Performance Report

State: Oklahoma

Project Title: Fisheries Management Survey

Southwest Region Fisheries Management

Tom Steed Lake

Abstract

Tom Steed Lake was surveyed via gill netting in 2023 to access the large bodied fish community to determine population structure and dynamics to evaluate the fishery for needs and possible improvements to the lake. Tom Steed Lake was last sampled by gill netting in 2016. The need to sample this lake was a priority for 2023 to maintain up-to-date baseline data for future management goals.

Introduction

Tom Steed Lake is a large impoundment (6400 acres) located north of Snyder Oklahoma that is operated by the Bureau of Reclamation for water storage for the City of Altus and as a recreation area. Tom Steed was developed as a water supply for local municipalities and agriculture based practices while also supporting recreational activities which include a state park and wildlife management areas. This lake project was funded and built in 1975 by the damming of West Otter Creek and other small tributaries in the Mountain Park area.

The main objective is to provide a quality fishery for anglers in Southwest Oklahoma by means of best management practices. In the past 5 years we have completed two habitat project that include sinking of ~50 cedar trees throughout the lake and 30 spider blocks around the fishing dock. Tom Steed Lake is known 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.

Results

Our gill net samples were conducted in October of 2022 and 2018 when water temperatures were between 61-63^{0}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. While conducting this survey we had a boat malfunction and were only capable of 10 net nights due to the boat being taken for repairs. 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 Tom Steed 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 2.70, Hybrid Striped Bass .50 CPUE (Figure 1). The overall catch rates were low compared to past data in 2018 (Figure 2.) but was an effect of not having a boat to complete 15 net/nights of sampling. 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 117, Hybrid Striped Bass 88 (Figure 1) which is acceptable level to population present with saugeye having an above average condition showing good growth of individuals. The White Bass that sampled should be noted also having larger individuals and body condition being high for larger individuals. When comparing to 2018-2022 growth rates and abundance, the lake is maintaining a healthy balance with forage (Shad) remaining high reflecting with good growth rates.

The length frequency of fish (Figure 3) was normally distributed and having a higher abundance of larger individuals for Saugeye, Hybrids, and White Bass; this reflects optimum growth rates within Tom Steed. Age and growth data was collected for saugeye (Figure 4), Age 0 averaged 9.5" , Age 1 averaged 14", and age 3-6 fish ranging from 19-22" respectively. Hybrid striped bass age and growth was also collected (Figure 5), Age 1 averaged 15", Age 2 averages 19", and Age 3 averaged 24", these growth rates are on the higher end of average growth. When pairing relative weights, growth rates, and forage base Tom Steed is a healthy fishery with optimum potential being reached.

Tom Steed	Gill Net Summary Statistics			2022
	# Samples = 10			
Species	CPUE	Standard Deviation	Standard Error	Relative Weight W_r
Saugeye	2.70	1.95	0.62	117
Hybrid Striped Bass	0.50	1.58	0.50	88
White Bass	2.20	4.10	1.30	90
Channel Catfish	0.40	0.70	0.22	86
Blue Catfish	3.90	2.64	0.84	83
White Crappie	0.60	0.97	0.31	111
All Crappie	0.60	0.97	0.31	103
Gizzard Shad	4.20	5.85	1.85	-

Figure 1: Catch per unit effort and relative weights for gill net samples at Tom Steed 2022

Tom Steed	Gill Net Summary Statistics			2018
	# Samples = 15			
Species	CPUE	Standard Deviation	Standard Error	Relative Weight W_r
Walleye	0.07	0.26	0.07	92
Saugeye	8.00	3.66	0.95	92
Hybrid Striped Bass	2.13	1.30	0.34	108
White Bass	6.67	3.56	0.92	93
Channel Catfish	1.47	1.73	0.45	94
Blue Catfish	2.27	2.34	0.61	108
White Crappie	3.20	3.82	0.99	105
All Crappie	3.20	3.82	0.99	99
Gizzard Shad	7.60	5.91	1.53	-
Largemouth Bass	0.07	0.26	0.07	112

