

**EUFAULA RESERVOIR
CRAPPIE MANAGEMENT REPORT**

FALL 2010

Prepared by

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Introduction

The objective of the Eufaula Reservoir management plan is to collect quantitative biological data to assist district biologists in developing management strategies to enhance the fishery (Cook 1999). The crappie population is sampled annually by the Alabama Division of Wildlife and Freshwater Fisheries (ADWFF) during the fall to follow trends in growth, recruitment, and mortality.

A detailed description of Lake Eufaula can be found in Newman et al. (1986). A summary of morphometric, physical, and chemical characteristics is listed in Table 1 of this report. Currently there is no minimum length limit restriction in place for Lake Eufaula crappie, but the creel limit is 30 per day.

Methods

Crappie were collected via boat electrofishing October 27-28, 2010. General sampling locations are depicted in Figure 1. Total length to the nearest millimeter and weights to the nearest gram were recorded for each fish collected. Sagittal otoliths were removed from crappie and read in whole view by District VI personnel to determine age. Catch per effort (CPE) was computed as the number of crappie collected per hour of electrofishing. Stock density indices and relative weight were calculated according to Anderson and Neumann (1996).

Results and Discussion

A total of 108 black crappie were collected during the 2010 fall sample with a catch rate of 46.5 fish/hr, similar to the 2009 catch rate (Table 2). Black crappie ranged from age-2 to age-10 with age-4 fish being most abundant (Table 3, Figure 2).

The 2010 crappie sample size structure was dominated by preferred-memorable (RSD P-M) size fish, representing 81% of the sample and exceeding the lake average by 119% (Table 2; Figure 3). Quality-preferred (RSD Q-P) size black crappie represented 19% of the sample (Table 2; Figure

3). Although the size structure revealed good numbers of preferred-memorable size fish, condition was disappointing as relative weights were lower than lake averages for all RSD categories except quality-preferred size fish (Table 2).

Length-at-age frequency reveals a modal length of 270 mm for the 2010 sample, and wide ranges of length-at-age for fish ages 2 through 9 (Table 3; Figure 2). Growth, expressed as mean length-at-age, was well above Chattahoochee Drainage Basin averages for ages 2 through 4 black crappie and above statewide averages for ages 2 and 3 (Table 3; Damon Abernethy, unpublished data). However, growth slowed by age 5 as mean length-at-age was below lake averages for fish ages 5 through 7 (Table 3; Damon Abernethy, unpublished data).

Total annual mortality was calculated as 38% for age 4-10 black crappie (Figure 4) which is similar to the 37% estimate reported in 2008 (Holley et al. 2008). The highly variable recruitment to the fishery that crappie are notorious for has not been detected at Lake Eufaula for several years.

Summary

The current black crappie fishery is sustained by the 2007, 2006 and 2004 year classes. The 2005 year-class was represented well in the 2010 sample, also. Anglers should experience good catch rates of larger crappie during spring 2011 as fish in the 250 to 300 mm size range were readily available during the fall 2010 sample.

Conclusions

1. District VI Fisheries personnel should continue standardized crappie sampling on Lake Eufaula in 2011. The potential for water allocation changes make monitoring sportfish population trends invaluable. Additionally, annual fluctuations in submersed vegetation (hydrilla) abundance warrant the need to closely monitor sportfish populations.
2. Further harvest restrictions such as minimum size limits for crappie in Lake Eufaula are not recommended at this time.

LITERATURE CITED

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Appendix A

Tables and Figures

Table 1. Morphometric, physical, and chemical characteristics of Lake Eufaula.

