WISCONSIN DEPARTMENT OF NATURAL RESOURCES

2022 Comprehensive Summary Report
Marion Millpond, Waupaca County
294500

Introduction And Objectives

In 2022, the Wisconsin Department of Natural Resources (DNR) conducted a comprehensive fish survey of Marion Millpond in order to provide insight and direction for the future fisheries management of this system. Comprehensive fish surveys include both spring fyke netting and spring electrofishing surveys. Primary sampling objectives of these surveys are to characterize species composition, relative abundance, and size structure. The following report is a brief summary of the activities conducted, general status of fish populations and future management options for Marion Millpond.

SURVEY INFORMATION

Site Location	Survey Dates	Water Temperature (° F)	Target Species	Gear	Number of Nets	Effort
Marion Millpond	4/13/2022 - 4/19/2022	40 - 45	Northern Pike	Fyke Net	5	26 net nights
Marion Millpond	5/22/2022	64	Bass/Panfish	Boomshocker	N/A	2.5 miles

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).

RELATIVE ABUNDANCE — CATCH PER UNIT EFFORT (CPUE)

Species	Protocol	Total Number Captured	CPUE	Units	Statewide Percentile
Northern pike	Spring Netting I	242	9.3	fish/net night	75th
Yellow perch	Spring Netting I	203	7.8	fish/net night	68th
Largemouth bass	Spring Electrofishing II	75	30.0	fish/mile	79th
Black crappie	Spring Electrofishing II	6	6.0	fish/mile	51st
Bluegill	Spring Electrofishing II	434	434.0	fish/mile	96th
Pumpkinseed	Spring Electrofishing II	133	133	fish/mile	98th

DNR Contact

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Lake Information

Lake Acres:116
Max. Depth: 12
Shoreline Miles:
Public Access: 2 Boat Landings

Regulations

Statewide Regulations except for northern pike has a 2 bag limit and a 26 inch minimum length requirement.

Survey Method

- Marion Millpond was sampled according to spring netting I (SNI), and spring electrofishing II (SEII) protocols as outlined in DNR Fisheries Monitoring Protocols. The primary objective of the spring fyke netting I survey is to count and measure adult walleye and northern pike, and mark adult northern pike to estimate northern pike abundance. The primary objective of the spring electrofishing II survey is to count and measure adult largemouth bass, smallmouth bass, and panfish. Other species of fish may be sampled during each survey, but are considered by-catch as part of that survey.
- Boom shockers were used to electrofish miles of shoreline. Gamefish were collected and measured throughout, and panfish were collected and counted along 1.0 miles of shoreline.
- Fyke nets were deployed in areas of the lake that contained spawning habitat or were likely travel areas for northern pike and walleye. All newly captured individuals were marked with a fin clip. Aging structures (spines/otoliths) were taken from a sample of northern pike, bluegill and black crappie for age and growth analyses.

