

**SURVEY REPORT**

**OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION**



**FISH MANAGEMENT SURVEY AND RECOMMENDATIONS**

**FOR**

**KONAWA LAKE**

**2022**

## **SURVEY REPORT**

**State:** Oklahoma

**Project Title:** Konawa Lake Fish Management Survey Report

**Period Covered:** 2021-2022

**Prepared by:** Michael Hollie

**Date Prepared:** January 23<sup>rd</sup>, 2024

### **Konawa Lake**

#### **ABSTRACT**

Konawa Lake was surveyed by fall suspended gill nets (2021), fall floating shad nets (2021), and spring electrofishing (2022) surveys to monitor trends in the fish populations. Relative abundance of Largemouth Bass decreased, however, growth rates, body conditions, and size structure increased. Abundance also decreased for Channel Catfish, Hybrid striped bass, White Bass, Threadfin and Gizzard Shad. 18,150 Hybrid striped bass were stocked in 2023. Monitoring of Largemouth Bass, White Bass, Hybrid striped bass and Shad population dynamics will continue.

## 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.

Striped bass x white bass hybrids have been stocked annually since 1988; however, in recent years stockings have been reduced to every few years, with the purpose of reducing competition for forage in order to maintain growth rates of Largemouth Bass and Hybrid striped bass. 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 1<sup>st</sup>, 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

### Largemouth Bass

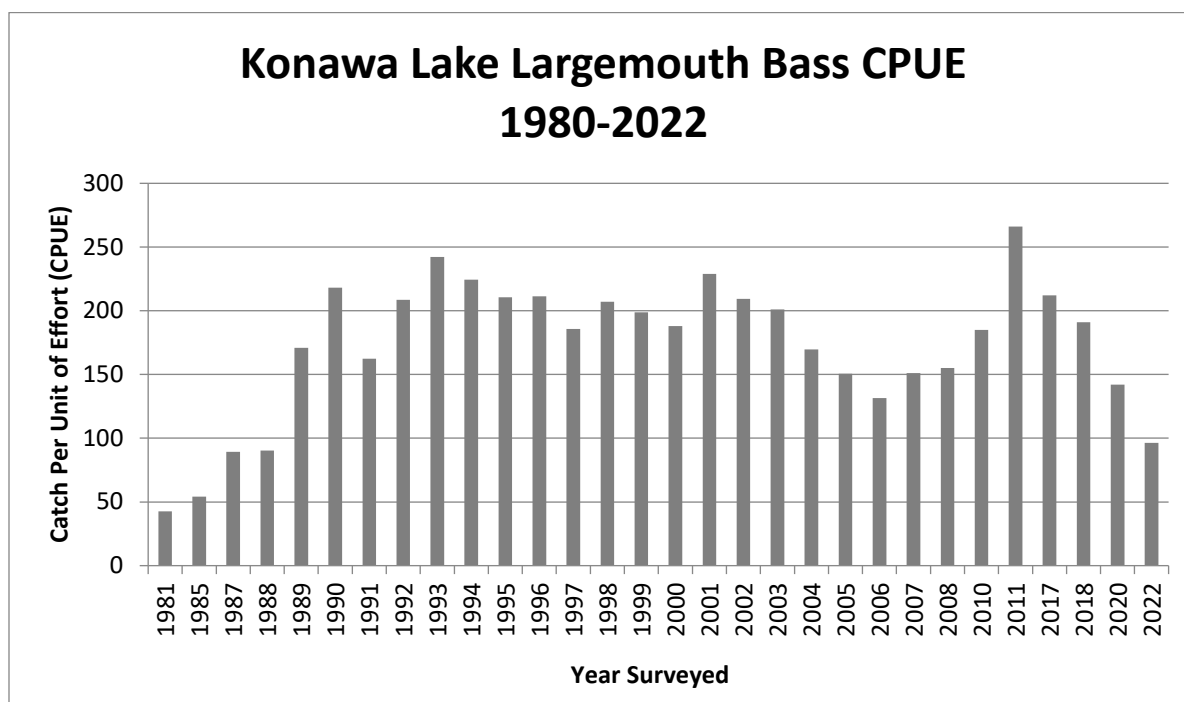
Largemouth Bass (LMB) were surveyed in spring of 2022 by means of boat electrofishing. A total of 14 Randomly selected shoreline units were sampled. LMB abundance decreased in 2022 (CPUE = 96.4) compared to the last survey in 2020 (CPUE = 142.0) but still considered to be a “High Quality” fishery (Figure 1). All size classes had decreased in abundance except for quality (CPUE = 28.7) and memorable (CPUE = 6.9) size fish (Table 1). Abundance of fish greater than 21 inches also increased in 2022 (CPUE = 4.3) compared to 2020 (CPUE = 3.7). The 2022 length frequency histogram (Figure 2) along with catch rates for substock size fish indicates poor recruitment from the 2021-year class. Less than 1% of the fish surveyed were eight inches or less (Figure 2). It is important to note that electrofishing systems switched from Smith-Roots to an ETS System in 2022. The two systems differ in design and possibly efficiency. The 2022 results should be viewed as an estimate and not directly comparable to the 2020 survey. Future surveys will be comparable with the 2022 survey.

