

SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION



FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

NANIH WAIYA LAKE

2025

SURVEY REPORT

State: Oklahoma

Project Title: Nanih Waiya Lake Fish Management Survey Report

Period Covered: 2025

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Date Prepared: January 2026

Nanih Waiya Lake

ABSTRACT

Largemouth Bass data collected in 2024 shows that over the last 25 years largemouth bass CPUE has been very steady with some minor fluctuations in the abundance of larger sized individuals.

INTRODUCTION

Nanih Waiya Reservoirs lies within one mile from the Choctaw Nation of Oklahoma Capitol and Museum. At normal elevation of 594 ft., the surface area of the lake is 104 acres (3rd Edition, Oklahoma Water Atlas) and was constructed in 1958 by the ODWC. There is 200 acres of land around the lake for hunting, primitive camping, and fishing access via jetties, two boat ramps and one dock. Outlet structures consist of a primary uncontrolled spillway, emergency uncontrolled spillway and a screw-gate valve. The current storage capacity is 1,064 ac. ft., with a mean depth of 8.1 ft., a maximum depth of 25 ft., and a shoreline length of 2.4 miles.

The lake has a wide variety of fish species, including grass pickerel and bowfin. Largemouth bass (Florida strain) and channel catfish are routinely stocked by ODWC State Fish Hatcheries. Crappie, Bluegill, and Redear sunfish are also abundant. Sportfish populations are monitored with various fisheries sampling gear. Game species present include: white-tailed deer, bobwhite quail, eastern wild turkey, cottontail rabbit, fox and gray squirrel, waterfowl and furbearers. Bald eagles are a non-game species that many enjoy watching on the area.

Legal methods of take: Fishing is limited to rod and reel (2 per person) and bowfishing. No hunting or shooting is allowed between May 7 and Aug. 31. Deer hunting is restricted to shotgun (CLOSED to antlerless deer gun harvest) or archery, and all other hunting is restricted to shotgun with pellets or archery during open hunting seasons. Trapping is not allowed on the area.

Public entry for any activity requires a valid hunting and/or fishing license or wildlife conservation passport issued by the ODWC. Required license signs are posted at each access point. Some roads that did not lead to the water have closed due to littering and restrooms have been removed due to vandalism.

Recent management practices on the area are directed at excessive vegetation that makes fishing difficult. Non-restricted use pesticide was applied to emergent plants (cattails, rush and willows) around jetties and other areas of the lake. Water clarity is measured with a secchi disk

by the Oklahoma Water Resources Board (OWRB) quarterly in lakes of Oklahoma. The average secchi depth at Lake Nanih Waiya is 3.2 ft. (OWRB; Dec. 2007 – July 2008 sampling period) meaning sunlight can penetrate to depths of > 9 ft. allowing submerged vegetation to flourish in much of the lake. Triploid (sterile) grass carp were introduced in 2011 as a biological control for submerged plants (coontail, muskgrass and others). Large grass carp do not sustain vegetation control and therefore are not desired. Overtime, attrition from bow fishing harvest and escape during flood events controlled the size structure.

Manual removal of woody vegetation along the southeast shoreline opened the understory for fishing access and camping. The tree thinning allows law enforcement to monitor visitor activity from all directions for safety and security. Non-restricted use pesticide was applied to terrestrial vegetation on the earthen dam to prevent structural damage caused by roots and animal burrows. Prescribed fire was used to burn approximately 150 acres around the lake to benefit wildlife habitat and maintain progress of manual clearing.

Fish habitat consists primarily of aquatic vegetation, rock rip rap along the dam and brush piles. Brush fish attractors are maintained by sinking eastern red cedar trees with concrete blocks.

RESULTS

Largemouth Bass

Nanih Waiya was sampled in 2025 as an update to the 2024 sample to confirm findings and explore the opportunity to collect additional DNA samples to supplement samples collected the previous year for trophy bass management. Unfortunately, the catch rates were low owing to the opportunistic sampling added on to the end of the ideal sampling period and no additional DNA samples were able to be collected in meaningful sample size. Overall, the 2025 update matches the results of 2024 with the following exceptions. Catch rate per unit effort (CPUE) was much lower than the previous year but this is not unexpected due to the timing of the sample being not ideal and late in the year compared to 2024. With fewer fish comes less fish in various size groups (table 2), lower Proportional Stock Density (table 3) and missing year classes (table 5 & 6) as well as inflated mortality rate (table 8). Relative Weights (Wr) were confirmed to be 88 which is lower than the desired 95-105. This has been noted across many lakes in SE Oklahoma and what staff wanted to confirm from the 2024 sample. This Wr of 88 has been consistent since 2002 with the exception of 2009. Interestingly, the high 2009 Wr matches the same pattern as Broken Bow lake Largemouth Bass relative weights. What is so fascinating about this is broken bow is many times larger than Nanih Waiya and yet shows similar challenges. Fortunately Nanih Waiya is of small enough size that population dynamics can be manipulated and the low relative weight possibly corrected. For a full discussion of Nanih Waiya Largemouth Bass characteristics please review the 2024 report.

