Pennsylvania Fish & Boat Commission Biologist Report

Lake Wilhelm

Mercer County

Spring 2024 Trap Net and Night Boat Electrofishing Surveys

Fisheries Management Area 2 Fisheries Biologist Garrett Herigan with an adult Muskellunge.

Lake Wilhelm is a 1,724-acre impoundment located in Maurice K Goddard State Park, Mercer County. The lake contains a wide variety of fish species that offer diverse year-round angling opportunities. The Pennsylvania Fish and Boat Commission (PFBC) manages Lake Wilhelm's fishery under Statewide Regulations for Commonwealth Inland Waters for all species except Muskellunge, which are managed in the Brood Stock Lakes Program that requires immediate release of all Muskellunge caught from April 1 through May 31. The PFBC stocks Lake Wilhelm with Walleye fingerlings, Muskellunge yearlings and, beginning in 2019, Channel Catfish yearlings. Anglers are encouraged to consult the PFBC summary book for further details regarding seasons, sizes, and creel limits.

Biologists from Fisheries Management Areas 1 and 2 set and retrieved Pennsylvania-style trap nets the week of April 15th and conducted night-time boat electrofishing surveys the week of May 13th.

The purposes of these surveys were to evaluate the status of the lake's Walleye, Muskellunge, panfish and Largemouth Bass populations. Specifically, we wanted to assess the status of the Walleye and Muskellunge stocking programs to determine if catch rates and population levels were meeting respective (e.g. Walleye and Muskellunge) minimum management plan abundance benchmarks. Relative abundance, or catch rate, of fish collected, were expressed as catch-per-unit of effort (CPUE); or number of targeted-fish collected per unit of time gear was deployed.

Overall results of the 2024 survey were impressive as 6,807 individuals representing 17 different species were captured during our sampling (Table 1). Unlike the 2010 and 2018 trap net surveys, Gizzard Shad were not the most abundant species captured, comprising only 2.2% (145) of the total trap net catch in 2024.

Trophy-sized Walleye captured in our trap nets.

Table 1. Summary of catch for 2024 trap net and boat electrofishing surveys on Lake Wilhelm.

Species	Number	Size Range (in.)
Black Crappie	2789	2 to 19
Bluegill	1379	2 to 7
Brown Bullhead	875	7 to 15
Largemouth Bass	474	4 to 22
Yellow Bullhead	221	3 to 13
Muskellunge	191	25 to 49
Pumpkinseed	173	3 to 6
Gizzard Shad	145	Not measured
Channel Catfish	140	5 to 34
Yellow Perch	137	5 to 10
White Crappie	122	5 to 17
Walleye	100	14 to 29
Common Carp	20	Not measured
White Sucker	16	Not measured
Golden Shiner	13	Not measured
Bowfin	3	22 to 29
Green Sunfish	3	Not measured

Walleye, Muskellunge, and Panfish Trap Net Assessment

During the week of April 15th, we completed 28 overnight sets of Pennsylvania style trap nets totaling 628.42 hours of effort.

Walleye

In the spring 2024 survey, our nets captured 100 Walleyes yielding a catch rate of 0.16 fish per net hour. Captured Walleyes ranged in size from 14 - 29 inches with 99 (99%) of legal size (≥ 15 inches). The size distribution of Walleyes in Lake Wilhelm is shown in Figure 1.

While the 2018 survey produced a record high Walleye catch rate (0.48 fish/hr), a 66% decrease was observed in 2024 (Figure 2). Although catch rates were lower than the previous survey, this year's value is equal to the historical average (0.16 fish/hr) prior to 2018. As stated in the Walleye Management Plan, a minimum trap net catch rate of 0.15 fish per hour applies to larger sized lakes as a benchmark for producing a quality Walleye fishery. Based on our results, with multiple year classes represented and an overall catch exceeding the minimum required rate, it is evident that our stocking program is producing a viable Walleye fishery for harvestable and trophy sized fish. However, the low abundance of Walleyes under 20 inches suggests that survival of stocked fingerlings has been poor the past few years. Lake Wilhelm is part of a study of the effects of increased Walleye stocking rates on the abundance of adult Walleyes and it is scheduled to receive 50 fingerlings per acre (versus the statewide standard of 20 per acre) for the next several years.

