SURVEY REPORT

OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION

FISH MANAGEMENT SURVEY AND RECOMMENDATIONS

FOR

ROBERT S. KERR RESERVOIR

2024-2025

SURVEY REPORT

State: Oklahoma

Project Title: Robert S Kerr Reservoir Fish Management Survey Report

Period Covered: 2024-2025

Prepared by: Chris Whisenhunt

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Robert S Kerr Reservoir

ABSTRACT

R.S. Kerr (Kerr) was sampled by spring boat electrofishing for black bass to determine fish population trends and condition. Largemouth Bass were the dominant black bass species sampled (n = 146) with one Spotted Bass sampled (C/f = 0.25). Overall catch rate for Largemouth Bass (C/f = 36.5) was just below the threshold of what is considered a quality fishery (C/f ≥ 40.0). Since the most recent previous sample was in 2012, more samples over a shorter period of time are needed to determine reliable trend data for the fishery and to determine if the lake is a quality fishery for Largemouth Bass. Relative weights for all size groups of Largemouth bass sampled were good to excellent ($W_r \geq 90$).

Kerr was also sampled by summer catfish electrofishing for Blue Catfish to determine fish population trends and otoliths were collected from a sub-sample of Blue Catfish to help determine growth rates and mortality estimates. Catch per unit effort for Blue Catfish (C/f =340.67; n = 511) was higher than the previous sample in taken in 2021 (C/f = 254.67; n = 382). Relative weights for all size groups were good to excellent ($W_r \geq 90$) and improved from previous sample from 2021. Three Flathead Catfish were captured in the sample (C/f = 22.67) and no channel catfish were captured, indicating that Blue Catfish are the dominant catfish species in Kerr Lake for anglers to utilize.

INTRODUCTION

Robert S. Kerr is a main stem reservoir on the Arkansas River, the dam is located approximately 9 miles south of Sallisaw in Sequoyah County, OK. RS Kerr is owned and operated by the U.S. Army Corps of Engineers (USACE) and was authorized as part of the McClellan-Kerr Arkansas River Navigation System in the River and Harbor Act approved July 34, 1946. The lock and dam project became operational in 1970 and also has hydroelectric capability. At normal pool Kerr covers approximately 43,800 surface acres. Water quality can vary widely within Kerr with the main body of the lake having an average fall secchi reading of 19 inches with turbidity levels due to plankton and suspended solids.

Shoreline habitat in Kerr consists of large woody debris, naturally rocky areas, submerged and emergent vegetation and man-made structures such as jetties, docks, areas of riprap, barge ports and bridge pilings. A stable water level allows for floating and emergent vegetation to become established along the edges and in shallow areas. ODWC fish attractors are maintained primarily in the short mountain, Cowlington Point and Sallisaw Creek areas (Appendix I). The ANS species Hydrilla has been found throughout much of Kerr, especially along much of the shoreline intermixed with native vegetation.

Kerr offers a variety of angling opportunities with a large diversity of game and non-game fish from skipjack to striped bass, making it a popular destination for anglers. Kerr follows statewide regulations for all sportfish species except sauger and walleye which have a 16” minimum length limit.

RESULTS

Largemouth Bass

1. Largemouth Bass catch rates (C/f) for 2024 was 36.5, slightly below the threshold for a quality fishery and below the catch rates from the most recent samples of 2002 and 2012 (Table 1).
2. Relative weights (W_r) for Largemouth Bass was good to excellent for all size classes for fish sampled in 2024 and consistent with previous samples (Table 1) indicating good forage availability within the lake.
3. A vast majority of Largemouth Bass (89.73%) were less than 16 inches in length (Figure 1) and eligible for being harvested by anglers under the new Black Bass regulation passed in 2022.