Body condition or relative weights (Wr) were considered excellent and had increased in all size classes in 2022 compared to 2020 except for stock size fish, where no change occurred (Table 1). The largest fish sampled during the 2022 survey was measured at 23.5 (in) in total length and 7.3 (lbs.) in weight.

Proportional size distribution (PSD) values increased in all size classes, indicating an increase in the proportion of larger size fish (Table 2). However, quality (PSD-Q = 97) and preferred (PSD-P = 67) sizes increased to levels higher than desired, indicating an unbalanced population. While high PSD values indicate higher proportion of large fish, too high may indicate poor recruitment with too few fish in the smaller size classes.

Age data was collected on a subset of Largemouth Bass from the 2022 survey. Growth was considered moderate, taking approximately three years to reach a mean length of 15 inches and 18.7 inches by age six, a slight increase compared to 2020. Then slows greatly between ages six and seven (roughly 18 inches) (Table 3). The Von Bertalanffy growth curve (Figure 3) gives a visual representation of LMB growth for Konawa Lake and shows a slight increase compared to 2020. A slight increase in the L infinity (estimated mean maximum length) was also observed in 2022 (L inf. = 18.8 in) compared to 2020 (L inf. = 18.5 in) (Table 3). The 2022 age frequency indicated poor recruitment occurred from the 2021-year class with Less than 3% of the LMB sampled were age one (Figure 4). Florida largemouth bass genetic samples were collected in 2022, analysis is still in progress.

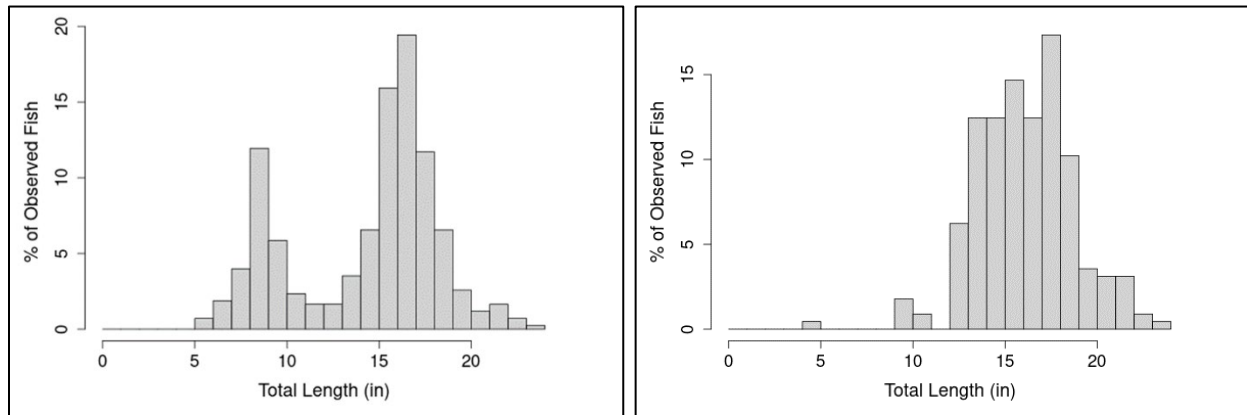
With the decrease in Largemouth Bass abundance, body conditions, growth rates, size structure and overall estimated mean maximum growth increased. While Konawa Lake continues to see a decrease in LMB numbers, it still has a high abundance and is considered a “High Quality” fishery. Poor recruitment continues to be a concern for Konawa Lake. Low recruitment for a short time can be good, reducing abundance, reducing competition for forage, and increase growth potential. However, recruitment needs to be monitored. Statewide LMB 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. Konawa Lake removed the special regulations and adopted the new statewide regulation.



