

SURVEY REPORT
OKLAHOMA DEPARTMENT OF WILDLIFE
CONSERVATION



FISH MANAGEMENT SURVEY AND
RECOMMENDATIONS
FOR
STILWELL CITY LAKE
2024-2025

SURVEY REPORT

State: Oklahoma

Project Title: Stilwell City Lake Fish Management Survey Report

Period Covered: January 1, 2024 – December 31, 2025

Prepared by: Chris Whisenhunt

Date Prepared: December 2025

Stilwell City Lake

ABSTRACT

Stilwell City Lake was surveyed by fall trap netting in 2025 to monitor trends in fish populations. Survey results indicate a low abundance of Black Crappie ($C/f = 1.07$, No. = 18) which was similar to 2022 sample ($C/f = 0.9$, No. = 15), and no White Crappie have been sampled in the lake. These samples are a dramatic decline from the 2019 survey ($C/f = 10.0$, No. = 145). Condition, age, and growth measurements are calculated and included in this report, but from such a small sample, management implications are difficult to determine. Stillwell Lake has a high abundance of bullhead catfish that may be impacting the overall Crappie population, possibly by outcompeting for resources and by predation on juvenile crappie. Additional sampling should be done every 2-4 years to continue monitoring the population and determine if Crappie is a viable fishery in Stilwell Lake. Stilwell Lake should also be sampled by spring electrofishing to continue monitoring Bass populations and determine if there are any impacts to that fishery.

In 2025, seven “Shelbyville” cube habitat structures were placed within the lake. Locations for each structure are included in Table 9.

Recommendations include monitoring the bass and crappie populations through surveys planned for 2026 (spring electrofishing) and 2028 (fall trap netting). Habitat enhancement should occur on an as needed basis.

INTRODUCTION

Stilwell City Lake (C.J. Carson Lake) is located southwest of Stilwell in Adair County, Oklahoma, approximately 5 miles west on state highway 100 and 1 mile south. The lake covers 188 surface acres, has an average depth of 16.8 ft. and drains a watershed of 7.34 square miles (4,697 acres). The dam was constructed in 1965 on an unnamed tributary to Sallisaw Creek and is located in Section 24, Township 15 North, Range 24 East of the Indian Meridian. The lake was built for water supply, flood control, and recreation and is owned by the city of Stilwell. Water quality measurements show some stratification occurs in the summertime and is usually around 4 meters. The OWRB BUMP report classifies the lake as eutrophic with a TSI of 54 and is phosphorus limited. It has a stable water level and is encircled with water willow. Other aquatic vegetation includes *Potamogeton spp.*, cattail, primrose, and filamentous algae. Annually, in the spring, Stilwell utilities treat the lake with copper sulfate to control algae growth. The lake does receive pressure from locals and is known for its healthy bluegill and red ear populations.

Fish habitat consists of a ring of water willow around the lake and numerous submerged aquatic macrophytes, riprap at the dam and multiple ODWC habitat enhancement sites (Appendix I). In June of 2019, 500 triploid grass carp were stocked to help control submerged vegetation and were purchased by the city of Stilwell. Stilwell's recent stockings can be seen in Appendix II.

Public facilities include two boat ramps and multiple areas with shoreline access. Anglers are limited to pole and line fishing only and internal combustion engines are prohibited except for Stilwell High School team anglers during practice fishing (personal communication Adair County game warden).