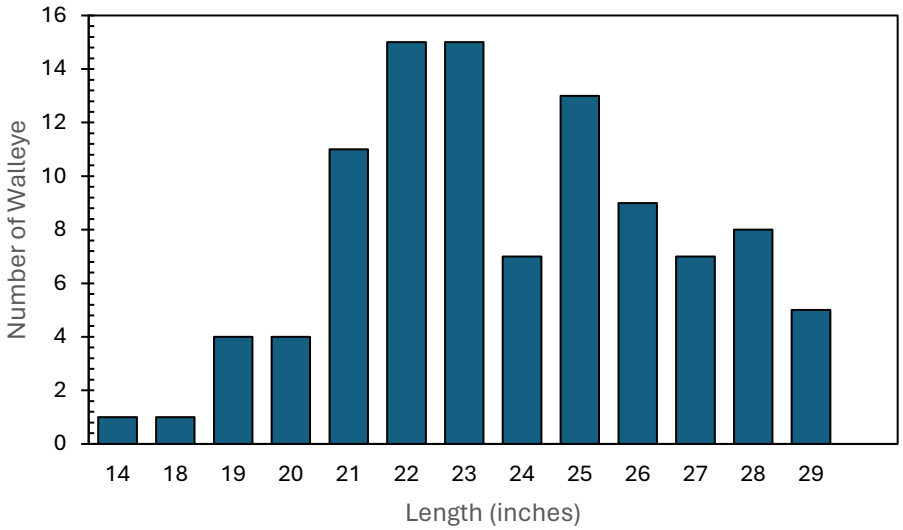

Figure 1. Walleye size distribution from Lake Wilhelm during spring 2024.

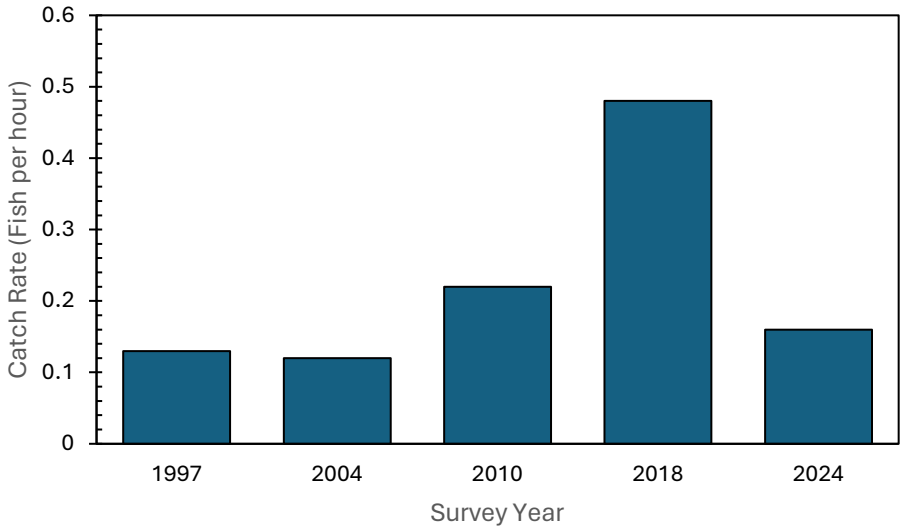

Figure 2. Walleye catch per trap net hour in Lake Wilhelm 1997-2024.

