SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

Heyburn Lake

2022-2023

SURVEY REPORT

State: Oklahoma

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations –Heyburn Lake

Period Covered: 1 January 2022 – 31 December 2023

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Heyburn Lake

ABSTRACT

Heyburn Lake was sampled in 2022 by fall experimental gill netting to assess sportfish populations and conditions. Catch rates for White Crappie (C/f = 7.48) were somewhat consistent with recent samples (Figure 2) and was above the threshold for a quality fishery, however relative weights were poor for all size groups (Table 2). Channel Catfish catch rates (C/f = 5.78) were higher than the previous two samples (Figure 4) but still below the threshold for a quality fishery. Relative weights were also poor for fish greater than 12 inches (Table 3). Blue Catfish catch rates (C/f = 2.89) were slightly lower than recent samples (Figure 6) and still below the threshold for a quality fishery, but relative weights were good for all size groups (Table 4). Gizzard Shad are the primary forage base for sportfish in Heyburn Lake. In 2022, catch rates for Gizzard Shad (C/f = 14.76) were significantly higher than in the previous sample and well above the threshold for a quality fishery.

Largemouth Bass were not sampled in the Grant years of 2022-2023 but were most recently sampled in 2019 (Table 1, Figure 1). Largemouth Bass are scheduled to be sampled again by spring shoreline electrofishing in 2024 or as soon as lake level conditions allow.

INTRODUCTION

Heyburn Reservoir is a 396-hectare (978.5 acres) flood control and water supply impoundment located on Polecat Creek approximately 18 kilometers west of Sapulpa in Creek County. The reservoir was impounded by the U.S. Army Corps of Engineers in 1950. Since that time heavy siltation has reduced the area and volume of the reservoir.

Past fish stockings include Blue Catfish, Channel Catfish, Largemouth Bass, and Hybrid Striped Bass. Fish production in Heyburn has been historically low with poor reproductive success for most species attributed to persistent high turbidities of the reservoir.

Fish population data was collected on Heyburn Lake by fall experimental gill netting in 2022. Fish management recommendations are made based on survey data collected.

RESULTS

Largemouth Bass

1. Largemouth Bass were not sampled in the grant years of 2022 and 2023.
2. Abundance from spring boat electrofishing in 2019 was below that of a quality fishery (C/f = 33.3) but was consistent with recent previous samples (Table 1, Figure 1).
3. Relative weights for largemouth bass less than eight inches (W_r = 86) were slightly below the acceptable minimum value but was good for fish 8-12 inches (W_r = 91) and excellent for fish greater than 12 inches (W_r = 101).
4. Largemouth Bass sampling by spring boat electrofishing is scheduled to occur again in 2024 to monitor changes in populations.

Crappie

1. Crappie were most recently sampled in 2022 by fall experimental gill netting where catch rates (C/f = 7.48) were slightly up from the previous sample in 2020, but down from years 2016 and 2018. The catch rate was above the minimum for a quality fishery (Table 2).
2. Relative weights for all size groups were below the minimum acceptable values for healthy fish (Table 2).
3. Crappie will be sampled again within the next five years to continue monitoring population trends.

Channel Catfish

1. Channel Catfish catch rates in 2022 (C/f = 5.78) were slightly up from previous samples in 2018 and 2016 (Table 3).
2. Relative weights were good for fish less than 12 inches but poor for fish greater than 12 inches.
3. Channel Catfish will be sampled again within the next five years to continue monitoring population trends.

Shad

1. Gizzard Shad were last sampled by experimental gill netting in 2022 where catch rates were good (C/f = 14.76) and up dramatically from the previous sample (Table 6).
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.
3. Gizzard Shad will be sampled again within the next five years to continue monitoring population trends.

Non-game Fish

Other non-game fish species represented in the 2022 fall experimental gill net sample include Bluegill Sunfish, Freshwater Drum, Hybrid Sunfish, River Carpsucker, and Yellow Bullhead Catfish.

