SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

KONAWA LAKE

2024

SURVEY REPORT

State: Oklahoma

Project Title: Konawa Lake Fish Management Survey Report

Period Covered: 2024

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Date Prepared: January 2025

Konawa Lake

ABSTRACT

Konawa Lake was surveyed by fall suspended gill nets (2024) and fall floating shad net (2024) surveys to monitor trends in the fish populations. Relative abundance for Channel Catfish increased, while body conditions and size structure decreased slightly. Hybrid striped bass increased slightly but sample size was small. White Bass, Threadfin and Gizzard Shad abundance increased significantly since the last survey.

INTRODUCTION

Konawa Lake impounds Jumper Creek two miles east of the town of Konawa in Seminole County, Oklahoma. It covers 1,350 surface acres. Construction began in 1968 and was completed in 1970. The lake is owned by Oklahoma Gas and Electric Company. This lake serves as the cooling water source for a gas-fired power generation station; therefore, water temperatures are higher year-round than in most other lakes in the state.

Konawa Lake has a mean depth of 17 feet and a maximum depth of 49.8 feet, a shoreline development ratio of 3.5, and a secchi disc visibility of around 37.4 inches in the main pool in August. Turbidity is from plankton. The lake has a shoreline length of 20 miles and a storage capacity of 23,000 acre-feet. It has large stretches of shoreline covered by cattails while most of the remainder is eroded clay banks and riprap.

Hybrid Striped Bass were stocked annually from 1988-2007; however, in recent years stocking frequency has been reduced, with the purpose of reducing competition for forage in order to maintain growth rates of Largemouth Bass and Hybrid Striped Bass. Hybrid Striped Bass stockings will continue but at a reduced frequency to maintain the fishery. Florida largemouth bass (FLMB) have been stocked since 1973 (Appendix 1), however, stockings ceased in 2005 to prevent overcrowding. Monitoring of FLMB genetics continues.

Tilapia were present for several years but have not been collected in surveys for quite some time.

Fish habitat consists primarily of aquatic vegetation. Due to good water fertility, the lake generally supports abundant populations of several game and forage fish species. Twenty fish attractor sites consisting of artificial habitat structures made from polyethylene pipe called “spider blocks” have been installed by the Oklahoma Department of Wildlife Conservation (ODWC) (Appendix 2).

A boating access project consisting of a two-lane boat ramp, boat dock, restrooms and paved parking lot was completed in 1997.

January 1st, 2003, bass fishing regulations were changed from a slot length limit of 406-559 mm (16-22 inches) with only one bass 22 inches or longer per day, to six bass per day only one of which can be 22 inches or longer. Konawa Lake changed from special trophy regulations to follow the standard statewide regulations in 2022 as a means of “simplicity”. Statewide Largemouth Bass fishing regulations changed in the fall of 2022 to: A creel limit of six (6) Largemouth Bass of which only one may be larger than 16 inches.

Species observed in recent surveys include: Largemouth Bass, Hybrid Striped Bass, White Bass, White Crappie, Channel Catfish, Flathead Catfish, Gizzard Shad, Threadfin Shad, Common Carp, Longnose gar and Drum.

RESULTS

Channel Catfish

Channel Catfish were surveyed in 2024 using suspended gill nets. A total of ten stations were randomly sampled for a period of 24 hours each. Relative abundance increased slightly in 2024 (CPUE = 14.4) compared to 2021 (CPUE = 11.9) and was considered high (Table 1). Relative abundance increased significantly for stock size fish in 2024 (CPUE = 5.5) compared to 2021 (CPUE = 0.6), however, all other size class decreased slightly in 2024. Body conditions decreased in all size classes present compared to 2021 and were below acceptable conditions (Wr = 90) for all size classes survey except memorable size fish (Wr = 99) (Table 1). Length frequency histograms (Figure 1) and proportional size distribution (PSD) values (Table 2) showed a decrease in overall size structure. PSD values decreased for all size classes PSD-Q = 60, PSD -P=10, and PSD-M = 1, indicating a decrease in the proportion of larger fish. Even though abundance and size structure decreased slightly, Konawa Lake still had a high abundance of quality size and larger fish.

