

SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION



FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

SKIATOOK LAKE

2023

SURVEY REPORT

State: Oklahoma

Project Title: Skiatook Lake Fish Management Survey Report

Period Covered: This report discusses survey results from 2023.

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Skiatook Lake

ABSTRACT

Skiatook Lake was surveyed using experimental gillnets to determine the status of the Hybrid Striped Bass, Walleye and White Perch populations during the 2023 fall sampling season.

Recommendations include shad netting in spring of 2024, fall night electrofishing for Smallmouth Bass in fall of 2024, maintain stocking rates of Hybrid Striped Bass and Walleye, continue to monitor White Perch abundance

INTRODUCTION

Skiatook Lake is a multipurpose lake used for flood control, water quality control, water supply, recreation, and fish and wildlife management. Impoundment occurred in 1984. Skiatook Lake is one of five projects in the Bird Creek Basin to meet the water resource needs of the area. Skiatook Lake impounds Hominy Creek, a tributary of Bird Creek, in Osage county. Skiatook Lake is roughly 5 miles west of Skiatook, Oklahoma, and is in the Verdigris River Basin. Skiatook Lake has a surface area of 10,190 surface acres, 187 miles of shoreline, and a mean depth of 32 feet, shoreline development ratio of 11.3, and a low water exchange rate of .5. Skiatook Lake has a 350 square mile watershed and drains mostly grassland and cross-timber areas.

Fish habitat consists primarily of rocky shorelines and flooded timber. Some limestone rock can be found in the lower pool, but sandstone is the primary rock that can be found on the shoreline. A total of 4.9 miles of rip-rap habitat can be found. There are five major areas of flooded timber: the upper end of Hominy Creek, Wildhorse Creek, Bull Creek, Cedar Creek, and Turkey Creek.

Skiatook Lake is stocked with Hybrid Striped Bass and Walleye annually. Hybridized fish species do not have the ability to reproduce and sustain their populations as other game fish can. Walleye are able to reproduce naturally but have been a challenge to catch in any abundance in Skiatook Lake. 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. Skiatook Lake is a premier fishery in the state and supports many Hybrid Striped Bass fishing guides. Sampling Hybrid Striped Bass in Skiatook Lake allows for better continuous understanding of the condition of the species and allow us to adequately communicate with anglers of the fishery. Gillnet samples are used to determine Hybrid Striped Bass and Walleye 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.

The aquatic nuisance species White Perch was first documented in Skiatook Lake in 2015. White Perch are associated with negative impacts of sportfish and angler dissatisfaction. Maintaining knowledge of abundance of White Perch in Skiatook Lake will better allow managers to adapt in years to come in hopes of limiting the negative effects of this invasive species.

RESULTS

Hybrid Striped Bass

We sampled Skiatook Lake targeting Hybrid Striped Bass using experimental gillnets. We sampled a total of 36 net nights in 2023. The minimum number of net nights was 15 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, length frequencies and age frequencies were calculated for Hybrid Striped Bass.

A total of 156 Hybrid Striped Bass were collected in the fall of 2023. Lengths ranged from 248mm to 608mm, and weights ranged from 174g to 3020g. Ages ranged from 0 to 7 years old. In 2018 no Hybrid Striped Bass we stocked in Skiatook Lake, no age 2 individuals were collected in the 2020 samples, this year class is still absent, and no age 5 individuals were collected in 2023.

Hybrid Striped Bass catch per unit effort (CPUE) was similar in 2023 and 2020 (Table 2). In 2020 the peak of the length frequency graph was around 500mm, currently in 2023 we see the peak around 400mm. Age frequency graphs also indicate the majority of the Hybrid Striped Bass are ages 1 and 2. Growth at all ages has significantly increased since 2020. L infinity or asymptotic length has also significantly increased from 516.8mm to 573.1mm. Overall relative weight has significantly increased from 84.67 to 86.69 from 2020. Hybrid Striped Bass appear to be growing faster, and to larger sizes in Skiatook Lake. This is likely due to the supplementation of threadfin shad, a more consistent forage base. Supplemental threadfin shad inputs from the nurse pond are likely benefitting the HSB population. Additionally, no known major winter shad kills have occurred since the 2020 sample further benefiting the population. With a large population of HSB age 1 and 2, increased growth rates, and high relative weights Skiatook Lake should be a prime fishing location for the next several years.