Surface area	45,181 acres
Drainage area	7,460 sq. mi.
Full pool elevation	190 feet-msl
Mean annual fluxuation	6 feet
Shoreline distance	515 miles
Shoreline development index	17.3 (Welch 1948)
Mean depth	20.4 feet
Maximum depth	93 feet
Outlet depth	65 feet
Total dissolved solids	84 mg/l
Morphoedaphic index	4.1 TDS/mean depth(ft) (Ryder 1965)
Growing season	249 frost free days (Jenkins 1967)
Date of Impoundment	1962

Table 2. Relative stock density, catch per effort, and relative weight of black crappie in Lake Eufaula, 2003- 2010.

TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																												
Year	Gear	Number Samples	Effort (hours)	SUBSTOCK			RSD S-Q				RSD Q-P				RSD P-M				RSD M-T				RSD-T				TOTAL	
				no.	cpe	ratio	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe
2003	E	3	1.26	0	0.0	0	10	7.9	10	80	31	24.6	31	83	38	30.2	38	91	21	16.7	21	95	0	0.0	0	0	100	79.4
2004	E	6	2.81	0	0.0	0	4	1.4	4	73	28	10.0	28	83	40	14.2	40	87	28	10.0	28	91	1	0.4	1	101	101	36.0
2005	E	3	0.52	0	0.0	0	8	15.4	8	87	65	125.0	66	85	15	28.8	15	89	11	21.2	11	91	0	0.0	0	0	99	190.4
2006	E	6	2.84	0	0.0	0	5	1.8	5	80	36	12.7	36	85	40	14.1	40	92	18	6.3	18	86	1	0.4	1	89	100	35.2
2007	E	9	4.45	1	0.2	2	6	1.3	13	81	12	2.7	25	80	8	1.8	17	80	21	4.7	44	87	1	0.2	2	86	49	11.0
2008	E	7	3.32	0	0.0	0	34	10.2	24	87	87	26.2	61	90	19	5.7	13	95	2	0.6	1	103	0	0.0	0	0	142	42.8
2009	E	5	2.31	0	0.0	0	4	1.7	4	72	43	18.6	39	83	57	24.7	51	89	6	2.6	5	87	1	0.4	1	85	111	48.0
2010	E	5	2.32	0	0.0	0	0	0.0	0	0	20	8.6	19	85	87	37.5	81	85	1	0.4	1	85	0	0.0	0	0	108	46.5
LAKE AVERAGE							5.0	9	80		28.6	38	84		19.6	37	89		7.8	16	91		0.2	1	90		61.2	

Table 3. Age composition, CPE at-age, mean total length, range of length-at-age, and standard error of mean total length for black crappie collected from Lake Eufaula, fall 2010.

Age	Year Class	Number	Percent	CPE	Mean TL	Range	SE
2	2008	3	2.8	1.3	241.7	211-262	15.6
3	2007	23	21.3	9.9	265.1	240-293	3.4
4	2006	33	30.6	14.3	265.8	211-308	3.0
5	2005	13	12.0	5.6	260.6	229-290	4.3
6	2004	17	15.7	7.3	267.2	207-298	5.3
7	2003	9	8.3	3.9	263.4	245-295	5.3
8	2002	3	2.8	1.3	274.0	250-290	12.2
9	2001	6	5.6	2.6	261.5	237-294	9.4
10	2000	1	0.9	0.4	275.0		
Total		108	100.0	46.6			

