

## **Performance Report**

State: Oklahoma

Project Title: Fisheries Management Survey

Southwest Region Fisheries Management

### **Waurika Lake**

#### **Abstract**

Waurika Lake was surveyed via gill netting in 2022 to assess the large bodied fish community to determine population structure and dynamics to evaluate the fishery for needs and possible improvements to the lake. Waurika Lake was last sampled by gill netting in 2017. The need to sample this lake was a priority for 2022 to maintain up-to-date baseline data for future management goals.

#### **Introduction**

Waurika Lake is the largest impoundment in Southwest Oklahoma at 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 gill net samples were conducted in November of 2022 and 2017 when water temperatures were between 63-64°F and consistent with our fall gill netting standard sampling protocols (SSP). In order to conduct surveys to SSP standards a minimum requirement of 15 net/nights must be completed for accurate data collection. When gill nets were set each net was fished 8-20' deep with a perpendicular orientation to the shoreline. The sample sites were randomly selected throughout the lake and set accordingly to weather conditions for that day and following days.

Samples conducted at Waurika were focused on Saugeye, Hybrid Striped Bass, and forage base. Gill net 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 2022 were; Saugeye 6.80, Hybrid Striped Bass 3.00 CPUE (Figure 1). The overall catch rates were lower compared to past data in 2017 (Figure 2.) but were significantly higher for saugeye. 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 2022 were Saugeye 105, and Hybrid Striped Bass 92(Figure 1) which is acceptable level to population present with saugeye having an above average condition showing good growth of individuals. The white bass and crappie that sampled were lower in abundance in 2022 compared to past catch rates and coincided with lower relative weights as well. When comparing 2017-2022 data, growth rates and abundance within Waurika have varied in favor of saugeye over hybrids, white bass and crappie. 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.