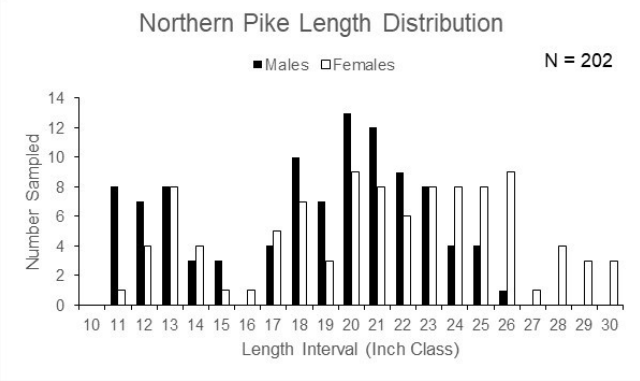
Map of Marion Millpond

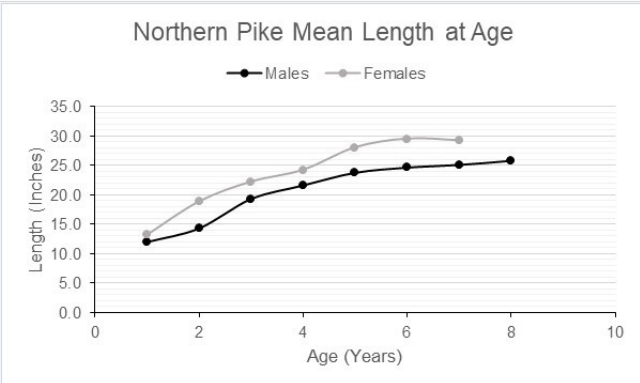
Northern Pike

- Northern pike (*Esox lucius*) are a common predatory fish species found across many Wisconsin waterbodies. Northern pike spawn in areas of emergent vegetation at approximately 34-40°F water temperatures. Fyke netting is the preferred sampling gear for northern pike. All results presented for northern pike are from spring fyke netting surveys.

2022 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
202	20.1	10.0 - 30.6	14.0 and 21.0	166	96	58	69th	Moderate - High





RELATIVE ABUNDANCE (CPUE = NUMBER PER NET NIGHT)

Total Sampled	2006	2013	2017	2022	2022 Statewide Percentile Rank	2022 Abundance Rating
242	2.4	8.1	9.3	9.3	89th	Moderate - High

SIZE STRUCTURE (PSD) TRENDS

PSD by Year			
2006	2013	2017	2022
69	87	58	58

2022 GROWTH METRICS

Number Sampled	Length Bin (inches)	Sex	Mean Age	Age Range	Percentile Rank	Growth Rating
5	18.0 - 18.9	M	2.8	2 - 3	77th	Moderate - Fast
4	18.0 - 18.9	F	2.0	2	99th	Fast
2	26.0 - 26.9	F	4	4	81st	Moderate - Fast

ADULT ABUNDANCE (POPULATION ESTIMATE)

Marked	Captured	Recaptures	Population Estimate (95% CI)	Number per Acre
202	235	33	643 (456-1098)	5.5

Species Summary

- Marion Millpond supports a moderate to high density northern pike population with 2022 catch rates at 9.3 fish per net night. A catch rate of 9.3 per net night ranks in the 89th percentile when compared to northern pike catch rates statewide. When compared to past surveys, the 2022 northern pike catch rates have remained stable since 2017 and are higher than surveys done prior to the drawdown in 2006.
- Size structure of northern pike in the 2022 survey was moderate to high with a PSD of 58 which ranks in the 69th percentile when compared to lakes statewide. The length ranges of male (11 - 26 inches) and female (11 - 30 inches) northern pike are within the ranges commonly found statewide. Size structure and abundance levels of northern pike in Marion Millpond are at acceptable levels and provide a quality fishing opportunity.
- Aging structures were collected from 117 individuals, showing moderate to fast growth for both sexes, across all age classes. Female northern pike on average reached 26.0 inches in 4 years, while males reached 21.0 inches in 4 years.
- High exploitation may be hindering the production of northern pike over 30.0 inches, as the food source and growth potential in Marion Millpond would be able to grow larger sized northern pike.

Largemouth Bass

- Largemouth bass (*Micropterus salmoides*) are a common predatory fish species found in many Wisconsin waterbodies. Largemouth bass typically spawn in shallow nearshore areas consisting of sand/mud or gravel substrate at approximately 60-70°F water temperatures. Electrofishing is the preferred sampling gear for largemouth bass. All results presented for largemouth bass are from spring electrofishing surveys.

