WISCONSIN DEPARTMENT OF NATURAL RESOURCES

# Lake Mary - 2023 Fish Management Report

WBIC 530500

*Photo Credit: WDNR*

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WISCONSIN DEPT. OF NATURAL RESOURCES

2023

# SUMMARY


Lake and location:
Lake Mary, Marinette County, T33N R21E Sec 25

Physical / chemical attributes (Wisconsin DNR, 1977):
**Surface acres:** 167
**Maximum depth (ft):** 38
**Average depth (ft):** 9
**Shoreline length (mi):** 2.1
**Lake type:** Drainage
**Lake class:** Simple, warm, clear
**Basic water chemistry:** Hard water, slightly alkaline, clear water with very high transparency, Secchi = 12 ft. (summer).
**Littoral substrate:** Sand (90%) and muck (10%)
**Aquatic vegetation:** Sparse
**Other features:** This lake is highly developed with homes along east and south shores.

Purpose of survey:
Evaluated abundance and size structure of bass and panfish populations.

Surveys:

| Survey Sequence | Survey Begin | Survey End | Primary Survey Purpose |
|---|---|---|---|
| 515099384 | 6/5/2023 | 6/8/2023 | FISHERIES ASSESSMENTS LAKES SUMMER PANFISH |
| 515099333 | 5/30/2023 | 5/30/2023 | FISHERIES ASSESSMENTS LAKES LATE SPRING BASS PAN |

Fishery:

The fishery of Lake Mary is comprised of panfish species (bluegill, pumpkinseed, black crappie, yellow perch and rock bass) and gamefish species (largemouth bass and northern pike).

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# INTRODUCTION

Lake Mary is a 167-acre drainage lake in Marinette County and is considered a simple, warm, clear lake by classification. Lake Mary is very clear, relatively infertile and has 2.1 miles of shoreline. Half of the shoreline is developed with homes along the south and east sides of the lake. Two public boat landings provide access to the lake.

The Wisconsin Department of Natural Resources (WDNR) has surveyed Lake Mary several times since the 1980's. Depending on the objectives, sampling has consisted of seining (1987), electrofishing (1984, 2004, 2013), spring fyke netting (1983) and mini fyke netting (2004). Based on the results of previous surveys, the goal of the 2023 survey was to assess the status of gamefish (primarily largemouth bass *Micropterus salmoides*) and panfish populations. Therefore, a SE2 electrofishing survey and summer panfish netting were completed.

# METHODS

## DATA COLLECTION

Standard fyke nets (3-foot hoop, $^{3}/_{4}$-bar, 1.5-inch stretch) and a standard WDNR electrofishing boat (summer/SE2) were used to collect fish. All fish collected were measured to the nearest 0.1-inch (in) total length (TL). A sub-sample of scales, dorsal spines, or anal fin rays was collected for age and growth analysis from all gamefish. Aging structures from target species were collected from 5 fish per half inch group in the stock, quality and preferred length groups. Ages were assigned to each fish using standard WDNR procedures.

## DATA ANALYSIS

Catch per unit effort (CPUE) was calculated as catch by gear divided by sampling effort for each species collected. Length frequency distributions were tabulated from fish measured during the electrofishing and fyke net samples; not all panfish were measured. Proportional stock density (PSD) and relative stock density for preferred length fish ($RSD^{P}$) were calculated for dominant gamefish (Anderson and Neumann 1996). Preferred lengths of various gamefish have a minimum length between 45 and 55% of the world record length for that species (Anderson and Neumann 1996). Stock, quality, and preferred lengths were used as proposed by Gabelhouse (1984). Mean length at capture data was calculated for dominant gamefish and compared to the average of mean length at age for northern Wisconsin.

# RESULTS & DISCUSSION

Overall, 1,002 fish representing 13 species and were collected during the 2023 sampling season (Table 1). The five most abundant species collected by number were bluegill *Lepomis macrochirus* (47%), pumpkinseed *Lepomis gibbosus* (19%), yellow bullhead *Ameiurus natalis* (15%), largemouth bass (8%), and warmouth *Lepomis gulosus* (3%).