RECOMMENDATIONS

Fish Attractor Structures

1. No additional habitat projects are needed in Heyburn Lake for the next five years.
2. If enough Shelbyville Cube structures are available, Heyburn Lake may receive a few to enhance fishing near popular fishing areas.

Fish Stockings

1. No fish stockings are currently recommended.

Fish Surveys

1. With the statewide regulation changes for Largemouth Bass, additional electrofishing surveys should be conducted in 2024 and again within five years after that to monitor potential changes in the population.
2. Continue with fall experimental gill net surveys once within the next five years to continue monitoring crappie and Channel Catfish populations.

Fishing Regulations

1. Maintain current statewide regulations for all species.

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 Heyburn 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)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1978	15	15.00								
1981	103	17.16								
1982	36	12.00								
1984	44	6.52								
1986	71	7.64								
1989	105	46.67	16.4	89	15.6	88	14.7	90	6.2	92
1994	160	49.23	6.77	87	27.39	92	15.08	95	8.92	96
2006	73	24.33	3.33	86	8.33	92	12.67	93	5.33	89
2010	59	19.67	0.67	80	13.33	108	9.0	89	3.67	91
2014	68	34.0	2.0	73	20.0	96	17.5	95	10.5	94
2019	100	33.3	2.0	86	15.33	91	20.33	101	12.33	104

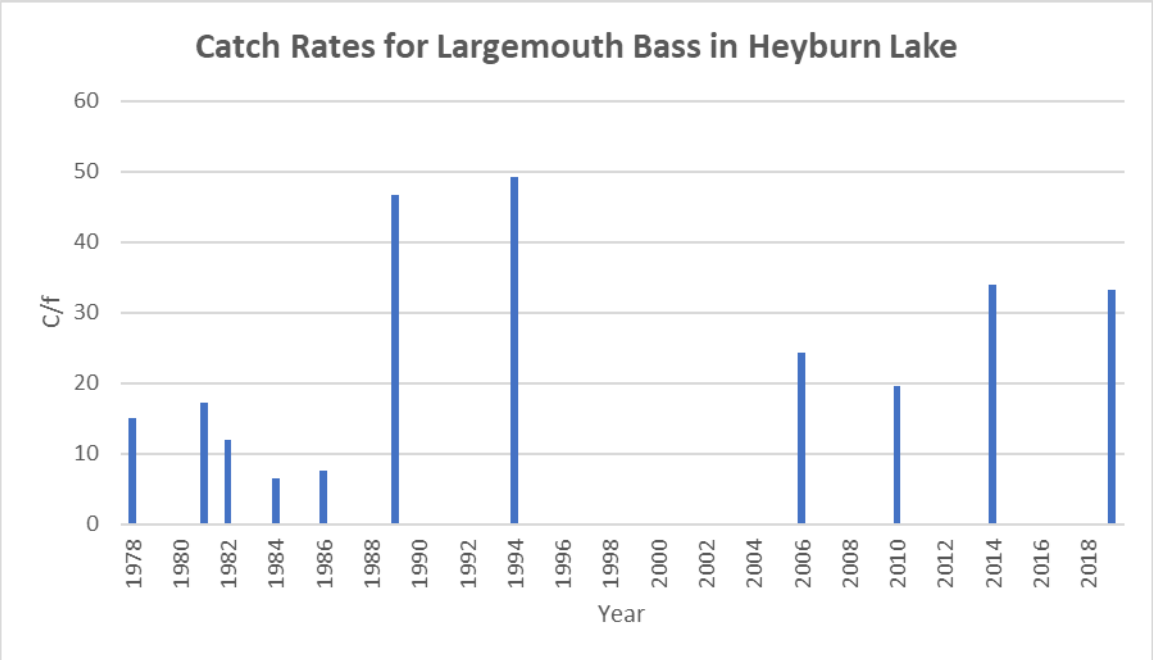

Figure 1. Total catch per unit effort (CPUE; C/f) for **Largemouth Bass** in Heyburn Lake from spring electrofishing surveys from 1978-2019.

