Performance Report

State: Oklahoma

Project Title: Fisheries Management Survey

Southwest Region Fisheries Management

Waurika Lake

Abstract

Waurika Lake was surveyed via electrofishing in 2024 to access the largemouth bass fishery and community to determine population structure and dynamics to evaluate the needs and possible improvements to the lake. Waurika Lake was last sampled by electrofishing in 2012 and only sampled for large bodied fish with gill nets since this time. Waurika Lake has limiting factors such as high turbidity and lack of shoreline vegetation that is not ideal for largemouth bass fishery. Since the completion of the lake there have been numerous efforts to increase the bass populations such as stocking fry to broodstock largemouth (both Florida and Northern strain, planting of shoreline aquatic vegetation, habitat projects with large scale trees, and introduction of more forage species and yet the fishery has consistently been lacking. The need to sample this lake was a priority for 2024 to maintain up-to-date baseline data for future management goals and possible implications that SWR can make to improve the fishery.

Introduction

Waurika Lake is the largest impoundment in Southwest Oklahoma at just over 10,000 acres and located near Waurika Oklahoma. Waurika is owned and operated by the Corps of Engineers for water storage for the Cities of Lawton and Duncan and for recreational activities. Waurika was developed as a water supply for local municipalities and agriculture based practices while also supporting recreational activities which include camping, boating, and wildlife management areas. This lake project was funded and built in 1980 by the damming of Big and Little Beaver Creeks in the Waurika and Courm area.

The main objective is to provide a quality fishery for anglers in Southwest Oklahoma by means of best management practices for sportfish. Waurika Lake is known by anglers to be a good Saugeye, Hybrid Striped Bass, Blue Catfish, and Crappie fishery. The management goals of continuing a quality fishery include yearly stocking of saugeye (fry and fingerlings) and Hybrid Striped Bass. There is a need for more habitat and cover throughout the lake, creating more habitat will be a high priority to achieve management goals. In an effort to maintain a quality fishery, we will continue to stock sportfish produced by our hatchery system, sample routinely, and provide habitat/cover to allow for optimum potential at Waurika Lake.

Results

Our electrofishing samples were conducted in April of 2024 when water temperatures were 67-69^{0}F and consistent with our spring electrofishing standard sampling protocols (SSP). In order to conduct surveys to SSP standards a minimum requirement of 20 sample sites must be completed for accurate data collection. When electrofishing were sample all available shoreline habitat that is present and that fish may be utilizing. The sample sites were randomly selected throughout the lake and sampled accordingly to weather conditions for that day and following days.

Samples conducted at Waurika were focused on Largemouth Bass, Spotted Bass, and forage base. Electrofishing samples are measured in catch per unit effort (CPUE) and were extrapolated to each species to get a representation for abundance of fish and for 2024 largemouth bass 6 and spotted bass 1 (Figure 1). The overall catch rates were very low compared to statewide lakes but were similar to past electrofishing surveys (Table 1) and has similar trends to historic records of catch rate. When measuring fish body condition (body mass/length) relative weight (Wr) is the metric that is used to describe how fit individuals are in a population; relative weight for 2024 for both species were fairly high showing good growth and body condition (Figure 1) which is acceptable level to population present. Knowing that Waurika has consistently low abundance of bass but good growth rates shows the individuals are doing well and can reflected as not being a great angler lake for bass (abundance). When looking at forage base at Waurika, The lake is maintaining a healthy balance of Gizzard Shad and a small population of Threadfin Shad; this continual, stable forage source is shown by reflecting with good growth rates among all fish species.

The length and growth plots of bass species (Figure 3) look to have an even abundance of individuals among size classes and some on the slightly higher size (+16”) but representing a small sample size. The largemouth population shows a typical stockpile effect of fish in the 12-15” range with few smaller recruitment sized fish and low numbers of larger older fish. These trends are very similar to 2012 surveys where almost half the catch were in the 12-15” range. Age and growth data collected for bass were not collected during this sample due to low numbers of fish being caught. When comparing Waurika to other reservoirs in southwest Oklahoma, CPUE and abundance is very low but has remained similar to historic records. When pairing relative weights, growth rates, and forage base, Waurika is a healthy fishery but is heavily lacking in habitat availability thus making it a high priority to optimize potential of the fishery. Thus forward in 2025 we will complete another electrofishing survey at Waurika to collect age data and more sample date, this will take efforts of more sample sites; along with sampling a habitat plan has been established to place more cedar and hardwood structures along areas where suitable habitat is available.