*Table 1. Species composition of fishes collected during the 2023 survey of Lake Mary, Marinette County, WI.*

| 2023 | | | | | |
|---|---|---|---|---|---|
| **SPECIES COMPOSITION OF FISHES COLLECTED** | | | | | |
| ***COMMON NAME** | **TOTAL NUMBER COLLECTED** | **PERCENT** | **NUMBER COLLECTED (SE2 - EF)** | **NUMBER COLLECTED (FN)** | **AVERAGE LENGTH (inches)** |
| Bluegill | 468 | 47% | 57 | 411 | 6.3 |
| Pumpkinseed | 187 | 19% | 40 | 147 | 6.2 |
| Yellow Bullhead | 150 | 15% | | 150 | |
| Largemouth Bass | 76 | 8% | 66 | 10 | 10.1 |
| Warmouth | 32 | 3% | | 32 | 5.8 |
| Rock Bass | 27 | 3% | 5 | 22 | 6.5 |
| Black Crappie | 23 | 2% | | 23 | 8.2 |
| Yellow Perch | 16 | 2% | 16 | | 4.1 |
| Northern Pike | 11 | 1% | 3 | 8 | 17.1 |
| Bowfin | 6 | 1% | | 6 | |
| Hybrid Sunfish | 3 | 0.3% | 1 | 2 | |
| Lake Chubsucker | 1 | 0.1% | 1 | | |
| Bluntnose Minnow | 1 | 0.1% | 1 | | |
| Black Bullhead | 1 | 0.1% | | 1 | |
| | | | | | |
| TOTALS | **1,002** | | **190** | **812** | |

* Common names of fishes recognized by the American Fisheries Society.

A total of 57 bluegill was collected during the 2023 SE2 electrofishing survey (Table 1). Electrofishing CPUE increased from 65/mile in 2013 to 114/mile in 2023. Bluegill ranged in length from 2.0 to 9.5 inches and averaged 6.3 inches from the electrofishing sample (Figure 1). Bluegill $RSD^{P}$ from the electrofishing sample was 0 in both 2013 and 2023 but PSD increased from 3 to 6 between 2013 and 2023.