2022 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
75	8.7	4.0- 19.8	8.0 and 12.0	24	14	58	48th	Moderate

2022 RELATIVE ABUNDANCE (CPUE = NUMBER PER MILE)

CPUE Total	Percentile Rank	Overall Abundance Rating	Length Index	Length Index CPUE	Length Index Percentile Rank	Length Index Abundance Rating
30.0	73rd	Moderate - High	≥ 14.0 inches	5.6	69th	Moderate - High

SIZE STRUCTURE (PSD) TRENDS

PSD by Year			Historical Median
2009	2017	2022	
7	55	58	55

RELATIVE ABUNDANCE TRENDS (CPUE = NUMBER PER MILE)

CPUE by Year			Historical Median
2009	2017	2022	
33.0	40.0	30.0	33.0

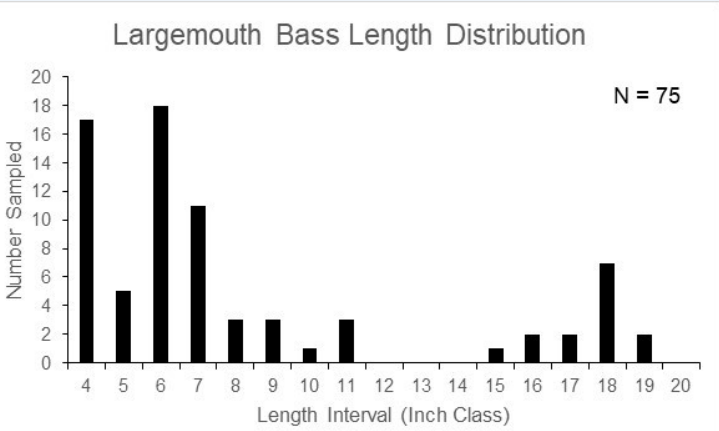



Photo Credit : DNR Staff

Species Summary

- The Marion Millpond supports a moderate - high density largemouth bass population with catch rates of 30.0 fish per mile of electrofishing. A catch rate of 30.0 fish per mile ranks in the 73rd percentile among lakes throughout Wisconsin. Relative abundance comparisons among years indicate that CPUE was stable over the past few surveys.
- Size structure of largemouth bass in Marion Millpond was moderate with a PSD value of 58 which ranks in the 48th percentile when compared to statewide values. When compared to recent surveys on Marion Millpond, largemouth bass PSD values have remained relatively consistent and at moderate levels over the last couple of surveys.
- The current status of the largemouth bass population on Marion Millpond; Moderate - high relative abundance and a moderate size structure results in angling opportunity to catch largemouth bass of all sizes including harvestable fish > 14 inches and memorable fish > 18 inches.

Black Crappie

- Black crappie (*Pomoxis nigromaculatus*) are a common panfish species distributed widely across many Wisconsin waterbodies. Black crappie typically spawn in nearshore areas consisting of detritus, sand/mud or gravel substrate at approximately 58-68°F water temperatures. Electrofishing and fyke netting can be effective sampling gear for black crappie and therefore, results from both gears are presented for black crappie.

2022 SIZE STRUCTURE METRICS

Gear	Number Measured	Average Length	Length Range	Stock and Quality Size	Stock	Quality	PSD	Percentile Rank	Size Rating
Fyke Netting	20	8.0	5.0 - 10.5	5.0 and 8.0	19	8	42	35th	Moderate
Electrofishing	6	9.0	8.4 - 9.5	5.0 and 8.0	6	6	100	N/A	N/A

FYKE NETTING CPUE TRENDS (NUMBER PER NET NIGHT)

2022 Number Sampled	2006	2013	2017	2022	2022 Statewide Percentile Rank	2022 Abundance Rating
20	1.7	0.5	0.2	0.8	24th	Low

SIZE STRUCTURE (PSD) TRENDS FYKE NETTING

PSD by Year			
2006	2013	2017	2022
78	27	57	40

ELECTROFISHING CPUE (NUMBER PER MILE)