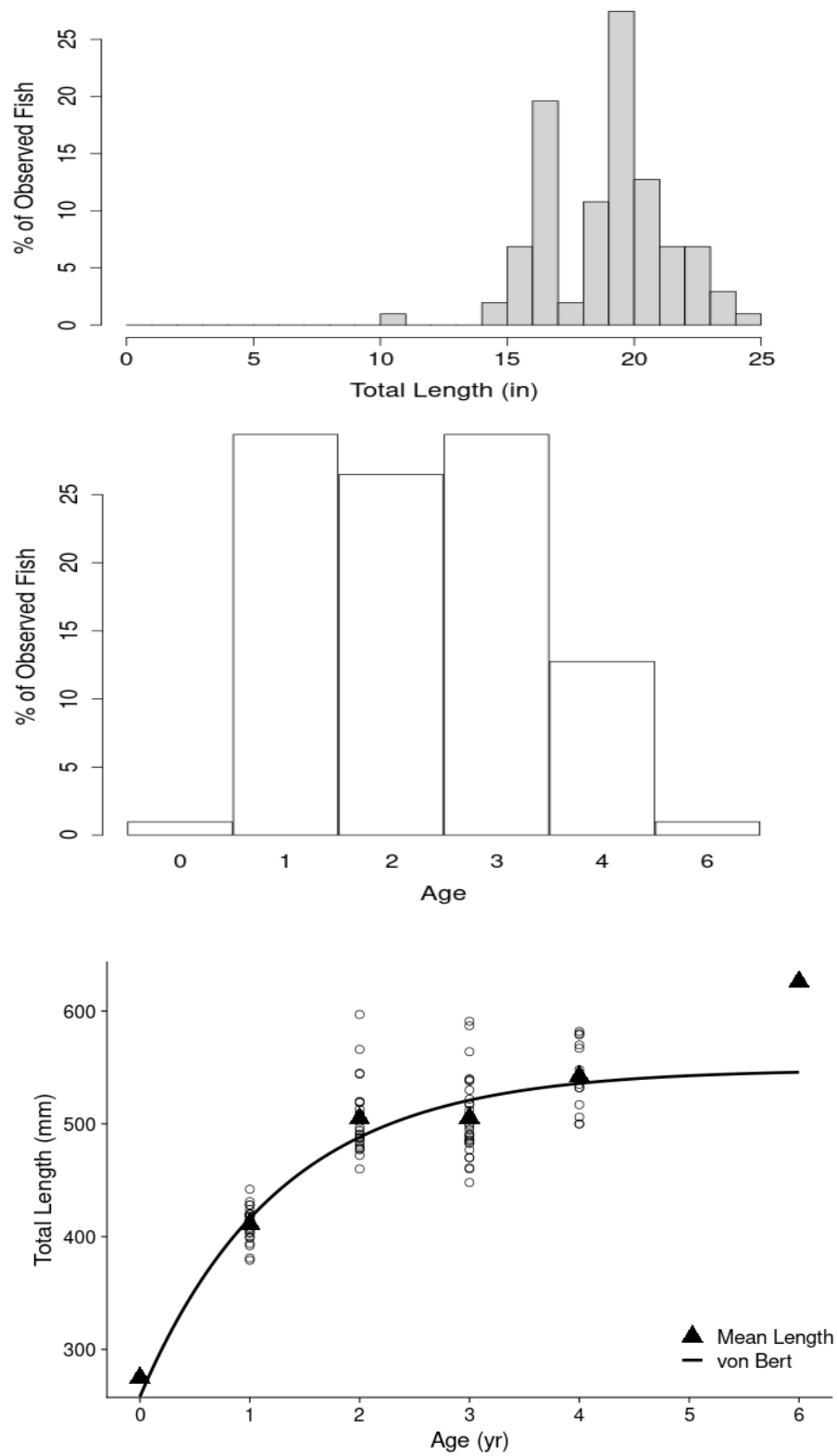
The length and growth plots of saugeye (Figure 3) were normally distributed and having a higher abundance of individuals compared to 2017 data with a strong year class of age 1-3 fish. Age and growth data collected for saugeye (Figure 3) showed Age 0 averaged 6" , Age 1 averaged 15" , and age 3-6 20" respectively and comparable growth with other large reservoirs in our region. The overall saugeye growth rate has increased over a 5 year period. Hybrid striped bass age and growth was also collected (Figure 4), Age 0 averaged 9" , Age 1 averaged 15" , Age 2 averages 18" , Age 3 averaged 19" , Age 5 averaged 20" , and Age 6 averaged 23" . When looking at hybrid striped bass growth rates, Waurika are comparable to other reservoirs in southwest Oklahoma, but slightly on the lower bounds. These lower growth rates among hybrid striped bass could be due to competition among saugeye and other predators. 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.

Waurika	Gill Net Summary Statistics			2022
Species	# Samples = 15			Relative Weight $W_r$
	CPUE	Standard Deviation	Standard Error	
Saugeye	6.80	6.89	1.78	105
Hybrid Striped Bass	3.00	3.82	0.99	92
White Bass	7.33	7.11	1.84	94
Channel Catfish	1.27	1.10	0.28	83
Blue Catfish	6.40	3.66	0.95	78
White Crappie	0.20	0.41	0.11	103
All Crappie	0.20	0.41	0.11	96
Gizzard Shad	5.80	3.73	0.96	-
Threadfin Shad	0.60	1.84	0.48	-