Blue Catfish

1. Blue Catfish catch rates, measured as catch per unit of effort (CPUE; C/f), was 340.7 fish per hour and higher than the previous sample in 2021 (Table 4).
2. Blue Catfish body condition measured as relative weight (W_r) were above acceptable levels ($\geq$90) for all size classes indicating good forage availability within the lake.
3. Blue cat length frequencies show fish represented across a large spectrum of inch groups with the 16- & 17-inch groups having a slight advantage in the 2022 sample but displaying a classic bell curve (Figure 2).
4. Mean length at age for Blue Catfish showed significant growth until 8 years and then slow growth until 14 years when the fish begin to show a significant jump in size (Table 7, Figure 3).
5. Most fish sampled were two to five yeas old and a significant number of fish in the 14 year-class (Figure 3) showing good recent recruitment of fish, but inconsistent over the years. The oldest fish observed were 28 years. The von Bertalanffy mean length at age plot for Blue Catfish may not be a good fit based on the limited number of fish ≥25 inches in the sample (Figure 4).
6. Estimated annualized mortality for Blue Catfish was 15.5% (Tables 8 and 9) and since fishing mortality is negative, it is a sign that the estimated natural mortality was already larger than total mortality...suggesting the estimated natural mortality was not a good fit to these data (and/or that most mortality is caused by natural mortality).

RECOMMENDATIONS

Fish Attractor Structures

1. Habitat structures should be refurbished in 2027 or 2028 as conditions allow.

Fish Stockings

1. No new fish stockings are recommended.

Fish Surveys

1. Spring boat electrofishing surveys should be conducted in 2027 or soon after as conditions allow to continue monitoring changes in the overall black bass populations, to establish better trend data, and to monitor impact of new statewide bass regulations that were passed in 2022.
2. Summer catfish boat electrofishing surveys should be conducted in 2027 as conditions allow to continue monitoring changes in the overall Blue Catfish populations and to establish trend data.

Fishing Regulations

1. Kerr follows statewide regulations for all sportfish species except sauger and walleye which have a 16” minimum length limit.
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 R.S. Kerr 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
1986	254	21.1	3.0	90	6.33	89	11.3	100	1.64	101
1988	110	11.3	1.44	99	3.18	93	6.66	96	4.0	96
1990	282	24.0	6.98	95	4.4	96	12.6	102	10.8	102
1992	255	40.8	11.4	91	6.1	101	23.4	101	13.4	103
1995	261	45.4	11.0	96	6.4	96	28.0	98	18.1	95
1997	222	38.6	8.7	101	5.2	99	24.7	94	15.7	92
1999	179	35.8	8.2	103	5.6	100	22.0	95	16.8	95
2002	153	76.5	19.0	96	18	102	39.5	97	25.0	96
2012	211	50.6	6.24	92	25.44	103	30.0	105	14.16	105
2024	146	36.5	13.3	102	15.0	99	12.25	98	5.75	99

Table 2. Total catch rate of **Largemouth Bass** collected by spring electrofishing from R.S. Kerr Lake, 2024 (OFAT analysis).

Species	**Mean**	**Count**	**RSE**	**SE**	**L 95% CI**	**U 95% CI**	**N RSE = 12.5 (25% range)**	**N RSE = 20 (40% range)**
LMB	36.5	24	16.4	6.0	24.7	48.3	41	16