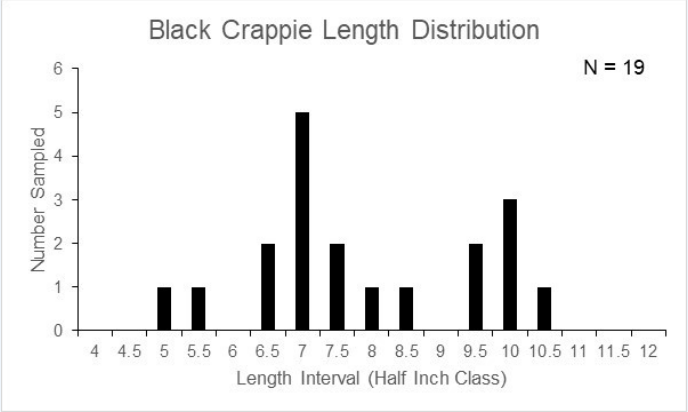
CPUE Total	Percentile Rank	Overall Abundance Rating	Length Index	Length Index CPUE	Length Index Percentile	Length Index Abundance Rating
6.0	51st	Moderate	≥ 8.0 inches	6.0	73rd	Moderate - High

ELECTROFISHING TRENDS CPUE (NUMBER PER MILE)

CPUE by Year			Historical Median
2009	2017	2022	
0	7.0	6.0	6.0

ELECTROFISHING SIZE STRUCTURE (PSD) TRENDS

PSD by Year			Historical Median
2009	2017	2022	
-	100	100	100



Species Summary

- The Marion Millpond supports a moderate density black crappie population with catch rates of 0.8 fish per net night from the fyke netting survey and 6.0 fish per mile of electrofishing from the boom shocking survey. Catch rates of 0.8 per net night and 6.0 per mile rank in the 51st and 35th percentiles respectively.
- Size structure of black crappie in Marion Millpond differed by gear. In the fyke netting survey, most individuals captured ranged were 7-10 inches in length, whereas in the electrofishing survey the majority of individuals captured were in the 9 inch range and sample size was small. This provides a great example of why it can be informative to use results from both gears to assess the population status. Length data from the fyke netting survey resulted in a PSD value of 42 which is in the 35th percentile when compared to fyke netting data statewide. Length data collected from the electrofishing survey resulted in a PSD value of 100 which is likely skewed because of the low sample size and was similar to 2017.
- Population trends from previous electrofishing surveys on Marion Millpond indicate that size structure has decreased from the 2017 survey, but is similar to the historical median. Relative abundance estimates have remained similar to the 2017 survey.
- Due to a low catch rate fish were not sacrificed for the collection of otoliths for aging.

Bluegill

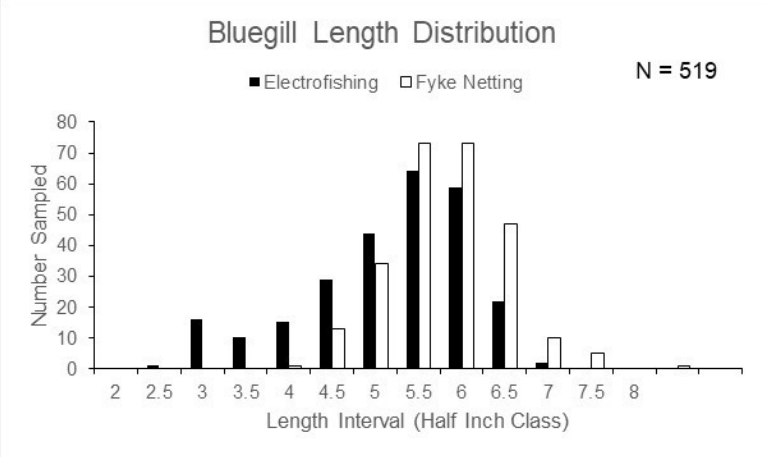
- Bluegill (*Lepomis macrochirus*) are a common panfish species distributed widely across many Wisconsin waterbodies. Bluegill typically spawn in nearshore areas consisting of sand/mud or gravel substrate at approximately 67-80°F water temperatures. Electrofishing is the standard sampling gear for bluegill, but fyke netting can show some information as well. Electrofishing data is used here for the comparison of the bluegill populations to other waterbodies.

