

# **COFFEEVILLE RESERVOIR CRAPPIE MANAGEMENT REPORT**

**Fall 2008**

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## **Introduction**

Coffeeville Reservoir is an 8,500-acre impoundment on the Tombigbee River impounded by the United States Army Corps of Engineers in 1958 (Table 1, Figure 1). Coffeeville Reservoir has been sampled following the Alabama Division of Wildlife and Freshwater Fisheries Reservoir Management protocol (Cook 1999) and the results of these efforts, including a detailed description of the physical and biological characteristics, are summarized in Tucker et al. 1996 and Ricks et al. 2006. This report evaluates data taken from standardized sampling in Fall, 2008. Management activities since 1987 have included standardized sampling, aquatic plant management, general surveillance, and the stocking of Gulf-strain and Atlantic-strain striped bass, hybrid striped bass, and Florida largemouth bass (Table 2). Currently no hybrid or Atlantic-strain striped bass are being stocked to conserve our Gulf-strain striped bass stocks. Coffeeville Reservoir is a river-run reservoir with few creeks and backwater areas, resulting in limited habitat for backwater species. The backwater areas on this reservoir are important nursery habitat for both game and non-game fish species, as they are in Demopolis Reservoir upstream of Coffeeville (Slipke et. al. 2005).

## **Methods**

On December 2 and 3, 2008, 11, 30-minute, transects in 10 backwater coves were selected for a total effort of 5.5 hours of electrofishing. The coves selected are indicated on the reservoir map (Figure 1). Both white crappie and black crappie were target species for electrofishing. Transects were selected by choosing the best available habitat within the coves. Total length (mm) and weight (g) were recorded for all fish collected. For age determination, otoliths were removed and preserved from all fish collected. Otoliths were read independently by two readers using a dissecting microscope. Discrepancies in age of the otoliths were reconciled during a third read in concert between the two readers. Any crappie otolith aged

older than six years was sectioned and read under a compound microscope using the methods outlined by Maceina (1988).

## **Results**

Electrofishing produced a sample of 124 white crappie and 68 black crappie from 10 coves in the reservoir. Catch-rates for white crappie and black crappie were 22.4 and 12.3 fish/hour (Table 3, Figure 1).

### White Crappie:

Relative-stock-density (RSD) values for white crappie collected were 43%, 23%, 23%, 10%, and 1% for stock-, quality-, preferred-, memorable-, and trophy-length fish (Table 3, Figure 2). White crappie catch-rates were highest for stock-length fish at 9.2 fish/hour and lowest for trophy-length fish at 0.2 fish/ hour. Catch rates were the same for quality- and preferred-length fish (Table 3). Age-0 through age-6 were present in the sample; however, the catch-curve-regression was not statistically significant. Forty percent of the white crappie sample were age-3 and older (Tables 5 and 7, Figure 3).

### Black Crappie:

RSD values for black crappie collected were 41%, 30%, and 27% for stock-, quality-, and preferred-length fish (Table 3 and Figure 2). Black crappie catch-rates were highest for stock-length fish, 4.2 fish/hour (Table 3). The black crappie sample consisted of ages 0 -7 and 9-11 (Table 4). Since only 68 black crappie were collected, catch-curve regression was not reliable. Forty-six percent of the black crappie sample were age-3 and older (Table 6, Figure 4).

## **Discussion**

Water temperature of the reservoir was between 50°F and 48°F during collection, which impeded our ability to get a large fish sample to completely explain population metrics of the crappie populations. At this temperature, crappie generally begin to shift from shallow habitats to deeper habitats. Many of the crappie in the reservoir were no longer vulnerable to electrofishing gear and; therefore, our catch-rates and sample sizes were not as high as expected.

Overall, the white crappie population seems to be healthy and at acceptable levels. RDS's and length frequencies did not indicate problems such as overexploitation or poor year classes. Only fish up to age-6 were collected, which suggests low survival; however, with a larger sample size we would probably observe older white crappie in the reservoir. We feel confident that at warmer water temperatures older fish would have been collected.

Black crappie are less dominant than white crappie in Coffeerville Reservoir. In comparison, the small sample size (N=68) was expected. Surprisingly, black crappie up to age-11 were collected, suggesting high survival. Though in low abundances, RSD metrics suggest that the black crappie population is healthy and consistent with previous years.

Angling for crappie on Coffeerville Reservoir should be consistent with previous years.

## **Management Recommendations**

Black and white crappie should be sampled again in spring, 2009, during the largemouth bass collection to obtain and corroborate these age data.

