SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

OKMULGEE LAKE

2024

SURVEY REPORT

State: Oklahoma

Project Title: Okmulgee Lake Fish Management Survey Report

Period Covered: Changes in ODWC standard reporting occurred since the 2007 Survey Report. This report discusses survey results from 2007-2024.

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Okmulgee Lake

ABSTRACT

Okmulgee Lake was surveyed by spring electrofishing (2015, 2019), fall gill netting (2007, 2015, 2019, 2024), and fall trap netting (2024) techniques to monitor trends in fish populations. Largemouth Bass abundance decreased, and recruitment was lower than desired, while relative weights and size structure increased. Channel Catfish, White Bass, and Crappie abundance remain low. Crappie Growth rates were moderate reaching a mean length of 10.2 inches by age three. Channel Catfish recruitment remains low. Continued monitoring of the Channel Catfish spawning success and Crappie population dynamics is recommended.

Introduction

Okmulgee Lake impounds Salt Creek 5 miles west of Okmulgee in Okmulgee County, Oklahoma. Okmulgee Lake covers 668 surface acres and was constructed in 1928 by the City of Okmulgee. Okmulgee Lake has a mean depth of 17.5 feet and a maximum of 70 foot, a shoreline development ratio of 5.4, and a secchi disc visibility of around 60 inches in the main pool in August; turbidity is primarily from plankton. Fish habitat types range from steep rocky shoreline to gently sloping mud flats with abundant aquatic vegetation.

Previous surveys have indicated an increasing abundance of Largemouth Bass with an improvement in the population size structure. More recent studies continue to show improvement in Largemouth Bass size structure, however, abundance has decreased but remained as a quality fishery. These surveys generally indicated fairly abundant populations of Spotted Bass, and sunfish; while Channel Catfish, Crappie and White Bass were present in low numbers.

Recent fish stocking activities have included stocking of Channel Catfish fingerlings and Florida largemouth bass (Appendix 1). A boating access project consisting of a fishing dock was constructed in 2000, and 3 boat docks with ADA parking was constructed in 2017 and are currently under a cooperative agreement. Fish attractor habitat (cedar trees) was installed in three sites in 1984. These sites have been refurbished periodically to increase angler fishing success. In 2006, these fish attractor sites were refurbished with spider blocks. Over the years additional sites have been added and some dropped. Currently a total of seven fish attractor sites are maintained and were refurbished in 2022 and 2024 with a combination of spider blocks, cedar trees, and Shelbyville cubes (Appendix 2). Other fish management activities have included the installation of catfish spawning structures, and the use of length limits to improve bass population size structure. In 2001 a slot limit of 13-16 inches was enacted. In 2022 the black bass regulations changed for simplicity to follow new statewide regulations, harvest limit of six Largemouth Bass of which only one may be larger than 16 inches. There is no longer a minimum length limit.

Okmulgee Lake was surveyed by spring electrofishing (2015, 2019), fall gill netting (2007, 2015, 2019, 2024), and fall trap netting (2024), techniques to monitor trends in fish populations.

RESULTS

Largemouth Bass

Largemouth Bass (LMB) were surveyed in spring of 2015 and 2019 by means of boat electrofishing. Randomly selected shoreline units were sampled. Overall LMB abundance, catch per unit of effort (CPUE) decreased from 2006 (CPUE = 149.3) to 2015 (CPUE = 75.2) and again during the 2019 (CPUE = 60) survey (Table 1). While CPUE decreased for the 2015 and 2019 surveys, both still had high abundance of LMB and were considered high quality fisheries. CPUE decreased for all size classes from 2006 to 2019 except for Substock (CPUE = 13.6), Memorable (CPUE = 4.4), and Trophy (CPUE = 0.6) where a slight increase was observed. Recruitment appeared to be slightly lower than desired with the low relative abundance of Substock size class, however it had increased compared to 2015. While CPUE decreased, body condition or relative weights (Wr) increased for all size classes and were above acceptable values of 90 (Table 1). The largest fish sampled was from the 2019 survey and measured 24.8 (in) in total length and 8.7 (lbs). It is important to note that the standard sampling procedures (SSP) for Largemouth Bass electrofishing surveys changed from 15 minute to 10 minute units in 2015. While this change decreased the amount of time sampled per unit, it is unknown how that would have affected catch rates. CPUE's can vary based on habitat types sampled.

Length frequency histograms showed a slight increase in overall size structure with an increase in the percentage of fish exceeding the slot limit (13-16 inches) from roughly 15% in 2015 to 19% in 2019 (Figure 1). Proportional size distribution (PSD) values during the 2019 survey decreased for PSD-Q = 66 compared to 2015 PSD-Q = 75 but increased in both PSD-P = 33 and PSD-M = 11 indicating an increase in proportion of larger size fish (Table 2).

Age data was collected on a subset of Largemouth Bass from the 2019 survey. Growth was slow but steadily increased. Largemouth Bass grew to a legal harvest limit of 16 inches between ages five and six with a mean length 15.5 inches at age five and 18.9 inches by age six (Table 3). The Von Bertalanffy growth curve (Figure 2) gives a visual representation of the predicted growth of Largemouth Bass for Okmulgee Lake and estimates the mean maximum length at 24.1 inches. The 2019 age frequency histogram indicated stronger year classes present with nearly 50 percent of the fish were aged from 2018 (age one) and 2017 (age two) (Figure3).