Table 2. Total number (No.), catch rates (C/f), and relative weights (Wr) by size groups of **Crappie** collected by fall gill netting from Heyburn 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 (1.92)**		**≥ 10 inches (>0.96)**	
Year	**No.**	**C/f**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**
2009	37	7.68	2.64	85	5.04	83	3.6	86
2011	24	4.8	1.60	70	3.20	82	2.41	86
2016	67	14.4	10.02	83	3.97	84	2.71	87
2018	54	11.05	6.56	92	4.50	96	3.48	100
2020	34	6.64	1.38	112	5.26	95	2.72	95
2022	34	7.48	4.41	86	3.08	85	2.20	86

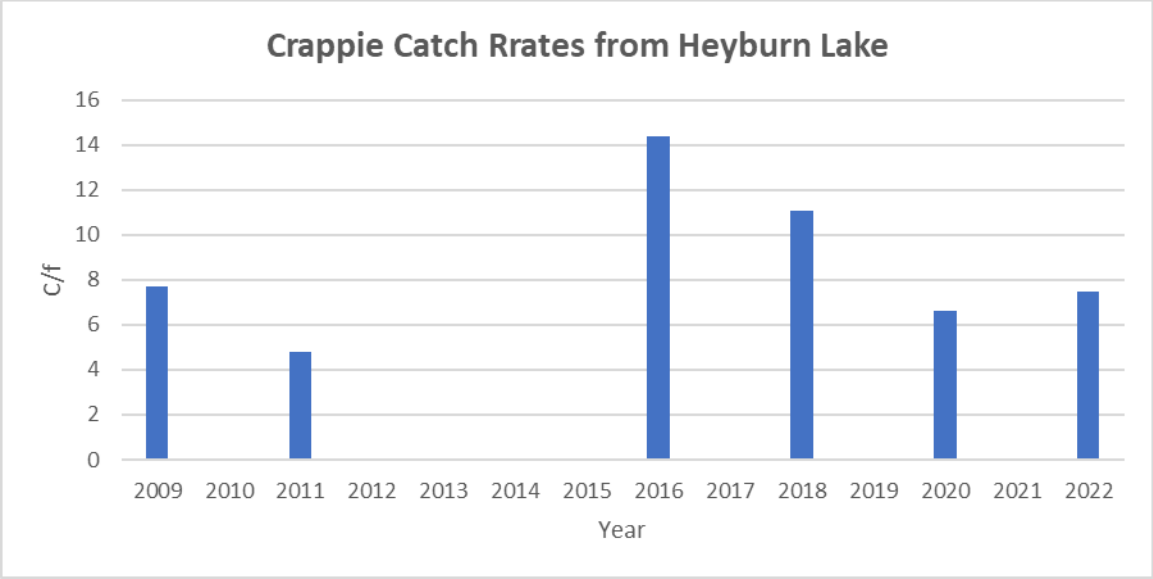

Figure 2. Total catch per unit effort (CPUE; C/f) for **White Crappie** in Heyburn Lake from fall experimental gill net surveys from 2009-2022.