## Literature Cited

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**APPENDIX A**

**TABLES AND FIGURES**

TABLE 1. COFFEEVILLE RESERVOIR MORPHOMETRIC, PHYSICAL, AND CHEMICAL CHARACTERISTICS OF COFFEEVILLE RESERVOIR.

Surface area	8,500	acres
Drainage area	18,600	sq. mi.
Full pool elevation	32.5	feet-msl
Shoreline distance	300	miles
Shoreline development index	23.2	(Welch 1948)
Mean depth	23	feet
Maximum depth	40	feet
Total dissolved solids	203	mg/l
Morphoedaphic index	8.83	TDS/mean depth(ft) (Ryder 1965)
Growing season	230-245	frost-free days (Jenkins 1967)
Date of impoundment	1958	

TABLE 2. FISH STOCKING IN COFFEEVILLE RESERVOIR, 1991-2008.

Species	Year	No/Ac	Total
Largemouth Bass (Florida-strain)	1992	1.0	8550
Hybrid Striped Bass	1993	3.0	25500
	1997	2.2	19040
	1998	2.2	19114
	2000	2.2	19020
	2001	5.1	43000
	2002	2.4	20260
	2003	2.2	19000
	2004	2.3	19392
Striped Bass	1991	1.4	11962 A
	1992	2.2	19000 G
	1993	2.2	19000 G
	1995	2.2	19049 G
	1996	2.4	20685 G
	1997	2.2	19080 G
	1998	2.3	19210 G
	1999	2.4	20202 G
	2001	2.2	19000 A
	2003	2.3	19200 G
	2004	2.3	19200 G
	2005	2.3	19200 G
	2006	2.2	19000 G
2007	2.3	19644 G	
2008	2.3	19470 G	

A denotes Atlantic-strain

G denotes Gulf-strain

TABLE 3. NUMBER, RELATIVE STOCK DENSITY, CATCH-PER-EFFORT, AND RELATIVE WEIGHT OF BLACK CRAPPIE AND WHITE CRAPPIE IN COFFEENVILLE RESERVOIR, 1995 - 2008. TRAPNET SAMPLES ARE COMPARED TO ELECTROFISHING DATA COLLECTED DURING FALL, 2008.

Species	Gear	Year	Number Samples (Effort)	TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																				
				SUBSTOCK		RSD-S		RSD-Q		RSD-P		RSD-M		RSD-T		TOTAL								
				no.	cpe	ratio	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe				
Black Crappie	TN	1995	15	8	0.5	22	19	1.3	53	68	8	0.5	22	80	9	0.6	25	92	0	0	44	2.9		
Black Crappie	TN	2006	32	23	0.7	22	66	2.1	64	73	23	0.7	22	86	11	0.3	11	92	3	0.1	3	94	0	
LAKE AVERAGE				0.6	22		1.7	58	71		0.6	22	83		0.5	18	92		0.0	1	94		3.4	
White Crappie	TN	1995	15	94	6.3	26	133	8.9	36	73	105	7.0	29	80	87	5.8	24	85	40	2.7	11	89	0	
White Crappie	TN	2006	32	665	20.8	94	453	14.2	64	70	177	5.5	25	78	42	1.3	6	87	32	1.0	5	86	0	
LAKE AVERAGE				13.5	60		11.5	50	72		6.3	27	79		3.6	15	86		1.8	8	88		36.7	
Black Crappie	EF	2008 11 (5.54 hr)	12	2.2	21		23	4.2	41	74	17	3.1	30	81	15	2.7	27	86	1	0.2	2	67	0	
White Crappie	EF	2008 11 (5.54 hr)	6	1.1	5		51	9.2	43	73	27	4.9	23	81	12	2.2	10	85	1	0.2	1	83	1	
																							124	22.4

TABLE 4. AGE COMPOSITION AND MEAN LENGTH OF BLACK CRAPPIE FROM COFFEEVILLE RESERVOIR, FALL, 2008. TOTAL EFFORT = 5.54 HRS.