Figure 2. Catch per unit effort and relative weights for gill net samples at Tom Steed 2018
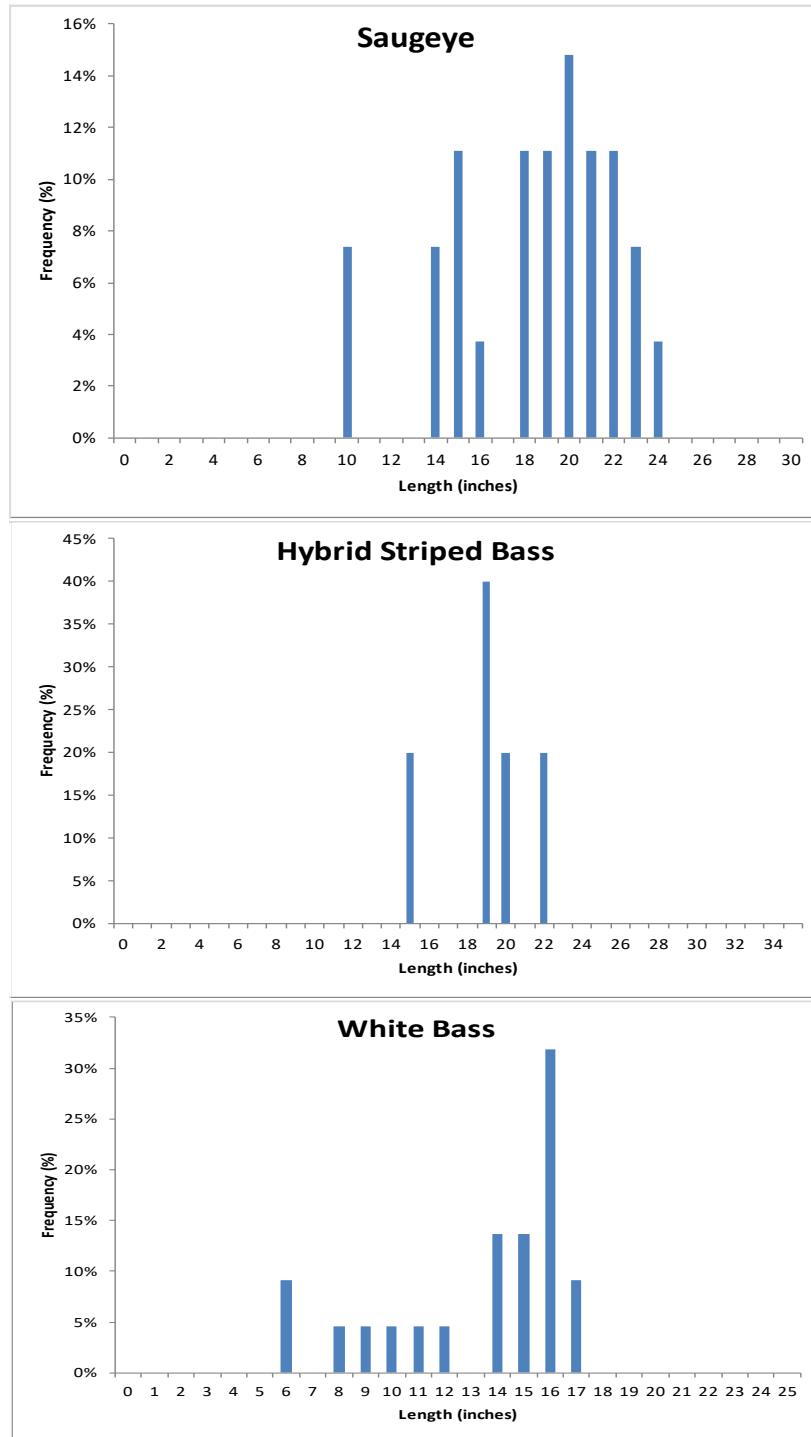
Figure 3. Length frequency and size structure of Saugeye, Hybrid Striped Bass, and White Bass Tom Steed 2022 gill net samples