Recommendations

1. Since low relative weights have been confirmed implement research project to correct low weights by removing Largemouth Bass and adding supplemental forage as time and hatchery resources allow.

Table 1: Largemouth Bass Catch Per Unit Effort (CPUE) by year.

Total CPUE	2002	2009	2020	2024	2025
Mean	74.67	46.67	51	50	19
Count	3	6	6	6	6
SE	19.64	9.1	4.31	10.7	3.92
L 95% CI	36.17	28.83	42.54	29.04	11.31
U 95% CI	113.16	64.51	59.45	70.96	26.69

Table 2: Largemouth Bass CPUE by size class across time.

CPUE Size	2002		2009		2020		2024		2025	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Substock	26.67	7.42	8.67	2.81	20	8.14	7	2.86	.	.
stock	10	2	12.67	3.33	5	2.41	12	4.38	12	4.38
Quality	14	5.77	18	4.47	7	1.84	21	5.95	7	1.84
Preferred	22.67	5.33	6.67	3.21	18	6	10	4.29	.	.
Memorable	1.33	0.67	0.67	0.67	1	1	.	.	.	.
Trophy	.	.	.	.	.	.	.	.	.	.

Table 3: Largemouth Bass Proportional Stock Density by year.

PSD	2002	2009	2020	2024	2025
PSD	70	67	84	72	37

Table 6: Largemouth Bass Mean weight at age with standard errors.

Mean Weight at Age	2006		2009		2020		2024		2025	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
1	.	.	.	.	55.33	5.58	30.5	8.66	.	.
2	.	.	.	.	230	35.19	187.4	32.78	200.57	22.99
3	.	.	.	.	530.66	29.89	408.15	32.88	416.55	38.68
4	.	.	.	.	902.72	63.19	825.58	67.55	.	.
5	.	.	.	.	927.77	46.21	924.8	81.34	634	.
6	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	1504	.	1674	.	.	.
8	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.

Table 7: Largemouth Bass Von Bertalanffy metrics.

Von Bert	2002	2009	2020	2024	2025
L inf	.	.	471.36	526.295	360.10
K	.	.	0.46	0.321	0.935
t0	.	.	0.05	0.063	0.638

Table 8: Largemouth mortality estimates.

Mortality Table	2002	2009	2020	2024	2025
Instantaneous	.	.	0.24	0.38	0.9
Annualized	.	.	21.41	31.7	59.18

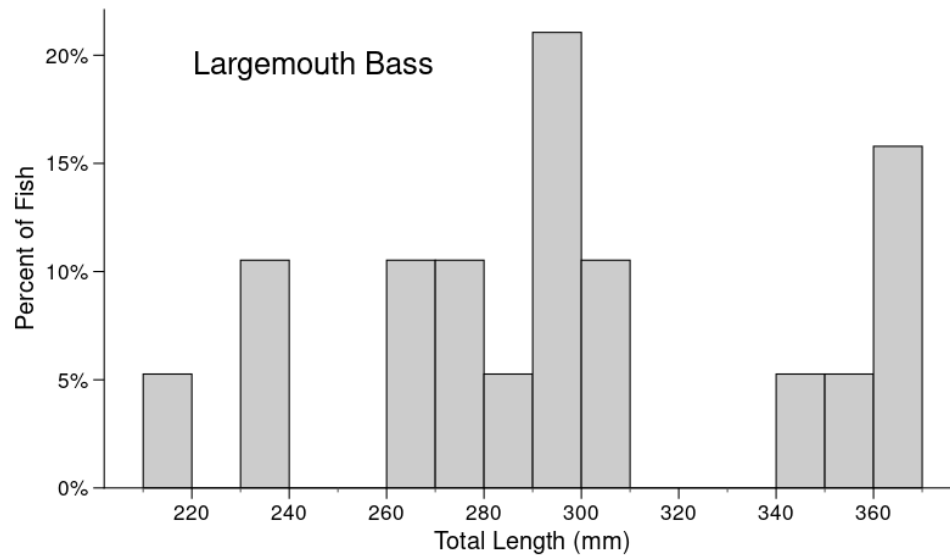


Figure 1: Largemouth Bass age frequency histogram.



Figure 2: Largemouth Bass length frequency histogram.