SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

Stroud City Lake

2024

SURVEY REPORT

State: Oklahoma

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations – Stroud City Lake

Period Covered: 1 January 2024 – 31 December 2024

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Stroud City Lake

ABSTRACT

Stroud City Lake was sampled in 2024 by spring shoreline electrofishing and fall gill netting to assess black bass populations and conditions, channel catfish and crappie condition and population trends, as well as assessment of fish community in the lake. Electrofishing catch rates were well above the threshold for a quality fishery (C/f = 115.0) and far higher than recent samples and dominated by fish between five to 12 inches. Relative weights for fish ≥12 inches, ≥14, and ≥16 was excellent, but fish below 12 inches was below acceptable values. Based on the new sampling data, it is recommended that the City of Stroud strongly consider adopting the new statewide regulations for largemouth bass by allowing the harvest of six Largemouth Bass with only one over 16 inches. This will encourage the harvest of the abundant, smaller fish, while protecting the larger fish from overharvest. Fall gill netting showed similar catch to previous years for channel catfish and white bass. Catch rates increased from 2022 catch but are like previous years.

INTRODUCTION

Stroud Lake impounds the Salt Camp Creek 8 km northeast of Stroud in Creek County, Oklahoma. Stroud Lake covers 240 surface hectares (600 acres) and was constructed in 1970 by the City of Stroud. The lake has a mean depth of 3 meters and a maximum depth of 18 meters, a shoreline development ratio of 0, a water exchange rate of 0.5, and a secchi disk visibility of around 28 inches in the main pool in April. Turbidity is primarily from suspended clay. Fish habitat consists primarily of aquatic vegetation, flooded timber, and rock. The major fisheries are Largemouth Bass, Crappie, and Channel Catfish.

Current city fishing regulations for Stroud Lake are:

Fishing is free with a state fishing permit.

Daily Limits

6 Black Bass
6 Channel Catfish
32 Crappie

Size Restrictions

Flathead Catfish must be 20-inches or longer.
Bass must be 14-inches or longer.

Stroud City Lake was most recently sampled by spring shoreline electrofishing in 2024 to monitor black bass population trends. Other recent samples include fall experimental gill netting in 2022 for pelagic sportfish and shad population monitoring and fall trap netting for Crappie population age, growth, and mortality assessment in 2019.

RESULTS

Largemouth Bass

1. Largemouth Bass were last sampled in spring of 2024 where catch rates (C/f) were well above the threshold for a quality fishery (C/f = 115.0) and far higher than recent samples (Table 1, Figure 1).
2. Relative weights (W_r) for fish less 8 inches and 8-12 inches (W_r = 89 and 85, respectively) was below the acceptable value (W_r ≥90). Relative weights for fish ≥12 inches, ≥14, and ≥16 were excellent (W_r = 102 and W_r = 104 respectfully; Table 1).
3. The large population of fish between 6 and 12 inches indicates a possibility of a couple of large year-classes of fish dominating the population and possibly limiting growth due to competition for resources (Figure 2).
4. Stroud City Lake is scheduled to be sampled again by spring electrofishing in 2026 to continue monitoring largemouth bass population trends.

Crappie

1. Crappie were sampled in 2024 by fall experimental gill netting to determine population trends and condition. Catch rates were significantly higher is 2024 than in 2022. Catch rate (C/f) for crappie in 2024 was 4.04 and only slightly lower than the threshold for a quality fishery (C/f = 4.8) and was similar to previous samples (Table 2, Figure 3). It should be noted that gill net samples are not always the most reliable method for determining overall crappie abundance but an indicator of population trends.
2. Relative weights were adequate for all sizes and overall was 94.29 (Table 2).
3. Crappie were sampled in 2019 by fall trap netting to determine age and growth rates for the population as well as estimated mortality rates. Growth data for crappie show that the fish are growing at a satisfactory rate (Table 4, Figure 5)).
4. Three, four, and five-year-old fish all made up a small portion of the trap net sample which was dominated by two-year-old fish (Figure 7), possibly due to higher harvest of the larger, older fish.
5. White Crappie mortality rates (Figure 6, Table 5) show that natural mortality may be the dominant factor affecting the overall population. Even though there is a large amount of angling pressure and harvest of White Crappie, sample numbers, growth rates, and mortality calculations suggest that current fishing pressure may not be the dominant factor affecting the overall population.

Channel Catfish

1. Channel Catfish were sampled in 2024 by fall experimental gill netting to determine population trends and condition. Catch rates (C/f = 7.05) was above the acceptable value for a quality fishery and consistent with previous samples (Table 6, Figure 8).

2. Relative weights for fish below 12 inches were just below the threshold for acceptable values but consistent with previous samples. Fish ≥12 inches had very good relative weights (Table 6). Overall relative weight was very near average at 88.44.
3. Channel catfish are one of the most sought-after fish in Stroud City Lake and sampling should continue in 2026 to continue monitoring population trends and health.

White Bass

1. White Bass were sampled in 2024 by fall experimental gill netting to determine population trends and condition. Catch rates (C/f) for White Bass in 2024 (C/f = 6.26) were above the minimum requirements for a quality fishery (Table 7, Figure 10), but lower than the previous sample.
2. Relative weights for all size groups other than stock were below the acceptable value (Table 7) and overall were 87.52.
3. White Bass did not appear in samples before 2015 and may have been introduced sometime prior to that. Sampling should continue in 2026 to continue monitoring population trends.