**Figure 1.** Catch Per Unit of Effort (CPUE) for Largemouth Bass 1980-2022.

**Table 1.** Total number (No.), catch per unit of effort (CPUE), and relative weights ( $W_r$ ) by size groups of Largemouth Bass collected by spring electrofishing from Konawa Lake. Acceptable  $W_r$  values are  $\geq 90$ .

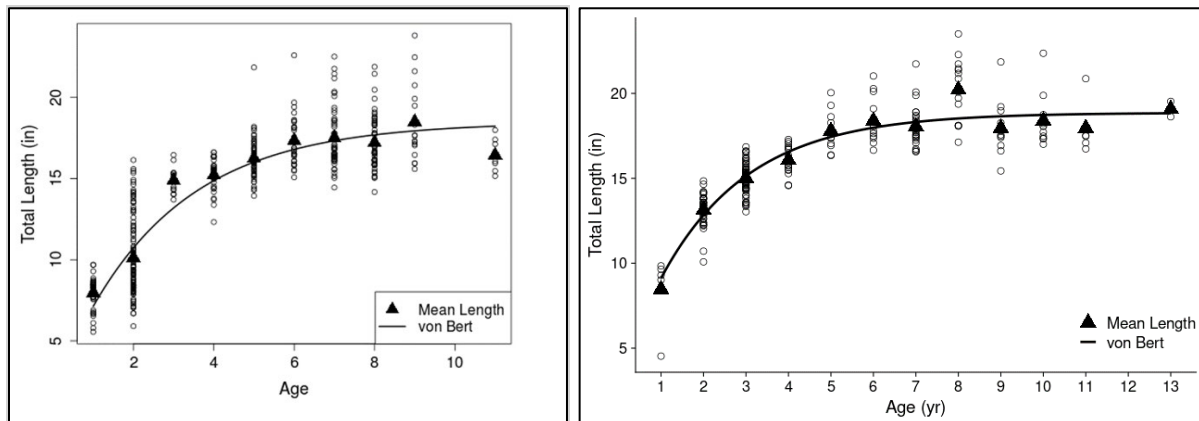
		Total CPUE	<u>Substock</u> 0-7.8 in	<u>Stock</u> 7.9 in		<u>Quality</u> 11.8 in		<u>Preferred</u> 15 in		<u>Memorable</u> 20.1 in		<u>≥21 in</u>	
Year	No.	CPUE	CPUE	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
<u>2010</u>	836	185.8	18.2	17.8	103	77.3	98	69.8	92	2.7	95	2.2	99
<u>2011</u>	1198	266.2	26.7	39.5	104	116.2	90	79.6	86	3.8	84	3.6	.
<u>2017</u>	638	212.7	3.3	6.7	100	62.3	97	132.3	90	7.3	95	5.0	93
<u>2018</u>	573	191	2.7	5.0	92	47.0	92	129.3	87	7.0	94	4.9	98
<u>2020</u>	427	142	8.0	31.3	99	16.7	101	81.0	91	5.3	88	3.7	90
<u>2022</u>	225	96.4	0.4	2.6	99	28.7	102	57.9	95	6.9	91	4.3	95



**Figure 2.** 2020 (left) and 2022 (right) Largemouth Bass Length Frequency Histograms for Konawa Lake.

**Table 2.** Proportional Size Distribution (PSD) of Largemouth Bass. 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. Values in parentheses indicated the desired proportion for trophy bass management.

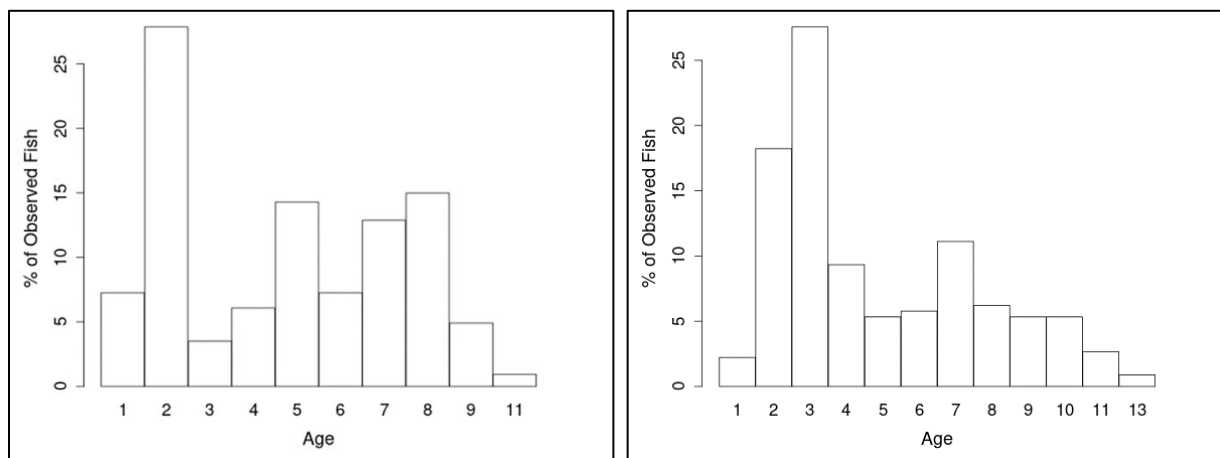
<u>Year Surveyed</u>	<u>PSD-Q</u> <u>(50-80)</u>	<u>PSD-P</u> <u>(30-60)</u>	<u>PSD-M</u> <u>(10-25)</u>
<b>2010</b>	89	43	2
<b>2011</b>	83	35	2
<b>2017</b>	97	67	4
<b>2018</b>	97	72	4
<b>2020</b>	77	64	4
<b>2022</b>	97	67	7



