

**JONES BLUFF RESERVOIR**

**MANAGEMENT REPORT**

**FALL 2008**

Prepared by

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March 1, 2009

## Introduction

Jones Bluff Reservoir, also known as R. E. “Bob” Woodruff Lake, is a 12,510 acre impoundment on the Alabama River near Montgomery (Table 1). It is operated by the Corps of Engineers as a run-of-river reservoir with limited storage capacity and a very short retention time. Jones Bluff crappie have been sampled by the Alabama Department of Conservation on a rotational basis every few years since 1986 (Tables 2 and 3). Auburn University also conducted crappie sampling on this reservoir from 1989 – 2000 (Maceina et al. 2002) and these data have been used to supplement state collected data. Both crappie species subsist in the Alabama River, but white crappie is distinctly the more dominant species. A nine-inch minimum length limit for both crappie species is currently in place on this impoundment.

Refer to “An Angler’s Guide to Interpreting Alabama Wildlife and Freshwater Fisheries Reservoir Reports” for a detailed description of fisheries terms used in this report. The Angler’s Guide is available on the Department’s website at:

<http://www.outdooralabama.com/fishing/freshwater/where/reservoirs/guide.pdf>.

## Methods

Crappie were collected via boat electrofishing on November 4, 2008 according to guidelines presented in the Alabama Reservoir Management Manual (Cook 1999). Sampling effort was concentrated on the lower reservoir in Prairie, Ivy, House, Beaver, and Cypress Creeks (Figure 1). Past crappie samples on this reservoir utilized trap nets as the primary collection method which typically selects for smaller sized fish and is better at predicting the future of the fishery. Electrofishing excels in that present populations can be better evaluated and growth and mortality estimates are more reliable.

## Results and Discussion

A total of 105 white crappie and 33 black crappie were collected from specific shoreline areas containing submerged woody structure. Effort was not recorded since sampling areas were selected in a non-random fashion; therefore, all summary statistics were restricted to indices related to fish size, age, and growth.

Black crappie are the secondary crappie species in this system and comprise only a small portion of the fishery. This is contrary to many other Alabama reservoirs where they are the dominant crappie species. Five year classes were represented in the sample with the 2006 age group being the most abundant (Table 4). All size classes exhibited improved condition factors when compared to fish from past samples (Table 2). Only 33 total fish were collected during the 2008 sample and few inferences can be made about the population based on this small sample size.

The white crappie sample included seven year classes of fish with age-1 to age-3 fish comprising over 90% of the sample (Table 5). Younger, smaller fish are typically not the most abundant size groups collected by electrofishing, which may mean that several moderate year-classes have been produced recently which will benefit the fishery. The impacts of the 2007 and 2008 drought are yet to be seen.

Surprisingly, the younger year-classes of white crappie were somewhat equally distributed in the 2008 sample which suggests that year-class strength in recent years has been rather stable. This is contrary to several past samples where equal distribution of fish among the younger age groups was not apparent (Abernethy et al. 2006, Rider et al. 2002). This led to the conclusion that crappie year-class strength in this reservoir was highly variable. This discrepancy will obviously require further investigation in future samples to determine if these changes are temporary and may have been related to environmental conditions or a change in sampling method.

The total annual mortality estimate of white crappie (ages 2-7) was estimated to be 54% (Figure 4). Crappie mortality in most Alabama lakes is high due to the popularity of angling harvest and their short life span. The growth of white crappie is excellent in Jones Bluff Reservoir with fish reaching the 9-inch limit between age-1 and age-2 according to the von Bertalanffy growth equation. Fast growth rates for crappie in this reservoir have also been observed by Auburn University (Maceina et al. 2002). All size classes of white crappie exhibited excellent condition factors.

