

WARRIOR RESERVOIR CRAPPIE MANAGEMENT REPORT FY 2007

Prepared by

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Introduction

Crappie were previously sampled at Warrior Reservoir in 1994, 1999, and 2002 (Moss et al. 2003). In 2002, white crappie exhibited satisfactory size structure and growth, and variable recruitment. Black crappie were incidental in our collection. The recruitment of the strong 2001 year-class produced a high-quality fishery.

Methods

Crappie were collected from 10 trap nets on November 6, 2006 from Big Brush and Minter Creeks and Martin Slough, according to the guidelines of the Alabama Reservoir Management Manual (1999).

Results and Discussion

Black and White Crappie

A total of 316 white crappie and 34 black crappie were captured. The CPE of white crappie (31.6) was the highest catch rate ever recorded at Warrior (Table 2). The PSD for white crappie was 57 and the RSD-P was 25. Incremental RSD values in 2006 were at or above the lake and statewide average, except for S - Q fish (Figure 3).

In 2006, catch rates of black and white crappie for all incremental RSD size categories exceeded the lake average and were well above the 75% percentile of CPE values in lowland reservoirs, statewide, except for substock fish (Figure 4). The CPE of Q - P fish in 2006 was twice the lake average thanks to 2 strong year-classes (2003 and 2004). Due to the contribution of four age classes (2+ to 5+) catch rates of RSD-P crappie in 2006 were also well above average. Mean W_r values of white crappie ranged from 73 to 90.

Mean W_r values for most incremental RSD size categories were greater than the lake average but less than the statewide average (Table 2). The annual survival rate of "legal-size" white crappie (fish ≥ 229 mm) was estimated to be 36% (adjusted $r^2=0.996$) based on catch curve analysis of 3 to 5-year old fish.

The white crappie sample included six age classes (ages 0+ to 5+). Young-of-year white crappie comprised just 9.2% of the collection. Five strong year-classes (2001-05) were present in our collection and 4 year-classes (2001-2004) contributed to this quality fishery. The 2006 year-class was weak. Growth rates of white crappie in 2006 were slower than in previous collections (Figure 5).

The black crappie sample consisted of 34 fish ranging in total length from 155 - 280 mm. Five year-classes (2002-06) were represented (Figure 6).

Summary

In spite of a very extensive fish kill that occurred in September along a 20-mile section of the Warrior River (primarily in the main channel) the CPE of white crappie was the highest ever recorded at Warrior Reservoir. Recruitment was variable. Five moderately strong year-classes were present in our collection; the only exception was the weak 2006 year-class. Growth of white crappie was slow.

Conclusions

1. Resample crappie in 2009.
2. Maintain the 9-inch minimum-length limit regulation on all crappie.

Literature Cited

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Welch , P. S. 1948. Limnological Methods. McGraw-Hill. pp. 93-94.

Appendix 1

Tables and Figures

TABLE 1. MORPHOMETRIC, PHYSICAL AND CHEMICAL CHARACTERISTICS AT WARRIOR RESERVOIR.

Surface area	8,580 acres
Drainage area	5,828 sq. mi.
Full pool elevation	96 feet-msl
Mean annual fluxuation	1 - 2 feet
Shoreline distance	300 miles
Shoreline development index	23.7 (Welch 1952)
Mean depth	23 feet
Maximum depth	50 feet
Outlet depth	10 feet
Thermocline depth	None
Stratification index	$62.9 \text{ (cfs} \cdot 365) / \text{dsf}$
Total dissolved solids	106 mg/l
Morphoedaphic index	$4.6 \text{ TDS} / \text{mean depth(ft)}$ (Ryder 1965)
Growing season	235 frost free days (Jenkins 1967)
Year impounded	1948

TABLE 2. INCREMENTAL RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE) AND RELATIVE WEIGHT (Wr) OF WHITE CRAPPIE TRAP NETTED AT WARRIOR RESERVOIR.