**Figure 3.** 2020 (left) and 2022 (right) Largemouth Bass Mean Length at Age: Von Bert Estimated Growth Curve. The Von Bert Growth Curve indicates the estimated growth rate of Largemouth Bass.

**Table 3.** Mean Total Length at age (inches) and L infinity (estimated mean maximum length) for Largemouth Bass from Konawa Lake.

<u>Year</u>	<u>Age 1</u>	<u>Age 2</u>	<u>Age 3</u>	<u>Age 4</u>	<u>Age 5</u>	<u>Age 6</u>	<u>Age 7</u>	<u>Age 8</u>	<u>Age 9</u>	<u>Age 10</u>	<u>L inf.</u>
<b>2010</b>	7.7	12.7	14.4	15.5	15.8	17.4	17.5	18.7	.	.	17.0
<b>2017</b>	7.4	12.6	14.1	15.1	16	16.3	17.5	17.1	20.1	17	17.7
<b>2020</b>	8.0	10.1	14.9	15.2	16.2	17.3	17.5	17.2	18.5	.	18.5
<b>2022</b>	8.3	13.1	15.0	16.0	17.7	18.7	18.1	19.6	17.7	19.3	18.8



**Figure 4.** 2020 (left) and 2022 (right) Age Frequency of Largemouth Bass.

### **Channel Catfish**

Channel Catfish were surveyed in 2021 using suspended gill nets. A total of ten stations were randomly sampled for a period of 24 hours each. Relative abundance decreased slightly in 2022 (CPUE = 11.3) compared to 2020 (CPUE = 12.9) but remained high (Table 5). Body conditions increased in all size classes but remained below acceptable conditions for both stock and quality size fish. Length frequency histograms (Figure 5) and proportional size distribution (PSD) values (Table 5) showed an increase in overall size structure. PSD values increased significantly in both PSD-Q = 95 and PSD -P=19, indicating an increase in the proportion of larger fish. However, Values too high may indicate poor recruitment with too few fish in the smaller size classes.

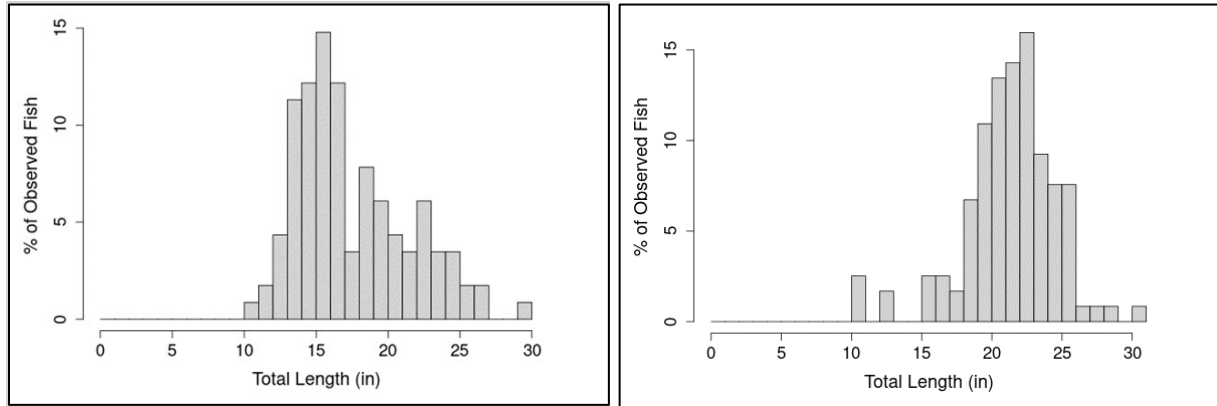
Age data was collected on a subset of Channel Catfish in 2021. Growth rates were moderate. Channel Catfish at Konawa Lake grew to a mean length of 11.4 inches by age one, 19.4 inches by age four and 21.7 inches by age six (Table 7). The largest fish sampled measured 30.8 (in) in total length and weighed 13.1 (lbs.) in weight. The oldest Channel Catfish was aged at twelve years old.

