SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

CHIMNEY ROCK LAKE

2023

SURVEY REPORT

State: Oklahoma

Project Title: Chimney Rock Fish Management Survey Report

Period Covered: 2022

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Date Prepared: January 2024

Chimney Rock

ABSTRACT

Chimney Rock Lake was surveyed in the fall of 2022 by gill netting techniques to monitor fish populations. A low sample size of all fish populations was collected, and further sampling should be conducted for further information on abundance and population structure. Fall Smallmouth Bass electrofishing and Spring SSP electrofishing will be conducted in the coming years to retrieve proper sample sizes. Shad abundance was acceptable and should be continued to be monitored.

INTRODUCTION

Chimney Rock Lake is a reservoir located in Mayes County and created in 1968 by the Grand River Dam Authority (GRDA). The main purpose for its creation was for electrical power generation, but it also provides recreational use for fishing. The lake has a surface area of 762 acres, mean depth of 66.1 ft., and a maximum depth at 182 ft. Secchi visibility was approximately 66.3 inches in the fall of 2022. Its storage capacity is 50,372-acre feet and at normal full pool operating level the reservoir is 865 feet.

Chimney Rock Lake resides in the Ozark Plateau, an area typically characterized by flat divides separated by V-shaped stream valleys. Within these deep stream valleys, dendritic drainage patterns form in limestones and cherts. The dendritic shape of Chimney Rock is due to the flooding of these valleys. No tributary inflows or natural drainage occurs in Chimney Rock. Water is pumped into the reservoir from the Saline Creek arm of Hudson Lake during low energy use times and released back down to Hudson Lake for Hydropwer during peak energy use times. The reservoir surface water elevation can change up to 10 feet in a 24-hour period.

Several game species occupy this lake including Crappie, Channel Catfish, Largemouth Bass, Smallmouth Bass, White Bass, Hybrid Striped Bass, Blue Catfish, Flathead Catfish, and Walleye. Chimney Rock Lake was sampled in October 2022 using experimental gill nets. Data collected were used to determine length frequency and relative abundance of observed species. Five stations were randomly set according to the Standard Sampling Protocol (SSP). Several species were sampled including, but not limited to Crappie, Bluegill Sunfish, Channel Catfish, Gizzard Shad, Largemouth Bass, and White Bass (Appendix 1). Several species only had a

sample size of one fish for the year of 2022. These species included Black Crappie, Blue Catfish, Common Carp, and Walleye. No stocking took place during the years 2022 and 2023.

RESULTS

Crappie

A total of 8 Crappie were caught over 5 net nights with an abundance of 1.48 catch per unit effort (CPUE; Crappie per net night). Fish were collected in the preferred and memorable proportional size distribution groups (PSD). The preferred PSD (9.8 inches) had a CPUE of 0.92 and memorable (11.8 inches) had a CPUE of 0.55. Relative weight (Wr) scores were calculated for the individual PSD, as well. Both groups had acceptable body conditions with values equal to or greater than 90 (Table 1).

A length-frequency histogram for White Crappie shows the distribution of total lengths across the percentage of observed fish (Figure 1). Only one Black Crappie was captured during sampling, so a length-frequency histogram with Black Crappie was not created. White Crappie in the 12-inch length group were sampled the most and made 40% of observed catch. No White Crappie were caught below the 10-inch length group. Further sampling should be done to properly determine information about this population as the sample sizes are not sufficient to provide valuable information.

		Total CPUE	**Preferred 9.8 in**		**Memorable 11.8 in**	
	n	**CPUE**	**CPUE**	**Wr**	**CPUE**	**Wr**
2022	8	1.48	0.92	101.3	0.55	97.4

Table 1. Total amount of Crappie captured (*n*) and the catch per unit effort (CPUE) from fall 2022 gill nets. CPUE was separated by proportional size distributions (PSD). Reference lengths for PSDs are noted. Relative weights (Wr) were calculated for each PSD. Acceptable values were equal to or greater than 90.