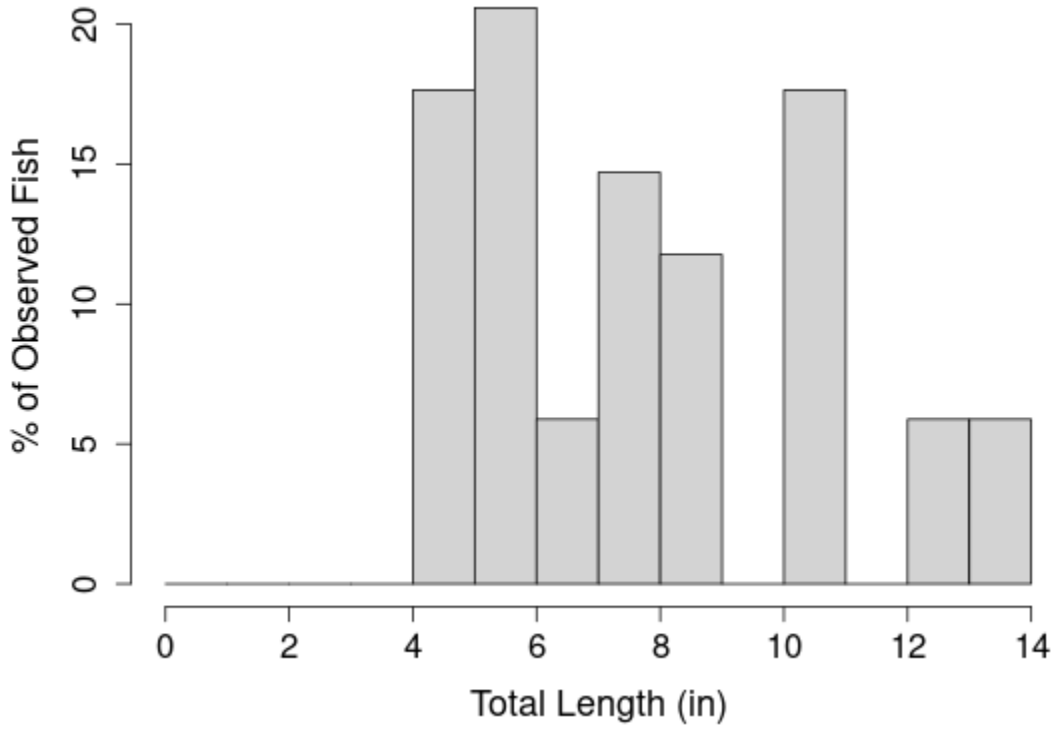

Figure 3. Length frequencies for **White Crappie** collected by fall experimental gill net survey from Heyburn Lake in 2022.

Table 3. 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 Heyburn Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥4.8)		**<12 inches (≥2.4)**		**≥12 inches (≥2.4)**		**≥ 16 inches (≥1.2)**	
Year	**No.**	**C/f**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**
2009	30	6.24	4.08	90	1.92	81	0.72	81
2011	35	7.0	5.60	80	1.41	69	0.81	72
2016	36	7.51	3.55	82	3.97	81	1.67	82
2018	16	3.23	3.03	99	0.21	88		
2020	11	2.12	0.58	102	1.54	90	0.58	87
2022	26	5.78	3.34	94	2.44	87	0.66	79

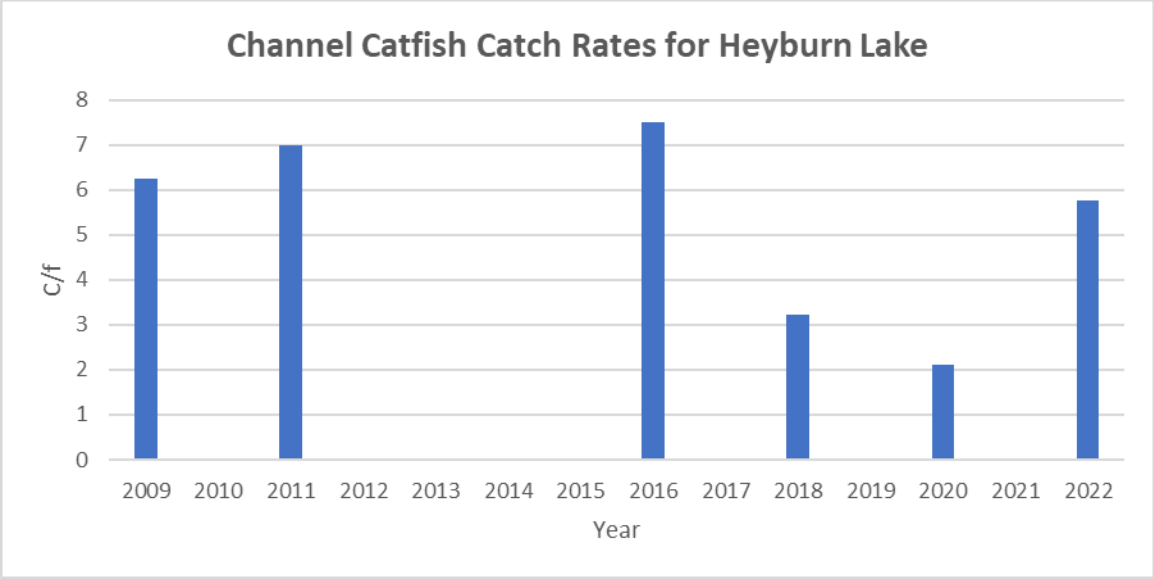

Figure 4. Total catch per unit effort (CPUE; C/f) for **Channel Catfish** in Heyburn Lake from fall experimental gill net surveys from 2009-2022.