Shad

1. Gizzard Shad were last sampled by experimental gill netting in 2024 to determine population trends. Catch rates for Gizzard Shad (C/f = 1.83; Table 8).
2. Gizzard Shad populations are known to fluctuate dramatically within reservoirs and usually not a concern unless there are multiple consecutive samples with below acceptable catch rates or sportfish populations are suffering from low W_r.
3. Since Gizzard Shad is the dominant forage for most sportfish in Stroud Lake, sampling will continue in 2026 to continue monitoring population trends, especially since the introduction of White Bass as an additional predator competing for forage with other native sportfish.

RECOMMENDATIONS

Fish Attractor Structures

1. If enough Shelbyville Cube structures are available, Stroud City Lake may receive a few to enhance fishing near popular fishing areas.

Fish Stockings

1. No new fish stockings are currently recommended.

Fish Surveys

1. Electrofishing surveys should be conducted in 2026 and again within five years after that to monitor potential changes in the population.
2. Continue with fall experimental gill net surveys twice within the next five years to continue monitoring crappie and Channel Catfish populations.
3. Continue with fall trap net surveys again within the next five years to continue monitoring crappie growth rates and mortality rates.

Fishing Regulations

1. Current regulations for Stroud City Lake are set by the City of Stroud. Fishing regulations from the City of Stroud website are:
    a. ***Fishing is free with a state fishing permit.***
    b. ***Daily Limits***
        i. *6 Black Bass*
        ii. *6 Channel Catfish*
        iii. *32 Crappie*
    c. ***Size Restrictions***
        i. *Flathead Catfish must be 20-inches or longer.*
        ii. *Bass must be 14-inches or longer.*
2. We recommended that the City of Stroud update the black bass regulations to the new statewide regulation:
    a. **Largemouth Bass and/or Smallmouth Bass**
        i. *limit of six (6) fish*
        ii. *only one over 16 inches*
    b. **Spotted bass**
        i. *No limit*
        ii. *No size limit*

    This will help with keeping the bass population in good condition by protecting the larger fish from overharvest and keeping the smaller fish from becoming overpopulated.

3. We recommend the city maintain current regulations on all other species 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 Stroud 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)		8-12 inches (15-30)		≥12 inches (≥15)		≥14 inches (≥10)		≥16 inches (≥10)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1994	174	69.6	12.8	99	50.4	81	6.8	86	4.0	91		
1995	291	77.6	28.267	95	42.13	82	23.73	81	4.0	87		
1998	162	92.57	35.43	97	45.71	85	24.0	86	5.71	89		
2008	202	67.33	11.67	77	33.33	83	39.67	83	6.0	85		
2009	43	14.33	2.0	79	8.0	84	7.0	80	1.67	86		
2016	163	54.33	16.67	81	21.33	84	21.67	85	10.33	88		
2021	150	58.0	5.43	86	40.86	85	18.86	92	9.0	100		
2024	230	115.0	32.0	89	57.50	85	31.0	97	21.0	102	15.5	104

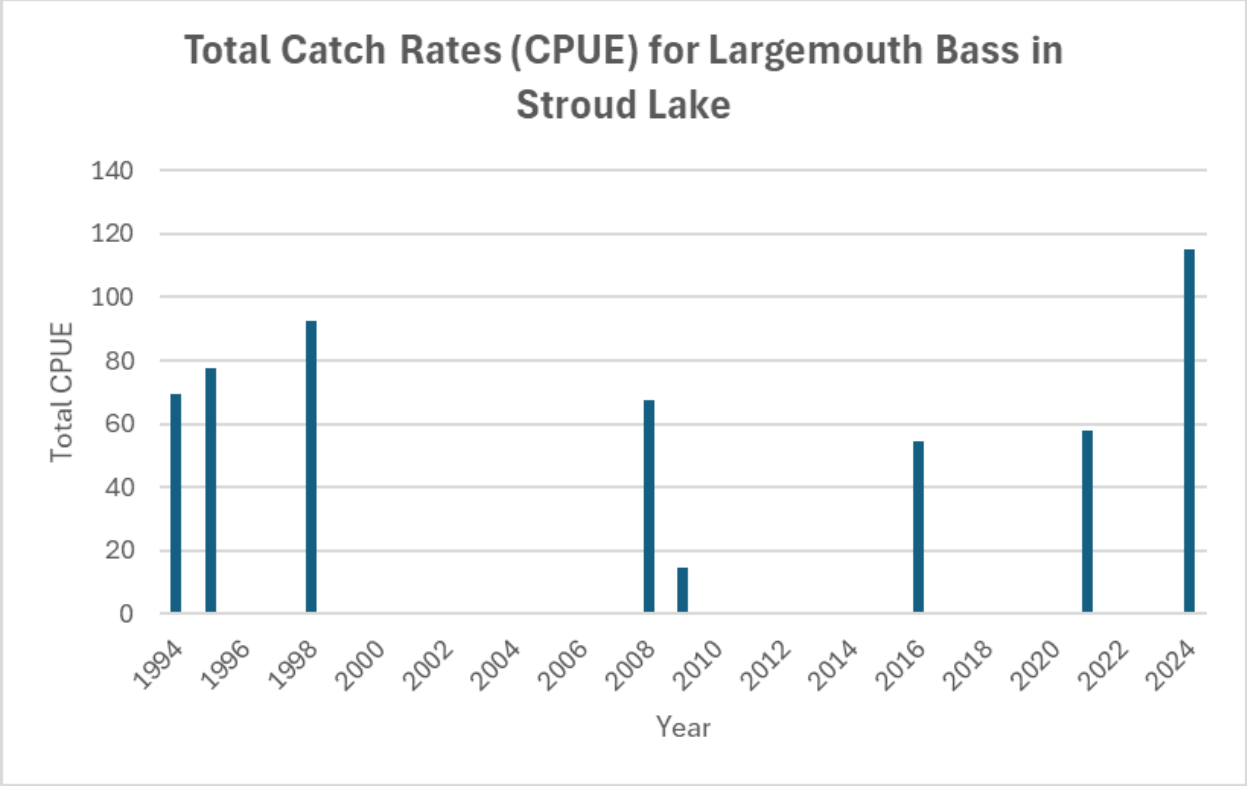

Figure 1. Total catch per unit effort (CPUE; C/f) for **Largemouth Bass** in Stroud Lake from spring electrofishing surveys from 1994 - 2024.