Annulus	Year-Class	Number	Percent	CPE	Mean Length (mm)	Standard Error	Length Range (mm)
0	2008	9	13.2	1.6	86.6	4.9	65-108
1	2007	23	33.8	4.2	144.0	4.6	65 - 171
2	2006	5	7.4	0.9	213.8	13.9	188 - 265
3	2005	8	11.8	1.4	233.6	9.2	194 - 286
4	2004	13	19.1	2.3	246.3	5.1	211 - 282
5	2003	4	5.9	0.7	260.3	6.0	246 - 273
6	2002	2	2.9	0.4	269.0	14.0	255 - 283
7	2001	1	1.5	0.2	275.0		275
8	2000	0					
9	1999	1	1.5	0.2	276.0		276
10	1998	1	1.5	0.2	275.0		275
11	1997	1	1.5	0.2	310.0		310
Total		68	100.0	12.3			

TABLE 5. AGE COMPOSITION AND MEAN LENGTH OF WHITE CRAPPIE FROM COFFEEVILLE RESERVOIR, FALL, 2008. TOTAL EFFORT = 5.54 HRS.

Annulus	Year-Class	Number	Percent	CPE	Mean Length (mm)	Standard Error	Length Range (mm)
0	2008	5	4.0	0.9	101.2	10.0	75 - 129
1	2007	31	25.0	5.6	166.0	4.5	111 - 214
2	2006	39	31.5	7.0	209.8	6.4	146 - 292
3	2005	21	16.9	3.8	229.4	7.9	186 - 306
4	2004	21	16.9	3.8	287.3	7.4	209 - 334
5	2003	3	2.4	0.5	302.0	31.2	255 - 361
6	2002	4	3.2	0.7	332.5	20.6	282 - 380
Total		124	100.0	22.4			

TABLE 6. LENGTH-AT-AGE FREQUENCY OF BLACK CRAPPIE FROM COFFEEVILLE RESERVOIR, FALL, 2008.

Length (10 mm)	Age - 0	Age - 1	Age - 2	Age - 3	Age - 4	Age - 5	Age - 6	Age - 7	Age - 8	Age - 9	Age - 10	Age - 11	Total
60	2.9	1.5											4.4
70	1.5												1.5
80	1.5												1.5
90	4.4												4.4
100	2.9												2.9
110		1.5											1.5
120		1.5											1.5
130		5.9											5.9
140		7.4											7.4
150		5.9											5.9
160		8.8											8.8
170		1.5											1.5
180			1.5										1.5
190			1.5	1.5									2.9
200			1.5										1.5
210			1.5	1.5	2.9								5.9
220				1.5									1.5
230				4.4									4.4
240				1.5	8.8	1.5							11.8
250					4.4	1.5	1.5						7.4
260			1.5		1.5	1.5							4.4
270						1.5		1.5		1.5	1.5		5.9
280				1.5	1.5		1.5						4.4
290													
300													
310												1.5	1.5
Total	13.2	33.8	7.4	11.8	19.1	5.9	2.9	1.5	0.0	1.5	1.5	1.5	100.0

TABLE 7. LENGTH-AT-AGE FREQUENCY OF WHITE CRAPPIE FROM COFFEEVILLE RESERVOIR, FALL, 2008.

Length (mm)	Age - 0	Age - 1	Age - 2	Age - 3	Age - 4	Age - 5	Age - 6	Total
70	0.8							0.8
80	0.8							0.8
90	0.8							0.8
100								
110	0.8	0.8						1.6
120	0.8							0.8
130		2.4						2.4
140		4.8	0.8					5.6
150		3.2	1.6					4.8
160		0.8	3.2					4.0
170		4.8	3.2					8.1
180		2.4	2.4	1.6				6.5
190		4.0	3.2	2.4				9.7
200		0.8	3.2	4.0	0.8			8.9
210		0.8	0.8	0.8				2.4
220			2.4					2.4
230			1.6		0.8			2.4
240			1.6	3.2	0.8			5.6
250			3.2	1.6	0.8	0.8		6.5
260			2.4	0.8	1.6			4.8
270				0.8	0.8			1.6
280			0.8		2.4		0.8	4.0
290			0.8	0.8	2.4	0.8		4.8
300				0.8	0.8			1.6
310					1.6			1.6
320					3.2		0.8	4.0
330					0.8			0.8
340							0.8	0.8
350								
360						0.8		0.8
370								
380							0.8	0.8
Total	4.0	25.0	31.5	16.9	16.9	2.4	3.2	100.0