Florida Largemouth Bass (FLMB) were stocked twice since 2006, once in 2012 with 53,836 fingerlings and again in 2013 with 59,906 fingerlings (Appendix 1) in an effort to introduce FLMB genetics into the bass population. FLMB will grow quicker and larger than native Northern Largemouth Bass, given enough forage and the right conditions within the system

Overall abundance decreased, while size structure, and relative weights increased. Recruitment was slightly lower than desired but had increased in 2019 compared to 2015. The LMB population in

Okmulgee Lake appears to be healthy and improving in the quality of the fishery. While this report details changes in the population from 2006 to 2019, it is important to note that the 13-16 inch slot limit changed in 2022 to align with the new state wide regulations. Since 2022 Okmulgee Lake follows the statewide regulations for LMB, a combined daily harvest limit of six fish, of which only one may be larger than 16 inches. There is no minimum length limit. No changes are recommended for Largemouth Bass regulations at this time.

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 Okmulgee Lake. Acceptable Wr values are ≥90.

		Total CPUE	Substock 0-7.8 in	Stock 7.9 in		Quality 11.8 in		Preferred 15 in		Memorable 20.1 in		Trophy 24.8 in	
Year	No.	CPUE	CPUE	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
2006	448	149.3	48.3	55.0	87	30.7	87	12.3	98	3.0	101	.	.
2015	213	75.2	10.9	15.9	89	29.7	86	15.5	90	3.2	94	.	.
2019	110	60.0	13.6	15.8	92	15.3	93	10.4	95	4.4	96	0.6	92

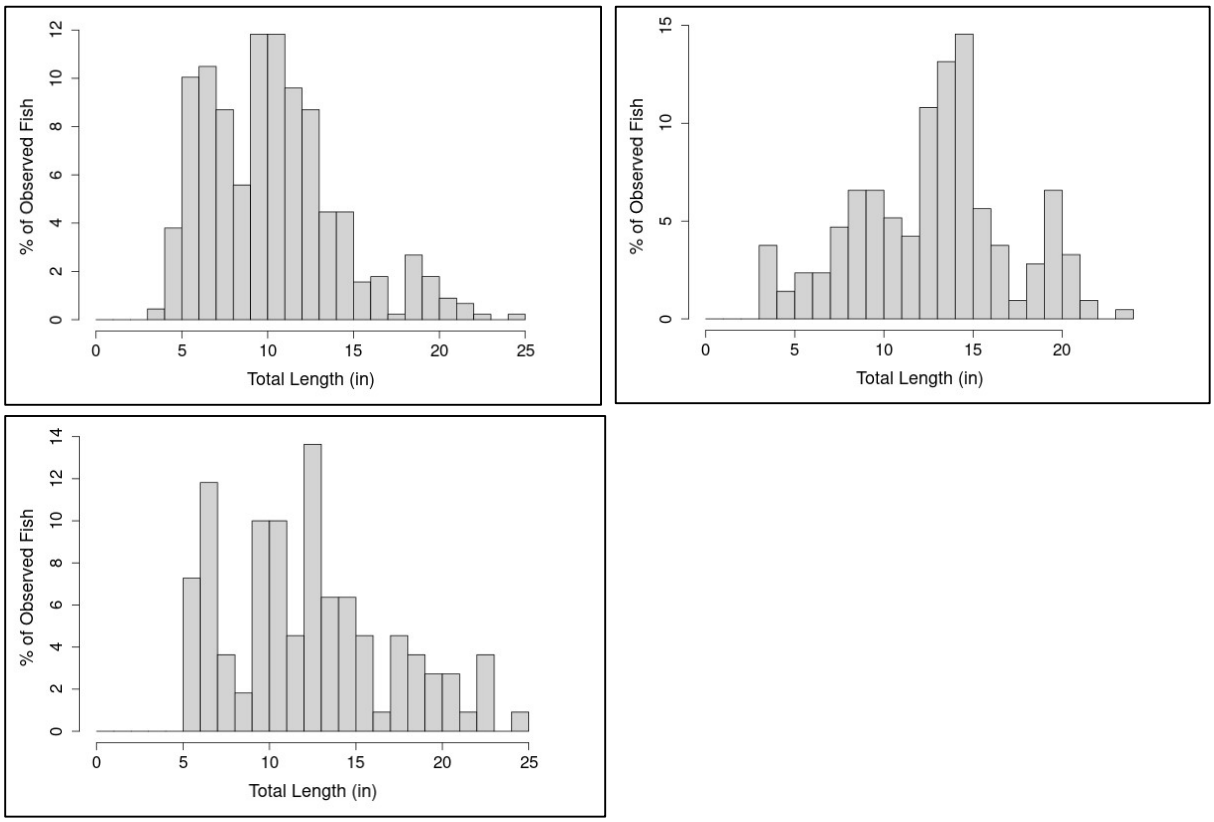

Figure 1. Largemouth Bass Length Frequencies for Okmulgee Lake 2006 (Top Left), 2015 (Top Right), and 2019 (Lower Left).

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.

Year Surveyed	PSD-Q (11.8 in)	PSD-P (15 in)	PSD-M (20.1 in)
2006	46	15	3
2015	75	29	5
2019	66	33	11

Table 3. Mean Total Length at age (inches) and L infinity (estimated mean maximum length) for **Largemouth Bass** from Okmulgee 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.
2019	6.4	10.1	12.3	14.2	15.5	18.9	18.5	18.1	20.6	22.3	22.1	.	24.1

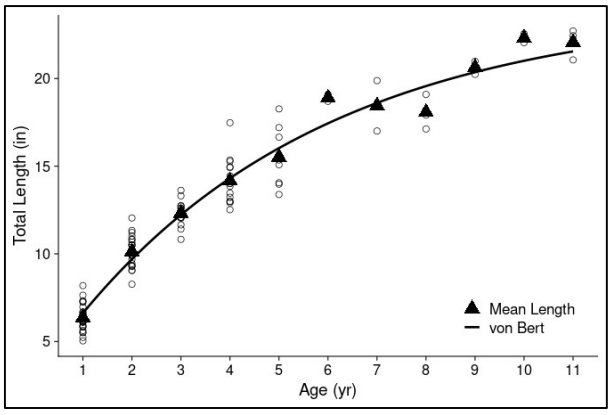

Figure 2. 2019 Largemouth Bass Mean Length at Age: Von Bert Estimated Growth Curve. The Von Bert Growth Curve indicates the estimated growth rate of Largemouth Bass.

