2022 LATE SPRING PANFISH SURVEY REPORT

WATER: LAKE ELLWOOD COUNTY: FLORENCE

INTRODUCTION AND SURVEY OBJECTIVES

Lake Ellwood has been surveyed extensively since 2012, with comprehensive surveys conducted during 2012, 2015 and 2019. The 2012 survey documented a major collapse of nearly all of the native fish species in Lake Ellwood. The major collapse of the fishery was linked to the extended use of aquatic herbicides to control Eurasian Watermilfoil. From 2012 to 2021 there have been no herbicide treatments, and we have seen a major recovery of most fish species. However, a herbicide treatment was permitted for 2022 using a new chemical. This survey was conducted to update our data on the summer spawning panfish population and assess for any potential chemical treatment impact. The survey was designed to assess abundance, size structure, age structure and growth of summer spawning panfish (bluegill, pumpkinseed and rock bass), other species are also captured, but the data collected from those species doesn't give a fair representation of those species populations. The summary that follows will detail the current fishery and how it relates to previous surveys of Lake Ellwood. Lake Ellwood is located between Florence, WI and Iron Mountain, MI, with boat access on West Lake Ellwood Road.

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General Waterbody Characteristics:

Acres: 132
Shoreline Miles: 2.9
Maximum Depth (feet): 25
Lake Type: Seepage/Drained
Public Access: Boat Landing
Regulations: Statewide Regulations
40" MSL for Northern Pike

Table 1. Summary of all surveys conducted during 2022 — **SURVEY INFORMATION**

Species	Survey Date(s)	Gear Used	Effort	Water Temp. (°F)
Bluegill, Pumpkinseed, Rock Bass	6/14-6/15/2022	Fyke Net	10 Net-Nights	68

FISH METRIC DESCRIPTIONS

Catch per unit effort (CPUE) is the number of fish per mile (electrofishing) or per net-night (netting), and is used to index abundance when we are unable to get a PE.

Relative stock density (RSD) is an index used to describe size structure of fish populations. It is calculated by dividing the number of fish larger than a certain length by the number of stock size fish for a given species. Stock size is a length set for each species, and is used to offset potential large year classes of juvenile fish. Example: RSD6 is the percentage of fish (above stock length) that were greater than 6 inches during the survey.

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

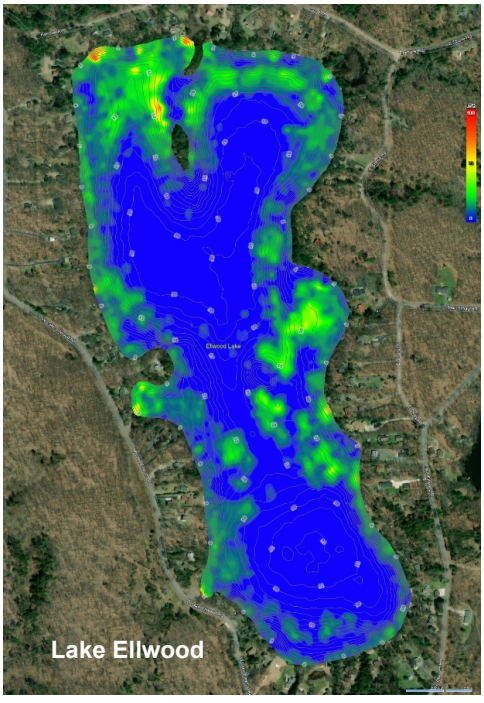
Mean length at age is used to index growth. Structures are taken from a subsample of fish captured, these structures can be used to estimate the age of that particular fish. The mean length at each age is then used to characterize growth of the entire population.

SURVEY METHODS

- Surveys are designed to evaluate each species when they are particularly vulnerable to our gear.
- Standard fyke nets and/or electrofishing gear is used to capture fish.
- Data is collected from the target species of each survey to gather population metrics.
- Fish metrics are compared to previous surveys of this water, lakes with similar characteristics, other waters in the area or region, and all waters of the state.