The 2021 age frequency indicates poor recruitment, with few age one fish surveyed. A strong 2012 (age 9) and 2013 (age 8) year classes were observed (Figure 6). Channel Catfish in Konawa Lake are naturally reproducing and considered a self-sustaining population. No stockings are recommended.

**Table 4.** 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  $\geq 90$ .

	<u>Total</u> CPUE	<u>Stock</u> 11 in	<u>Quality</u> 16.1 in	<u>Preferred</u> 24 in	<u>Memorable</u> 28 in	<u>Trophy</u> 35.8 in
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<u>Year</u>	<u>No.</u>	<u>CPUE</u>	<u>CPUE</u>	<u>Wr</u>	<u>CPUE</u>	<u>Wr</u>	<u>CPUE</u>	<u>Wr</u>	<u>CPUE</u>	<u>Wr</u>	<u>CPUE</u>	<u>Wr</u>
<b>2006</b>	114	13.7	9.5	81	3.9	88	0.4	110	.	.	.	.
<b>2008</b>	199	22.0	6.7	84	6.9	83	0.6	95	.	.	.	.
<b>2015</b>	115	12.9	6.1	79	5.7	83	0.9	90	0.11	98	.	.
<b>2021</b>	119	11.3	0.6	83	8.3	87	1.9	90	0.2	120	.	.



**Figure 5.** Channel Catfish Gill Net Length Frequency Histogram 2015 (left) and 2021 (right).

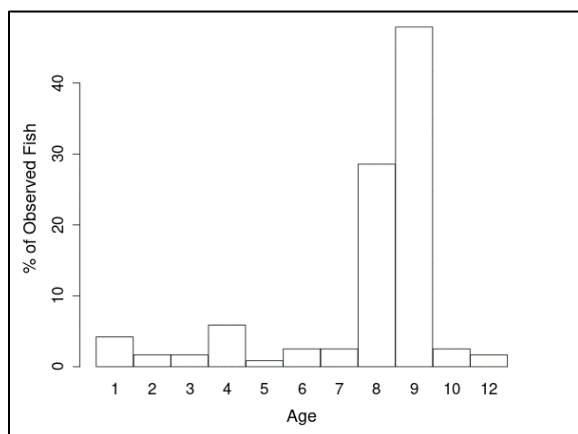
**Table 5.** Proportional Size Distribution (PSD) of Channel Catfish. Quality (PSD-Q), preferred (PSD-P) and memorable (PSD-M) lengths. PSD values indicate the proportion of fish in or above the Quality, preferred or memorable size classes.

<u>Year Surveyed</u>	<u>PSD-Q</u> <u>(16.1 in)</u>	<u>PSD-P</u> <u>(24 in)</u>	<u>PSD-M</u> <u>(28 in)</u>
<b>2006</b>	31	3	.
<b>2008</b>	52	4	.
<b>2015</b>	53	8	1
<b>2021</b>	95	19	2

**Table 6.** Mean Total Length at age (inches), and L infinity (estimated mean maximum length) for Channel Catfish from Konawa Lake.

<u>Year</u>	<u>Age</u> <u>1</u>	<u>Age</u> <u>2</u>	<u>Age</u> <u>3</u>	<u>Age</u> <u>4</u>	<u>Age</u> <u>5</u>	<u>Age</u> <u>6</u>	<u>Age</u> <u>7</u>	<u>Age</u> <u>8</u>	<u>Age</u> <u>9</u>	<u>Age</u> <u>10</u>	<u>Age</u> <u>11</u>	<u>Age</u> <u>12</u>	<u>L inf.</u>
<b>2021</b>	11.4	15.5	17.3	19.4	15.9	21.7	20.0	21.8	22.2	24.6	.	29.3	26.0





**Figure 6.** 2021 Age Frequency Histogram for Channel Catfish.

### **Hybrid Striped Bass**

Hybrid striped bass were surveyed in 2021 using suspended gill nets. A total of ten stations were randomly sampled for a period of 24 hours each. The 2021 survey indicated a decrease from 2015 (CPUE = 1.6) to a low abundance in 2021 (CPUE = 0.2) (Table 7). Only two Hybrid striped bass were collected during the 2021 survey. Both were in the preferred size class, and both had body conditions below ( $Wr = 84$ ) acceptable values. The largest fish sampled in 2021 measured 21.9 (in) in total length and 4.9 (lbs.) in weight.