YEAR	¹ TOTAL EFFORT	² SUBSTOCK			RSD S - Q				RSD Q - P				RSD P - M				RSD M - T				TOTAL	
		NO.	CPE	SSR	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1994	13	57	4.4	24	186	14.3	80	71	24	1.8	10	76	20	1.5	9	77	3	0.2	1	79	290	22.3
1999	10	63	6.3	41	94	9.4	61	66	23	2.3	15	73	29	2.9	19	83	8	0.8	5	80	217	21.7
2002	9	74	8.2	63	70	7.8	60	83	27	3.0	23	87	20	2.2	17	92		0.0	0		191	21.2
2006	10	39	3.9	14	120	12.0	43	73	89	8.9	32	84	52	5.2	19	90	16	1.6	6	87	316	31.6
AVERAGE			5.7	36		10.9	61	73		4.0	20	80		3.0	16	86		0.7	3	82		24.2

¹ EFFORT IS IN NET-NIGHTS

² SSR DENOTES SUBSTOCK RATIO; THE NUMBER OF SUBSTOCK SIZE FISH PER 100 FISH STOCK SIZE AND LARGER.

TABLE 3. INCREMENTAL RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE) AND RELATIVE WEIGHT (Wr) OF BLACK CRAPPIE TRAP NETTED AT WARRIOR RESERVOIR.

YEAR	¹ TOTAL EFFORT	² SUBSTOCK			RSD S - Q				RSD Q - P				RSD P - M				RSD M - T				TOTAL	
		NO.	CPE	SSR	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1994	13	2	0.2	12	12	0.9	71	74	3	0.2	18	76	2	0.2	12	84		0.0	0		19	1.5
1999	10	4	0.4	80	2	0.2	40	67	2	0.2	40	64		0.0	0		1	0.1	20	78	9	0.9
2002	9		0.0	0	4	0.4	33	91	2	0.2	17	89	6	0.7	50	86		0.0	0		12	1.3
2006	10	1	0.1	3	9	0.9	27	76	18	1.8	55	85	6	0.6	18	90		0.0	0		34	3.4
AVERAGE			0.2	24		0.6	43			0.6	32			0.4	20			0.0	5			1.8

¹ EFFORT IS IN NET-NIGHTS

² SSR DENOTES SUBSTOCK RATIO; THE NUMBER OF SUBSTOCK SIZE FISH PER 100 FISH STOCK SIZE AND LARGER.

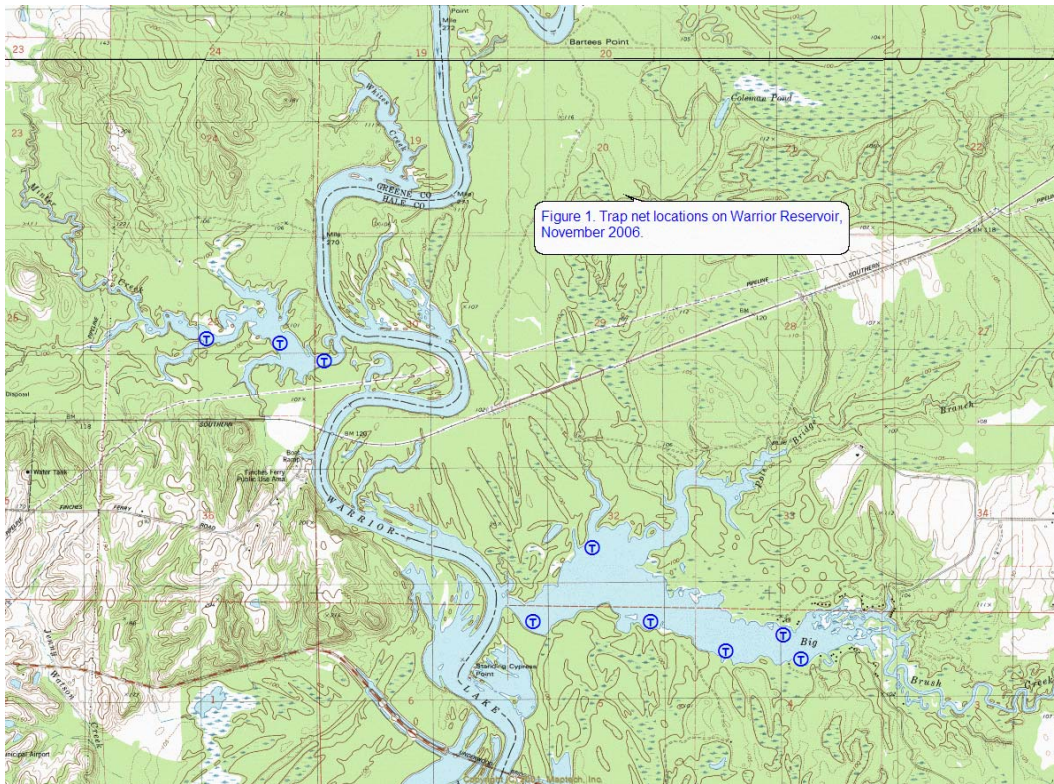
TABLE 4. AGE COMPOSITION AND MEAN TOTAL LENGTH (mm) AT CAPTURE OF WHITE CRAPPIE AT WARRIOR RESERVOIR, NOVEMBER 2006.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
0+	2006	29	9.2	2.9	84	2	65 - 105
1+	2005	124	39.2	12.4	160	2	122 - 239
2+	2004	93	29.4	9.3	225	3	152 - 288
3+	2003	46	14.6	4.6	263	4	233 - 327
4+	2002	18	5.7	1.8	271	8	230 - 338
5+	2001	6	1.9	0.6	324	7	302 - 346
Total		316	100.0	31.6			

