of coarse woody habitat, protection/promotion of aquatic vegetation and maintenance/restoration of vegetative buffers are needed habitat work in Spooner Lake. This website <https://healthylakeswi.com/> is a great resource to learn more.
8. 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.

## Acknowledgements

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## References

- 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.
- Neumann, R.M., C.S. Guy, and D.W. Willis. 2013. Length, weight, and associated indices. Pages 637-676 in A.V. Zale, D.L. Parrish, and T.M. Sutton, editors. Fisheries techniques, 3<sup>rd</sup> edition. American Fisheries Society, Bethesda, Maryland.

Appendix Table 1. 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 2. Proportional size distribution 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