

# **COFFEEVILLE RESERVOIR CRAPPIE MANAGEMENT REPORT**

**Fall 2006**

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## **Introduction**

Coffeeville Reservoir is an 8,500-acre reservoir on the Tombigbee River impounded by the United States Army Corps of Engineers in 1958 (Table 1, Figure 1). Coffeeville has been sampled one before for crappie 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. This report evaluates data taken from standardized sampling in Fall, 2006. 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).

Coffeeville Reservoir is a river-run reservoir with few creeks and backwater areas, resulting in limited habitat for centrarchids. 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**

Standardized sampling of this reservoir included trap netting for white crappie and black crappie; however white crappie are more abundant and the focus of the sampling. Six areas were selected for a total effort of 32 net nights; sites are indicated on the reservoir map (Figure 1). By-catch was recorded; however no measurements were made in this analysis (Table 3). Total length (mm) and weight (g) were recorded for all white crappie and black crappie collected. For age determination of white crappie and black crappie, otoliths were removed and preserved. All otoliths were read by two readers with a dissecting microscope. Discrepancies in age of the otolith 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 and Discussion**

Thirty-two net nights of trap netting, during November 30-31, 2006, produced a total of 1369 white crappie and 126 black crappie from six locations on the reservoir (Figure 1). Crappie catch rates were 42.8 and 3.9 per net night for white crappie and black crappie (Table 3 & 4).

### White Crappie

Relative-stock-density (RSD) values for white crappie were above the lowland average for stock-length fish and below the lowland average for preferred-length fish. RSD values for substock-, quality-, and memorable-length white crappie were within the lowland inner quartile range (Table 4, Figure 3). Catch-rates of white crappie (42.8 fish/night) were well above the statewide average (9.2 fish/night). Due to the lack of data, it is difficult to describe this as either good sample timing or a strong year class. Catch-curve regression was used to estimate total mortality ( $A = 55\%$ ,  $R^2 = 90\%$ ) and year-class strength. There were no missing year-classes from ages 0 to 8. A strong year-class of white crappie in 2004 and stable year-classes from 2006-2005 and 2003-1998 were observed (Table 5 & 6, Figure 2).

### Black Crappie

RSD values of stock-length black crappie were higher than the lowland average (Figure 4). However, RSD values for black crappie were below the statewide average for length groups greater than stock-length. Catch-rates of black crappie were over 10 times lower than white crappie catch rates. Catch-curve analysis for black crappie was not significant. Missing year-classes were present indicating variable recruitment (Table 5 & 7).

## **Conclusions**

Based on infrequent sampling, it is not possible to determine trends. However, white crappie numbers at stock-length are high compared to the statewide average and indicate an increase in the number of crappie entering the fishery. Anglers should see an increase in the catch rates of legal-sized crappie during 2007 (Table 6, Figure 5). Due to the dominance of white crappie, anglers should expect to see catches of black crappie equal to their relative composition to the total crappie population.

## **Management Recommendations**

1. There are no management recommendations at this time.
2. Resample crappie population in Fall 2009 and Spring 2010.

## Literature Cited

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# **APPENDIX A**

## **TABLES AND FIGURES**

Table 1. Coffeerville Reservoir morphometric, physical and chemical characteristics

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Surface area	8,500	acres
Drainage area	18,600	sq. mi.
Full pool elevation	32.5	feet-msl
Mean annual fluctuation	> 10	feet
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	

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Table 2. Fish stocking in Coffeerville Reservoir, 1975-2006

Species	Year	No/Ac	Total
Largemouth Bass (Florida-strain)	1986	2.1	18000
	1987	1.0	8500
	1989	4.0	34000
	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	1975	2.1	17500 A*
	1976	1.5	12665 A
	1977	1.4	12240 A
	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	

\* A denotes Atlantic-strain

G denotes Gulf-strain

Table 3. Number of species collected by trapnets in Coffeerville Reservoir, Fall, 2006

Species	Trap Net Sample		
	No.	CPE	Tot E (Net Nights)
White Crappie	1369	42.78	32
Black Crappie	126	3.94	32
Bluegill	240	7.74	31*
Channel Catfish	2	0.06	32
Freshwater Drum	1	0.03	32
Gizzard Shad	9	0.28	32
Hogchoker	1	0.03	32
Longear Sunfish	12	0.38	32
Longnose Gar	1	0.03	32
Redear Sunfish	17	0.53	32
Spotted Gar	5	0.16	32
Spotted Sucker	1	0.03	32
Silverside Shiner	1	0.03	32
Threadfin Shad	41	1.28	32
White Bass	1	0.03	32
Yellow Bullhead	1	0.03	32

\* Only crappie were counted in some samples.

