

SEII Summary Report Bughs Lake, Waushara County WBIC: 102100

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### **Introduction And Objectives**

In 2022, the Wisconsin Department of Natural Resources (DNR) conducted a one night electrofishing survey of Bughs Lake in order to provide insight and direction for the future fisheries management of this water body. Primary sampling objectives of this survey were to characterize species composition, relative abundance, and size structure. The following report is a brief summary of that survey including the general status of the fish populations and future management options for Bughs Lake.

	SURVEY INFORMATION							
Site Location	Survey Dates	Water Temperature (°F)	Target Species	Gear				
Bughs Lake	05/10/2023	64.8	Bass and Panfish	Electroshocking				

### **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. For electrofishing, we quantify CPUE as the number caught per mile of water electrofished. 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.
- Total abundance is a metric that describes population size and is estimated by mark and recapture. In
  our study, all captured (insert species) were given a partial caudal fin (i.e., tail fin) clip and released. Each time
  the nets were checked, all (insert species) were examined for a partial caudal fin clip. The number of previously
  captured individuals (i.e., fin clipped) was recorded, and proportions of marked individuals to unmarked
  individuals were used to estimate the total abundance of the (insert species) population.
- Proportional Stock Density (PSD) is an index used to describe the 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 age at length is an index used to assess fish growth. Calcified structures (e.g., otoliths, spines or scales) are collected from a specified length bin of interest (e.g., 7.0-7.5 inches for bluegill). Mean age is compared to statewide data by percentile with growth characterized by the following benchmarks: slow (<33rd percentile); moderate (33rd to 66th percentile); and fast (>66th percentile).
- Relative weight is an index used to assess the plumpness (i.e., condition) of fish. It is calculated by comparing the observed weight of a fish to the standard weight (i.e., predicted average weight) of that fish, given its length. A relative weight of 93 means it has average plumpness/weight compared to other fish of the same length. Relative weights above 93 mean it is more plump than average.

### DNR Contact

Scott Bunde - Fisheries Biologist Senior 427 E Tower Dr. Suite 100 Wautoma, WI. 54982 Phone: 920-787-5683 Email: Scott.Bunde@wisconsin.gov

#### Lake Information

Acres: 30 Max. Depth: 18 ft Shoreline Miles: 0.79+ Public Access: 1 Lake Class: Simple Warm Dark

#### Regulations: Minimum length, Bag

Panfish: no minimum, 25 bag Largemouth Bass: 14 inch, 5 bag Northern Pike: 26 inch, 2 bag

### **Survey Method**

- Bughs Lake was sampled according to spring electroshocking (SEII) protocols as outlined in DNR Fisheries Monitoring Protocols. The primary objective for these sampling periods is to count and measure adult bass and panfish. Other gamefish/ panfish may be sampled but are considered by-catch as part of this survey.
- Boom shockers were used to electrofish 0.7 miles of shoreline. Gamefish and panfish were collected and measured throughout.

	RELATIVE A		— CATCH PER	R UNIT EFF	ORT (CPUE)		
Species	Total Number Captured	Average Length (Inches)	Length Range (inches)	CPUE/Mile	Statewide Percentile	Lake Class Percentile	Overall Abundance Rating
Bluegill	313	4.19	2.7 - 6.9	447.1	96th	95th	High
Pumpkinseed	45	6.04	4.6 - 7.5	64.2	95th	90th	High
Yellow perch	3	3.95	3.5 - 5.1	5.7	35th	-	Low
Largemouth bass	50	12.46	6.6 - 16.8	71.4	92nd	75th	High
Northern pike	10	21.62	18.7 - 24.6	14.2	98th	-	High



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				Bughs	Lak	e Bluegill				
				YEAR SIZE S	TRUC	TURE METRIC	S			
Total Numbe Measured	r Average (inc	e Length hes)	Length Range (inches)	Stock and Quality (inches)	Size	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
313	4.	19	2.7 - 6.9	3 and 6		211	8	4	4th	Low
RELA	TIVE ABU	NDANCE (C	PUE = NUMBE	R PER MILE)			Bluegill Len	gth Distrib	ution	
2014	2023	Historical Average	2023 Statewi Percentile Ra	ide 2023 Abundance Rating	e P	90 80 70				
630	447.1	539	96th	High	mple	50				
	SIZE	STRUCTUR	E (PSD) TRENI	DS	mber Sa	40 30				
	PSD by Ye	ar			٦R	20				

SI	SIZE STRUCTURE (PSD) TRENDS								
PSD by	Year	Listeria d Madian							
2014	2023	Historical Median							
1	4	2.5							
AVER	AGE BLUEGILL	AGE AT 6 INCHES							

Sex	Count	Average Age	Age Range	Lake Class Rating	Regional Rating
Male	8	6.125	5 - 7	Below Average	Below Average
Female	0	-	-	-	-
All	8	6.125	5 - 7	Below Average	Below Average



## **Bughs Lake Pumpkinseed**

20 10 0

YEAR SIZE STRUCTURE METRICS								
Total Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
45	6.04	4.6 - 7.5	3 and 6	45	24	53	70th	Moderately High

RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)									
2014	2023	Historical Average	2023 Statewide Percentile Rank	2023 Abundance Rating					
73	64	68.5	95th	High					

