SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

ELMORE CITY LAKE

2024

SURVEY REPORT

State: Oklahoma

Project Title: Fish Management Survey Report

Period Covered: 2024

Prepared by: Oklahoma Fishery Reasearch Laboratory

Date Prepared: December 2024

ABSTRACT

Elmore City Lake was surveyed by spring electrofishing in 2023 to assess the Largemouth Bass population. Hoop netting for Channel Catfish was completed in 2021 and additional sampling occurred in 2024 as part of ongoing research to estimate the population size. Trap netting for White Crappie occurred in 2024 also. The fishery consists of Largemouth Bass, various sunfish species, White Crappie, Channel and Flathead Catfish. No regulation changes are recommended at this time.

INTRODUCTION

Elmore City Lake is in Garvin County, one mile north of Elmore City on SH 74 and one-half mile east on Kay Buse Parkway. The lake consists of 2.4 miles of shoreline and is 69 acres in size. Impoundment was completed in 1966. Fish habitat consists primarily of flooded timber and some aquatic vegetation. Average secchi depth is 49 centimeters. The lake is classified as eutrophic.

Our primary management goal is to establish relevant baseline data considering the lack of sampling until recently. There are two boat ramps with docks available for loading/unloading purposes, as well as a fishing dock. There are two fish attractor sites that are periodically loaded with brush, typically cedar trees. The fishery consists of Largemouth Bass, various Sunfish species, White Crappie, Channel Catfish and Flathead Catfish. In efforts to enhance fishing, Channel Catfish are periodically stocked (Appendix 1).

Aquatic Nuisance Species

There are no known ANS in Elmore City Lake.

RESULTS

Fall Trap Net (Gear 31)

Crappie were sampled at Elmore City Lake, Elmore City, OK using gear 31 from October 22-23, 2024. The average water temperature was 21.1 C and water levels were normal. Sites were randomly chosen as specified by SSP for a total of 306 hours of effort resulting in the capture of 500 White Crappie. No Black Crappie were observed during sampling.

The mean total length (TL) of White Crappie sampled was 146 mm with a range of 79-386 mm (Figure 1). The mean catch per unit effort (CPUE) of White Crappie was 39.1 with a standard error (SE) of 5.9, a relative standard error (RSE) of 15.0, and lower and upper 95% confidence interval (CI) of 27.6 and 50.7 respectively (Table 1). The mean CPUE by size category was highest for sub-stock (4.54) and stock (33.1) sized crappie (Table 1).

A total of 119 crappie were aged; age classes ranged 0-6 with approximately 80% of fish being one year old. The mean TL was 137 mm at age-1, 166 mm at age-2, and 184 mm at age-3. Too few individuals of age-0 or > age-3 were captured to provide mean length at age estimates. The overall relative weight (Wr) was 84.2 with relative weights of all size categories at or above the 75th percentile (Table 2). Only one individual from each age class 4-6 was observed and therefore removed from age and mortality estimates. A von Bertalanffy growth curve is provided, however, due to the low number of observed age 3-year-olds and their shorter sizes, predicted parameters such as theoretical maximum length ($L_\infty = 189$) was less than what was observed during sampling (Figure 2). A catch-curve regression calculated an annual mortality (A) of 73.8% and an instantaneous mortality (Z) of 1.4 (Figure 3).

Hoop Net (Gear 33)

As part of an ongoing research project related to Channel Catfish, abundance was estimated in Spring 2024. Hoop nets were used to capture fish across three distinct sampling events and fish were marked by clipping the fish's left pelvic fin initially followed by the right pelvic fin if necessary (i.e., a second recapture of the same fish). Abundance was estimated using the Schnabel Method. The population was estimated at 2,134 individuals (95 % CI 1,054-3,925).

RECOMENDATIONS

1. Continue to monitor population dynamics for sportfish species (Largemouth Bass, White Crappie, Sunfish spp., Catfish spp.).
2. No regulation changes are recommended at this time.

Table 1: Catch per unit effort (CPUE) of total sample and size categories of White Crappie from Elmore City Lake.

