Performance Report

State: Oklahoma

Project Title: Fisheries Management Survey

Southwest Region Fisheries Management

Crowder Lake

Abstract

Crowder Lake was surveyed in 2022 via electrofishing for Largemouth Bass to determine population structure, Florida Largemouth Bass genetics, and dynamics to evaluate the fishery for needs and possible improvements to the lake to enhance the system as a whole. Southwest region considers Crowder to be a high priority bass fishery and routine sampling occurs to monitor current trends in the population.

Crowder Lake has long been a quality Largemouth Bass fishery to many anglers and entities in southwest Oklahoma. Electrofishing surveys have been conducted here in 2022, 2018, and 2016 to continually assess the bass population. Crowder Lake has an above average population of Largemouth Bass, a balanced population of sunfish, and an overabundance of Common Carp.

Introduction

Crowder Lake is a small impoundment (300 acres) that is owned and operated by Southwestern Oklahoma State University (SWOSU) for water storage, a public recreational area for anglers and outdoor classrooms for students. This fishery is managed by both SWOSU along with ODWC who conducts surveys and compiles data for Bass, Channel Catfish, and Sunfish. Crowder is a clear lake with average depths of 9 feet with high abundance of Bass, Common Carp, and small crappie.

The biggest management issues that seem to be present is the high abundance of common carp that are taking up a huge biomass of the lake. This overabundance of carp leads to competition of sport fish and forage fish not being able to compete with these larger carp fish resulting in lower body conditions bass and lack of plankton for shad. Conversely, both shallow and deep water habitat such as cedar trees used for thermal cover and predation avoidance is found throughout the lake.

Crowder Lake has continually been a lake with high catch rates and acceptable ranges of fish health. This combination has led Crowder to being a sought after bass fishing destination in southwest Oklahoma. Our management objectives has been geared towards maintaining a quality bass fishery by evaluating the fishery and stocking Florida Largemouth Bass to allow anglers an opportunity to catch sizeable fish and enhance the genetic variation to maximize growth potential. There are two management principles that we set out to achieve along with stocking recommendations; 1) Elimination of common carp biomass and 2) provide various habitat types to forage and young of year bass.

The most recent stocking events at Crowder Lake was in 2015 with 75,000 fingerling Largemouth Bass being stocked. There have not been any other stockings in the last 10 years to the lake, but based on sampling, it would be recommended to have +10" channel catfish and if possible forage base such as Gizzard Shad.

Results

Our electrofishing samples were conducted in May of 2022 when water temperatures were 72^0F which are slightly above our spring electrofishing standard sampling protocols (SSP) but were sufficient enough to conduct a survey. Being a smaller lake, we were able to sample all available shoreline which consisted of 8 sample sites with each timed site being a 10 minute units of effort that included bare bank/cobble, cedar tree piles, and deep drops with dense shoreline vegetation. In the duration of the 80 minute sample we collected a total of 100 largemouth bass from Crower Lake in the upper 2/3rds of the lake. We felt that 8 sample sites were sufficient in collecting of individuals and met the current SSP protocols and Florida Largemouth Bass DNA sample protocols.

Largemouth bass samples are measured in catch per unit effort (CPUE) and were low based off of similar sized bodies of water with 75 fish/hr for largemouth CPUE (Figure 1). When measuring fish body condition (body mass/length) relative weight (Wr) is the metric that is used to describe how fit the population is, the relative weight for Crowder Lake was on average a 94 (Figure 1) which would be considered the acceptable level to population present. The length frequency of fish (Figure 2) was normally distributed with overall size structure looking similar to previous data (Figure 4) showing a equally distributed range of growth with older individuals being found in the population. Age and growth data showed individuals in Crowder rapidly grow up to age 3 (16" range) then slowdown in growth when they reach that 16 inch range from age 4-8+ (Figures 3 and 5). In 2022 we collected fin clips, sex, and basic data for Florida Largemouth Bass (FLMB) genetics for all 100 individuals collected and submitted samples for a statewide FLMB genetic project.