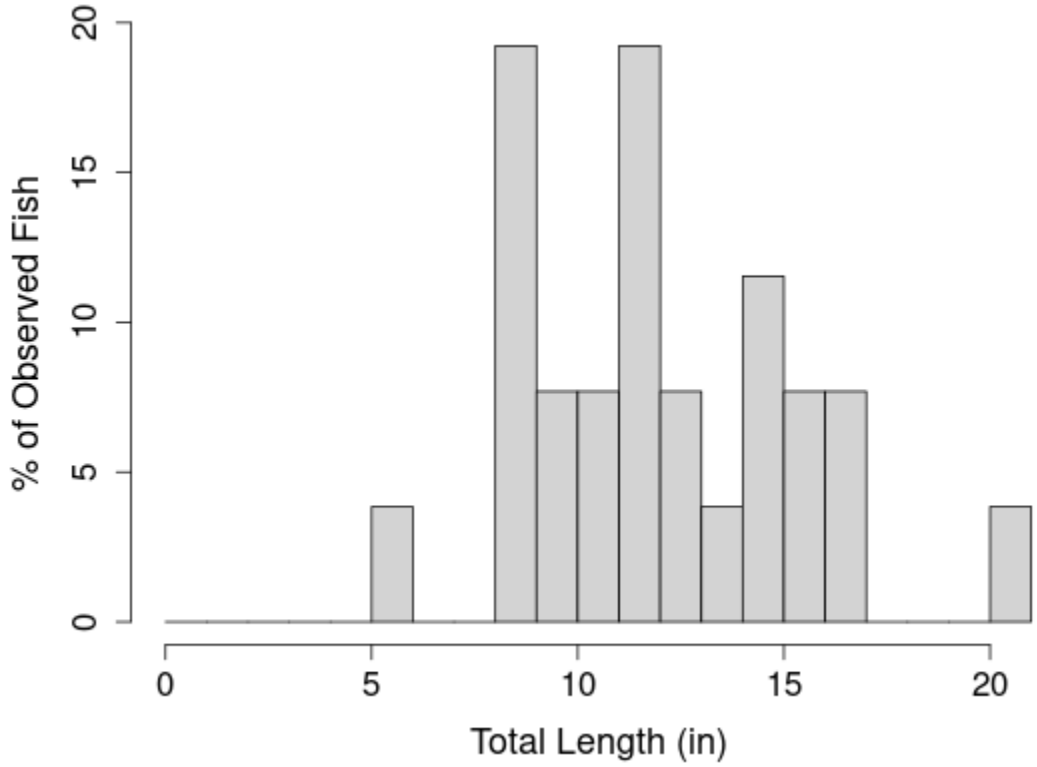

Figure 5. Length frequencies for **Channel Catfish** collected by fall experimental gill net survey from Heyburn Lake in 2022.

Table 4. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **Blue Catfish** collected by fall gill netting from Heyburn Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥4.8)		**<12 inches (≥2.4)**		**≥12 inches (≥2.4)**		**≥ 16 inches (≥1.2)**	
Year	**No.**	**C/f**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**
2009	27	5.76	5.04	89	0.72	85	0.48	80
2011	37	7.4	5.80	84	1.60	82	1.40	82
2016	20	4.17	2.5	84	1.67	82	0.63	77
2018	16	3.29	1.24	90	2.04	93	0.41	96
2020	17	3.30			3.30	87	2.53	87
2022	13	2.89	0.22	93	2.67	93	1.99	95