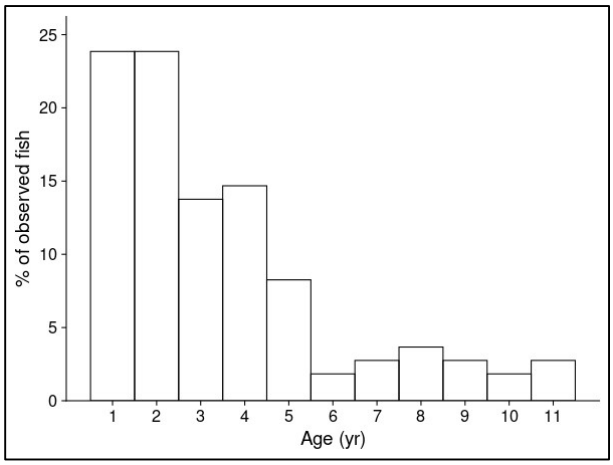

Figure 3. 2019 Age Frequency of Largemouth bass.

Spotted Bass

Spotted Bass were surveyed in spring of 2015 and 2019 by means of boat electrofishing. Randomly selected shoreline units were sampled. Overall Spotted Bass abundance decreased from 2006 (CPUE= 26.0) to 2015 (CPUE = 18.4) then increased in 2019 (CPUE = 27.3) (Table 4). While relative abundance increased overall, it decreased for quality size fish (CPUE = 2.2), but increased for preferred size fish (CPUE = 1.1). It is important to note that the standard sampling procedures (SSP) for Black bass electrofishing surveys changed from 15 minute to 10 minute units in 2015. While this change decreased the amount of time sampled per unit, it is unknown how that would have affected catch rates. CPUE's can vary based on habitat types sampled.

Body condition or relative weights (Wr) varied slightly between years surveyed. Ultimately body conditions during the most recent 2019 survey were acceptable (values at or above 90) for stock size fish but considered poor for quality and preferred size classes (Table 4). The largest fish collected was from the 2015 survey and measured 15.5 (in) in total length and 1.7 (lbs.) in weight.

Proportional size distribution (PSD) values increased considerably from 2006 (PSD-Q = 11) to 2015 (PSD-Q = 44) then decreased in 2019 (PSD-Q = 14). Only the 2019 survey had fish in the preferred size class with a PSD-P = 5, indicating an increase in proportion of larger size fish in 2019 compared to 2006 and 2015 (Table 5). Spotted Bass length frequency histograms (Figure 4) also demonstrate an increase in overall size structure during the 2019 survey and a decrease in total number of fish 11 inches and larger. No age data was collected during these surveys.

Overall, relative abundance for Spotted Bass increased, size structure increased, and body conditions varied slightly but could use improvement. Spotted Bass typically grow slower and obtain smaller sizes than Largemouth Bass but they compete for the same food source. For management reasons low abundance of Spotted Bass is preferred. Spotted Bass have no harvest or minimum length limit. No changes in regulations are recommended at this time.

Table 4. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of Spotted Bass collected by spring electrofishing from Okmulgee Lake. Acceptable Wr values are ≥90.

		Total CPUE	**Stock 7.1 in**		**Quality 11 in**		**Preferred 13.8 in**		**Memorable 16.9 in**		**Trophy 20.1**	
Year	**No.**	**CPUE**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**	**CPUE**	**Wr**
2006	78	26.0	18.0	88	2.3	88	.	.	.	.	.	.
2015	52	18.4	9.5	90	7.4	83	.	.	.	.	.	.
2019	50	27.3	20.7	90	2.2	83	1.1	88	.	.	.	.

Table 5. Proportional Size Distribution (PSD) of Spotted 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.

Year Surveyed	PSD-Q (11 in)	PSD-P (13.8 in)	PSD-M (16.9 in)
2006	11	.	.
2015	44	.	.
2019	14	5	.