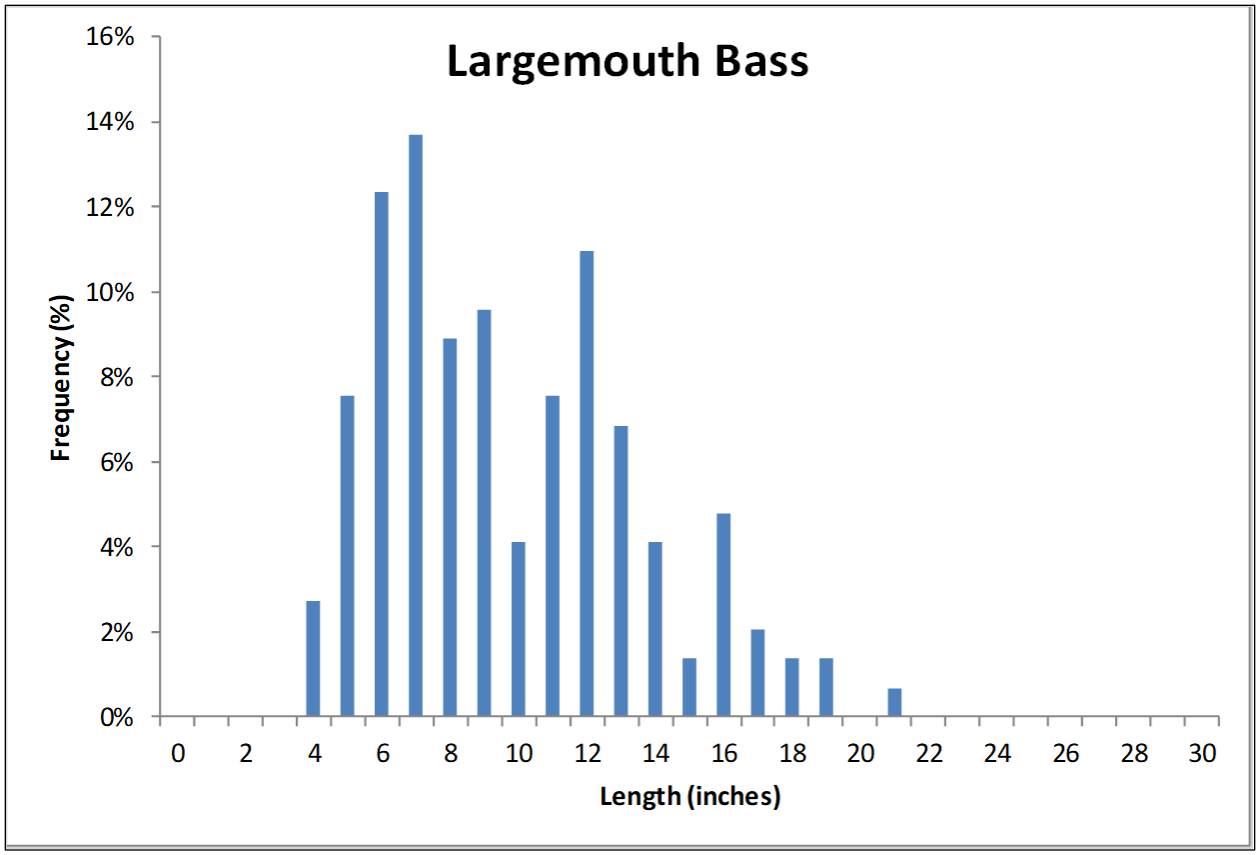

Figure 1. Length frequencies for **Largemouth Bass** collected from spring electrofishing of R.S. Kerr Lake, 2024.

