SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

LAKE BIXHOMA

2024-2025

SURVEY REPORT

State: Oklahoma

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations – Bixhoma Lake

Period Covered: 1 January 2024 – 31 December 2025

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Date Prepared:

BIXHOMA LAKE

ABSTRACT

Bixhoma Lake was sampled in 2024 and 2025 using spring electrofishing to evaluate Largemouth Bass populations for abundance and condition. Abundance remains high over the years, particularly of fish between 10 and 15 inches in length with low relative weights, representing a stunted bass population. Trophy potential still exists within the lake with fish greater than 21 inches being caught almost annually in samples. If the City of Bixby can be convinced to adopt the new statewide regulations for bass, it is hoped that anglers can help the stunted bass situation by harvesting smaller Largemouth Bass to help reduce competition, increase growth rates, and improve overall health of the fish population.

Bixhoma has been stocked annually with shad to help improve the forage base available to sportfish within the reservoir. Experimental gill netting was conducted in fall 2023 to evaluate the presence or absence of shad within the lake as well as sportfish abundance and condition. Shad were not found in 2023 but stockings will continue to help supplement forage. Crappie and sunfish were caught in the nets, but not in a quantity to make any population assumptions or management decisions. Due to the low numbers of other sportfish, Largemouth Bass is the primary fishery for Bixhoma Lake.

INTRODUCTION

Lake Bixhoma impounds Mountain Creek, 14.8 km southeast of Bixby in Wagoner County, Oklahoma. Bixhoma covers 44 surface hectares and was constructed in 1965 by the City of Bixby. Bixhoma Reservoir has a mean depth of 10 m (32.8 feet) and a maximum depth of 18.7 m (61.4 feet), a shoreline development ratio of zero, a water exchange rate of zero, and a secchi disc visibility of around 59 inches in the main pool in August. Fish habitat consists primarily of aquatic vegetation, rock, and flooded timber. The primary sportfish species is Largemouth Bass, with regular stockings of certified Florida strain Largemouth Bass. White Crappie, Black Crappie, and various sunfish species are also present.

The most recent stocking of Florida strain Largemouth Bass was 30,989 fingerlings stocking in 2022 to maintain the Florida genetic potential for trophy Largemouth Bass. Approximately 3,000 Threadfin and Gizzard shad were stocked in Bixhoma Lake in 2023 to supplement forage for sportfish.

In 2018, ODWC placed 10 habitat structures throughout the lake consisting of hardwood trees to enhance largemouth bass habitat. Additional artificial structures consisting of PVC “Georgia cubes” and MossBack Fish Habitat™ structures were placed throughout the lake in spring of 2022.

In 2024 and 2025, Bixhoma lake was sampled using spring electrofishing to evaluate Largemouth Bass populations for abundance and condition. Bixhoma was also sampled in 2023 by experimental gill netting to evaluate other sportfish abundance and condition, as well as the presence or absence of shad within the lake.

RESULTS

Largemouth Bass

1. Largemouth Bass abundance from spring boat electrofishing in 2024 (C/f = 158.25) was very high and has remained high since 2003 (Tables 1 and 2).
2. Relative weights (W_r) were poor for all size groups less than 16 inches (Table 1), indicating stunting due to overpopulation and limited forage within the lake.
3. Trophy potential remains for Largemouth Bass due to the regular stocking of Certified FLMB into the lake with Memorable and Trophy sized fish caught almost annually (Tables 1, 3, and 4). Therefore, Certified FLMB stockings should continue to ensure that the trophy potential continues within the reservoir.

Crappie

1. Crappie populations are low in Bixhoma Lake with catch rates in 2023 being C/f = 0.44, with the primary species being Black Crappie (Table 5).
2. Relative weights (W_r) for the Black Crappie caught in 2023 were good at W_r = 98.
3. Since crappie show such low abundance in our samples, we cannot confidently make management assumptions or decisions to manage the population.

Shad

1. Shad abundance from fall experimental gill netting in 2023 (C/f = 0) showed that there seems to be little to no survival of shad from the stockings in spring of 2023.
2. A mix of Threadfin and Gizzard Shad will continue to be stocked into Bixhoma Lake annually and then checked again for survival in hopes of establishing a reproducing population that can maintain a good forage base for Largemouth Bass.