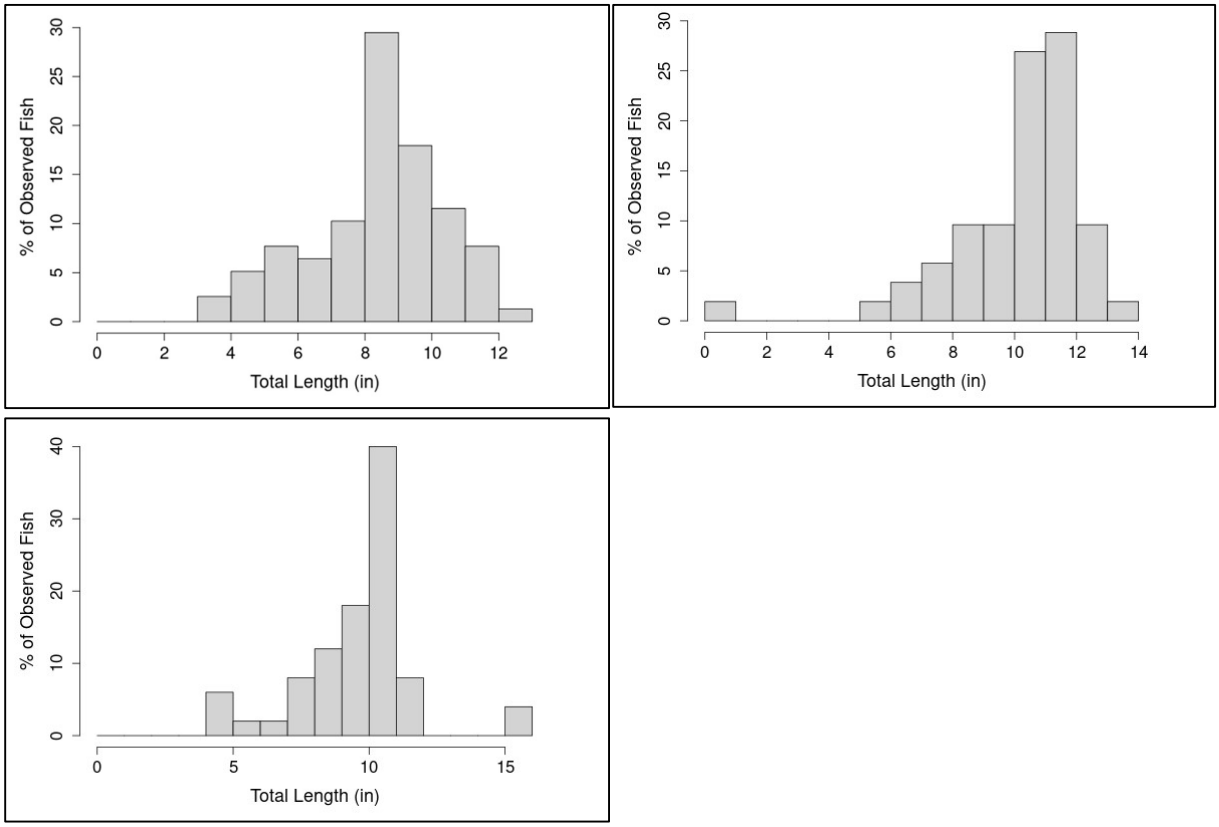

Figure 4. Spotted Bass Length Frequencies for Okmulgee Lake 2006 (Top Left), 2015 (Top Right), and 2019 (Lower Left).

Channel Catfish

Channel catfish were surveyed in 2007, 2015, 2019 and 2024 using suspended gill nets. Standard sampling protocols for gill net lengths changed in 2009 to 80 foot nets. Gill net lengths and effort varied prior to 2009. Five stations were randomly sampled for a period of 24 hours in the 2015, 2019 and 2024 surveys. Overall relative abundance was considered low for all years surveyed but was the highest in 2015 (CPUE = 4.3) and lowest in 2024 (CPUE = 1.6) (Table 6). Body conditions varied between years and size classes, the most recent survey in 2024 indicated both stock and quality size classes were below accepted values of 90 while the preferred size class (Wr = 114) was considered to be in excellent condition (Table 6).

Length frequency histograms (Figure 5) for 2024 indicated a decrease in size structure with only a couple fish present above 15 inches. The proportional size distribution (PSD) values indicated a decrease for quality size fish in 2024 compared to 2019 but an increased for preferred size fish (Table 7). High PSD-Q values and low PSD-P and M values indicate fewer fish in the larger size classes and an overabundance of fish in the smaller size classes.

Age data was collected on a subset of Channel Catfish in 2019 and 2024. Growth rates were moderate, reaching a mean length of 12.9 inches by age two (Table 8). 2019 age frequency indicates only age four and age five year classes were present. The 2024 age frequency only showed ages one, two and five present, indicating many missing year classes and poor natural recruitment (Figure 6). However, too few fish were sampled to make reliable age conclusions. The largest fish sampled measured 25.7 (in) and weighed 6.1 (lbs.) collected in the 2015 survey. The oldest Channel Catfish was aged at five years old. The most recent stocking occurred in 2024 and 2023, prior to that, stockings occurred nearly every year from 2000 through 2015 (Appendix 1).

Overall, Channel Catfish were present in low abundance with little to no natural recruitment. The Channel Catfish stocking program is meant to establish a self-sustaining population. Past stocking efforts have been unsuccessful in establishing a self-sustaining population as a results stockings ceased in 2015. In 2021, 15 catfish spawning structures were installed as an attempt to increase catfish spawning success and recruitment. Channel Catfish stockings resumed in 2023 and will be reassessed to determine if spawning structures were successful. High relative abundance of Largemouth Bass has been known to forage on Channel Catfish fingerlings and has likely contributed to the poor recruitment of Channel Catfish. Future gill net surveys will be conducted to determine stocking needs.

Table 6. 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 Okmulgee 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
2007	12	2.4	0.4	88	0.6	93	.	.	.	.	.	.
2015	19	4.3	1.1	88	1.3	85	0.4	94	.	.	.	.
2019	17	3.5	.	.	3.3	84	0.2	86	.	.	.	.
2024	9	1.6	0.9	75	0.2	87	0.2	114	.	.	.	.