2022 SIZE STRUCTURE METRICS

Gear	Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock	Quality	PSD	Percentile Rank	Size Rating
Fyke Netting	257	6.0	4.1 - 8.7	3.0 and 6.0	257	136	53	45th	Moderate
Electrofishing	262	5.0	2.7 - 7.1	3.0 and 6.0	262	83	32	49th	Moderate

FYKE NETTING CPUE TRENDS (NUMBER PER NET NIGHT)

2022 Number Sampled	2006	2013	2017	2022	2022 Statewide Percentile Rank	2022 Abundance Rating
257	42.7	144.6	31.2	9.9	65th	Moderate



SIZE STRUCTURE (PSD) TRENDS FYKE NETTING

PSD by Year			
2006	2013	2017	2022
43	36	54	53

2022 GROWTH METRICS

Sample (n)	Length Bin	Sex	Mean	Age Range	Percentile	Growth Rating
10	6.0 - 6.9	M	5.0	4 - 6	54th	Moderate
5	6.0 - 6.9	F	6.0	6	31st	Slow

ELECTROFISHING CPUE (NUMBER PER MILE)

CPUE Total	Percentile Rank	Overall Abundance Rating	Length Index	Length Index CPUE	Length Index Percentile Rank	Length Index Abundance Rating
434	96th	High	≥ 7.0 inches	2.0	33rd	Low

ELECTROFISHING TRENDS CPUE (NUMBER PER MILE)

CPUE by Year			Historical Median
2009	2017	2022	
725.0	579.0	434.0	579.0

ELECTROFISHING SIZE STRUCTURE (PSD) TRENDS

PSD by Year			Historical Median
2009	2017	2022	
2	4	32	4

Species Summary

- The Marion Pond supports a high density bluegill population with catch rates of 434.0 fish per mile of electrofishing from the boom shocking survey, ranking at the 96th percentile statewide. Catch rates of bluegill greater than 7 inches in the electrofishing survey was 2.0 per mile which ranks in the 33rd percentile and low when compared to lakes statewide.
- Size structure of bluegill in the Marion Millpond was characterized as moderate based on the fyke netting survey, and moderate based on data from the electrofishing survey. Length data collected from the electrofishing survey resulted in a PSD value of 32 which is in the 49th percentile when compared to statewide values.
- Population trends from previous electrofishing surveys on the Marion Millpond indicate that size structure has improved since the previous electrofishing surveys. Moreover, relative abundance estimates have declined when compared among past surveys but still are at the 96th percentile when compared statewide.
- Growth metrics calculated from age estimates indicate that bluegill in the Marion Millpond have slow to moderate growth when compared to growth rates from bluegill populations across the state. For the 6 inch length category growth was moderate for males, while females were slow growing.

Pumpkinseed

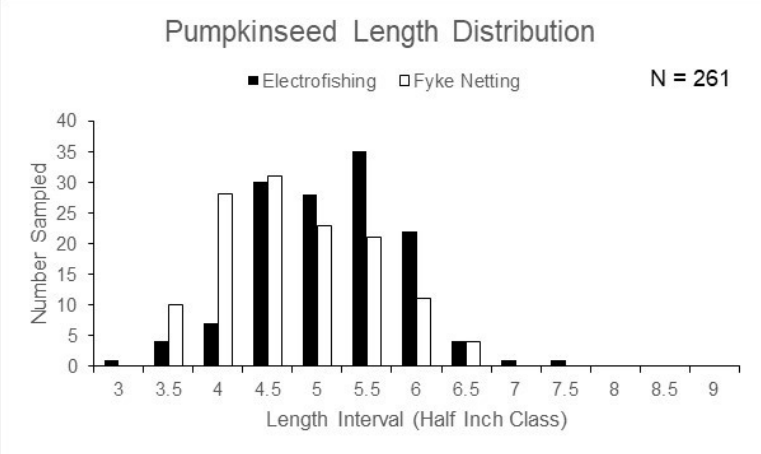
- Pumpkinseed (*Lepomis gibbosus*) are a common panfish species distributed widely across many Wisconsin waterbodies. Pumpkinseed typically spawn in nearshore areas consisting of sand or gravel substrate at approximately 60-70°F water temperatures. Electrofishing is the standard sampling gear for pumpkinseed, but fyke netting can show some information as well. Electrofishing data is used here for the comparison of the pumpkinseed populations to other waterbodies.

