

HOLT RESERVOIR CRAPPIE MANAGEMENT REPORT FY 2007

Prepared by

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Introduction

Crappie were previously sampled in 1991, 1996, and 2002 (Moss et al. 2002). In 2002, the white crappie population was characterized by low numbers and low recruitment. Black crappie were incidental in the collection.

Methods

Crappie were collected from 11 trap nets from November 14 - 17, 2006, (Figure 1) according to the guidelines of the Alabama Reservoir Management Manual (1999). Total length (mm) and weight (g) were recorded for all crappie collected in trap nets. Otoliths were removed from crappie ≥ 100 mm TL and aged by District III personnel.

Results and Discussion

Black and White Crappie

A total of 81 white crappie and four black crappie were captured. The CPE of white crappie from Holt Reservoir was only 1.8 fish/net-night (Table 2). The RSD value of S-Q white crappie (67%) was well above the lake average of 18%. With S-Q fish dominating the collection, not surprisingly, RSD values for Q-P, P-M, and M-T fish fell below the lake average (Figure 2).

Catch rates for Holt crappie were significantly lower than those from other District III reservoirs (Moss et al. 2006 and Haffner et al. 2006) and is a result of decreasing backwater habitat and spawning sites due to surface coal mining activities. For many years, the land area around Holt Reservoir was heavily disturbed by surface mining and the resulting erosion and spoil from this activity has severely impacted tributary streams and backwater sites along the reservoir.

Mean W_r values for incremental RSD categories ranged from 70 to 79 and were less than the lake average (Figure 3). A reliable estimate of crappie mortality could not be calculated due to variable recruitment.

The white crappie sample included four age classes (ages 0+, 1+, 2+, and 4+). Young-of-year white crappie comprised 38.3% of the collection (Table 4). Two relatively strong year classes (2005 and 2006) were present in our collection. Growth rates of white crappie were at or near the Holt average (Figure 5).

The black crappie sample consisted of four fish ranging in total length from 156 - 282 mm (Table 5). Three year-classes were represented.

Summary

The CPE of white crappie was the highest catch rate ever recorded at Holt Reservoir. Recruitment was excellent, but relatively poor when compared to most other west Alabama reservoirs. Two strong year classes were present in the collection. Growth of white crappie was similar to previous collections. The statewide nine-inch minimum length limit on crappie may reduce mortality of young crappie and improve the size distribution and age structure. Creel surveys have indicated that anglers are generally supportive of this regulation.

Recommendations

1. Resample crappie in fall 2009.
2. Maintain the 9-inch minimum-length limit regulation on all crappie.
3. Encourage tournament clubs to participate in the B.A.I. T. Program.
4. Continue to monitor and document the loss of backwater habitat on Holt Reservoir.

Literature Cited

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- Ryder, R. A. 1965. A method for estimating the potential fish production of north-temperate lakes. Transactions of the American Fisheries Society. 94:213-218.

Appendix A

Tables and Figures

TABLE 1. MORPHOMETRIC, PHYSICAL AND CHEMICAL CHARACTERISTICS OF HOLT RESERVOIR.

Surface area	3,296 acres
Drainage area	4,232 sq. mi.
Full pool elevation	187 feet-msl
Mean annual fluxuation	1 - 2 feet
Shoreline distance	65 miles
Shoreline development index	10.5
Mean depth	36 feet
Maximum depth	85 feet
Outlet depth	55 feet
Thermocline depth	None
Stratification index	19.4 (cfs*365)/dsf
Total dissolved solids	188 mg/l
Chlorophyll a	14.2 mg/m**3
Morphoedaphic index	2.8 TDS/mean depth(ft) (Ryder 1965)
Growing season	235 frost free days (Jenkins 1967)
Reservoir age	38 years

TABLE 2. INCREMENTAL RELATIVE STOCK DENSITY (RSD) VALUES, CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (Wr) OF WHITE CRAPPIE COLLECTED BY FALL TRAP NETTING AT HOLT RESERVOIR.