Table 4. Relative stock density, catch-per-unit effort, and relative weight of white crappie and black crappie in Coffeenville Reservoir, 1995-2006

Species	Year	Gear	Net Nights	TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																					
				SUBSTOCK		RSD-S		RSD-Q		RSD-P		RSD-M		TOTAL											
				no.	cpe	ssr*	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe					
White Crappie	1995	Trapnet	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	459	30.6	
White Crappie	2006	Trapnet	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	1369	42.8	
LAKE AVERAGE				Trapnet			13.6	60			12	50	72			6.3	27	79			3.6	15	86		36.7
Black Crappie	1995	Trapnet	15																				44	2.9	
Black Crappie	2006	Trapnet	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	126	3.9	
LAKE AVERAGE				Trapnet			0.7	22			2.1	64	73			0.7	22	86			0.3	11	92		3.4

\* ssr denotes substock ratio; the number of substock fish in the collection per 100 stock fish

Table 5. Age composition and mean length of white crappie and black crappie from Coffeerville Reservoir, Fall, 2006

Species	Year-Annulus	Class	Number	Percent	Mean CPE	Mean Length (mm)	Standard Error	Range (mm)
White Crappie	0	2006	663	48.4	20.7	78.1	0.5	60-130
White Crappie	1	2005	247	18.0	7.7	151.3	0.7	100-170
White Crappie	2	2004	372	27.2	11.6	200.6	1.5	130-300
White Crappie	3	2003	47	3.4	1.5	235.3	6.1	180-330
White Crappie	4	2002	23	1.7	0.7	294.6	7.3	230-360
White Crappie	5	2001	9	0.7	0.3	317.6	5.0	290-340
White Crappie	6	2000	3	0.2	0.1	304.0	11.2	280-320
White Crappie	7	1999	1	0.1	0.0	344.0		340
White Crappie	8	1998	4	0.3	0.1	362.3	4.5	340-370
<b>TOTAL</b>			1369	100.0	42.8			
Black Crappie	0	2006	8	6.3	0.3	92.3	4.3	70-100
Black Crappie	1	2005	71	56.3	2.2	145.8	2.4	100-210
Black Crappie	2	2004	12	9.5	0.4	171.4	9.4	130-220
Black Crappie	3	2003	22	17.5	0.7	229.7	4.2	160-250
Black Crappie	4	2002	1	0.8	0.0	301.0		300
Black Crappie	5	2001	4	3.2	0.1	257.3	8.4	230-270
Black Crappie	6	2000	0	0.0	0.0	0.0		
Black Crappie	7	1999	2	1.6	0.1	293.5	13.5	280-300
Black Crappie	8	1998	0	0.0	0.0	0.0		
Black Crappie	9	1997	5	4.0	0.2	285.2	3.5	270-290
Black Crappie	10	1996	1	0.8	0.0	317.0		310
<b>TOTAL</b>			126	100.0	3.9			
Total effort = 32 Net Nights								

Table 6. Length at age of white crappie from Coffeerville Reservoir, Spring 2006.

Length (mm)	Age - 0	Age - 1	Age - 2	Age - 3	Age - 4	Age - 5	Age - 6	Age - 7	Age - 8	Total
60	130									130
70	277									277
80	148									148
90	68									68
100	19	2								21
110	13	1								14
120	5	2								7
130	3	20	2							25
140		69	8							77
150		91								91
160		55	14							69
170		7	62							69
180			58	6						64
190			53	5						58
200			58							58
210			38	8						46
220			21	9						30
230			21	3	2					26
240			12	3	2					17
250			7		1					8
260			6	2	1					9
270			3	1	1					5
280			3	1	2		1			7
290			5	4	3	1				13
300			1	2	1	1	1			6
310				2	4	3				9
320					3	3	1			7
330				1	1					2
340					1	1		1		3
350									2	2
360					1				1	2
370									1	1
<b>Total</b>	<b>663</b>	<b>247</b>	<b>372</b>	<b>47</b>	<b>23</b>	<b>9</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>1369</b>

