

Marsh Creek Lake

Chester County

2023 Muskellunge Survey

Marsh Creek Lake is a 535 acre reservoir located in [Marsh Creek State Park](#), Chester County.

The park is managed by the [Pennsylvania Department of Conservation and Natural Resources \(DCNR\)](#) and is located four miles north of Downingtown.

Historically, Marsh Creek Lake supported a robust tiger muskellunge population that was popular with anglers. More recently, pure-bred Muskellunge has become the dominant species in Marsh Creek Lake (Figure 1). The Muskellunge population in Marsh Creek Lake has been primarily supported by Muskies Inc., Penn-Jersey Chapter 50, which has purchased and stocked advanced Muskellunge fingerlings periodically since 2006.

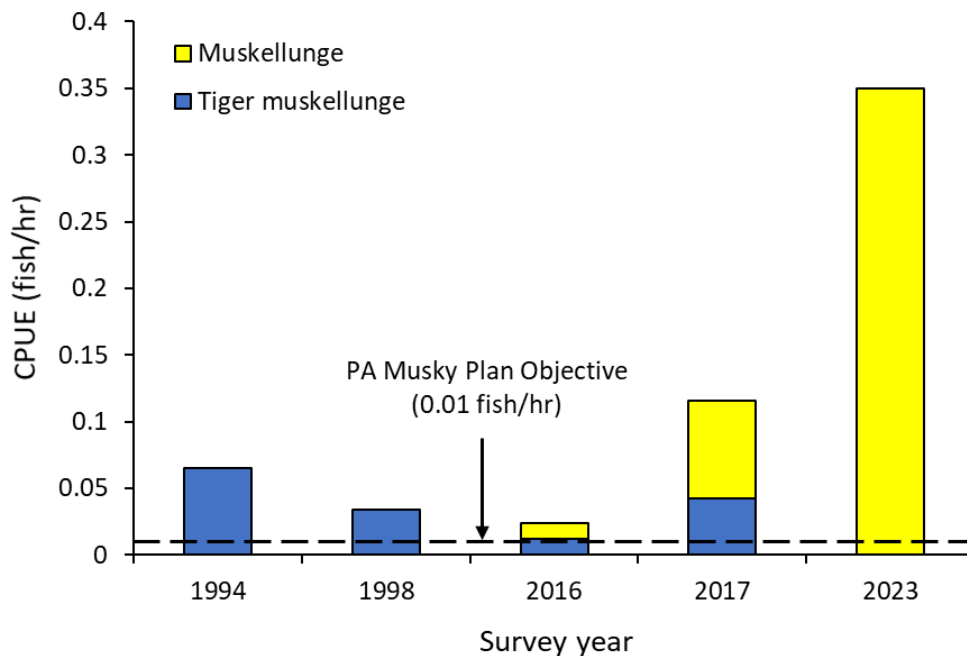


Figure 1. Long-term catch-per-unit-effort (CPUE) of tiger muskellunge and pure Muskellunge captured from Marsh Creek Lake during spring trap net surveys.

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A trap net survey was conducted at Marsh Creek Lake to characterize the Muskellunge population. During April 10-13, 2023, eight Pennsylvania style trap nets were set in Marsh Creek Lake. The trap nets were set and allowed to fish overnight for approximately 24 hours before being processed the following day. Captured fish were measured, weighed, sexed, an individually numbered Passive Integrated Transponder (PIT) tag was implanted, a pelvic fin ray was removed for aging purposes, and the fish was released. Each net was then re-located to another sampling location to ensure that all suitable habitats were evaluated.

Marsh Creek Lake supports a high abundance of Muskellunge. A total of 64 pure Muskellunge were captured, which equates to a catch rate of 0.35 fish/hr (Figure 1). This catch rate easily exceeded (35 times higher) the Pennsylvania Muskellunge Management Plan catch rate objective of 0.01 fish/hr. Muskellunge sizes ranged from 28 to 43 inches (Figure 2). Only 3% of the sample exceeded 40 in, which is the length preferred by anglers and is the minimum length limit for this species.

