

**WHEELER RESERVOIR**  
**CRAPPIE MANAGEMENT REPORT**  
**FALL 2010**

**Prepared By**

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**February 28, 2011**

## **Introduction**

The reservoir management objective for Wheeler Reservoir is to collect baseline biological data on the important sport fishes. From these data, length-at-age frequencies, growth, relative abundance, survival, and relative weights were calculated. Results of these analyses were used to formulate changes, if necessary, to the current crappie management plan for Wheeler Reservoir.

Wheeler Reservoir was previously sampled for crappie in 1991 (Floyd et al. 1994), 1994 (Floyd et al. 1995), and 2007 (Floyd et al. 2008). In the past, sampling for crappie utilizing trap nets has been laborious while producing limited results. Based on our success in obtaining an adequate sample of crappie during fall 2007 utilizing electrofishing gear, we again used electrofishing to collect crappie during fall 2010.

## **Methods**

Wheeler Reservoir was electrofished on October 21, 25, and 27 in Flint Creek, Anderson Creek (Elk River), and Limestone Creek, respectively (Figure 1). These sites proved productive during fall 2007, so sites were again electrofished during fall 2010. All black and white crappie collected were measured to the nearest millimeter and weighed to the nearest gram. Otoliths were removed from all crappie greater than 100 mm total length for aging. All crappie greater than 100 mm in length were identified as male, female, or immature. Data analysis was conducted using the Alabama Division of Wildlife and Freshwater Fisheries (ADWFF) Data Analysis and Report Utilities (Slipke, 2004).

## **Results**

During fall 2010, 150 white crappie and 27 black crappie were collected. All fish were associated with woody debris (blow-downs or stumps) in depths ranging from 2 to 10 feet. At the time of the Flint Creek collection, anglers were catching crappie from blow-downs along the creek banks utilizing crappie jigs and/or minnows fished 2-10 feet below the water's surface (personal communication).

Relative Stock Density (RSD) values for white crappie increased for substock, quality, preferred and memorable size categories, while RSD values for both stock and trophy size categories expressed decreases, when compared to the 2007 sample (Table 2, Figure 3). The preferred and memorable categories dominated the sample and were above the statewide 75<sup>th</sup> percentile values for trap net data (Table 2). The stock and quality size categories were below statewide 25<sup>th</sup> percentile values for trap nets (Table 2). This is not unexpected due to the size selectivity that can occur with electrofishing gear.

Age distribution for white crappie was acceptable with ages ranging from 0 to 8, with no age-6 or age-7 white crappie being captured (Table 3). White crappie age-0, 1, and 2 dominated the sample and comprised 33.3%, 27.3%, and 26.0%, respectively (Table 3). Annual survival (S) for ages 1-8 was 50% ( $r^2=0.9111$ ) based on the catch curve regression (Figure 4).

Relative weight calculations for white crappie for all RSD categories equaled or exceeded the statewide 75<sup>th</sup> percentile for trap net collections (Table 2). Growth of white crappie is rapid with 78% of the 2009 year class (age-1) and 92% of the 2008 year class (age-2) exceeding 9 inches (Figure 2).

Thirty-seven percent (37%) of the white crappie sampled were mature males, 29% were mature females, and the remaining 33% were sexually immature (Figure 5). This ratio of 3:2 for sexually mature fish indicates that the entire population was adequately sampled, thus establishing more confidence in the accuracy of the population metrics obtained.

Although the sample size (N=27) of black crappie was too small to obtain any statistically valid conclusions about the population, individuals representing five year classes were collected during fall electrofishing. The majority of the sample was age 2 (59%) with age 1 black crappie making up 26% (Table 4). RSD values were 40% for preferred and 8% for memorable sized black crappie which were both above the statewide mean for crappie collected with trap nets. The RSD values for stock and quality sized fish were 24% and 28%, respectively; both below the Alabama mean (Table 2). Values for RSD P-M and RSD M-T were similar to the 2007 collection. The RSD S-Q value increased, while the value for RSD Q-P decreased, when compared to the 2007 sample. The high RSD values for both preferred and memorable categories are likely a result of electrofishing bias towards larger sized fish. Black crappie growth was slower than observed for white crappie and the mean length-at-age was lower for all year classes compared to the white crappie mean length-at-age data (Tables 3 and 4).