The growth trends that we have found since 2016 (Figure 4 and 5) show the fish in 2022 were growing slightly slower than past years but there is not stockpiling or a high abundance of individuals under the 12-14" range. The growth curves in 2018 show quicker growth rates among smaller individuals compared to 2022 with a similar amount of larger individuals in the population as a whole. The relative weights for the lake have remained constant in the last 7 years even though catch rates were significantly higher in 2022 (Table 1).

Since we have sampled consecutively from 2016-present and having comparative data it can be easier to determine the overall extent of the largemouth bass population at Crowder. Crowder Lake has remained a quality fishery over the past 7 years based on growth rates and size structure. The amount of usable habitat, cedar trees and shoreline vegetation, is higher than most lakes in our region showing a positive trend in the bass fishery. Crowder Lake has the potential to improve if a large amount of common carp biomass is removed. The best management plan should utilize the forage present, continue to provide habitats, and sample routinely for stocking recommendations to optimize sportfish growth.

Crowder	Electrofishing - Bass Summary Statistics			2022
	# Samples = 8			
Species	CPUE	Standard Deviation	Standard Error	Relative Weight W_r
Largemouth Bass	75.00	37.95	13.42	94

Crowder	Electrofishing - Bass Summary Statistics			2022
	# Samples = 8			
Species	CPUE	Standard Deviation	Standard Error	Relative Weight W_r
Largemouth Bass >=8<13	12.00	18.14	6.41	95
Largemouth Bass >=8<14	18.00	19.77	6.99	94
Largemouth Bass >=12	70.50	35.10	12.41	93
Largemouth Bass >=14	57.00	30.59	10.82	93
Largemouth Bass >=13<16	31.50	19.18	6.78	94
Largemouth Bass >=16	31.50	22.85	8.08	93
Largemouth Bass >=21	2.25	4.46	1.58	97

Figure 1: Catch per unit effort and relative weights of Largemouth Bass at Crowder Lake 2022 samples

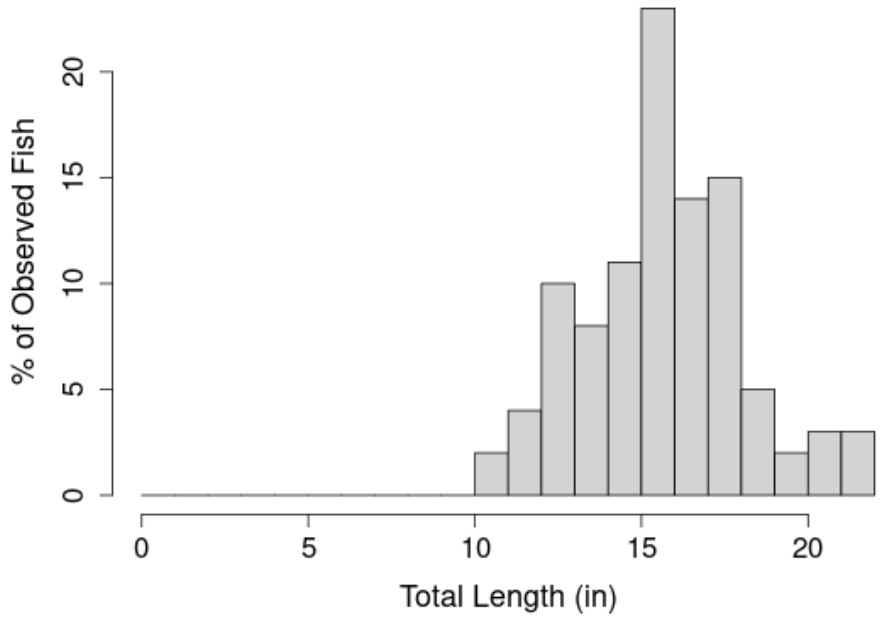

Figure 2. Length frequency and size structure of Largemouth Bass at Crowder Lake 2022 samples