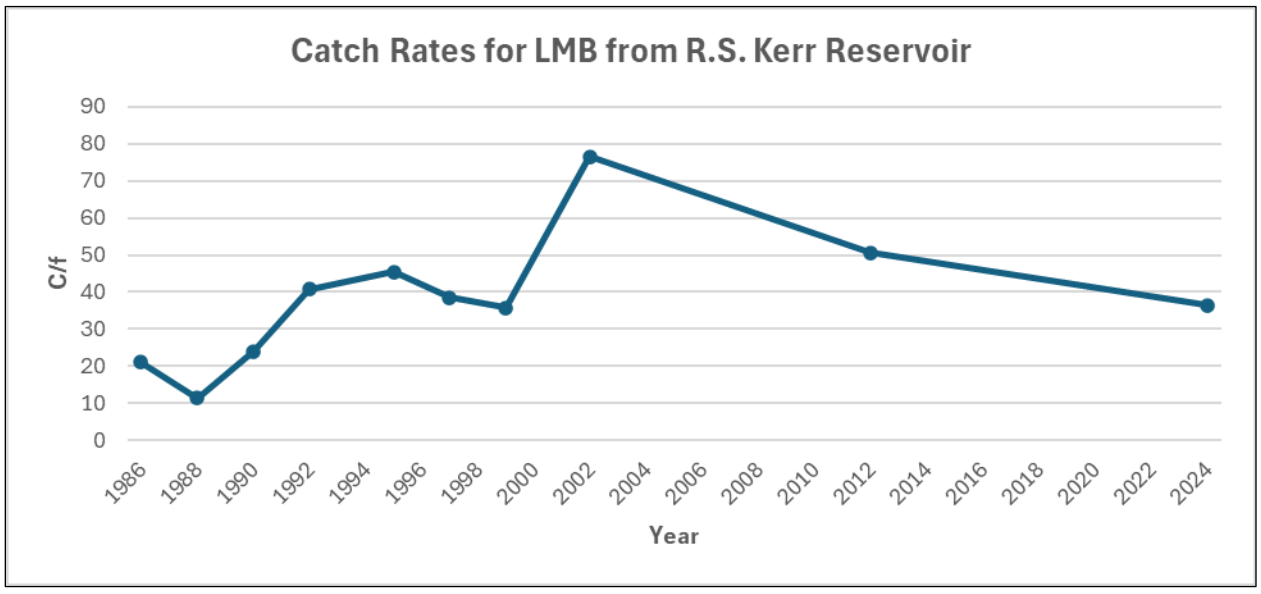

Figure 2. Catch rate trend for Largemouth Bass sampled from R.S. Kerr Reservoir, 1986-2024.

Table 3. Catch rates by PSD size category for **Largemouth Bass** collected by spring electrofishing from R.S. Kerr 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	12.5	27.4	3.4	5.8	19.2	115	45
LMB	stock	11.75	20.3	2.4	7.1	16.4	63	25
LMB	quality	8	16.7	1.3	5.4	10.6	43	17
LMB	preferred	4	29.5	1.2	1.7	6.3	134	52
LMB	memorable	0.25	100	0.25	-0.24	0.74	1536	600
LMB	trophy	0	NA	NA	NA	NA	NA	NA

Table 4. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **Blue Catfish** collected by spring electrofishing from R.S. Kerr Lake. Acceptable W_r values are ≥90.

	Total		<12 inches		≥12 inches		≥16 inches		≥30 inches	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
2021	382	254.7	89.3	100	165.3	87	112.7	86	5.3	99
2024	511	340.7	128.0	109	212.7	94	160.0	93	7.3	90

Table 5. Total catch rate of **Blue Catfish** collected by spring electrofishing from R.S. Kerr Lake, 2024 (OFAT analysis).

Species	Mean	Count	RSE	SE	L 95% CI	U 95% CI	N RSE = 12.5 (25% range)	N RSE = 20 (40% range)
Blue Catfish	340.7	18	16.0	54.6	233.7	447.6	30	12

Table 6. Catch rates by PSD size category for **Blue Catfish** collected by spring electrofishing from R.S. Kerr 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)
Blue Catfish	substock	123.3	24.6	30.4	63.8	182.9	70	27
Blue Catfish	stock	134	24.5	32.8	69.6	198.4	69	27
Blue Catfish	quality	76	32.9	25.0	27.0	125.0	125	49
Blue Catfish	preferred	3.3	48.7	1.6	0.1	6.5	274	107
Blue Catfish	memorable	4	68.6	2.7	-1.4	9.4	542	212
Blue Catfish	trophy	0	NA	NA	NA	NA	NA	NA