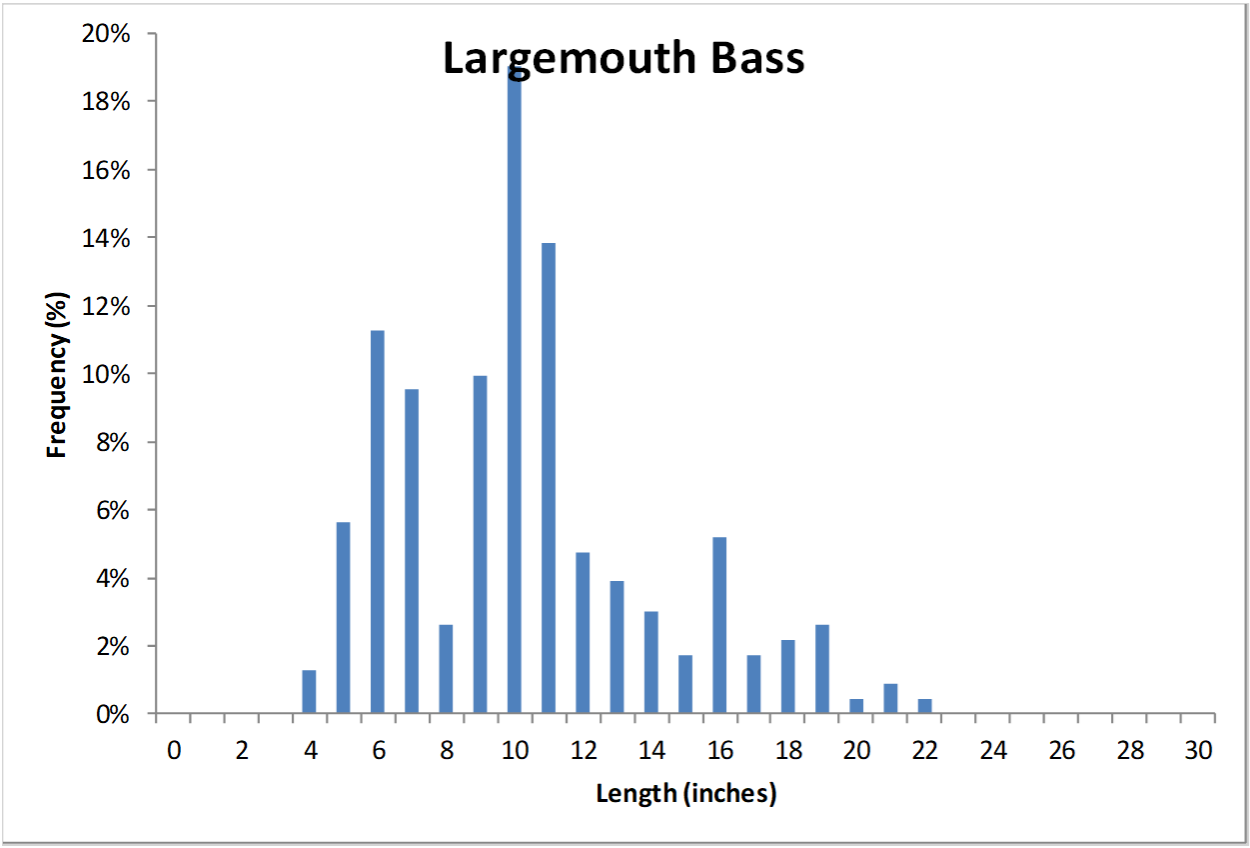

Figure 2. Length frequency plot of largemouth bass from Stroud Lake sampled by spring electrofishing in 2024.

Table 2. Total number (No.), catch rates (C/f), and relative weights (Wr) by size groups of **Crappie** collected by fall gill netting from Stroud Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable Wr values are ≥90.

	Total (≥4.8)			**Stock (1.2-7.2)**		**Quality (1.9)**		**Preferred or larger (>1.0)**	
Year	**No.**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**
2015	19	4.15	91	0.65	97	3.49	89	2.4	89
2019	18	3.76	92	1.25	93	1.88	92	0.63	93
2022	6	1.43	87	0.40	85	0.83	88	-	-
2024	20	4.04	94	1.21	97	1.22	91	.35	93

