Abstract

Lone Chimney was surveyed using boat electrofishing for Largemouth Bass and trap nets to evaluate the crappie population in the lake during spring of 2022 and Fall of 2023.

Current Management Practices

Monitoring of Heavily Utilized Black Bass Populations

Largemouth bass was the most sought after species in Oklahoma according to the most recent angler survey. The NCR has high profile largemouth bass fisheries that are utilized by both recreational and tournament anglers. The introduction of Florida Largemouth Bass genetics into largemouth bass populations can be a valuable management tool to improve growth rates. These black bass populations require monitoring for constituent interaction, potential future regulation changes, and evaluation of genetic contribution of FLMB. Florida Largemouth Bass (FLMB) were stocked initially in Lone Chimney since 1985, one year after impoundment then not again till 2001. These fingerling stockings continued for 6 more scattered stockings until 2016 when a new approach was taken to introducing FLMB genetics in more northern latitudes. Larger cull brooders from Durant Fish Hatchery were stocked in ranging at first 6in in size to large adults >16in and finally settled on 9in two year old cull brooders. Evaluating the gene flow in the population is important in determining the success of the stockings and growth of the population over time.

Evaluation of Historically Stunted and High Profile Crappie Populations

Crappie was the second most sought after species in Oklahoma according to the most recent angler survey. It is important to keep a finger on the pulse of high profile crappie fisheries in the region, especially with the recent developments in fish finding technology. The Garmin Livescope allows anglers to single out and harvest the largest fish in a school. As this technology becomes more affordable and more widespread in use, it will be important to have baseline information on high profile crappie fisheries. Slow growing crappie populations have been observed in some NCR reservoirs.

2022

Blass Bass were sampled using pulsed DC current using a 5.0 GPP over 7 days. A total of 37 sites were randomly sampled a total of 271 Largemouth Bass (LMB) were collected and otoliths were taken from 222 individuals for aging purposes. Fin clips were collected from 132 individuals for DNA analysis.

Catch Per Unit Effort (CPUE) was 43.95 with a C.V. of .09. A significant increase from 2019, CPUE = 21.53, C.V. = .15. Length frequencies indicate the two large year classes have spread out in size since last sampled (Figure 1). Proportional Size distributions (PSD) and Relative Weights (Wr) were not significantly different from 2019 samples. Age frequencies show the two large year classes from 2019 (2 and 4 year olds) are still present in the 2022 sample and in large proportions for older age classes. It also appears there is a large 2 year old age class that will be present in the population for many years as well (Figure 2). Mean length at age decreased significantly for age 3 LMB to a mean length of 319mm down from 374mm in 2019 (Figure 3). While this is concerning at first the 2019 sample only had 7 individuals and may not be the most robust comparison for the two. No other mean length at age had a significant change positive or negative. LMB did reach preferred size at 5 years compared to 4 years in 2019 but this most likely has to be due to the large year classes getting older and competing for resources. LMB mortality was not significantly different with an annual mortality of 38.7% in 2022 and 24% in 2019.

Largemouth Bass in Lone Chimney appear to be doing well, large year classes have allowed there to be a larger percentage of older fish in the population. As of time of writing DNA results have not

returned for analysis. Continued monitoring how long these fish remain in the population may show what maximum growth for the reservoir may hold.

2023

Crappie were sampled using trap nets deployed around the lake in chosen areas to have the highest catch rates. Trap nets were deployed perpendicular to the bank and anchored at the point where the net started at the water's edge. Max depth of the nets did not exceed 15ft were checked daily and moved to another location if catch was deemed too low. Five trap nets were set over five days for a total of four net nights. Catch Per Unit Effort (CPUE) was not calculated due to sample sites not being random. 194 White Crappie and 148 Black Crappie were collected lengths (TL) and weights (g) were collected and a subsample of crappie had their otoliths removed for age and growth metrics (101 White Crappie and 75 Black Crappie). Over 50% of White Crappie collected were between 150mm and 200mm (6 to 7in) with low abundances of all other sizes, while Black Crappie were most abundant at 75 – 99mm and 150 – 174mm (3in and 6in) (Figure 4). Proportional Size Distributions (PSD) for White Crappie were 26 ±10, Preferred 14±8 and memorable 6±6, while Black Crappie had a PSD of 2 ±4 and a PSD –P of 1 ± 3. Overall relative weights (Wr) for White Crappie were 87.9 and 90.4 for Black Crappie. Age frequency of White Crappie indicate over 40% sampled were age 1 with a max age collected of 6 and age 0 and 2 had over 30% with a max age of 6 for Black Crappie (Figure 5). Growth of White Crappie was moderate and poor for Black Crappie with fish reaching quality size (200mm, 7.9in) at age 3 and age 4 respectively (Figure 6). Annual mortality for White Crappie was 47.51 and 37.9 for Black Crappie.

