Performance Report

State: Oklahoma

Project Title: Fisheries Management Survey

Southwest Region Fisheries Management

Lake Lawtonka

Abstract

Lake Lawtonka was surveyed in 2024 via gill netting for all large bodied, sportfish to determine population structure and dynamics to evaluate the fishery for needs and possible improvements to the lake to enhance the system as a whole. Southwest region considers Lake Lawtonka to be one of the highest priority fisheries for Largemouth Bass and Saugeye resulting in routine sampling occurs to monitor current trends in the population. SWR 2024 gill net sample was conducted in December of 2024 as a follow up survey from our 2023 gill net survey comparatively for sportfish data.

Lake Lawtonka has long been a quality Largemouth Bass fishery and high use saugeye, catfish, and crappie fishery to many anglers and entities in southwest Oklahoma. Gill netting surveys have been conducted routinely in past years to continually assess the sportfish populations. Lawtonka has an above average population of bass and a good population of Channel Catfish, Blue Catfish, and Saugeye.

Introduction

Lake Lawtonka is a medium size impoundment (2400 acres) that is main catchment of Medicine creek. Lawtonk is owned and operated by the City of Lawton Oklahoma mainly for water storage as well as for a recreational activities such as boat, camping, and fishing. This highly used fisheries regulations are set by the City of Lawton but managed jointly with ODWC who conducts surveys and compiles data for Bass, Channel Catfish, and saugeye. Lake Lawtonka is a clear lake with average depths of 10 feet with moderate water quality.

Management issues that seem to be present are water quality issues such as being a high eutrophic system, invasive species (Eurasian Milfoil and Zebra Mussels), large biomasses of common carp, and drought related issues. In recent years we have noted that invasive milfoils are starting to take over areas of the lake such as School House Slough, Robinson Landing, and north shallow flats area. While sampling we collect and remove as many common carp as possible to reduce the amount of biomass that competes with other fish. There is a moderate amount of woody habitat (cedar trees and cut willow trees) that is found in many cove areas of the lake but native vegetation is lacking in most areas. The City of Lawton routinely pumps in water from Lake Ellsworth for the use of municipal water for the Lawton and Ft. Sill leading to fluctuating water levels throughout the year. Lake Lawtonka is a historically a clean system that houses several oddity species not normally found in SW Oklahoma.

Lawtonka has historically been a lake with high catch rates and acceptable ranges of fish health with sportfish and data shows a more unstable trend with more cyclic events of adult and young of year fish. This combination has led Lake Lawtonka to being a sought after fishing destination in southwest Oklahoma. Over the past 5 years Lake Lawtonka has been a surrogate lake for a statewide Florida Bass genetic study since we have known stockings and a large population size range to sample from and for a nationwide study looking at blotchy bass syndrome in which we collected Smallmouth bass that show signs of having this pigmentation issue. Our management objectives has been geared towards maintaining a quality fishery by evaluating the populations of Large/smallmouth Bass, Saugeye, and Channel Catfish to allow anglers an opportunity to catch sizeable fish and enhance maximize growth potential.

The most recent stockings at Lake Lawtonka includes Saugeye, Channel Catfish, and Florida Strain Largemouth Bass.

Results

Our gill netting samples were conducted in December of 2024 when water temperatures were 48^0F which fall low but within our range for standard sampling protocols (SSP). Being a moderate sized lake, we were able to sample much of available areas consisting of 5 sample sites with each site being a 24 hour units of effort that included bare bank/cobble, woody cedar trees, and deep drops near the dam area. In the duration of the net/nights we collected a total of 112 saugeye, 11 channel catfish, 3 crappie, shad, and white bass. Otoliths were collected from saugeye and crappie for age and growth; although crappie numbers were low we tend not to see many crappie within this system.

Samples are measured in catch per unit effort (CPUE, Table 1) and were low based off of previous year samples but total samples were reduced due to time constraints and previous year (2023) gill net survey. Comparative numbers, even though reduced net nights, saugeye showed to have a higher catch rate than the previous year, while channel catfish and white bass had fairly similar catch rates based on survey size. The gizzard shad rates have historically been lower than other SWR lakes but lacking spawning structures during dry periods and have a cyclic effect on Lawtonka shad production, through electrofishing and seining we know the forage base is rich with silversides, blacktail shiners, and small freshwater drum.

When measuring fish body condition (body mass/length) relative weight (Wr) is the metric that is used to describe how fit the population is, relative weight for saugeye was 98 and crappie spp. 96 (Figure 1 and Table 2.) which would be considered the acceptable level to population present. Saugeye and Crappie are the sportfish of focus, other than Large/Smallmouth Bass, for gill netting purposes. The length frequency for all sportfish (Figure 2) was normally distributed to previous years but overall size structure was lacking by slightly have more larger fishes but year class strength can be seen consistent with saugeye, this could be a result of less net nights and gear bias. Age and growth data was only collected for saugeye and crappie, age metrics are to be determined through shiney app.

