SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

BRUSHY (SALLISAW CITY) LAKE

2024

SURVEY REPORT

State: Oklahoma

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations – Brushy Lake

Period Covered: 1 January 2024 – 31 December 2024

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BRUSHY LAKE

ABSTRACT

Brushy Lake was sampled in 2024 using spring boat electrofishing to evaluate Largemouth Bass populations for abundance and condition. Largemouth Bass abundance was above the threshold for a quality fishery with a CPUE of 75.0 with 30.67% of fish ≥16 inches. Relative weights for fish ≥14 inches (W_r = 92) was above minimum acceptable value (W_r = 90), but smaller size groups were below the minimum value. Brushy also contains a fishable population of Spotted Bass with a CPUE of 22.0.

Recommendations include investigating the crappie population by trap netting for age and growth in the fall of 2025, Channel Catfish populations via baited summer hoop netting in 2025, and Largemouth Bass populations by spring electrofishing in 2027. Threadfin shad should be stocked as a supplemental forage on a 3-year rotation. Habitat enhancement occurred in 2021 and should be refurbished every 3 to 4 years, with buoys checked annually.

INTRODUCTION

Brushy Lake (aka, Sallisaw City Lake) is located 3 kilometers north of the city of Sallisaw in Sequoyah County, Oklahoma, and is an impoundment of Brushy Creek. The lake was constructed in 1964 by the city of Sallisaw as a water supply. Brushy Lake covers 270 surface acres, has a mean depth of 3 meters, and a maximum depth of 14 meters. The main pool is turbid and has a secchi disk reading of about 31 inches. Turbidity is primarily due to plankton. Fish habitat consists mainly of water willow which encircles perimeter along with pond lily, pondweed, primrose, rush and buttonbush on the margins mostly occurring in the upper end with the lower lake having steep, rocky shorelines. Popular fish species include largemouth bass, spotted bass, channel and flathead catfish and crappie. Recent habitat improvements include the addition of 7 brush pile locations consisting of approximately 29 cedar trees in total. Three of these habitat sites are marked with buoys. The remaining sites were marked with GPS coordinates and the information will be uploaded to the ODWC website. Facilities include a small boat ramp, floating courtesy dock, fishing dock, parking lot and picnic tables. There is park owned and run by the city of Sallisaw where some camping is available for a fee; see city website for details (http://www.sallisawok.org/243/Brushy-Lake-Park).

In 2024, Brushy Lake was sampled using spring electrofishing to evaluate Largemouth Bass populations for abundance and condition.

RESULTS

Largemouth Bass

1. Largemouth Bass abundance from spring boat electrofishing in 2024 (C/f = 75.0) was up from the previous sample in 2021 (C/f = 47.14; Table 1, Figure 1) indicating that the lake contains a quality fishable population.
2. Relative weights (W_r) were poor for all size groups less than 14 inches but acceptable for fish ≥ 14 inches (W_r = 92; Table 1) indicating limited forage availability for fish < 14 inches.
3. Length frequencies for Largemouth Bass collected by spring electrofishing in Brushy Lake have shown a shift to larger fish represented in the population than previous samples (Figure 5). Anglers have better opportunities to catch quality (12-15 inches), preferred (15-20 inches), and memorable (20-25 inches) size fish.

RECOMMENDATIONS

Fish Attractor Structures

1. Habitat structures should be refurbished every three to four years and buoys checked annually. Shelbyville Cubes will be constructed and placed in 2025, or as soon as materials are made available.

Fish Stockings

1. No new sportfish fish stockings are recommended at this time.
2. If W_r values for Largemouth Bass continue to decline, then additional shad stockings will be considered to increase forage availability.

Fish Surveys

1. Spring boat electrofishing surveys should be conducted every three to four years as conditions allow to continue monitoring changes in the overall black bass populations and to monitor impact of new statewide bass regulations that were passed in 2022.
2. Age data from Largemouth Bass should be taken as needed to monitor growth rates within the lake.

Fishing Regulations

1. Fishing regulations for Brushy Lake follow statewide regulations for all species.
2. No new regulation changes are recommended at this time.

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 Brushy Lake. 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
1987	88	13.04	1.92	83	8.6	81	1.04	89	1.48	92		
1990	103	34.45	8.5	89	6.5	94	12.4	83	5.5	85		
1992	113	64.57	27.43	88	26.9	82	10.3	86	4.0	88		
1994	105	84.0	41.6	89	29.6	88	12.8	81	3.2	81		
1997	100	100.0	38	91	32.0	88	30.0	77	2.0	91		
1998	102	68.0	29.33	89	24.7	85	14.0	83	4.0	82		
1999	97	64.67	13.33	91	14.0	83	37.3	84	12.7	84		
2005	149	99.3	36.0	85	54.0	89	4.0	83	1.33	76		
2008	185	123.0	62.6	87	101.3	86	1.46	88	1.3	91	0.7	99
2014	101	60.6	11.2	81	12.0	84	31.8	90	20.4	94	1.8	99
2018	81	81.0	15	77	32.0	76	31.0	90	16.0	91	1.0	102
2021	55	47.14	12.86	86	19.71	89	12.0	96	5.14	100	0.86	97
2024	75	75.0	16.0	86	18.0	84	33.0	92	23.0	94	1.0	101

Table 2. Total catch per unit effort (CPUE; C/f) for Largemouth Bass collected by spring electrofishing from Brushy Lake, 2018 – 2024 (OFAT analysis).

