Wisconsin Department of Natural Resources

2025 Comprehensive Summary Report
Pigeon Lake, Waupaca County
WBIC 293300

Photo Credit: Elliot Hoffman

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Introduction

In 2025, the Wisconsin Department of Natural Resources (DNR) conducted a comprehensive fish survey of the Pigeon Lake 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. The 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, the general status of fish populations and future management options for the Pigeon Lake.

Survey Effort

Table 1. Survey information for Pigeon Lake

Site Location	Survey Dates	Water Temperature (°F)	Target Species	Gear	Number of Nets	Net Nights
Pigeon Lake	3/27/202 - 4/04/2025	33 - 39	Northern Pike	Fyke Net	7	56 net nights
Pigeon Lake	5/12/2024	68	Bass and Panfish	Boomshocker	-	3.09 Miles

Table 2. 2025 Relative Abundance — catch per unit effort (CPUE)

Species	Protocol	Total Number Captured	CPUE	Units	Lake Class Percentile
Northern pike	Spring Netting I	252	4.5	fish/net night	50 - 75th
Largemouth bass	Spring Electrofishing II	61	17.0	fish/mile	25 - 50th
Black crappie	Spring Netting I	392	7.0	fish/net night	50 - 75th
Bluegill	Spring Electrofishing II	110	110	fish/mile	50 - 75th
Pumpkinseed	Spring Electrofishing II	0	0	fish/mile	-
Yellow perch	Spring Netting I	76	1.4	fish/net night	25 - 50th

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 plumper than average.

Survey Method

- Pigeon Lake 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 while marking 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 bycatch as part of that survey.
- Boom shockers were used to electrofish 3.09 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 to travel to areas for northern pike and muskellunge. All newly captured individuals were marked with a fin clip or PIT tag. Aging structures (spines/otoliths) were taken from a sample of northern pike, largemouth bass, bluegill, and black crappie for age and growth analyses.

Results

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.

Pigeon Lake supports a high abundance of northern pike with 2025 catch rates at 4.5 fish per net night. A catch rate of 4.5 per night ranks in the 77th percentile when compared to northern pike catch rates statewide. When compared to past surveys, the 2025 northern pike catch rates are slightly lower than the historical median. The population estimate shows a higher density, while having 3.2 northern pike per acre. Population estimates are a better indicator of density when ample data is able to be collected. High abundance levels in 2013 can be attributed to drawdowns of the Marion Millpond in 2007 and 2009 as high abundance levels of northern pike in the next impoundment upstream filled Pigeon Lake.

The size structure of northern pike in the 2025 survey was low with a PSD of 41 which ranks in the 48th percentile when compared to lakes statewide. The length ranges of male (9 - 23 inches) and female (11 - 38 inches) northern pike are within the ranges commonly found statewide. Size structure trends over the last several surveys show an increase in northern pike size structure.

Aging structures were collected from 118 individuals, showing that growth is moderate. Exploitation is a concern with northern pike in Pigeon Lake, as growth shows potential to grow to larger sizes, while having an ample forage base to support

large fish. A 25–35-inch protected slot and bag limit of 2 is recommended to maintain the quality of northern pike in Pigeon Lake.

Figure 1. 2025 Northern pike length frequency from fyke netting.