Jones Bluff Reservoir contains a variety of habitat types including deep, main river channel drop-offs and an abundance of creeks and backwater areas with shallow spawning sites. The water level depends primarily on rainfall amounts since it is operated as a run-of-river system. This operational procedure more closely mimics natural river conditions than most other impounded water bodies and seemingly benefits the crappie population. Reservoir water levels and retention time have been proven to affect crappie year-class strength (Maceina and Stimpert 1998).

### Conclusion

Jones Bluff Reservoir has consistently produced excellent crappie angling and the results of the 2008 sample reveal this pattern will not likely change. Based upon this survey, the 9-inch minimum length limit should be retained for both crappie species. The reservoir should again be sampled in 3-4 years based on guidelines in the Alabama Reservoir Management Manual (Cook 1999). Future sampling results should focus on understanding the impacts of the 2007-08 drought as well as determining if recruitment has become less variable compared to historical samples.

## Literature Cited

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TABLE 1. JONES BLUFF RESERVOIR MORPHOMETRIC, PHYSICAL AND CHEMICAL CHARACTERISTICS.

Surface Area	12,510 acres
Drainage Area	3,250 sq. mi.
Full Pool Elevation	125 feet-msl
Mean Annual Fluctuation	2 feet
Shoreline Distance	368 miles
Shoreline Development Index	23.5
Mean Depth	27.8 feet
Maximum Depth	60.0 feet
Outlet Depth	0-43 feet
Thermocline Depth	10 feet
Storage Ratio	55.2
Total Dissolved Solids	64.8 mg/L (ADEM 2008 unpublished)
Morphoedaphic Index	2.3 TDS/mean depth (ft) (Ryder 1965)
Growing Season	235 frost free days (Jenkins 1967)
Date of Impoundment	1975

TABLE 2. - RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (Wr) OF BLACK CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR.

TOTAL			SUBSTOCK			RSD <sub>S-Q</sub>				RSD <sub>Q-P</sub>				RSD <sub>P-M</sub>				RSD <sub>M-T</sub>				TOTAL	
YEAR	EFFORT <sup>a</sup>	METHOD	NO.	CPE	SSR <sup>b</sup>	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1998	40	TN	86	2.2	205	22	0.6	53	73	14	0.4	33	79	5	0.1	12	86	1	<0.1	2	88	128	3.2
1999	40	TN	78	1.9	181	31	0.8	72	71	7	0.2	16	79	4	0.1	9	83	1	<0.1	2	82	121	3.0
2000	40	TN	38	0.9	90	26	0.6	62	74	11	0.3	26	82	4	0.1	10	91	1	<0.1	2	87	80	2.0
2005	20	TN	29	1.5	29	48	2.4	48	73	32	1.6	32	78	18	0.9	18	83	1	0.1	1	86	128	6.4
2008	-	EF	0	-	0	3	-	9	83	5	-	15	100	16	-	48	98	9	-	27	98	33	-

<sup>a</sup>TRAP NET EFFORT IS IN NET-NIGHTS

<sup>b</sup>SSR DENOTES SUBSTOCK RATIO (THE NUMBER OF SUBSTOCK SIZE FISH PER 100 FISH STOCK SIZE AND LARGER).

TABLE 3. - RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (Wr) OF WHITE CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR.