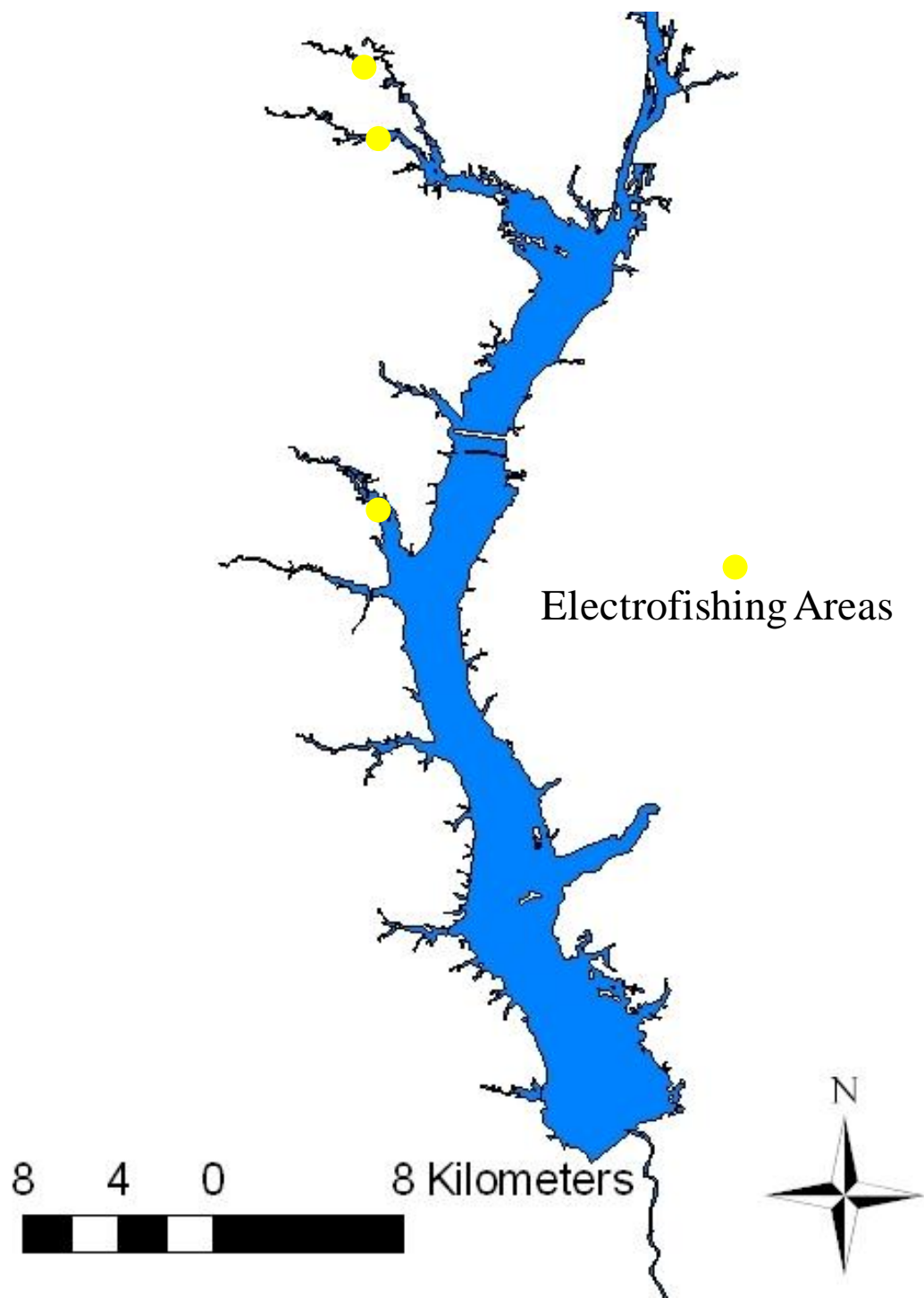


Figure 1. Electrofishing general locations for Lake Eufaula, fall 2010.