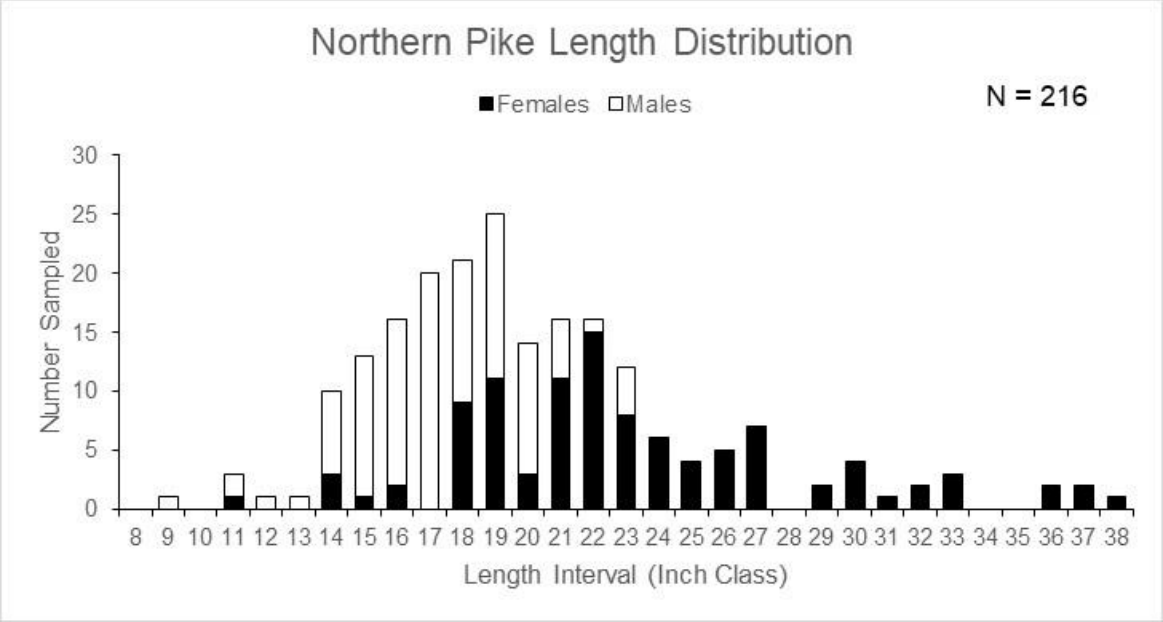

Table 3. 2025 size structure metrics for northern pike on Pigeon Lake

Total Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number
216	20.2	9.7 - 38.0	14.0 and 21.0	203	83

Table 4. Fyke netting number per net night for northern pike on Pigeon Lake

Total Sampled	1998	2013	2025	Historical Median	2025 Statewide Percentile Rank	2025 Abundance Rating
252	6.3	19.8	4.5	6.3	77	High

Table 5. Proportional stock density for northern pike on Pigeon Lake

1998	2013	2025	Historical Median	2025 Statewide Percentile Rank	2025 Abundance Rating
23	42	40	40	48	Moderate

Table 6. Adult abundance (population estimate) for northern pike on Pigeon Lake

Year	Marked	Captured	Recaptures	Population Estimate (95% CI)	Number per Acre
2025	220	252	32	703 (495 - 1,210)	3.2
2013	664	756	80	2,541 (2,046 - 3,194)	11.7
1998	320	367	47	1,097 (820 - 1,657	5.0

Table 7. 2025 Growth Metrics for northern pike on Pigeon Lake.

Number Sampled	Length Bin (inches)	Sex	Mean Age	Age Range	Percentile Rank	Growth Rating
5	18.0 - 18.9	M	3.0	3	73	Moderate
5	18.0 - 18.9	F	3.2	3-4	34	Moderate
5	21.0 - 21.9	M	3.6	3-4	70	Moderate
5	21.0 - 21.9	F	4.2	4-5	27	Slow
5	26.0 - 26.9	F	4.8	4-7	56	Moderate

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.

Pigeon Lake supports a moderate density largemouth bass population with catch rates of 17.0 fish per mile of electrofishing. A catch rate of 17.0 fish per mile ranks in the 25-50th percentile among other simple riverine lakes throughout Wisconsin. Relative abundance comparisons among years indicate that CPUE was down slightly from the 2013 survey. Further, the CPUE of largemouth bass greater than 14 inches was high when compared to statewide values.

The size structure of largemouth bass in Pigeon Lake was high with a PSD value of 78, which ranks in the 78th percentile when compared to statewide values. When compared to recent surveys on the Pigeon Lake, largemouth bass PSD values have decreased slightly, indicating that younger year classes of largemouth bass have been recruiting into the adult population.