Non-game fish species

1. In fall of 2023, a total of six non-game fish species were collected by gill netting. Those species were Black Bullhead, Yellow Bullhead, Bluegill Sunfish, Redear Sunfish, Warmouth Sunfish, and Spotted Sucker.

RECOMMENDATIONS

Fish Attractor Structures

1. No new habitat structures are needed within the next five years.

Fish Stockings

1. It is recommended that certified Florida Largemouth Bass stockings continue to maintain the genetic potential for trophy fish.
2. Stockings of Gizzard Shad and Threadfin Shad should continue annually to try to establish and maintain a forage base for bass and other sportfish.

Fish Surveys

1. Spring boat electrofishing surveys should be conducted annually as conditions allow to continue monitoring changes in the overall bass populations.
2. Age data from Largemouth Bass and genetic samples should be taken as needed based on recommendations from the FLMB coordinator.
3. Sampling for shad post stocking should continue regularly to determine if a self-sustaining population can be established.

Fishing Regulations

1. The current regulations as of 2024 set by the City of Bixby are six Largemouth Bass with a 14-inch minimum length limit.
2. Work will continue to convince the City of Bixby to change the black bass regulations to reflect the statewide regulations of six Largemouth and/or Smallmouth Bass daily, only one over 16 inches. This will hopefully encourage the harvest of the overabundant smaller fish and help increase growth rates and help improve the overall condition of the population.
3. Current regulations for catfish (14 inch minimum, limit five per day) and crappie (10 inch minimum, limit five per day) should remain in effect.

Table 1. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **Largemouth Bass** collected by spring electrofishing from Lake Bixhoma. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥40)		<8 inches (15-45)		8-13 inches (15-30)		≥14 inches (≥10)		≥16 inches (≥8)		≥21 inches (≥2)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1981	103	31.7										
1983	49	9.1										
1984	106	20.0										
1986	103	24.2										
1990	154	68.4										
2003	215	143.3	40.7	99	66.7	85	32.7	82	18.7	85	3.3	89
2004	143	95.3	29.3	89	44.0	82	17.3	81	11.3	85	2.7	91
2005	154	102.6	28.7	99	34.7	88	25.3	83	12.0	79	3.3	70
2009	158	105.3	22.0	98	35.3	92	38.0	84	16.7	84	4.0	78
2010	188	125.3	3.3	80	28.0	82	58.7	81	16.0	80	0.7	86
2013	140	140	6	94	76	81	39	78	16	75	2	74
2016	212	115.64	9.27	88	28.36	87	63.27	85	32.18	84	1.09	99
2017	238	142.80	4.8	74	60.6	83	56.40	80	21.00	77	1.20	96
2018	253	116.77	7.38	76	28.62	82	58.62	83	22.62	83	0.46	84
2019	247	148.20	6.60	67	43.2	86	79.8	90	23.40	88		
2021	264	121.85	3.23	82	57.69	84	44.31	86	15.23	89	1.38	100
2022	250	125.0	6.0	86	61.00	83	35.5	85	11.5	89	0.5	92
2023	235	141.0	7.8	76	74.4	80	31.8	80	7.8	85	1.2	97
2024	211	158.25	11.25	90	116.25	80	18.75	83	6.75	90	3.0	99

Table 2. Total catch per unit effort (CPUE; C/f) for Largemouth Bass collected by spring electrofishing from Bixhoma Lake, 2019 - 2024.