Muskellunge

Another highlight of our sampling was the abundant and high-quality Muskellunge population which continues to improve in overall size and age structure with each successive survey. We captured a total of 191 adult Muskellunge in 628.39 hours of effort that yielded a catch rate of 0.30 fish per hour. This catch rate far exceeded the Musky Management Plan minimum benchmark of 0.01 fish per hour, a requirement for continued stocking. Captured Muskellunge ranged in size from 26 to 49 inches in total length. Additionally, the total number of Muskellunge captured and the calculated catch rate in 2024 were both record highs. Future lake stockings of Muskellunge yearlings will be on an every other year basis as referenced in the recently updated Muskellunge Management Plan (2017). In adopting this new stocking strategy, we fully anticipate these 12-14 inch yearlings to yield increased survival rates to adulthood and thus should continue to further enhance the quality Musky population that presently exists in the lake. Table 2 provides historical catch information for Muskellunge in Lake Wilhelm for 1997, 2004, 2010 and 2018, in which catch rates exceeded the minimum catch rate criteria (0.01 fish/hr) for all years of sampling.

Table 2. Muskellunge spring trap net catch summary for five surveys between 1997 and 2024 at Lake Wilhelm.

Year	Number Collected	Size Range	Catch Rate
1997	12	37 to 46	0.02
2004	14	33 to 49	0.05
2010	23	28 to 50	0.02
2018	47	21 to 43	0.05
2024	191	26 to 49	0.30

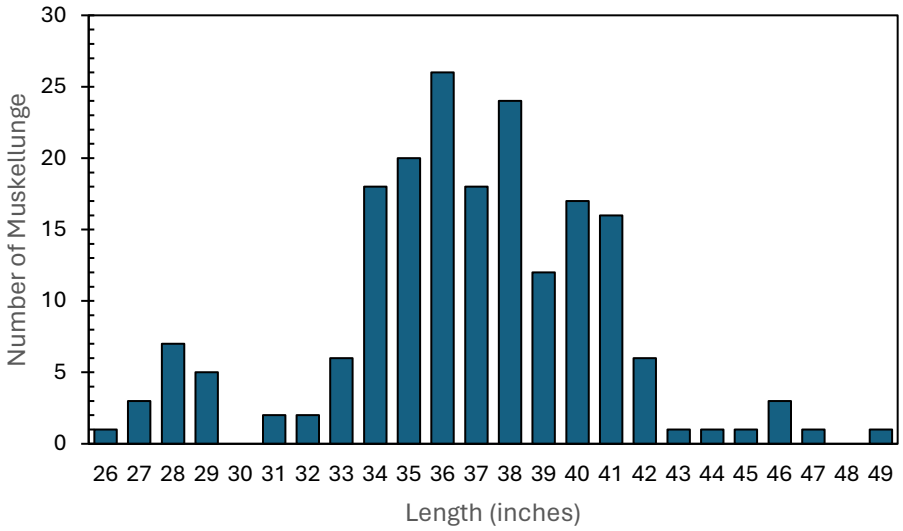

Figure 3. Muskellunge size distribution from Lake Wilhelm during spring 2024.

Panfish

Panfish comprised 73% of the total trap net catch (Table 1). The predominate panfish species captured was Black Crappie, followed by Bluegill, Pumpkinseed, Yellow Perch, White Crappie, and Green Sunfish. Black Crappies were the most abundant fish captured in our nets. Most of the Black Crappies, about 77%, were between 6-8 inches however some large individuals were collected up to 19 inches (pictured below). White Crappies were less common than Black Crappies in our nets accounting for only 2% of our total catch. Although less common, the White Crappies were larger on average with over 50% of individuals ≥ 10 inches. Bluegills were the second most abundant panfish captured in our nets with most (85%) falling between 5-7 inches. Yellow Perch are present and can be found up to 10 inches. Additional panfish species that anglers may encounter include Pumpkinseeds and Green Sunfish.

***Left**: Fisheries Biologist Davis Fray with a large Black Crappie captured in our trap nets.*

***Right**: Fisheries Biologist Garrett Herigan with a Channel Catfish captured in our trap nets.*

Catfish

Channel Catfish yearlings have been stocked into Lake Wilhelm on a yearly basis since 2019 and this year's survey results indicate that the stocking program is off to a great start. We captured 140 total Channel Catfish ranging from 5-34 inches. These fish are showing excellent growth for the short amount of time that has passed since the initiation of the stocking program. In addition to Channel Catfish, Brown Bullhead and Yellow Bullhead populations are healthy and should continue to provide anglers with a sustainable recreational fishery (Table 1).

