SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

Nanih Waiya LAKE

2024

SURVEY REPORT

State: Oklahoma

Project Title: Nanih Waiya Lake Fish Management Survey Report

Period Covered: 2024

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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. Channel Catfish numbers are below the threshold for data analysis but are healthy. Work conducted at the lab will provide direction on improving Channel Catfish opportunity in the near future. Crappie abundance at Nanih Waiya remains low while the size structure of available fish is very good. Reports in the last few years indicate the presence of some individuals surpassing 3 lbs.

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

Largemouth Bass numbers have remained relatively steady over the last 20 years with the exception of 2002 which is likely a relic of small sample size compared to other years (table 1). Numbers of preferred size Largemouth bass are down overall but up from 2020 and likely represent a smaller year class passing though (table 2). The length frequency histogram for Largemouth Bass shows a relatively normal distribution with a peak between 250 and 360 mm (figure 1). Overall Largemouth Bass PSD has remained surprisingly steady over the past 24 years with only larger differences in the preferred size class based on total fish collected in that size class (table 3). Similarly, Relative Weight (Wr) has not varied much indicating decent fish condition (table 4). Overall Largemouth Bass Wr is lower than ideal the range of values over the last 25 years are acceptable and indicate a stable population given the size of that water body and available food resources. Length and Weight at age are down from 2020 to 2024 but lack of previous samples preclude comparisons from prior to 2020 and any long term trends Table 5 and 6). Once fish reach approximately 375 mm length and weight is comparable to previous sample. The vast majority of individuals are between 2 and 4 years old which encompasses approximately 78% of the sample (figure 2). Efforts to increase the survival of age 4 fish to age 5 could dramatically improve the size distribution of Largemouth Bass as there appears to be a bottleneck at age 4. Von Bertalanffy estimates are acceptable for Largemouth Bass in both 2020 and 2024 (table 7). A longer-term data set is needed for trend data inferences. Mortality estimates for 2024 are on the upper end for Largemouth Bass in the region but not out of an acceptable range (table 8).

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

Total CPUE	2000	2002	2009	2020	2024
Mean	50	74.67	46.67	51	50
Count	4	3	6	6	6
SE	5.03	19.64	9.1	4.31	10.7
L 95% CI	40.13	36.17	28.83	42.54	29.04
U 95% CI	59.87	113.16	64.51	59.45	70.96

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

CPUE Size	2000		2002		2009		2020		2024	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Substock	17.83	6.48	26.67	7.42	8.67	2.81	20	8.14	7	2.86
Quality	6.83	2.11	14	5.77	18	4.47	7	1.84	21	5.95
Preferred	16.33	2.38	22.67	5.33	6.67	3.21	18	6	10	4.29
Memorable	1.5	1.5	1.33	0.67	0.67	0.67	1	1	.	.
Trophy	.	.	.	.	.	.	.	.	.	.

Table 3: Largemouth Bass Proportional Size Distribution by year.

PSD	2000	2002	2009	2020	2024
PSD	70	70	67	84	72
PSD-P	52	50	19	61	23
PSD-M	5	10	2	3	.
PSD-T	.	.	.	.	.
PSD S-Q	30	30	33	16	28
PSD Q-P	19	20	47	23	49
PSD P-M	47	40	18	58	23
PSD M-T	5	10	2	3	.

Table 4: Largemouth Bass Relative weight by year.

Wr	2000		2002		2009		2020		2024	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Substock	99.25	3.97	82.62	2.87	85.01	6.21	90	1.61	85.42	2.94
Stock	91.68	1.75	85.92	4.77	93.09	2.48	91.15	5.49	86.79	1.44
Quality	95.24	2.92	91.28	6.01	97.57	5.3	82.36	9	87.54	1.66
Preferred	93.11	1.22	95.36	2.27	96.2	1.51	86.72	1.36	92.71	2.08
Memorable	88.27	1.51	102.32	.	106.73	.	90.37	.	.	.

Trophy	.	.	.	.	.	.	.	.	.	.
Total	93.24	0.94	88.06	2.15	94.5	2.47	87.69	1.62	88.33	1.02

Table 5: Largemouth Bass Mean length at age by year.

Mean Length at Age	2020		2024	
	Mean	SE	Mean	SE
1	166.47	7.43	140	11.34
2	279.2	15.68	241.73	13.65
3	345.33	6.22	318.85	9.26
4	403.81	9.26	387.75	8.05
5	409.44	7.9	401.2	9.84
6	.	.	.	.
7	494	.	481	.
8	.	.	.	.
9	.	.	.	.
10	.	.	.	.

Table 6: Largemouth Bass Mean weight at age by year.

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

Table 7: Largemouth Bass Von Bertalanffy by year.

Von Bert	2020	2024
L inf	471.36	526.29
K	0.46	0.321
t0	0.05	0.063

Table 8: Largemouth Bass mortality estimates by year.