TABLE 5. AGE COMPOSITION AND MEAN TOTAL LENGTH (mm) AT CAPTURE OF BLACK CRAPPIE AT WARRIOR RESERVOIR, NOVEMBER 2006.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
0+	2006	1	2.9	0.1	88		
1+	2005	5	14.7	0.5	179	8	155 - 203
2+	2004	9	26.5	0.9	200	5	172 - 224
3+	2003	15	44.1	1.5	227	6	195 - 278
4+	2002	4	11.8	0.4	264	10	236 - 280
Total		34	100.0	3.4			

WARRIOR RESERVOIR



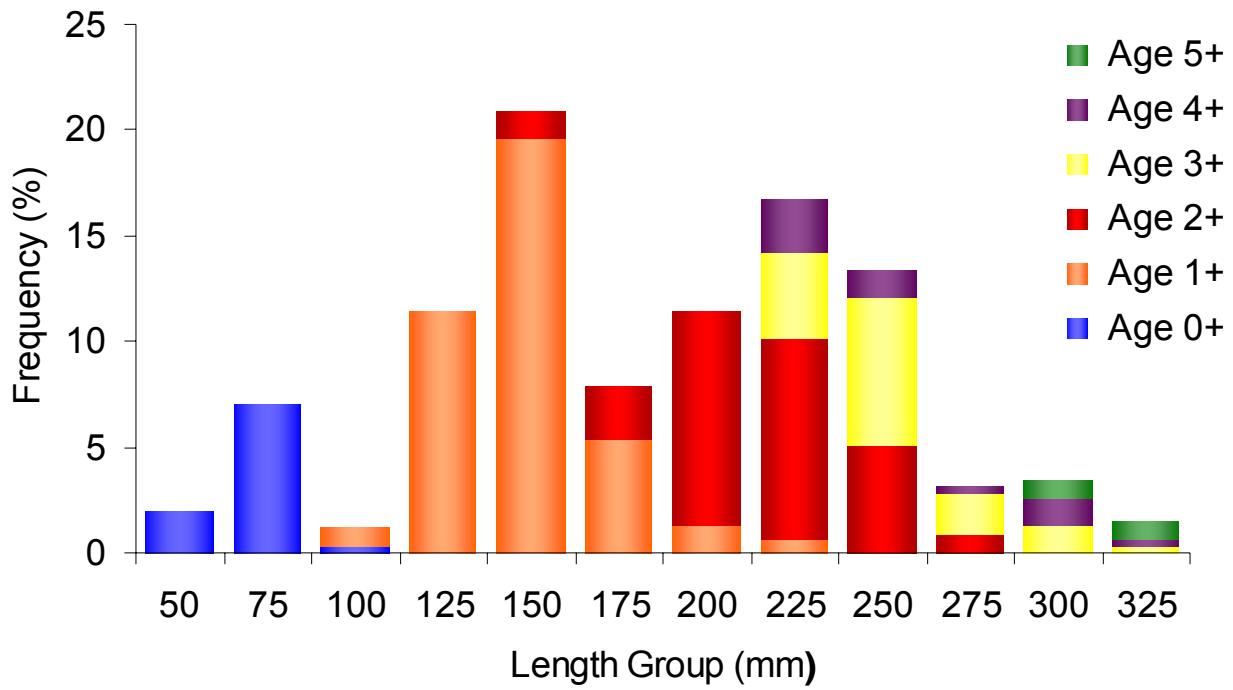


Figure 2. Length at age frequency of white crappie (N=316) at Warrior Reservoir, November 2006.