Gizzard Shad

Gizzard Shad were first documented at Lake Wilhelm in 2004. Since then, their numbers increased with each successive survey until this year, when abundance declined to the lowest level in almost 20 years (Figure 4). Gizzard Shad can be a double-edged sword to a fish community. While Gizzard Shad can serve as an important diet component for larger predators such as Largemouth Bass, Walleyes and Channel Catfish and large crappies may use young of the year Gizzard Shad as forage, they may also have negative ecological consequences with respect to some species, especially panfish and juvenile bass. Young Gizzard Shad may out-compete juvenile gamefish for food resources such as zooplankton, which can lead to reduced growth rates especially in Bluegills, crappies, and young bass where food preferences overlap.

Our increased stocking efforts of Walleyes, Largemouth Bass, and Muskellunge fingerlings/yearlings in recent years seems to have helped to stabilize the Gizzard Shad population. Winter die offs of Gizzard Shad appear to have also played a role in the recent decline. We are hopeful that predation by gamefish will maintain this reduced abundance of adult Gizzard Shad and benefit panfish populations in Lake Wilhelm.

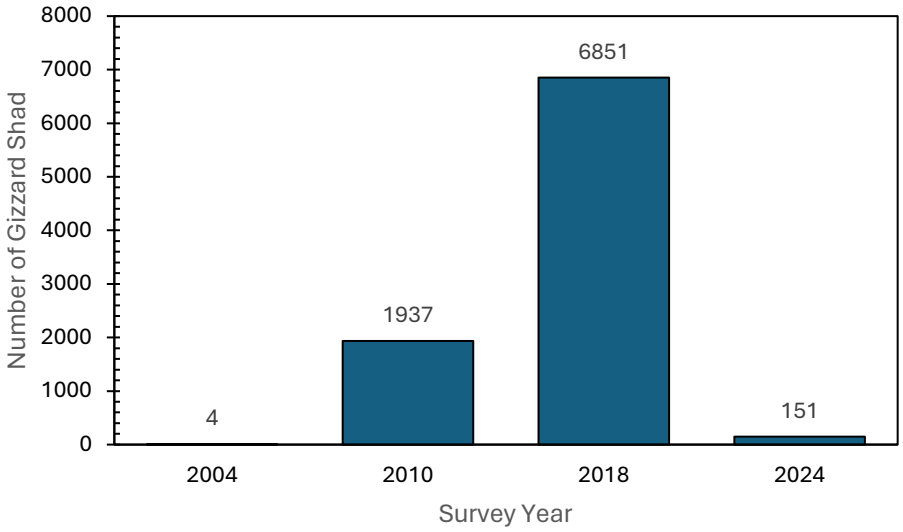

Figure 4. Gizzard Shad total catch in trap net surveys between 2004 and present.

Largemouth Bass Night-Time Boat Electrofishing Assessment:

Fisheries Management staff from Areas 1 and 2 returned to Lake Wilhelm on the nights of May 15th & 16th to evaluate the status of the Largemouth Bass population via night-time boat electrofishing (NTBEF). Ten runs totaling 3.0 hours of effort were conducted along the shoreline covering a representative portion of the lake. A total catch of 473 Largemouth Bass were netted and ranged in size from 4 to 22 inches in length for a catch rate of 157.7 fish per hour (Figures 4 & 5). This is a new record high catch rate for total Largemouth Bass in Lake Wilhelm. Additionally, the catch rate of Largemouth Bass ≥ 12 inches at 81.7 fish per hour was more than double the historical mean of 33.3 fish per hour. Finally, the catch rate of Largemouth Bass ≥ 15 inches was the highest on record with a catch rate of 24.0 fish/hr. These results indicate that Lake Wilhelm's bass population is thriving and should provide excellent angling opportunities for Largemouth Bass into the foreseeable future.