### **Summary**

The white crappie and black crappie populations on Wheeler Reservoir show excellent size distribution and age structure. High relative weights and fast growth rates indicate that forage is not limited. The satisfactory age and size distribution, adequate survival, high relative weights, and fast growth rates, all indicate that there is no need to change the management strategies at this time.

### Literature Cited

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**Appendix A**  
**Tables and Figures**

TABLE 1. Wheeler Reservoir morphometric, physical and chemical characteristics.

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Surface area	67,070 acres
Drainage area	29,590 sq. mi.
Full pool elevation	556 feet-msl
Mean annual fluxuation	6 feet
Shoreline distance	899 miles
Shoreline development index	24.8 (Welch 1948)
Mean depth	15.7 feet
Maximum depth	57 feet
Outlet depth	52 feet
Total dissolved solids	92.6 mg/l
Morphoedaphic index	5.9 TDS/mean depth(ft) (Ryder 1965)
Growing season	214 frost free days (Jenkins 1967)
Year of Impoundment	1939

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TABLE 2. Total number, cpe, percent, and Wr for black crappie and white crappie from Wheeler Reservoir, fall 2010 and fall 2007.

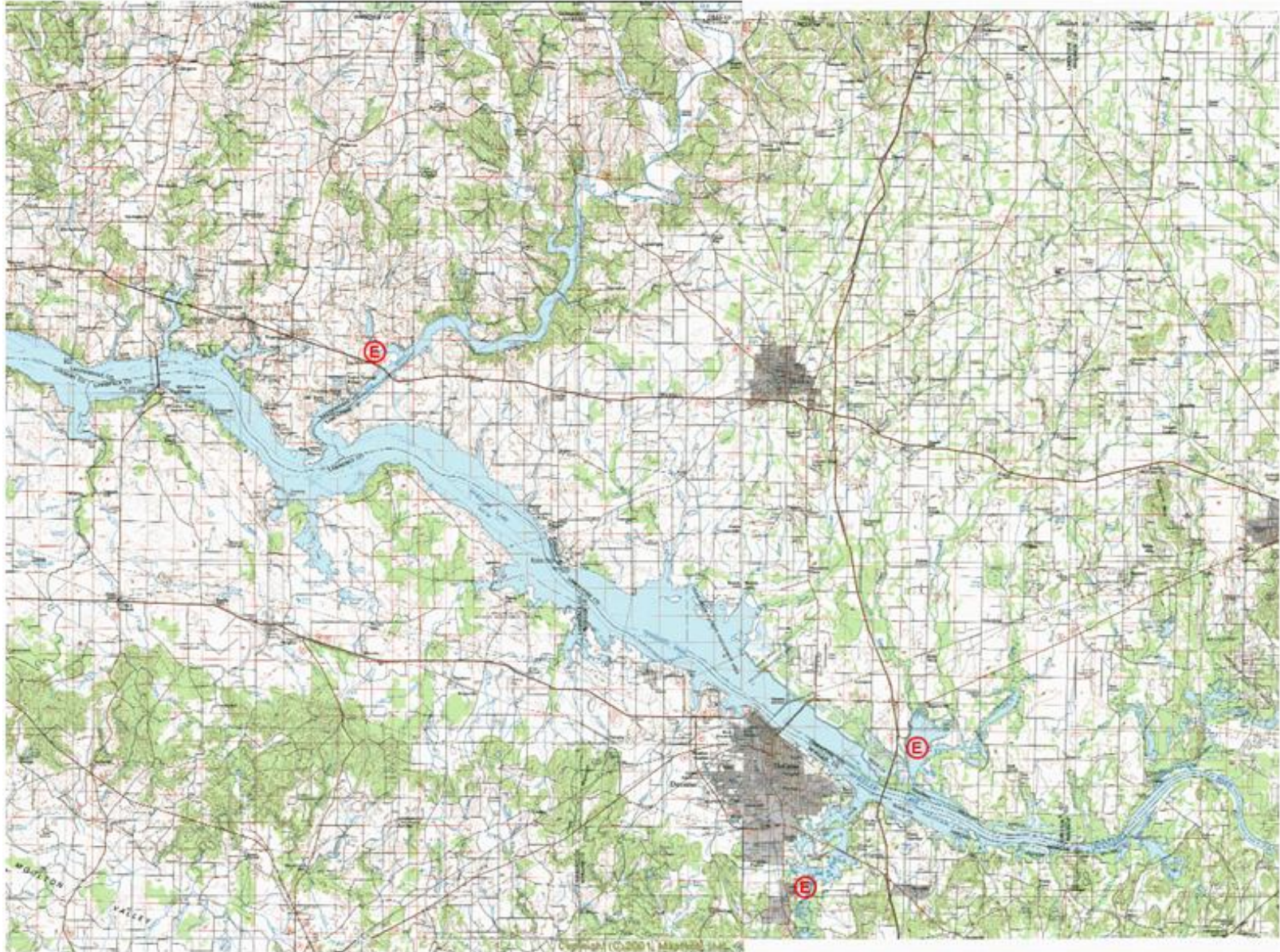
Species	Gear	Year	Time (sec.)	TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																				TOTAL																														