Age data was collected on both fish surveyed in 2021. Both fish were aged to be four years old and were 21 inches in length (Table 8). However, sample size was too 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. Data is still in processing.

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). Hybrid striped bass surveys are planned for fall of 2024. Future stocking decisions will be made based on data from the 2024 survey.

**Table 7.** 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  $\geq 90$ .

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

**Table 8.** Mean Total Length at age for Hybrid striped bass from Konawa Lake.

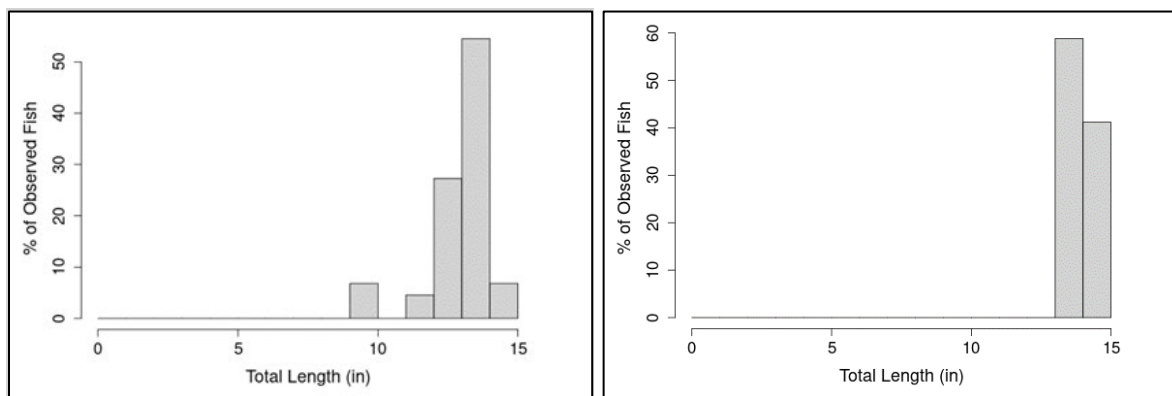
Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9
<u>2008</u>	16.04	14.05	20.27	.	.	.	.	.	.
<u>2015</u>	15.2	.	.	.	.	.	.	.	.
<u>2021</u>	.	.	.	21.4	.	.	.	.	.
<u>2023</u>	TBD								

### White Bass

White bass were surveyed in in 2021 using suspended gill nets. A total of ten stations were randomly sampled for a period of 24 hours each. Overall abundance had decreased and was considered low in 2021 (CPUE = 1.7) (Table 9). A total of 17 White Bass were collected and all were in the preferred size class at 13 and 14 inches in length (Figure 7). Body conditions were considered excellent (Wr = 115), an increase compared to 2015 (Wr = 94). Age data was collected on all 17 White Bass surveyed. All were aged to be one year old with a mean length of 13.9 inches. The largest fish sampled in 2021 measured 14.5 (in) in total length and 1.8 (lbs.) in weight.

**Table 9.** 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  $\geq 90$ .

		Total CPUE	<u>Stock</u> 5.9 in		<u>Quality</u> 9.1 in		<u>Preferred</u> 11.8 in		<u>Memorable</u> 15 in		<u>Trophy</u> 18.1 in	
Year	No.	CPUE	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
<u>2006</u>	145	17.7	3.6	88	0.9	91	12.9	88	0.23	94	.	.
<u>2008</u>	54	5.9	.	.	2.2	100	3.8	99	.	.	.	.
<u>2015</u>	44	4.9	.	.	0.56	95	4.3	94	.	.	.	.
<u>2021</u>	17	1.7	.	.	.	.	1.7	115	.	.	.	.