Age data was collected on a subset of Channel Catfish in 2024. Growth rates varied between years and ages, and decreased slightly up to age four, then increased up to age 8 where the fell below 2021's growth rates for the remainder of the ages present. Channel Catfish at Konawa Lake grew to a mean length of 13.9 inches by age two, 20.2 inches by age four and 23.6 inches by age six (Table 3). The largest fish sampled measured 30.2 (in) in total length and weighed 11.0 (lbs.) in weight. The oldest Channel Catfish was aged at 13 years old.

The 2024 age frequency indicated a strong 2021 (age 3) year class (Figure 2). Channel Catfish in Konawa Lake are naturally reproducing and considered a self-sustaining population. No stockings are recommended.

Table 1. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of Channel Catfish collected by fall gill netting from Konawa Lake. Acceptable Wr values are ≥90.

		Total CPUE	Stock 11 in		Quality 16.1 in		Preferred 24 in		Memorable 28 in		Trophy 35.8 in	
Year	No.	CPUE	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
2006	114	13.7	9.5	81	3.9	88	0.4	110	.	.	.	.
2008	199	22.0	6.7	84	6.9	83	0.6	95	.	.	.	.
2015	115	12.9	6.1	79	5.7	83	0.9	90	0.11	98	.	.
2021	119	11.3	0.6	83	8.3	87	1.9	90	0.2	120	.	.
2024	138	14.4	5.5	76	7.0	85	1.3	89	0.1	99	.	.

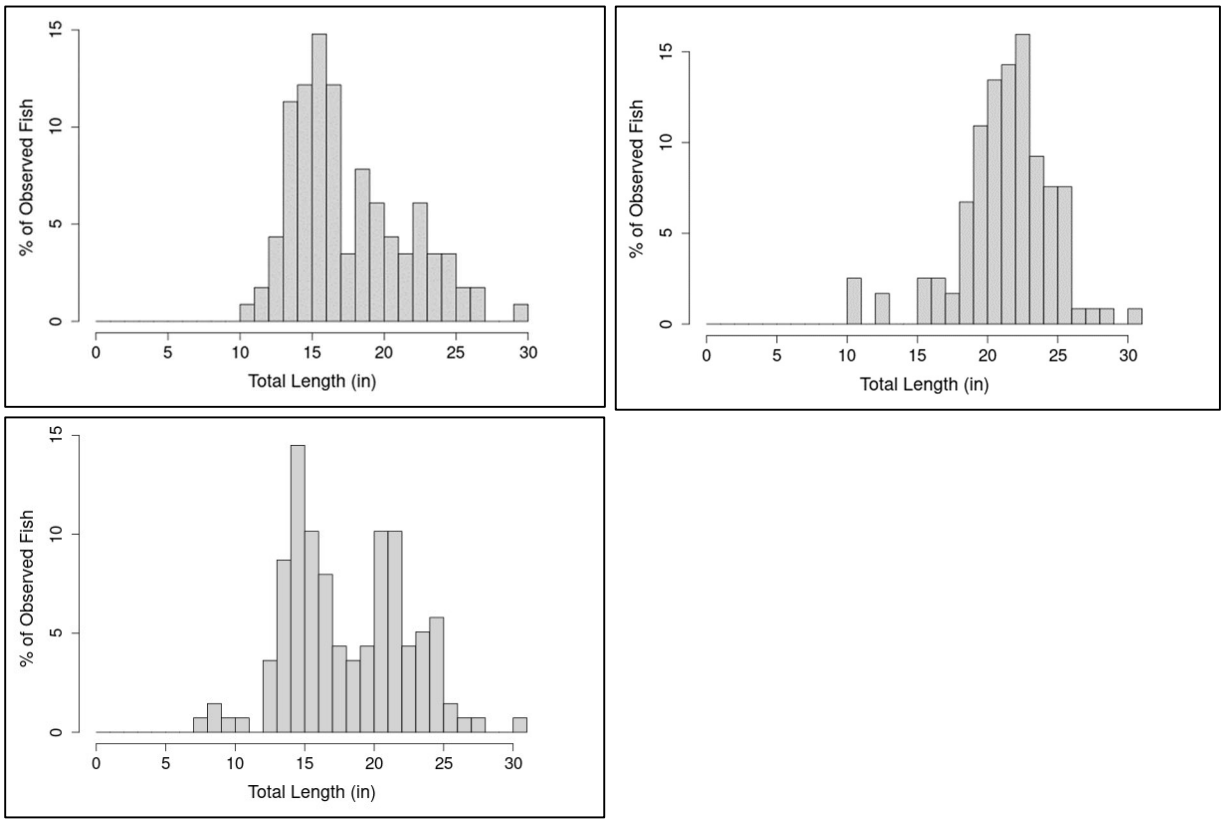


Figure 1. Channel Catfish Gill Net Length Frequency Histogram 2015 (Top Left), 2021 (Top Right), and 2024 (Lower Left).