The current status of the largemouth bass population on the Pigeon Lake looks to be positive. Moderate relative abundance and a moderate size structure results in angling opportunities to catch largemouth bass of all sizes.

Largemouth bass in Pigeon Lake reach 14 inches on average at 6.0 years old, which is fast when compared to growth rates of largemouth bass statewide.

Figure 2. 2025 Largemouth bass length frequency from electrofishing.

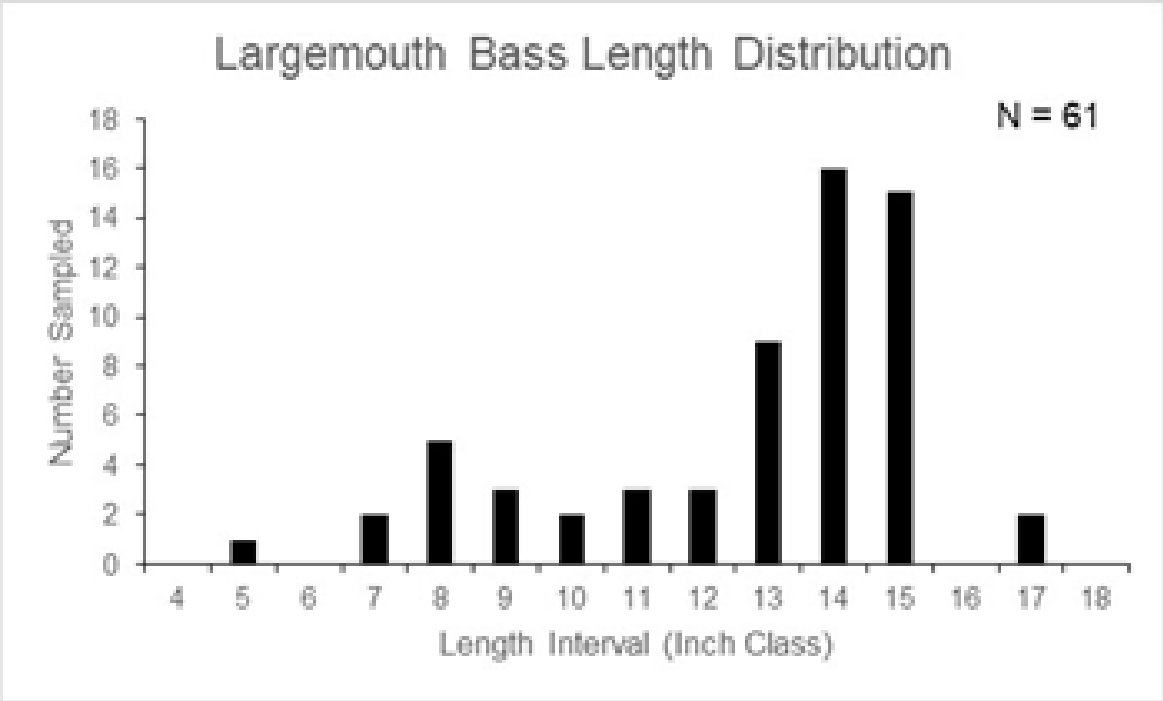

Table 8. 2025 size structure metrics for largemouth bass on Pigeon Lake.

Total Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number
61	13.2	5.9 - 17.5	8.0 and 12.0	58	45

Table 9. Electrofishing number per mile for largemouth bass on Pigeon Lake.

2013	2025	Historical Median	2025 Statewide Percentile Rank	2025 Abundance Rating
41.2	17.0	29.1	25-50	Moderate

Table 10. Proportional stock density for largemouth bass on Pigeon Lake .