YEAR	TOTAL		SUBSTOCK			RSD <sub>S-Q</sub>				RSD <sub>Q-P</sub>				RSD <sub>P-M</sub>				RSD <sub>M-T</sub>				RSD-T				TOTAL			
	EFFORT <sup>a</sup>	METHOD	NO.	CPE	SSR <sup>b</sup>	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE		
1989	64	TN	91	1.4	94	35	0.5	36	76	19	0.3	20	92	27	0.4	28	96	16	0.3	16	99							188	2.9
1990	80	TN	634	7.9	200	181	2.3	57	72	73	0.9	23	82	44	0.6	14	91	19	0.2	6	93							951	11.9
1991	80	TN	288	3.6	56	410	5.1	80	68	47	0.6	9	81	23	0.3	5	84	29	0.4	6	92	1	<0.1	<1	90		798	10.0	
1992	80	TN	410	5.1	106	184	2.3	47	73	123	1.5	32	87	61	0.8	16	92	20	0.3	5	92						798	10.0	
1993	40	TN	494	12.4	225	73	1.8	33	72	69	1.7	31	87	50	1.3	23	93	26	0.7	12	94	2	<0.1	1	90		714	17.9	
1994	40	TN	177	4.4	77	183	4.6	80	71	15	0.4	6	80	22	0.6	10	88	9	0.2	4	88						406	10.2	
1995	40	TN	128	3.2	110	31	0.8	27	81	55	1.4	47	95	26	0.7	22	100	4	0.1	3	102						244	6.1	
1996	40	TN	803	20.1	449	94	2.4	53	71	27	0.7	15	79	35	0.9	20	92	22	0.6	12	94	1	<0.1	1	66		982	24.6	
1997	40	TN	149	3.7	45	284	7.1	86	72	21	0.5	6	79	15	0.4	5	88	11	0.3	3	93						480	12.0	
1998	40	TN	490	12.3	340	51	1.3	36	76	61	1.5	42	86	25	0.6	17	94	7	0.2	5	89						634	15.9	
1999	40	TN	357	8.9	149	181	4.5	75	75	21	0.5	9	81	26	0.7	11	87	12	0.3	5	94						597	14.9	
2000	40	TN	171	4.3	79	97	2.4	45	79	78	1.9	36	88	35	0.9	16	91	7	0.2	3	97						388	9.7	
2005	20	TN	152	7.6	50	117	5.9	39	74	106	5.3	35	83	49	2.5	16	88	29	1.5	10	89						453	22.7	
2008	-	EF	0	-	0	5	-	5	86	22	-	21	100	26	-	25	99	50	-	48	101	2	-	2	105		105	-	

<sup>a</sup>TRAP NET EFFORT IS IN NET-NIGHTS

<sup>b</sup>SSR DENOTES SUBSTOCK RATIO (THE NUMBER OF SUBSTOCK SIZE FISH PER 100 FISH STOCK SIZE AND LARGER).

TABLE 4. AGE COMPOSITION AND MEAN TOTAL LENGTH (mm) OF BLACK CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL 2008.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
1+	2007	5	15.2	-	198.6	10.4	168 - 222
2+	2006	20	60.6	-	280.1	4.9	223 - 303
3+	2005	4	12.1	-	306.3	9.7	378 - 322
4+	2004	2	6.1	-	332.0	1.0	331 - 333
5+	2003	0	0.0	-	0.0	-	-
6+	2002	2	6.1	-	331.0	10.0	321 - 341
Total		33	100.0				

TABLE 5. AGE COMPOSITION AND MEAN TOTAL LENGTH (mm) OF WHITE CRAPPIE COLLECTED FROM JONES BLUFF RESERVOIR DURING FALL 2008

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
1+	2007	30	28.6	-	222.0	5.0	147 - 260
2+	2006	34	32.4	-	292.5	4.9	241 - 353
3+	2005	31	29.5	-	327.0	4.7	266 - 373
4+	2004	3	2.9	-	343.7	4.3	336 - 351
5+	2003	5	4.8	-	373.8	6.1	353 - 388
6+	2002	1	1.0	-	347.0	-	-
7+	2001	1	1.0	-	361.0	-	-
Total		105	100.0				