	Mean	Count	RSE	SE	L 95% CI	U 95% CI	N RSE = 12.5 (25% range)	N RSE = 20 (40% range)
Elmore Lake								
White Crappie								
Total	39.1	15	15.0	5.9	27.6	50.7	22	8
Substock	4.54		25.7	1.2	2.3	6.8	63	25
Stock	33.1		14.6	4.8	23.6	42.6	21	8
Quality	1.0		30.7	0.3	0.4	1.5	91	35
Preferred	0.2		68.2	0.1	0	0.4	446	174
Memorable	0.3		44.3	0.1	0.0	0.6	189	74

Table 2. Relative Weights (Wr) of White Crappie from Elmore City Lake.

	Mean	Count	CV	SE	L 95% CI	U 95% CI
Elmore Lake						
White Crappie						
Overall	84.2	496	12.92	0.5	83.3	85.2
Substock	90.4	56	18.4	2.2	86.0	94.7
Stock	83.4	421	11.2	0.5	82.5	84.3
Quality	85.7	12	10.7	2.3	71.1	80.3
Preferred	85.4	2	25.6	17.3	61.6	129.3
Memorable	106.2	4	6.4	3.4	99.5	112.8

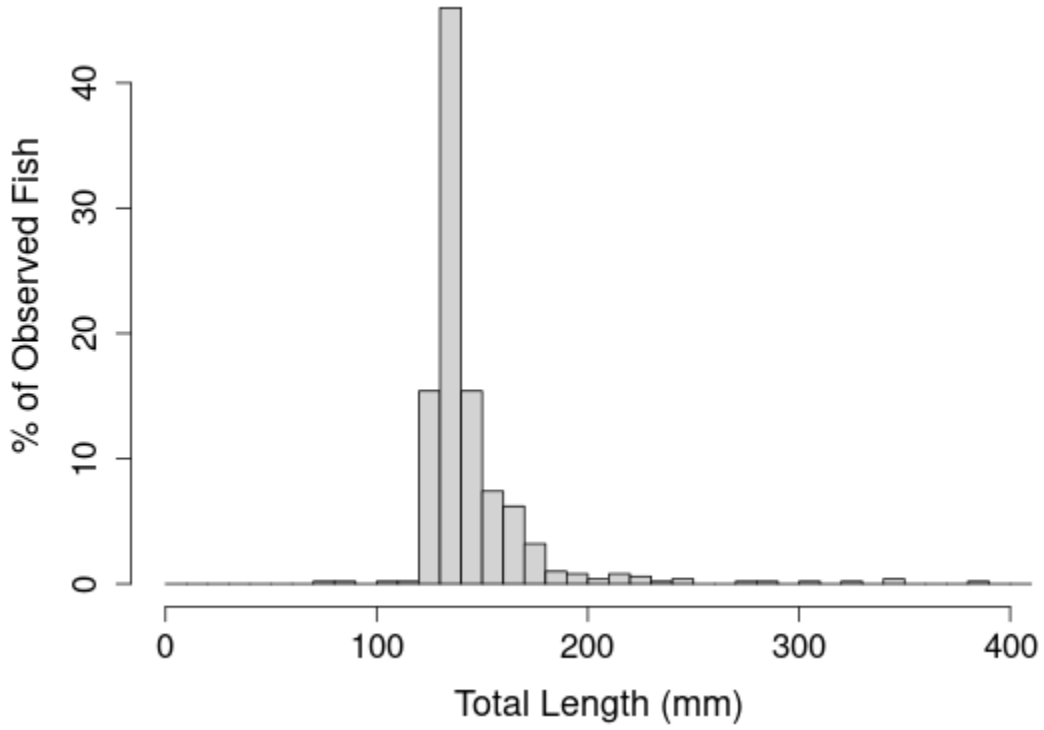

Figure 1: Length-frequency distribution of White Crappie in Elmore City Lake.