1998	2013	2025	Historical Median	2025 Statewide Percentile Rank	2025 Abundance Rating
91	84	78	84	78	High

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.
Pigeon Lake supports a moderate to high density black crappie population with catch rates of 7.0 fish per net night from the fyke netting survey. Catch rates of 7.0 per net night rank in the 50– 75th percentiles when looking at similar simple riverine systems. The size structure of black crappie in Pigeon Lake based on the fyke netting survey, most individuals captured ranged from 4-10 inches in length. Length data from the fyke netting survey resulted in a PSD value of 55 which is in the 44th percentile when compared to fyke netting data statewide.
Population trends from previous fyke netting surveys on Pigeon Lake indicate that the size structure has improved from the 2013 survey, but lower than the 1998 survey. Moreover, relative abundance estimates have increased from the 2013 survey.
Growth metrics calculated from age estimates indicate that black crappie in Pigeon Lake grow moderate - fast for both male and female individuals up to 8.0 inches. Growth is above average at 10.0 inches but has slowed down closer to statewide averages.
Pigeon Lake District has been adding fish sticks over the last few years and have plans for more in coming years. Woody debris and further management of common carp should have a positive impact on the black crappie population.

Figure 3. 2025 Black Crappie length frequency from fyke netting.

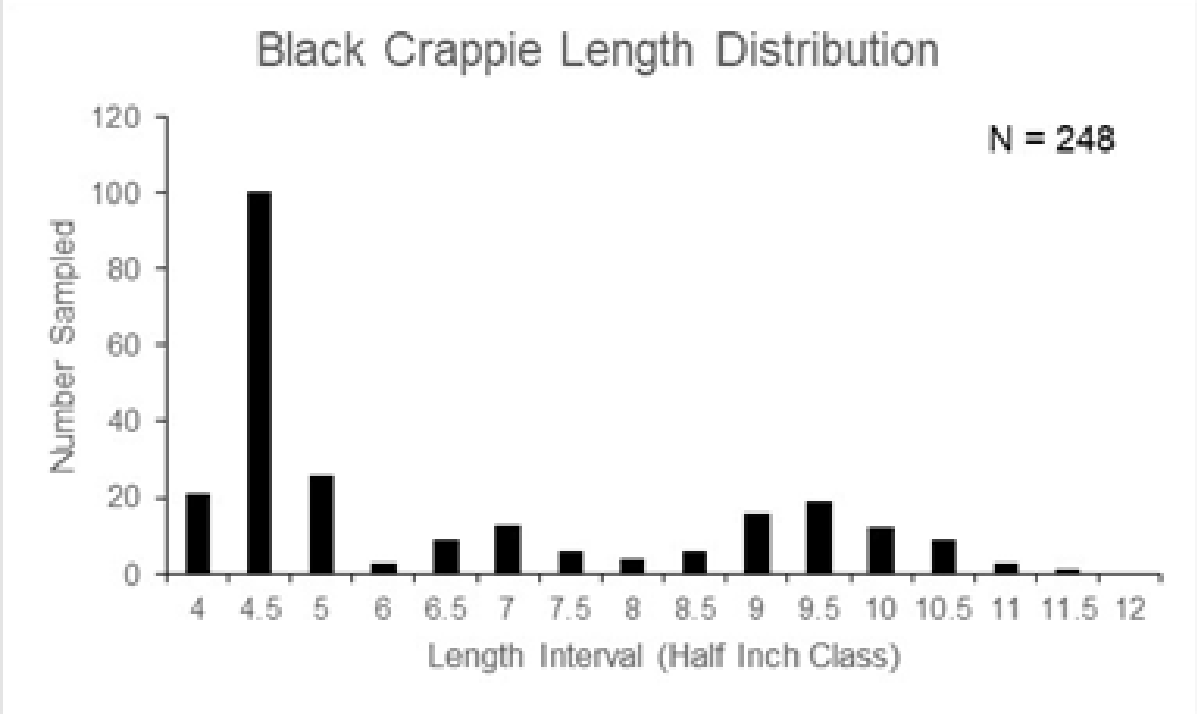

Table 11. 2025 size structure metrics for black crappie on Pigeon Lake.