RESULTS

Largemouth Bass

1. Largemouth Bass (LMB) were surveyed in spring of 2023 by means of boat electrofishing. Randomly selected shoreline units were sampled in discrete 10-minute units of effort. Largemouth abundance measure as catch per unit effort (CPUE) was moderate to high with a catch rate of 129.6 bass/hr. This CPUE was similar to the 2020 spring sample but still well below the 2017 CPUE (Table 1, Figure 1). The highest catch rate fell into the preferred category, indicating a shift in the population to larger individuals (Table 2).
2. Body condition, measured as relative weight (W_r), shows Stilwell bass to be above acceptable levels in all size categories except fish less than 8 inches (200 mm; Table 1).
3. Proportional Size Distribution (PSD) values were slightly above the balanced range for quality and preferred sized fish (Table 3). Length Frequencies also show the shift to larger individuals with 46% of the sampled bass measuring ≥ 14 inches (Figure 2).
4. LMB growth was moderate with 4-year-old fish averaging 16" in length, then growth rates slowing way down at 5 years of age and beyond (Table 4).
5. Age frequencies show good age 1- and 2-year classes with distribution tapering off from there. The oldest fish aged 12 years (Figure 3). The largest bass sampled was 19.9 inches long and weighed 4 lbs.

Crappie

1. Stilwell Black Crappie were sampled using fall trap netting in 2025. Eight shoreline sites were selected and were fished for 18-24 hours. Crappie abundance measured as catch per unit effort (CPUE) was very low at 1.07, which was significantly lower than the 2019 trap netting survey (Tables 5 and 6).
2. Body condition, measured as relative weight (W_r) was above satisfactory levels at 93, except for fish ≥ 12 inches, where W_r was less than satisfactory at 84. (Tables 5 and 6).
3. Crappie length frequencies show that the 2025 sample was dominated by the 10-inch group that comprised over 70% of the sample (Figure 4).
4. Age and growth show fast growing one-year-old fish (Table 7, Figure 6). Age frequencies show that most of the catch was made up of one-year-old fish (Figure 5). The 2019 sample was dominated by 2-year-old fish, and the catch rates of that sample were much higher. The large 2-year-old class from the 2019 sample must have had a large die-off before the 2022 sample resulting in low catch rates and only younger fish being caught.
5. The low abundance of crappie has led to good growth rates and body condition. The high population of Bullhead Catfish may have a negative impact on the Crappie populations due to increased competition for resources and possible predation on juvenile Crappie by the Bullheads. Stilwell crappie should be monitored via fall trap netting in 2028 to determine if the population has rebounded or if the lake can sustain a viable Crappie fishery.

RECOMMENDATIONS

Fish Attractor Structures and Habitat

1. Artificial habitat structures (Shelbyville Cubes) were placed in the lake in 2025 (Table 9).
2. Structures and buoys should be inspected every two to three years to determine if anything becomes damaged or needs replaced.

Fish Stockings

1. Most recent fish stockings are listed in Table 10
2. No new stockings are currently recommended.

Fish Surveys

1. Spring boat electrofishing surveys for Largemouth Bass should be conducted in 2026 to evaluate population abundance and condition.
2. Fall trap netting should be conducted in fall of 2028 to continue monitoring Crappie population age and growth.
3. Population assessment of Bullhead Catfish should be considered to help determine potential impact on Largemouth Bass and Crappie populations.

Fishing Regulations

1. City regulations state that anglers are limited to pole and line fishing only and internal combustion engines are prohibited except for Stilwell High School team anglers during practice fishing (personal communication with Adair County game warden).
2. No new regulations are currently recommended.

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

Year	Total (<40)		<200 mm (15-45)		200-330 mm (15-30)		≥ 300 mm (≥ 15)		≥ 356 mm (≥ 10)		≥ 406 mm (≥ 10)	
	No.	C/f	C/f	Wr	C/f	Wr	C/f	Wr	C/f	Wr	C/f	Wr
1995	134	89.3	24.7	90	44.7	85	35.3	82	12.0	80	0.07	93
1997	135	135.0	67.0	94	39.0	92	44.0	86	21.0	85	6.0	87
1999	116	154.7	32.0	89	56.0	93	86.7	87	48.0	86	17.3	84
2004	204	136.0	26.7	99	94.7	90	20.0	85	12.7	86	6.0	87
2009	140	80.0	18.9	87	49.7	84	-	-	8.0	88	2.8	91
2014	554	277.0	129.0	81	136.5	82	24.5	90	9.0	93	6.0	95
2017	47	94.0	38.0	76	14.0	82	46.0	93	34.0	94	22.0	94
2020	126	126.0	20.0	86	40.0	90	80.0	94	56.0	94	21.0	94
2023	108	129.6	40.8	76	22.8	94	73.2	97	60.0	96	38.4	97