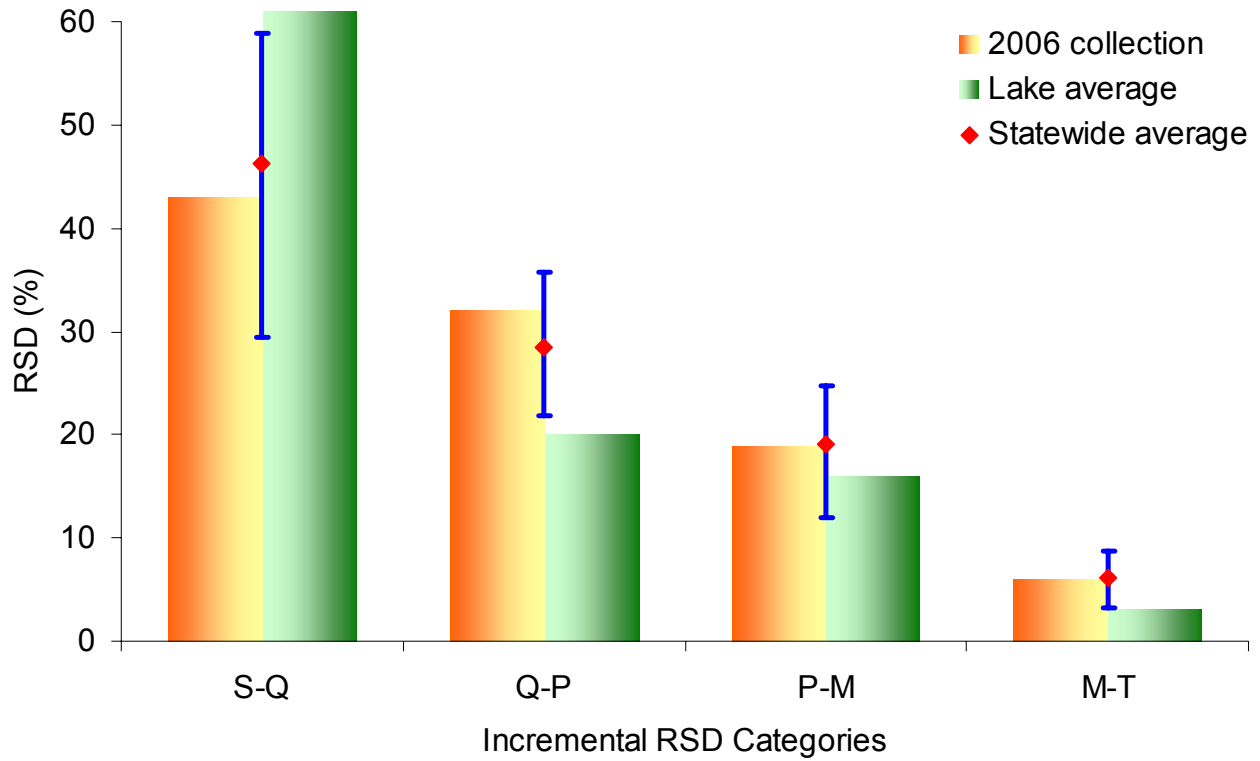


Figure 3. Relative stock density (RSD) of black and white crappie (N=350) at Warrior Reservoir, November 2006. Error bars represent the 25th and 75th percentile of RSD values of black and white crappie in lowland reservoirs, statewide.

