WISCONSIN DEPARTMENT OF NATURAL RESOURCES

2023 SEII Summary Report

Big Twin Lake , Waushara County

WBIC: 182300

Introduction And Objectives

In 2023, the Wisconsin Department of Natural Resources DNR conducted a one night electrofishing survey of Big Twin 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 Big Twin Lake.

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Lake Information

Acres: 93
Max. Depth: 13 ft
Shoreline Miles: 2.4+
Public Access: 1
Lake Class: Simple Warm Clear

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

SURVEY INFORMATION				
Site Location	**Survey Dates**	**Water Temperature (°F)**	**Target Species**	**Gear**
Big Twin Lake	05/25/2023	65	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.

Survey Method

- Big Twin 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 2.04 miles of shoreline. Gamefish were collected and measured throughout, and panfish were collected and counted along 1 mile.

RELATIVE ABUNDANCE — CATCH PER UNIT EFFORT (CPUE)							
Species	**Total Number Captured**	**Average Length (Inches)**	**Length Range (inches)**	**CPUE/Mile**	**Statewide Percentile**	**Lake Class Percentile**	**Overall Abundance Rating**
Bluegill	191	4	1.5 – 8.3	191	78th	65th	Moderate
Pumpkinseed	24	6.4	3.3 – 8.2	24	81st	75th	High
Yellow perch	1	7.4	7.4	1	6th	-	Low
Largemouth bass	207	12.4	5.9 – 18	101.4	96th	93rd	High
Northern pike	10	17.4	14.4 – 28	4.9	83rd	-	High

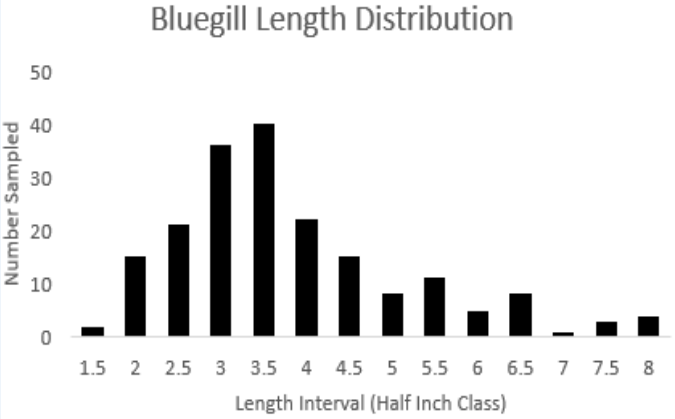
Big Twin Bluegill

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
191	4	1.5 – 8.3	3 and 6	153	21	14	10th	Low

RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)						
2005	2012	2023	Historical Average	2023 Lake Class Percentile Rank	2023 Statewide Percentile Rank	2023 Abundance Rating
624	258	191	357.7	65th	78th	Moderate

SIZE STRUCTURE (PSD) TRENDS			
PSD by Year			Historical Average
2005	2012	2023	
4	11	14	12.5

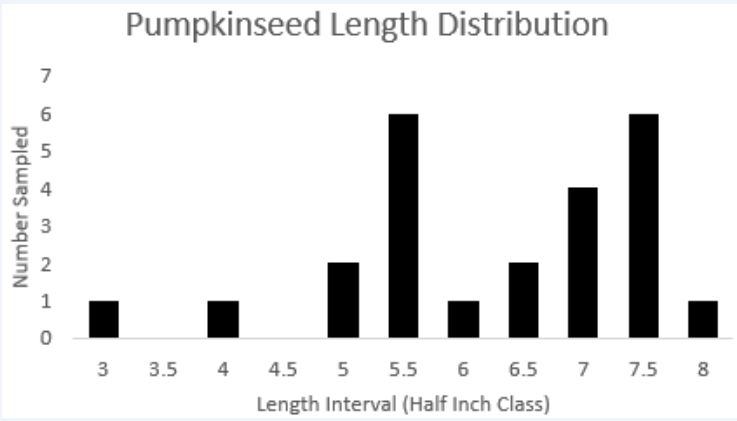
AVERAGE BLUEGILL AGE AT 6 INCHES					
Sex	Count	Average Age	Age Range	Lake Class Rating	Regional Rating
Male	6	5.75	5 –7	Average	Average
Female	3	7	7	Below Average	Below Average
All	9	6.37	5 –7	Below Average	Below