Year	**Mean**	**Count**	**RSE**	**SE**	**L 95% CI**	**U 95% CI**	**N RSE = 12.5 (25% range)**	**N RSE = 20 (40% range)**
2018	81.0	6	11.6	9.4	62.6	99.4	5	2
2021	55.0	6	31.2	17.1	21.4	88.6	37	15
2024	75.0	6	23.4	17.5	40.7	109.3	21	8

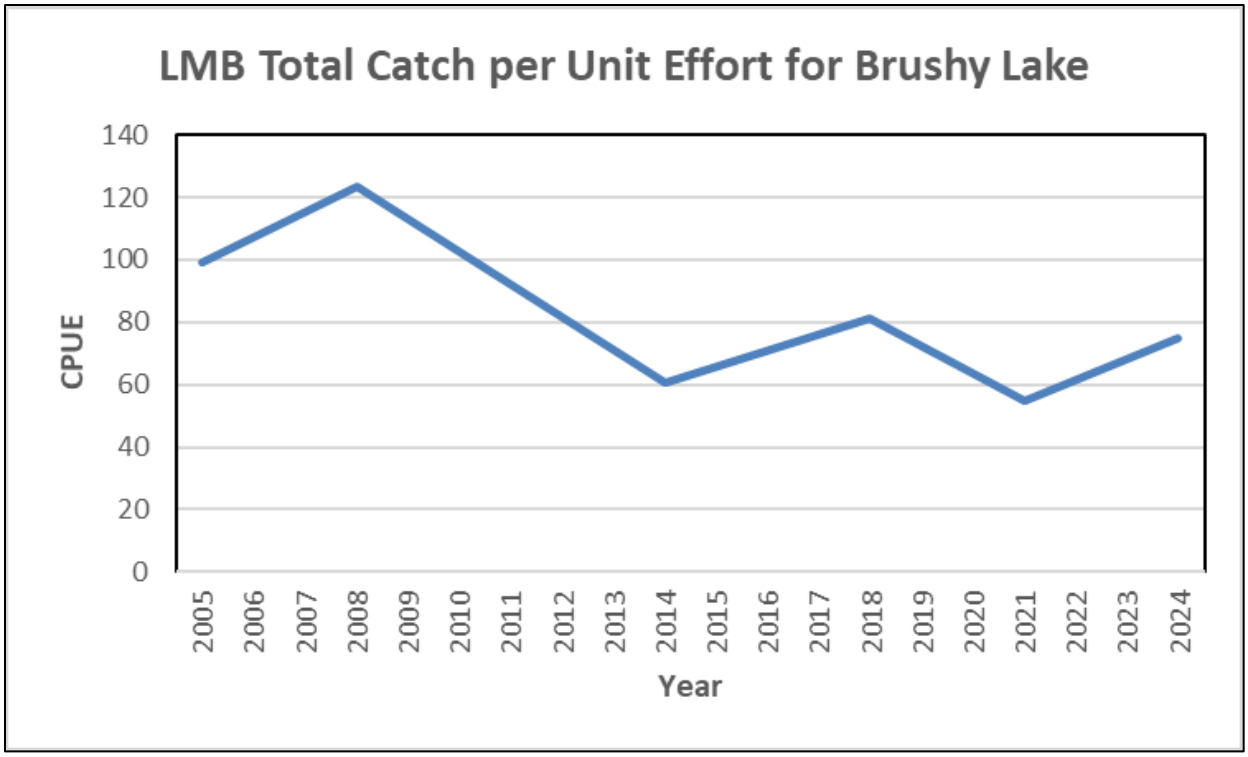

Figure 1. Total catch per unit effort (CPUE; C/f) for Largemouth Bass in Brushy Lake from spring electrofishing surveys from 2005-2024.