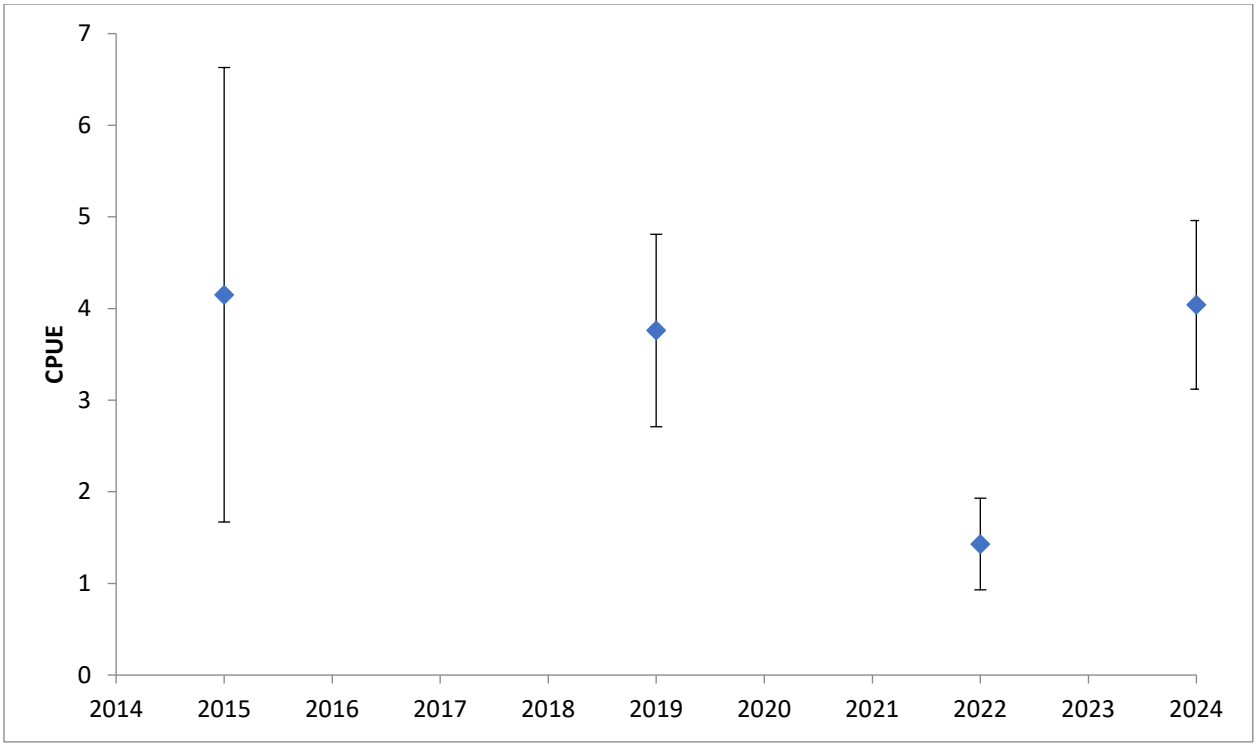

Figure 3. Total catch per unit effort (CPUE) for **White Crappie** in Stroud Lake from fall experimental gill net surveys from 2015 – 2024.

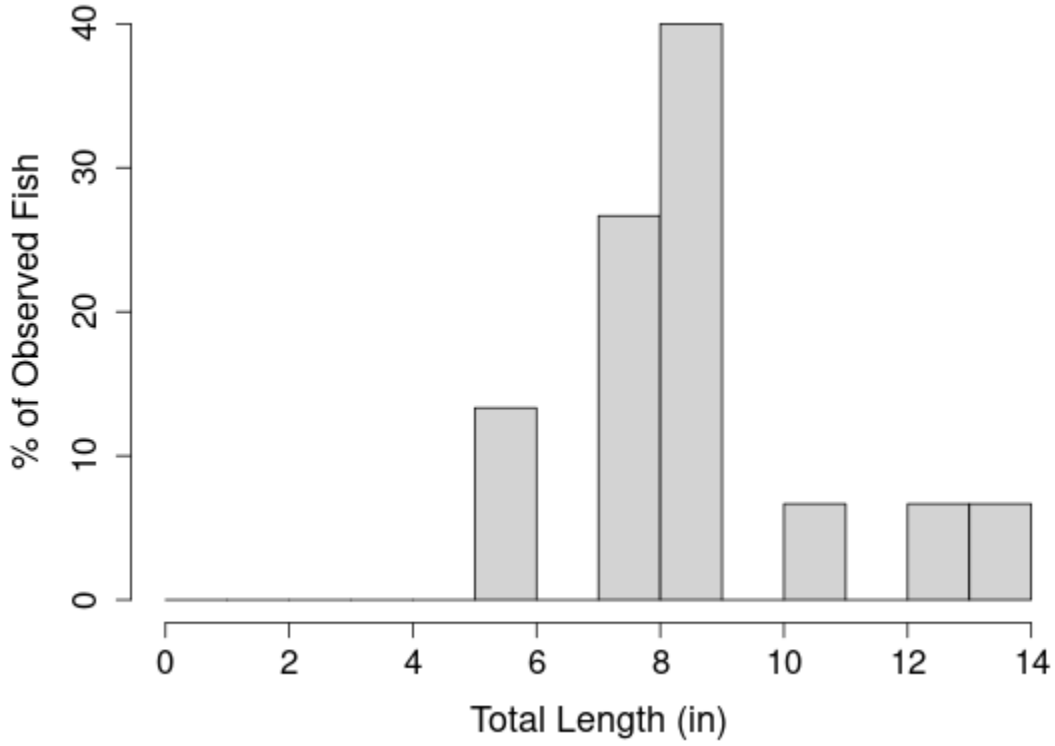

Figure 4. Length frequencies for **White Crappie** collected by fall experimental gill net survey from Stroud Lake in 2024.