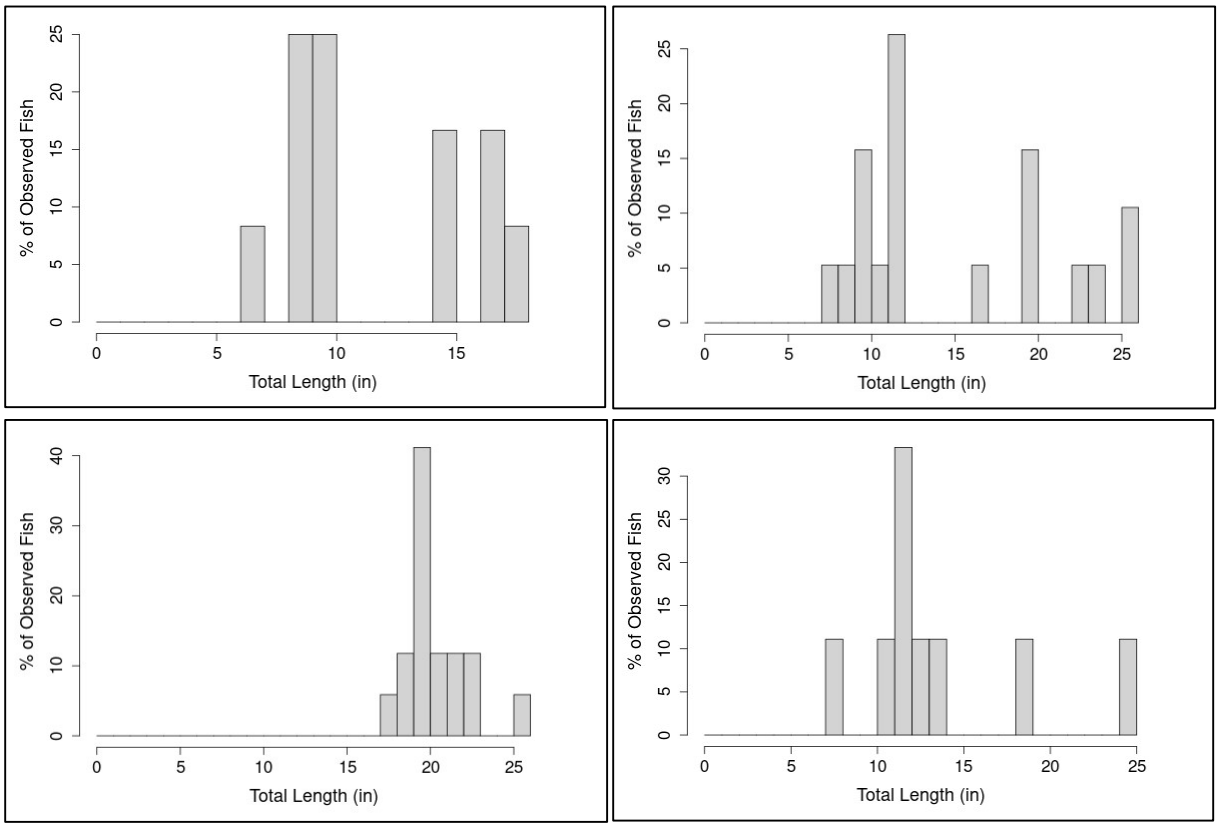

Figure 5. Channel Catfish Gill Net Length Frequency Histogram 2007 (Top Left), 2015 (Top Right), 2019 (Lower Left), and 2024 (Lower Right).

Table 7. 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)
2007	60	.	.
2015	62	15	.
2019	100	6	.
2024	29	14	.

Table 8. Mean Total Length at age (inches) for Channel Catfish from Okmulgee 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
2019	.	.	.	19.5	20.6	.	.	.	.	.	.	.
2024	10.4	12.9	.	.	18.5	.	.	.	.	.	.	.

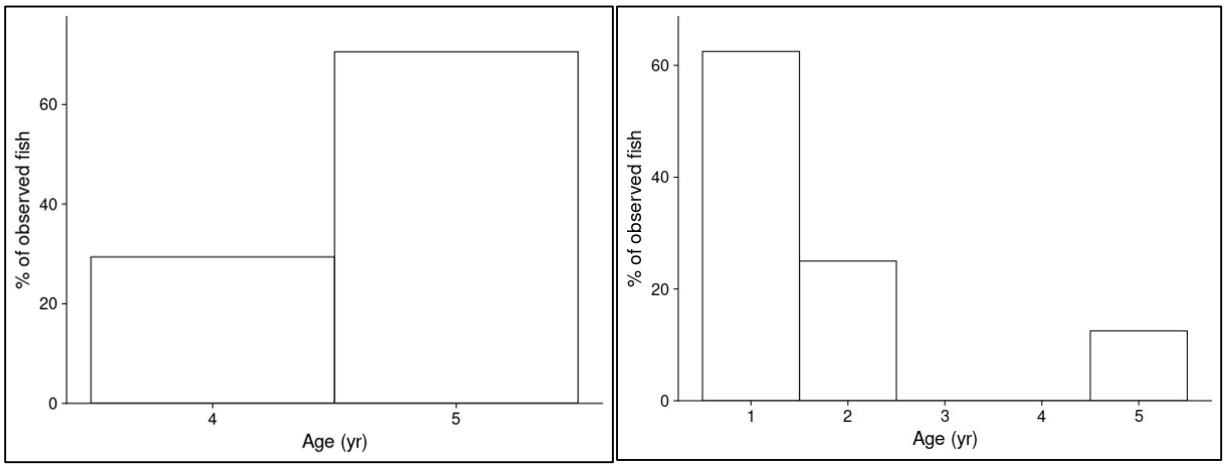

Figure 6. 2019 (Left) and 2024 (Right) Age Frequency of Channel Catfish.