				SUBSTOCK			RSD S-Q				RSD Q-P				RSD P-M				RSD M-T				RSD-T			no.	cpe																											
				no.	cpe	ratio	no.	cpe	pct.	B-Wr	W-Wr	no.	cpe	pct.	B-Wr	W-Wr	no.	cpe	pct.	B-Wr	W-Wr	no.	cpe	pct.	W-Wr																													
WCP	Elect.	F'10	13619	47	12.4	46	6	1.6	6	82	19	5.0	18	97	48	12.7	47	100	30	7.9	29	102					150	39.7																										
WCP	Elect.	F'07	23248	3	0.5	3	24	3.7	22	87	15	2.3	14	95	44	6.8	41	102	23	3.6	21	103	1	0.2	1	106	110	17.0																										
BCP	Elect.	F'10	13619	2	0.5	8	6	1.6	24	82	7	1.9	28	94	10	2.6	40	107	2	0.5	8	106					27	7.1																										
BCP	Elect.	F'07	23248	3	0.5	10	2	0.3	6	99	14	2.2	45	99	13	2.0	42	101	2	0.3	6	96					34	5.3																										
BCP/WCP	Elect.	F'10	13619	49	13.0	38	12	3.2	9	82	26	6.9	20	94	58	15.3	45	107	100	32	8.5	25	106	102				177	46.8																									
BCP/WCP	Elect.	F'07	23248	6	1.0	4	26	4.0	19	99	29	4.5	21	99	57	8.8	41	101	102	25	3.9	18	96	103	1	0.2	1	106	144	22.3																								
Statewide mean (trap net data)				74			36				74				76				33				85				89				24				92				94				7				98				95			
25% Tile (trap net data)				18			19				69				72				25				78				83				14				84				88				3				90				91			
75% Tile (trap net data)				86			52				76				79				43				88				93				34				97				100				10				106				99			