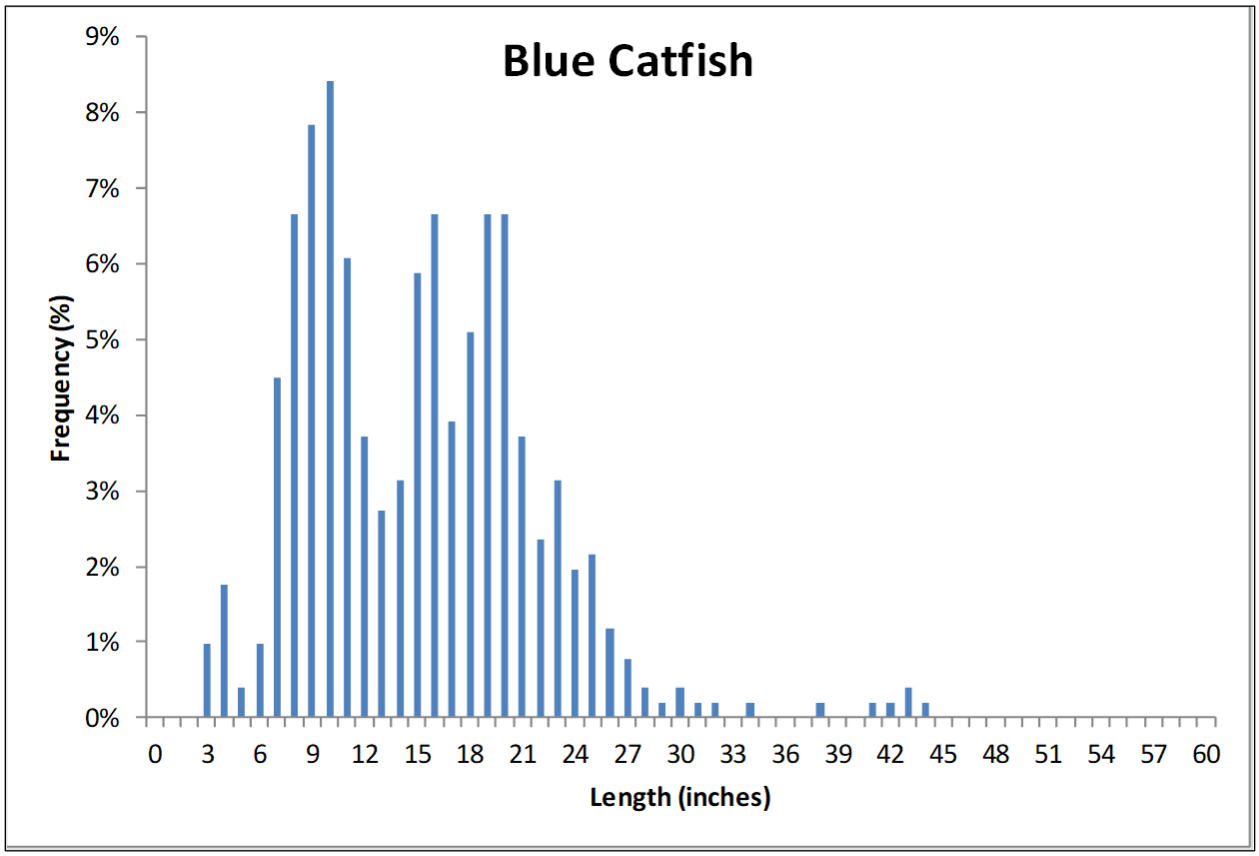

Figure 2. Length frequencies for **Blue Catfish** collected from summer catfish electrofishing of R.S. Kerr Lake, 2024.

Table 7. Mean length at age of **Blue Catfish** sampled from R.S. Kerr Reservoir, 2024 (OFAT analysis).

Age	Mean TL	Count	CV	SE	L 95% CI	U 95% CI
2	264.36	55	26.95	9.61	245.53	283.20
3	245.36	160	26.68	5.17	235.22	255.51
4	356.24	50	17.63	8.88	338.84	373.64
5	390.93	30	10.74	7.66	375.92	405.95
6	435.61	18	6.65	6.83	422.23	449.00
7	483.00	21	7.23	7.63	468.05	497.95
8	500.82	17	5.52	6.70	487.69	513.96
9	487.93	29	8.40	7.61	473.01	502.86
10	504.31	29	6.56	6.14	492.28	516.35
11	497.90	10	5.95	9.38	479.52	516.28
12	513.33	3	3.51	10.41	492.92	533.74
13	480.50	4	5.88	14.12	452.82	508.18
14	598.54	48	8.42	7.27	584.28	612.80
15	628.80	10	8.82	17.54	594.43	663.17
16	648.64	11	10.87	21.25	606.99	690.29
17	777.00	4	27.65	107.44	566.42	987.58

18	1108.00	1	NA	NA	NA	NA
19	953.33	3	17.29	95.15	766.85	1139.82
20	974.00	4	15.03	73.18	830.57	1117.43
21	733.00	1	NA	NA	NA	NA
28	540.33	3	9.56	29.83	481.86	598.81