Table 7. Length at age of black crappie from Coffeerville reservoir, Fall, 2006

Length (mm)	Age - 0	Age - 1	Age - 2	Age - 3	Age - 4	Age - 5	Age - 6	Age - 7	Age - 8	Age - 9	Age - 10	Total
70	1											1
80	2											2
90	2											2
100	3	1										4
110		4										4
120		10										10
130		13	3									16
140		20										20
150		6	1									7
160		4	2	1								7
170		10	2									12
180		2										2
190			1	1								2
200			1									1
210		1	1	1								3
220			1	6								7
230				5		1						6
240				6								6
250				2		1						3
260												0
270						2				1		3
280								1		2		3
290										2		2
300					1			1				2
310											1	1
Total	8	71	12	22	1	4	0	2	0	5	1	126

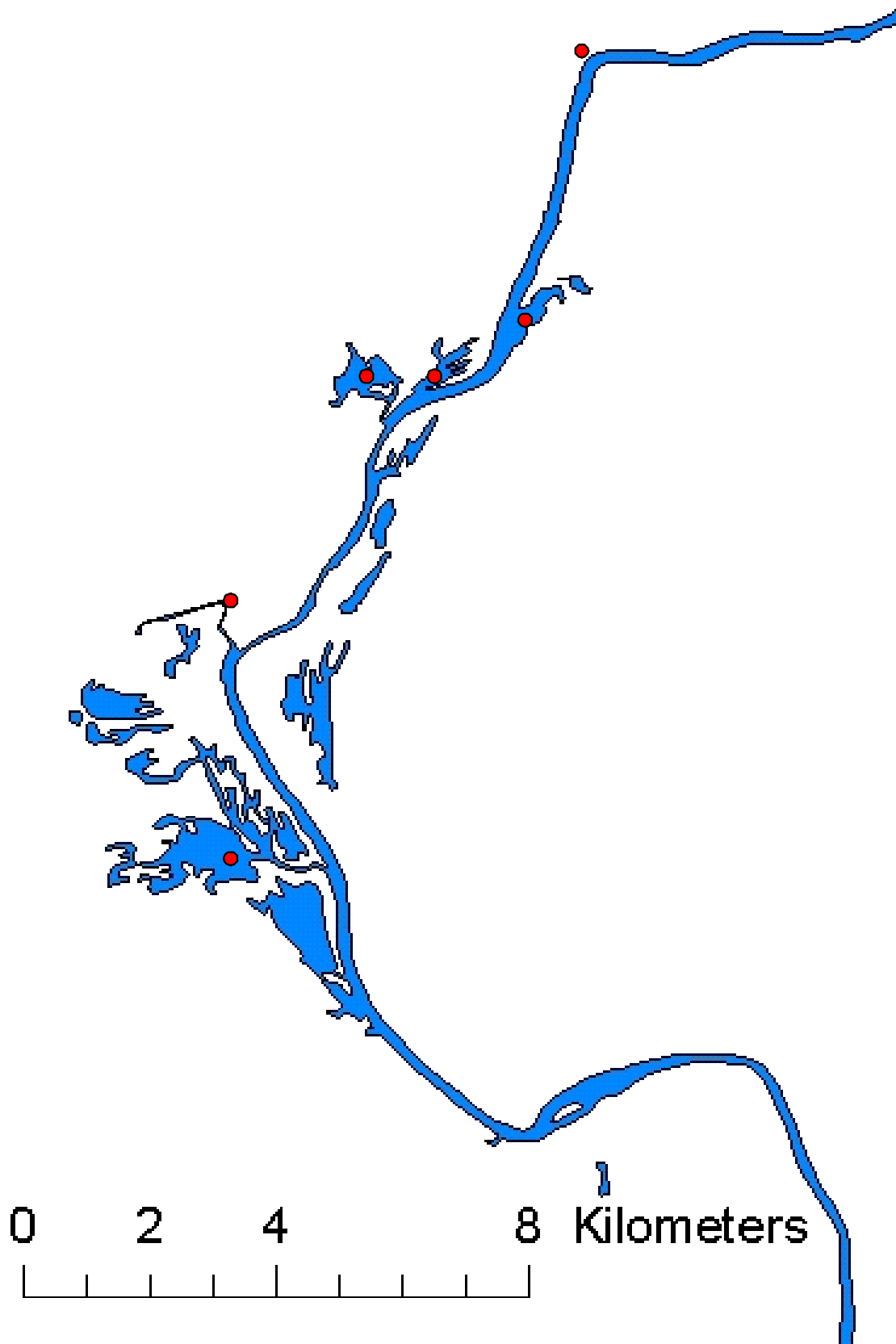


Figure 1. Coffeerville Reservoir Fall, 2006, sampling sites. Red dots indicate sample areas.

