SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

BIRCH LAKE

2023

SURVEY REPORT

State: Oklahoma

Project Title: Birch Lake Fish Management Survey Report

Period Covered: This report discusses survey results from 2023.

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Birch Lake

ABSTRACT

Birch Lake was surveyed using experimental gillnets to determine the status of the Hybrid Striped Bass population during the 2023 fall sampling season. Data from the 2023 sample will be compared to previous standardized sampling efforts to monitor trends in catch per unit effort (CPUE) and population dynamics. Fall trap netting was conducted to evaluate population demographics of White Crappie and Black Crappie populations.

Recommendations include gillnetting and trap netting in fall of 2025.

INTRODUCTION

Birch Lake is a multipurpose lake for flood management, water supply, water quality control, recreation, and fish and wildlife. Dam construction began in 1973 and was completed in 1977. Birch Lake is part of the comprehensive plan for flood management and water conservation in the Verdigris River Basin. Birch Lake impounds Birch Creek, which is 2 miles south of Barnsdall, and approximately 20 miles southwest of Bartlesville in Osage County. Birch Lake has a surface area of 1137 acres, 31 miles of shoreline, and a maximum depth of 53 feet.

Birch Lake is stocked with Hybrid Striped Bass. Hybridized fish species do not have the ability to reproduce and sustain their populations as other game fish can. These put and take fisheries are subject to greater control by fisheries managers who must request annual introductions to maintain their abundances in satisfactory levels for the angling public. Populations must be monitored closely to ensure this limited resource is used most efficiently. Gill net samples are used to determine Hybrid Striped Bass abundance, growth rates, and length frequencies. No natural reproduction of Hybrid Striped Bass allows for evaluation of stocking rates, bag limits, and determination of continued stockings.

Crappie was the second most sought after fish species in Oklahoma according to the most recent angler survey. In addition to being highly sought after, advancements in forward facing sonar require these populations to be monitored. Birch Lake has both white and black crappie present in fair numbers, and data for both species will be analyzed separately. Trapnets are used to determine crappie growth rates, and length frequencies. Trap net locations are selected by crew, and not randomly assigned, so abundance data with not be calculated for crappie populations. Population data will be used to determine if populations are stunted, and if so, examine potential changes management practices.

RESULTS

Hybrid Striped Bass

We sampled Birch Lake targeting Hybrid Striped Bass using experimental gillnets. We sampled a total of 26 net nights in 2023. The minimum number of net nights was 10 per the standard sampling procedure, but sampling didn't cease until suitable coefficient of variation was achieved for Hybrid Striped Bass. Otoliths were collected, and catch per unit effort, mean length at age and length frequencies were calculated for Hybrid Striped Bass.

A total of 110 Hybrid Striped Bass were collected in 2023, and all fish were used for age analysis. Lengths ranged from 383mm to 596mm. Ages ranged from 1 to 8 years old. No Hybrid Striped Bass were stocked

in Birch Lake in the summer of 2023. As a result, no age 0 Hybrid Striped Bass were collected in our sample.

Hybrid Striped Bass catch per unit effort (CPUE) was lower in 2023 than in 2021 (Table 1). Some of the decrease in CPUE can be explained by no age 0 fish being collected. Over 70% of fish collected are age 1, 2 and 3 years old. Older year classes are seen, but in lower numbers. Average total length of age one fish in 2023 was larger than in 2021 (Table 2). This could be an indirect effect of no Hybrid Striped Bass being stocked in 2023. Relative weights for Hybrid Striped Bass were lower than we prefer. Relative weights for the Hybrid Stiped Bass collected from Birch Lake are 85.12 in 2023, which is similar to 2021.

Following the 2021 sample it was suggested that decreased stocking quantities, or introducing Threadfin Shad could allow for better growth rates, and allow more Hybrid Striped bass to reach older, larger sizes. With no fish being stocked in 2023, we can evaluate these effects over the next several years. On the surface it appears age one fish are growing faster than in previous samples and could potentially reach larger sizes. This will need to be further evaluated after the next sampling effort. Due to lower CPUE in 2023, decreasing stocking rates is not the preferred management decision. If Threadfin Shad are available in a nearby lake in 2024, we suggest stocking them in Birch Lake. The addition of Threadfin Shad has increased growth rates and relative weights in other lakes in the North Central Region. If the addition of Threadfin Shad does not increase growth rates and relative weights decreased stocking rate should be considered.