Sample Size and Effort

Sample Sizes

Species	Number
Largemouth Bass	23
No fish in sample	15
Spotted Bass	6

Total Effort

Gear Code	Gear Name	Effort
41	Electrofishing - All Species	220.0

Catch per Unit Effort

Total CPUE

Species	Mean	Count	RSE	SE	L 95% CI	U 95% CI	N RSE = 12.5 (25% range)	N RSE = 20 (40% range)
Largemouth Bass	6.27	22	37.49	2.35	1.66	10.88	198	77
Spotted Bass	1.64	22	100.00	1.64	-1.57	4.84	1408	550

Figure 1: Catch per unit effort of Largemouth and Spotted Bass Waurika Lake 2024 spring electrofishing

CPUE years/species	2012	2024
Largemouth Bass	5.67	6.27
Spotted Bass	5.33	1.64

Table 1. CPUE of Largemouth and Spotted Bass at Waurika Lake 2012-2024 spring electrofishing sample

Relative Weight (Wr)

Details of standard weight equation

Species	Model Type	Reference Percentile	Min.TL	Intercept	Slope	Source
Spotted Bass	linear	75	100	-5.392	3.215	Wiens et al. (1996)

Size Category	Mean	Count	CV	SE	L 95% CI	U 95% CI
stock	93.34	1	NA	NA	NA	NA
quality	106.58	3	7.69	4.73	97.31	115.85
preferred	93.64	2	4.00	2.65	88.45	98.82
Overall	100.06	6	8.97	3.67	92.87	107.24

Relative Weight (Wr)

Details of standard weight equation

Species	Model Type	Reference Percentile	Min.TL	Intercept	Slope	Source
Largemouth Bass	linear	75	150	-5.528	3.273	Henson (1991)

Size Category	Mean	Count	CV	SE	L 95% CI	U 95% CI
stock	91.99	3	4.47	2.38	87.34	96.65
quality	97.88	9	10.79	3.52	90.99	104.78
preferred	101.23	10	7.61	2.44	96.46	106.01
memorable	91.62	1	NA	NA	NA	NA
Overall	98.30	23	8.97	1.84	94.69	101.90

Figure 2. Relative weights of Largemouth and Spotted Bass Waurika Lake 2024 spring electrofishing

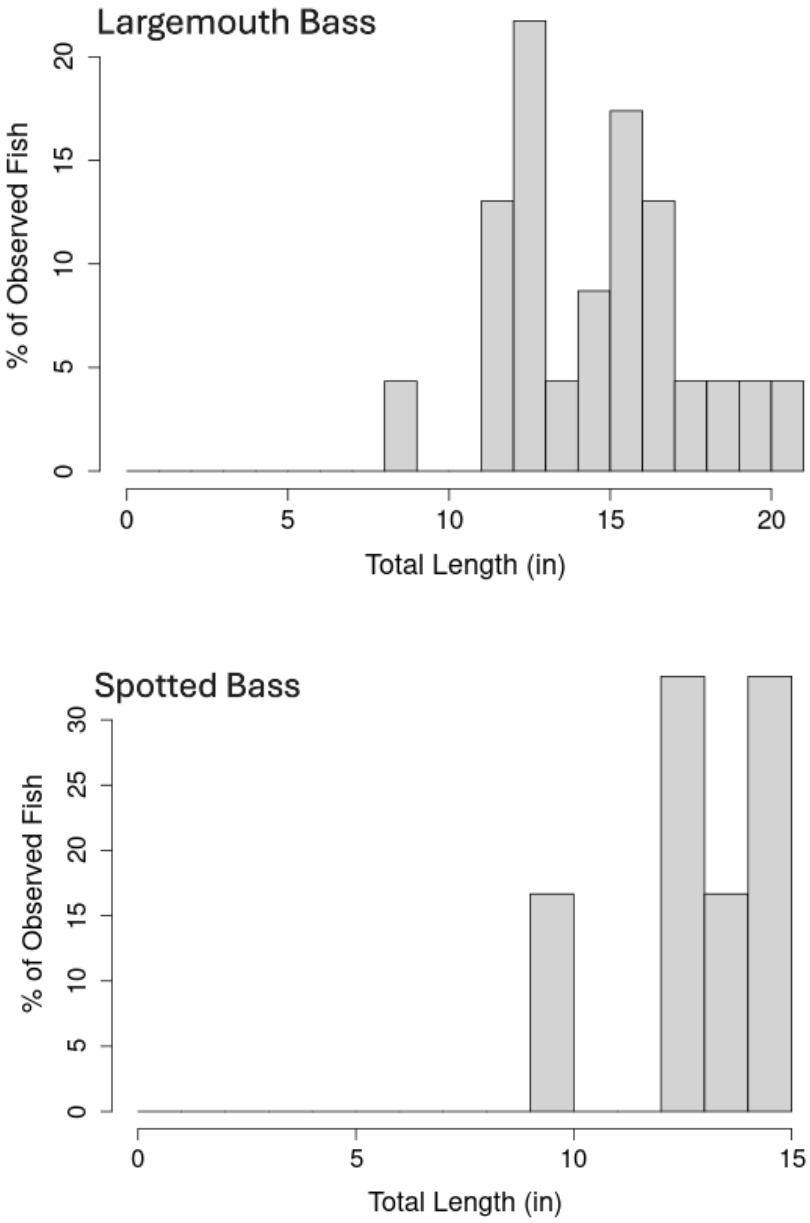

Figure 1. Length frequency of Largemouth and Spotted Bass 2024 Waurika Lake Spring Electrofishing