**Figure 7.** White Bass Gill Net Length Frequency Histograms for 2015 (left) and 2021 (right).

### **Crappie**

Crappie were surveyed in 2021 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 2021 survey. The largest fish collected was 7.5 (in) in total length and 0.21 (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 2021. A total of 10 suspended gill nets and 17 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 and Gizzard Shad abundance decreased for both species and gear types in 2021 compared to the previous surveys in 2019 and 2015. While Relative abundance decreased, abundance was still considered acceptable for total shad for each gear type in 2021. Relative abundance of Gizzard Shad from the 2021 gill net was (CPUE = 6.0), and from the floating shad nets was (CPUE = 2.5). Threadfin Shad abundance from the gill nets was (CPUE = 0.3), and from the floating shad nets was (CPUE = 10.3) (Table 10).

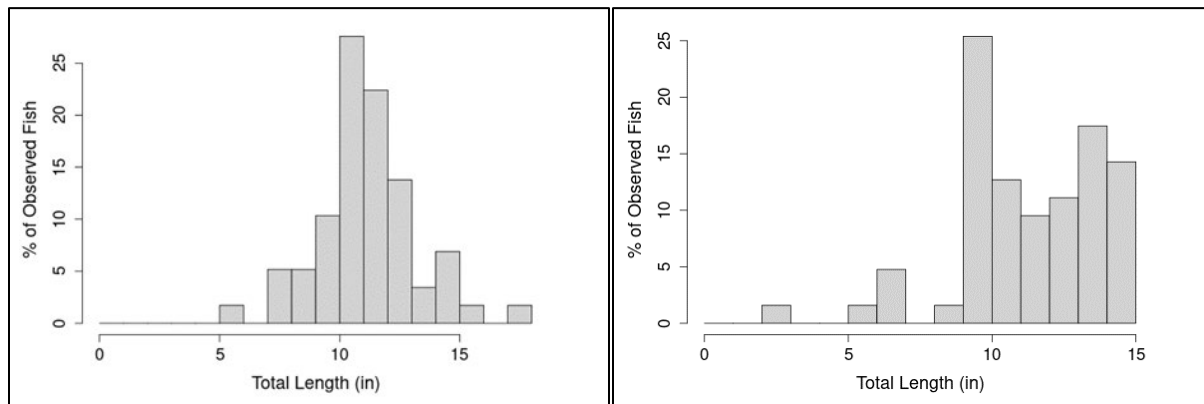
Gizzard Shad length frequency histograms for suspended gill nets in 2021 (Figure 8) show that nearly 92% of the gizzard shad sampled were larger than six inches in length. While all the Gizzard Shad from the floating nets were less than six inches in length (Figure 9). Threadfin shad rarely exceed 6 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.

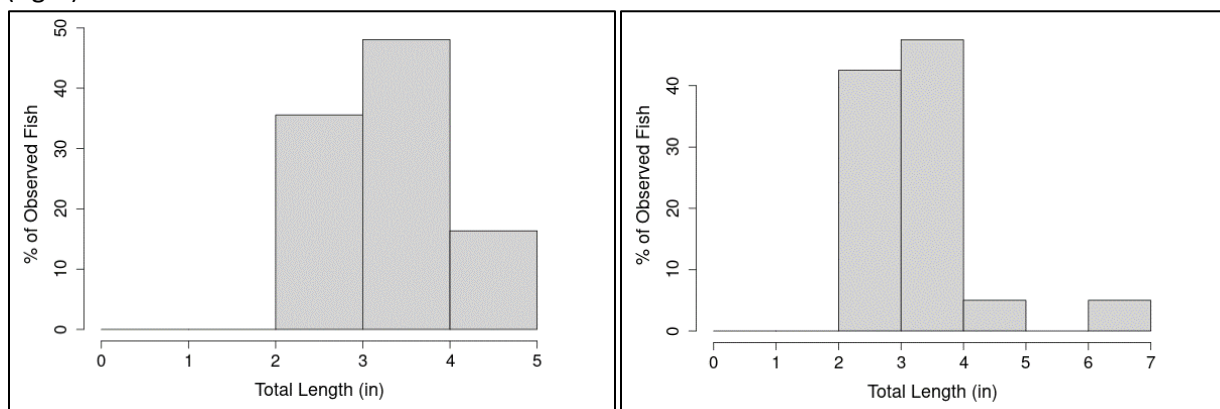
**Table 10.** Total number (No.) and catch per unit of effort (CPUE) by size groups of Gizzard and Threadfin

Shad collected by fall shad netting and gill netting from Konawa Lake.