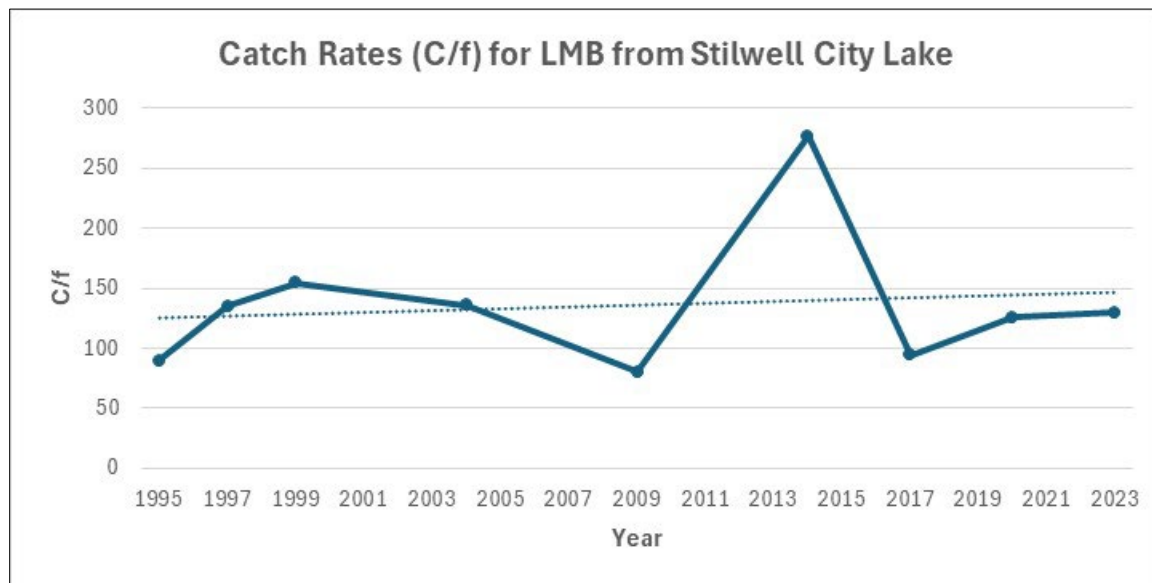


Figure 1. Total catch rate (C/f) trend data for Largemouth Bass (LMB) collected from Stilwell City Lake. Dashed line represents overall C/f trend.

Table 2. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of **Largemouth Bass** collected by spring electrofishing from Stilwell City Lake. Acceptable Wr values are ≥ 90 (OFAT analysis).

		Substock		Stock		Quality		Preferred		Memorable		Trophy	
		Total	0-7.8 in	7.9 in		11.8 in		15 in		20.1 in		24.8	
Year	No.	CPUE	CPUE	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
2017	451	270.6	98.4	100.8	93.7	67.2	87.4	3.6	95.4	0.6	86.4	.	.
2020	126	126	20	24	90.3	41	95	39	93.2	2	89.8	.	.
2023	108	129.6	40.8	10.8	93.8	28.8	100.3	49.2	94.2	.	.	.	.

Table 3. Largemouth Bass Proportional Stock Densities Stilwell City Lake (OFAT analysis).