Crappie in Lone Chimney are a mixed bag. White Crappie mean length at ages are averaging around the 50% range when compared to other White Crappie fisheries in the north central region, with age 1 and 3 above 50% and age 2 fish below 50%. Relative weights were low, ranking in the 25% compared to other lakes in the region. A bright spot was the PSD-M of White Crappie ranking in the upper 75% of lakes in the state. The Black Crappie population has poor growth, 25% at age 1 and 5% at age 2 when compared statewide populations. Condition was moderate compared to other lakes ranking about the 50% mark. While most of the White Crappie population is average in the larger amount of preferred sized fish gives anglers a better chance at catching these desired fish.

Lone Chimney crappie populations are typical of most crappie populations with boom-and-bust cycles of spawning with a very large age 1 White Crappie year class and large 0 and 2 Black Crappie year classes. It is of some interest that the two species don't have booming year classes on the same years, which may be evolutionary response to decrease competition of early life stages or maybe water quality has an effect on which species has better spawns. Since recovering from a severe drought in 2015 the crappie populations have not been sampled until now. Continued monitoring at least once over the next 5 years would help managers get a better understanding of the crappie in the lake and start to establish trend data useful for long term management.

RECCOMENDATIONS

1. Request Flordia Largemouth Bass (FLMB) cull brooders be stocked in Lone Chimney in 2024. Pending DNA results from the 2022 sample.

2. Evaluate LMB populations in 2025, this would mean the two old large year classes would be 8 and 10. Collecting fish spring 2025 may yield what maximum size LMB Lone Chimney can produce before they are no longer present.
3. Continue to monitor black and white Crappie population dynamics, determine if boom-bust years alternate between White and Black Crappie. Sample in 2026.

Figures

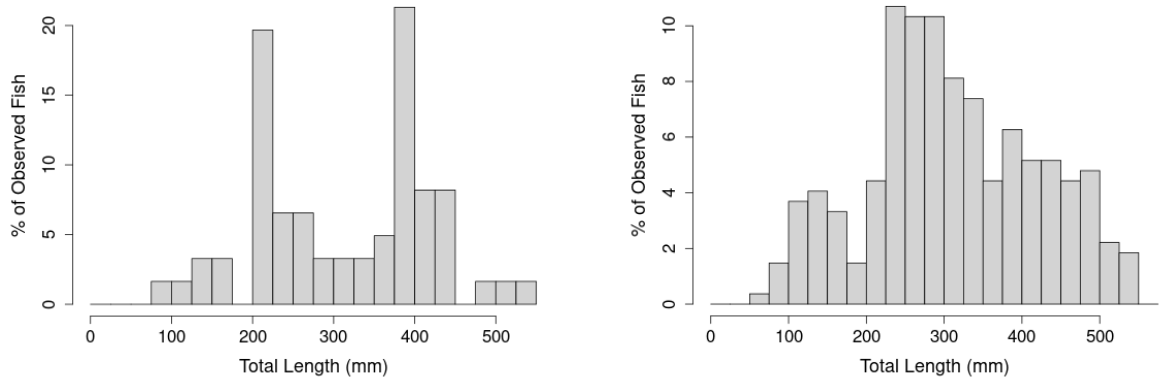

Figure 1. Length frequencies of Largemouth Bass in Lone Chimney Lake from 2019 (Left) and 2022 (Right).