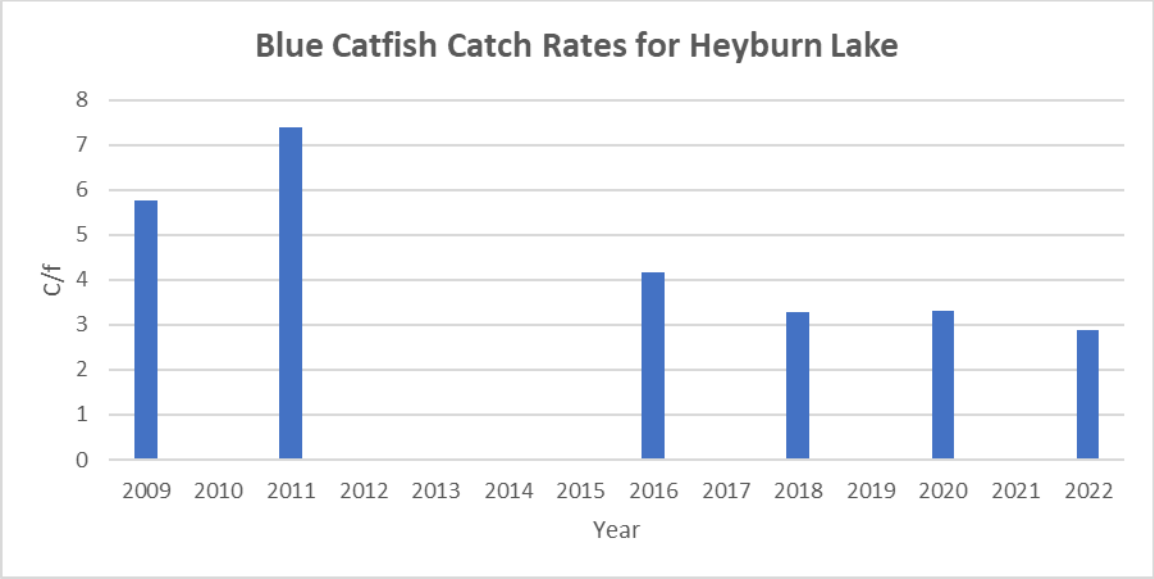

Figure 6. Total catch per unit effort (CPUE; C/f) for **Blue Catfish** in Heyburn Lake from fall experimental gill net surveys from 2009-2022.