Table 2. Proportional Size Distribution (PSD) of Channel Catfish. Quality (PSD-Q), preferred (PSD-P) and memorable (PSD-M) lengths. PSD values indicate the proportion of fish in or above the Quality, preferred or memorable size classes.

Year Surveyed	PSD-Q (16.1 in)	PSD-P (24 in)	PSD-M (28 in)
2006	31	3	.
2008	52	4	.
2015	53	8	1
2021	95	19	2
2024	60	10	1

Table 3. Mean Total Length at age (inches), and L infinity (estimated mean maximum length) for Channel Catfish from Konawa Lake.

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11	Age 12	L inf.
2021	11.4	15.5	17.3	19.4	15.9	21.7	20.0	21.8	22.2	24.6	.	29.3	26.0
2024	.	13.9	14.8	20.2	23.8	23.6	26.4	23.8	21.7	20.9	21.6	.	24.0

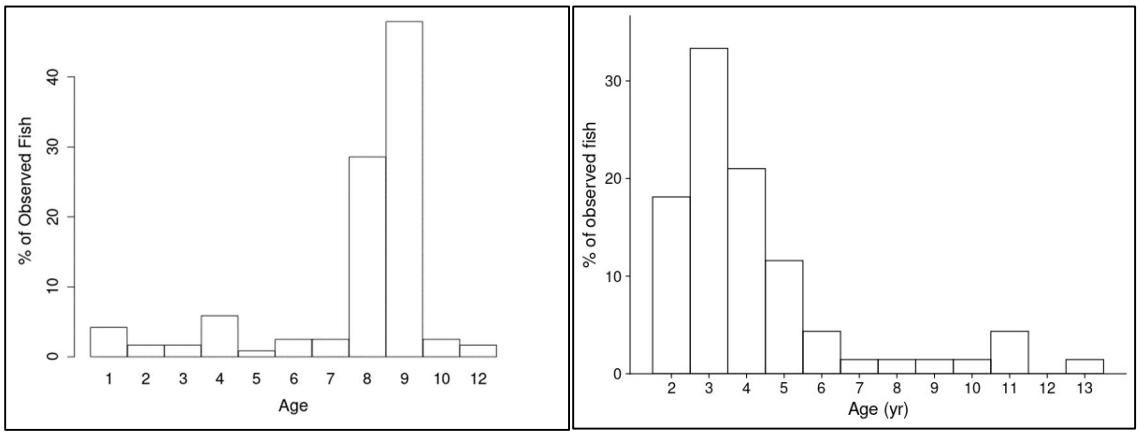


Figure 2. Age Frequency Histogram for Channel Catfish 2021 (Right) and 2024 (Left).

Hybrid Striped Bass

Hybrid striped bass were surveyed in 2024 using suspended gill nets. A total of ten stations were randomly sampled for a period of 24 hours each. The 2024 survey (CPUE = 0.3) indicated a slight increase from 2021 (CPUE = 0.2) but relative abundance remained low (Table 4). Only three Hybrid striped bass were collected during the survey. One was in the stock size class while the other two were in the quality size class. All three had excellent body conditions with relative weights above 100. The largest fish sampled in 2021 measured 17.1 (in) in total length and 2.7(lbs.) in weight.

Age data was collected all three fish surveyed in 2024. All three were aged to be one year old with a mean length of 17.1 inches (Table 4). However, sample size was to small to make reliable comparisons to past surveys. Additional age data was taken from Hybrid striped bass that were collected during a fish kill in the summer of 2023. A total of 10 were collected, though the kill contained an estimated 60 hybrid striped bass. Age data suggested all ten fish collected were from the 2017 stocking. They grew to a mean length of 23.2 inches by age six (Table 4).