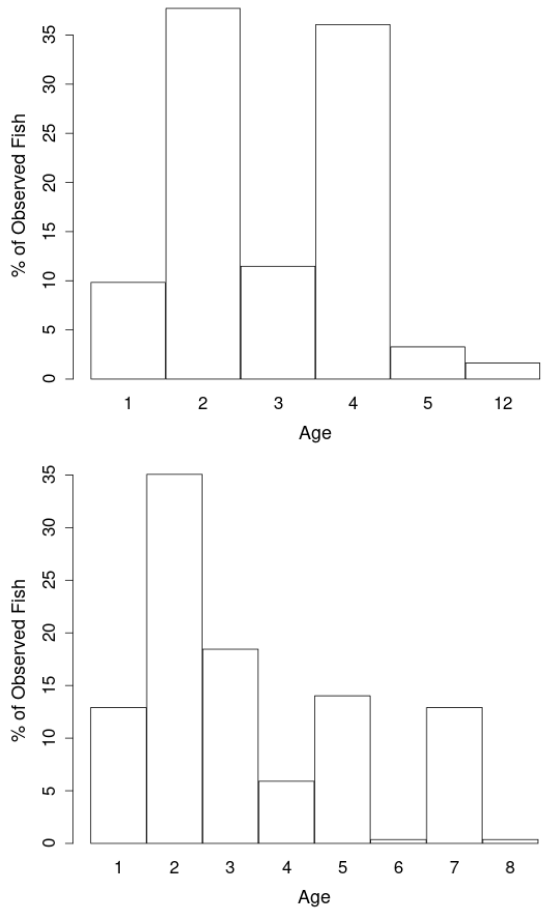

Figure 2. Age frequencies of Largemouth Bass in Lone Chimney 2019 (left) and 2022 (right).

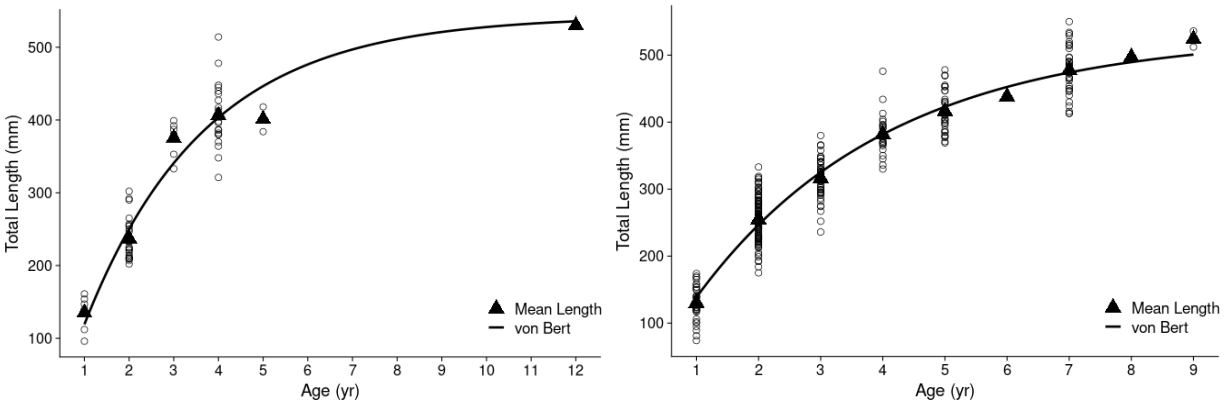

Figure 3. Mean Length at age and von Bertalanffy growth equation of Largemouth Bass in Lone Chimney sampled in 2019 (left) and 2022 (right).