Table 3. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **Crappie** collected by fall trap netting from Stroud City Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r 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**
1994	116	7.92	4.28	88	3.7	84	0.24	90
2019	118	5.28	1.92	87	3.36	85	0.96	85

Table 4. Mean length at age of **Crappie** collected from Stroud Lake. Numbers in parentheses represent values for acceptable growth rates.

	Age 1	Age 2	Age 3	Age 4	**Age 5**
Year	(≥160mm) (6.3 inches)	(≥200 mm) (8 inches)	(≥225 mm) (9 inches)	(≥250 mm) (10 inches)	(≥275 mm) (11 inches)
2019	153.2	205.74	243.69	261.25	285.33

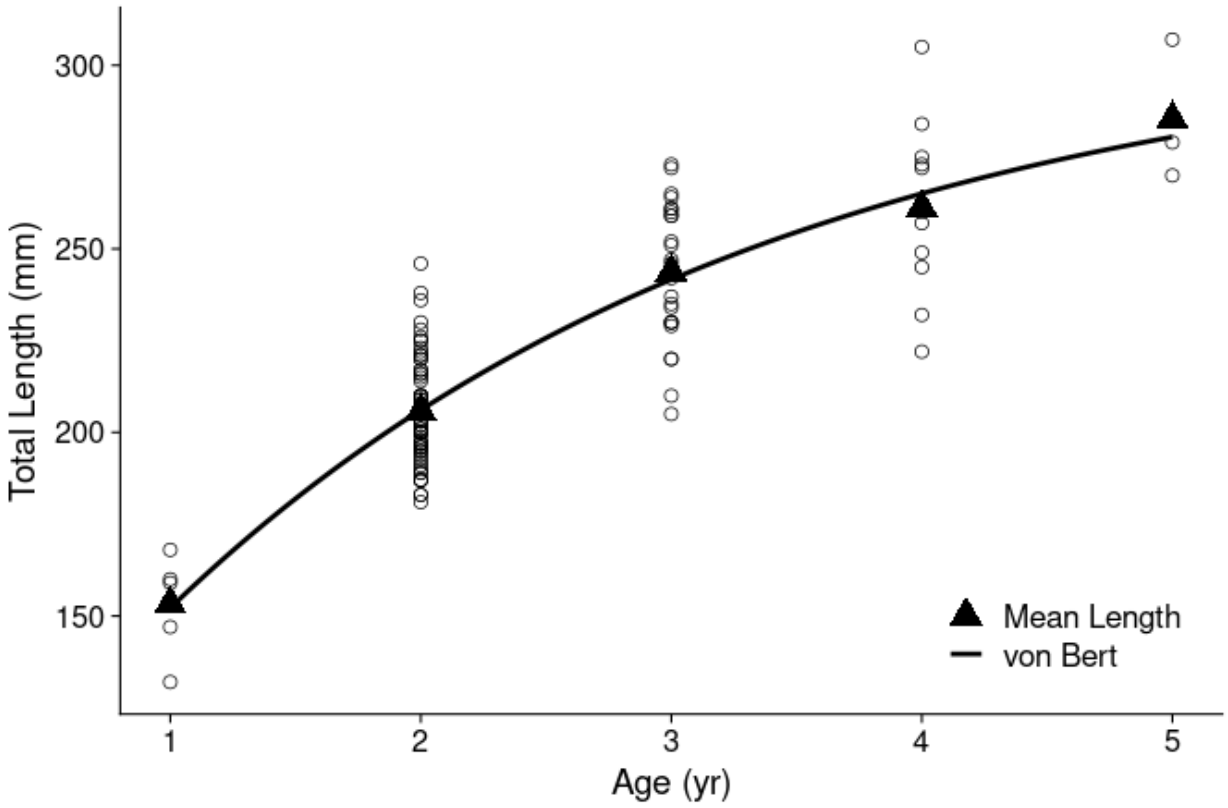

Figure 5. Von Bertalanffy growth plot for White Crappie collected and aged by fall trap net sampling on Stroud Lake, 2019.