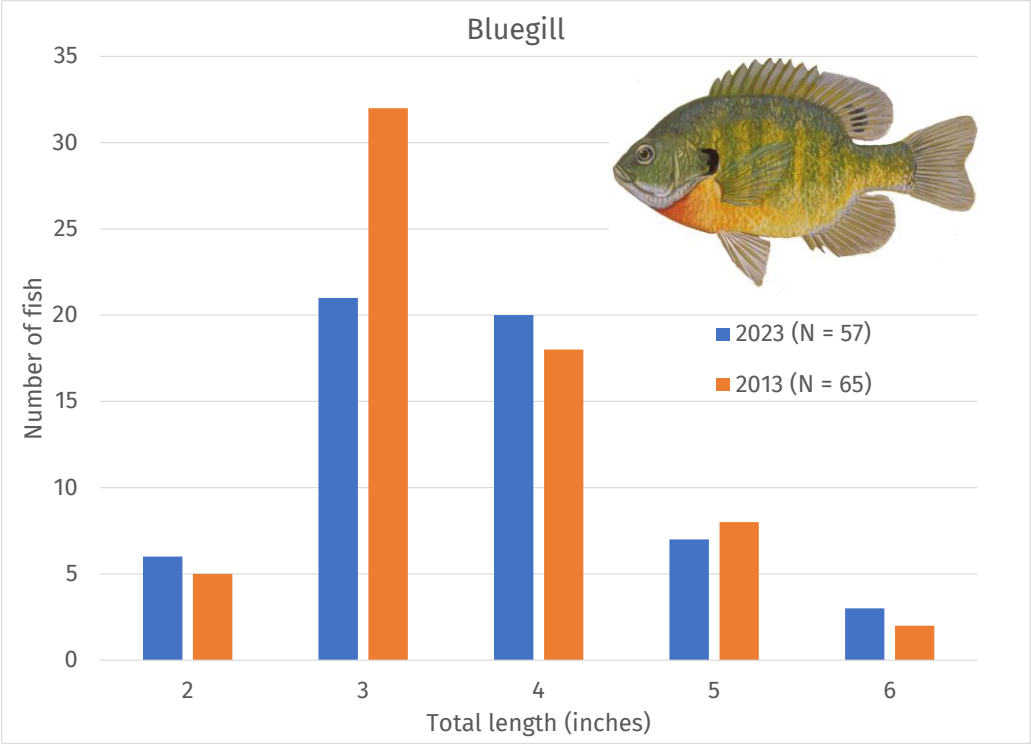


*Figure 1. Length frequency of bluegill collected electrofishing from Lake Mary, Marinette County, WI.*

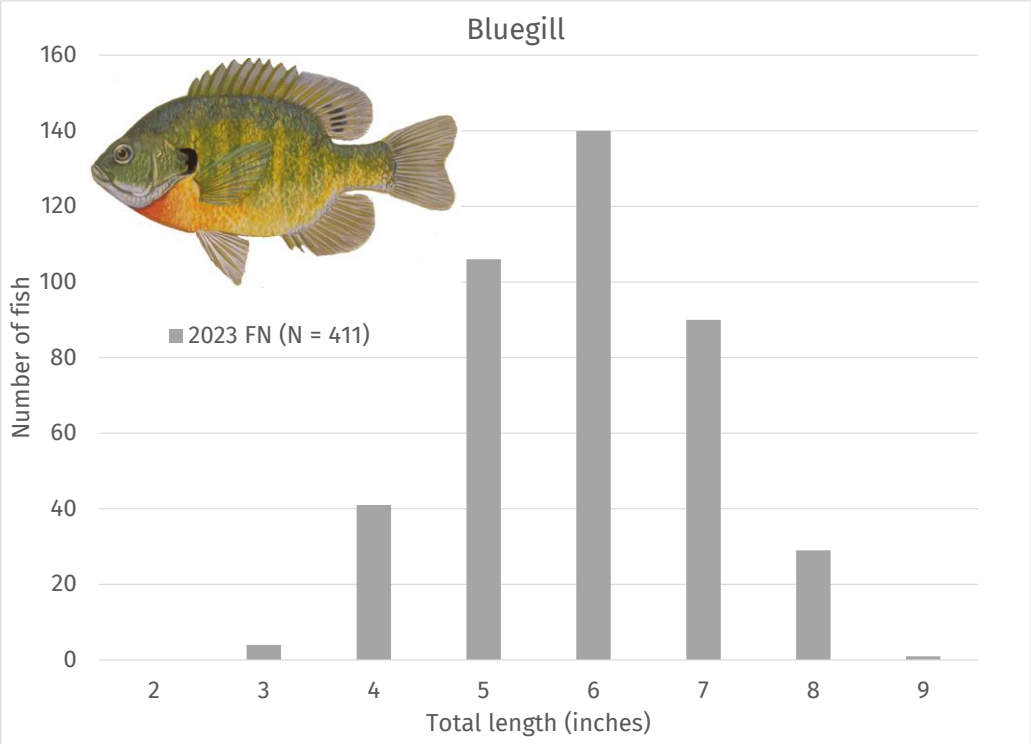


*Figure 2. Length frequency of bluegill collected fyke netting from Lake Mary, Marinette County, WI.*

Summer panfish netting resulted in the collection of 411 bluegill or a CPUE of 23 bluegill/net night (NN) (Figure 2). Bluegill ranged in length from 3.5 to 9.9 inches and averaged 6.3 inches from the fyke net sample (Figure 2). Summer fyke netting provided a better description of bluegill size structure however, estimating PSD and $RSD^P$ from the netting survey would be inaccurate since fyke nets are not effective at catching smaller bluegill (Figure 2).

