SURVEY REPORT
OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS
FOR
LAKE ELMER
2024

SURVEY REPORT

State: Oklahoma

Project Title: Lake Elmer Fish Management Survey Report

Period Covered: 2015-2024

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Date Prepared: November 2024

LAKE ELMER

ABSTRACT

Lake Elmer was sampled in 2015, 2017, 2018, 2021, and 2023 with summer hoop net surveys and with spring electrofishing to examine and monitor the channel catfish and largemouth bass populations in the lake. Channel catfish surveys produced similar results throughout all years sampled. Largemouth bass surveys produced lower catch per unit effort (CPUE) values in 2023 compared to previous years, likely due to low lake level. Proportional size distribution (PSD) values for largemouth bass in all three categories were higher than previous years.

INTROUCTION

Lake Elmer impounds an unnamed tributary to Kingfisher Creek, 6.4 km northwest of Kingfisher in Kingfisher County, Oklahoma. Lake Elmer covers 24 surface hectares and was constructed in 1962 by the Oklahoma Department of Wildlife Conservation.

Lake Elmer has a mean depth of 1.95m and a maximum depth of 3.35m, a shoreline development ratio of 3.13, and a secchi disc visibility of around 50cm in the main pool; turbidity is primarily from suspended clay. Fish habitat consists primarily of aquatic vegetation in shallow areas and tire reefs scattered throughout the lake. Major fisheries are primarily largemouth bass, channel catfish and bluegill.

Past surveys have shown largemouth bass to be very abundant with the majority of the population comprised of fish less than 12 inches in length, but generally in good condition. Bluegill abundance has been very high with large numbers of harvestable size (> 150mm) fish. Smaller size bluegill have been subjected to intense predation from the abundant bass population.

From 2009-2013, Lake Elmer was drained and renovated following a fish kill caused by nutrient buildup. Silt was removed from the lake, the shorelines were deepened, and bank angling access was improved by the construction of 10 earthen fishing berms. Numerous polyethylene pipe fish attractors and cedar brush piles were constructed in the lake. These cedar brush piles were renovated in the winter of 2024 (Appendix 1).

Lake Elmer was sampled in 2015, 2018, 2021, and 2023 with summer hoop net surveys to examine and monitor channel catfish populations. Lake Elmer was also sampled in 2014, 2015, 2016, 2017, 2018, 2021, and 2023 with spring electrofishing to examine and monitor the largemouth bass population. Channel Catfish have also been stocked at Lake Elmer every year since 2016 (Appendix 2).

RESULTS

CHANNEL CATFISH

Channel catfish were surveyed in the summer of 2015, 2018, 2021, and 2023 at Lake Elmer. Standard Sampling Procedures for Fisheries Management were followed when conducting hoop net surveys. Tandem hoop net surveys were conducted by setting six stations of three net nights each totaling 18 net nights at random locations throughout the lake. Ideal depth of net sets was 2-3 meters. Each station was three hoop nets set in tandem with the bridle end tied to the cod end. Before 2023, each of these three nets was baited with a whole bar of Zoat soap (400g). During the 2023 survey, cheese logs were used. These cheese logs were cut into thirds of about 0.9kg. This bait was first placed in a 0.9 kg plastic sample jar with 25-30 6 mm holes in it. The largest hoop on these nets was 0.8 meters and the net itself was approximately 3.4 meters long.

Per Unit Effort (CPUE) was between 1.22 and 3.22 in 2018, 2021, and 2023. The CPUE for the 2015 survey was much higher than the following years (CPUE=26.9). The statewide average CPUE value for channel catfish hoop net surveys is CPUE=4.27. This statewide average was only met in 2015 with a CPUE value of CPUE=26.9 (Table 1).

Relative weight (Wr) values were only collected in 2021. These values were over the favorable value of Wr=80, except the substock size class, which demonstrates good body condition. The statewide average Wr value for channel catfish hoop net surveys is Wr=88. This average value was only met in the preferred size class in 2021. The channel catfish collected in 2021 at Lake Elmer were below average body condition compared to the state of Oklahoma (Table 1).

Proportional size distribution (PSD) values for channel catfish collected at Lake Elmer were high in 2023 and 2021. The value was low in 2018 and 2015. These high PSD values show that a large propotion of individuals collected in the hoop net surveys were of favorable size for anglers to interact with. The statewide average PSD value for channel catfish collected in hoop net surveys is PSD=24. In 2021 and 2023, the PSD value for Lake Elmer channel catfish was higher than the statewide average Table 2).

Individuals collected in 2023 are yet to be aged.

It is recommended that annual channel catfish hoop net surveys continue to evaluate the status of the fishery. It is also recommended that channel catfish stockings continue as grow-out sized (9”) are needed to maintain the population..