YEAR	TOTAL ¹	SUBSTOCK			RSD S-Q				RSD Q-P				RSD P-M				RSD M-T				TOTAL	
	EFFORT	NO.	CPE ²	SSR ³	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1991	25	0	0.0	0	2	0.1	5	86	17	0.7	43	95	15	0.6	38	97	6	0.2	15	101	40	1.6
1996	40	9	0.2	50	0	0.0	0		11	0.3	61	81	3	0.1	17	83	4	0.1	22	94	27	0.7
2001	42	0	0.0	0	0	0.0	0		9	0.2	35	94	14	0.3	54	97	3	0.1	12	98	26	0.6
2006	44	30	0.7	59	34	0.8	67	70	12	0.3	24	78	3	0.1	6	78	2	0.0	4	79	81	1.8
LAKE AVERAGE			0.2	27		0.2	18	78		0.4	40	87		0.3	28	89		0.1	13	93		1.2

TABLE 3. INCREMENTAL RELATIVE STOCK DENSITY (RSD) VALUES, CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (Wr) OF BLACK CRAPPIE COLLECTED BY FALL TRAP NETTING AT HOLT RESERVOIR.

YEAR	TOTAL ¹	SUBSTOCK			RSD S-Q				RSD Q-P				RSD P-M				RSD M-T				TOTAL	
	EFFORT	NO.	CPE ²	SSR ³	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1991	25	0	0.0	0	0	0.0	0		3	0.1	43	101	3	0.1	43	100	1	0.0	14	100	7	0.3
1996	40	2	0.1	67	0	0.0	0		0	0.0	0		2	0.1	67	82	1	0.0	33	82	5	0.1
2001	42	0	0.0	0	0	0.0	0		0	0.0	0		2	0.0	50	89	2	0.0	50	91	4	0.1
2006	44	0	0.0	0	1	0.0	25	68	0	0.0	0		3	0.1	75	75	0	0.0	0		4	0.1
LAKE AVERAGE			0.0	17		0.0	6	68		0.0	11	101		0.1	59	87		0.0	24	91		0.1

¹ EFFORT IS IN NET-NIGHTS.

² CPE IS IN FISH CAUGHT PER NET-NIGHT OF EFFORT.

³ SSR DENOTES SUBSTOCK RATIO; THE NUMBER OF SUBSTOCK FISH IN THE COLLECTION PER 100 STOCK-SIZE FISH.