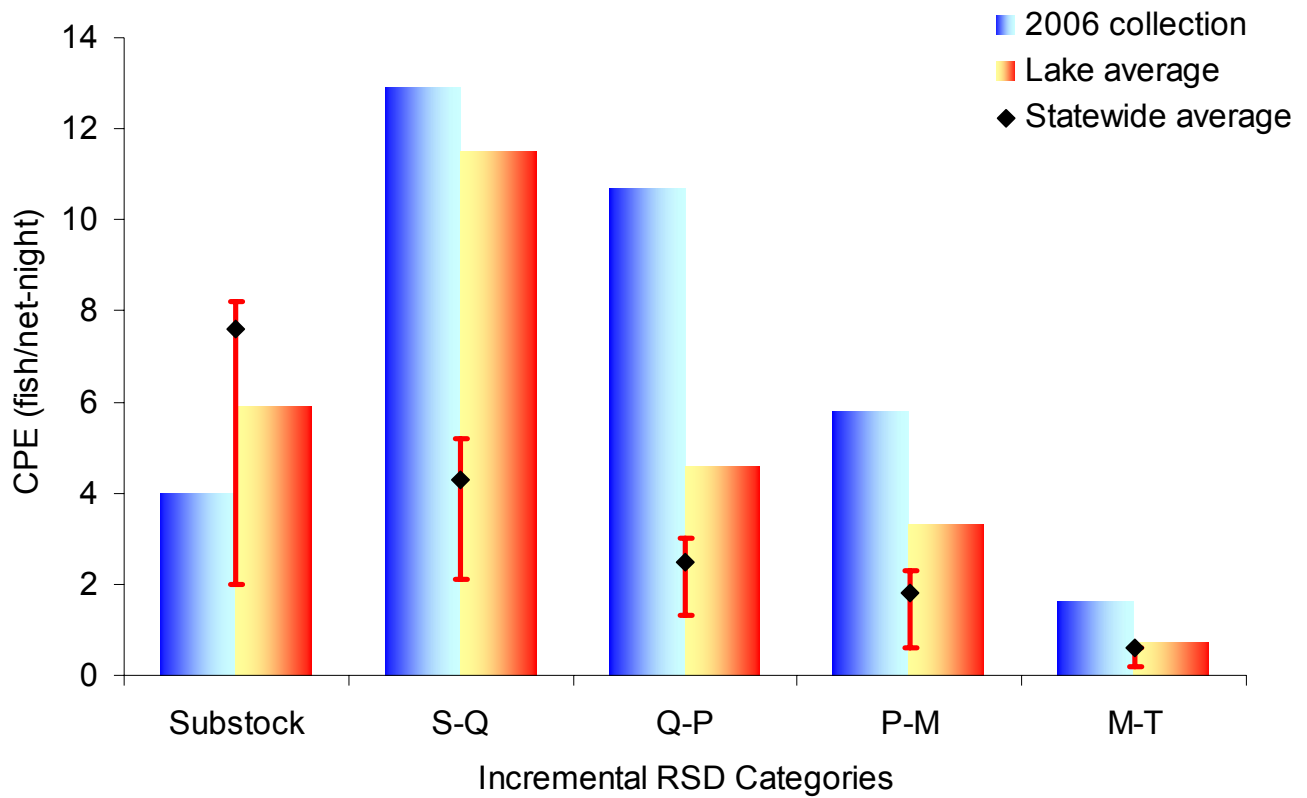


Figure 4. Catch per effort (CPE) of black and white crappie (N=350) at Warrior Reservoir, November 2006. Error bars represent the 25th and 75th percentile of CPE values of black and white crappie in lowland reservoirs, statewide.