Table 1: Total number (No), catch per unit effort (CPUE), and relative weights (Wr) by size group of Channel Catfish collected in hoop net surveys from Lake Elmer.

		Total CPUE	Substock <280mm		Stock 280mm		Quality 410mm		Preferred 610mm	
Year	**No**	**CPUE**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**
2023	49	2.72	0.11	-	1	-	1.61	-	-	-
2021	58	3.22	0.17	73.32	0.83	85.58	2.17	80.36	0.06	96.13
2018	22	1.22	0.28	-	0.83	-	0.06	-	0.06	-
2015	555	26.9	17.86	-	7.76	-	1.14	-	0.14	-

Table 2: Proportional Size Distribution (PSD) and Proportional Size Distribution of Preferred (PSD-P) of Channel catfish collected from Lake Elmer hoop net surveys.

Year	PSD	PSD-P
2023	62	-
2021	73	2
2018	12	6
2015	9	1

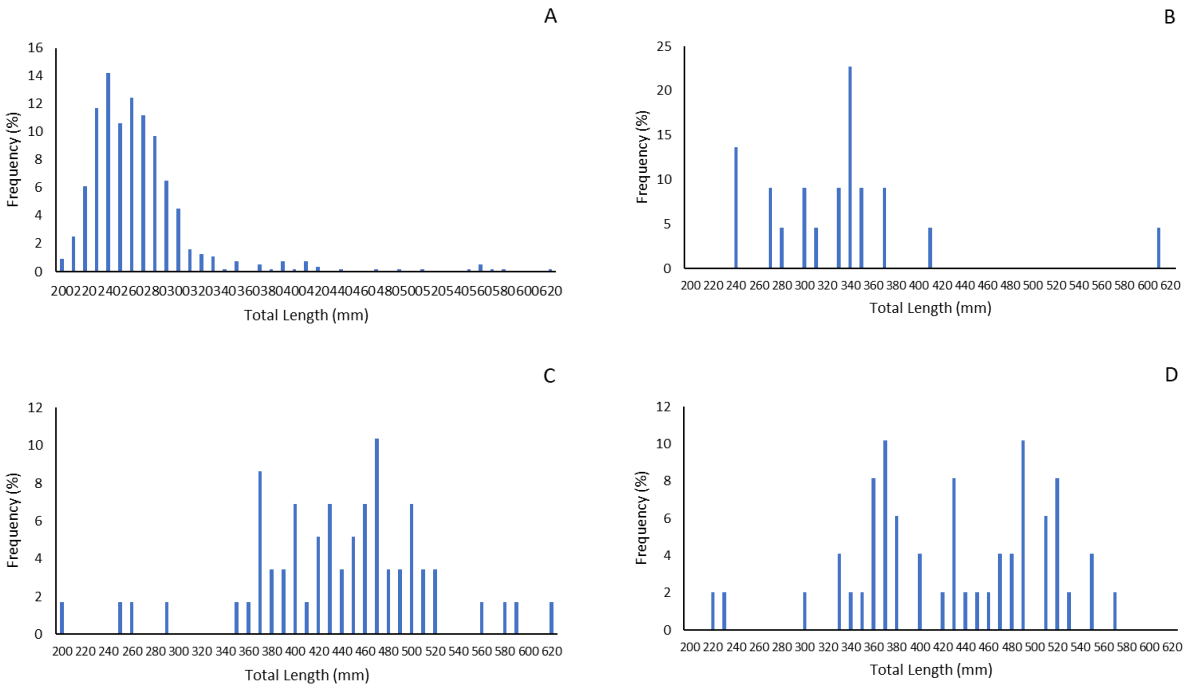


Figure 1: Channel Catfish Length Frequencies for Lake Elmer 2015(A), 2018(B), 2021(C), and 2023(D).

LARGEMOUTH BASS

Largemouth Bass (LMB) were surveyed in the spring of 2014, 2015, 2016, 2017, 2018, 2021, and 2023 by boat electrofishing. Whole shoreline samples were conducted by using ten-minute stations. Standard Sampling Procedures for Fisheries Management were followed when conducting electrofishing surveys. Total Catch Per Unit Effort (CPUE) did fluctuate throughout the four years sampled with 2021 being the highest (CPUE=109.64) and 2023 being the lowest (CPUE=48) The population of Largemouth bass is very high given the CPUE values from surveys and number of individuals collected in the surveys. The statewide average CPUE value CPUE=62.5. This statewide average was met and exceeded every year sampled except for 2023. (Table 3).

Relative weight (Wr) values for largemouth bass surveys on Elmer, except in 2021, were well over the Wr=80 value demonstrating good body condition. The statewide average Wr value for largemouth bass

electrofishing surveys in Oklahoma is Wr=92. The Wr values for the electrofishing surveys were all over the statewide average except for the substock size class in 2021 and 2018 (Table 3).