2022 SIZE STRUCTURE METRICS

Gear	Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock	Quality	PSD	Percentile Rank	Size Rating
Fyke Netting	128	4.9	3.7 - 6.9	3.0 and 6.0	128	15	12	14th	Low
Electrofishing	133	5.3	3.1 - 6.5	3.0 and 6.0	133	28	21	37th	Moderate

FYKE NETTING CPUE TRENDS (NUMBER PER NET NIGHT)

2022 Number Sampled	2006	2013	2017	2022	2022 Statewide Percentile Rank	2022 Abundance Rating
128	2.2	5.4	9.3	4.9	84th	Moderate - High



SIZE STRUCTURE (PSD) TRENDS FYKE NETTING

PSD by Year			
2006	2013	2017	2022
39	13	7	12

ELECTROFISHING CPUE (NUMBER PER MILE)

CPUE Total	Percentile Rank	Overall Abundance Rating	Length Index	Length Index CPUE	Length Index Percentile Rank	Length Index Abundance Rating
133.0	98th	High	≥ 7.0 inches	2.0	77th	Moderate - High

ELECTROFISHING TRENDS CPUE (NUMBER PER MILE)

CPUE by Year			Historical Median
2009	2017	2022	
390.0	196.0	133.0	196.0

ELECTROFISHING SIZE STRUCTURE (PSD) TRENDS

PSD by Year			Historical Median
2009	2017	2022	
0	5	21	5

Species Summary

- The Marion Millpond supports a high density pumpkinseed population with catch rates of 133.0 fish per mile of electrofishing. Catch rates of 133.0 per mile rank in the 98th percentile. Catch rates of pumpkinseed greater than 7 inches in the electrofishing survey was 2.0 per mile which ranks in the 77th percentile and slightly above average when compared to lakes statewide.
- Size structure of pumpkinseed in the Marion Millpond was characterized as low - moderate based on data from the electrofishing survey. Length data collected from the electrofishing survey resulted in a PSD value of 21 which is in the 37th percentile when compared to statewide values.
- Population trends from previous electrofishing surveys on Marion Millpond indicate that size structure has decreased over recent fyke netting surveys and increased slightly over recent electrofishing surveys. Relative abundance has slightly decreased based on data from the fyke netting survey. Similarly electrofishing survey data indicate relative abundance has decreased since the 2017 survey.