A subsample of 21 Bluegill was aged from the summer netting survey and were 6 to 9 years old (Figure 3). Bluegill averaged 6.2 inches at age 6 and 8.0 inches at age 8. In 2023, growth was average compared to the mean length at age of Bluegill in northern Wisconsin (Figure 3).

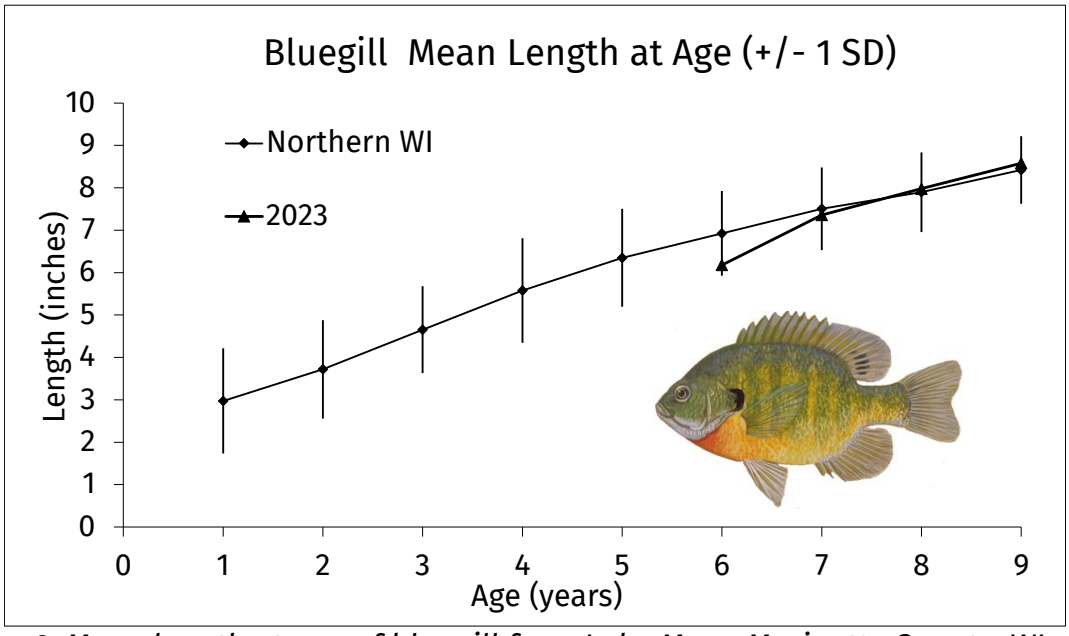


*Figure 3. Mean length at age of bluegill from Lake Mary, Marinette County, WI.*

A total of 66 largemouth bass was collected during the SE2 electrofishing survey (Table 1). Largemouth bass ranged in length from 3.0 to 19.5 inches and averaged 10.1 inches (Figure 4). Electrofishing CPUE increased between 2013 and 2023 from 29/mile to 33/mile. PSD (the ratio of fish >12" to fish >8") was 45 in 2013 and 33 in 2023. But the number of big largemouth increased between 2013 and 2023. In 2013 $RSD^P$ (the ratio of fish >15") was 4 compared to 0 in 2023.