Table 1. Mean length at age of Hybrid Striped Bass in Skiatook Lake collected using gillnets from 2020 and 2023

Year	Sample Size (N)	Age-0	Age-1	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7
2020	156	-	367.89	-	473.35	502.51	510.70	-	-
2023	156	259.33	411.73	475.70	524.60	549.60	-	553.88	599.00

Table 2. Catch per unit effort of Hybrid Striped Bass in Skiatook Lake sampled with gillnets

Lake	Year	Samples	Species	L 95% CI	CPUE	U 95% CI
Skiatook	2020	25	Hybrid Striped Bass	4.29	7.17	10.04

Skiatook	2023	36	Hybrid Striped Bass	2.59	4.56	6.70
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Figure 1. Hybrid Striped Bass length frequencies for Skiatook Lake 2023 (top) and 2020 (bottom)

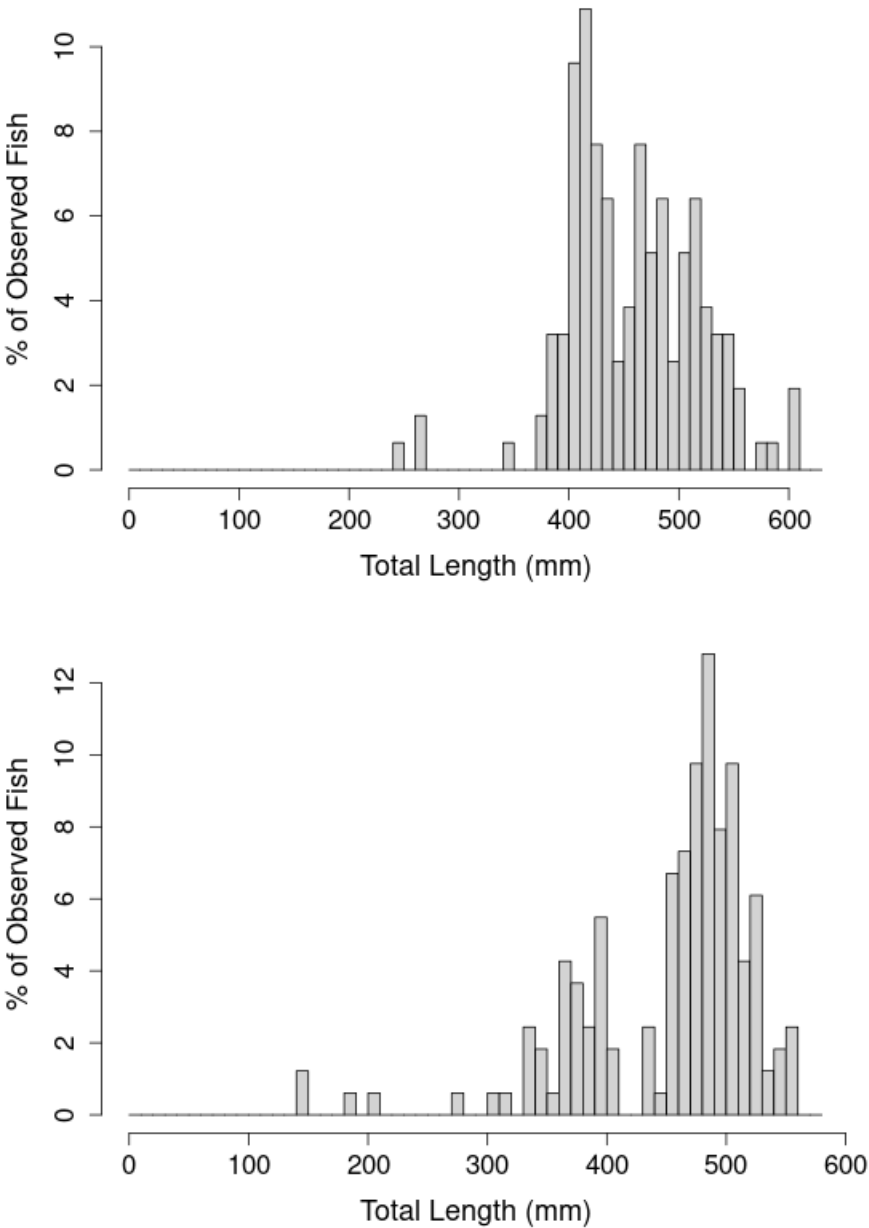
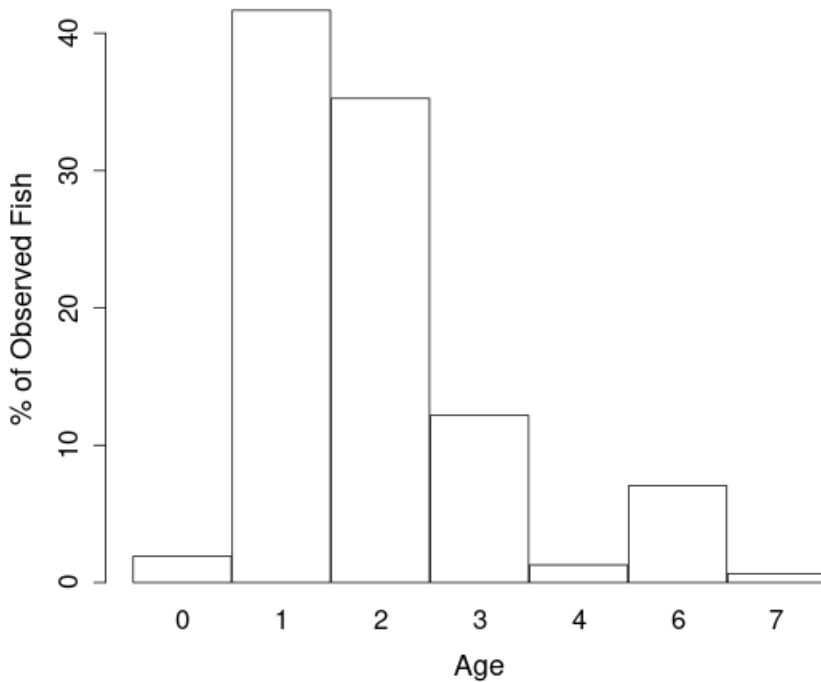