### Pumpkinseed Length Distribution





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	Bughs Lake Black Crappie       SIZE STRUCTURE METRICS       Number     Average Length (inches)     Length Range (inches)     2014     2023     Historical Average     2023 Statewide Percentile Rank     2023 Abundance Rating       2     9.4     7.9     10.9     0     0.4     0.00     1.4     0.00     0.00							
SI	ZE STRUCTURE MET	TRICS		RELATIVE A	BUNDANCE (CP	UE = NUMBER PER MI	LE)	
Total Number Measured	Average Length (inches)	Length Range (inches)	2014	2023	Historical Average	2023 Statewide Percentile Rank	2023 Abundance Rating	
2	9.4	7.9 - 10.9	0	2.8	1.4	30th	Low	

		B	ughs Lake	Yellow Po	erch		
SI	ZE STRUCTURE MET	TRICS	RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE				LE)
Total Number Measured	Average Length (inches)	Length Range (inches)	2014	2023	Historical Average	2023 Statewide Percentile Rank	2023 Abundance Rating
4	3.95	3.5 - 5.1	0	5.7	2.9	35	Low

### **Bughs Lake Walleye**

	SIZE STRUCTURE MET	RICS		RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)			
Total Number Measured	al Number leasured Average Length (inches) Length Range (inches)			2023	2023 Statewide Percentile Rank	2023 Abundance Rating	
3	16.5	11 - 19.6					
5	10.5			4.3	33rd	Low	

## Bughs Lake Largemouth Bass

			YEAR SIZE STRUC	TURE METRICS	6			
Total Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
50	12.46	6.6 - 16.8	8 and 12	49	27	55	43rd	Moderate

	RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)											
2014	014 2023 Historical Lak Average Perce		Historical Average		Lake Class Percentile Rank			Lake Class 202 Percentile Rank Per		2023 Statewide Percentile Rank		2023 Abundance Rating
31.4	71	1.4	103	3	85th				92nd	High		
SIZE STRUCTURE (PSD) TRENDS												
		PS	D by Ye	ear					Listerias Aver			
	201	4		2023					HISTORICAI AVER	age		
	86	6			55				70.5			
	AV	ERA	GE LA	RGE	MOUTH	BA	SS A	G	E AT 12 INCH	IES		
Sex	¢	Co	ount	Avei	rage Age	Age Rang		ge	Lake Class Rating	Regional Rating		
All			8		4.75 4		4 - 5		Above Average	Above		

# Largemouth Bass Length Distribution



## **Bughs Lake Northern Pike**

RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)						
2014	2023	Historical Average	2023 Statewide Percentile Rank	2023 Abundance Rating		
4.3	14.2	9.3	98th	High		

YEAR SIZE STRUCTURE METRICS					
Total Number	Average Length	Length Range			
10	21.62	18.7 - 24.6			



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### Summary

#### Bluegill

- Abundance has declined slightly since the 2014 survey; At 447.1 per mile it ranks in the 96th percentile statewide.
- Size structure has not changed significantly since the survey in 2014. PSD = 4% is very low and ranks in the 4th percentile.
- Age structures show below average growth taking 6.1 years to reach 6.0 inches in length.
- An ideal management option would be to decrease the abundance to under 300/mile and size structure (PSD = 40-60%).

#### Pumpkinseed

- Abundance has stayed relatively unchanged and it would be ideal to decrease pumpkinseed numbers.
- Size structure is good with 53% of fish larger than 3 inches also larger than 6 inches.(70th percentile.
- An ideal management option would be to maintain abundance around 70/mile and increase size structure to more than PSD=60.

### Largemouth Bass

- Abundance of 71.4 per mile has increased two fold when compared to the previous survey (31.4/mile) and is at a high level (85th percentile) compared to lakes in same lake class.
- Size structure of PSD = 55 is moderate and down from survey in 2014 where PSD = 86; Size structure ranking is in the 43rd percentile.
- The recommended management would be to maintain abundance between 50 –75/mile and size structure (PSD = 50 to70 %). Our goal is to maintain or increase density of largemouth bass to maintain or increase predation on bluegill with the goal of improving bluegill growth.

#### **Northern Pike**

• This type of survey is not meant to assess the northern pike population, but at 14.2/mile the abundance has increased from 2014 when we sampled 4.3/mile.

#### Walleye

Bughs Lake is not being managed for walleye, but they have been stocked at low numbers almost annually since 2015 as an attempt to control the overabundant panfish population and provide some fishing opportunity. This type of survey is not meant to assess the walleye population, but at 4.3/mile the abundance is low in the 33rd percentile statewide. Continued the provide some provide some fishing opportunity is not mean to assess the walleye population.

stocking may provide a limited fishery but has not proven to be effective at balancing out the fishery and reducing the abundant small panfish.

#### Habitat

• An increase in nearshore woody habitat would be beneficial to the bass population and generally improve the fishery. Recent reductions in EWM in the lake might also contribute to more efficient predation.

#### Other Species

• Other species sampled were pumpkinseed x bluegill cross(26), green sunfish x pumpkinseed cross(4), yellow bullhead(2), brown bullhead(2) and golden shiners (2).





Shocking Boat Used