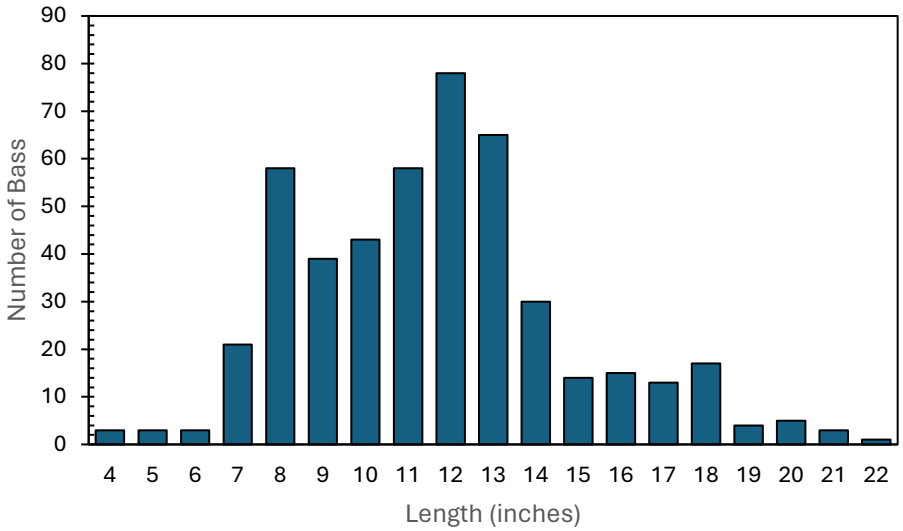

Figure 4. Largemouth Bass size distribution from Lake Wilhelm during spring 2024.

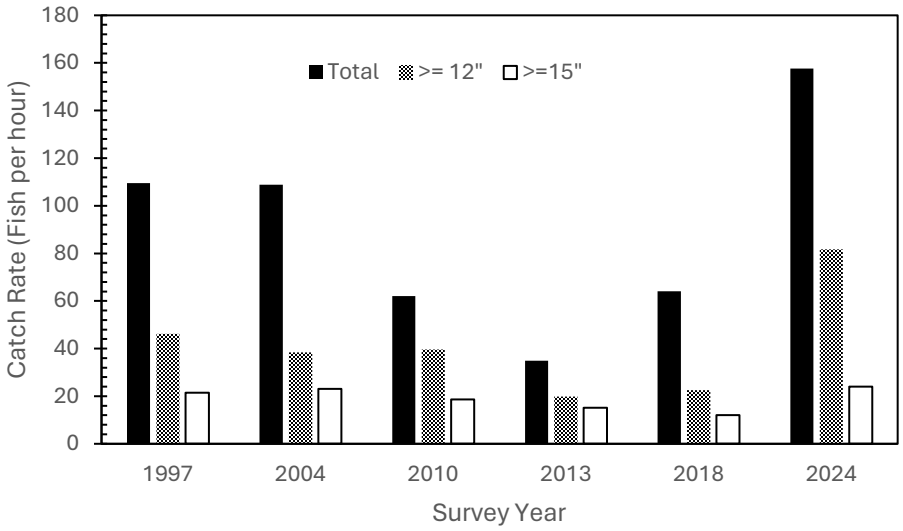

Figure 5. Largemouth Bass catch per trap net hour in Lake Wilhelm 1997-2024.

***Left**: Area Fisheries Manager Tim Wilson with a quality sized Largemouth Bass captured during the night-boat electrofishing survey. **Right**: Fisheries Biologist Aides Joel Dean and Ben Smith with two trophy-sized Largemouth Bass from Lake Wilhelm.*

Conclusion

In conclusion, anglers interested in great fishing opportunities with abundant numbers and quality sizes should continue to invest their time in fishing Lake Wilhelm. The Muskellunge, Catfish, and Largemouth Bass populations of Lake Wilhelm are performing exceptionally well. Walleyes offer large and trophy size fish at moderate density, while panfish provide a high-density fishery with moderate quality. Both fisheries are worthy targets for anglers. Good Luck!

Fisheries Management Area 2