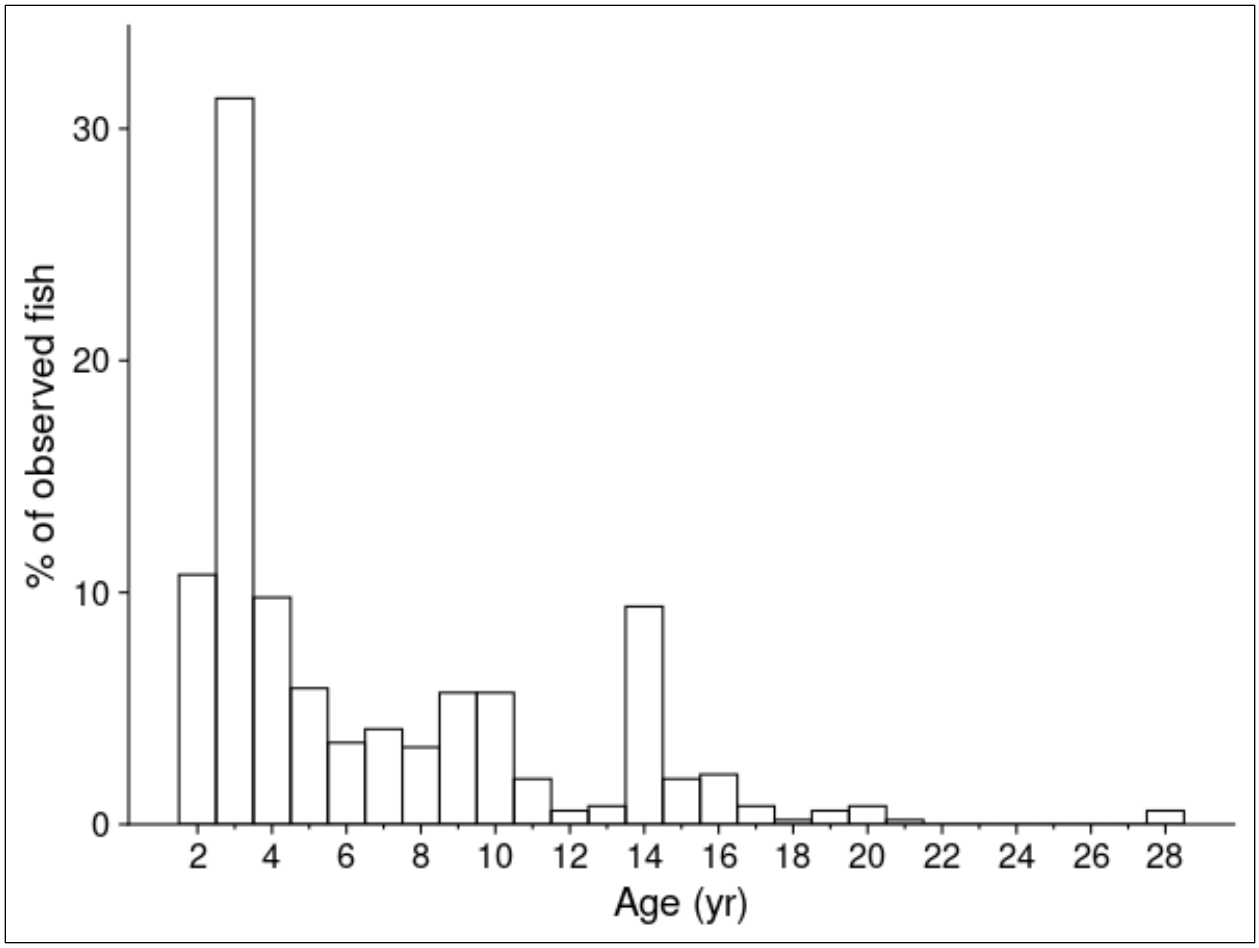

Figure 3. Age frequency plot for **Blue Catfish** sampled from R.S. Kerr Reservoir, 2024 (OFAT analysis).