Hybrid striped bass add an additional fishery to Konawa Lake but will also help to reduce numbers of large Gizzard Shad that aren't being utilized as forage because of their size. However, Hybrid striped bass will compete with Largemouth Bass for forage. Body condition and growth rates of both species should be monitored to make sound stocking decisions. Hybrid striped bass were last stocked in 2023 (Appendix 1). .

Table 3. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of Hybrid striped bass collected by fall gill netting from Konawa Lake. Acceptable Wr values are ≥90.

		Total CPUE	Stock 9.8 in		Quality 16.1 in		Preferred 20.1 in		Memorable 24 in		Trophy 28	
Year	No.	CPUE	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
2006	62	7.5	3.9	87	2.8	86	0.6	80	.	.	.	.
2008	108	12.1	7.2	96	9.3	94	1.2	84	.	.	.	.
2015	14	1.6	1.6	92	.	.	.	.	.	.	.	.
2021	2	0.2	.	.	.	.	0.2	84	.	.	.	.
2024	3	0.3	0.1	105	0.2	101	.	.	.	.	.	.

Table 4. Mean Total Length at age for Hybrid striped bass from Konawa Lake.

Year	Age 1	Age 2	Age 3	Age4	Age 5	Age 6	Age 7	Age 8	Age 9
2008	16.04	14.05	20.27	.	.	.	.	.	.
2015	15.2	.	.	.	.	.	.	.	.
2021	.	.	.	21.4	.	.	.	.	.
2023	.	.	.	.	.	23.2	.	.	.
2024	17.1	.	.	.	.	.	.	.	.

White Bass

White bass were surveyed in in 2024 using suspended gill nets. A total of ten stations were randomly sampled for a period of 24 hours each. Overall abundance had increased in 2024 (CPUE = 6.1) compared to 2021 (CPUE = 1.7) and was the highest since 2006 (Table 5). A total of 58 White Bass were collected with an increase in relative abundance for all size classes. The preferred size class had the highest abundance during the 2024 survey (CPUE = 2.7 Body conditions were considered excellent in all size classes.

The 2024 length frequency histogram (Figure 3) showed a balanced distribution of sizes. Age data was collected on a subset of the White Bass surveyed. White Bass at Konawa Lake grew to a mean length of 13.8 inches by age one, 14.6 inches by age two and 16.6 inches by age four (Table 6). The largest fish sampled in 2021 measured 18.9 (in) in total length and 3.3 (lbs.) in weight.

Table 5. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of White Bass collected by fall gill nets from Konawa Lake. Acceptable Wr values are ≥90.

		Total CPUE	Stock 5.9 in		Quality 9.1 in		Preferred 11.8 in		Memorable 15 in		Trophy 18.1 in	
Year	**No.**	**CPUE**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**
2006	145	17.7	3.6	88	0.9	91	12.9	88	0.23	94	.	.
2008	54	5.9	.	.	2.2	100	3.8	99	.	.	.	.
2015	44	4.9	.	.	0.56	95	4.3	94	.	.	.	.
2021	17	1.7	.	.	.	.	1.7	115	.		.	.
2024	58	6.1	1.3	92	1.6	100	2.7	101	0.4	107	0.1	101