Proportional size distribution (PSD) values for the largemouth bass surveys show that a large portion of the individuals collected were of a favorable size for angler to interact with. The statewide average PSD value for largemouth bass electrofishing survey is PSD=72. The statewide average was exceeded in 2018, 2021, and 2023 (Table 5).

The mean length at age values for the 2021 largemouth bass survey conducted were all below the statewide average mean length at age values. This means that the largemouth bass collected in the 2021 electrofishing survey were slower growing than the statewide average (Table 4).

Length frequency figures demonstrate that fewer smaller individuals were being collected through time the distribution is similar through the years sampled except for 2023. This is due to the small sample size (Figure 2).

It is recommended that annual electrofishing surveys at Lake Elmer continue to evaluate the largemouth bass fishery.

Table 3: Total number (No), catch per unit effort (CPUE), and relative weights (Wr) by size group of Largemouth Bass collected in electro-fishing surveys from Lake Elmer.

		Total CPUE	Substock <200mm		Stock 200mm		Quality 300mm		Preferred 380mm		Memorable 510mm	
Year	**No**	**CPUE**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**
2023	32	48	1.5	101.36	7.5	93.74	6	109.47	25.5	107.93	7.5	138.06
2021	201	109.64	0.55	72.11	18.55	94.11	36.55	104.35	45.27	106.55	8.73	120.58
2018	182	109.2	7.2	88.58	25.8	133.55	31.8	103.81	42	113.98	2.4	108.27
2017	297	104.82	11.65	93.85	27.18	97.65	24.71	109.83	39.18	102.95	2.12	110.51
2016	91	91	-	-	26	101.25	35	104.11	27	109.26	3	104.72
2015	20	60	3	114.71	30	106.94	24	106.37	3	98.03	-	-
2014	151	100.67	25.33	95.9	49.33	105.74	8.67	117.6	16	110.56	1.33	110.22

Table 4: Mean total length at age (mm) and L infinity (estimated mean maximum length) for Largemouth Bass collected from Lake Elmer electrofishing surveys.

Year	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	L inf
2021	263.8	321.76	371.51	400.86	464	474	497	679.995

Table 5: Proportional Size Distribution (PSD), Proportional Size Distribution of Preferred (PSD-P) and Memorable (PSD-M) Largemouth bass collected from Lake Elmer electrofishing surveys.

Year	PSD	PSD-P	PSD-M

2023	84	71	16
2021	83	50	8
2018	75	44	2
2017	71	44	2
2016	71	33	3
2015	47	5	-
2014	35	23	2

