SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

McAlester LAKE

2022

SURVEY REPORT

State: Oklahoma

Project Title: Mcalester Fish Management Survey Report

Period Covered: 2022

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Date Prepared: January 2024

McAlester

ABSTRACT

Electrofishing in 2022 found the Largemouth Bass in McAlester Reservoir to be a small population with decent growth rates consisting of older individuals compared to most other regional waters. The body condition of the larger individuals is better compared to smaller individuals. Results of trap netting revealed high catch rates of smaller white crappie and few larger fish. Mortality rate for White Crappie were very high which could contribute to the lack of larger fish and poor size structure.

INTRODUCTION

McAlester reservoir is a medium size reservoir located in Pittsburg county in Southeast Oklahoma and was impounded in 1930. The reservoir is shallow and fairly turbid with standing timber in the upper reaches. There is very little public access. Popular fish species in the reservoir include Blue Catfish, Channel Catfish, Largemouth Bass, and White Crappie.

RESULTS

Largemouth Bass

Southeast region Fish crew sampled Largemouth Bass spring of 2022. Catch Per Unit Effort (CPUE) was 7.33 (table 1). Preferred sized fish (380 mm) made up the majority of the sample but larger fish were not present in the sample (table 2). Largemouth Bass Proportional Stock Density (PSD) in McAlester reservoir was 78 (table 3). The high PSD value is an artifact of the small sample size. Largemouth Bass Relative Weight (Wr) a measurement of body condition was 97 and increased with increasing size class (table 4). Age data reveals the 2022 sample consisted of mostly age 1 and 3 individuals with a higher than usual proportion of ages 3-6 in the sample (figure 2). Length at age data shows fair growth tapering off at age 4 (table 5). Mean weight at age shows good average weight of older individuals (table 6). Von Bertalanffy metrics show an estimated L infinity of 480 mm (table 7). Largemouth Bass mortality estimates for 2022 is 6.38%. This is likely influenced by the large number of fish between 3 and 6 years old biasing the sample. Most regional waters have estimates between 20% to 40%. The low sample size precludes many inferences from being drawn. The Largemouth Bass population at McAlester reservoir appears to be a somewhat slow growing population with likely lower than normal mortality rate resulting in a population comprised of old individuals.

Crappie

Black and White Crappie were trap netted during the fall of 2021. Only 6 Black Crappie were collected in 30 net sets so they will not be discussed further. The CPUE of White Crappie was 29.53 (table 9). Over 95% of the sample was comprise of stock and sub-stock size fish (< 130 mm, table 10). White Crappie PSD values are below acceptable values driven by the lack of larger size fish (table 11). Relative weight values were lower than acceptable values (table 12). Relative weight values by size class were good for preferred size fish but this is the only size class that had acceptable Wr values. Mean length at age showed average to below average growth for ages less than 3 (table 13). Mean weight at age was also below normal showing very slow weight gain until age 4 (table 14). A von Bertalanffy growth curve is not available. The lack of larger individuals within the sample may have biased the mortality rate estimate which is very high at approximately 89% (table 15). While the rate is likely somewhat lower it surely is higher than other regional waters given the lack of older age individuals in the reservoir. McAlester reservoir is known locally for large crappie but does not usually receive very much fishing pressure. More recently attention has been given to the reservoir resulting in additional pressure. The lack of previous data makes it difficult to ascertain whether the results from this survey support the idea of excessive harvest of larger White Crappie resulting in size overfishing or if the results are characteristic of the reservoir given the high mortality rate. Future samples are needed to tease out the reservoir's typical cycles.

Recommendations

1. Monitor McAlester crappie population to develop trend data and identify potential issues.
2. Carry out a full suite of sampling methods to fully survey the fishery at McAlester.

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

Total CPUE	2022
Mean	7.33
Count	18
SE	2.25
L 95% CI	2.92
U 95% CI	11.75

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

CPUE Size	2022	
	Mean	SE
Sub-stock	1.33	0.78
Stock	1.33	0.6
Quality	0.67	0.46
Preferred	4	1.68
Memorable	.	.
Trophy	.	.

Table 3: Largemouth Bass proportional Stock Density by year.

PSD	2022
PSD-Q	78
PSD-P	67
PSD-M	.
PSD-T	.
PSD S-Q	22
PSD Q-P	11
PSD P-M	67
PSD M-T	.

Table 4: Largemouth Bass Relative Weight with standard errors across PSD classes by year.

Wr	2022	
	Mean	SE
Sub-stock	92.6	.
Stock	90.42	3.79
Quality	89.97	1.78
Preferred	100.92	8.04
Memorable	.	.
Trophy	.	.
Total	97.12	9

Table 5: Largemouth Bass Mean length at age with standard errors.