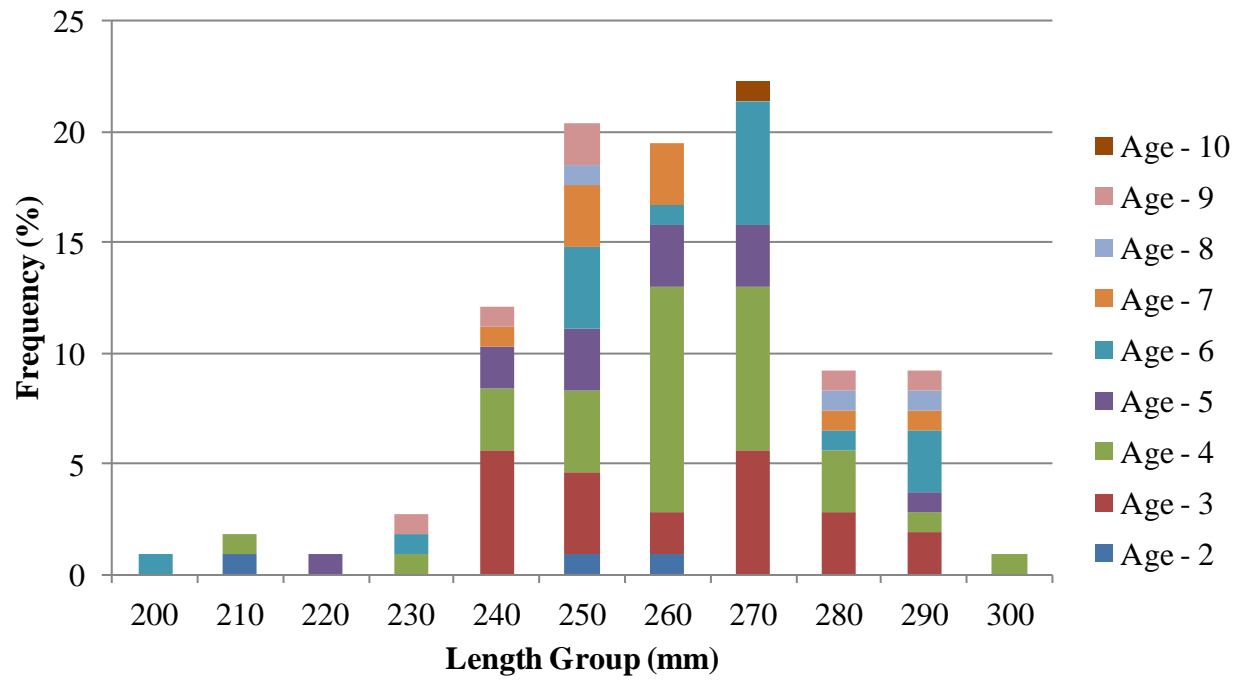


Figure 2. Length-at-age frequency for black crappie (N=108) collected in Lake Eufaula, fall 2010.