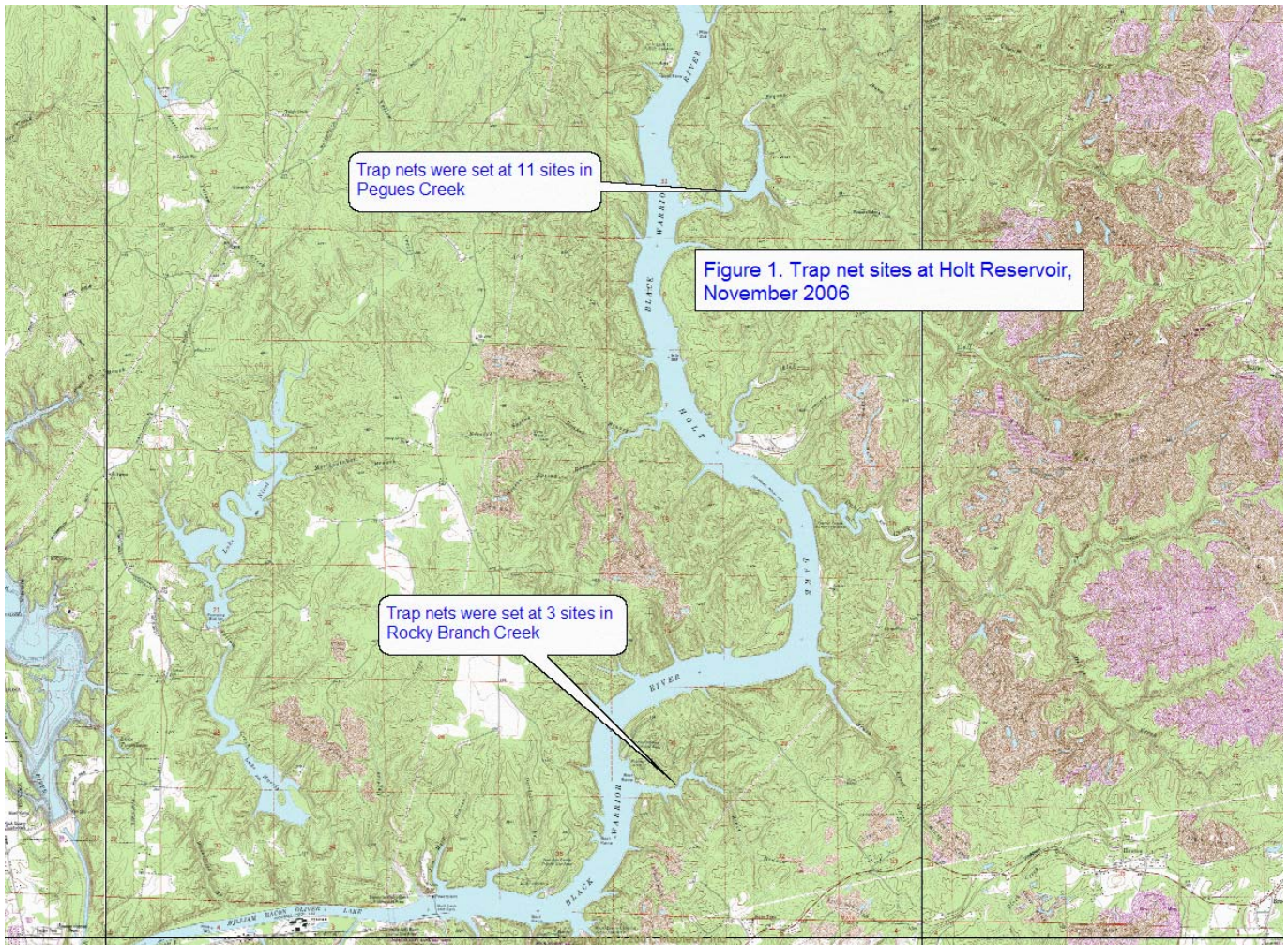
TABLE 4. AGE COMPOSITION AND MEAN TOTAL LENGTH (mm) OF WHITE CRAPPIE AT HOLT RESERVOIR, NOVEMBER 2006.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
0+	2006	31	38.3	0.7	94	3	72 - 131
1+	2005	42	51.9	1.0	186	3	153 - 239
2+	2004	7	8.6	0.2	270	13	222 - 316
3+	2003	0	0.0	0.0			
4+	2002	1	1.2	0.0	343		343
Total		81	100.0	1.8			

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

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
1+	2005	1	25.0	0.0	156		156
2+	2004	2	50.0	0.0	266	1	265 - 266
3+	2003	0	0.0	0.0			
4+	2002	1	25.0	0.0	282		282
Total		4	100.0	0.1			

