WISCONSIN DEPARTMENT OF NATURAL RESOURCES

2021 Electrofishing Summary Report
Shadow Lake, Waupaca County
258600

Introduction And Objectives

In 2021, the Wisconsin Department of Natural Resources (DNR) conducted a one night electrofishing survey of Shadow Lake in order to provide insight and direction for the future fisheries management of this water body. The primary sampling objectives of this survey were to characterize species composition, relative abundance and size structure of bass and panfish species. The following report is a brief summary of that survey including the general status of the fish populations and future management options for Shadow Lake.

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Lake Information
Acres: 44
Max. Depth: 41 feet
Shoreline Miles: 1.14 miles
Public Access: 1 boat landing
Lake Class: Complex - Warm - Clear

Regulations
Statewide default regulations; except during May and June 15 panfish may be kept , but only five of any one species

SURVEY INFORMATION

Site Location	Survey Dates	Water Temperature (°F)	Target Species	Total Miles Shocked	Number of Stations	Gear	Number of Netters
Shadow Lake	05/21/2021	70	All	1.12	3	Boomshocker	2

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.
- **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).

Survey Method

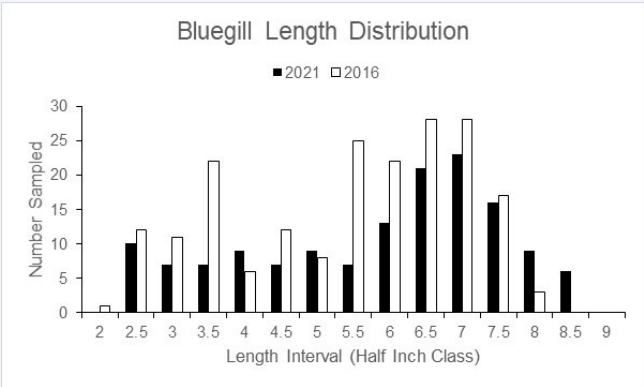
- Shadow Lake was sampled according to Spring Electrofishing II protocols as outlined in DNR Fisheries Monitoring Protocols. The primary objective for these sampling periods is to count and measure bass and panfish. Other gamefish and panfish may be sampled but are considered by-catch as part of this survey.
- Boom shockers were used to electrofish 1.14 miles of shoreline. Gamefish were collected and measured throughout. Panfish were collected and counted along 1.14 miles as well.

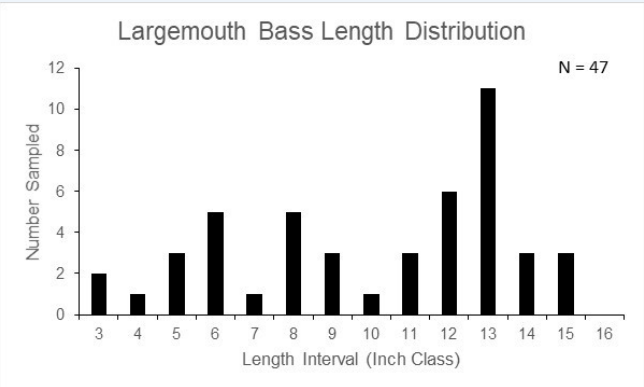
RELATIVE ABUNDANCE - CATCH PER UNIT EFFORT (CPUE)

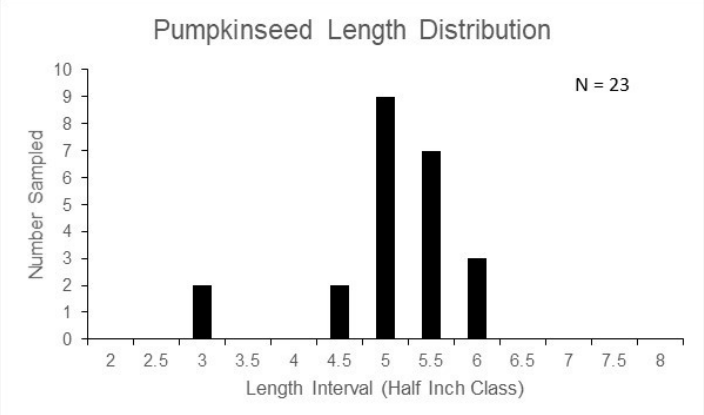
Species	Total Number Captured	CPUE Total (number per mile)	Statewide Percentile	Overall Abundance Rating	Length Index	Length Index CPUE	Length Index Statewide Percentile	Length Index Abundance Rating
bluegill	146	130.4	64th	Moderate	≥ 7.0 inches	48.2	93rd	High
pumpkinseed	23	20.5	90th	High	≥ 7.0 inches	0	-	-
largemouth bass	47	42.0	82nd	Moderate - High	≥ 14.0 inches	5.4	67th	Moderate - High