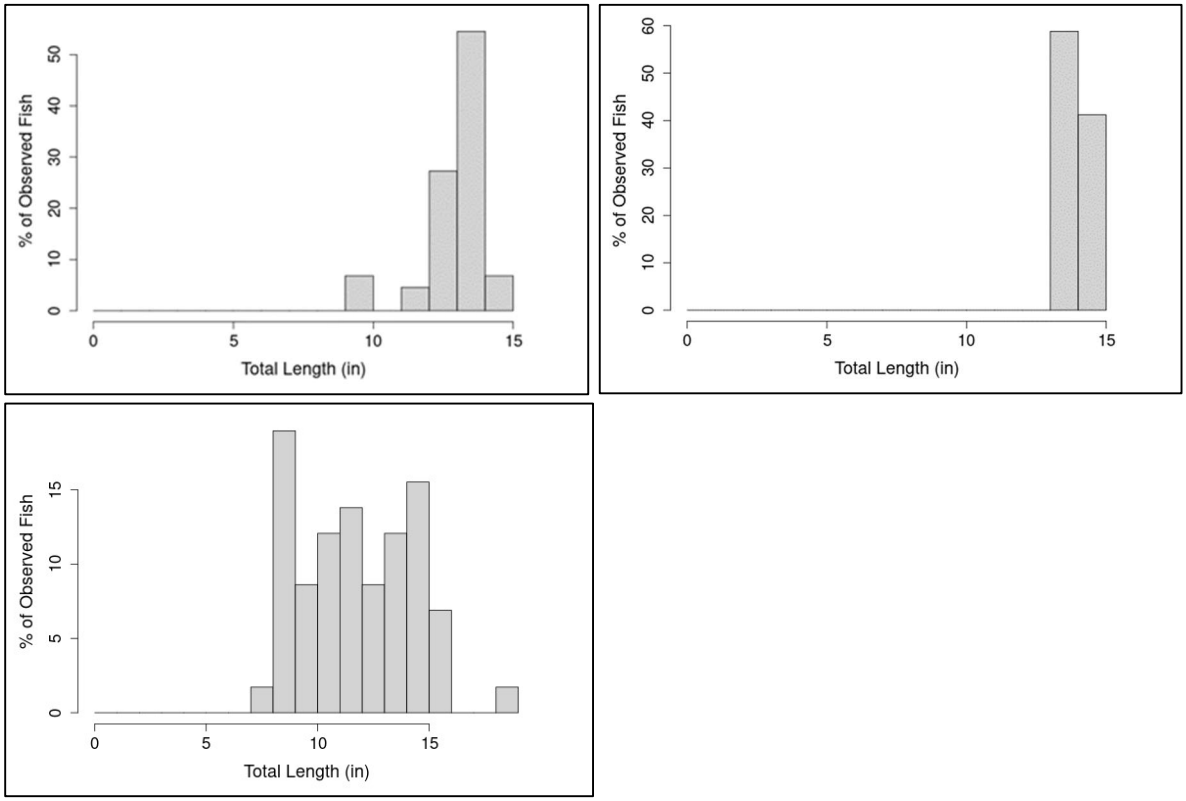


Figure 3. White Bass Gill Net Length Frequency Histograms for 2015 (Top Left), 2021 (Top Right), and 2024 (Lower Left).

Table 6. Mean Total Length at age (inches) and L infinity (estimated mean maximum length) for White Bass from Konawa Lake.

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8
2024	13.8	14.6	.	16.6	.	.	.	.

Crappie

Crappie were surveyed in 2024 using suspended gill nets. A total of ten stations were randomly sampled for a period of 24 hours each. Gill net surveys indicated a low abundance of Crappie in Konawa Lake. Only four Crappie were collected in the 2024 survey. The largest fish collected was 13.5 (in) in total length and 1.5 (lbs.) in weight. Sample size was too small analyze size structures and age data.

Shad

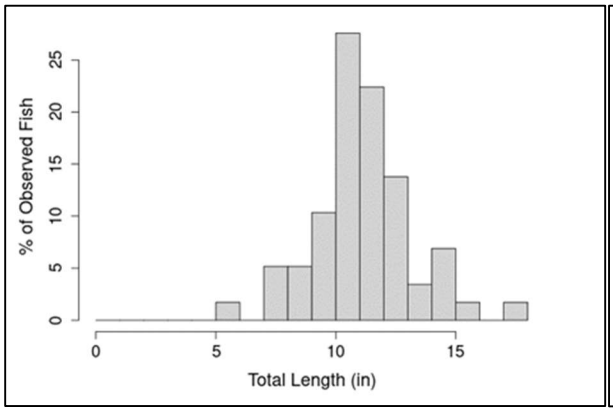
Gizzard and Threadfin Shad were sampled by suspended gill nets and by floating shad nets in 2024. A total of 10 suspended gill nets and 18 floating shad nets were fished for a total of 24 hours each, in randomly selected locations. Abundance of Gizzard and Threadfin Shad varied by gear type. Both Threadfin (CPUE = 35.4) and Gizzard Shad (CPUE = 21.8) abundance increased significantly during the floating shad net survey in 2024 compared to the previous survey. Gizzard Shad abundance (CPUE = 12.3) also increased significantly in the gill net survey (Table 7).