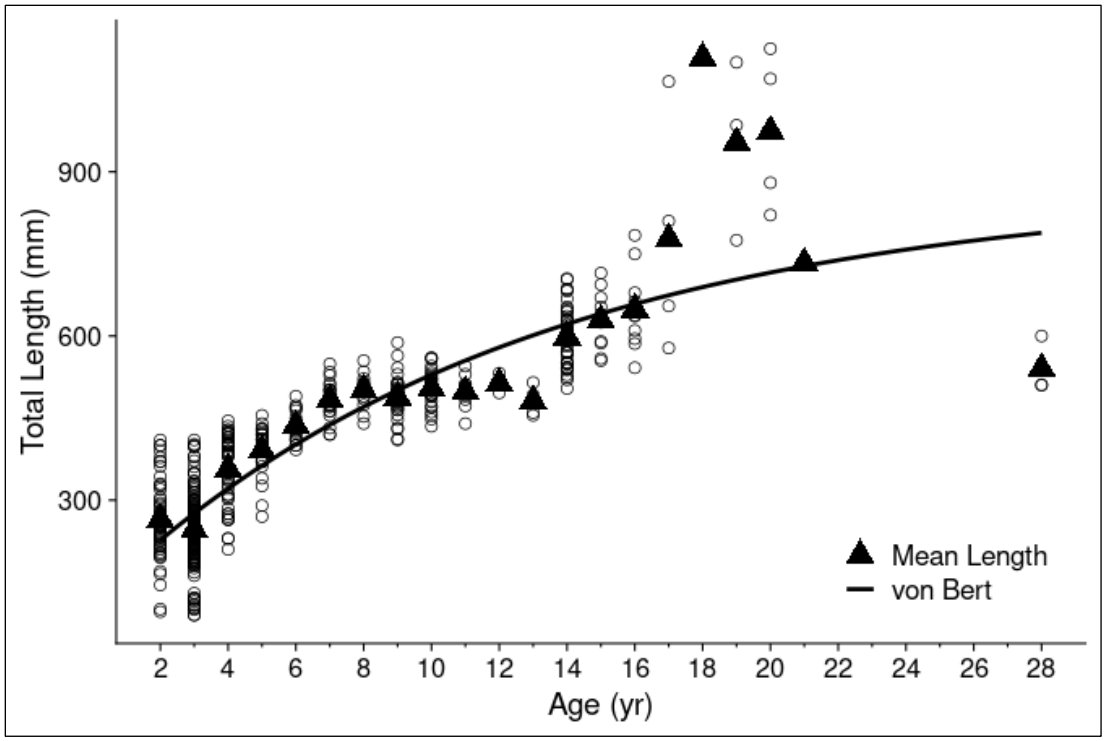

Figure 4. Von Bertalanffy mean length at age plot for **Blue Catfish** sampled from R.S. Kerr Reservoir, 2024 (OFAT analysis).