Species	**Mean**	**Count**	**RSE**	**SE**	**L 95% CI**	**U 95% CI**	**N RSE = 12.5 (25% range)**	**N RSE = 20 (40% range)**
Largemouth Bass (2019)	148.2	10	8.30	12.30	124.10	172.30	4	2
Largemouth Bass (2021)	121.85	13	8.75	10.66	100.95	142.75	6	2
Largemouth Bass (2022)	125	12	8.29	10.36	104.69	145.31	5	2
Largemouth Bass (2023)	141	10	5.75	8.11	125.10	156.90	2	1
Largemouth Bass (2024)	158.25	8	8.98	14.2	130.41	186.09	4	2

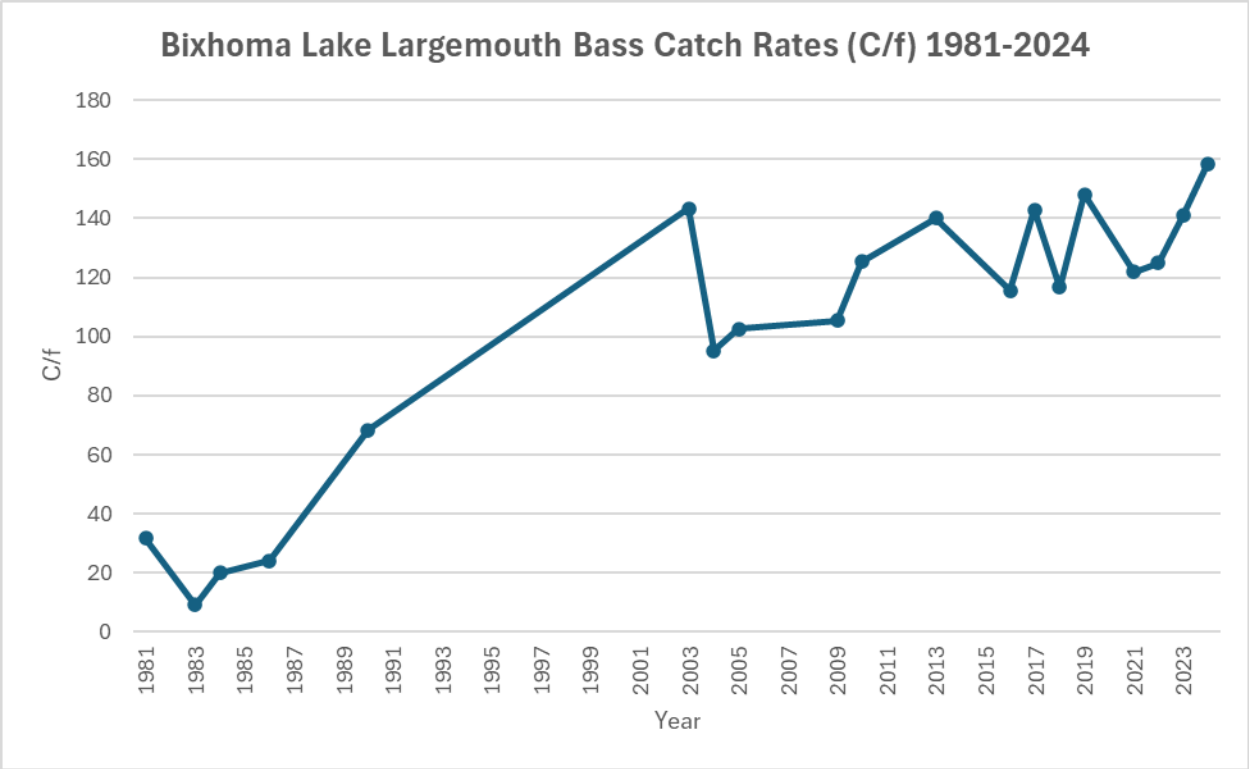


Figure 1. Total catch per unit effort (CPUE; C/f) for Largemouth Bass in Bixhoma Lake from spring electrofishing surveys from 1981-2024.

Table 3. Catch per unit effort (CPUE; C/f) by size category for Largemouth Bass collected by spring electrofishing from Bixhoma Lake, 2022 (OFAT analysis).

Species	Size Category	Mean	RSE	SE	L 95% CI	U 95% CI	N RSE = 12.5 (25% range)	N RSE = 20 (40% range)
Largemouth Bass	substock	6	32.57	1.95	2.17	9.83	81	32
Largemouth Bass	stock	29.5	13.12	3.87	21.91	37.09	13	5
Largemouth Bass	quality	67.5	11.32	7.64	52.52	82.48	10	4
Largemouth Bass	preferred	19	10.88	2.07	14.95	23.05	9	4
Largemouth Bass	memorable	3	38.92	1.17	0.71	5.29	116	45
Largemouth Bass	trophy	0	NA	NA	NA	NA	NA	NA

Table 4. Catch per unit effort (CPUE; C/f) by size category for Largemouth Bass collected by spring electrofishing from Bixhoma Lake, 2023 (OFAT analysis).