Table 3. Catch per unit effort (CPUE; C/f) by size category for Largemouth Bass collected by spring electrofishing from Brushy Lake, 2018 (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)
LMB	substock	15.0	17.13	2.6	10.0	20.0	11	4
LMB	stock	24.0	12.9	3.1	17.9	30.1	6	2
LMB	quality	21.0	17.7	3.7	13.7	28.3	12	5
LMB	preferred	18	24.1	4.4	9.4	26.6	23	9
LMB	memorable	3.0	68.3	2.1	-1.0	7.0	179	70
LMB	trophy	0.0						

Table 4. Catch per unit effort (CPUE; C/f) by size category for Largemouth Bass collected by spring electrofishing from Brushy Lake, 2021 (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)
LMB	substock	15	55.4	8.3	-1.3	31.3	118	46
LMB	stock	14.0	34.4	4.8	4.6	23.4	45	18
LMB	quality	17.0	26.4	4.5	8.2	25.8	27	10
LMB	preferred	7.0	67.9	4.8	-2.3	16.3	177	69
LMB	memorable	2.0	63.3	1.3	-0.5	4.5	154	60
LMB	trophy	0.0						

Table 5. Catch per unit effort (CPUE; C/f) by size category for Largemouth Bass collected by spring electrofishing from Brushy 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)
LMB	substock	16	42.3	6.9	2.5	29.5	71	28
LMB	stock	11	29.6	3.3	4.6	17.4	34	13
LMB	quality	19	22.2	4.2	10.7	27.3	19	7
LMB	preferred	26.0	18.5	4.8	16.6	35.4	13	5
LMB	memorable	3.0	68.3	2.1	-1.0	7.0	179	70
LMB	trophy	0.0						

Table 6. Mean length at age for Largemouth Bass caught by boat electrofishing for Brushy Lake.

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8
2018	6.74	10.28	13.323	15.13	17.23	18.5		19.25
2021	7.3	11.13	13.14		15.35	18.59		21.65

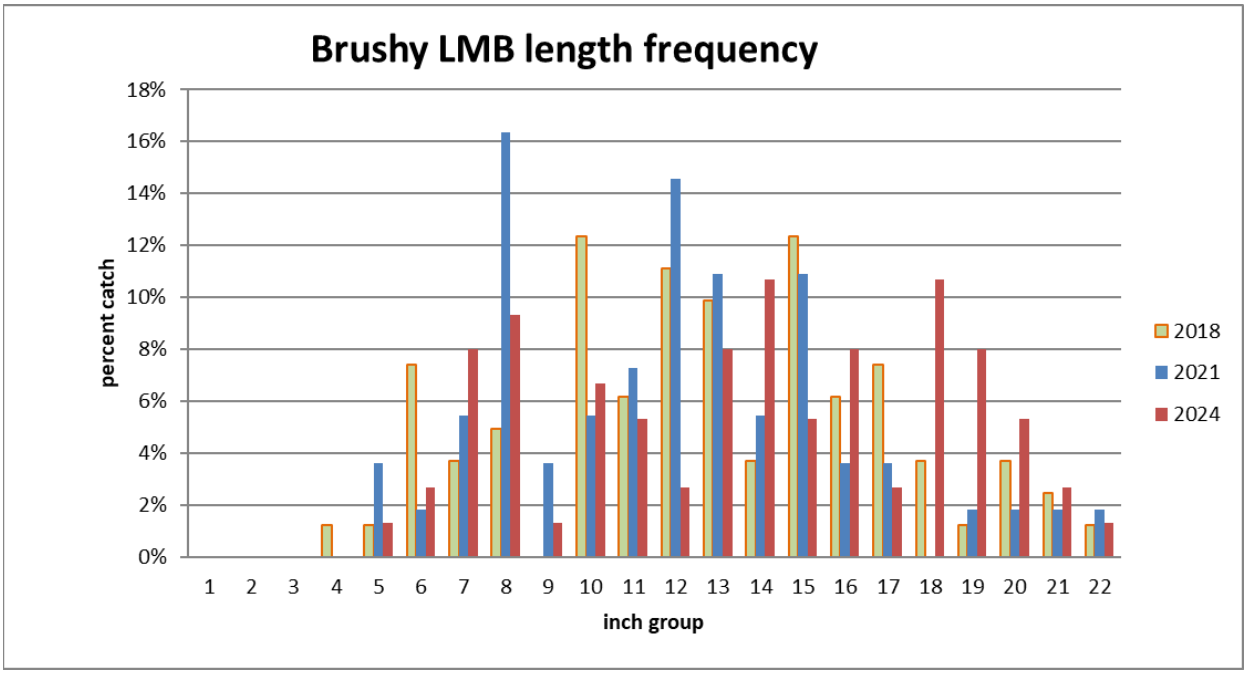

Figure 5. Length frequencies for Largemouth Bass collected by spring electrofishing in Brushy Lake, 2018-2024

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

Date	Species	Number	Size
2000	Channel catfish	7250	7
2001	Channel catfish	7180	7
2002	Channel catfish	7315	6.25
2006	Threadfin Shad	200	4
2006	Gizzard Shad	50	7
2011	Threadfin Shad	1000	3
2018	Channel catfish	14448	7
2020	Channel catfish	14420	7
2021	Channel catfish	14430	7