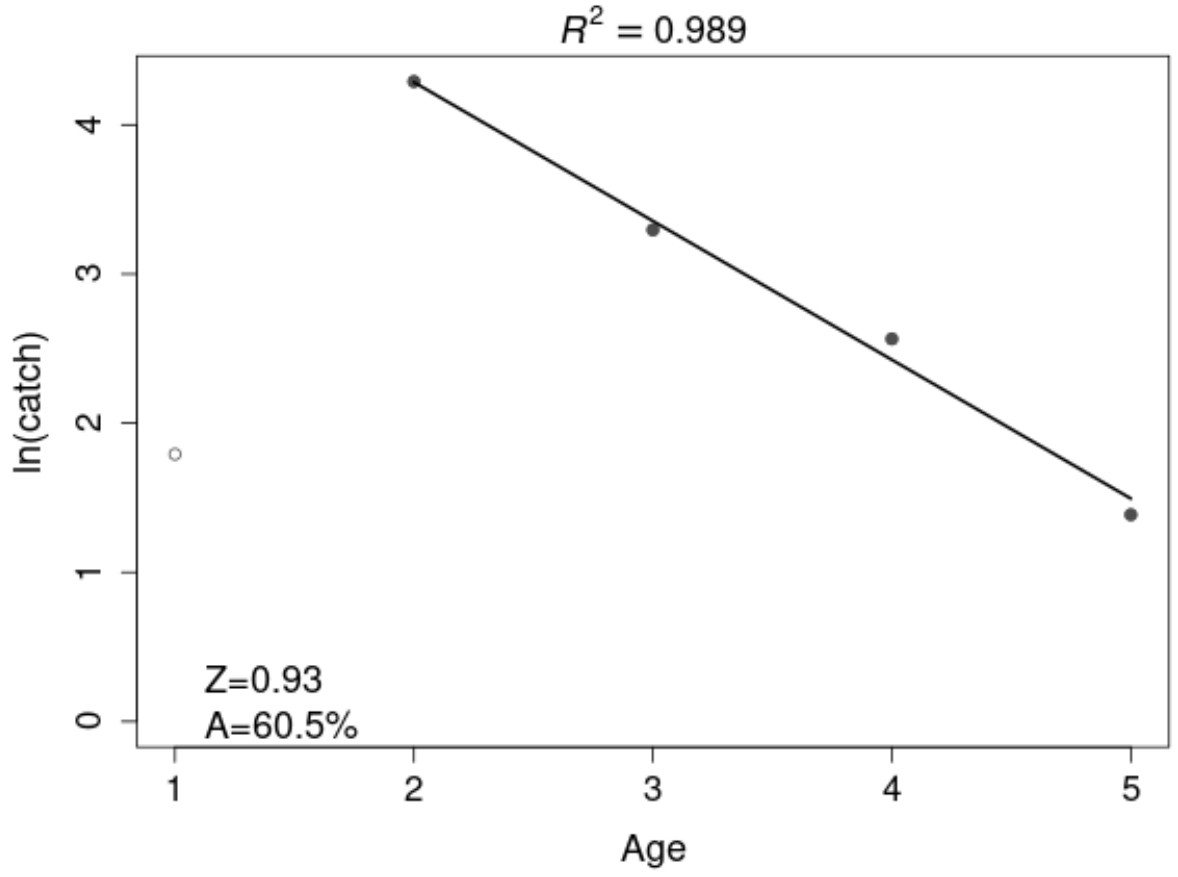

Figure 6. Catch curve plot (mortality) for White Crappie collected by fall trap netting on Stroud Lake, 2019.

Table 5. Estimated natural and fishing mortality rates for White Crappie collected by fall trap netting on Stroud Lake, 2019.

Method	Est. Inst. Nat. Mort (M)	Est. Inst. Fishing Mort. (F)	Instantaneous Total Mort. (Z)	Annualized total Mort. (A)	Est. Annual. Nat. Mort. (v)	Est. Exploitation /Annual. Fish. Mort. (u)
Hoenig NLS (Then et al. 2015)	0.87	0.06	0.93	60.6%	56.6%	3.9%
Pauly NLS-T (Then et al. 2015)	0.70	0.23	0.93	60.6%	45.6%	14.9%

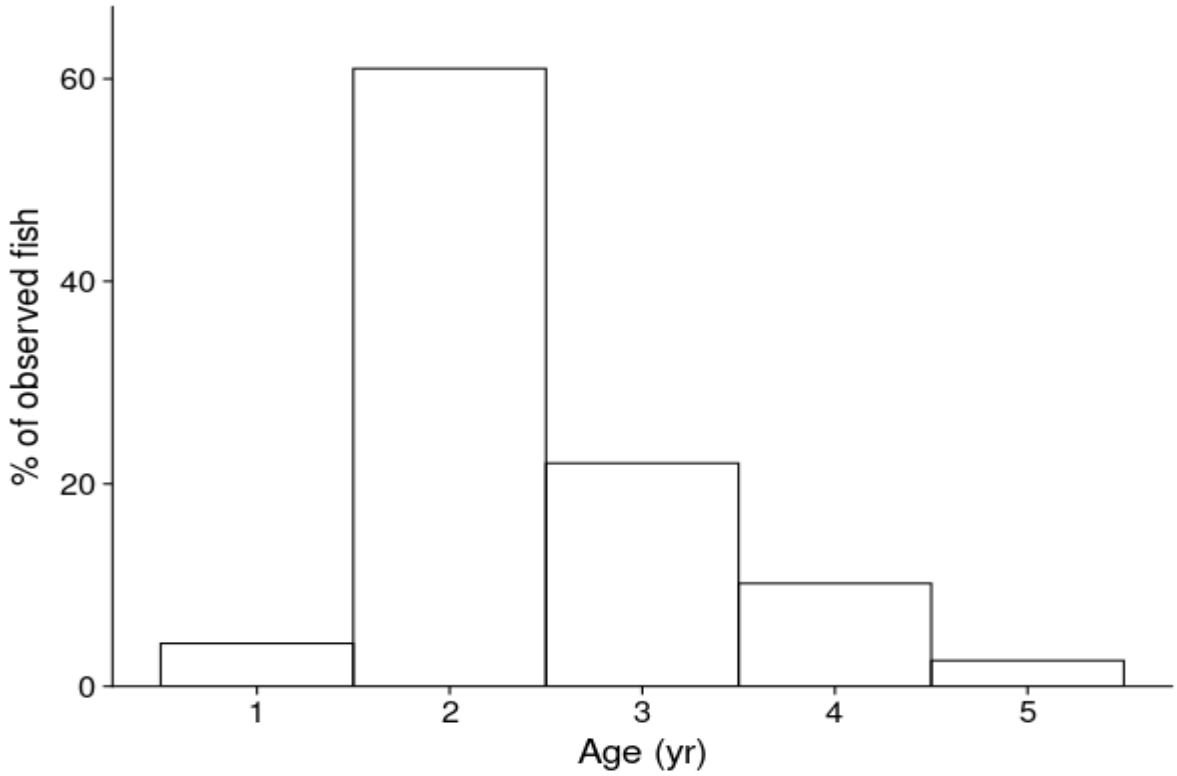

Figure 7. Age frequency histogram for White Crappie collected from fall trap net sampling on Stroud Lake, 2019.