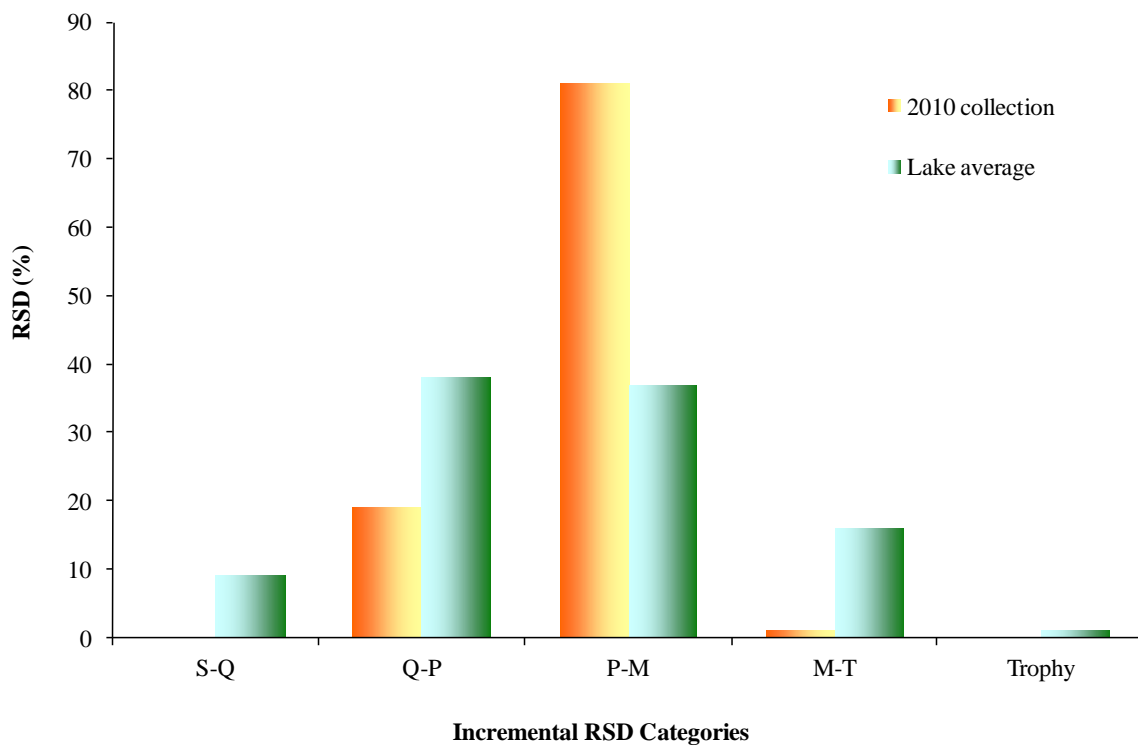


Figure 3. Relative stock densities (vertical orange bars) for black crappie (N=108) collected from Lake Eufaula, fall 2010. Green bars indicate the lake average for relative stock indices.

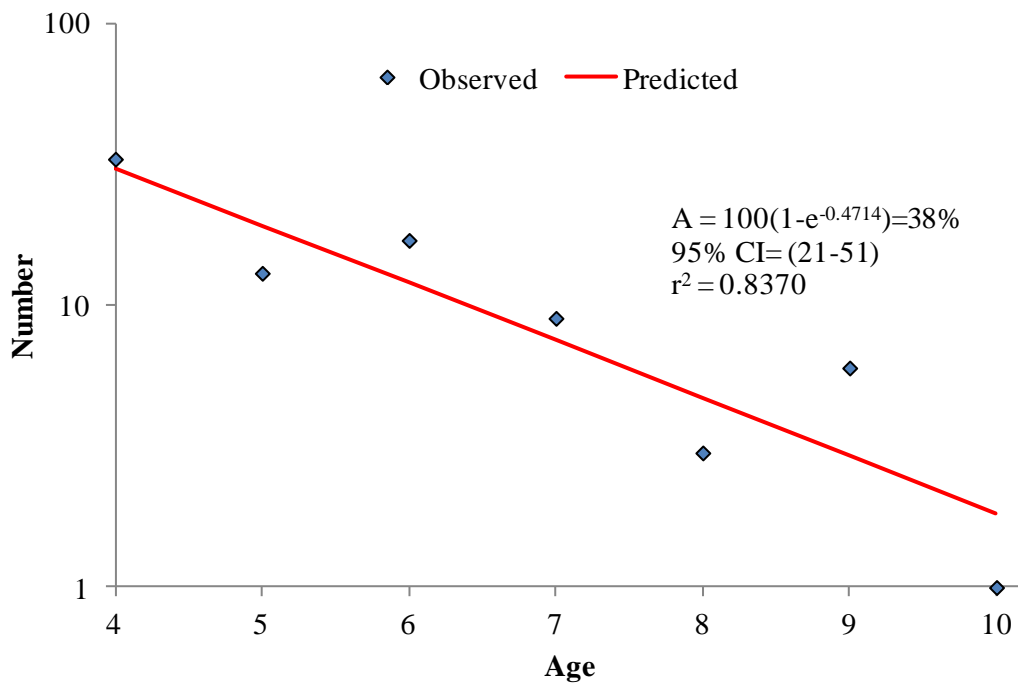


Figure 4. Weighted catch-curve regression for black crappie ages 4-10 collected from Lake Eufaula, fall 2010.