Species	Size Category	Mean	RSE	SE	L 95% CI	U 95% CI	N RSE = 12.5 (25% range)	N RSE = 20 (40% range)
Largemouth Bass	substock	7.2	24.22	1.74	3.78	10.62	38	15
Largemouth Bass	stock	39.6	13.96	5.53	28.76	50.44	12	5
Largemouth Bass	quality	76.8	8.38	6.44	64.18	89.42	4	2
Largemouth Bass	preferred	15	30.55	4.58	6.02	23.98	60	23
Largemouth Bass	memorable	1.8	50.92	0.92	0.00	3.60	166	65
Largemouth Bass	trophy	0.6	100.00	0.60	-0.58	1.78	640	250

Table 5. Catch per unit effort (CPUE; C/f) by size category for Largemouth Bass collected by spring electrofishing from Bixhoma Lake, 2024 (OFAT analysis).

Species	Size Category	Mean	RSE	SE	L 95% CI	U 95% CI	N RSE = 12.5 (25% range)	N RSE = 20 (40% range)
Largemouth Bass	substock	11.25	27.49	3.09	5.19	17.31	39	15
Largemouth Bass	stock	79.50	14.32	11.38	57.19	101.81	10	4
Largemouth Bass	quality	57.00	5.63	3.21	50.71	63.29	2	1
Largemouth Bass	preferred	6.75	20.14	1.36	4.09	9.41	21	8
Largemouth Bass	memorable	3.00	53.45	1.60	-0.14	6.14	146	57
Largemouth Bass	trophy	0.75	100.00	0.75	-0.72	2.22	512	200