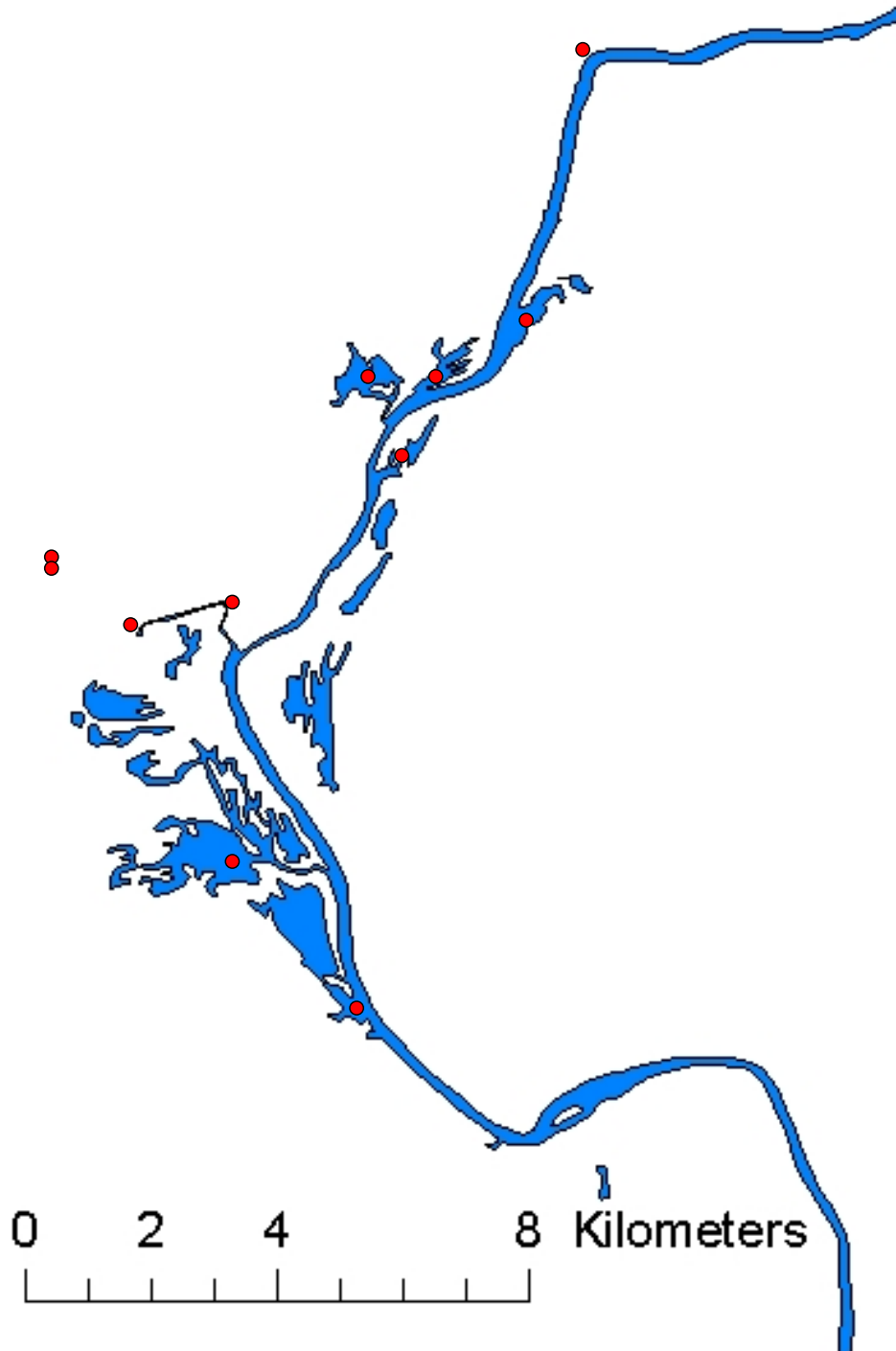


Figure 1. Coffeerville Reservoir Fall, 2008, sampling sites. Red dots indicate sample areas.

