

GUNTERSVILLE RESERVOIR MANAGEMENT REPORT

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Prepared by

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Introduction

The objective of the Guntersville Reservoir Management Plan is to collect quantitative biological data to assist district biologists in developing management strategies to enhance the fishery. Reservoir sampling is conducted periodically to follow trends in growth, recruitment, and mortality of its major sport fish species. Previous samples were conducted in: 1986, 1988, 1989, 1990, 1993, 1995, 1996, 1999, 2002, and 2004. Guntersville Reservoir physical characteristics can be found in the 1989 Guntersville management report (Darr et al. 1994). A summary of morphometric, physical, and chemical characteristics is found in Table 1 of this report.

Methods

Guntersville crappie were sampled via trapnet November 14-16, 2005 for a total of 40 net-nights. Sampling was conducted according to guidelines of the Fisheries Section's Reservoir Management Manual (Cook 1999). Gear description and deployment methods can be found in the Guntersville 2004 report (Andress et al. 2004). Data collection and analysis methods can also be found in the 2004 management report (Andress et al. 2004). Sample sites are shown in Figure 1.

In addition to fish sampling, a General Reconnaissance Survey was conducted to evaluate angler success, determine the need for additional facilities, report public relation problems, and describe commercial fisheries.

Tables and figures are located in Appendix A. These should be reviewed carefully because all information provided may not be cited specifically within the report text.

Results

Fall 2005 trap netting resulted in the capture of 124 black crappie (Tables 2 and 3). Stock to trophy catch-per-effort (CPE) improved 113% from the 2003 sample, but remained below average (2.4 fish/net night) for upland reservoirs (Table 2, Jim McHugh, unpublished data). CPE of stock to preferred size black crappie were all between the lower 25th percentile and statewide mean for upland reservoirs, while CPE for memorable black crappie exceeded the 75th percentile of 0.2 fish/net-night (Table 2, Jim McHugh, unpublished data).

The 2005 sample was the first sample over the past 15 years in which all size classes (stock-trophy) were represented (Table 2). Stock-size black crappie were dominant at 34%, exceeding the mean for upland reservoirs (Table 2, Jim McHugh, unpublished data). RSD-Q was below the upland lower 25th percentile, RSD-P slightly below the upland mean and RSD-M exceeded the upland upper 75th percentile (Table 2, Figure 3, Jim McHugh, unpublished data). Also notable, 85 substock crappie were sampled per every 100 stock size and larger crappie, exceeding the upper 75th percentile (59.5) for upland reservoirs (Table 2, Jim McHugh, unpublished data).

Growth, expressed as mean length at age, for age 0 and age 1 black crappie decreased 10.5% and 20.7%, respectively from the 2003 fall sample, while age 2 growth improved 6.6% (Table 3, Andress et al. 2004). Guntersville black crappie currently reach harvestable length (9 inches=228.6 mm) as early as age 2 (Table 3).

Relative weights (Wr) dropped for quality through memorable-sized crappie, but improved for stock size crappie. Stock-sized crappie are the only fish that exceed the

lake average for condition (Table 2). A reliable estimate of crappie mortality could not be calculated due to variable recruitment.

Conclusions

There has been no evidence of a strong crappie year class since 2000. However, substock and stock numbers have increased enough to suppress growth rates for age 0 and age 1 crappie in 2005 as compared to the 2003 sample. Even more important, condition of stock sized fish is better than samples have shown since the 1998 fall sample. The 2003 and 2004 year classes should support the crappie fishery in 2006 as they continue to mature.

The positive aspect of light spawns or poor year classes is that fewer crappie numbers usually result in better growth, thus larger crappie. This is evidenced by the percentage of memorable crappie sampled in 2005 following the poor year classes of the past few years. The 2007 crappie fishery will be dependent upon the strength and recruitment of the 2005 year-class, which exceeded the substock 75th percentile for upland reservoirs.

The general reconnaissance survey revealed a couple of potential problems:

- 1) Hostility between commercial anglers and sport anglers concerning gill nets is evident.
- 2) Areas of aquatic vegetation (milfoil and hydrilla) are abundant and present serious access problems for some portions of the reservoir.

Literature Cited

- Andress, R. O., E. D. Catchings and K. W. Baswell, 2004. Guntersville reservoir management report. Alabama Wildlife and Freshwater Fisheries Division, Montgomery.
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- Jenkins, R. M. 1967. The influence of some environmental factors on the standing crop and harvest of fishes in U. S. reservoirs. Pages 291-298 *in* Reservoir Fisheries Resources Symposium. Southern Division American Fisheries Society, Bethesda, Maryland, USA.
- Ryder, R.A. 1965. A method for estimating the potential fish production of North American temperate lakes. Transactions of the American Fisheries Society. 94:214-218.

Appendix A

Tables and Figures

TABLE 1. -- Guntersville Reservoir morphometric, physical and chemical characteristics.