Table 2. Summary of applicable fish metrics for this survey — **PANFISH ABUNDANCE AND SIZE STRUCTURE**

Species	CPUE (catch/net-night)	RSD6	RSD7	RSD8	RSD9	RSD10
Bluegill	46.1	38.4	16.3	3.3	0.0	0.0
Rock Bass	20.5	24.7	5.4	2.7	0.5	0.0



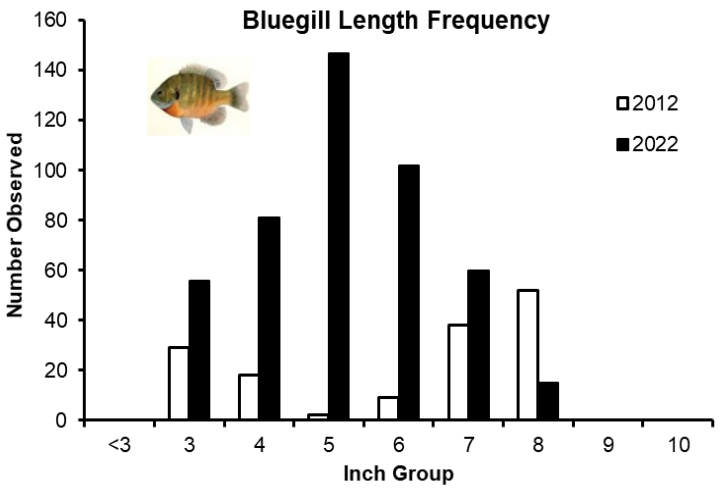
GEAR USED DURING THIS SURVEY

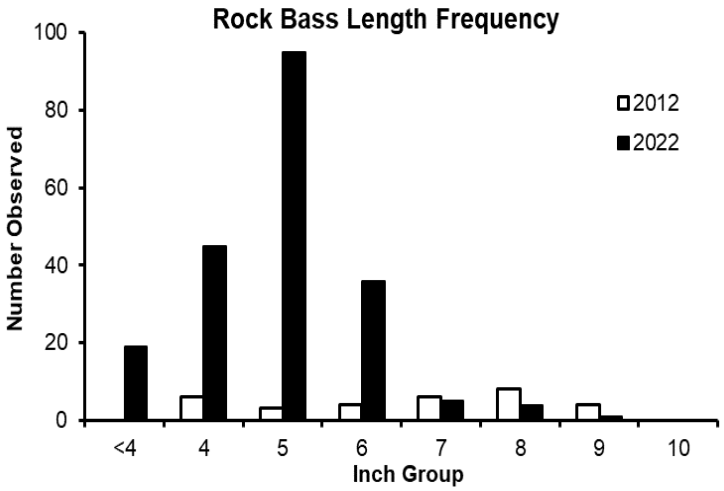
- **Fyke Nets** are set in areas where we anticipate fish to congregate. Fish traveling along the shoreline will be met by a "lead" which is similar to a fence. The lead directs the fish toward the trap end of the net, fish travel through a series of funnels and eventually become trapped. Fish are then removed from the net and placed in holding tanks to gather data before being returned to the lake.

BLUEGILL

During our two day fyke net survey we captured 461 bluegill, which is a relative abundance of 46.1 fish/net-night. This shows that the bluegill population has increased nearly 5-fold since the last herbicide treatment in 2012 (9.9/net-night). The current abundance of bluegill is now above the median (39.8/net-night) and below the mean (62.0/net-night) for Florence and Forest Counties.

Every bluegill captured was measured to assess size structure. Bluegill size structure was below the area average with RSD6 and RSD8 values of 38.4 and 3.3 respectively. Both of these values are lower than 2012 when RSD6 and RSD8 were 66.7 and 35.1. Although the size structure is below average, the current size structure indicates a healthier and more sustainable population than it was 10 years ago.





ROCK BASS

Similar to bluegill, the rock bass population has grown substantially since herbicide treatments have stopped. Rock bass abundance was 2.1 fish/net-night in 2012, and this year it was measured at 20.5 fish/net-night. Every rock bass captured during this survey was measured to assess size structure. With a RSD7 value of 5.4 the size structure is considered poor. Size structure has decreased substantially since 2012 when the RSD7 value was 58.1. The reason for the major decline in size structure is that the population is now successfully recruiting and there are many young/small fish present, it is likely that size structure will improve as these fish continue to grow.