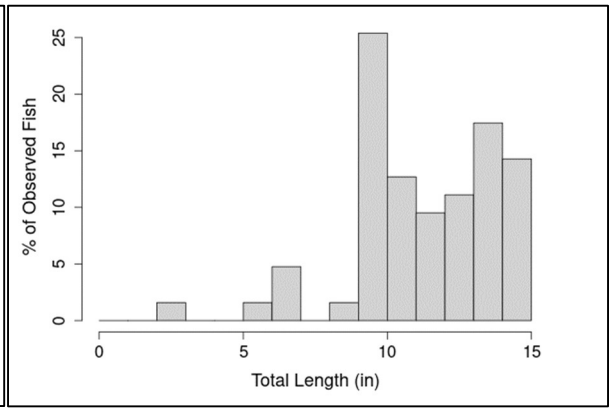
Gizzard Shad length frequency histograms for suspended gill nets in 2024 (Figure 4) shows that more than half of the gizzard shad sampled were larger than six inches in length. While nearly all the Gizzard Shad from the floating nets were less than six inches in length (Figure 5). Threadfin shad rarely exceed 6 inches in length and remain at optimal forage size ($\leq$6 inches) for Largemouth Bass.

Threadfin Shad are one of the main forage species for sport fish in Konawa Lake. They cannot tolerate water temperatures below the low 50's. With reduced power generation water temperatures are likely to stay cooler for longer periods; in return Threadfin shad abundance will decrease. Productivity for the entire system relies on the warmer temperatures created from power generation. Continued monitoring of shad abundance is necessary for stocking recommendations of Largemouth Bass and Hybrid striped bass.

Table 7. Total number (No.) and catch per unit of effort (CPUE) by size groups of Gizzard and Threadfin Shad collected by fall shad netting and gill netting from Konawa Lake.

Shad Net							Gill Net					
Gizzard					Threadfin		Gizzard				Threadfin	
Year	No.	Total CPUE	<6 inches	≥ 6 Inches	No.	Total CPUE	No.	Total CPUE	<6 inches	≥6 inches	No.	Total CPUE
2006							250	30.2	13.7	16.5	543	65.3
2008							100	11.0	0.6	10.5	16	1.8
2010	.	.	.	.	65	11.1						
2014	44	4.6	4.4	0.2	325	33.9						
2015	2	0.2	0.2	.	274	27.4	58	6.5	0.11	6.37	9	1.0
2017	2	0.2	0.2	.	96	10.7						
2019	104	7.4	7.4	.	402	28.8						
2021	40	2.5	2.3	0.1	170	10.3	63	6.0	0.2	5.8	3	0.3
2024	373	21.8	21.7	0.1	615	35.4	118	12.3	2.8	9.5	.	.





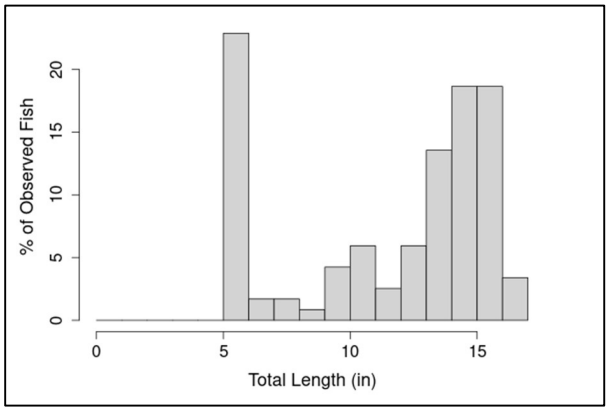


Figure 4. Gizzard Shad Length Frequency Histograms from suspended gill nets 2015 (Top Left), 2021 (Top Right), and 2024 (Lower Left).