Blue Catfish

Blue Catfish were surveyed in 2007, 2015, 2019 and 2024 using suspended gill nets. Standard sampling protocols for gill net lengths changed in 2009 to 80 foot nets. Gill net lengths and effort varied prior to 2009. Five stations were randomly sampled for a period of 24 hours in the 2015, 2019 and 2024 surveys. Blue Catfish were only found in the 2007 survey and were present in low abundance (CPUE = 1.0). No Blue Catfish were found in any of the surveys since 2007. Sample size is too small to make reliable conclusions. Currently, there are no plans for future stockings or surveys of Blue Catfish at Okmulgee Lake.

Crappie

Crappie were surveyed in 2007, 2015, 2019 and 2024 using suspended gill nets. Standard sampling protocols for gill net lengths changed in 2009 to 80 foot nets. Gill net lengths and effort varied prior to 2009. Five stations were randomly sampled for a period of 24 hours in the 2015, 2019 and 2024 surveys. Overall Crappie abundance was considered low during all years surveyed. CPUE varied between size classes and years surveyed. The most recent survey in 2024 had a low abundance (CPUE = 3.9) but increased compared to the 2019 (CPUE = 1.4) survey (Table 9). During the 2024 survey, abundance for preferred size fish (CPUE = 2.3) was the highest compared to the other size classes and had increased compared to the previous survey. Relative weights varied between years and size classes but were generally above the accepted value of 90. The most recent survey indicated excellent condition of stock (Wr = 99) size fish but poor quality (Wr = 84) size and just slightly lower than desired for preferred (Wr = 89) and memorable (Wr = 88) size classes (Table 9). The largest fished sampled was from the 2024 survey and measured 14.4 (in) in total length and 1.5 (lbs.) in weight.

Trap nets were also used to sample the Crappie population at Okmulgee Lake in 2024. Trap nets are more efficient and typically catch more fish, which gives a greater accuracy due to higher number of fish sampled. 30 locations were randomly selected during the 2024 survey. Trap nets are fished for a period of 24 hours. Total relative abundance was considered low with a (CPUE = 1.2) (Table 10). Relative

abundance was highest in the preferred size class (CPUE = 0.6). Body conditions were below acceptable conditions for all size classes surveyed (Table 10). Length frequency histograms for both the 2024 gill net and 2024 trap net surveys are similar and indicate most of the fish sampled were nine inches or larger (Figure 7). The largest fished sampled was from the 2024 survey and measured 12.9 (in) in total length and 1.1 (lbs.) in weight.

Age data was collected on a subset of Crappie from the 2015 gill net, 2024 gill net, and the 2024 trap net surveys. Growth was moderate for both years surveyed. Crappie grew to a mean length of 9.0 inches by age two and 10.2 inches by age three, then slowed but steadily increased, reaching a mean length of 11.8 inches by age five (Table 11).

Overall, Crappie at Okmulgee Lake are present in low numbers, growth rates were moderate reaching 9 inches by age two and 10.2 inches by age three. Growth slows around the 10 inch mark but continues to increase with age. Few fish in the smaller size classes were collected. Continued trap net surveys are recommended to gain additional age data. It is worth noting that rod and reel sampling events collected more fish than the total surveyed using trap nets. It is possible that water clarity and depth of shoreline in many areas of the reservoir reduce trap net efficiency.

Table 9. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of Black and White Crappie collected by fall gill netting from Okmulgee Lake. Acceptable Wr values are ≥90.

		Total CPUE	Stock 5.1 in		Quality 7.9 in		Preferred 9.8 in		Memorable 11.8 in		Trophy 15.0	
Year	No.	CPUE	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
2007	14	2.8	1.6	90	0.6	85	0.4	82	0.2	102	.	.
2015	30	6.7	0.9	102	2.5	94	3.1	98	0.2	100	.	.
2019	7	1.4	0.4	88	0.6	86	0.4	91	.	.	.	.
2024	22	3.9	0.5	99	0.9	84	2.3	89	0.2	88	.	.

Table 10. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of Black and White Crappie collected by fall trap netting from Okmulgee Lake. Acceptable Wr values are ≥90.

		Total CPUE	Stock 5.1 in		Quality 7.9 in		Preferred 9.8 in		Memorable 11.8 in		Trophy 15.0	
Year	No.	CPUE	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
2024	34	1.2	.	.	0.3	83	0.6	85	0.1	89	.	.

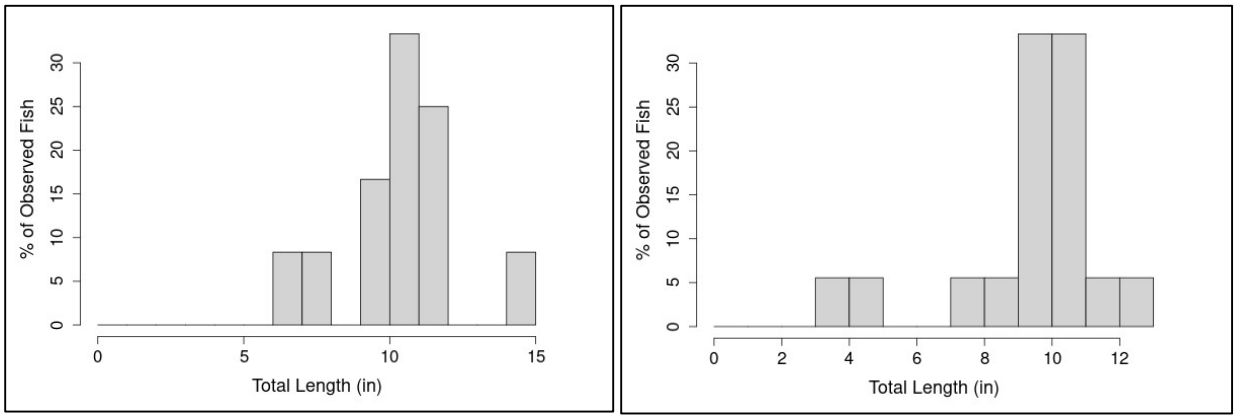

Figure 7. Trap Net and Gill Net Length Frequency Histograms: 2024 Gill Net (Left) and 2024 Trap Net (Right).