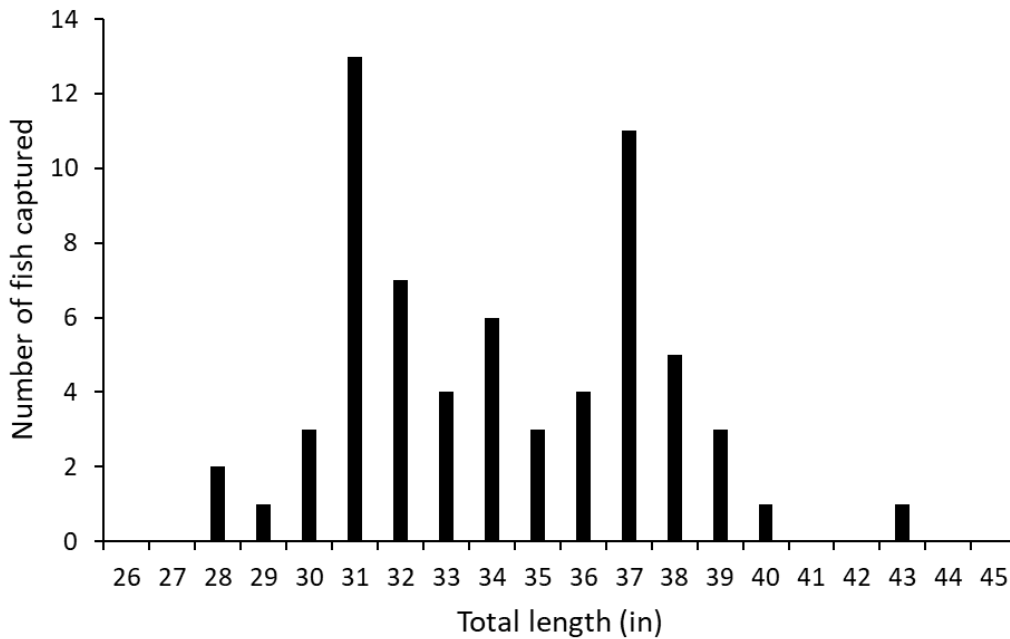


Figure 2. Length frequency distribution of pure Muskellunge captured from Marsh Creek Lake during April 10-13, 2023.

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The high abundance of Muskellunge in Marsh Creek Lake may be negatively affecting the condition of these fish. The mean relative weight (a metric used to describe the body condition of fishes) of Muskellunge collected in the 2023 trap net survey was 81 (Table 1), which is substantially lower than the statewide average of 95 calculated in the [2012 Plan for Management of Muskellunge \(MMP\) in Pennsylvania](#) (Figure 3). Additionally, the mean relative weight from the 2023 sample was lower than that observed for fish collected in 2016 and 2017; when Muskellunge were collected at lower abundances. During the 2016 survey, Area 6 biologists determined that all tiger muskellunge and Muskellunge captured were in good physical condition, suggesting that the lake was not overpopulated by these species at that time.

Table 1. Relative weights of Muskellunge captured from Marsh Creek Lake during spring trap net surveys conducted in 2016, 2017, and 2023.

	2016/2017 (n=9)	2023 (n=64)		
	Combined sexes	Males	Females	Combined sexes
Overall	89	81	83	81
Sex-specific	NA	80	82	NA

It is possible that Muskellunge abundance has reached a level in Marsh Creek Lake where increased intraspecific competition for forage resources is occurring. This may explain why Muskellunge had low relative weight which could result in slower growth rates. While anglers may experience increased catch rates resulting from high Muskellunge abundance, the current density may result in reduced trophy potential. Due to the high abundance of Muskellunge in this population, Area 6 staff plan to return to Marsh Creek Lake in future years to monitor abundance, condition, and size structure of Muskellunge in Marsh Creek Lake to make sure this was not a one-time occurrence and truly indicative of what is happening in the population. Additionally, the potential effects of an abundant, top-level predator on other fish populations will be evaluated. Results of these surveys will dictate future Muskellunge management at Marsh Creek Lake.