Year	PSD-Q	PSD-P	PSD-M	Balanced PSD Values	
2017	39	2	-	PSD-Q	40-70
2020	77	39	2	PSD-P	10-40
2023	88	55	-	PSD-M	0-10

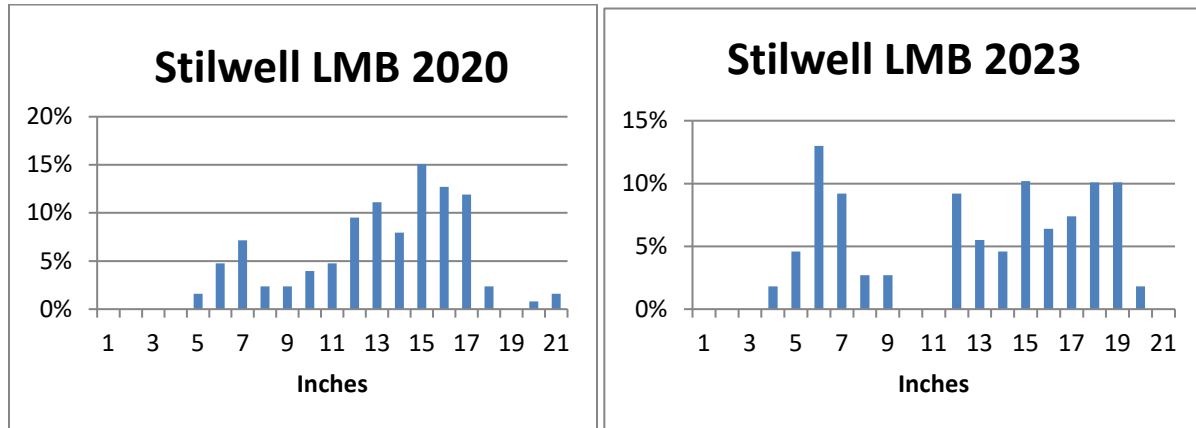


Figure 2. Largemouth Bass Length Frequency Histograms Stilwell City Lake.

Table 4. Largemouth Bass Mean Length at Age Stilwell City Lake.

Year	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 12
1993	9.8	11.3	13.3	-	-	-	-	-	-	-
1994	6.1	-	-	-	-	-	-	-	-	-
1999	9.1	11.9	13.8	15.1	17.3	14.0	-	-	-	-
2009	6.6	10.0	12.4	14.4	14.6	-	-	-	-	-
2017	6.9	10.6	12.3	12.1	13.5	-	-	-	-	-
2020	6.57	11.73	14.9	15.34	15.81	15.07	16.1	18.31	-	-
2023	5.71	11.29	12.3	16.1	15.7	16.8	17.2	18.4	15.5	19.9

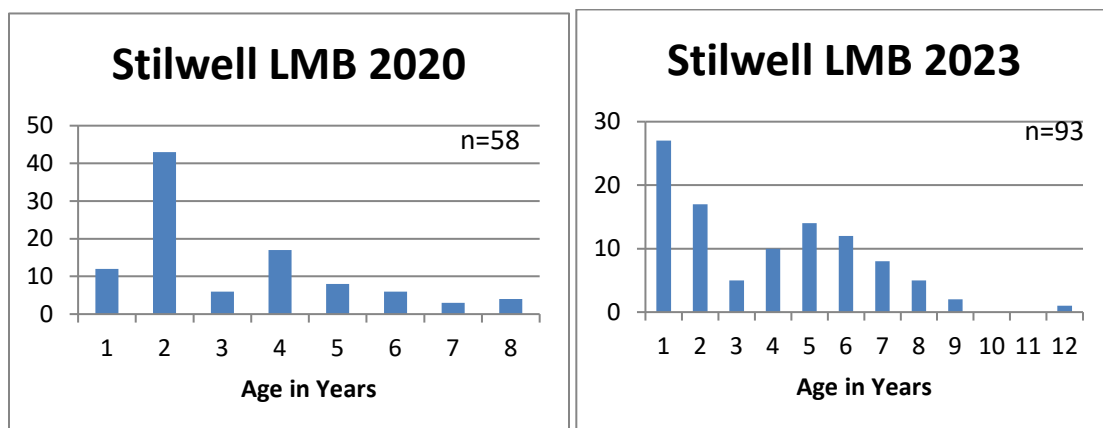


Figure 3. Largemouth Bass Age Frequencies Stilwell City Lake.

Table 5. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by size groups of **Black Crappie** collected by fall trap net from Stilwell City Lake. Acceptable Wr values are ≥ 90 .