Surface area	69,100 acres
Drainage area	24,450 sq. mi.
Full pool elevation	595 feet-msl
Mean annual fluctuation	2 feet
Shoreline distance	949 miles
Shoreline development index	25
Mean depth	15 feet
Maximum depth	45 feet
Outlet depth	16-43 feet
Total dissolved solids	92.6 mg/l
Morphoedaphic index	6.2 TDS/mean depth(ft) (Ryder 1965)
Growing season	214 frost free days (Jenkins 1967)
Date of impoundment	1939

TABLE 2. -- Relative stock density, catch per effort and relative weight values of black crappie in Guntersville Reservoir.

Species	Year	Gear	Number Samples	TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																								
				SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				RSD-T				TOTAL	
				no.	cpe	pct*	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe
Black Crappie	1990	Trap	24	3	0.1	12	--	--	--	--	4	1.7	16.0	89	19	0.8	76.0	96	2	0.1	8.0	107	--	--	--	--	28	1.2
	1995	Trap	20	80	4.0	49	57	2.9	36.3	74	51	2.6	32.5	85	42	2.1	26.0	96	7	0.4	4.0	102	--	--	--	--	237	11.9
	1996	Trap	39	174	4.5	82	42	1.1	20.0	78	55	1.4	26.0	87	88	2.3	42.0	99	26	0.7	12.0	108	--	--	--	--	385	9.9
	1998	Trap	30	326	10.9	487	40	1.3	60.0	78	11	0.4	16.0	85	15	0.5	22.0	101	1	0.0	1.0	90	--	--	--	--	393	13.1
	2000	Trap	32	140	4.4	212	12	0.4	18.0	74	26	0.8	39.0	90	26	0.8	39.0	98	2	0.1	3.0	99					206	6.5
	2003	Trap	34	7	0.2	26	3	0.1	11	68	15	0.4	56	90	9	0.3	33	97	--	--	--	--	--	--	--	--	34	1.0
	2005	Trap	40	57	1.4	85	23	0.6	34	76	14	0.4	21	81	17	0.4	25	87	12	0.3	18	93	1	0.0	1	86	124	3.1
Lake Average				3.6	136.1		1.1	29.9	74.7		1.1	29.5	86.7		1.0	37.6	96.3		0.3	7.7	99.8						6.7	

*Substock Pct. is substock ratio: number of substock size fish collected for every 100 fish of stock size and larger.

Fish surveyed by trap nets (Trap) were collected in the fall of year shown.

TABLE 3. -- Age composition and mean total length of black crappie collected from Guntersville Reservoir, November 2005 trap nets.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range (mm)
0	2005	57	46.0	1.4	99.2	1.2	65-120
1	2004	31	25.0	0.8	182.4	3.3	147-210
2	2003	22	17.7	0.6	259.6	6.1	208-300
3	2002	0	0.0	0.0	0.0		
4	2001	12	9.7	0.3	305.8	3.9	278-328
5	2000	0	0.0	0.0	0.0		
6	1999	1	0.8	0.0	397.0		397
7	1998	1	0.8	0.0	344.0		344
Total		124	100.0	3.1			



FIGURE 1. -- Guntersville fall 2005 trap net sites (N=20). Sites indicated by yellow circles in Brown Creek, Big Spring Creek, Short Creek and Town Creek.