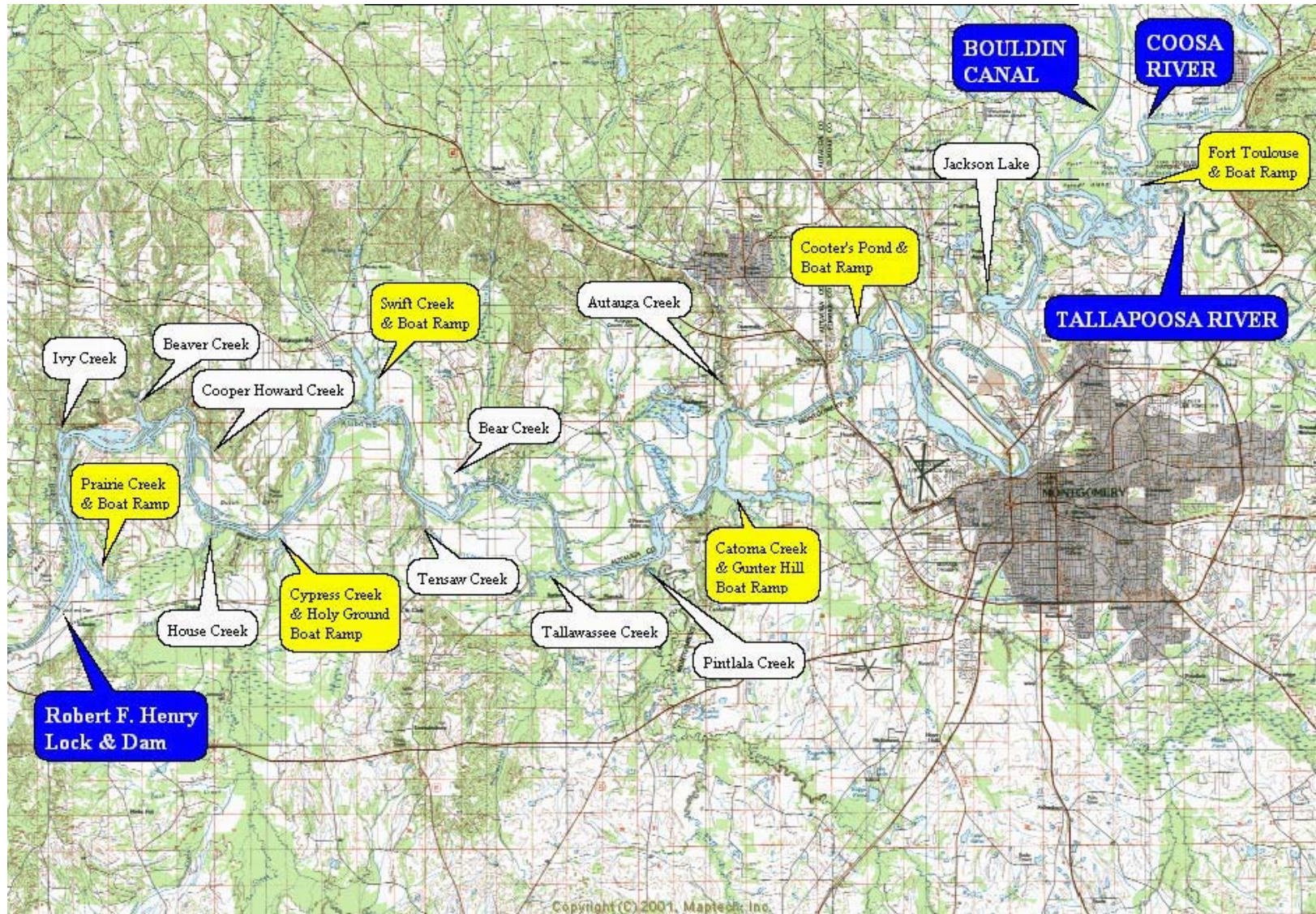


FIGURE 1. Map of Jones Bluff Reservoir with significant tributaries, features, and access areas.