Gear	Total Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number
Fyke Net	248	6.4	4.0-11.5	5.0 and 8.0	127	55

Table 12. Fyke netting number per net night for black crappie on Pigeon Lake.

2025? Total Sampled	1998	2013	2025	Historical Median	2025 Statewide Percentile Rank	2025 Abundance Rating
382	3.5	4.8	7.0	4.8	50 – 75th	Moderate -High

Table 13. Fyke net Proportional stock density for black crappie on Pigeon Lake.

1998	2013	2025	Historical Median	2025 Statewide Percentile Rank	2025 Abundance Rating
80	29	55	55	44	Moderate

Bluegill

Bluegill (Lepomis macrochirus) is a very 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 and fyke netting can be effective sampling gear for bluegill, and therefore, results from both gears are presented for bluegill.

Pigeon Lake supports a moderate density bluegill population with catch rates of 39.1 fish per net night from the fyke netting survey and 110 fish per mile of electrofishing from the boom shocking survey. Catch rates of 39.1 per net night and 110 per mile rank in the 86th and 58th percentiles respectively. Catch rates of bluegills greater than 7 inches in the electrofishing survey was 0 per mile.

The size structure of bluegills in Pigeon Lake was characterized as low based on the fyke netting survey and from the electrofishing survey. Length data from the fyke netting survey resulted in a PSD value of 16, which is in the 9th percentile when compared to bluegill fyke netting data statewide. Length data collected from the electrofishing survey resulted in a PSD value of 8, which is in the 11th percentile when compared to statewide values.

Population trends from previous surveys on Pigeon Lake indicate that size structure has been declining over recent surveys. Impacts could be caused because of habitat changes from the recent drawdown and the increase in the common carp population. Growth metrics calculated from age estimates indicate that bluegill in Pigeon Lake have moderate - slow growth when compared to growth rates from bluegill populations across the state.

Figure 4. 2025 Bluegill length frequency from electrofishing.

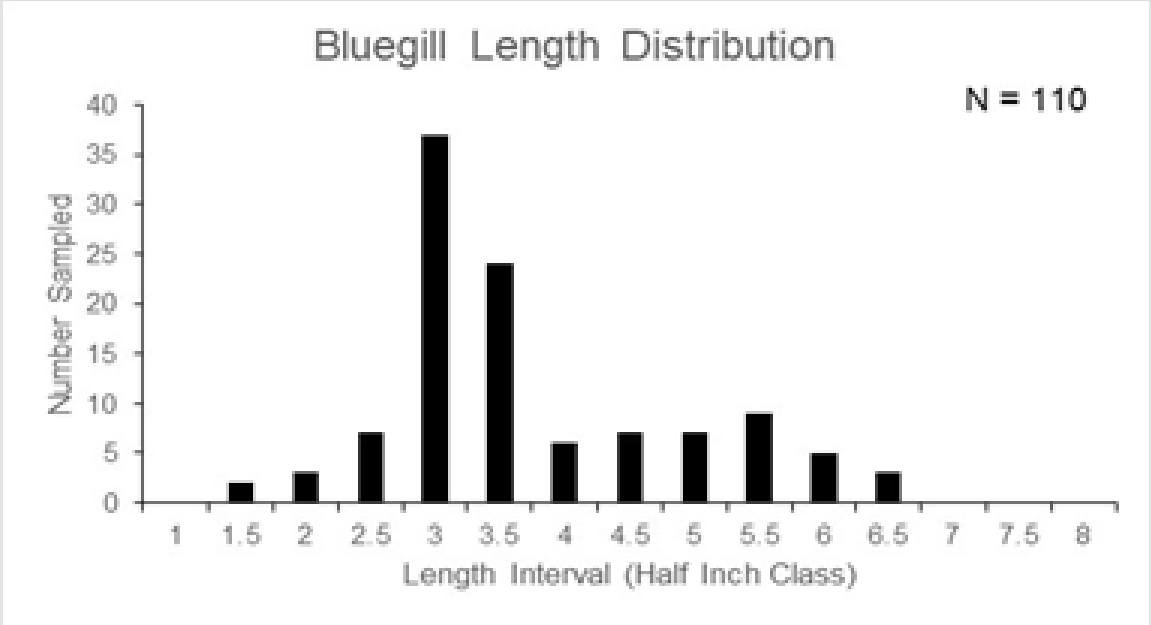

Table 14. 2025 size structure metrics for bluegill on Pigeon Lake.

