

2022 Comprehensive Fish Survey Summary Report

Cedar Lake (WBIC 45100)

Manitowoc County

Introduction and Objectives

In 2022, the Department of Natural Resources conducted a comprehensive fish survey of Cedar Lake in order to provide insight and direction for the future fisheries management of this lake. Comprehensive fish surveys include both spring fyke netting and spring electrofishing surveys. Primary sampling objectives of these surveys are to characterize species composition, relative abundance, and size structure. The following report is a brief summary of the activities conducted, general status of fish populations and future management options for Cedar Lake.

Acres: 131 Lake Type: Drainage Lake Regulations: Statewide Default Regulations Shoreline Miles: 3.57 Public Access: 1 Public Boat Launch Lake Class: Simple Cool Clear Maximum Depth (feet): 21

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Survey Methods

- Cedar Lake was sampled according to spring netting I (SNI), and spring electrofishing II (SEII)
 protocols as outlined in the statewide lake sampling protocols. The primary objective of the
 spring fyke netting I survey is to count and measure adult northern pike, walleye, and panfish.
 The primary objective of the spring electrofishing II survey is to count and measure adult
 largemouth bass, and panfish. Other species of fish may be sampled during each survey, but are
 considered by-catch as part of that survey.
- Spring fyke netting takes place shortly after ice out when northern pike and walleye begin to spawn. Northern pike typically spawn in near shore, emergent vegetation shortly after ice out when water temperatures are 35 40°F. Walleyes typically spawn over clean gravel and cobble when water temperatures are 38 44°F. Fyke nets were deployed in areas of Cedar Lake that contained spawning habitat or were likely travel areas for northern pike. While walleye were not a focal species for the netting survey, two nets were set in areas with more rocky substrates and nets were run until water temperatures reached 46°F, meaning walleyes could be encountered during this survey. All captured fish were identified to species and gamefish and panfish were measured for length. Age structures (i.e., otoliths, fin rays, and spines) were collected from a subsample of northern pike, bluegill, and black crappie for age and growth analysis.
- Spring electrofishing takes place later in the spring when water temperatures reach 60 70°F and largemouth bass and panfish move shallow to spawn. All fish captured were identified to species and gamefish and panfish were measured for length.
- Fish metrics used to describe fish populations include catch per unit effort, proportional stock density, length frequency distribution, and mean length at age.



Figure 1. Northern pike captured in DNR survey. Photo credit DNR.

FKYE NETTING SURVEY INFORMATION											
Site Location Survey Dates		/ Dates	Water Temperature (°F)		Target Species		Gear	Number of N	lets	Net Nights	
Cedar Lake	ke 4/7/2022 - 4/13/2022		36 - 46ºF		1	Northern pike and panfish		Fyke Netting	5		20
			SPI	RING ELECTR	OFISH	IING II SURVEY INFORI	MATIO	N			
Site Location	Survey Date	te Water Temperature (°F) Targe		Target Spec	et Species Total Miles Shocked		Number of Stations		Gear	I	Number of Netters
Cedar Lake	5/18/2022	67		Bass and panfish		2.5	3		Boomshocker		2

Fish Metric Descriptions

Catch per unit effort (CPUE) is an index used to measure fish population relative abundance, which simply refers to the number of fish captured per unit of distance or time. For netting surveys, we typically quantify CPUE by the number and size of fish per net night (NN). For electrofishing surveys, we typically quantify CPUE by the number and size of fish captured per (/) mile of shoreline. CPUE indexes are compared to statewide data by percentiles and within lake trends. For example, if a CPUE is in the 90th percentile, it is higher than 90% of the other CPUEs in the state. CPUE indexes are also compared to lakes within the same lake class (i.e., lakes with similar clarity, temperature regimes, and fish communities).

Proportional Stock Density (PSD) is an index used to describe size structure of fish populations. It is calculated by dividing the number of quality size fish by the number of stock size fish for a given species. PSD values between 40 - 60 generally describe a balanced fish population.

Length frequency distribution (LFD) is a graphical representation of the number or percentage of fish captured by half inch or one inch size intervals. Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.

Mean Length at Age is an index used to assess fish growth. Calcified structures (e.g., otoliths, spines, or fin rays) are collected from fish of all sizes that are present in the sample. Mean lengths at ages are calculated as the average length of all fish of a given age.



Figure 2. Largemouth bass captured in DNR survey. Photo credit DNR.



Gamefish Summary

Manitowoc County

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- Size structure of largemouth bass in 2022 was moderate - high with a PSD of 75, which is slightly higher than electrofishing surveys in previous vears. Furthermore, catch rates of legal size (i.e., ≥14 inches) largemouth bass was 14.4/mile. ranking among the highest catch rates in the state
- Largemouth bass growth rates in Cedar Lake in 2022 were similar to statewide rates.