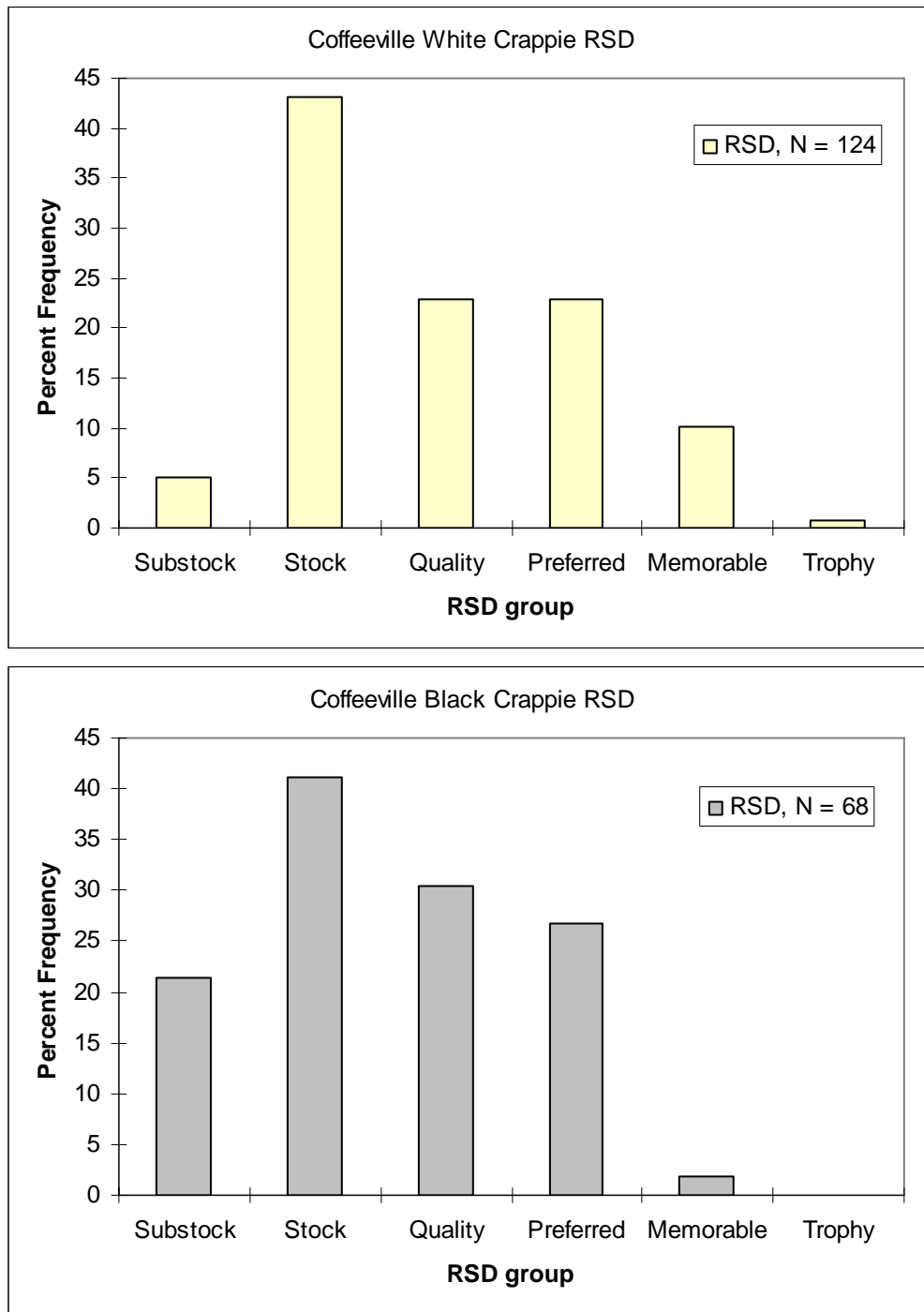


FIGURE 2. RELATIVE STOCK DENSITY (RSD) OF WHITE CRAPPIE AND BLACK CRAPPIE COLLECTED FROM COFFEEVILLE RESERVOIR, FALL, 2008.