SIZE STRUCTURE METRICS									
Species	**Total**	**Average Length (inches)**	**Length Range (inches)**	**Stock and Quality Size (inches)**	**Stock Number**	**Quality Number**	**PSD**	**Percentile Rank**	**Size Rating**
bluegill	146	6.0	2.4 - 8.8	3.0 and 6.0	134	88	66	84th	Moderate - High
pumpkinseed	23	5.3	3.2 - 6.4	3.0 and 6.0	23	3	13	25th	Low
largemouth bass	47	10.6	3.4 - 15.4	8.0 and 12.0	35	23	66	66th	Moderate

GROWTH METRICS						
Species	**Total**	**Length Bin**	**Mean Age**	**Age Range**	**Percentile Rank**	**Growth Rating**
2016 - Bluegill	9	6.0	5.1	4 - 7	38th	Moderate – Slow
2016 - Bluegill	13	7.0	5.8	5 - 7	31st	Moderate - Slow
2021 - Bluegill	5	6.0	5.4	5 - 6	25th	Slow
2021 - Bluegill	5	7.0	5.0	4 - 6	63rd	Moderate







Summary

- A total of 242 fish from 8 different species were captured in the electrofishing survey. The most frequently encountered and common species were bluegill (146), largemouth bass (47), pumpkinseed (23) and white sucker (10). Other species sampled in lower abundance include black crappie (3), warmouth (5), yellow bullhead (1) and yellow perch (7). All fish captured in this survey are native species.

- Largemouth bass were the dominant gamefish species captured in our survey. Largemouth bass were found in moderate densities with a PSD of 66 and a moderate to high density of harvestable size fish with 5.4 ≥ 14 inches captured per mile of electrofishing. Moderate numbers of smaller largemouth bass that should grow to sizes desired by anglers in the coming years were also captured.

- Northern Pike were not captured in the electrofishing survey. However, fyke netting is a more appropriate sampling gear to assess the northern pike population. The main focus of this survey was to evaluate the impact of the panfish regulation put into place in 2016.

- Pumpkinseeds and bluegills were the dominant panfish species captured in our survey. Densities of pumpkinseeds were high and size structure was low, with few pumpkinseed ≥ 6.0-inches captured. Bluegills were captured in moderate densities with good size structure as bluegill PSD was 66 and 48.2 bluegill ≥ 7.0-inches captured per mile of electrofishing. Bluegills growth rates in Shadow Lake were slow to moderate.

- Following regulation change, the average size of bluegills has increased 0.2 inches, and CPUE has decreased by almost half of what was captured in 2016. The possible reason for the little change in size structure with the bluegills fishery is they grow slow in Shadow Lake, thus it may take additional time to observe change in size metrics.

Management Options

This survey was primarily intended to assess Largemouth Bass and panfish populations. Other species are captured but different survey techniques are typically used to better assess their population metrics. Therefore, management recommendations are focused on largemouth bass and panfish.

Largemouth Bass

- While largemouth bass PSD and abundance metrics appear to be healthy, Shadow Lake lacks fish > 14.0-inches, which could be a sign of over abundance or slow growth. Further evaluation, regarding growth needs to be looked at to figure out what could be the limiting factor in the largemouth bass population. Abundant forage is available for largemouth bass including various bullhead and sucker species as well as panfish.

Panfish

- Bluegill size structure has improved little since the regulation change. Bluegills were captured in moderate densities and exhibited a balanced size structure. However, there were plenty of harvestable size bluegill captured as well as bluegill that will grow to harvestable size in the coming years. The lake will benefit from maintaining predator densities at current levels to prevent bluegill from becoming overabundant and stunting.

Other Management Objectives

- Slow growth may be inhibiting the new regulation from showing any positive changes in the panfish fishery. Shadow Lake will be reevaluated in another 5 years to see if a longer duration will result in improved size structure.

- Continue to work with the City of Waupaca and other groups to add additional fish sticks and large woody habitat to Shadow Lake. One habitat project was recently completed.