Gear	Total Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number
Fyke Net	449	5.2	3.3 - 7.5	3.0 and 6.0	449	70
Electrofishing	110	3.9	1.8 - 6.8	3.0 and 6.0	98	8

Table 15. Fyke netting number per net night for bluegill on Pigeon Lake.

Total Sampled	1998	2013	2025	Historical Median	2025 Statewide Percentile Rank	2025 Abundance Rating
2,189	4.7	73.4	39.1	39.1	86th	High

Table 16. Fyke net Proportional stock density for bluegill on Pigeon Lake.

2005	2010	2025	Historical Median	2021 Statewide Percentile Rank	2021 Abundance Rating
66	47	16	47	9th	Low

Table 17. 2025 Electrofishing number per mile for bluegill on Pigeon Lake.

CPUE Total	Percentile Rank	Overall Abundance Rating	Length Index	Length Index CPUE	Length Index Percentile Rank	Length Index Abundance Rating
110	58th	Moderate	≥ 7.0 inches	0	-	Low

Table 18. Electrofishing number per mile historical trend for bluegill on Pigeon Lake.

2013	2025	Historical Median
357	110	233.5

Table 19. Electrofishing proportional stock density historical trend for bluegill on Pigeon Lake.

2013	2025	Historical Median
18	8	13

Table 20. 2025 Growth metrics for bluegill on Pigeon Lake.

Sample (n)	Length Bin (inches)	Sex	Mean Age	Age Range	Percentile Rank	Growth Rating
7	6.0 - 6.9	M	5.3	4 - 7	43rd	Moderate
7	6.0 - 6.9	F	6.3	5 - 8	18th	Slow
2	7.0 - 7.9	M	6.0	6	43rd	Moderate
5	7.0 - 7.9	F	6.6	6 - 8	35th	Moderate

Common Carp

Common Carp (Cyprinus carpio) is distributed widely across many Wisconsin waterbodies. Common carp typically spawn in nearshore areas with vegetation and soft sediment at approximately 65-75° F water temperatures. Common carp in high densities can interrupt the food chain for other fish species and out compete others for spawning locations.

Pigeon Lake was drawn down in 2018 for dam repairs in the city of Clintonville. It was recommended to leave water levels down until the fall of 2019 as that would allow a stocking of northern pike and largemouth bass to predate on panfish and common carp to keep prey species balanced and healthy. The water levels were lowered until mid-May 2019. A large spawning event of carp took place almost immediately upon water being brought back up to pre drawn down levels.

Pigeon Lake has a high density common carp population with catch rates of 120.0 fish per mile of electrofishing from the boom shocking survey. Catch rates of 120 per mile rank in the 90th percentile when comparing to other simple riverine systems.

The size structure of common carp in the Pigeon Lake is characterized as low based on data from both the fyke netting surveys and electrofishing surveys. Length data from the fyke netting survey resulted in an average length of 17.6 inches. A positive,

is that the carp being caught in Pigeon Pond are from a single year class that can be traced back to 2019.
Population trends from previous surveys on Pigeon Lake indicate that size structure has increased very slowly from netting surveys. The high abundance of common carp is a limiting factor of the common carp growing at a faster rate. An abundance of carp is a limiting factor in carp and other species to find ample food to grow to larger sizes.
Several tournaments by the lake district and removal events from the WDNR have been performed to lower the densities of common carp. Furthermore, two separate break outs of Koi herpes virus, which only affected the carp family took place. Koi herpes caused significant die-offs in Pigeon Lake. Abundance levels post die-off still are at high abundance levels.