Figure 3. Largemouth bass captured in DNR electrofishing survey. Photo credit DNR.





Panfish Summary

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Bluegill

Spring electrofishing is the primary protocol for evaluating bluegill populations. Spring fyke netting can be effective at sampling bluegills. However, very
few bluegills were captured in the fyke netting survey due to the cold water temperatures. Therefore, only results from the electrofishing survey will be
presented for bluegill.

						2022 SIZE STRUC		IETRICS					
Gear Number Average Le Measured (inches		Average Ler (inches)	igth L	ength Range (inches)	Stock and Quality Sizes (inches)		Stock Number	Quality Number	PSD	Percentile Rar	nk Size Rating		
Electro	fishing	72	4.9		2.4 - 7.4 3.0 and 6.0 inc		hes	69	13	19	28th	Low - Moderate	
	202	2 ELECTRO	ISHING CPU	E (NUM	BER PER MILE)	ELECTROFISHING CPUE (NUMBER PER MILE) TRENDS						
		Overall								Historical Madian			
CPUE Total	Percentile Rank	Abundance Rating	Length Index	Index CPUE	Percentile Rank	Abundance Rating	20	06	2010	2016	2022	HIStorical Median	
							36	6.0	56.8	90.3	72.0	64.4	
72	45th	Moderate	≥ 7.0 inches	2	30th	Low - Moderate	ELECTROFISHING SIZE STRUCTURE (PSD) TRENDS						
		•							PSD by	Year			

2006

5

2010

16



Bluegill Length Frequency Distribution

2022

19

2016

51

Historical Median

18





Panfish Summary

Manitowoc County

Pumpkinseed

 Spring electrofishing is the primary protocol for evaluating pumpkinseed populations. Spring fyke netting can be effective at sampling pumpkinseed. However, very few pumpkinseeds were captured in the fyke netting survey due to the cold water temperatures. Therefore, only results from the electrofishing survey will be presented for pumpkinseeds.

	2022 SIZE STRUCTURE METRICS											
Gear	Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Sizes (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating			
Electrofishing	18	6.3	3.8 - 7.6	3.0 and 6.0 inches	18	14	78	92nd	High			





5	(inches)		Numb		er					-			
d 6.0 inches 18			14		78	92	nd		High				
	2022 ELECTROFISHING CPUE (NUMBER PER MILE)												
	CPUE Total	CPUE Percentile Total Rank		Overall Abundance Rating		Length Index	Length Index CPUE	Leng Per R	th Index centile lank	Length Index Abundance Rating			
	18.0		73rd	Moderate - I	ligh	≥ 7.0 inches	5.0	ε	39th	High			
	ELECTROFISHING CPUE (NUMBER PER MILE) TRENDS												
				CPUE b	y Ye	ar			Histo	rical Madian			
	2006			2010		2016	2022		HISLO				
	1.7			22.4		0.0	18.0			9.9			
	ELECTROFISHING SIZE STRUCTURE (PSD) TRENDS												
	PSD by Year												
	200)6		2010		2016	2022		insto				
	100		47		-	78	78		78				

Yellow Perch

Fyke netting is the preferred sampling gear for yellow perch. All results presented for yellow perch are from spring fyke netting surveys.

	2022 SIZE STRUCTURE METRICS											
Gear	Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Sizes (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating			
Fyke Netting	5	7.4	5.5 - 9.8	5.0 and 8.0 inches	5	2	40	79th	High			

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FYKE NETTING CPUE (NUMBER PER NET NIGHT) TRENDS										
2022 Number Sampled	22 Number Sampled2006201020162022Historical Median2022 Statewide 									
5	0.3	0.1	0.0	0.2	0.2	15th		Low		
FYKE NETTING SIZE STRUCTURE (PSD) TRENDS										
		PSD I	by Year				Llie	tariaal Madian		
2006		2010		2016	2022		HIS	torical median		



Total Length (Half Inch Class)

Panfish Summary

40

- Catch rates of black crappie in the spring 2022 fyke netting survey were moderate at 2.0 per NN. This catch rate
 ranks out in the 39th percentile for lakes in Wisconsin and is similar to the median catch rate for simple cool clear
 lakes. Additionally, catch rates have remained relatively stable through time indicating similar densities through
 time.
- Black crappie size structure in 2022 was also moderate with a PSD of 64.