TABLE 3. Age composition and mean length of white crappie from Wheeler Reservoir, fall 2010.

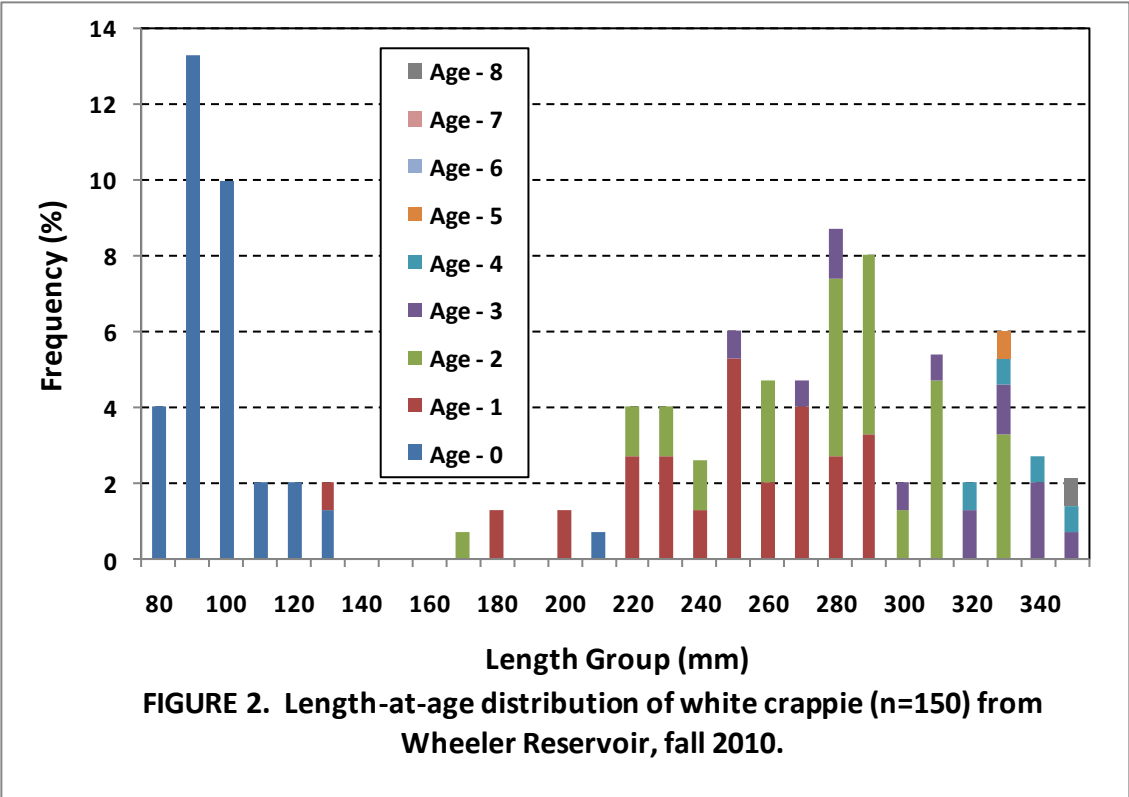
Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range
0	2010	50	33.3	13.2	103.3	2.8	85-216
1	2009	41	27.3	10.8	251.4	5.4	138-297
2	2008	39	26.0	10.3	286.6	5.8	171-339
3	2007	14	9.3	3.7	314.9	8.3	250-350
4	2006	4	2.7	1.1	340.3	6.0	329-357
5	2005	1	0.7	0.3	330.0		
6	2004	0	0.0	0.0			
7	2003	0	0.0	0.0			
8	2002	1	0.7	0.3	353.0		
Total		150	100.0	39.7			

TABLE 4. Age composition and mean length of black crappie from Wheeler Reservoir, fall 2010.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range
0	2010	2	7.4	0.5	95.0	13.0	82-108
1	2009	7	25.9	1.9	194.4	20.7	136-293
2	2008	16	59.3	4.2	249.8	9.9	187-305
3	2007	1	3.7	0.3	287.0		
4	2006	1	3.7	0.3	282.0		
Total		27	100.0	7.1			