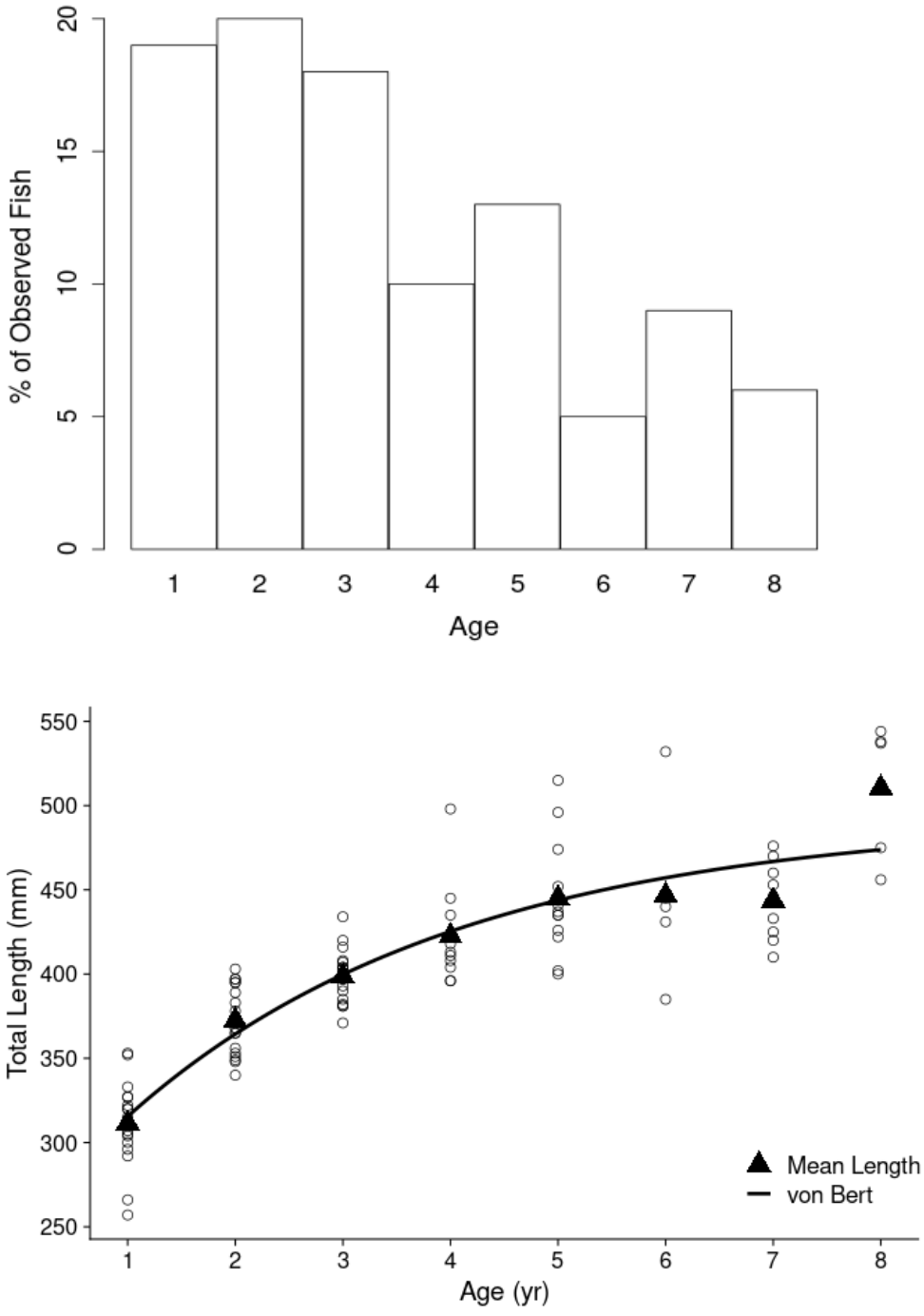

Figure 3. Age and Growth structure of Largemouth Bass at Crowder Lake 2022

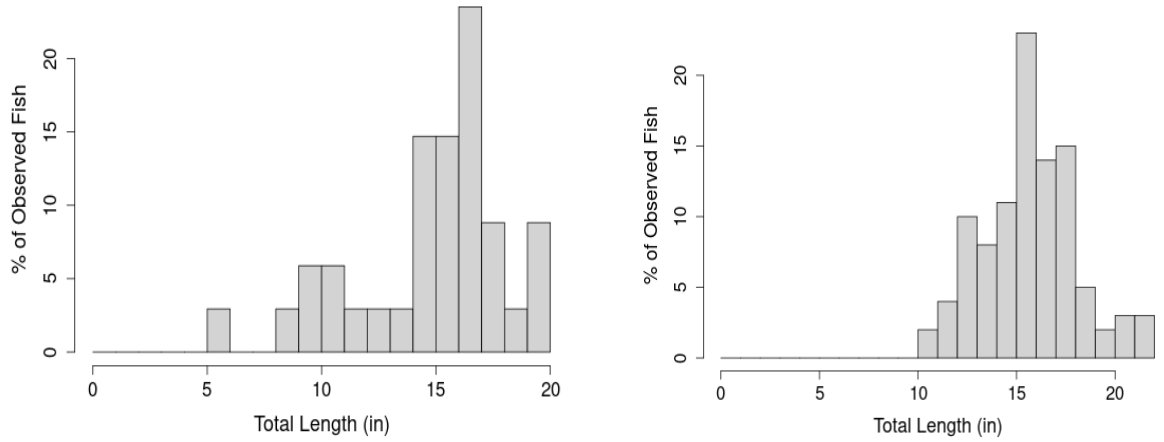

Figure 4. Length Frequency of Largemouth Bass in Crowder Lake 2018 (Left) and 2022 (Right)