HOLT RESERVOIR



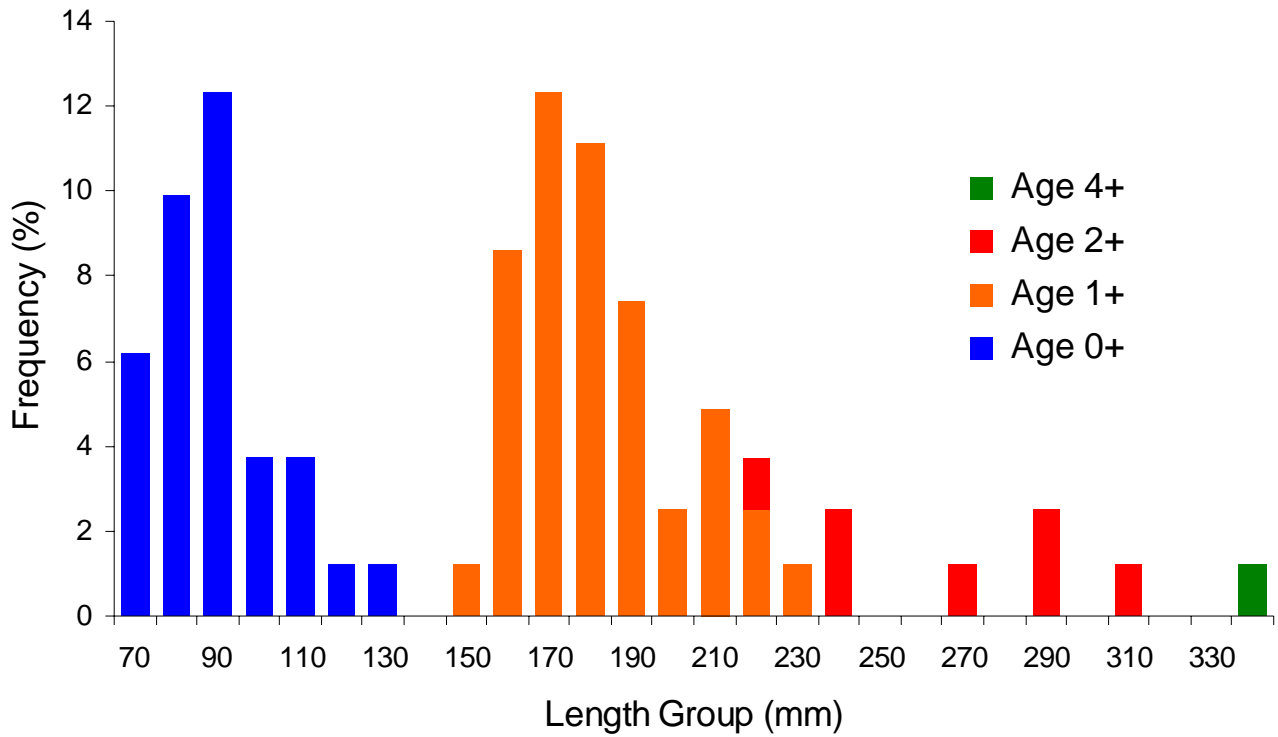


Figure 2. Length at age frequency of white crappie (N=81) at Holt Reservoir, November 2006.