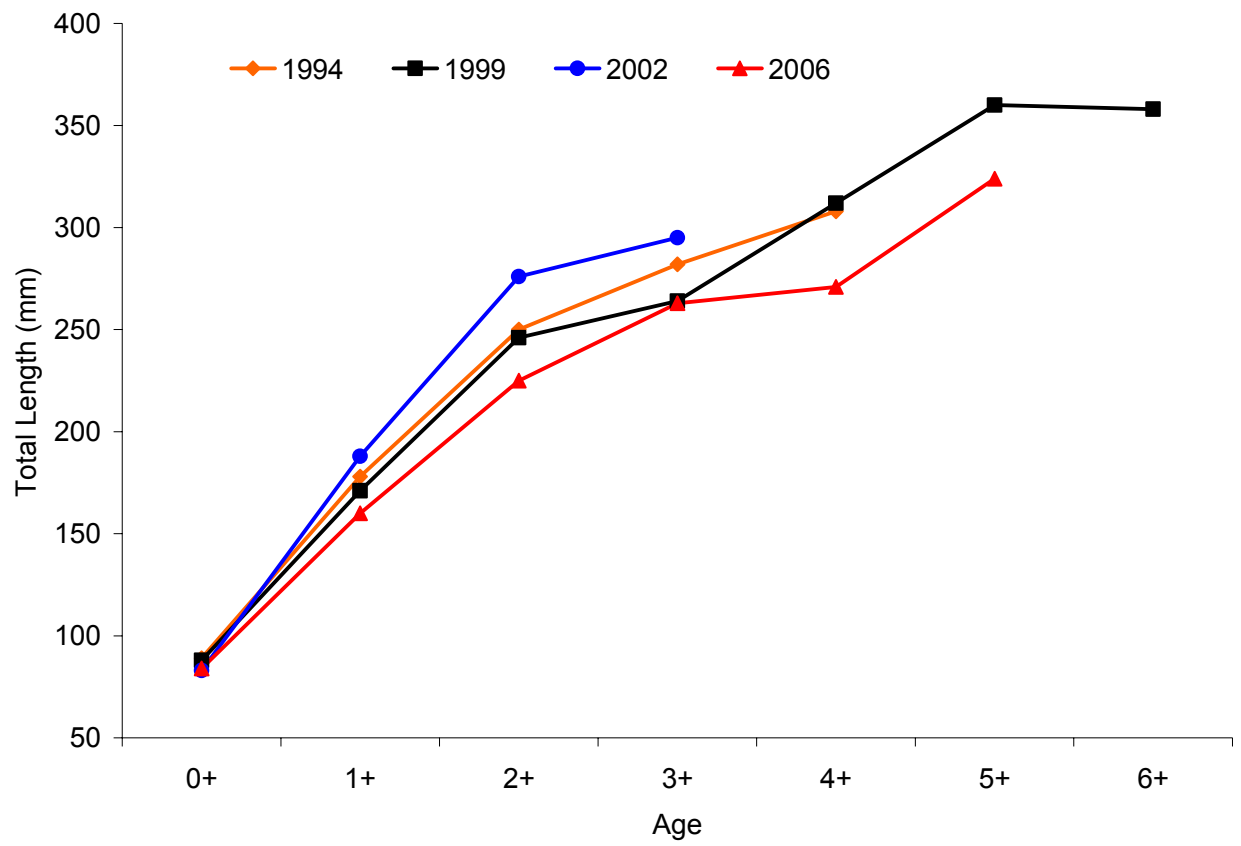


Figure 5. Length at capture of white crappie at Warrior Reservoir.

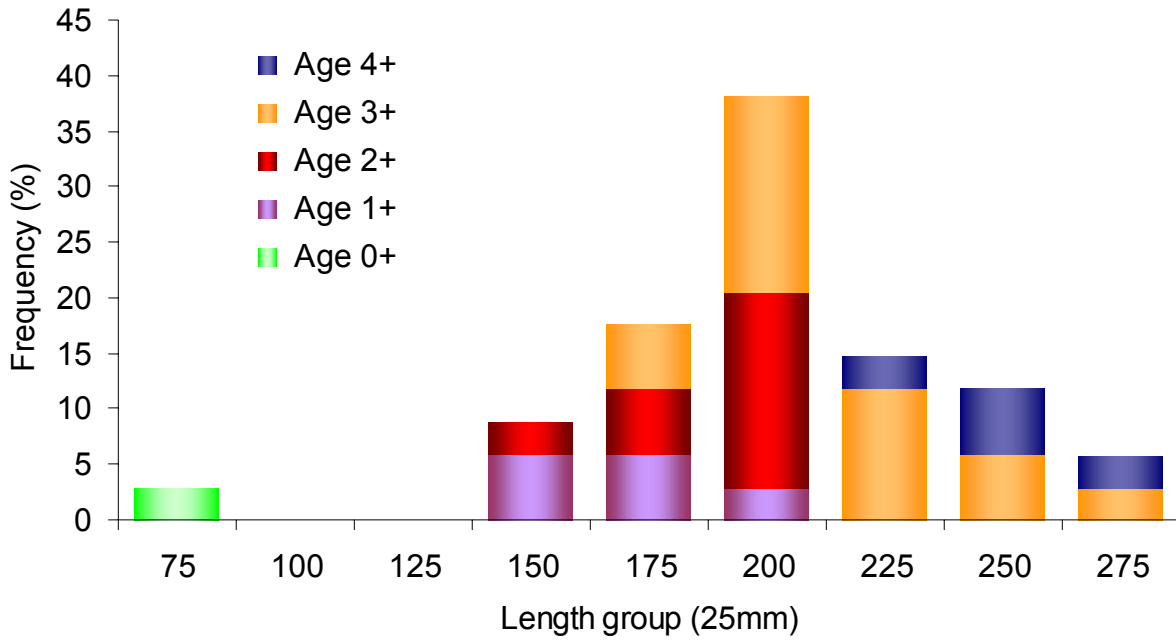


Figure 6. Length at age frequency of black crappie (N=34) at Warrior Reservoir, November 2006.