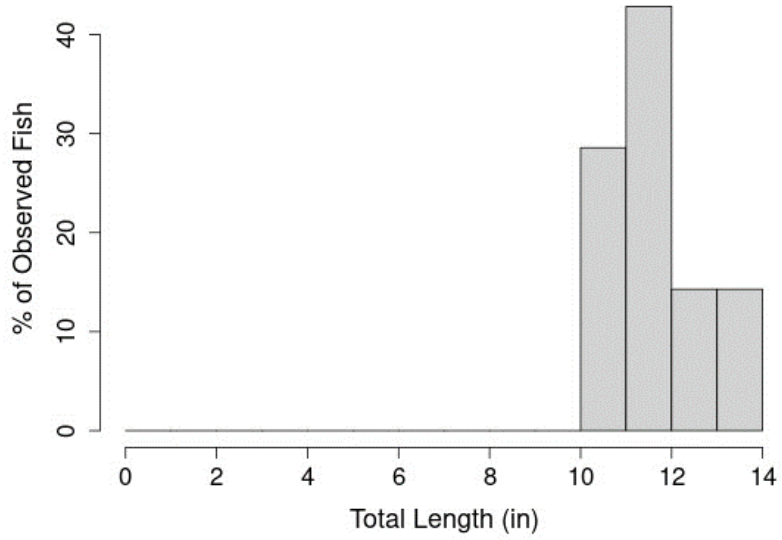

Figure 1. Length-frequency histograms for White Crappie collected during fall 2022 gill net sampling.

Channel Catfish

Channel Catfish were collected during fall 2022 gill net sampling. A total of 12 Channel Catfish were collected with a total CPUE of 2.22. Each PSD had a low CPUE for the stock, (CPUE = 1.11), quality (CPUE = 0.92), and preferred (CPUE = 0.18). The relative weights (Wr) were also calculated. Preferred had an acceptable Wr body condition value (Wr = 100.8). The stock (Wr = 86.63) and quality (Wr = 89.52) had a lower than acceptable body condition value (Table 2).

The length-frequency histogram shows sampled Channel Catfish and their total length groups by the percent of observed fish. Fish in the 14-inch length group were the most caught and made up 25% of the catch. The remaining distribution was relatively similar for the remaining length groups. The minimum size caught was 13 inches and a maximum size of 25 inches (Figure 2). However, the sample size was small, so this likely does not describe the overall population of Channel Catfish in Chimney Rock Lake.

		Total CPUE	**Stock 11.0 in**		**Quality 16.1 in**		**Preferred 24.0 in**	
	n	**CPUE**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**
2022	12	2.22	1.11	86.63	0.92	89.52	0.18	100.8

Table 2. The total number (*n*) and catch per unit effort (CPUE) for Channel Catfish collected during fall 2022 gill net sampling. CPUE and the relative weight (Wr) for each proportional size distribution (PSD) is shown. Acceptable relative weights are greater than or equal to 90.

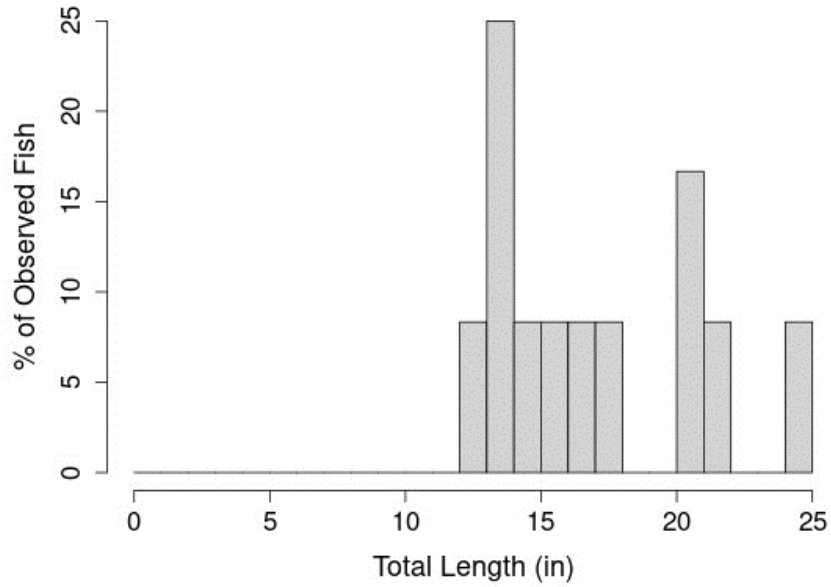

Figure 2. Length-frequency histogram for Channel Catfish sampled using gill nets in fall 2022.