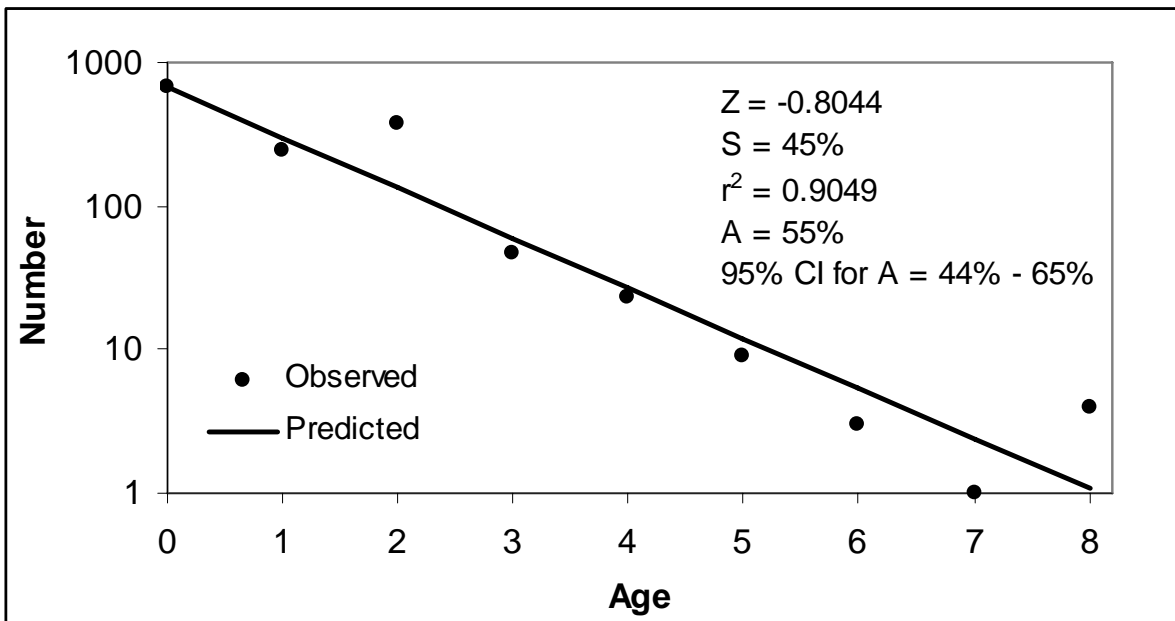


Figure 2. Catch-curve regression for white crappie collected from Coffeerville Reservoir Fall, 2006.