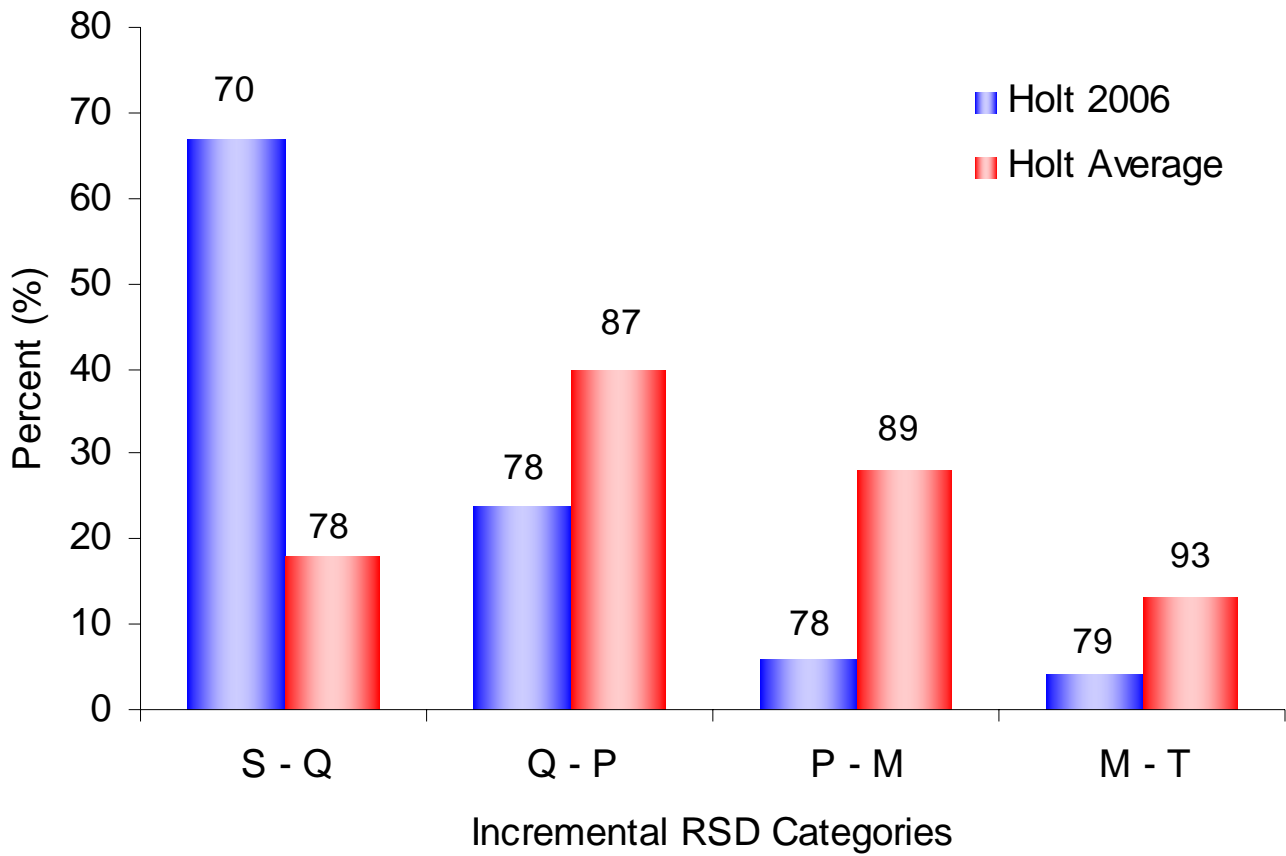


Figure 3. Relative stock density of white crappie at Holt Reservoir. Mean relative weight (W_r) values appear above each bar.