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



**Figure 8.** Gizzard Shad Length Frequency Histograms from suspended gill nets 2015 (left) and 2021 (right).



**Figure 9.** Gizzard Shad Length Frequency Histograms from floating shad nets 2019 (left) and 2021 (right)

### **Recommendations**

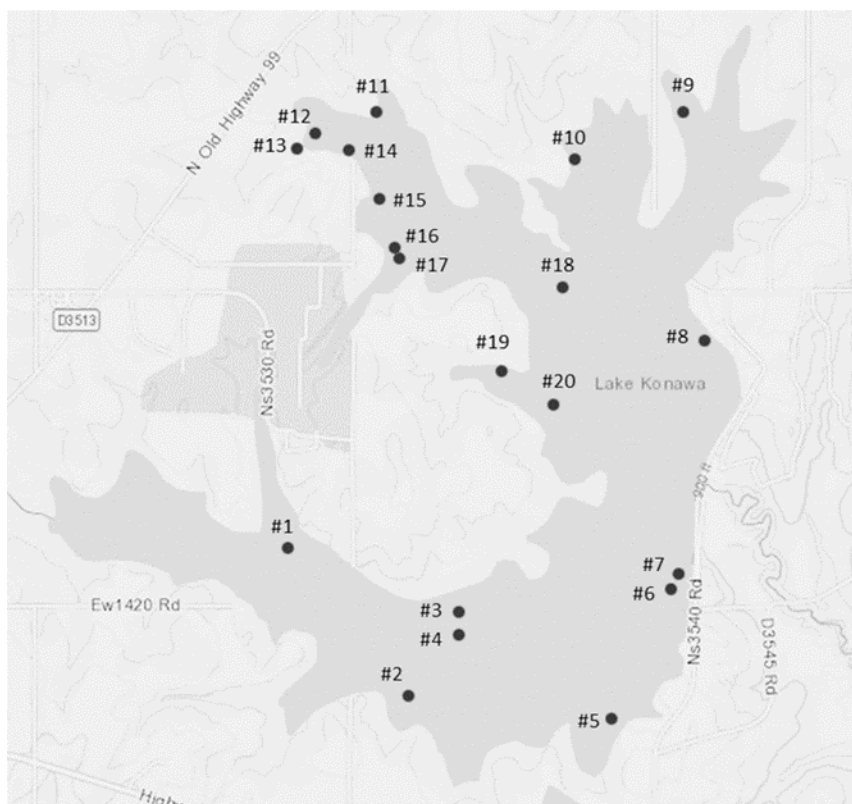
1. Maintain periodic electrofishing surveys to monitor size structure, growth rates, body conditions and recruitment of Largemouth Bass.
2. Evaluate Hybrid Striped Bass body condition and growth rates in 2024 gill net survey.
3. Continue Shad net surveys every few years to monitor Threadfin and Gizzard Shad abundance.
4. 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)
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<b>2000</b>	<b>Florida Largemouth Bass</b>	<b>27,400</b>	<b>2.75</b>
	<b>Hybrid Striped Bass</b>	<b>15,000</b>	<b>2</b>
<b>2001</b>	<b>Florida Largemouth Bass</b>	<b>27,405</b>	<b>3</b>
	<b>Hybrid Striped Bass</b>	<b>13,805</b>	<b>1.25</b>
<b>2002</b>	<b>Hybrid Striped Bass</b>	<b>15,000</b>	<b>1.5</b>
<b>2003</b>	<b>Florida Largemouth Bass</b>	<b>27,040</b>	<b>3</b>
	<b>Hybrid Striped Bass</b>	<b>15,625</b>	<b>1.3</b>
<b>2004</b>	<b>Hybrid Striped Bass</b>	<b>14,400</b>	<b>1.5</b>
<b>2005</b>	<b>Florida Largemouth Bass</b>	<b>26,560</b>	<b>3</b>
	<b>Blue Catfish</b>	<b>6,336</b>	<b>5</b>
	<b>Hybrid Striped Bass</b>	<b>14,620</b>	<b>1.5</b>
<b>2007</b>	<b>Hybrid Striped Bass</b>	<b>13,950</b>	<b>1.5</b>
<b>2014</b>	<b>Hybrid Striped Bass</b>	<b>9,100</b>	<b>1.5</b>
	<b>Hybrid Striped Bass</b>	<b>4,900</b>	<b>1.75</b>
<b>2017</b>	<b>Hybrid Striped Bass</b>	<b>15,050</b>	<b>1.5</b>
<b>2023</b>	<b>Hybrid Striped Bass</b>	<b>18,150</b>	<b>1.5</b>

**Appendix 2.** Konawa Lake Fish Attractor Locations.



Fish Attractor Site Information for Konawa Lake

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