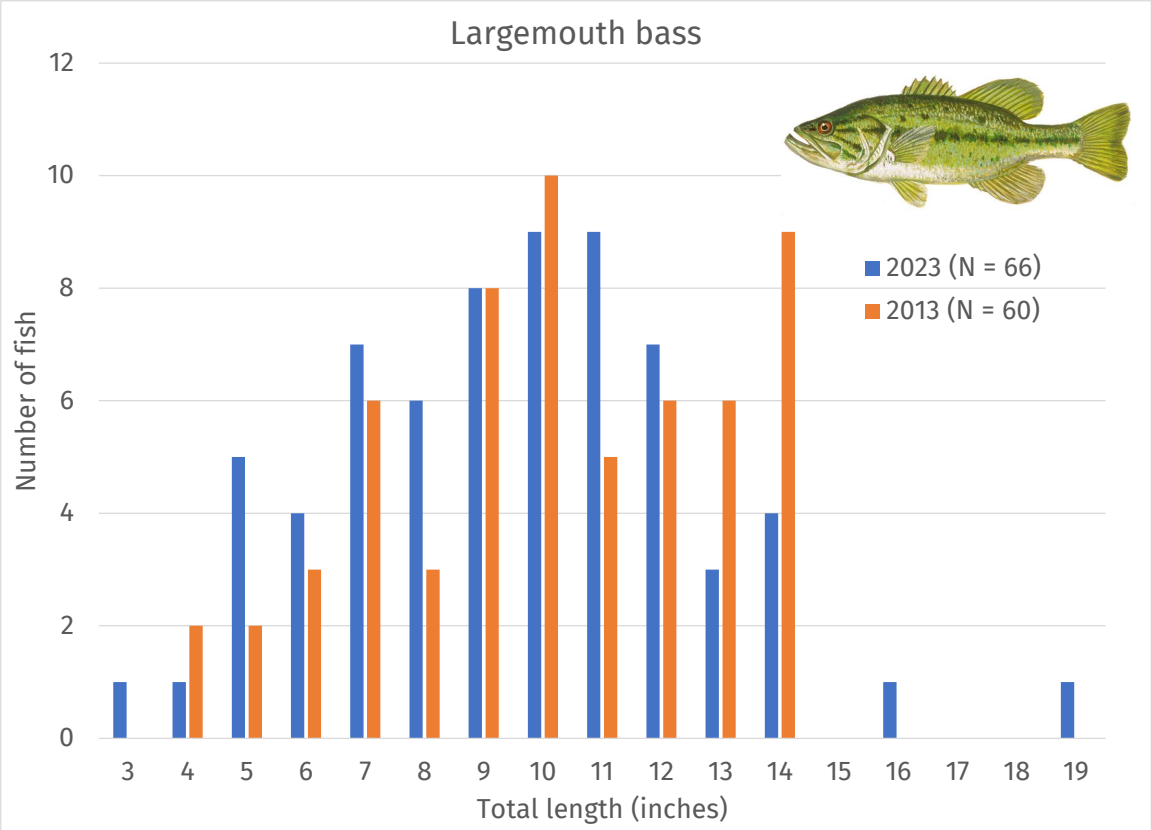


*Figure 4. Length frequency of largemouth bass collected during 2013 and 2023 SE2 electrofishing surveys from Lake Mary, Marinette County, WI.*

A subsample of 15 largemouth bass were aged using scales (<12") and dorsal spines (>12"). Ages ranged from 4 to 10 years old (Figure 5). Bass growth was average between ages 4 and 8 but below average at ages 9 and 10 (Figure 5). The below-average growth exhibited at age-9 and age-10 could be a result of small sample size (1 fish per age group). Additionally, there is some error associated with assigning ages to older fish using dorsal spines. Regardless, largemouth bass reproduction, recruitment and growth will continue to allow the population to remain self-sustaining and provide a good fishing opportunity.