25

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- Black crappie growth rates in 2022 were slightly below the statewide average, but black crappies were still growing to sizes anglers prefer with about 1/3 of the black crappies captured being ≥9 inches.
- Catch rates of bluegill in 2022 were moderate at 72.0 bluegills/mile. This catch rate ranks out in the 45th percentile for lakes in Wisconsin and is just under the median catch rate for simple cool clear lakes. Furthermore, bluegill catch rates in 2022 were lower than 2016 catch rates (90.3/mile).
- Bluegill size structure in 2022 was poor with a PSD of 19 and a catch rate of bluegill ≥7 inches at only 2.0/mile. Furthermore, the biggest bluegill captured in the electrofishing survey was only 7.4 inches. The 2022 PSD was lower than the 2016 electrofishing survey (51) and bluegill up to 8.3 inches were captured.
- Growth rates of bluegill in 2022 were well below the statewide average.
- Catch rates of pumpkinseed in 2022 were moderate high at 18.0/mile. This catch rate ranks out in the 73rd percentile for lakes in Wisconsin and is near the 75th percentile for simple cool clear lakes.
- Pumpkinseed size structure in 2022 was high with a PSD of 78 and a catch rate of pumpkinseed ≥7 inches at 5.0/ mile.
- Catch rates of yellow perch in 2022 were low at 0.2 per NN. This catch rate is very similar to catch rates in
 previous fyke netting surveys and is near the 25th percentile for simple cool clear lakes.
- While densities of yellow perch are low, two of the five yellow perch captured in 2022 were >9 inches, indicating they are capable of growing to sizes desired by anglers.



Figure 4. DNR crew electrofishing Cedar Lake. Photo credit Scott Otterson.



Stocking History, Final Summary, and Management Recommendations

Manitowoc County

Stocking History 1972 - Present												
Species	Year	Age	Mean Length (inches)	Number Stocked								
WALLEYE	2014	Yearling	6.0	1990								
WALLEYE	2013	Yearling	7.0	Unknown								
YELLOW PERCH	2013	Yearling	6.0	2000								
YELLOW PERCH	2008	Yearling	6.0	1875								
WALLEYE	2008	Large Fingerling	6.0	2049								
WALLEYE	2004	Yearling	5.5	2000								
YELLOW PERCH	2004	Yearling	5.5	1867								
NORTHERN PIKE	1975	Yearling	Unknown	900								



Figure 6. DNR staff measuring a norther pike caught in a fyke netting survey on Cedar Lake. Photo credit Scott Otterson.



Figure 7. Bluegills caught in a DNR fyke netting survey. Photo credit DNR.

Final Summary and Management Recommendations

Northern Pike:

- Catch rates of northern pike were very high in 2022.
- Size structure and growth rates of northern pike were poor.
- Only four legal size northern pike were captured.
- Recommend changing the northern pike regulation to a 25 35 inch protected slot limit with a daily bag limit of 2 northern pike and submit a regulation change proposal for spring hearings. This will allow harvest of some of the smaller, slow growing northern pike and protect the fastest growing fish that grow into the slot limit. Hopefully this improves the overall quality of the northern pike fishery.

Largemouth Bass:

- Catch rates of largemouth bass were moderate high in 2022.
- Largemouth bass size structure was very good with growth rates similar to the statewide average.
- No additional management actions are recommended at this time.

Walleye:

- Six walleyes ranging in size from 23.5 27.8 inches were captured in the 2022 spring fyke netting survey.
- These walleyes were likely from previous stockings that took place between 2004 - 2014.
- Only nine walleyes were captured in the spring 2016 fyke netting survey despite 72 NN of effort. These walleyes ranged in size from 15.1 26.2 inches with an average length of 21 inches.
- If there is a desire for a walleye fishery in Cedar Lake, lake groups could consider resuming stockings since there is no evidence of natural reproduction by walleyes in the lake.

Panfish:

- Catch rates of both black crappie were moderate in 2022 and size structure was also moderate with growth rates slightly below the statewide average.
- Pumpkinseed and yellow perch provide additional fishing opportunities for anglers targeting panfish.
- Bluegill catch rates declined in 2022 (72/mile) compared to 2016 (90/mile). Size structure was poor in the 2022 survey (PSD 19), a decrease from the 2016 survey (PSD 51).
- Cedar Lake residents have noted increased angler pressure that may be attributed to other area lakes having reduced bag limits and led to increased panfish harvest on Cedar Lake.
- Reducing the bag limit on panfish should be considered to maintain bluegill density and improve size structure. Reducing the panfish bag limit would also help maintain the quality of the black crappie fishery.

Other Management Recommendations:

- Consider adding coarse woody habitat along the shoreline where feasible. Coarse woody habitat is vital for fish spawning, to provide protection for small fish from predation, and to provide habitat for large predators to ambush prey from.
- Where necessary and feasible, work with DNR staff to control invasive aquatic plants.
- Continue to conduct stakeholder and public outreach regarding the Cedar Lake fishery and fisheries management actions.



Figure 5. Northern pike captured in DNR fyke netting survey. Photo credit DNR.