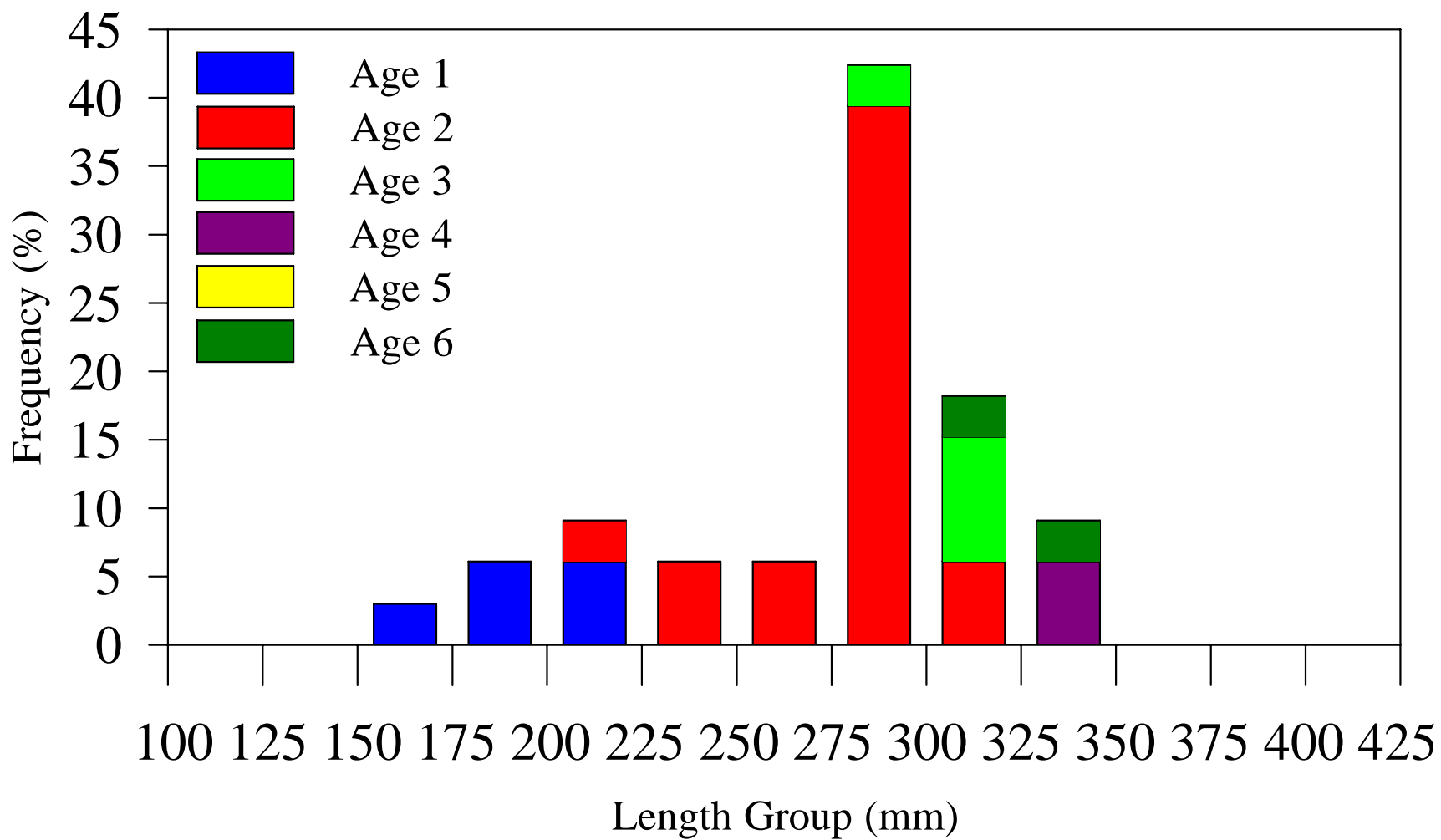


FIGURE 2. Length-at-age frequency of black crappie (N=33) collected by electrofishing from Jones Bluff Reservoir, fall 2008.