Big Twin Pumpkinseed

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
24	6.4	3.3 – 8.2	3 and 6	24	14	58	73th	Moderate

RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)					
2012	2023	Historical Average	2023 Lake Class Percentile Rank	2023 Statewide Percentile Rank	2023 Abundance Rating
63	24	43.5	78th	81st	High



Big Twin Black Crappie

SIZE STRUCTURE METRICS		
Total Number Measured	Average Length (inches)	Length Range (inches)
2	9	8.5 –9.5

RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)				
2012	2023	Historical Aver-age	2023 Statewide Percentile Rank	2023 Abundance Rating
5	2	3.5	24th	Low

Big Twin Yellow Perch

SIZE STRUCTURE METRICS		
Total Number Measured	Average Length (inches)	Length Range (inches)
1	7.4	–

RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)				
2012	2023	Historical Average	2023 Statewide Percentile Rank	2023 Abundance Rating
2	1	1.5	6th	Low

Big Twin Rock Bass

SIZE STRUCTURE METRICS		
Total Number Measured	Average Length (inches)	Length Range (inches)
22	5.27	3.3 –8.3

RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)				
2012	2023	Historical Average	2023 Statewide Percentile Rank	2023 Abundance Rating
0	22	11	84th	High

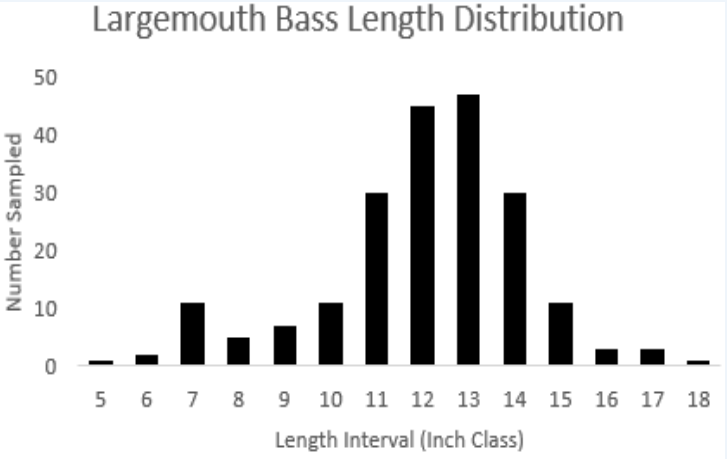
Big Twin Largemouth Bass

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
207	12.4	5.9 – 18	8 and 12	193	140	73	74th	Moderately High

RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)					
2005	2012	2023	Historical Average	2023 Statewide Percentile Rank	2023 Abundance Rating
24.6	95	101.4	73.7	96th	High

SIZE STRUCTURE (PSD) TRENDS			
PSD by Year			Historical Average
2005	2012	2023	
73	45	73	64

AVERAGE LARGEMOUTH BASS AGE AT 12 INCHES					
Sex	Count	Average Age	Age Range	Lake Class Rating	Regional Rating
All	8	4	3 - 5	Above Average	Above Average



Big Twin Northern Pike

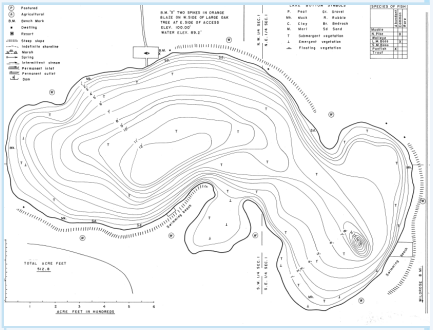
RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)					
2005	2012	2023	Historical Average	2023 Statewide Percentile Rank	2023 Abundance Rating
5.7	10	4.2	6.6	84th	High

YEAR SIZE STRUCTURE METRICS			
Year	Total Number	Average Length	Length Range
2005	10	17.0	14.8 - 19.6
2012	10	18.8	15.5- 21.0
2023	10	17.4	14.7 –18.2

Summary

Bluegill

- Abundance is down slightly since the 2012 survey and significantly lower than 2005. At 191 per mile it ranks in the 78th percentile statewide and 65th percentile compared to lakes in same class.
- Size structure is slightly higher from the survey in 2012. PSD = 14% is low and ranks 10th for a percentile. An ideal bluegill fishery would have slightly higher abundance (200-250/mile) and higher size structure (PSD = 40-60). However, since abundance is a bit lower and we are still observing slow growth and low size structure, our management goal is to continue to monitor this population to determine if the growth rate still remains slow given the current lower density
- Age structures show below average growth with fish taking 6.37 years on average to reach 6 inches in length.