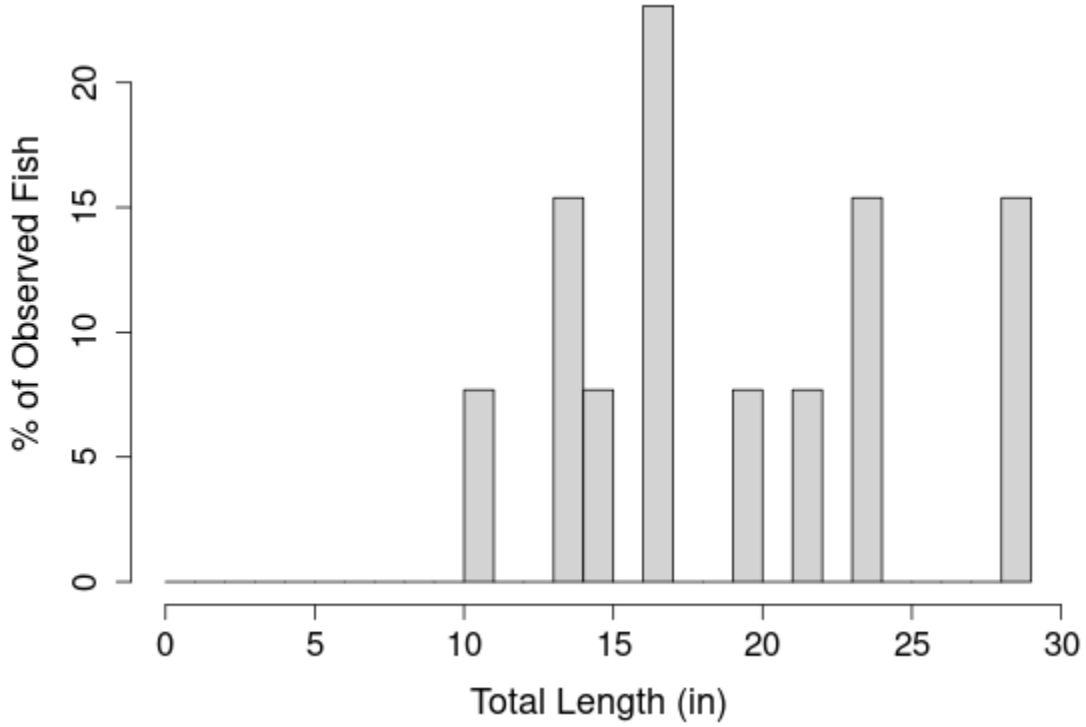

Figure 7. Length frequencies for **Blue Catfish** collected by fall experimental gill net survey from Heyburn Lake in 2022.

Table 5. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **Flathead Catfish** collected by fall gill netting from Heyburn Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total		**<12 inches**		**≥12 inches**		**≥20 inches**		**≥24 inches**		**≥28 inches**	
Year	**No.**	**C/f**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**
2009	0	0										
2011	0	0										
2016	0	0										
2018	1	0.20			0.20	117	0.20	117				
2020	0	0										
2022	0	0										

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

	Total (≥4.8)		**<6 inches (1.2-7.2)**		**>6 inches (>2.4)**			
Year	**No.**	**C/f**	**C/f**	**W_r**	**C/f**	**W_r**	**C/f**	**W_r**
2009		7.20	7.20					
2011		3.40	3.40					
2016		11.06						
2018		16.67						
2020	1	0.20	0.20					
2022	63	14.76	3.54		10.33			

Table 7. Species, number, and size of fish stocked in Heyburn Lake from 1983-2005.

Date	Species	Number	Size
1950	Largemouth Bass	7,560	
1950	Channel Catfish	4,500	
1950	Crappie	4,000	
1950	Redear Sunfish	10,000	
1950	Channel Catfish	4,500	
1951	Largemouth Bass	21,000	
1951	Redear Sunfish	26,000	
1953	Largemouth Bass	10	
1953	Channel Catfish	8	
1953	Crappie	10	
1953	Bluegill Sunfish	10	
1955	Largemouth Bass	10,000	
1961	Largemouth Bass	100	
1973	Largemouth Bass	15,000	4-6 inches
1978	Channel Catfish	19,800	3 inches
1978	Blue Catfish	19,650	4-4.5 inches
1979	Largemouth Bass	30,000	Fry
1979	Channel Catfish	84,270	3 inches
1980	Hybrid Striped Bass	98,000	Fry
1981	Hybrid Striped Bass	100,000	Fry
1981	Channel Catfish	24,520	5 inches
1982	Hybrid Striped Bass	98,000	Fry
1982	Channel Catfish	98,000	4.5 inches
1983	Channel Catfish	12,000	2.75 inches
1984	Hybrid Striped Bass	10,000	1.5 inches
1984	Channel Catfish	68,985	3 inches
1985	Blue Catfish	50,224	4 inches
1986	Largemouth Bass	100,200	Fry
1986	Hybrid Striped Bass	9,800	
1986	Channel Catfish	50,024	
1987	Channel Catfish	4,000	
1987	Channel Catfish	33,700	2 inches
1987	Channel Catfish	12,400	4 inches
1988	Blue Catfish	4,900	5.5 inches
1988	Channel Catfish	19,736	5 inches
1988	Channel Catfish	30,264	4-6 inches
1990	Largemouth Bass	25,608	3 inches
1990	Channel Catfish	40,000	4.2 inches
1998	Channel Catfish	17,767	6-7 inches
1998	Channel Catfish	17,767	6-7 inches
1999	Channel Catfish	8,315	7 inches

1999	Channel Catfish	4,275	7 inches
2000	Channel Catfish	9,802	7 inches
2001	Channel Catfish	12,320	4 inches
2002	Channel Catfish	20,000	5.6 inches
2002	Channel Catfish	20,000	5.6 inches