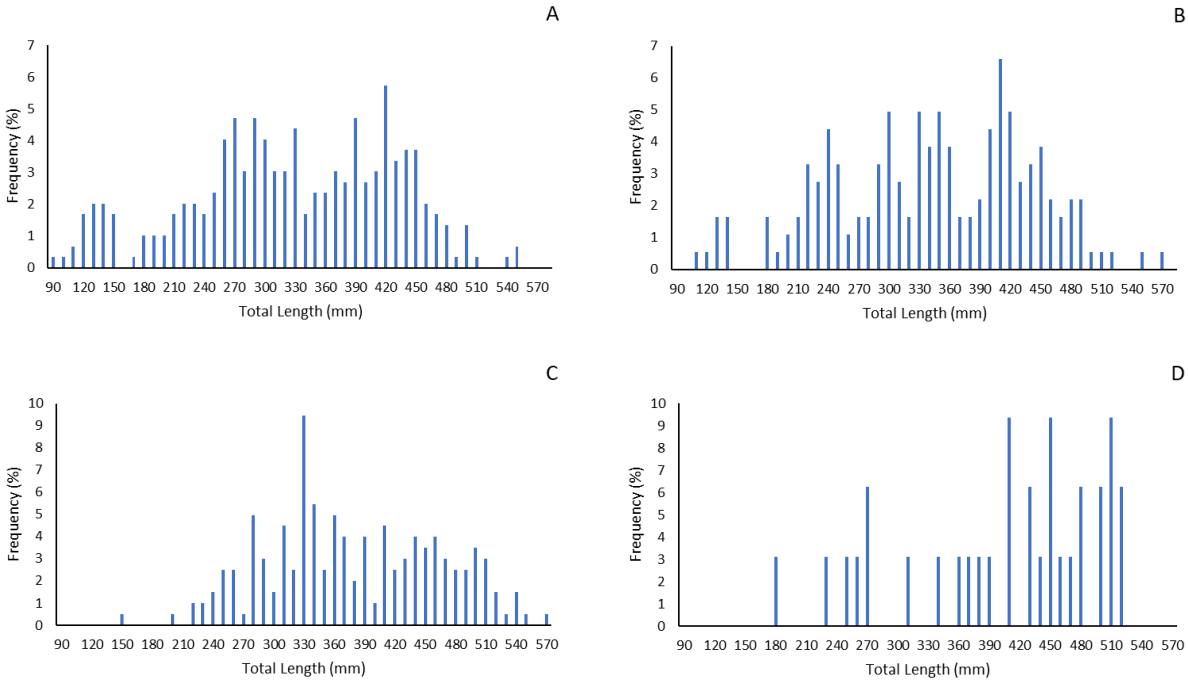
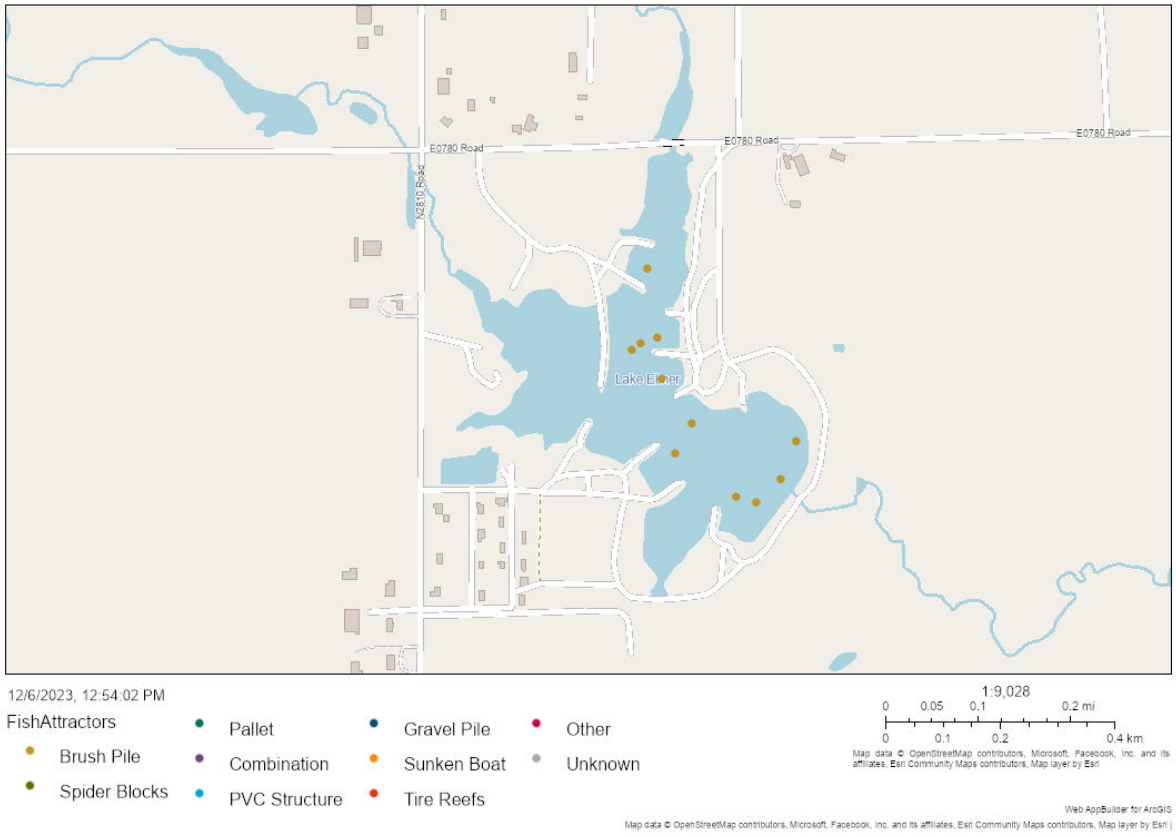


Figure 2: Largemouth Bass Length Frequencies for Lake Elmer 2017(A), 2018(B), 2021(C), and 2023(D).

Lake Elmer Fish Attractors



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FishAttractors

- Brush Pile
- Spider Blocks
- Pallet
- Combination
- PVC Structure
- Gravel Pile
- Sunken Boat
- Tire Reefs
- Other
- Unknown

1:9,028

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

APPENDIX 1

Year	Species	Number	Size (mm)
2024	Channel Catfish	2,279	240
2023	Channel Catfish	510	304.8
2021	Hybrid S.B.	300	38.1
2019	Florida Largemouth	75	152.4-203.2
	Channel Catfish	35,447	-
	Channel Catfish	2,010	215.9
2018	Channel Catfish	2,001	266.7
	Channel Catfish	6,600	63.5
	Channel Catfish	3,014	146.05
2017	Florida Largemouth	488	177.8
2016	Channel Catfish	14,005	76.2

APPENDIX 2