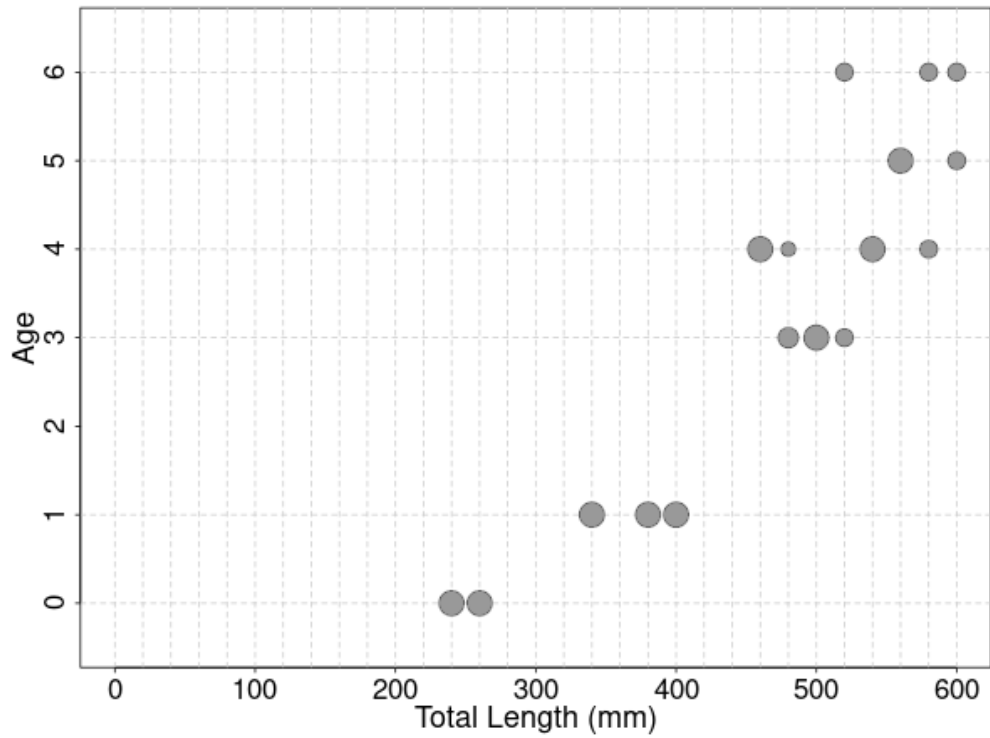**Figure 4.** Age and growth curves of Saugeye collected 2022 at Tom Steed
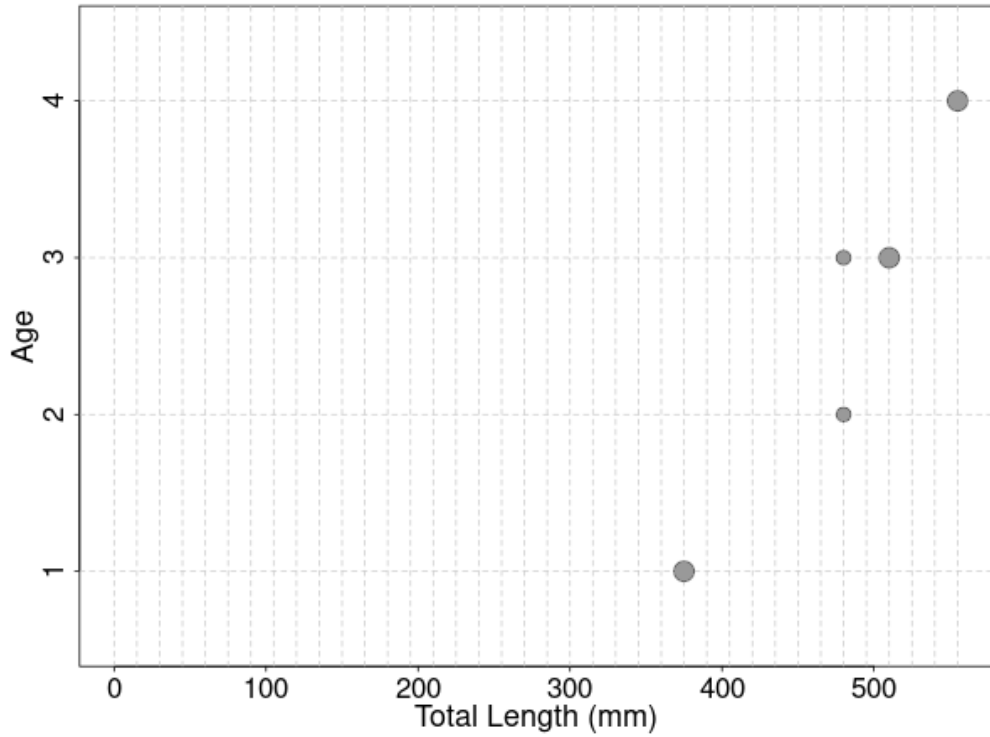

Figure 5. Age and growth curve of Hybrid Striped Bass collected 2022 at Tom Steed