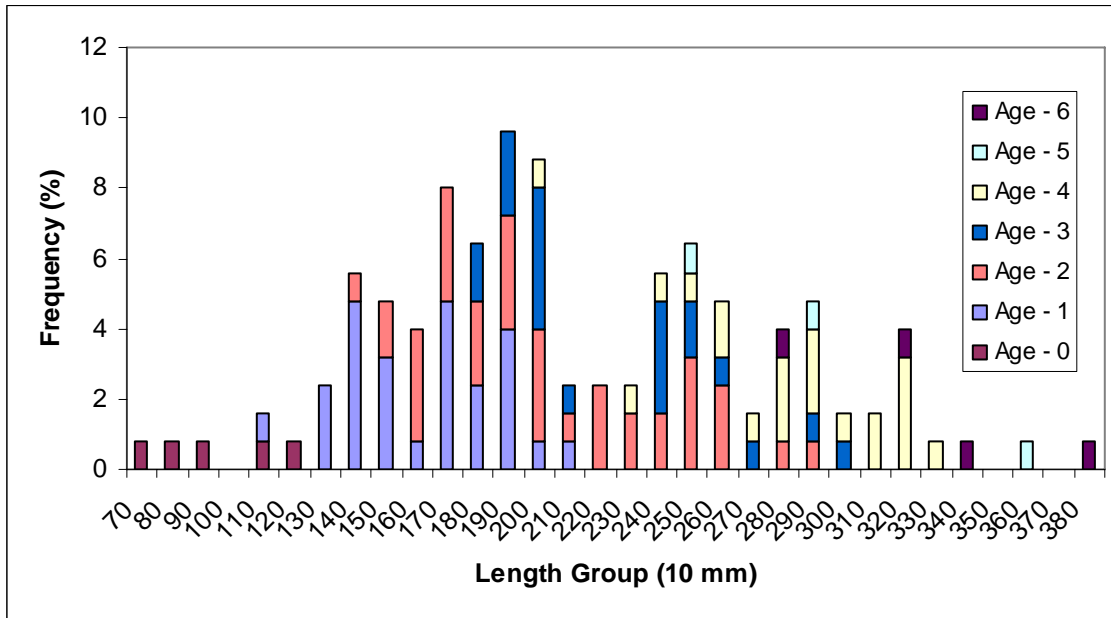


FIGURE 3. LENGTH-AT-AGE FREQUENCY OF WHITE CRAPPIE COLLECTED IN COFFEEVILLE RESERVOIR, FALL, 2008.

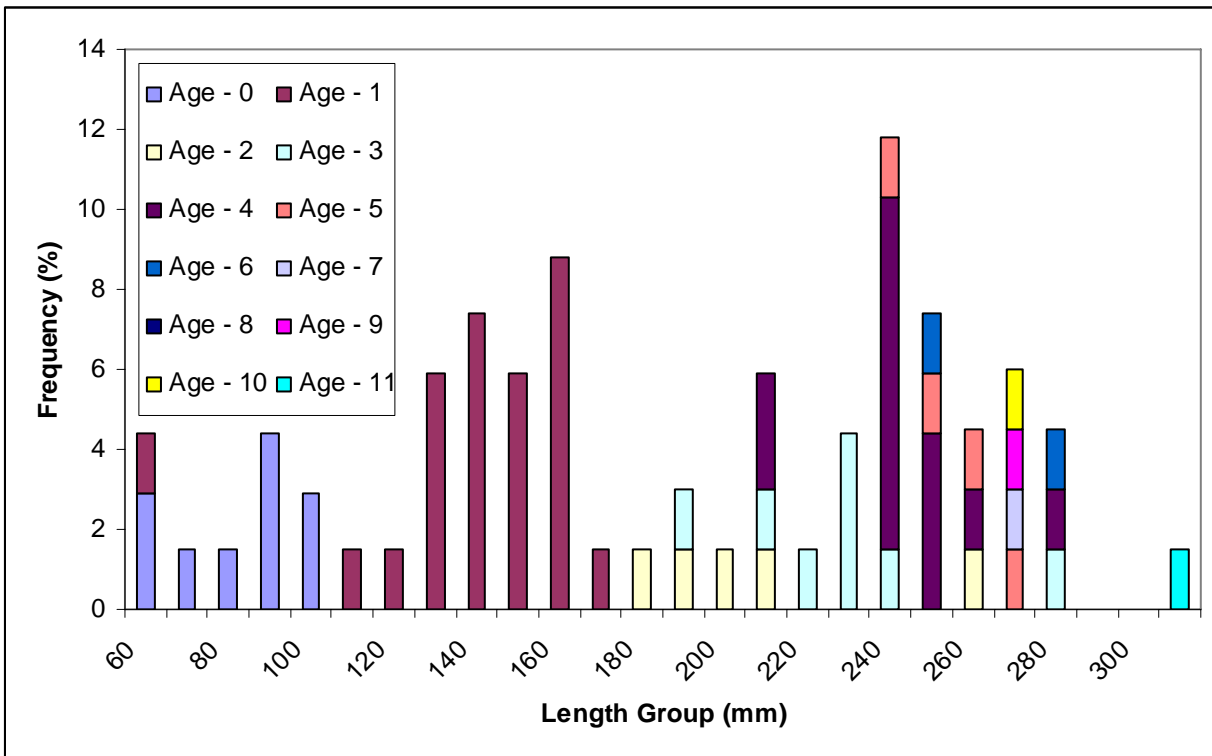


FIGURE 4. LENGTH-AT-AGE FREQUENCY OF BLACK CRAPPIE COLLECTED IN COFFEEVILLE RESERVOIR, FALL, 2008.