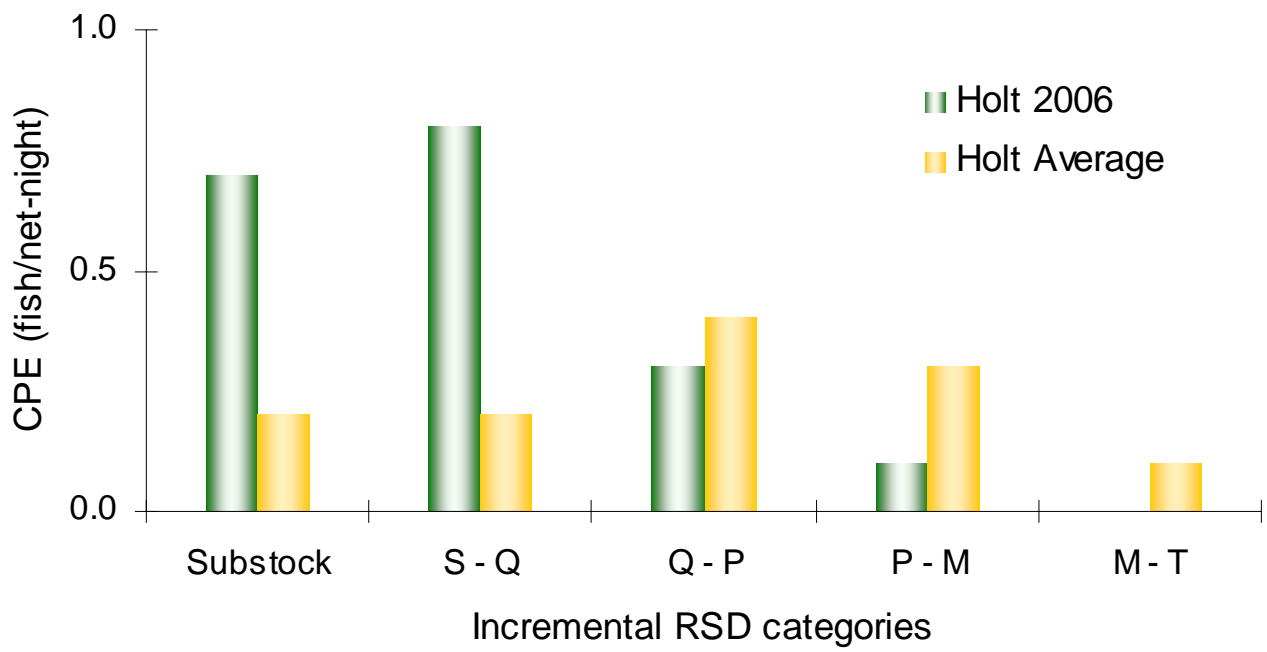


Figure 4. Catch per effort (CPE) of white crappie at Holt Reservoir.

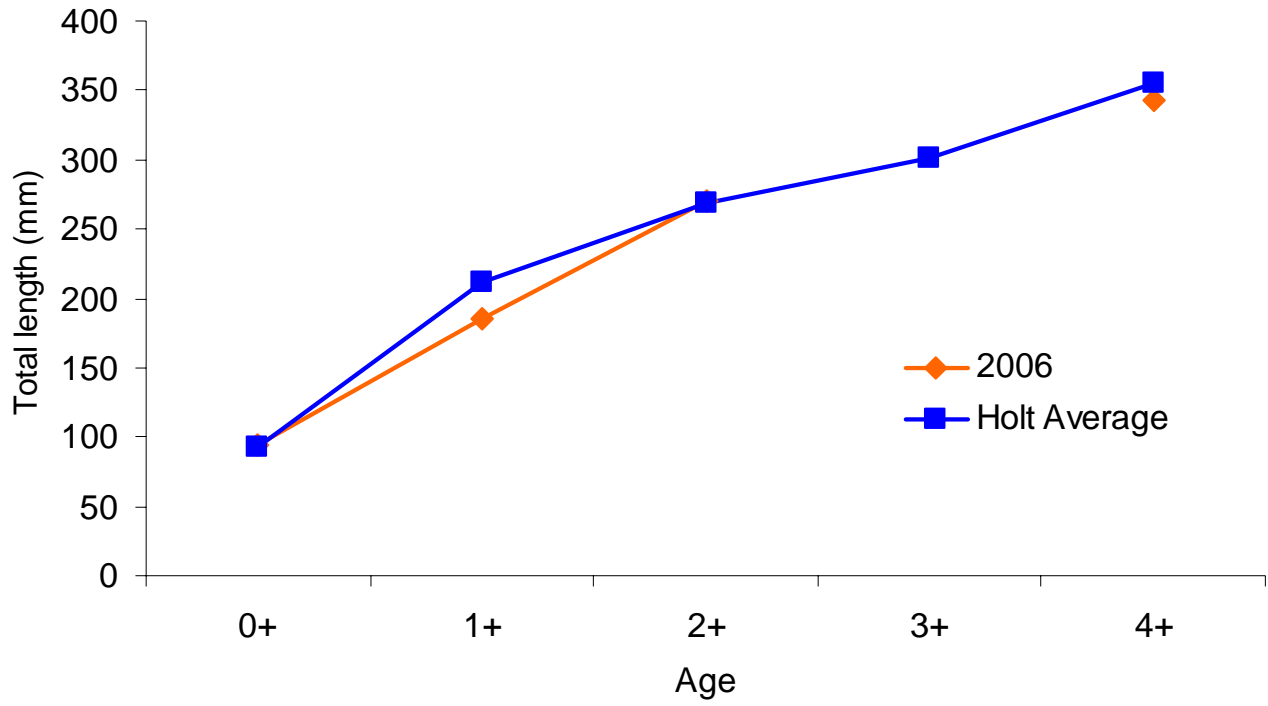


Figure 5. Length at capture of white crappie at Holt Reservoir.