Figure 5. Common carp and butterfly carp length frequency from electrofishing.

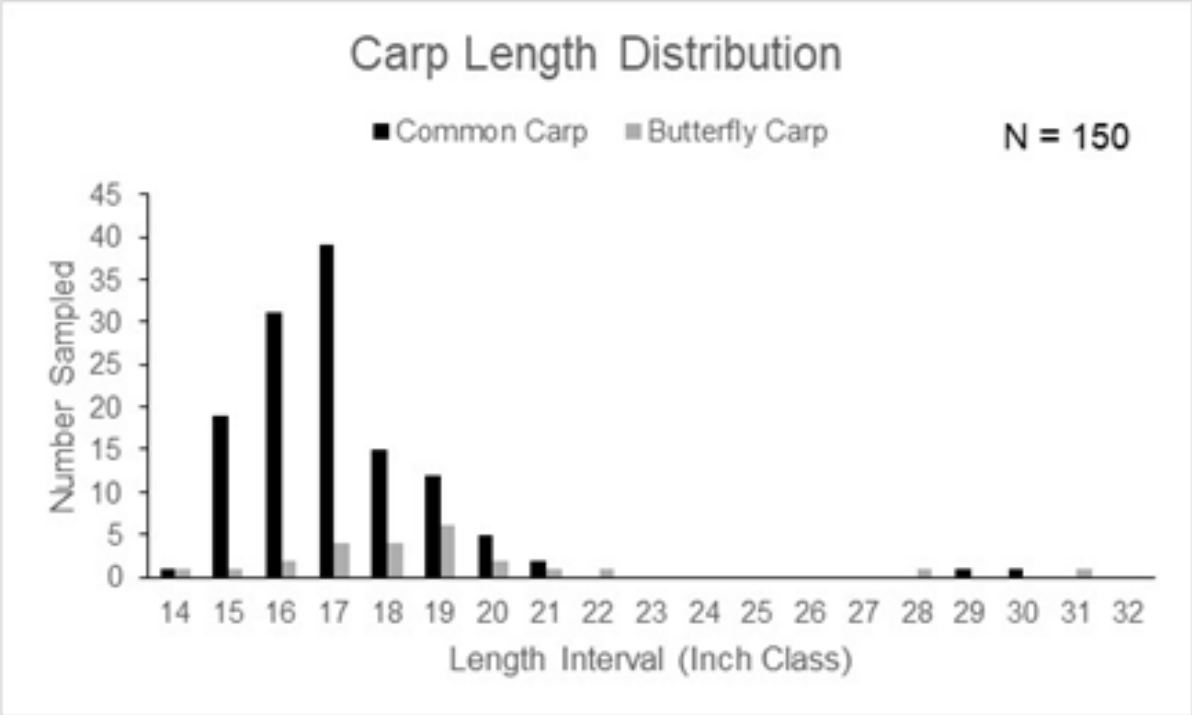

Table 21. Number of common carp and butterfly carp removed from Pigeon Lake.

Year	**Fyke Net**	**Electrofishing**	**Tournament**
2020	86	2,404	-
2021	-	234	404
2022	-	230	-
2023	-	-	518
2024	-	-	311
2025	273	124	519
Total	**359**	**2,992**	**1,752**

Table 22. Electrofishing number per mile historical trend for common carp and butterfly carp on Pigeon Lake.