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

	Total (≥4.8)			**Stock (≥2.4)**		**Quality (≥2.4)**		**Preferred or larger (≥1.2)**	
Year	**No.**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**
2015	31	6.76	83	3.93	82	1.31	76	-	-
2019	52	10.85	86	6.26	86	3.76	86	.31	84
2022	34	6.90	92	4.26	91	1.42	98	.61	98
2024	35	7.05	88	4.03	89	2.41	85	-	-

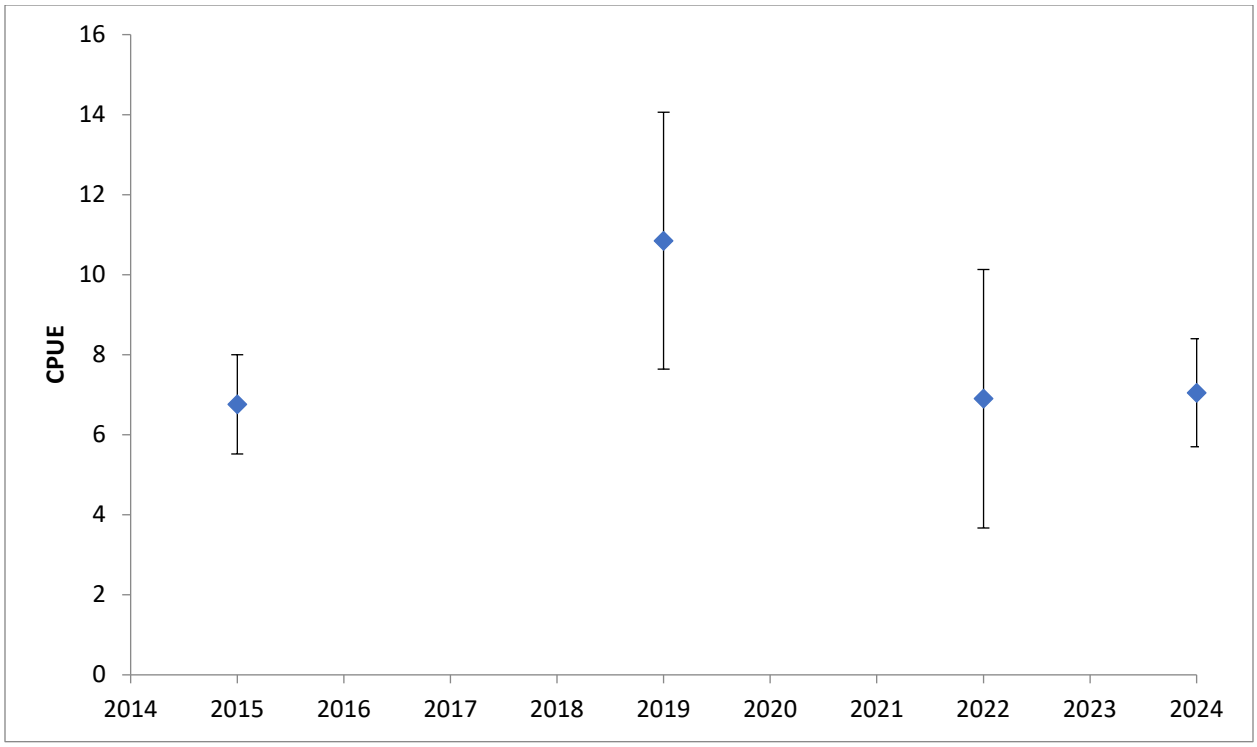

Figure 8. Total catch per unit effort (CPUE) for **Channel Catfish** in Stroud Lake from fall experimental gill net surveys from 2015 – 2024.