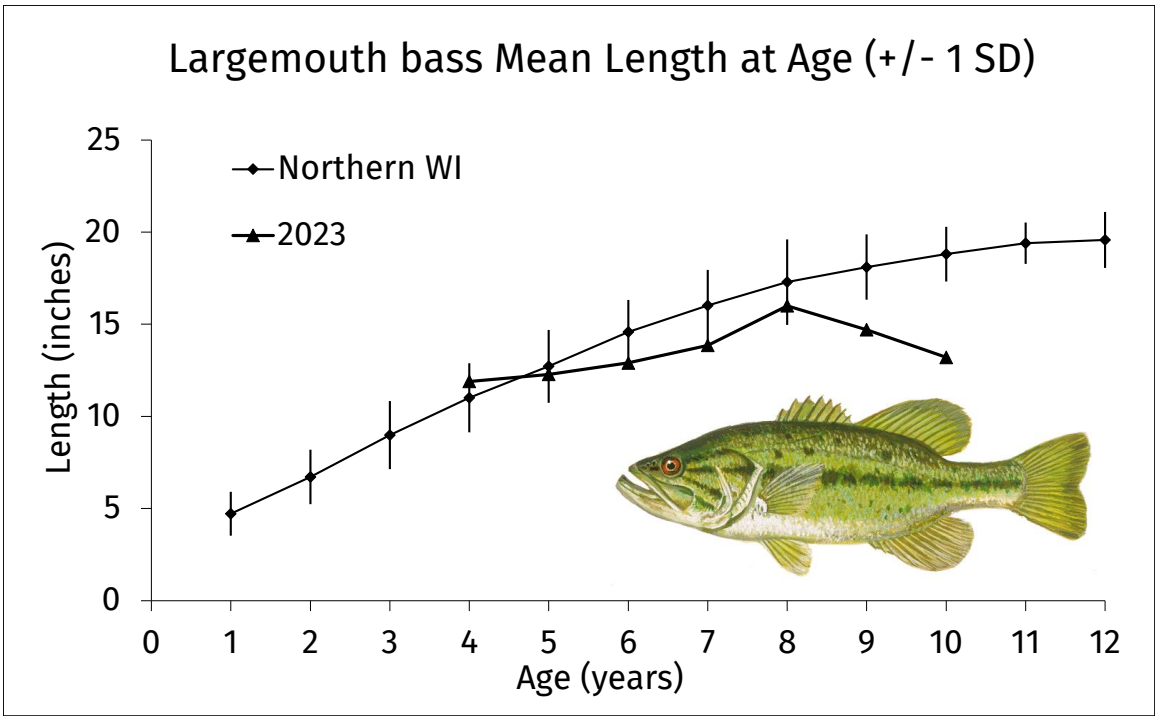


*Figure 5. Mean length at age of Largemouth Bass from 2013 and 2023 surveys from Lake Mary, Marinette County, WI.*

Additionally, rock bass *Ambloplites rupestris*, black crappie *Pomoxis nigromaculatus,* yellow perch *Perca flavescens* and northern pike *Esox Lucius* were collected and accounted for about 8% of the total number of fish collected during the 2023 fish survey in Lake Mary (Table 1).

# CONCLUSIONS & RECOMMENDATIONS

Lake Mary continues to support a quality fishing opportunity for bluegill. Between 2013 and 2023 electrofishing CPUE increased from 65 to 114/mile. While this increase in CPUE is significant, the modest improvement in size structure observed in the electrofishing sample prompted us to complete a summer panfish netting survey. The summer panfish netting survey revealed bluegill size structure was much better than we originally thought with several bluegill over 8 inches collected (Figure 2).

Largemouth bass abundance increased slightly, and size structure improved between 2013 and 2023 (Figure 4). Bass reproduction and recruitment have been consistent. Therefore, no fishing regulation changes are necessary to improve Bass abundance or size structure.

Several property owners have expressed interest in completing a habitat project on Lake Mary. Efforts to complete a fish sticks project were initiated in 2015 and

revisited several times however, residents never gained enough support form lake-front property owners to complete the project. In 2022 and 2023, residents again tried to garner support for a fish sticks or fish crib project but were unsuccessful.

The next survey of Lake Mary is scheduled for 2033 and will consist of a SE2 electrofishing survey (gamefish and panfish) and summer panfish netting.

Anglers can access Lake Mary from the Town of Wagner boat landing (east side) or from an unimproved landing on Marinette County Forest lands (west side). Boaters are reminded to remove all vegetation from their boat and trailer before leaving to limit the spread of this and other invasive species. A map of Lake Mary can be found at the following internet address: https://apps.dnr.wi.gov/doclink/lakes_maps/0530500a.pdf

# LITERATURE CITED

Anderson, R. O. and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Gabelhouse, D.W. Jr. 1984. A length-categorization system to assess fish stocks. North American Journal of Fisheries Management 4: 273-285.