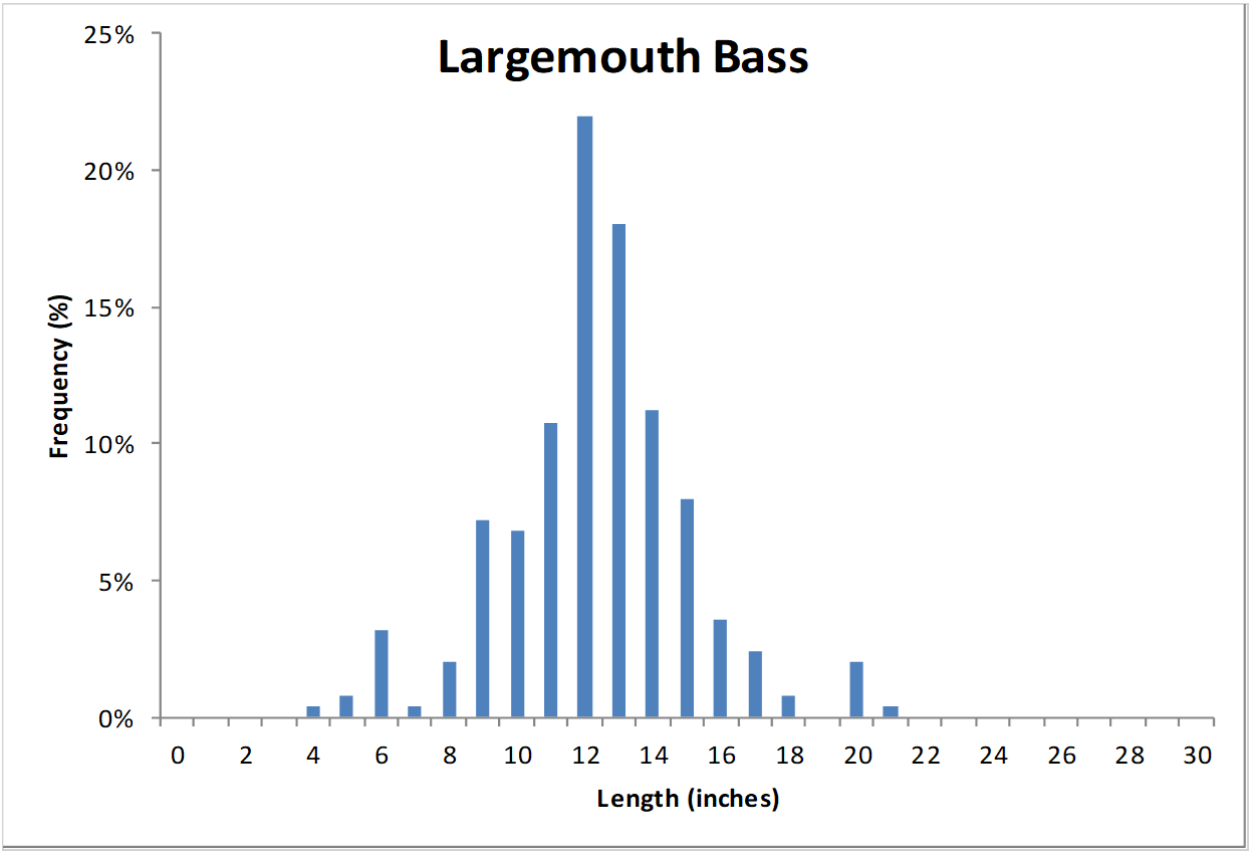
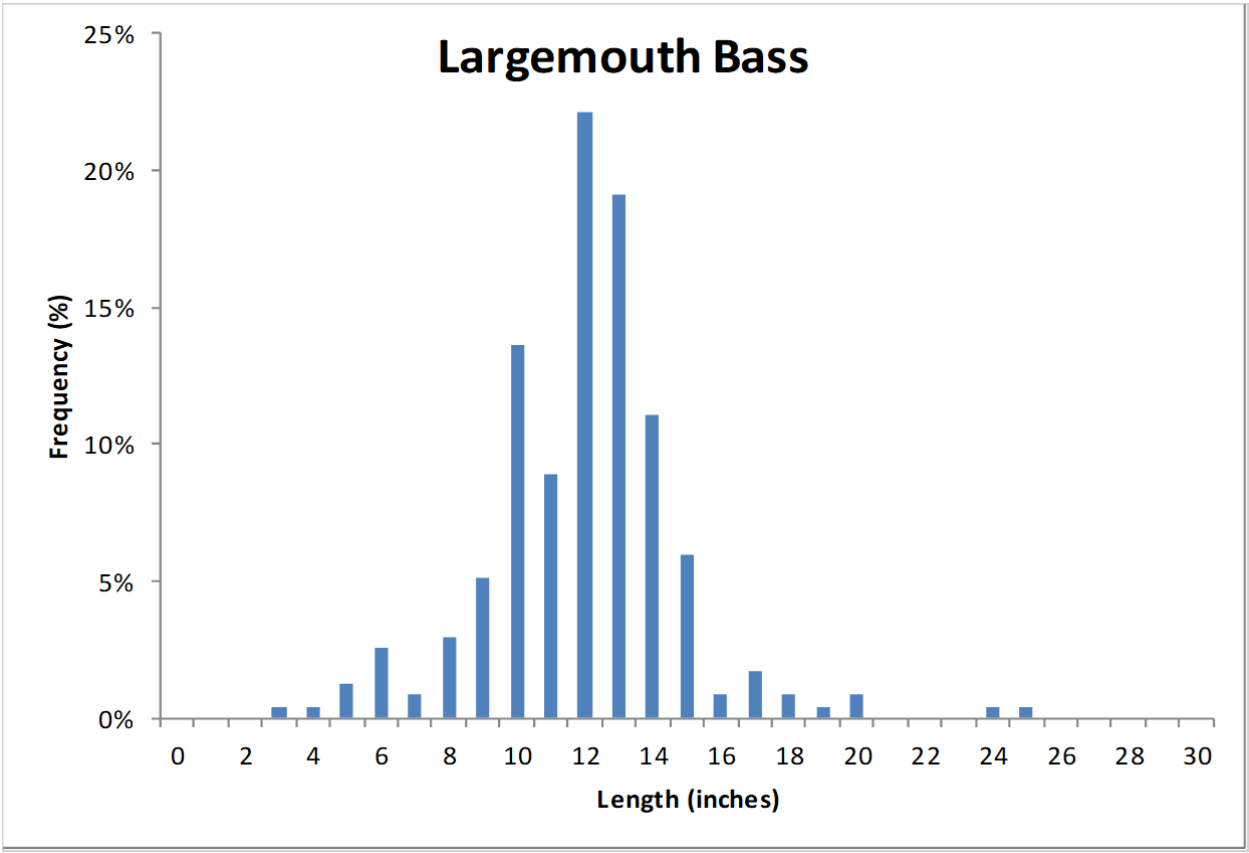