The growth trends that we have found in previous surveys (Figure 3 and table 2) show saugeye have a strong population and good size distributions among the population, the 2024 follow up samples show the same trends with growth rates among size classes. The stocking efforts can be seen to have an positive impact and are sufficient among all size classes and works well within the Lawtonka system. The crappie population has always been considerable low but when sample we tend to see larger fish that are not stunting or stockpiling in a certain size range (Figure 3). The channel catfish and white bass populations have vacillated over the past years but reintroduction of channel catfish stocking have improved the catfishery and the white bass have yearly fluctuations mainly due to flows and spawning conditions. Although catch rates (CPUE) show some variation among sampling years, factors such as timing and weather conditions could play a role in capture rates.

Since we have sampled consecutively from 2023-2024, having comparative data it can be easier to determine the overall extent of the sportfish population at Lawtonka. Biologically we have noticed a rapid explosion of invasive vegetation (mainly milfoil) and water quality slightly diminish but the sportfish population remains strong. There is a lack of deep water habitat that Bass, Sunfish, and Crappie need on a yearly basis and a project has been established to sink more cedar trees and other woody habitat in critical areas for thermal cover. If we continue to add habitat, monitor the population and make adjustments where we see fit Lawtonka will remain a great all around fishery. The best management plan should utilize the forage present, provide more habitats, and sample routinely for stocking recommendations in order to create a quality fishery.

Relative Weight (Wr)

Details of standard weight equation

Species	Model Type	Reference Percentile	Min.TL	Intercept	Slope	Source
Saugeye	linear	75	170	-5.692	3.266	Flammang et al. (1993)

Size Category	Mean	Count	CV	SE	L 95% CI	U 95% CI
substock	97.82	1	NA	NA	NA	NA
stock	100.54	27	6.36	1.23	98.13	102.95
quality	95.21	41	6.02	0.89	93.46	96.97
preferred	95.19	25	8.72	1.66	91.94	98.44
memorable	105.04	18	7.54	1.87	101.38	108.70
Overall	98.09	112	7.91	0.73	96.66	99.53

Relative Weight (Wr)

Details of standard weight equation

Species	Model Type	Reference Percentile	Min.TL	Intercept	Slope	Source
Black Crappie	linear	75	100	-5.618	3.345	Neumann and Murphy (1991)

Size Category	Mean	Count	CV	SE	L 95% CI	U 95% CI
preferred	96.92	3	2.01	1.12	94.71	99.12
Overall	96.92	3	2.01	1.12	94.71	99.12

Figure 1: relative weights of Saugeye and Crappie at Lake Lawtonka 2024 gill samples

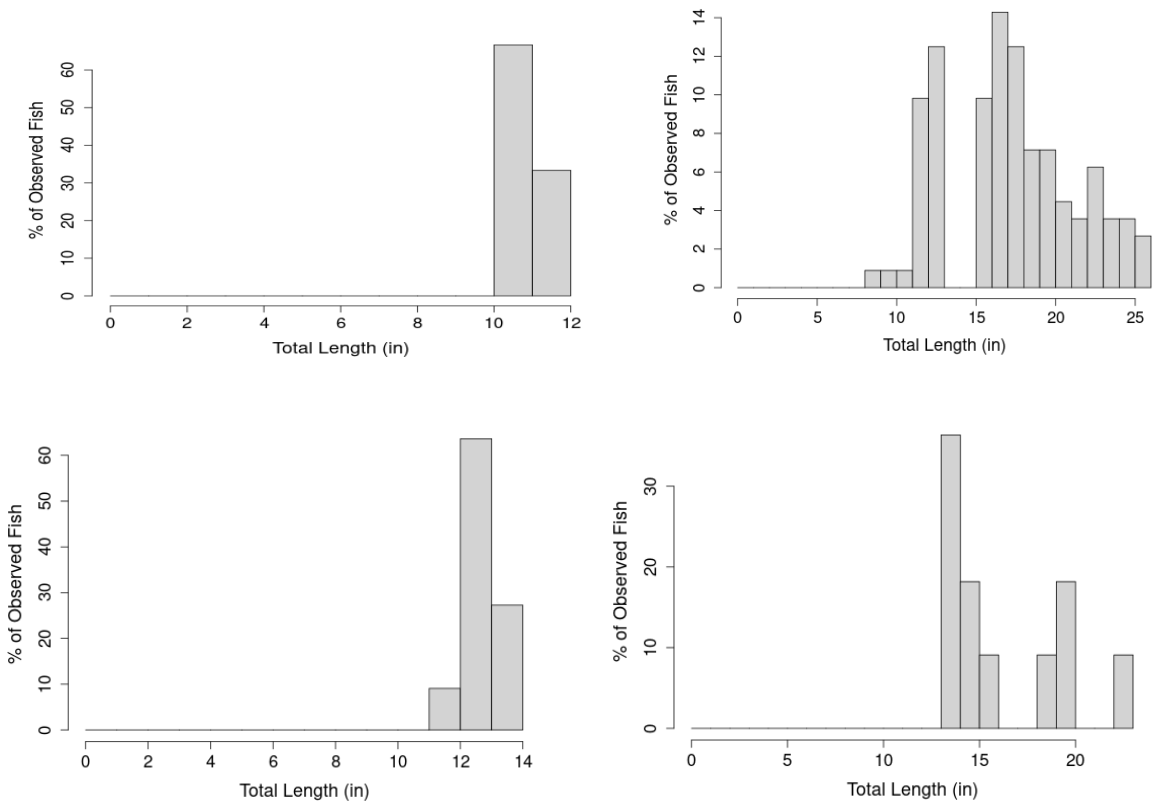

Figure 2. Length frequency and size structure for Crappie, Saugeye, White Bass, and Channel Catfish in Lake Lawtonka for 2024 gill samples (Crappie top left, Saugeye Top right, White Bass bottom Left, Channel Catfish bottom right).