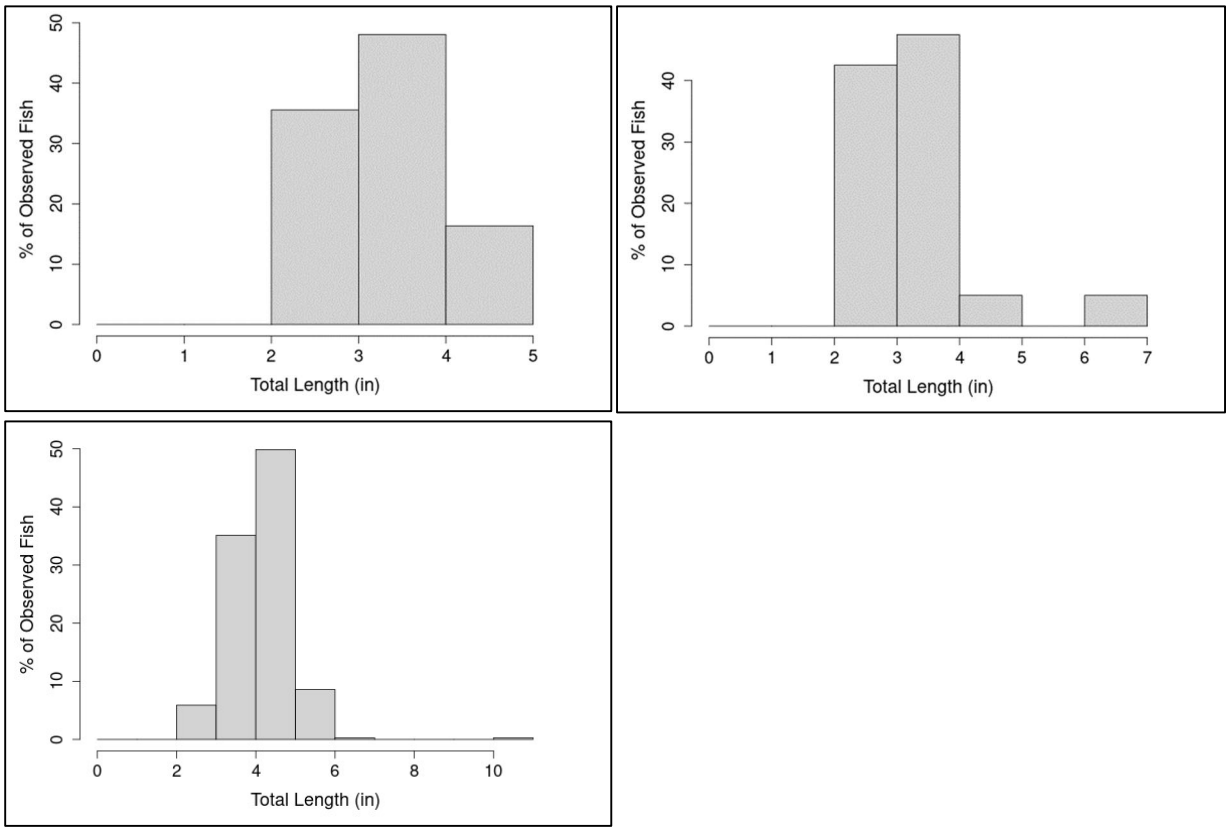


Figure 5. Gizzard Shad Length Frequency Histograms from floating shad nets 2019 (Top Left), 2021 (Top Right), and 2024 (Lower Left).