Figure 2. Length frequencies for Largemouth bass collected by spring electrofishing in Bixhoma Lake, 2022.



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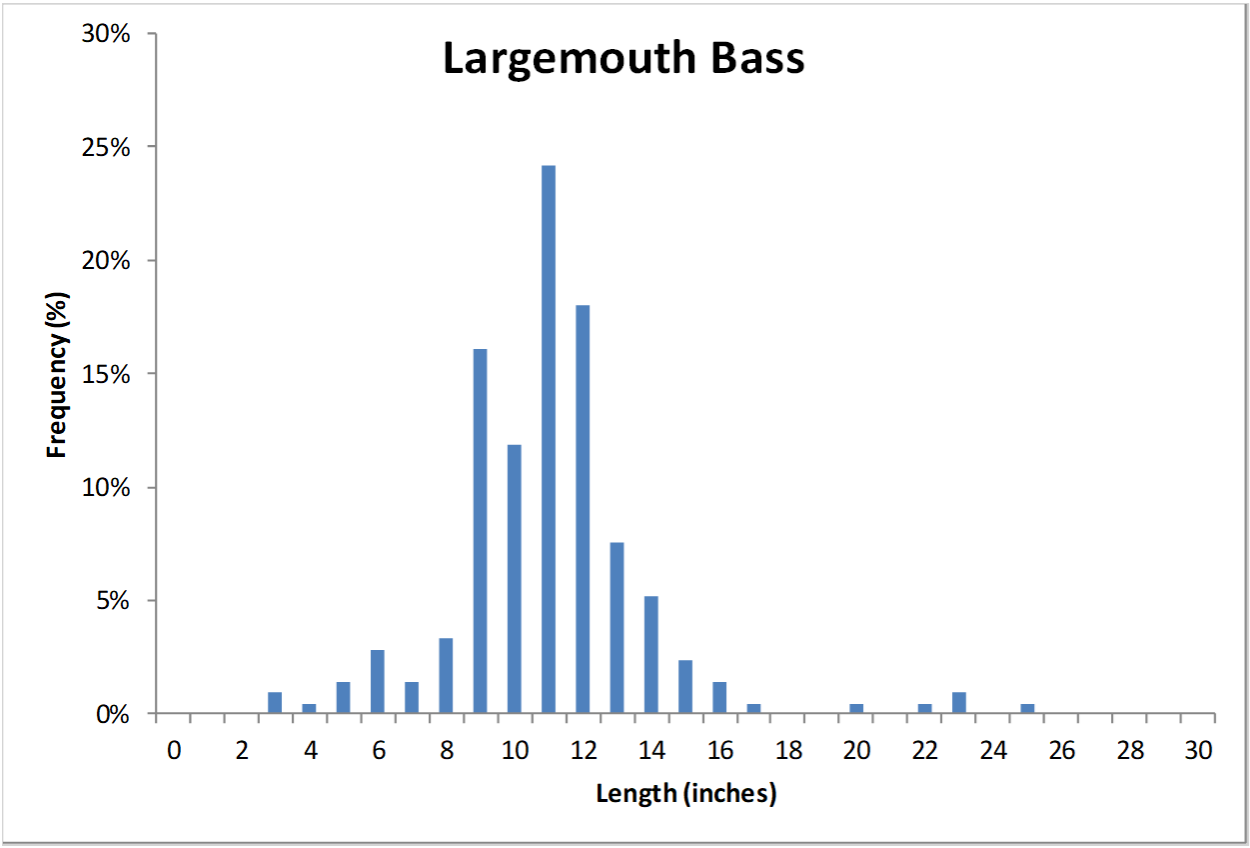

Figure 4. Length frequencies for Largemouth bass collected by spring electrofishing in Bixhoma Lake, 2024.