Figure 1. Hybrid Striped Bass age frequencies for Skiatook Lake 2023



Walleye

We sampled Skiatook Lake targeting Walleye using experimental gillnets. We sampled a total of 36 net nights in 2023. Walleye fingerlings have been stocked for several years, but low catch has made it difficult to manage the population. 26 Walleye were collected, and all were measured, weighed and had otoliths removed for aging data.

Catch per unit effort of Walleye was similar from 2020 to 2023. Growth appears to be consistent with the exception of age 1 fish. In both 2020 and 2023 the majority of the Walleye collected were age 1, and while this sample size is still relatively low it appears in 2023 age 1 fish are larger. This is likely due to Threadfin shad contributions from the nursery pond, and a more stable forage base. Overall relative weight has not significantly increased, but this will be something to monitor in future samples. A large sample size in Skiatook Lake continues to be difficult to collect, and alternative methods for sampling may be needed.

Table 3. Mean Length at age of Walleye collected from Skiatook Lake in 2016, 2020 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
2016	13	293.33	414.17	507.50	-	-	-	-	-	-	-
2020	14	-	399.00		483.00	566.67	509.50	-	-	-	561.00
2023	26	306	440.18		501.40	537.00	-	-	647.00	598.00	555.00

White Perch

We sampled Skiatook Lake targeting White Perch using experimental gillnets. We sampled a total of 36 net nights in 2023. 58 White Perch were collected all were measured, weighed, and had otoliths removed for aging data. Over 70% of the White Perch collected in 2023 were 2 years old. Total catch of White Perch decreased from 89 in 2020 to 58 in 2023. White Perch populations do not seem to have invaded Skiatook Lake as severely as other lakes in the North Central region. Methods for reducing White Perch populations are being investigated in other systems. Continued monitoring is needed to better understand how White Perch populations are changing in Skiatook Lake.

Table 4. Catch per unit effort of White Perch in Skiatook Lake sampled with gillnets

Lake	Year	Samples	Species	L 95% CI	CPUE	U 95% CI
Skiatook	2020	25	White Perch	2.29	3.99	5.69
Skiatook	2023	36	White Perch	1.10	1.76	2.41

RECOMMENDATIONS

1. Sample Skiatook Lake in the Spring of 2024 for Threadfin Shad
2. Electrofish in fall of 2024 for Smallmouth Bass
3. Maintain stocking rates of Hybrid Striped Bass and Walleye in Skiatook Lake
4. Continue to monitor White Perch abundance in Skiatook Lake