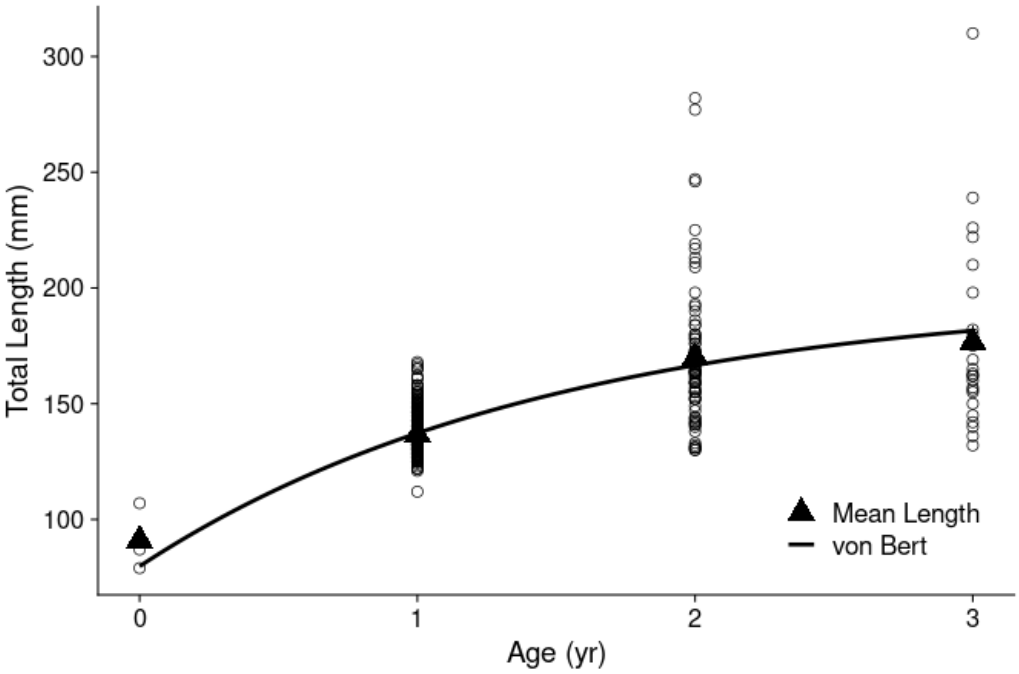

Figure 2: von Bertalanffy growth curve for White Crappie in Elmore City Lake.

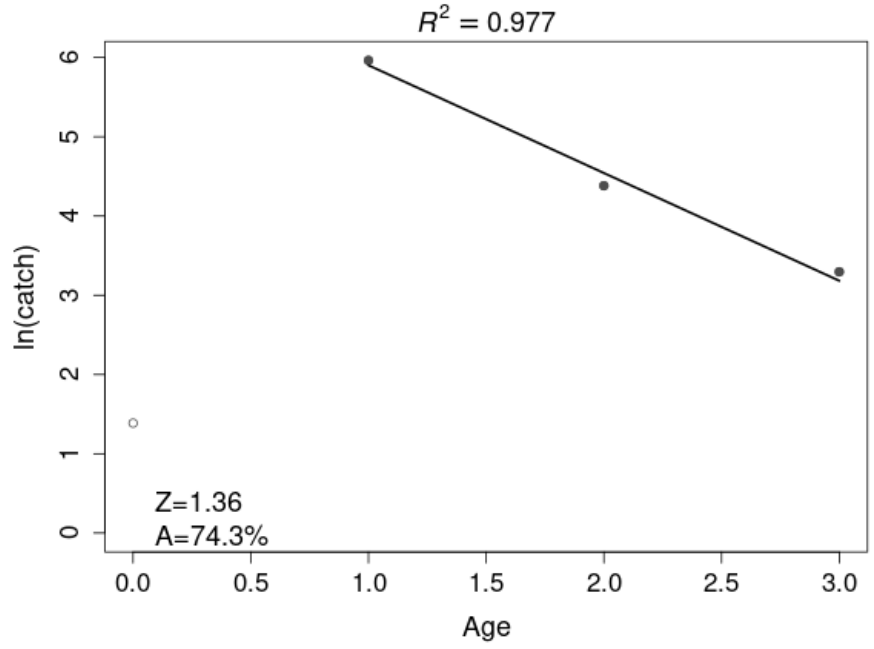

Figure 3: Catch curve for White Crappie in Elmore City Lake.

Appendix 1. Species, number, and size of fish stocked in Elmore City Lake since 2014.

Date	Species	Number	Size (inches)
2014	Channel Catfish	3,600	7
2014	Channel Catfish	3,602	7
2017	Channel Catfish	2,400	7
2017	Channel Catfish	2,620	6.25
2018	Channel Catfish	2,400	7.2
2020	Channel Catfish	2,492	7
2021	Channel Catfish	2,405	6.46