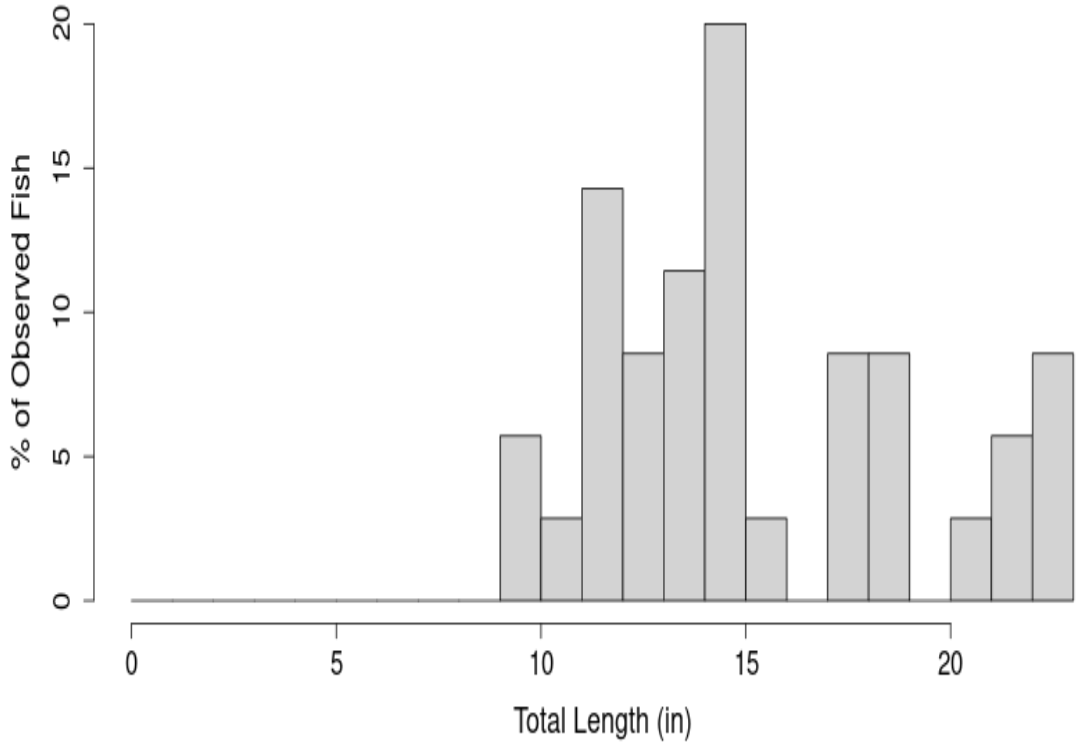

Figure 9. Length frequencies for **Channel Catfish** collected by fall experimental gill net survey from Stroud Lake in 2024.

Table 7. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **White Bass** collected by fall gill netting from Stroud City Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥4.8)			**Stock (1.2-7.2)**		**Quality (1.2-7.2)**		**Preferred or larger (>2.4)**	
Year	**No.**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**
1988									
1997									
2015	87	18.98	85	.65	87	4.58	83	13.31	86
2019	37	7.72	92	1.46	84	.63	82	5.63	94
2022	45	9.18	86	0.41	77	4.30	85	4.06	87
2024	31	6.26	87	.60	101	2.43	86	1.5	85

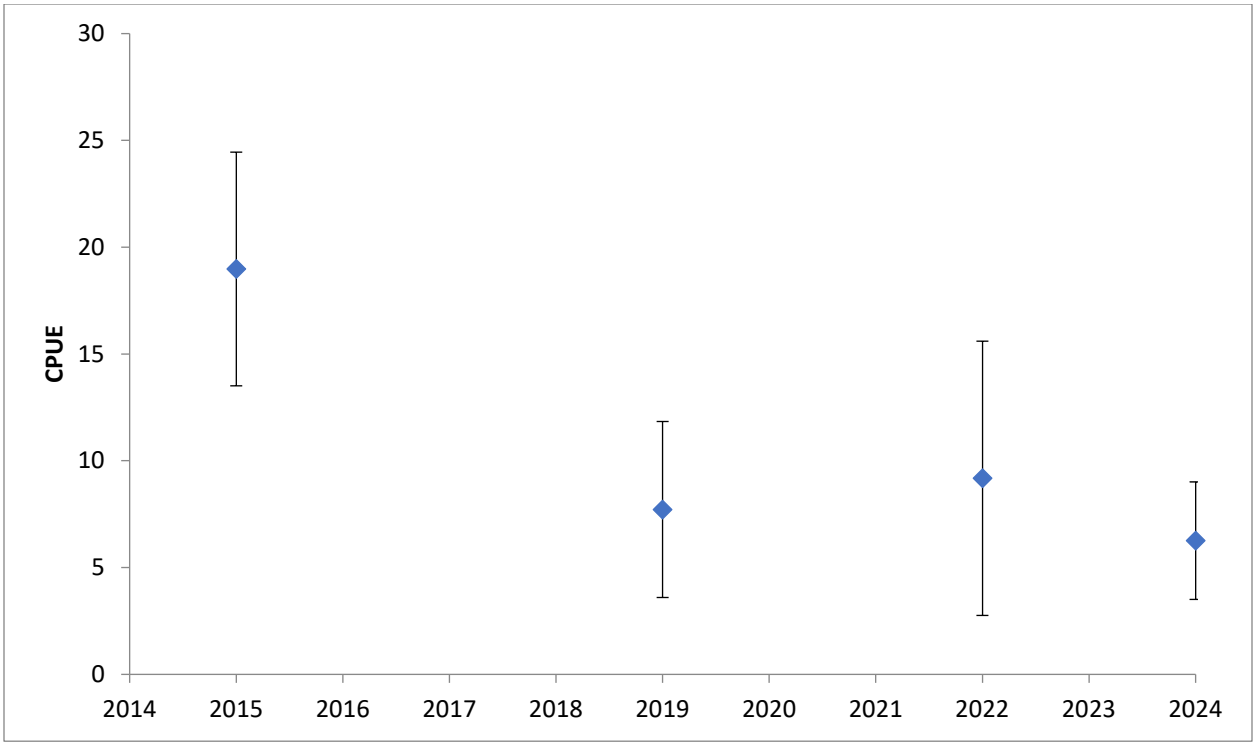

Figure 10. Total catch per unit effort (CPUE) for **White Bass** in Stroud Lake from fall experimental gill net surveys from 2015 – 2024.

Table 8. Total number (No.), catch rates (C/f) **Gizzard Shad** collected by fall gill netting from Stroud Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery.

	Total (≥4.8)	
Year	**No.**	**C/f**
2015	33	7.20
2019	4	1.25
2022	7	2.02
2024	9	1.83

Table 9. Species, number, and size of fish stocked in Stroud City Lake from 1996.

Date	Species	Number	Size
1996	Threadfin Shad	250	Adults
1997	Threadfin Shad	250	Adults
1999	Threadfin Shad	200	Adults
1999	Threadfin Shad	500	Adults
1999	Threadfin Shad	400	Adults