Table 11. Mean Total Length at age (inches) for Black and White Crappie from Okmulgee Lake.

Year	Age 1	Age 2	Age 3	Age4	Age 5	Age 6	Age 7	Age 8
2015	6.8	9.1	9.6	10.9	10.5	10.2	11.6	
2024	6.9	9.0	10.2	10.5	11.8	.	.	.

White Bass

White bass were surveyed in 2007, 2015, 2019 and 2024 using suspended gill nets. Standard sampling protocols for gill net lengths changed in 2009 to 80 foot nets. Gill net lengths and effort varied prior to 2009. Five stations were randomly sampled for a period of 24 hours in the 2015, 2019 and 2024 surveys. Overall abundance was considered low but steadily increased since 2007 (CPUE = 1.4) to 2024 (CPUE = 4.6) (Table 12). CPUE varied slightly within each size class from year to year and indicated an increase in preferred size fish and a decrease in quality and memorable size classes. Body conditions varied between size classes and years surveyed but ultimately were below acceptable values of 90 for all size classes during the 2024 survey. Sample size was considered small with only 27 White Bass collected in 2024. Both the 2019 and 2024 length frequency histograms indicated the majority of the fish sampled were in the 14-inch size class with a slight increase in size structure in 2024 (Figure 8). The largest fish sampled was from the 2015 survey and measured 15.3 (in) in total length and 2.1 (lbs.) in weight.

Age data was collected on White Bass during the 2019 and 2024 surveys. Growth appeared slow during both surveys. White Bass grew to a mean length of 12.9 inches by age two and 14 inches by age five during the 2024 survey (Table 13). Sample size is considered to small to make reliable conclusions.

Overall, relative abundance of White Bass was low but slowly and steadily increasing, body conditions were poor and growth rates slow. Sample size was too small to make reliable conclusions. No regulation changes are recommended at this time.

Table 12. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of White Bass collected by fall gillnet from Okmulgee 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**
2007	7	1.4	1.0	88	.	.	0.4	98	.	.	.	.
2015	10	2.2	0.7	100	.	.	0.7	109	0.5	106	.	.
2019	19	3.9	.	.	0.8	89	2.9	86	.	.	.	.
2024	27	4.6	0.7	79	0.3	.	3.6	85	.	.	.	.

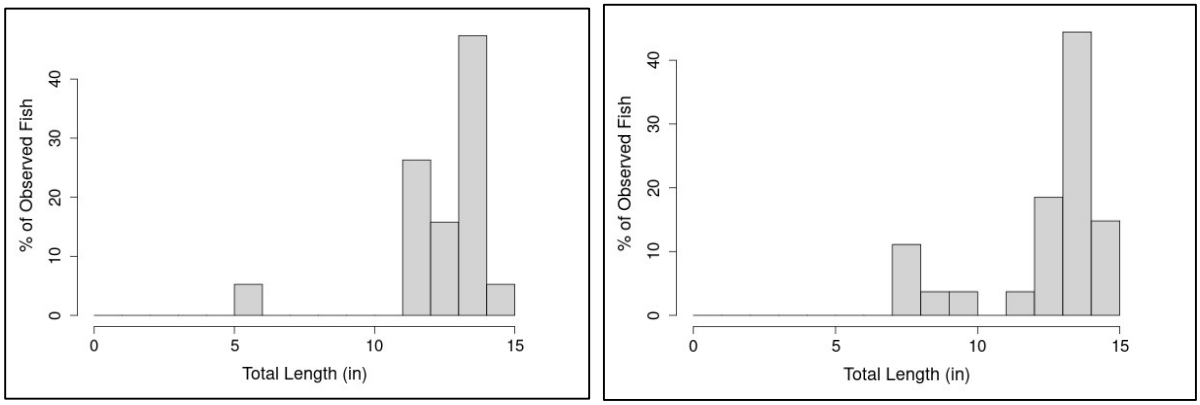

Figure 8. White Bass Gill Net Length Frequency Histogram 2019 (Left), and 2024 (Right).

Table 13. Mean Total Length at age (inches) and L infinity (estimated mean maximum length) for White Bass from Okmulgee Lake.

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8
2019	10.3	.	.	13.3	13.5	13.0	.	.
2024	.	12.5	13.2	13.9	14.0	.	.	.

Shad

Gizzard shad were surveyed in 2007, 2015, 2019 and 2024 using suspended gill nets. Standard sampling protocols for gill net lengths changed in 2009 to 80 foot nets. Gill net lengths and effort varied prior to 2009. Five stations were randomly sampled for a period of 24 hours in the 2015, 2019 and 2024 surveys. Total relative abundance of Gizzard Shad was acceptable for all years surveyed except 2019 (CPUE = 1.0) where it was slightly lower than desired. Relative abundance varied from year to year but was the highest in the 2024 survey (CPUE = 9.9) (Table14). However, while total relative abundance was acceptable, abundance of Gizzard Shad less than six inches in length was low for all years surveyed, with

2024 (CPUE = 0.7) higher than 2019 (CPUE = 0.0) and 2015 (CPUE = 0.2). Length frequency histograms (Figure 9) and CPUE's for all three surveys show the majority of Gizzard Shad for each year surveyed are larger than six inches in length. Optimal forage size for most species is six inches or less.