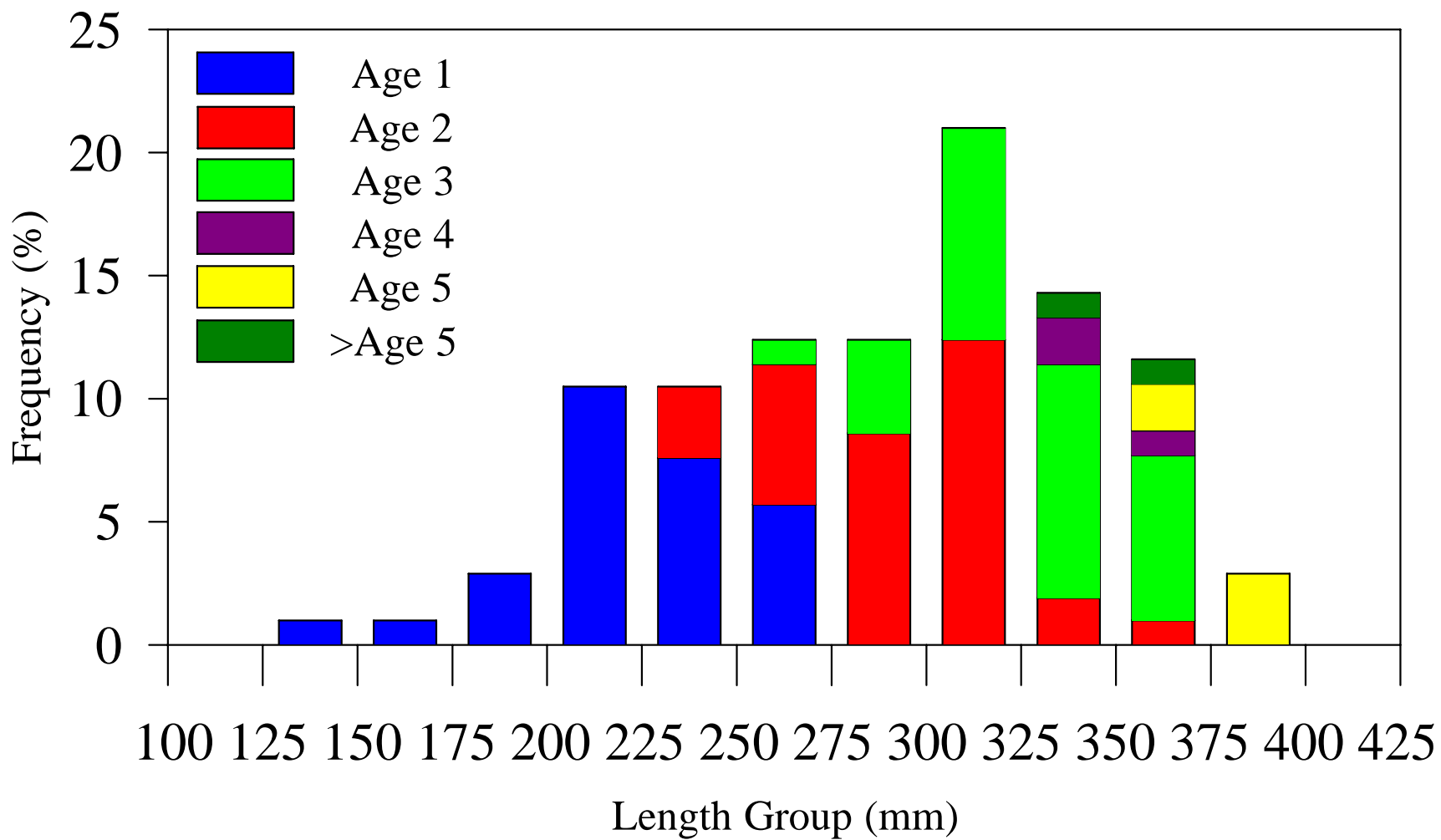


FIGURE 3. Length-at-age frequency of white crappie (N=105) collected by electrofishing from Jones Bluff Reservoir, fall 2008.