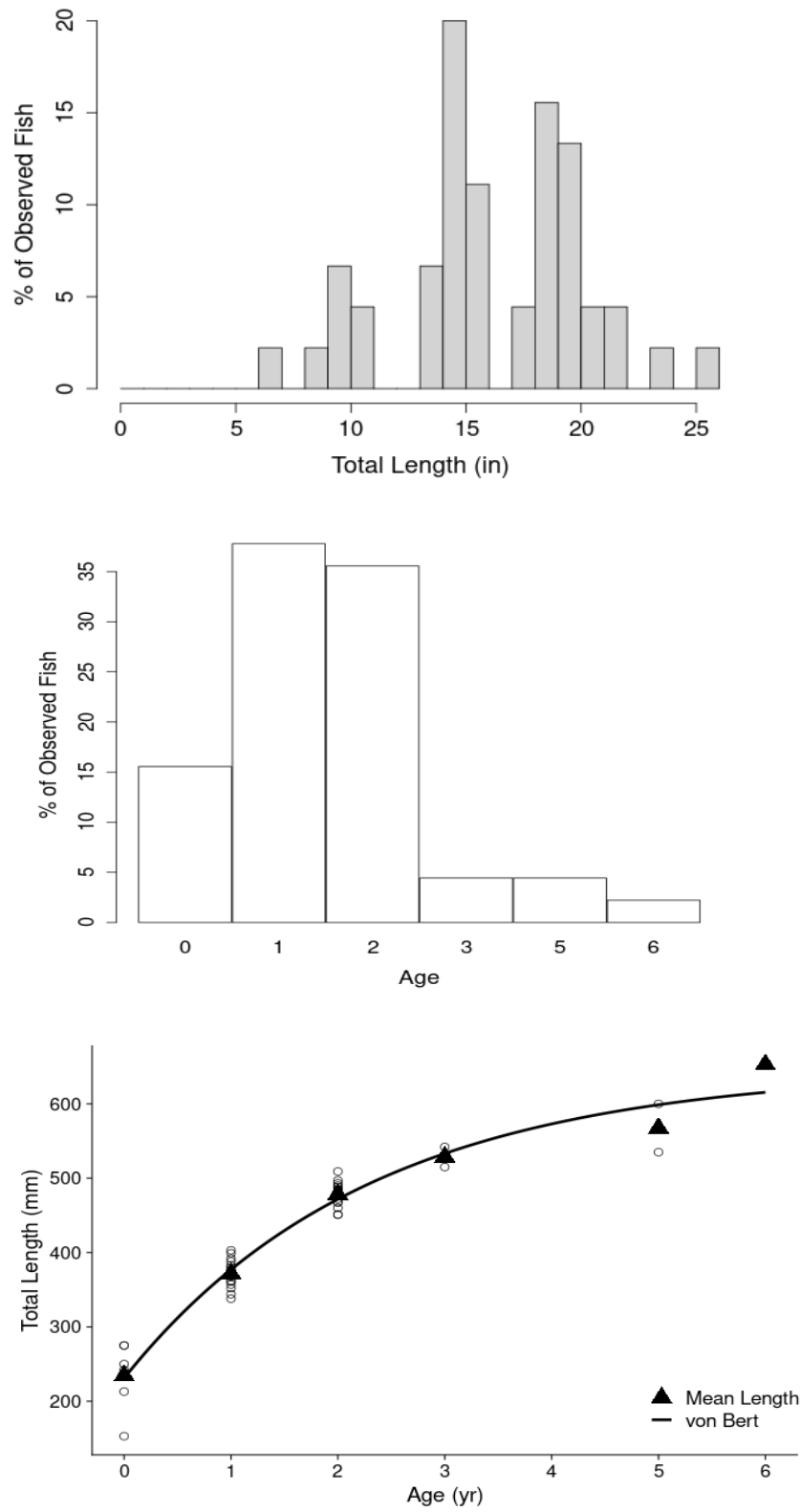
**Figure 1:** Catch per unit effort and relative weights for gill net samples at Waurika Lake 2022

Waurika		Gill Net Summary Statistics			2017
Species	# Samples = 15			Relative Weight $W_r$	
	CPUE	Standard Deviation	Standard Error		
Saugeye	3.07	2.52	0.65	96	
Hybrid Striped Bass	7.27	5.20	1.34	90	
White Bass	14.93	6.87	1.77	99	
Channel Catfish	2.27	1.75	0.45	85	
Blue Catfish	5.60	3.52	0.91	84	
White Crappie	3.27	2.66	0.69	107	
All Crappie	3.27	2.66	0.69	101	
Gizzard Shad	4.87	3.50	0.90	-	
Threadfin Shad	0.53	0.74	0.19	-	
Largemouth Bass	0.07	0.26	0.07	91	

**Figure 2.** Catch per unit effort and relative weights for gill net samples at Waurika Lake 2017



**Figure 3.** Length and age growth plots of Saugeye collected 2022 at Waurika Lake



**Figure 4.** Length and age growth plots of Hybrid Striped Bass collected 2022 at Waurika Lake