White Bass

White Bass were sampled in fall 2022 using experimental gill nets. A total of 15 White Bass were collected during sampling with a total of 2.77 CPUE (2.77 White Bass per net night). Fish were captured in the preferred and memorable PSD group. Total, preferred (CPUE = 0.23), and memorable (CPUE = 0.39) CPUEs were low (Table 4). Relative weight values were calculated for the preferred and memorable PSD groups and were acceptable for both.

The length-frequency histogram shows the minimum length of White Bass captured was within the 14-inch group no fish were captured in in any PSD group lower than preferred (11.8 inches). 45% of White Bass sampled were within the 15-inch length group (Figure 4). The PSD-M value was 27 and PSD P-M value 73.

		Total CPUE	**Preferred 11.8 in**		**Memorable 15.0 in**	
	n	**CPUE**	**CPUE**	**Wr**	**CPUE**	**Wr**
2022	15	2.77	0.23	99.52	0.39	96.99

Table 4. The total number and catch per unit effort (CPUE) of White Bass sampled during fall 2022 experimental gill nets. CPUE and relative weights (Wr) for preferred and memorable proportional size distributions. Acceptable Wr values are greater than or equal to 90.

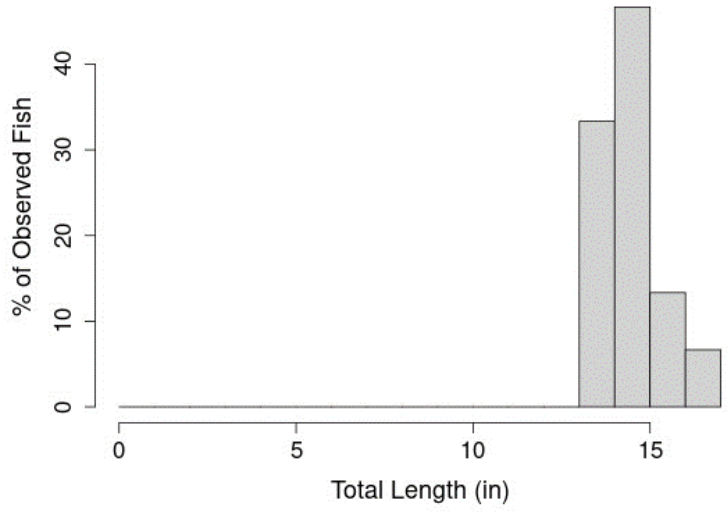

Figure 4. Length-frequency histogram for White Bass collected during fall 2022 gill nets

Shad

Gizzard and Threadfin Shad were collected from Chimney Rock Lake. During sampling, 42 Gizzard Shad and 6 Threadfin Shad were captured. Gizzard Shad had a catch per unit effort (CPUE) of 7.75 (Gizzard Shad per net night). Additionally, Threadfin Shad had a CPUE of 1.11. Monitoring the Shad population is needed to ensure foraging species for game fish are available. Current Shad population amounts are acceptable for fishes to forage on.

Recommendations

1. Continue monitoring fish populations in Chimney Rock to better understand population structures and give an accurate depiction of abundance.
2. In the future, sample Bass using electrofishing gear.
3. Monitor Shad populations to ensure foraging species are available for game fish
4. ODWC is looking into additional ways to sample Crappie populations in reservoirs lacking the ideal slope for the traditional trap nets to properly fish. This will be a prime lake to use the new sampling techniques on and will ideally be done in the future.

Species	Number
Black Crappie	1
Blue Catfish	1
Bluegill Sunfish	3
Channel Catfish	12
Common Carp	1
Flathead Catfish	3
Gizzard Shad	42
Largemouth Bass	5
Longear Sunfish	4
Smallmouth Bass	2
Smallmouth Buffalo	2
Spotted Bass	2
Striped Bass x White Bass Hybrid	2
Threadfin Shad	6
Walleye	1
White Bass	15
White Crappie	7

Appendix 1. Sample sizes for each collected species in 2022.