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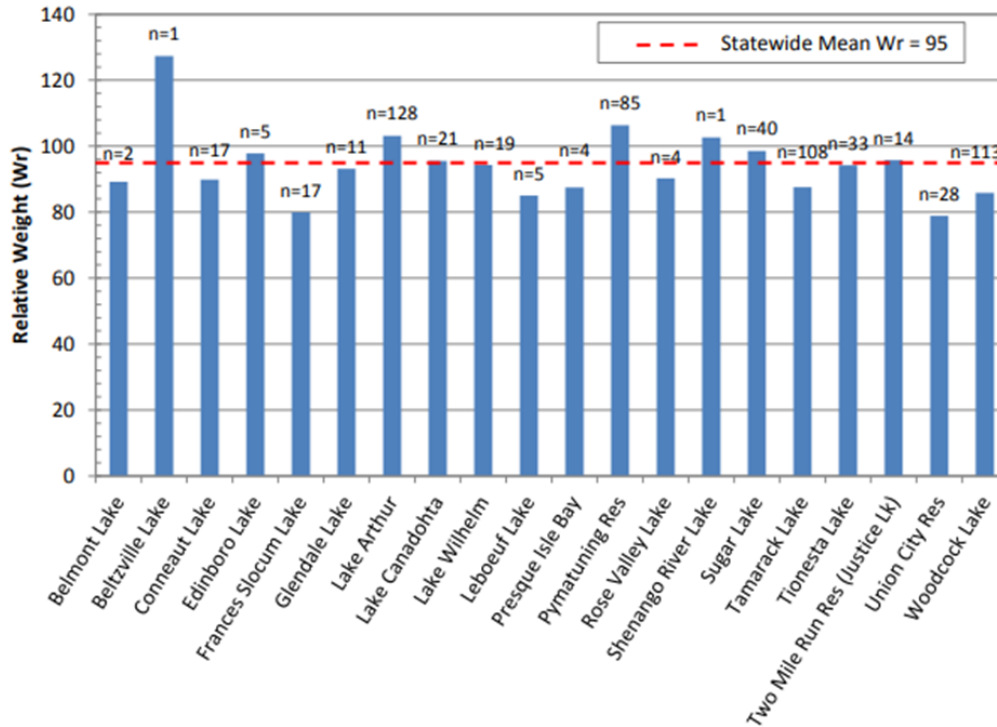


Figure 3. Graph depicting the mean relative weights of Muskellunge captured during 1978-2010. This figure was copied from the 2012 Plan for Management of Muskellunge in Pennsylvania (Page 49, Figure 14) for comparison. The mean relative weight of Muskellunge captured during the 2023 Marsh Creek Lake survey would be the third lowest value in this dataset.

Marsh Creek Lake is managed as a multiple-use fishery offering a variety of species for anglers to target. Many other fish species were captured during the 2023 trap net survey, such as Black Crappie, Bluegill, Pumpkinseed, White Crappie, White Perch, and Yellow Perch (Table 2). Black Crappie, Bluegill, and Yellow Perch were the most abundant panfish species captured. Crappies ranged from 2 to 10 inches, and only 2% (20 of 940 fish) exceeded 9 inches. Most (81%) of Bluegills were 5-6 inches, with only 5% attaining ≥ 7 inches. Yellow Perch ranged from 4 to 10 inches, and $< 2\%$ exceeded 9 inches. Several other panfish species were encountered during the survey but were captured at low abundances.

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Table 2. Summary of fish species, number (n), and length range (in) collected during a trap net survey at Marsh Creek Lake between April 10 and 13, 2023.

Species	n	Length Range (in)
Brown Bullhead	1	12
Channel Catfish	1	31
Muskellunge	64	28-43
White Perch	6	8-12
Rock Bass	1	7
hybrid sunfish	1	5
Green Sunfish	2	5-6
Pumpkinseed	5	5-6
Bluegill	251	2-7
White Crappie	2	7-9
Black Crappie	938	2-10
Yellow Perch	6	8-12

Largemouth Bass were not captured in this survey, which was expected since trap nets are not an effective gear type for capturing or monitoring black bass populations. For information on the lake's black bass population, please see the [2022 Marsh Creek Lake Biologist Report](#) for results of the most recent Largemouth Bass nighttime electrofishing survey.

Marsh Creek Lake has plenty of access for shoreline anglers, two boat launch areas (unpowered and electric motor use is permitted), and boat rentals. Night angling is permitted; however, night launching is only allowed from the west shore boat ramp. Largemouth Bass and Smallmouth Bass are managed under the Big Bass Program Special Regulations. All other species are managed with Commonwealth Inland Regulations.

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