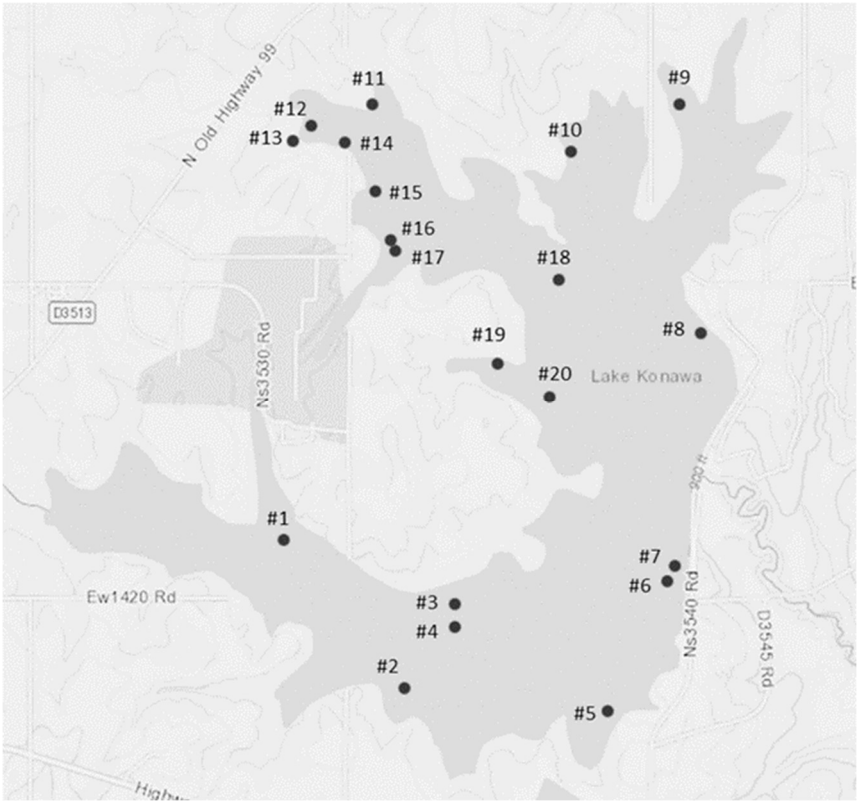
Recommendations

1. Maintain periodic electrofishing surveys to monitor size structure, growth rates, body conditions and recruitment of Largemouth Bass.
2. Continue Shad net surveys every few years to monitor Threadfin and Gizzard Shad abundance.
3. Monitor water temperatures to assess potential for Threadfin shad die off.

Appendix 1. Species, number, and size of fish stocked in Konawa Lake since 2000.

Date	Species	Number	Size (inches)
2000	Florida Largemouth Bass	27,400	2.75
	Hybrid Striped Bass	15,000	2
2001	Florida Largemouth Bass	27,405	3
	Hybrid Striped Bass	13,805	1.25
2002	Hybrid Striped Bass	15,000	1.5
2003	Florida Largemouth Bass	27,040	3
	Hybrid Striped Bass	15,625	1.3
2004	Hybrid Striped Bass	14,400	1.5
2005	Florida Largemouth Bass	26,560	3
	Blue Catfish	6.336	5
	Hybrid Striped Bass	14,620	1.5
2007	Hybrid Striped Bass	13,950	1.5
2014	Hybrid Striped Bass	9,100	1.5
	Hybrid Striped Bass	4,900	1.75
2017	Hybrid Striped Bass	15,050	1.5
2023	Hybrid Striped Bass	18,150	1.5

Appendix 2. Konawa Lake Fish Attractor Locations.



Fish Attractor Site Information for Konawa Lak

Area Name	Site #	Latitude	Longitude	Habitat Type	Marked	Bank Access	Date
Intake	1	34.9587	-96.7258	Spider Blocks	Yes	No	6/16/2010
S. Bank Across from S. Island	2	34.9519	-96.719	Spider Blocks	Yes	No	2/20/2012
W. of S. Island	3	34.9557	-96.7162	Spider Blocks	Yes	No	4/9/2008
S. point of S. Island	4	34.9547	-96.7161	Spider Blocks	Yes	No	6/15/2010
S. Bank W. of SE. Ramp	5	34.9508	-96.7075	Spider Blocks	Yes	No	6/15/2010
Between S. End of Dam & SE. Ramp	6	34.9568	-96.7043	Spider Blocks	Yes	Yes	6/15/2010
S. End of Dam	7	34.9575	-96.7038	Spider Blocks	Yes	Yes	4/30/2009
SE. of Swim Beach	8	34.9683	-96.7023	Spider Blocks	Yes	Yes	6/15/2010
Cove N. of NE. Ramp	9	34.9788	-96.7035	Spider Blocks	Yes	No	4/30/2009
Hump in Middle of N. Cove	10	34.9766	-96.7097	Spider Blocks	Yes	No	4/9/2008
Rock Corner on N. Back from Discharge	11	34.9788	-96.7208	Spider Blocks	Yes	No	4/30/2009
NW. of Discharge	12	34.9778	-96.7243	Spider Blocks	Yes	No	6/15/2010
NW. of Discharge in Cove	13	34.9771	-96.7252	Spider Blocks	Yes	Yes	6/15/2010
Old Road Bed NW. of Discharge	14	34.977	-96.7224	Spider Blocks	Yes	Yes	4/9/2008
Old Foundation N. of Discharge	15	34.9748	-96.7206	Spider Blocks	Yes	Yes	4/9/2008
Mouth of Discharge	16	34.9725	-96.7198	Spider Blocks	Yes	No	2/20/2012
Mouth of Discharge	17	34.9721	-96.7195	Spider Blocks	Yes	No	4/30/2009
Old Road Bed	18	34.9707	-96.7103	Spider Blocks	Yes	No	2/20/2012
E.-W. Cove E. of Plant	19	34.9668	-96.7138	Spider Blocks	Yes	No	6/15/2010
Mid Lake W. Bank	20	34.9652	-96.7108	Spider Blocks	Yes	No	2/20/2012