Big Twin Lake

Waushara County

Largemouth Bass

- Abundance of 101.4 per mile has increased slightly when compared to the previous survey (95/ mile) and is at a high level (96th percentile). Bass abundance has increased 4 fold from 2005 survey of 25 per mile.
- Size structure of PSD = 73 is good and higher then the survey in 2012 where PSD = 45. Size structure has been moderate the last 3 surveys and current size structure ranking is in the 74th percentile. Even the increased numbers of quality sized fish (> 12.0") did not contribute to increased abundance of preferred (20") fish. An ideal management option would be to maintain abundance less than 100/mile and maintaining a PSD = 50-70%.

Northern Pike

- This type of survey is not meant to assess the northern pike population, but at 4.2/mile the abundance has slightly declined from 10/mile in 2012 but is similar to the 2005 survey. Abundance rating is still high and in the 84th percentile. Big Twin would be a good candidate for removal of the size and bag restrictions on northern pike. Future management should include collection of an age sample from northern pike to help with this decision making.

Walleye

- This type of survey is not meant to assess the walleye population and only 2 were sampled. Walleyes are stocked almost every other year by the local We Really Kare fishing Club. Numbers are typically low, but provide an opportunity to catch an occasional quality fish.

Shocking Boat, Photo by DNR

Habitat Improvements

- The addition of nearshore wood and vegetation is imperative to a healthy bass fishery, and can improve the fishery in general.

Other species

- We also sampled warmouth(22).

Lake History Synopsis

Big Twin Lake is a 93 acre clear water seepage lake with a maximum depth of 13 feet. A number of severe winterkills have been documented on Big Twin Lake since our records began in the early 1950's. The most severe occurred in the winters of 1958-59, 1966-67 and 1977-78. Each of these were followed by reintroductions of northern pike, largemouth bass and panfish. Big Twin Lake experiences large fluctuations in water level due to its location in the watershed. This combined with abundant aquatic plant life makes it susceptible to periodic winterkills, especially in years of early ice and heavy snow cover. A partial winterkill was reported winter of 2007-08. Past surveys were completed in May 1964, July 1968, May 1970 and a comprehensive survey in 1998. The 1964 survey was a seine haul to get a representative sample of the fishery. An abundant northern pike population was reported from 9.0 - 35.0 inches. A good population of largemouth bass and bluegill were sampled also, both having good size structure. In 1968 a boomshocking run was done to evaluate the winterkill of 1966-67, it was determined that the winterkill was a severe one with very few fish of any species observed. A seine haul was made in May 1970 to further evaluate the winterkill 1966-67 recovery. All species had pulled off natural hatches and an abundant northern pike population was observed. Bluegills had become overabundant.

In 1998 a comprehensive survey was done on Big Twin. Largemouth bass and northern pike were the dominant gamefish. Walleyes were present at very low numbers, relying solely on stocking for existence. The bass displayed good growth rates and size structure was excellent. Northern pike abundance was slightly above average , with poor growth rates and size structure. Bluegill and pumpkinseed were the dominant panfish sampled and were found to be abundant (426/hr). Growth rates, condition and size structure were all poor. In the fall of 2005 a fall shocking survey was done on Big Twin. Largemouth bass were found to be at low numbers (31/hour > 8 inches) but good size structure (PSD12=73, RSD14=58). Growth rates were slightly below average (14.5 inches after 7 years). Ten northern pike were sampled (14.8 - 19.6 inches). Bluegills were very abundant with catch rates = 1018/hour > 3 inches. Size structure was poor (PSD6 = 4) and growth rates were below average (5.8 inches after 6