**FIGURE 1. Wheeler Reservoir electrofishing sites (E) for crappie, fall 2010.**



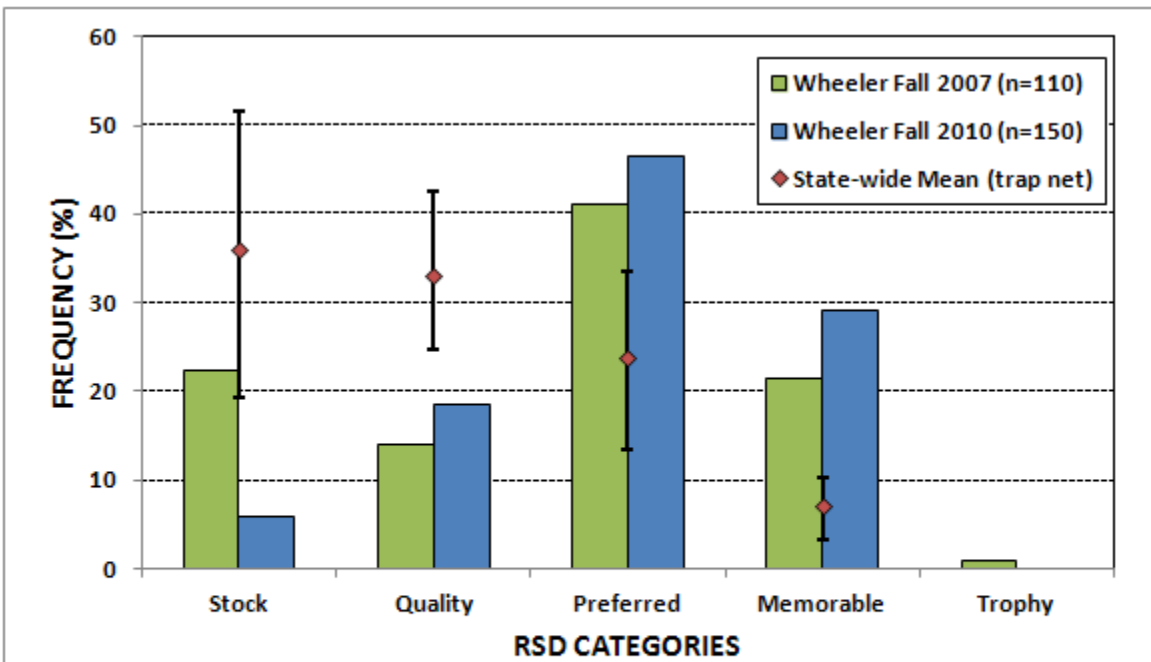
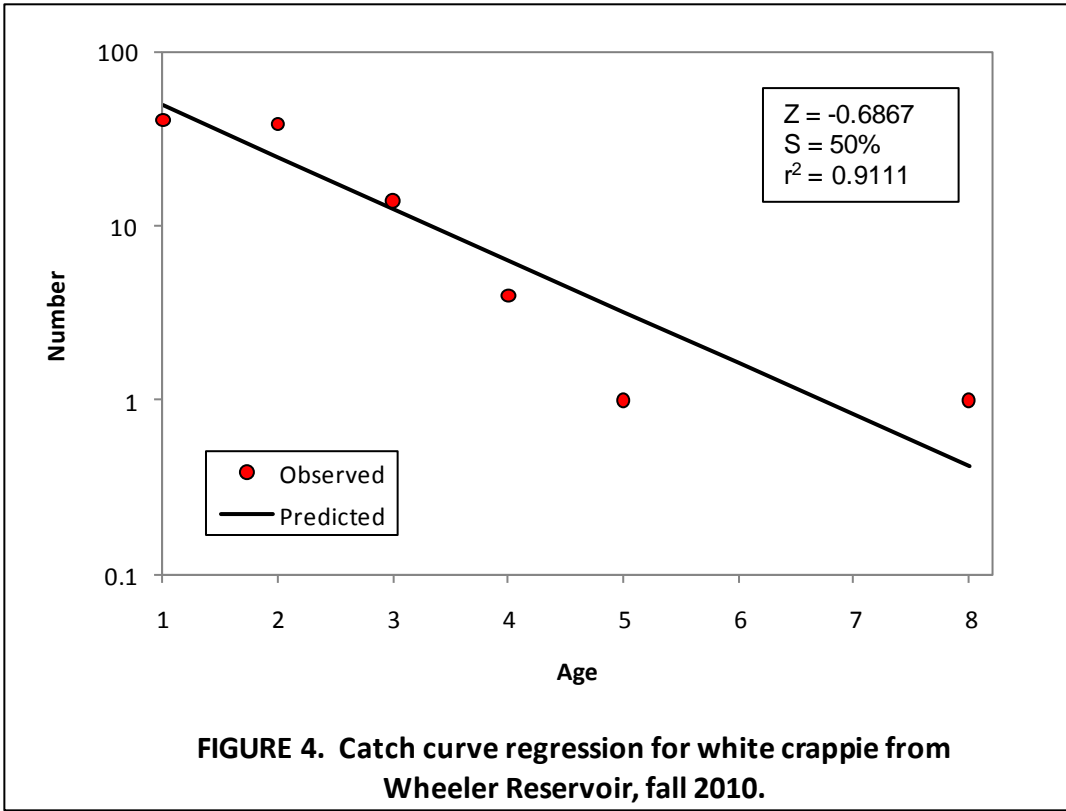


FIGURE 3. Relative Stock Density distribution of white crappie collected by electrofishing from Wheeler Reservoir, fall 2007 and fall 2010. The I-beams denote the statewide means, 25th, and 75th percentiles of RSD values for crappie collected by trap netting, statewide.



**FIGURE 4. Catch curve regression for white crappie from Wheeler Reservoir, fall 2010.**