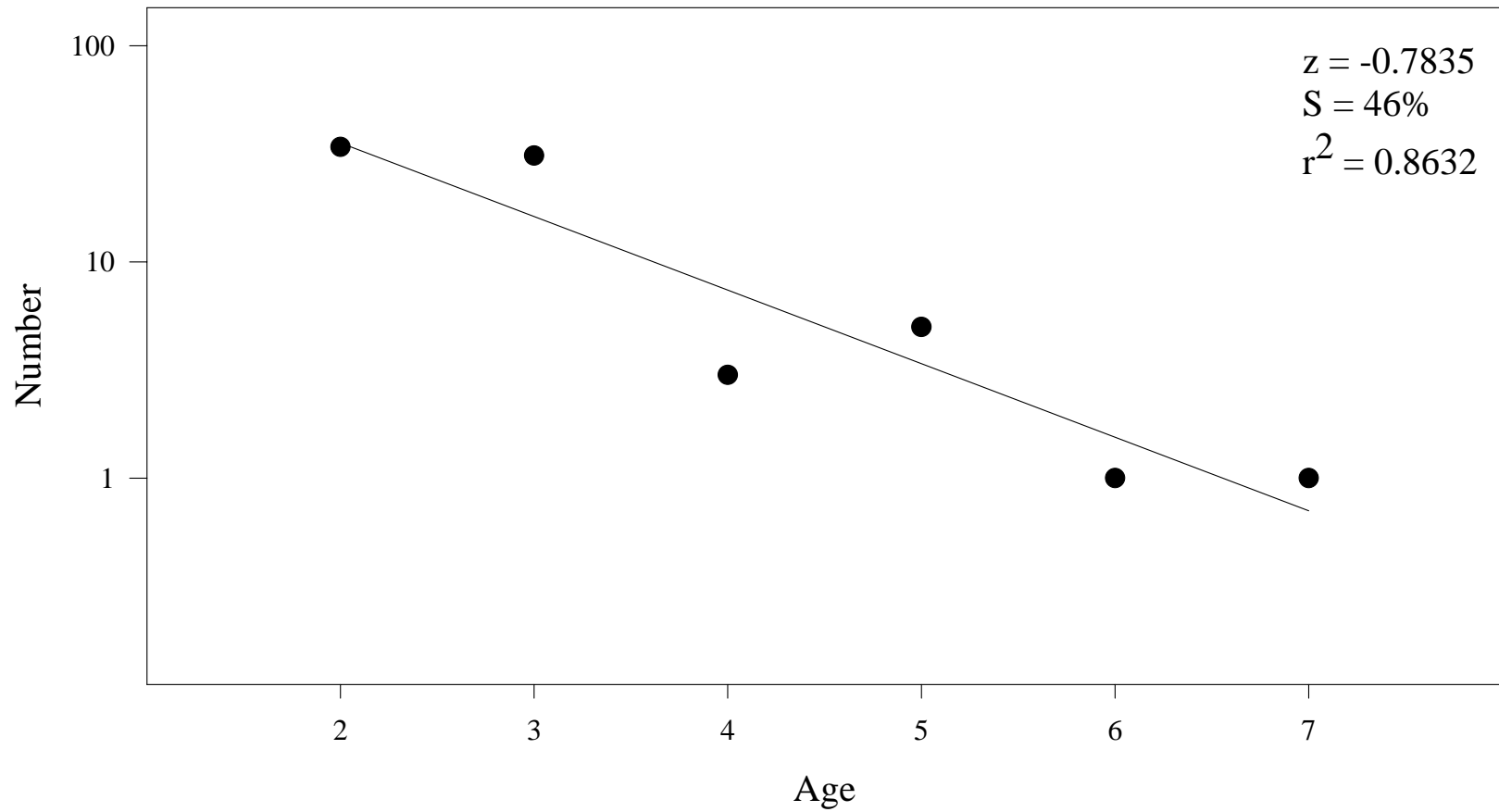


FIGURE 4. Total annual mortality regression for white crappie (ages 2-7) collected from Jones Bluff Reservoir, fall 2008.