Table 14. Total number (No.) and catch per unit of effort (CPUE) by size groups of Gizzard Shad collected by fall gill netting from Okmulgee Lake.

Gizzard Shad				
Year	**No.**	**Total CPUE**	**<6 inches**	**≥6 inches**
2007	32	6.5	1.4	5.1
2015	23	5.1	0.2	4.8
2019	5	1.0	0.0	1.0
2024	57	9.9	0.7	9.2

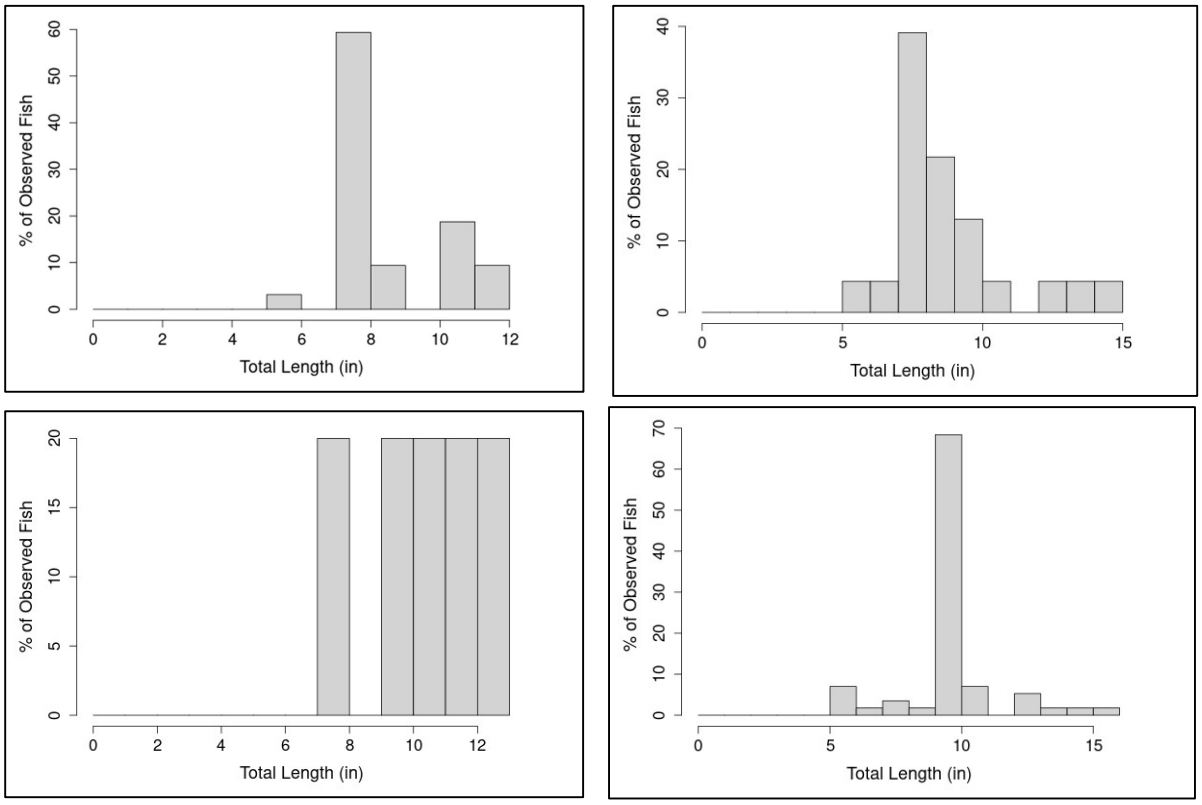

Figure 9. Gizzard Shad Length Frequency Histogram for 2007 (Top Left), 2015 (Top Right), 2019 (Lower Left), and 2024 (Lower Right).

RECCOMENDATIONS

1. Continued monitoring of black bass population dynamics and size structure.
2. Continued monitoring of Crappie population dynamics and size structure.
3. Continue assessment of catfish spawning structures and Channel Catfish stocking success.

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

Date	Species	Number	Size (inches)
2000	Channel Catfish	14,404	7
2001	Channel Catfish	14,448	7
2002	Channel Catfish	14,448	6.5
2003	Channel Catfish	14,976	7
2004	Channel Catfish	14,575	7
2005	Channel Catfish	14,408	7
2006	Channel Catfish	14,400	7
2007	Channel Catfish	14,720	7
2008	Channel Catfish	18,125	5
2009	Channel Catfish	15,006	7
2012	Florida Largemouth Bass	53,836	1.5
2013	Florida Largemouth Bass	59,906	1.5
2014	Channel Catfish	26,740	7
2015	Channel Catfish	22,228	7
	Channel Catfish	4,830	6.75
2023	Channel Catfish	22,070	7
	Channel Catfish	18,255	2.5
2024	Channel Catfish	20,385	7

Appendix 2. Okmulgee Lake Fish Attractor Locations and Site Information

Area Name	Site #	Latitude	Longitude	Habitat Type	Marked	Bank Access	Date
Lions Club Point	1	35.6252	-96.0784	cedars	Y	N	April 2024
Salvation Army Point	2	35.6130	-96.0841	cedars	Y	N	April 2024
Fishing Dock	3	35.6212	-96.0645	cedars,spiders, Artificial Cubes	Y	Y	April 2024
East Bank N of Blackjack	4	35.6192	-96.0708	cedars	N	Y	Sept. 2022
WPA Pavillion Red Oak	5	35.6115	-96.0749	cedars	N	Y	Sept. 2022
Red Oak Area	6	35.6099	-96.0764	cedars	N	Y	April 2024
Hickory Point	7	35.6027	-96.0793	cedars	Y	Y	Sept. 2022