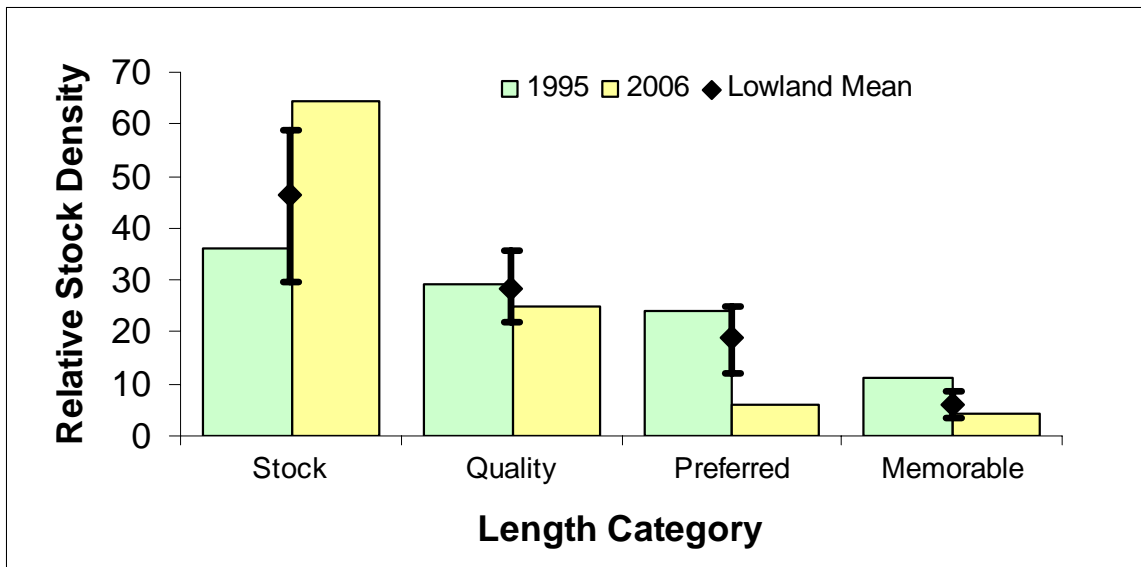


Figure 3. Relative stock density (RSD) of white crappie from Coffeerville Reservoir, 1995 and 2006. The I-beam denotes the inner quartile range for lowland Alabama reservoirs.

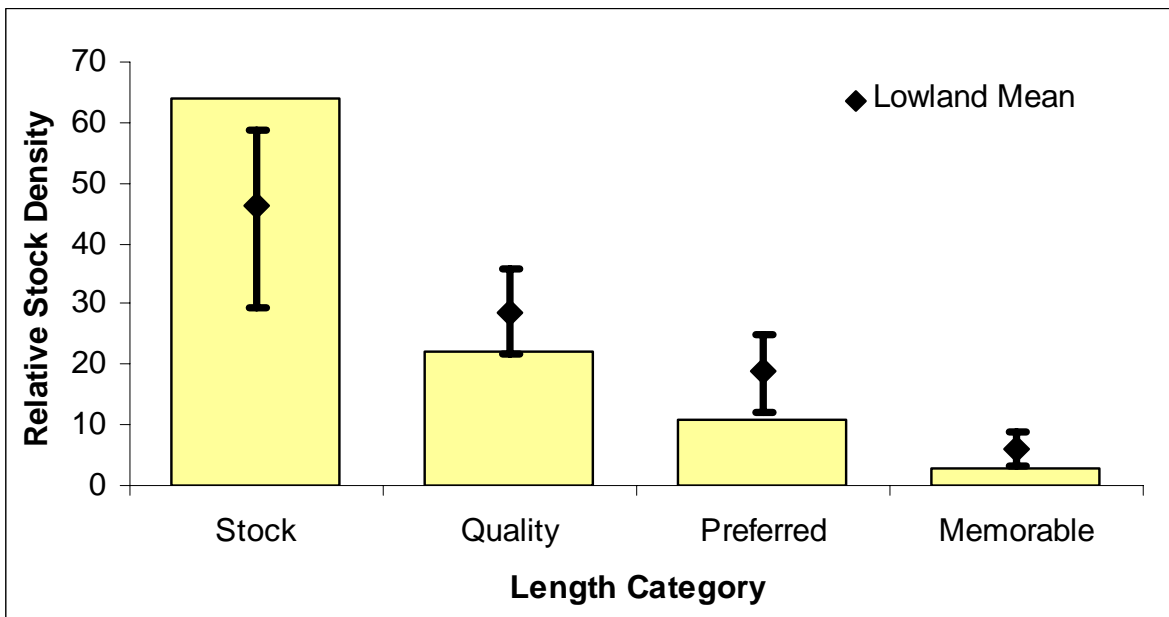


Figure 4. Relative stock density (RSD) of black crappie from Coffeerville Reservoir in Fall, 2006. The I-beam denotes the inner quartile range for lowland Alabama reservoirs.