Table 1. Catch per unit effort of Hybrid Striped Bass on Birch Lake sampled with gillnets

Lake	Year	Sample Size	Species	L 95% CI	CPUE	U 95% CI
Birch	2021	14	Hybrid Striped Bass	9.56	13.59	17.63
Birch	2023	26	Hybrid Striped Bass	2.61	4.46	6.31

Table 2. Mean length at age of Hybrid Striped Bass in Birch Lake collected using gillnets from 2021 and 2023

Year	Sample Size (N)	Age-0	Age-1	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8	Age-9	Age-10
2021	182	229.09	377.47	465.14	493.94	-	512.8	540.6	530	-	-	570
2023	110	-	405.03	470.68	483.00	530.33	525.86	545.50	555.78	535.00	515.00	-

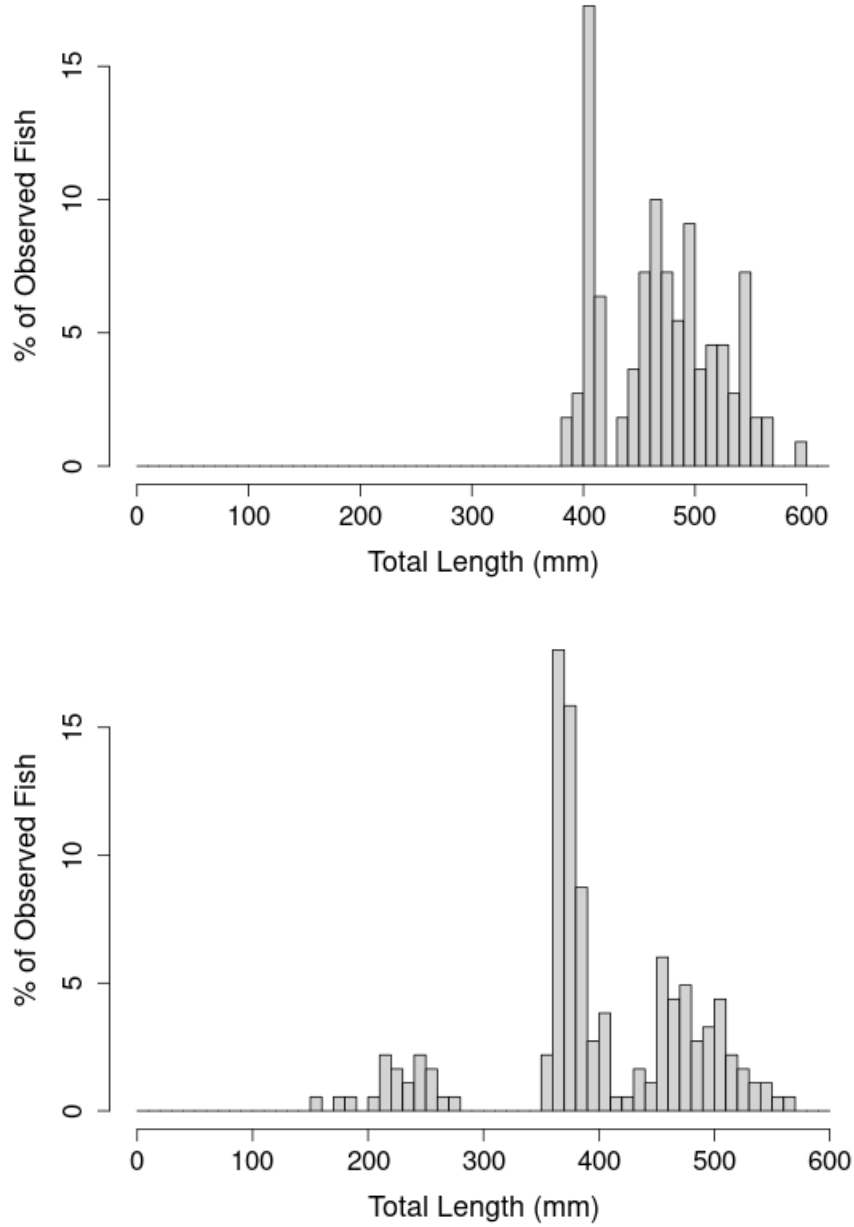

Figure 1. Hybrid Striped Bass length frequencies for Birch Lake 2023 (top) and 2021 (bottom)

Crappie

We sampled Birch Lake targeting black and white crappie using trapnets. We sampled a total of 16 net nights at 11 unique stations, and stations with high catch were fished multiple nights in a row. A total of 159 White Crappie, 49 Black Crappie were collected, measured, weighed, and used for age analysis. The largest white crappie collected was 363mm and was 5 years old, while the largest black crappie collected was 347mm and was 6 years old. Age 0 white crappie were collected in the sample indicating a spawning event did occur in the spring of 2023. In 2021 most fish collected were age 1, and this large

year class can still be seen in 2023, as 20% of individuals collected are from this year class. It appears that 2022 was a poor spawning year for White Crappie in Birch Lake, less than 10% of the population is age 1. The overall average relative weight was 90, which is a healthy condition for White Crappie. Over 50% of the White Crappie collected were 2 years old, these individuals are showing good growth compared to the 2-year-old fish collected in 2021. These 2-year-old fish are approaching 9 inches. Additionally, a few memorable and trophy White Crappie were collected. This should allow anglers to catch many quality White Crappie, with the chance to catch a trophy this season. Looking ahead, a small 2022-year class could persist for several years to come.

Black Crappie make up roughly 1/3 of the crappie catch in Birch Lake. Black Crappie are showing similar trends as White Crappie. The majority of Black Crappie collected are 2 years old. Very few Black Crappie collected were 1-year old. Again, this displays a poor crappie spawn took place in 2022. Black crappie are living longer and persisting in higher relative frequencies at older ages than White Crappie. Just under 60% of the black crappie collect are between 150mm and 200mm, with a few fish reaching large memorable sizes. Overall relative weight for Black Crappie in Birch Lake is 87. This is lower than other lakes in the North Central region, but similar to 2021.