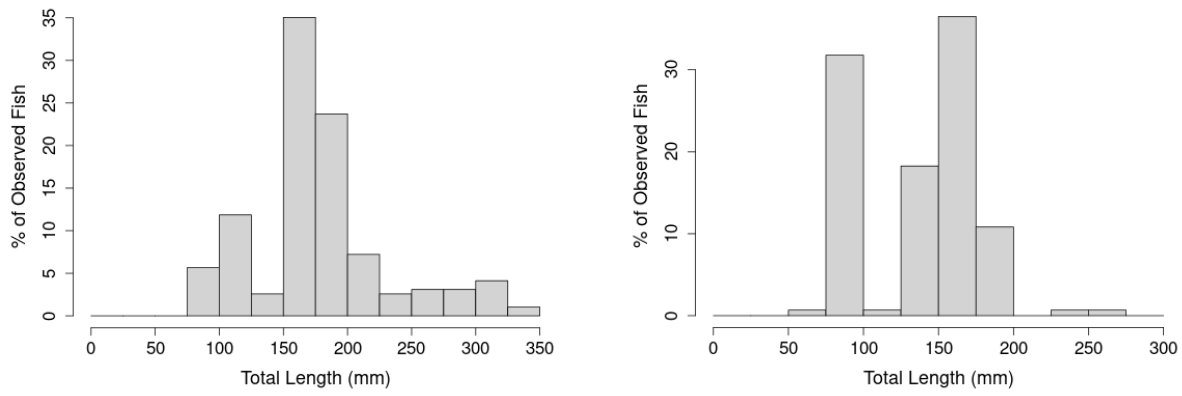

Figure 4. Length frequency of White Crappie (left) and Black Crappie (Right) collected fall 2023.

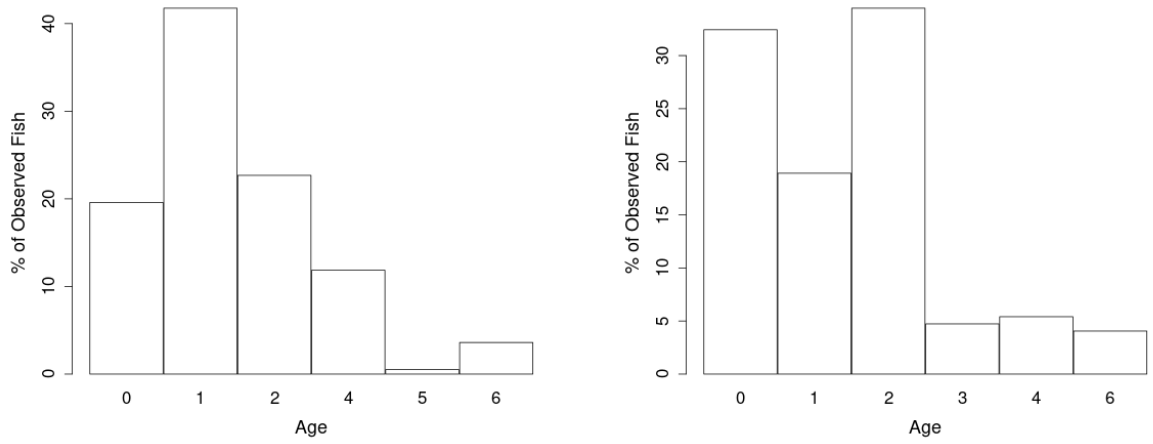

Figure 4. Age frequency of White Crappie (left) and Black Crappie (Right) collected fall 2023.

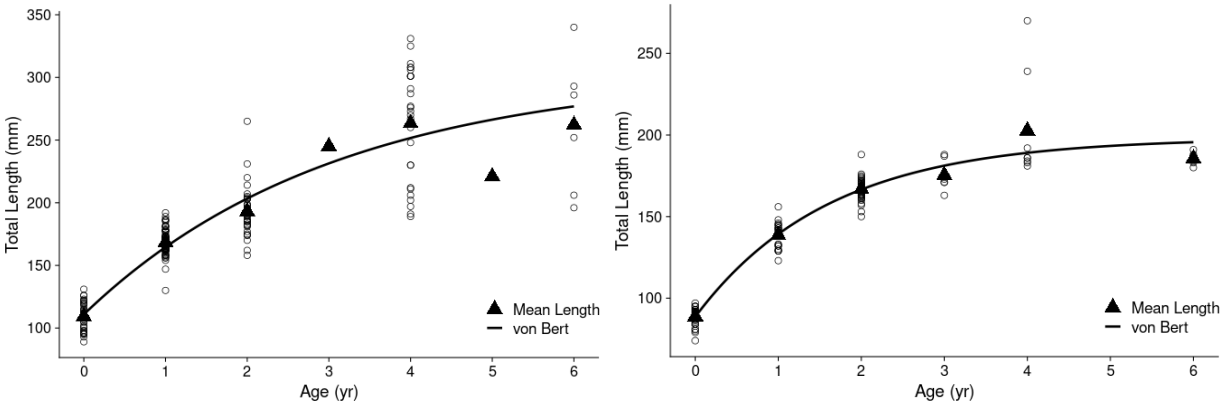

Figure 5. Mean Length at Age of White Crappie (right) and Black Crappie (left) collected Fall 2023.