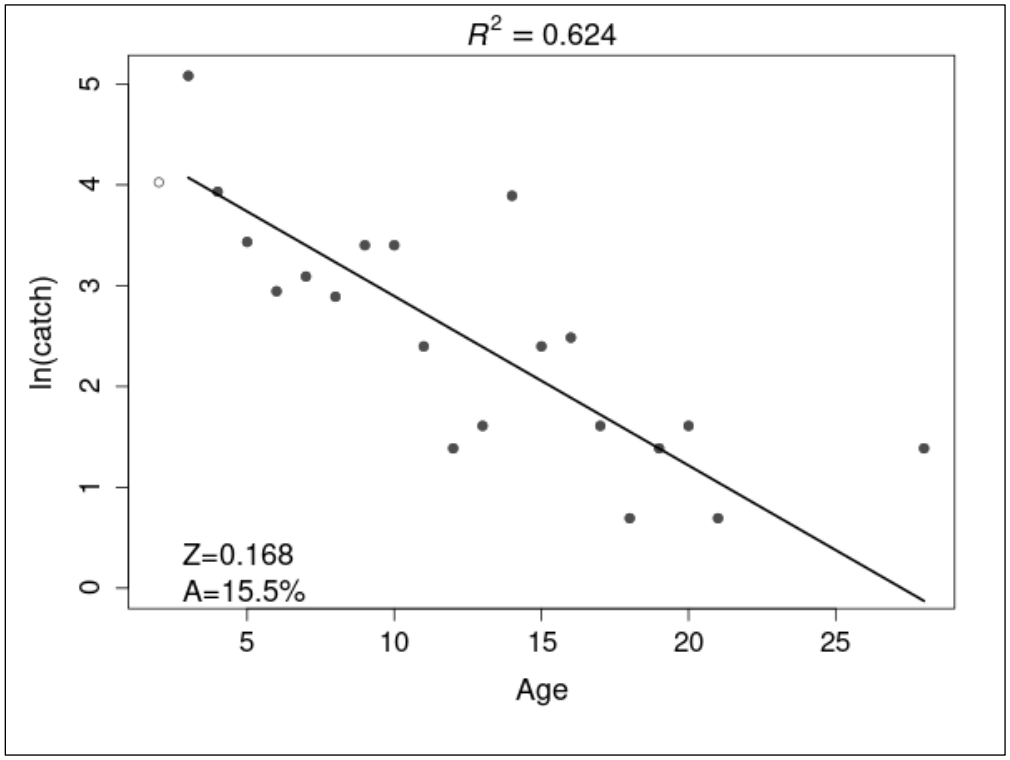

Figure 5. Catch Curve (Mortality) plat for **Blue Catfish** sampled from R.S. Kerr Reservoir, 2024 (OFAT analysis).

Table 8. Mortality table calculations for **Blue Catfish** sampled from R.S. Kerr Reservoir, 2024 (OFAT analysis).

	Mortality Rate	**Standard Error**	**L 95% CI**	**U 95% CI**
Instantaneous Z	0.17	0.03	0.11	0.23
Annualized A (%)	15.46	NA	10.07	20.53

Table 9. Estimated natural mortality table for **Blue Catfish** sampled from R.S. Kerr Reservoir, 2024 (OFAT analysis).

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	0.238	-0.07	0.168	15.50%	21.90%	-6.40%
Pauly NLS-T	0.148	0.02	0.168	15.50%	13.60%	1.80%

Appendix I. ODWC Habitat Enhancement Sites

Area	Type	Latitude	Longitude	Date
Short mtn Cove	Cedar Brush Pile	35.324941	-94.789358	9/12/2018
Short mtn Cove	Cedar Brush Pile	35.32116	-94.790869	9/12/2018
Short mtn Cove	18 cedars	35.320082	-94.788284	3/19/2020
Short mtn Cove	43 cedar trees: pile/row	35.323567	-94.790893	3/19/2020
Short mtn Cove	13 cedars near campgrounds			3/19/2020
Cowlington point	15 cedar trees	35.3195	-94.83205	5/17/2021
Cowlington point	14 cedar trees	35.324717	-94.8293	5/17/2021
Cowlington point	8 cedars along bank	35.323808	94.827134	5/17/2021
Cowlington point	9 cedars along bank	35.323437	94.825327	5/17/2021
Cowlington point	9 cedars trees	35.323569	94.824035	5/17/2021
Cowlington point	8 trees	35.324006	94.823632	5/17/2021
Sallisaw Creek	4 cedars	35.3834	-94.8693	5/18/2021
Sallisaw Creek	2 elm trees	35.38605	-94.871667	5/18/2021

Appendix II. R.S. Kerr recent stocking history

Year	Species	Number	Size
2001	Walleye	197,000	1.25
2001	Sauger	5,000	2
2002	Walleye	94,238	1
2002	Sauger	10,000	2
2003	Walleye	216,000	1.2
2004	Walleye	136,118	1.25
2004	Striped Bass	400,000	fry
2005	Walleye	200,500	2
2010	Sauger	88,000	1.25
2012	Sauger	172,256	fry
2012	Sauger	6,690	2
2023	Sauger	83,465	1.5