It appears neither black nor white crappie are exhibiting stunting in Birch Lake. Both populations are dominated by a large 2-year-old age class but followed by a weak age 1 year class. It appears the White Crappie did have a successful spawn in 2023 but cannot be confirmed for Black Crappie. Overall, the crappie population looks healthy, and should create a good fishery for this spring.

Table 3. Mean Length at age of White Crappie collected from Birch Lake in 2021 and 2023

Year	Sample Size (N)	Age-0	Age-1	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8
2021	117	-	147.68	196.71	281.28	-	314	-	-	-
2023	159	108.30	142.45	207.14	251.94	287.56	356.50	-	-	

Table 4. Mean Length at age of Black Crappie collected from Birch Lake in 2021 and 2023

Year	Sample Size (N)	Age-0	Age-1	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8
2021	45	-	125	164.65	212.71	225.20	291.5	-	-	-
2023	49	-	159	177.00	191.12	209.95	222.00	323.50	-	-

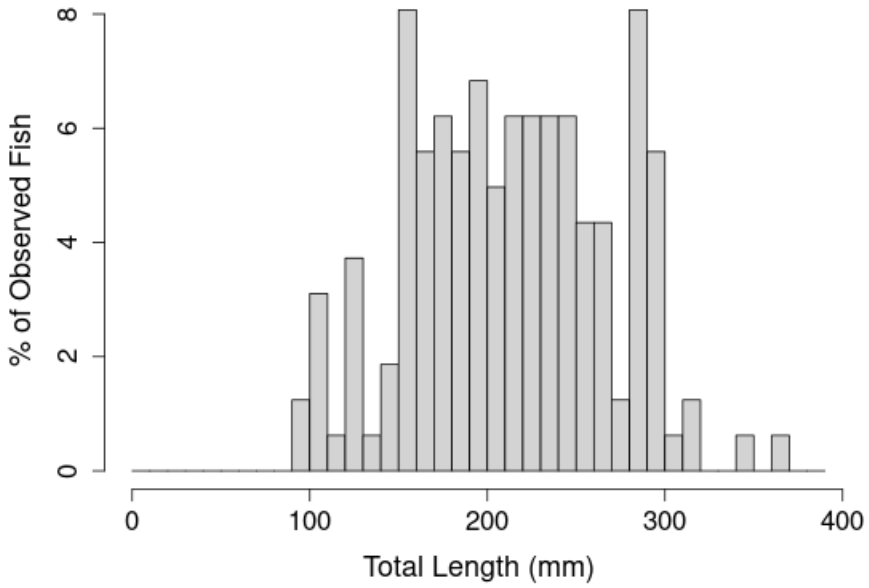

Figure 2. Length Frequencies of White Crappie collected from Birch Lake in 2023

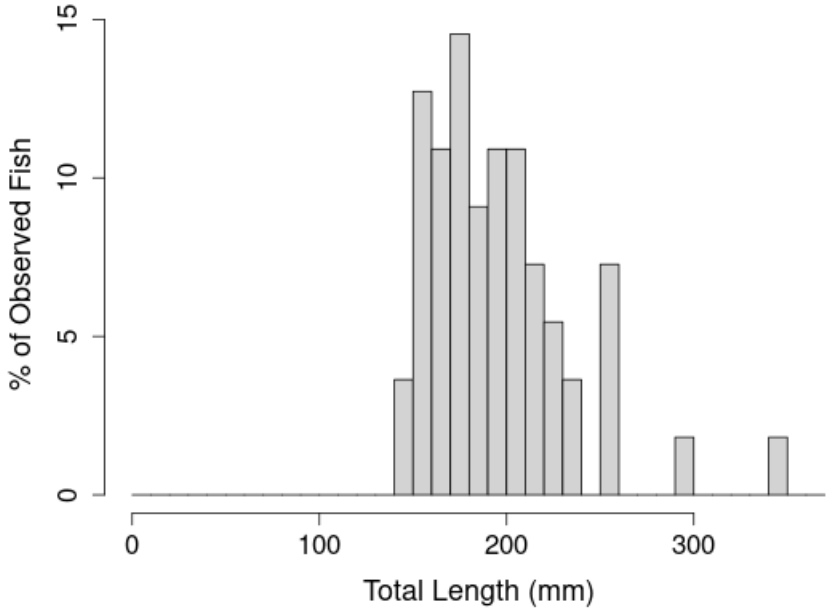

Figure 3. Length Frequencies of Black Crappie collected from Birch Lake in 2023

RECCOMENDATIONS

1. Request Hybrid Striped Bass (HSB) be stocked in Birch Lake in 2024.
2. Stock Threadfin Shad in Birch Lake in 2024
3. Evaluate if no (HSB) being stocked in Birch Lake in 2023 effects growth of HSB stocked in 2022 and 2024
4. Continue to monitor black and white Crappie population dynamics, anticipate a small year class from the poor 2022 spawn