Mortality Table	2020	2024
Instantaneous	0.24	0.38
Annualized	21.41	31.7

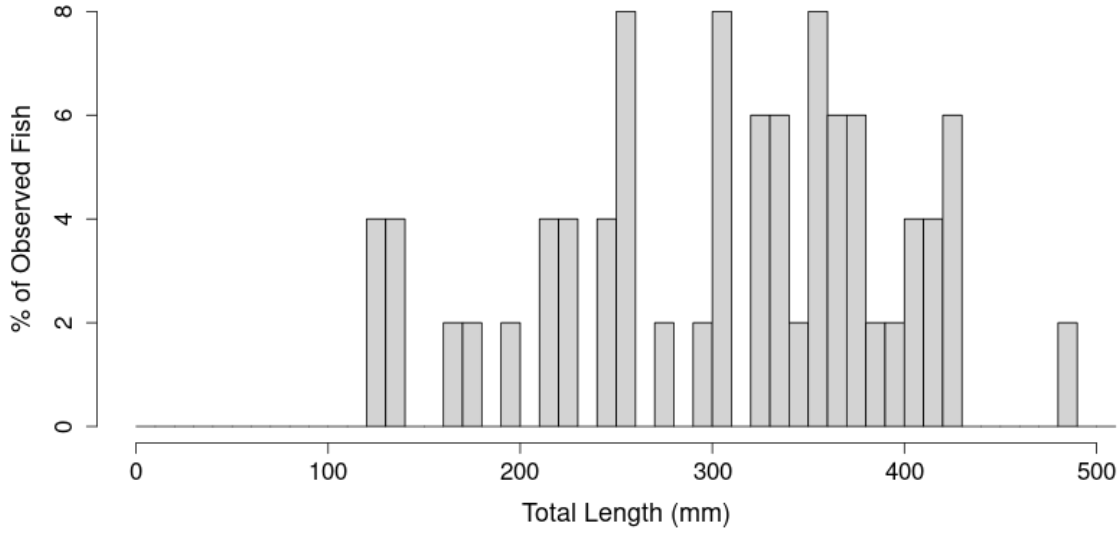

Figure 1: Largemouth Bass length Frequency histogram.

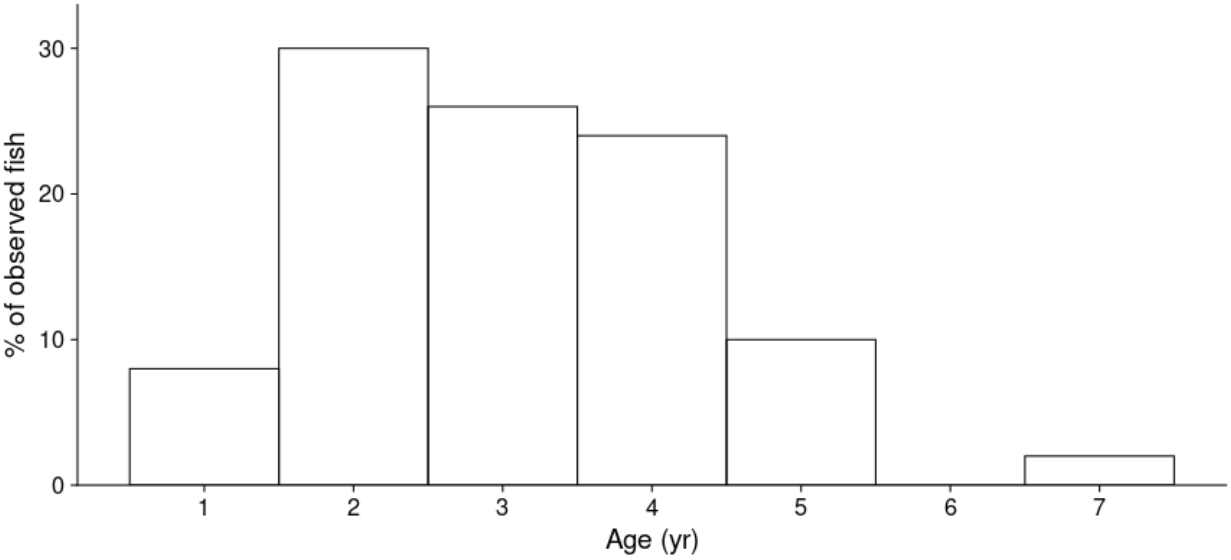

Figure 2: Largemouth Bass Age Frequency histogram.

Channel Catfish

Lake Nanih Waiya was sampled for Channel Catfish using Gill nets. Numbers were low and preclude any meaningful analysis. Current research efforts are ongoing at the Fish lab to investigate effective methods of increasing Channel Catfish recruitment and numbers. Once completed the staff will institute recommendations to increase access and opportunity at Nanih Waiya for Channel Catfish.

Crappie

Crappie were sampled but only 13 were collected in the entire reservoir. Approximately half were White Crappie and half were Black Crappie. All but 3 fish were a minimum of 250 mm with many measuring between 265 and 300 mm. Anecdotal observations suggest there are few crappie in the reservoir but typically are larger size and represent a small but coveted novel catch opportunity at Nanih Waiya.

Recommendations

1. Implement Lab findings when available to enhance Channel Catfish opportunities.
2. Consider Largemouth Bass removal and adding supplemental forage as time and resources allow.