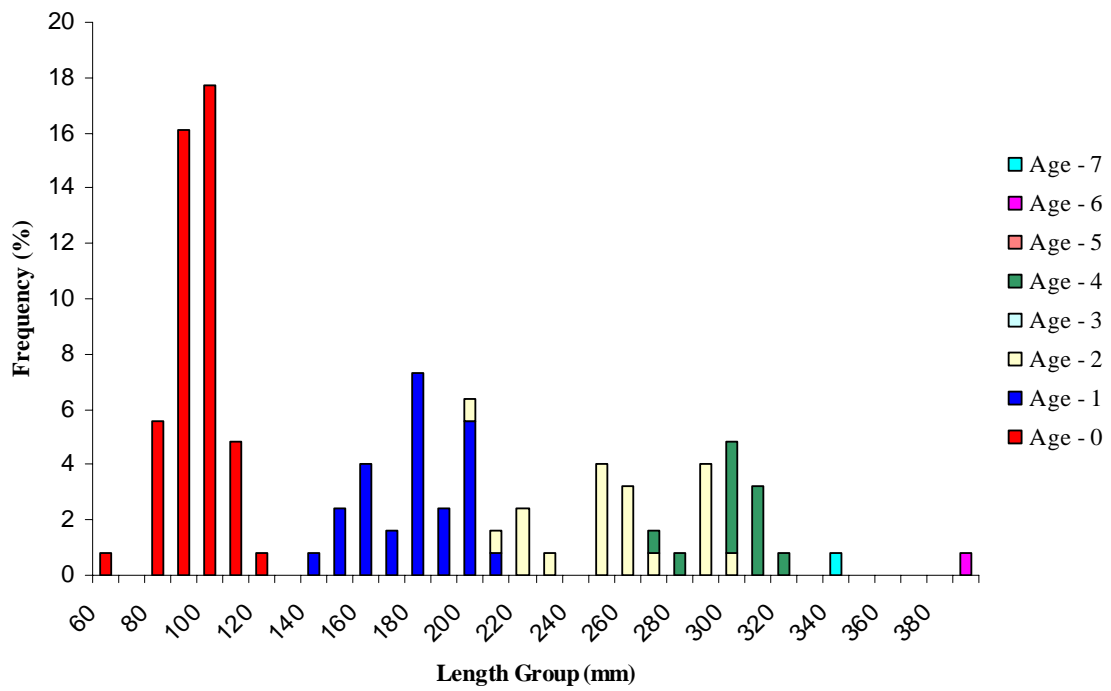


FIGURE 2. -- Length at age frequency of black crappie (N=124) from Guntersville Reservoir, November 2005.

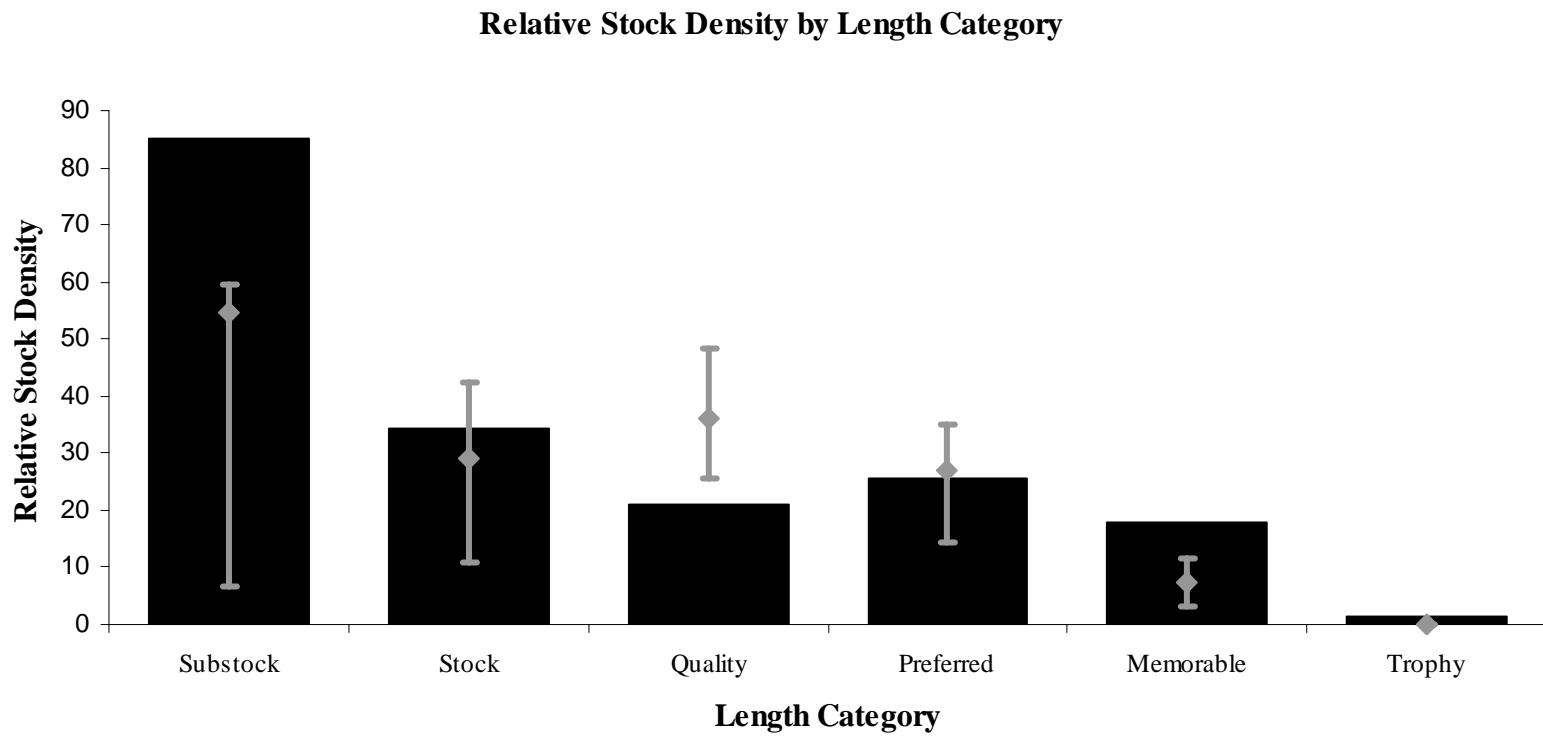


FIGURE 3. -- Relative stock density (RSD) of black crappie from Gunter'sville Reservoir, fall 2005, with upland reservoir means for each size group. I-beams denote the 25th and 75th percentiles for RSD values in upland reservoirs for black crappie.