Table 6. Total number (No.), catch rates (C/f), and relative weights (Wr) by size groups of **Crappie** collected by fall gill netting from Bixhoma Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable Wr values are ≥90.

	Total (≥4.8)		<8 inches (1.2-7.2)		≥8 inches (1.9)		≥ 10 inches (>1.0)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1997	6	1.2	0.24	77	0.96	85	0.02	86
1998	6	1.68	0.24	77	1.44	84	0.04	85
1999	2	0.96	0		0.96	101	0.04	101
2001	4	1.68	0		1.68	91	0.07	91
2008	5	1.92	0.72	77	1.2	91	0.02	105
2023	2	0.44			0.44	98	0.44	98

Table 7. Species, number, and size of fish stocked into Bixhoma Lake since 1967.

Date	Species	Number	Size
1967	Walleye	3,300	
1969	Northern Pike	1,000	
1969	Channel Catfish	2,500	
1969	Largemouth Bass	2,500	Fry
1969	Bluegill Sunfish	2,500	
1971	Northern Pike	1,600	
1971	Walleye	1,580	3.5 inches
1971	Walleye	300	5 inches
1973	Channel Catfish	3,000	
1974	Threadfin Shad	10,000	
1976	Channel Catfish	15,000	
1978	Channel Catfish	15,000	4.5 inches
1978	Flathead Catfish	2,500	
1981	Channel Catfish	2,520	5 inches
1982	White Crappie	10,000	
1982	Channel Catfish	3,160	10 inches
1985	Channel Catfish	2,000	7 inches
1986	Largemouth Bass	3,600	
1986	Channel Catfish	8,066	
1987	Channel Catfish	8,000	5 inches
1988	Channel Catfish	3,040	5 inches
1989	Grass Carp	86	8 inches
1989	Channel Catfish	4,800	4.5 inches
1991	Florida Largemouth Bass	74,000	1 inch
1991	Florida Largemouth Bass	36,000	1.25 inches
1994	Florida Largemouth Bass	104,000	fry
1996	Threadfin Shad	250	
1996	Threadfin Shad	250	
1997	Threadfin Shad	250	
1998	Threadfin Shad	300	
1998	Threadfin Shad	350	
1998	Threadfin Shad	2,200	4 inches
1998	Threadfin Shad	4,535	7 inches
1998	Florida Largemouth Bass	2,200	3 inches
1999	Florida Largemouth Bass	2,550	3 inches
2000	Channel Catfish	4,400	7 inches
2001	Channel Catfish	3,080	4 inches

2001	Channel Catfish	2,189	7 inches
2002	Channel Catfish	4,410	6.5 inches
2004	Threadfin Shad	500	
2004	Florida Largemouth Bass	2,200	3 inches
2011	Threadfin Shad	800	
2012	Threadfin Shad	3,000	
2013	Threadfin Shad	2,000	
2014	Threadfin Shad	2,000	
2015	Threadfin Shad	2,500	
2016	Threadfin Shad	4,500	
2016	Florida Largemouth Bass	15,015	1.5 inches
2017	Threadfin Shad	2,000	3 inches
2018	Threadfin Shad	3,000	2 inches
2018	Threadfin Shad	250	5 inches
2018	Florida Largemouth Bass	19,430	1.5 inches
2019	Florida Largemouth Bass	30,450	1.5 inches
2020	Threadfin Shad	2,000	3 inches
2020	Florida Largemouth Bass	30,495	1.5 inches
2021	Gizzard and Threadfin Shad	3,800	3 inches
2023	Gizzard and Threadfin Shad	1,000	3 inches
2023	Gizzard and Threadfin Shad	2,000	3 inches
2023	Florida Largemouth Bass	30,989	1.5 inches
2024	Gizzard and Threadfin Shad	3,000	3 inches