Yellow Perch

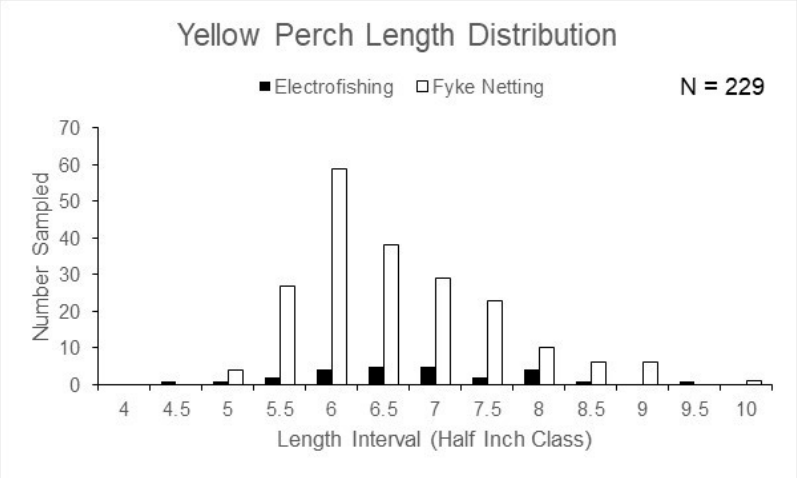
- Yellow Perch (*Perca flavescens*) are a common panfish species found throughout many Wisconsin waterbodies. Typically yellow perch spawn in areas of emergent or submergent vegetation or submerged brush at approximately 45-50°F water temperatures. Electrofishing and fyke netting can be effective sampling gear for yellow perch and therefore, results from both gears are presented for yellow perch.

YEAR SIZE STRUCTURE METRICS

Gear	Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
Fyke Netting	203	6.8	5.1 - 10.0	5.0 and 8.0	203	23	11	42nd	Moderate
Electrofishing	26	7.0	4.6 - 9.9	5.0 and 8.0	25	6	24	85th	Moderate - High

FYKE NETTING CPUE TRENDS (NUMBER PER NET NIGHT)

2022 Number Sampled	2006	2013	2017	2022	2022 Statewide Percentile Rank	2022 Abundance Rating
203	7.4	123.3	27.1	7.8	68th	Moderate - High



SIZE STRUCTURE (PSD) TRENDS FYKE NETTING

PSD by Year			
2006	2013	2017	2022
4	3	1	11

ELECTROFISHING CPUE (NUMBER PER MILE)

CPUE Total	Percentile Rank	Overall Abundance Rating	Length Index	Length Index CPUE	Length Index Per-centile Rank	Length Index Abundance Rating
26.0	76th	Moderate - High	≥ 8.0 inches	6.0	96th	High

ELECTROFISHING TRENDS CPUE (NUMBER PER MILE)

CPUE by Year			Historical Median
2009	2017	2022	
234.0	108.0	26.0	108.0

ELECTROFISHING SIZE STRUCTURE (PSD) TRENDS

PSD by Year			Historical Median
2009	2017	2022	
1	0	24	1

Species Summary

- The Marion Millpond supports a high density yellow perch population with catch rates of 7.8 fish per net night from the fyke netting survey and 26.0 fish per mile of electrofishing from the boom shocking survey. Catch rates of 7.8 per net night and 26.0 per mile rank in the 68th and 76th percentiles respectively. Catch rates of yellow perch greater than 8 inches in the electrofishing survey was 6.0 per mile which ranks in the 96th percentile and above average when compared to lakes statewide.
- Size structure of yellow perch in the Marion Millpond was characterized as moderate - high based on data from both the fyke netting survey and electrofishing survey. Length data from the fyke netting survey resulted in a PSD value of 11 which is in the 42nd percentile when compared to yellow perch fyke netting data statewide. Length data collected from the electrofishing survey resulted in a PSD value of 24 which is in the 85th percentile when compared to statewide values.
- Population trends from surveys on Marion Millpond indicate that size structure has increased over recent fyke netting surveys and increased over recent electrofishing surveys. Though slightly different PSDs were calculated for electrofishing and fyke nets, the general trend was much better than previous years. Relative abundance has decreased based on data from the fyke netting survey. Similarly electrofishing survey data indicate relative abundance has decreased since 2017. Collection of age samples in the future would give more insight into the size structure changes in the yellow perch population.