Mean Length at Age	2020	
	Mean	SE
0	.	.
1	149.5	21.47
2	256.5	32.5
3	351	25.99
4	406.33	11.79
5	401	19.5
6	439	13.49
7	.	.
8	497	.
9	.	.
10	.	.

Table 6: Largemouth Bass Mean weight at age with standard errors.

Mean Weight at Age	2020	
	Mean	SE
0	.	.
1	45.5	22.25
2	207	89
3	683	177.71
4	1042	1908
5	956.67	159.62
6	1327.5	153.54
7	.	.
8	2010	.
9	.	.
10	.	.

Table 7: Largemouth Bass Von Bertalanffy metrics.

Von Bert	2022
L inf	480.173
K	0.41
t0	0.157

Table 8: Largemouth Bass mortality estimates.

Mortality Table	2022
Instantaneous	0.07
Annualized	6.38

Figure 1: Largemouth Bass length frequency histogram.

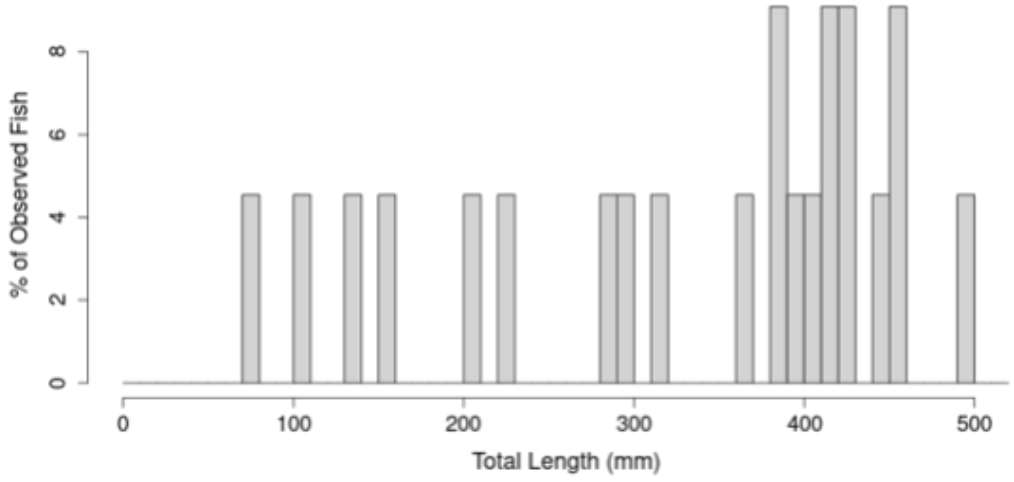

Figure 2: Largemouth Bass age frequency histogram.

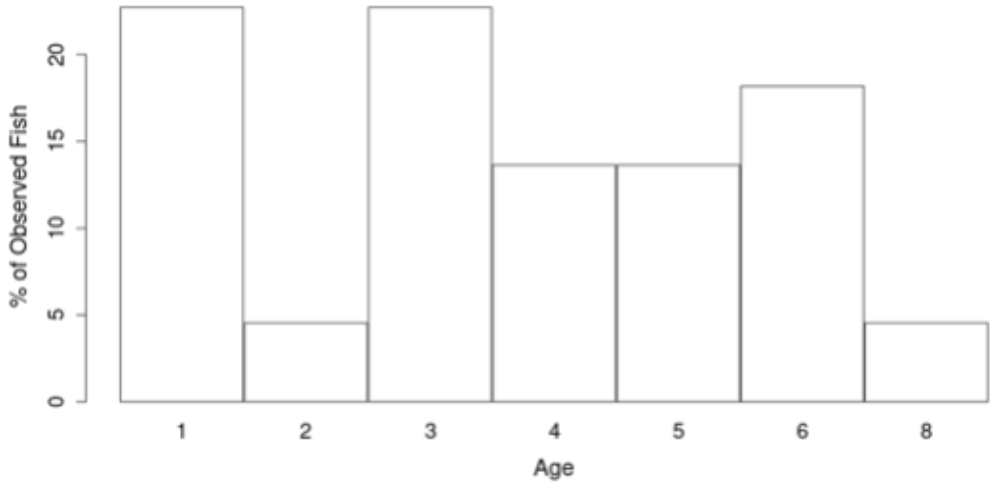

Table 9: White Crappie Catch Per Unit Effort (CPUE) by year.

Total CPUE	2021
Mean	29.53
Count	27
SE	7.4
L 95% CI	15.02
U 95% CI	44.03

Table 10: White Crappie CPUE by size class across time.

CPUE Size	2021	
	Mean	SE
Sub-stock	12.74	4.67
Stock	15.57	3.12
Quality	0.77	0.18
Preferred	0.32	0.15
Memorable	0.1	0.05
Trophy	0	.