1998	2013	2020	2021	2022	2025	Historical Median
0	0	116	156	55	120	85.5

Discussion/Recommendations

Northern Pike

Pigeon Lake supports a high abundance northern pike population with moderate size structure. Although there were individuals captured up to 38 inches, the majority of the sample consisted of 14 - 23 inch fish. Results from age and growth analyses show that the northern pike are able to grow at a faster rate than the statewide average and grow up to 26.0 inches in less than 5 years. Pigeon Lake consists of ample spawning area for northern pike, shallow muck bottom with an abundance of emergent and submergent vegetation and is excellent habitat. Spawning areas should be protected in order to sustain the excellent spawning habitat of Pigeon Lake. A concerning part of the northern pike population is that many of the fish are taken out of the population shortly after reaching the mid 20.0 inch range. Heavy fishing pressure and harvest is limiting the true potential of growing large northern pike. The DNR has talked with local user groups to discuss the possibility of putting in a protected slot limit for northern pike. The Pigeon Lake district is in favor of changing the northern pike regulation to a 25-35 inch protected slot, with a bag limit of two and a proposal has been initiated.

Largemouth Bass

The Pigeon Lake largemouth bass population has not recovered to pre-drawdown densities but has moderate size structure with fish reaching nearly 18.0 inches. Overall, the largemouth bass population is healthy but could benefit from slightly higher densities to maintain positive population characteristics and help keep panfish populations from becoming even more overabundant through predation. The largemouth bass population provides a high-action fishery with an above-average proportion of preferred size fish 15.0 inches or greater fish available for anglers. Population levels could be supplemented with a stocking event for largemouth bass. Abundant cover and a high forage base creates excellent conditions to grow largemouth bass to nearly 18.0 inches. Above average growth rates show that largemouth bass can reach 14.0 inches in less than 6 years. It is important to protect the predator species in Pigeon Lake, to keep common carp densities from becoming even higher.

Black Crappie

The black crappie density in Pigeon Lake is above average and provides an action angling opportunity. The 2025 survey results indicate that black crappie population levels were moderate - high when compared to waterbodies throughout Wisconsin. Further, the catch rate of black crappie greater than 8.0 inches was low compared to black crappie catch rates statewide. However, the 2025 survey results also show black crappie have above average growth rates up to 8.0 inches. Protection of predators can sometimes have a positive impact on controlling panfish numbers and potentially making growth rates faster.

Bluegill

Bluegill densities in the 2025 Pigeon Lake survey appear to have decreased since past surveys. Relative abundance has shown moderate densities of bluegill and size structure metrics have declined to low levels. Growth was assessed on bluegill using age estimates from otolith cross sections, and results indicate bluegills have below average growth in the Pigeon Lake compared to waterbodies statewide. In particular female bluegill slow down to well below average when compared to statewide data. Very few 7.0 inch bluegill were sampled using fyke nets and electrofishing gear. Similar to black crappie, bluegill populations could be improved by helping to protect predators within Pigeon Lake. Heavy vegetation, turbidity and high densities of smaller bluegill can be a limiting factor for the predator vs prey interactions, thus slowing down growth.

Pumpkinseed

Pigeon Lake pumpkinseed population has seen a significant decline since water levels were brought back up in the spring of 2019. Prior surveys showed moderate densities and size structure of pumpkinseed in Pigeon Lake. Competition of food sources in Pigeon Pond is at a premium. High abundance levels of common carp have most likely had a negative impact on the pumpkinseed population. Competition for spawning areas and similar food sources have lowered pumpkinseed populations to nearly nonexistent in Pigeon Lake.

Common Carp

Pigeon Lake has an abundant common carp population, with 10% of the carp made up of butterfly carp (hybrid common carp x koi). After 5 years of water levels being at normal levels, carp densities have remained high even though multiple attempts and events have taken place to reduce the carp population. Common carp have increased turbidity within the lake, have had a negative impact on vegetation, and are outcompeting many of the species in Pigeon Lake. The DNR surveys and removals were conducted over the last 5 years, along with the lake district holding several rough fish tournaments. Koi herpes outbreaks in 2022 were thought to have decreased the carp population as there were two separate significant die offs. Densities still remain high for carp in Pigeon Pond. Other avenues should be explored to decrease carp densities. Ideas include a carp bounty, private consulting firm removal by contract or other options may exist.