Year	Total		<8 inches		≥ 8 inches		≥ 10 inches		≥ 12 inches	
	No.	C/f	C/f	Wr	C/f	Wr	C/f	Wr	C/f	Wr
2019	145	10	0.58	84	9.42	88	3.46	88	0.20	86
2022	15	0.9	-	-	0.93	99	0.81	98	-	-
2025	18	1.07	0.07	93	1.01	93	0.94	93	0.07	84

Table 6. Total number (No.), catch per unit of effort (CPUE), and relative weights (Wr) by **PSD** size groups of **Black Crappie** collected by fall trap net from Stilwell City Lake. Acceptable Wr values are ≥ 90 (OFAT analysis).

Year	No.	Total		Stock 5.1 in		Quality 7.9 in		Preferred 9.8 in		Memorable 11.8 in		Trophy 15	
		CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr	CPUE	Wr
2019	145	10	0.5	85	6.1	87	3.9	88	0.2	86	-	-	-
2022	15	0.9	-	-	-	-	0.9	99	-	-	-	-	-
2025	18	1.07	0.06	93	0.06	92	0.82	93	-	-	0.06	84	-

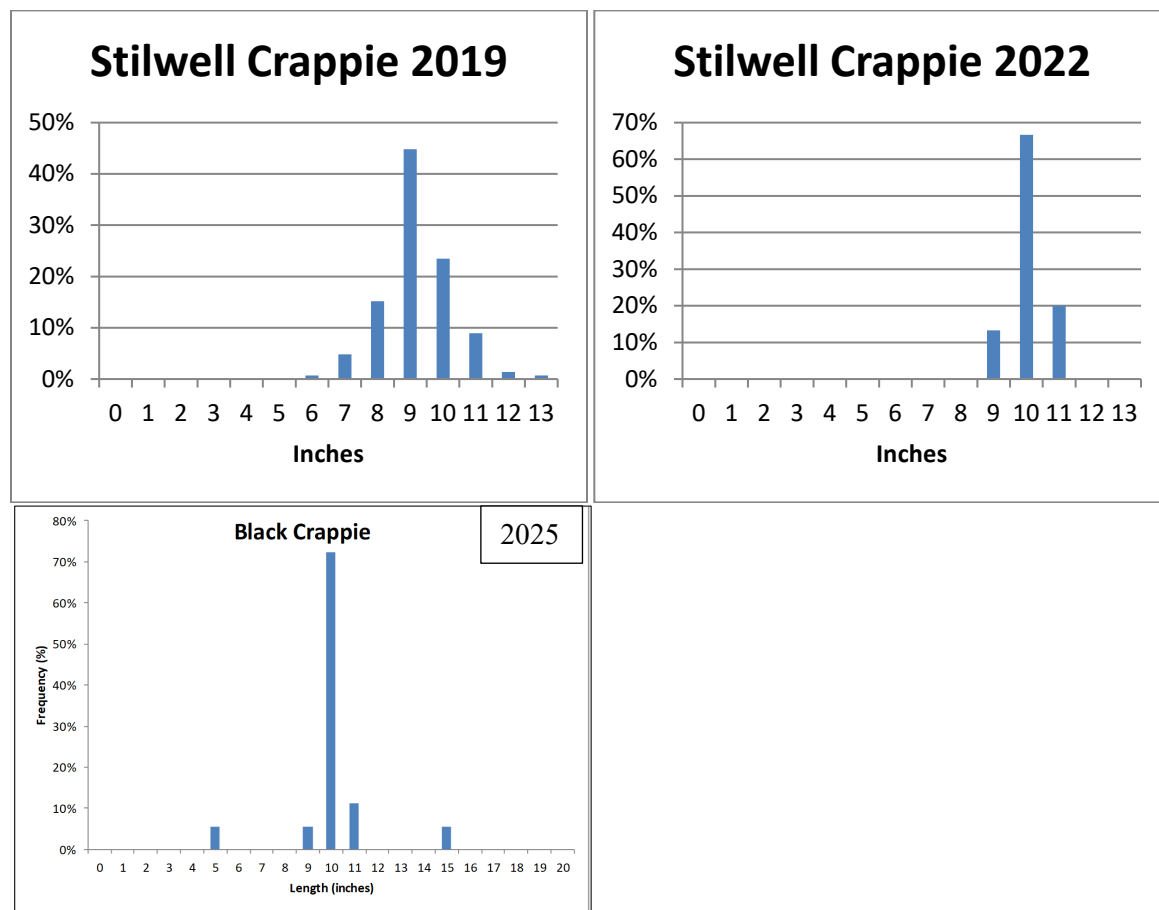


Figure 4. Crappie Trap Net Length Frequency Histogram for Stilwell City Lake.

Table 7. Crappie Mean length at age (inches) for Stilwell City Lake.

Year	Age 1	Age 2	Age 3	Age 4	Age 5
2019	7.8	9.7	10.3	-	13.1
2022	10.1	11.1	-	-	-
2025	10.5	11.1	-	15.0	-