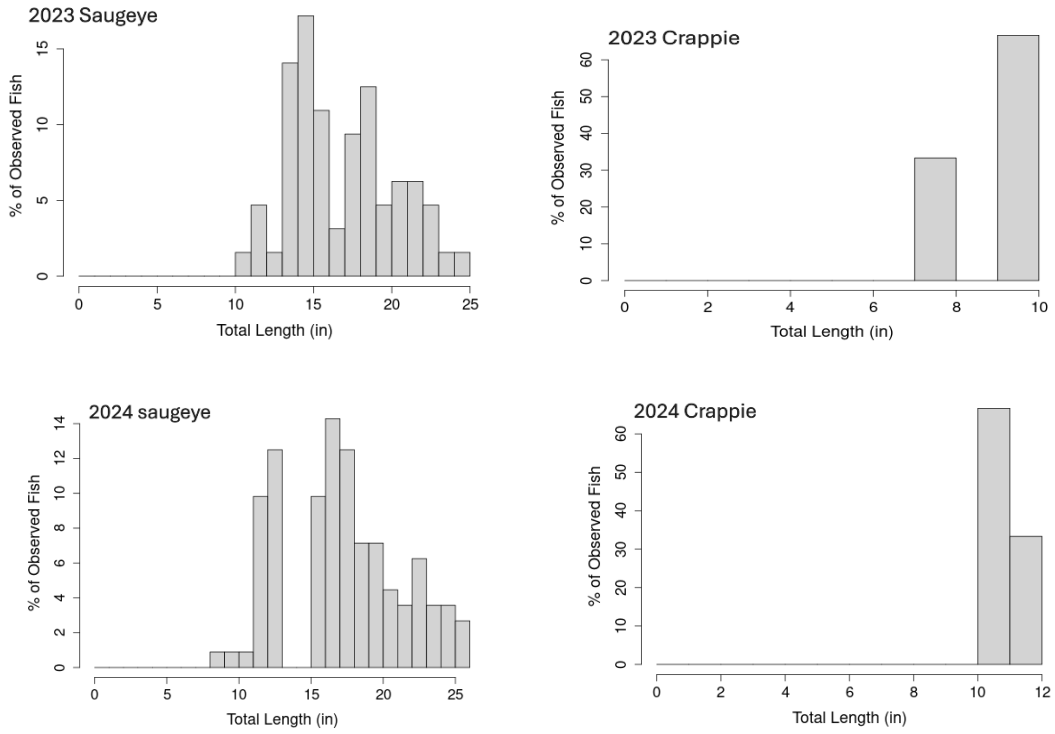

Figure 3. Length frequency of saugeye and crappie from 2023 and 2024 gill net samples at Lake Lawtonka.

Total CPUE

Species	Mean	Count	RSE	SE	L 95% CI	U 95% CI	N RSE = 12.5 (25% range)	N RSE = 20 (40% range)
Black Crappie	0.30	10	71.15	0.21	-0.12	0.72	324	127
Channel Catfish	7.10	10	9.72	0.69	5.75	8.45	6	2
Gizzard Shad	4.90	10	31.83	1.56	1.84	7.96	65	25
Saugeye	6.40	10	13.62	0.87	4.69	8.11	12	5
Smallmouth Bass	0.10	10	100.00	0.10	-0.10	0.30	640	250
White Bass (Sand Bass)	9.60	10	23.35	2.24	5.21	13.99	35	14
White Crappie	0.70	10	37.19	0.26	0.19	1.21	89	35

Total CPUE

Species	Mean	Count	RSE	SE	L 95% CI	U 95% CI	N RSE = 12.5 (25% range)	N RSE = 20 (40% range)
Black Crappie	0.60	5	66.67	0.40	-0.18	1.38	142	56
Channel Catfish	2.20	5	44.07	0.97	0.30	4.10	62	24
Gizzard Shad	2.00	5	35.36	0.71	0.61	3.39	40	16
Saugeye	22.40	5	12.60	2.82	16.87	27.93	5	2
White Bass (Sand Bass)	2.20	5	54.55	1.20	-0.15	4.55	95	37

Table 1. CPUE metrics from Lake Lawtonka from 2023 (Top) and 2024 (bottom) gill netting samples.

Year	Relative Weight (Wr)	Catch per Unit Effort (CPUE)
Crappie		
2023	82	.30
2024	96	.60
Saugeye		
2023	86	6.40
2024	98	22.40

Table 2. Relative weight and catch rate tables for Saugeye and Crappie at Lake Lawtonka 2023 and 2024 gill netting.