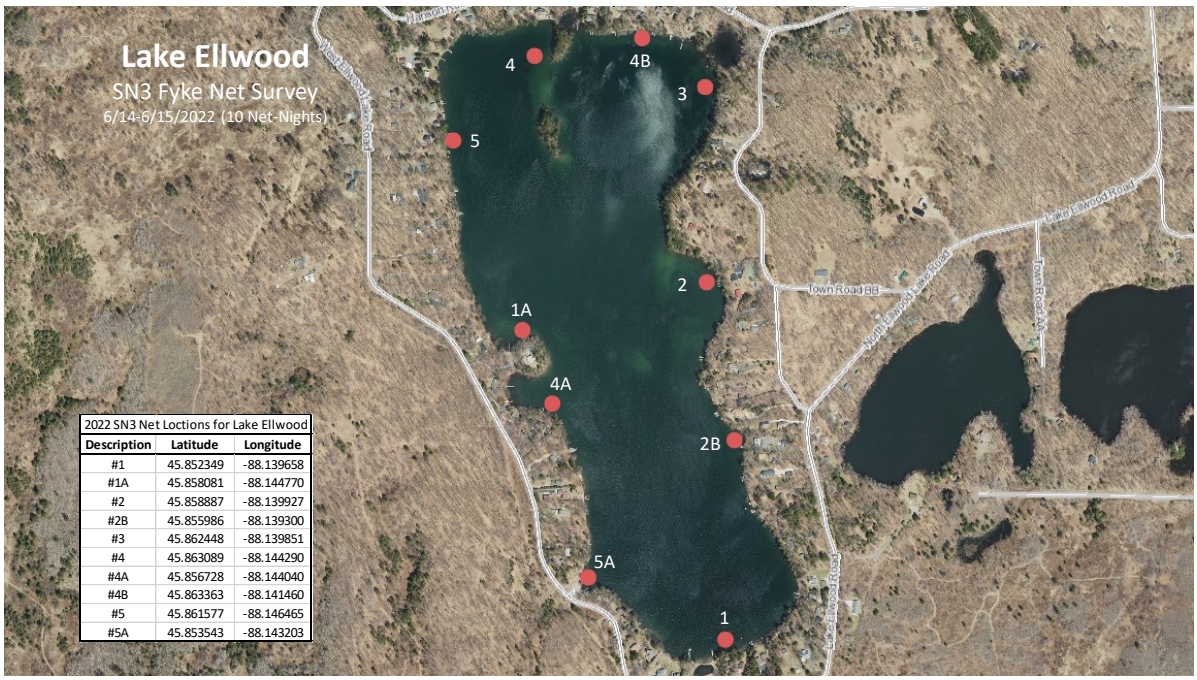
FINAL SUMMARY

This survey suggests that the bluegill and rock bass populations in Lake Ellwood have drastically improved in the last 10 years. The survey further documented successful bluegill and rock bass recruitment, more balanced size structure, and an improved fishery.

OTHER SPECIES

Other species captured during this survey include hybrid bluegill/pumpkinseed, yellow perch, largemouth bass, smallmouth bass, northern pike, walleye and white sucker. Yellow perch relative abundance was 1.6/net-night, white sucker abundance was 0.3/net-night and only 1 individual (0.1/net-night) was captured of the other species.

Similar catch rates were observed for these species during the same survey in 2012. It is not uncommon to have low catch rates of these species because they are not particularly vulnerable to this type of survey.



2022 SN3 Net Loctions for Lake Ellwood

Description	Latitude	Longitude
#1	45.852349	-88.139658
#1A	45.858081	-88.144770
#2	45.858887	-88.139927
#2B	45.855986	-88.139300
#3	45.862448	-88.139851
#4	45.863089	-88.144290
#4A	45.856728	-88.144040
#4B	45.863363	-88.141460
#5	45.861577	-88.146465
#5A	45.853543	-88.143203