Table 11: White Crappie proportional Stock Density by year.

PSD	2021
PSD-Q	7
PSD-P	3
PSD-M	1
PSD-T	.
PSD S-Q	93
PSD Q-P	5
PSD P-M	2
PSD M-T	1

Table 12: White Crappie Relative Weight with standard errors across PSD classes by year.

Wr	2021	
	Mean	SE
Sub-stock	90.1	1.62
Stock	81.7	0.77
Quality	88.25	2.5
Preferred	112.33	3.87
Memorable	90.07	34.11
Trophy	.	.
Total	84.33	0.72

Table 13: White Crappie Mean length at age with standard errors.

Mean Length at Age	2021	
	Mean	SE
0	95.77	0.42
1	130.6	1.24
2	145.56	0.93
3	220.45	13.09
4	261	13.17

Table 14: White Crappie Mean weight at age with standard errors.

Mean Weight at Age	2021	
	Mean	SE
0	7.61	0.61
1	22.5	0.83
2	32.72	0.98
3	177.81	38.36
4	305	76.5

Table 15: White Crappie mortality estimates.

Mortality Table	2021
Instantaneous	2.2
Annualized	88.93

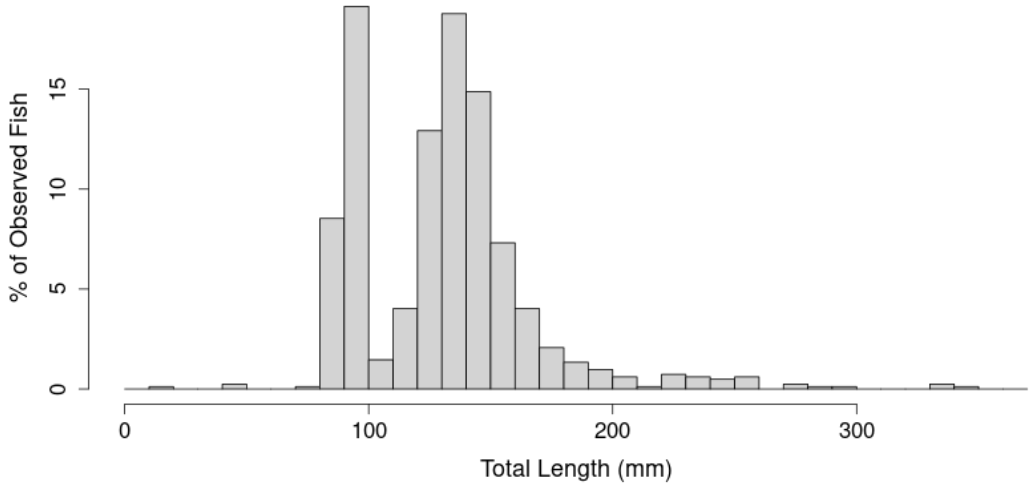

Figure 3: White Crappie length frequency histogram.

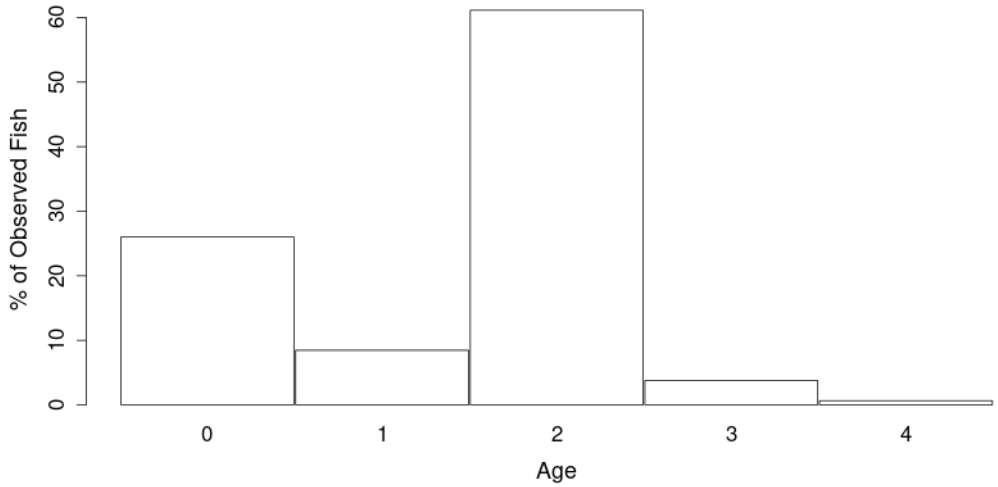

Figure 4: White Crappie age frequency histogram.