Full Summary

Northern Pike

The Marion Millpond supports a high density northern pike population with a moderate - high size structure. Although there were individuals captured up to 30 inches, the majority of the sample consisted of 17 - 26 inch fish. Growth appears to be moderate - fast for northern pike, with females reaching 26.0 inches in 4 years. Males which typically have slower growth were able to reach 21.0 inches in 4 years. Exploitation could be one potential factor affecting northern pike in the Marion Millpond, as growth rates have shown that northern pike grow quickly and there is a large forage base to support the fishery. It is unclear whether the current regulation is allowing for more harvest pressure on males, only females were captured above 26 inches. With stakeholder input there is potential to propose a the 25-35 slot regulation as a management option, and staff should work to gather input. The growth indicated here is more than suitable for a regulation change.

Largemouth Bass

The Marion Millpond largemouth bass population has remained relatively consistent over the past several surveys and overall the largemouth bass population is healthy, maintaining a moderate - high density and a moderate size structure. These population characteristics are helping keep panfish populations from becoming overabundant through predation. The largemouth bass population provides a high action fishery with an above average proportion of fish 14 inches or greater available for anglers. Management should focus on maintaining the present population levels in Marion Millpond. While the millpond may have the growth potential for more large bass the heavy vegetation may limit harvest and could lead to a less than ideal population if protected further.

Black Crappie

The black crappie population in Marion Millpond is healthy and provides an angling opportunity. The 2022 survey results indicate that black crappie population levels were moderate when compared to waterbodies throughout Wisconsin. Further, the catch rate of Black crappie greater than 8.0 inches was moderate to high in comparison to black crappie catch rates statewide. In addition to the moderate relative abundance of larger black crappie, the 2022 survey results also indicate a strong year class of 6.5 –7.5 inch fish that should recruit to desired lengths for harvest in the near future. The moderate relative abundance along with the current high abundance of target size (> 8 inch) individuals and strong year classes of smaller fish should promote a healthy black crappie fishery on the Marion Millpond for the next several years. Black crappie stocking has occurred over the last few years and is a contributing factor to the population of black crappie in Marion Millpond.

Bluegill

Bluegill population characteristics quantified in the 2022 Marion Millpond survey appear to have remained relatively similar to past surveys. High relative abundance and moderate size structure metrics provide an excellent action fishing opportunity. Growth was assessed on bluegill using age estimates from otolith cross sections and results indicate Bluegill have slow - moderate growth in the Marion Millpond compared to waterbodies statewide. Female bluegill were slow growing when compared to statewide data, reaching 6.0 inches in 6 years. Meanwhile male bluegill which grow slightly quicker reach 6.0 inches in 5 years. The catch rate of Bluegill > 7.0 inches was low when compared to Bluegill populations statewide. Although size structure of Bluegill could still improve, the Marion Millpond does provide a high action Bluegill fishery with a good number of > 6.0 inch individuals. Factors such as the amount of vegetation along with heavy fishing pressure could be affecting the bluegill population.

Pumpkinseed

The Marion Millpond pumpkinseed population has seen improvement compared to previous surveys with declining relative abundance and increasing size structure rating observed in the 2022 survey. Further, the number of > 7.0 inch size individuals was at moderate levels when compared to statewide pumpkinseed populations. This survey indicates the pumpkinseed population is trending towards a better size structure overall.

Yellow Perch

Data from the 2022 Marion Millpond survey indicates that the yellow perch population size structure has increased while relative abundance has decreased since the 2017 survey. Although relative abundance is considered moderate to high when compared to yellow perch populations statewide, the Marion Millpond supports good numbers of larger yellow perch. Moreover, the PSD value of 24 indicates a high size structure rating when compared to other lakes throughout the sate. The 2022 netting survey resulted in one of the lowest total catches of yellow perch recorded on the Marion Millpond. However, with lower relative abundance levels, yellow perch have seen an increase in the overall size structure of the population.

Habitat

Presently, Marion Millpond is heavily vegetated and consists of mostly stained shallow water. Nevertheless, protection of the emergent and submergent vegetation is vital to protect spawning areas for northern pike. Improvements to nearshore habitat such as the addition of tree drops or fish sticks could benefit both panfish and predatory species in Marion Millpond.