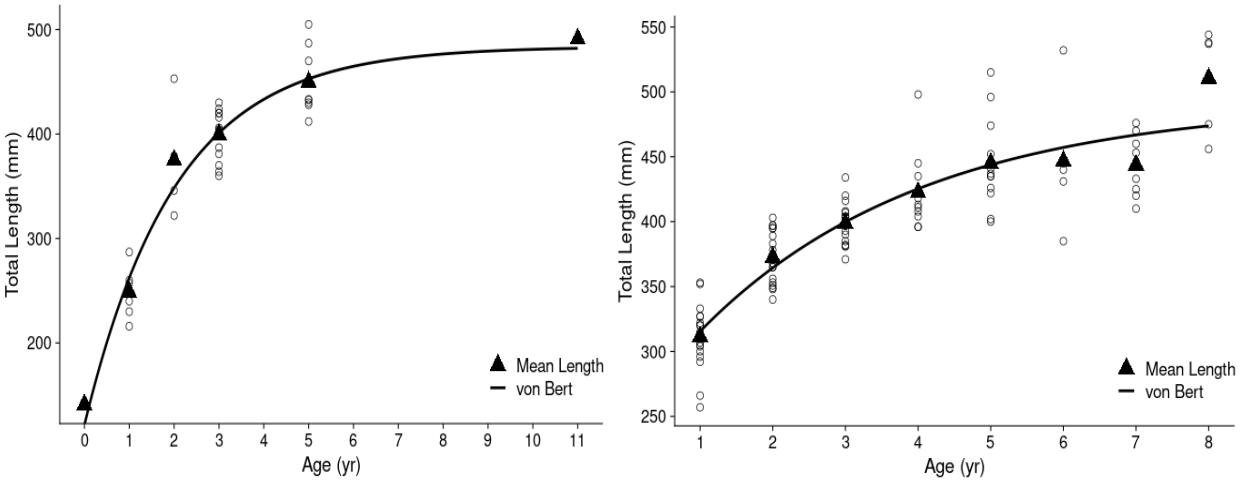

Figure 5. Age and Growth curves of Largemouth Bass in Crowder Lake 2018 (Left) and 2022 (Right)

Year	Total Catch	Relative Weight
2016	60	91
2018	34	90
2022	100	94

Table 1. Total Catch and relative weights of Largemouth Bass at Crowder Lake 2016-2022