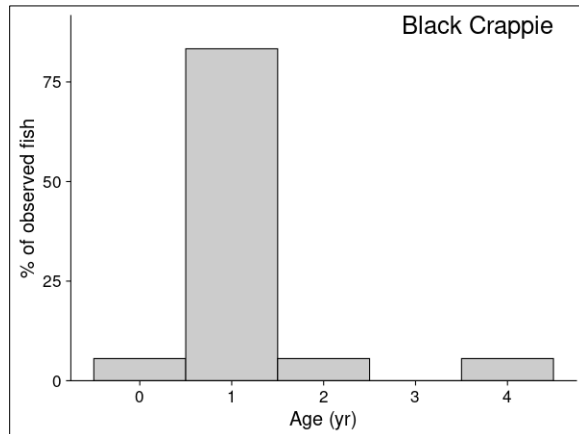


Figure 5. Crappie age frequencies from Stilwell City Lake, 2025.

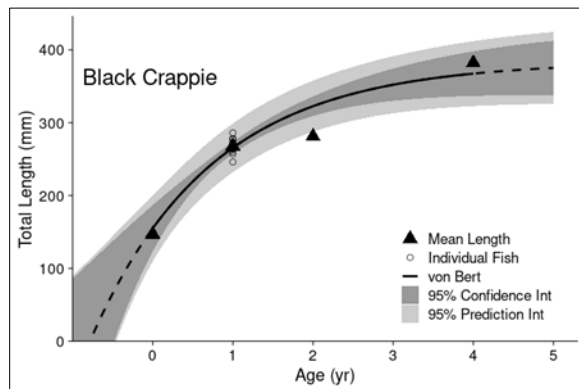


Figure 6. Von Bertalanffy growth curve for Black Crappie sampled from trap netting Stilwell Lake, 2025.

Table 8. Von Bertalanffy growth equation for Black Crappie sampled from trap netting Stilwell Lake, 2025.

	Estimate	<i>L</i> 95% <i>CI</i>	<i>U</i> 95% <i>CI</i>
Linf	383.632	339.4385	460.4075
K	0.660258	0.350125	1.015895
t0	-0.78365	-1.5196	-0.44924

Table 9. ODWC Habitat Enhancement Sites Stilwell City Lake.

Habitat type	Latitude	Longitude	Date installed
2 large trees	35.76502	-94.714122	10/16/2019
1 large cedar	35.76502	-94.714122	10/9/2020
11 cedars	35.76695	94.71011	10/9/2020
2 Shelbyville cubes	35.76693	-94.71013	9/16/2025
3 Shelbyville Cubes	35.76521	-94.7136	9/16/2025
2 Shelbyville cubes	35.76456	-94.7083	9/16/2025

Table 10. Stilwell City Lake Recent Stockings.

Year	Species	Number	Size
2001	Channel catfish	3762	7"
2016	Channel catfish	5000	7"
2019	Triploid Grass Carp	500	8-10"