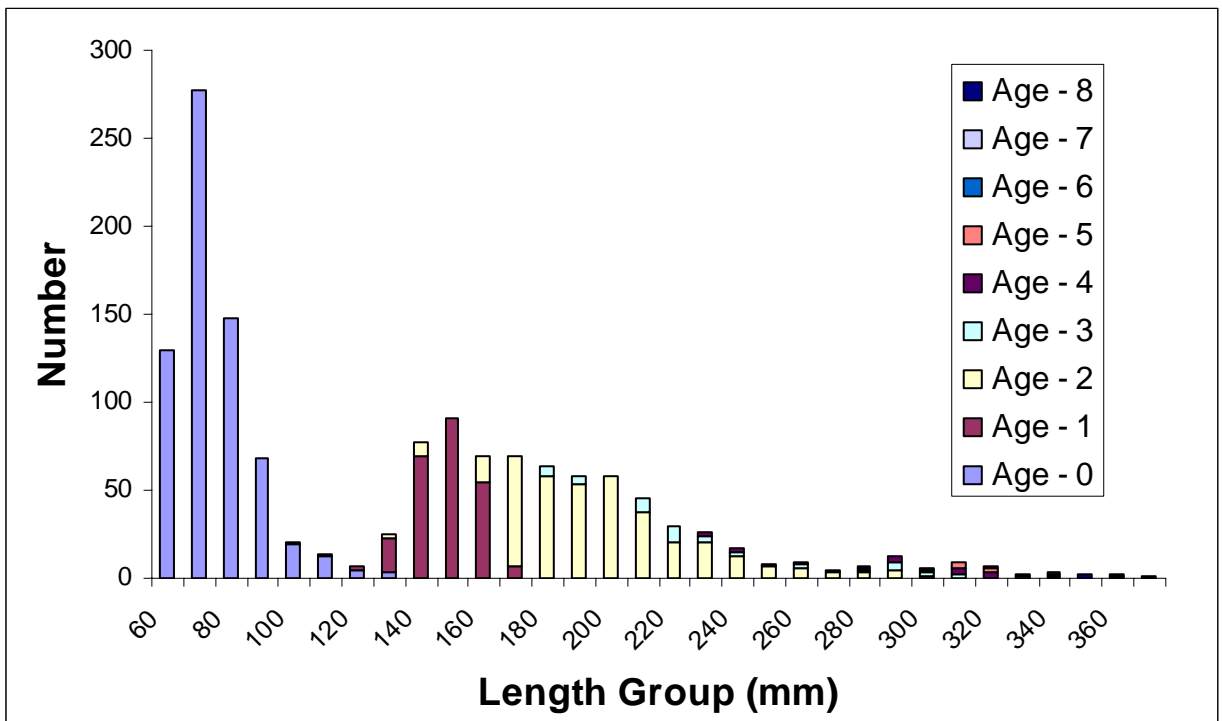


Figure 5. Length-at-age frequency of white crappie from Coffeerville Reservoir, Fall, 2006.

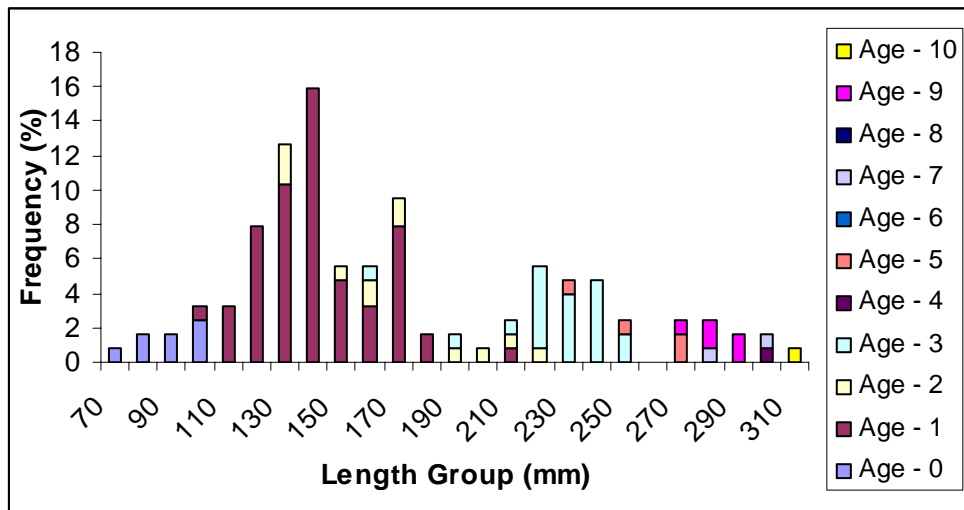


Figure 6. Length-at-age frequency of black crappie from Coffeerville Reservoir, Fall, 2006.