

MARTIN RESERVOIR
CRAPPIE MANAGEMENT REPORT

2010

Prepared by

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Introduction

Martin Reservoir, a 39,180-acre impoundment on the Tallapoosa River (Table 1), was last sampled for crappie during spring 2008. Past samples indicated that crappie mortality is relatively high compared to other reservoirs. However, crappie abundance each year seems to be good as recruitment is typically more stable in Martin Reservoir. The minimum size limit for crappie is 9 inches.

All sampling and reporting procedures follow the Alabama Reservoir Management Plan (Cook 1999). “An Angler’s Guide to Interpreting Alabama Wildlife and Freshwater Fisheries Reservoir Reports” provides a detailed description of fisheries terms used in this report. This guide is available on the Department’s website at: <http://www.outdooralabama.com/fishing/freshwater/where/reservoirs/guide.pdf>.

Methods

Martin Reservoir was sampled on October 27, 2010 by electrofishing in order to assess the crappie population. Crappie were collected in a non-standardized manner at four specific locations around brush piles in Sandy Creek (Figure 1). Total length (mm), weight (g), and sex were recorded for each fish collected and otoliths were extracted for ageing.

Results and Discussion

Historically, crappie have been sampled in Lake Martin in the fall using trap-nets. However, electrofishing was used to collect samples in spring 2008 and fall 2010. Greene et al. (2008) suggested there was some size selectivity by these different methods on Martin Reservoir where trap-netting selected for smaller crappie in 2003 and

electrofishing selected for larger crappie in 2008. The 2010 crappie sample was consistent with this trend. Therefore, comparisons of size structure and catch rates cannot be made between samples collected by the two methods. There did not seem to be any seasonal difference in the size of fish collected with electrofishing as the spring 2008 and fall 2010 samples had similar RSD values (Figure 5).

A total of 158 black crappie were collected in fall 2010. The 2003 year-class (age-7+) represented 25 percent of the sample of stock size and larger crappie and averaged 284 mm (Table 3). This exceptionally strong year-class was also observed in 2008 where it represented 43 percent of the sample. The 2005 year-class (age-5+) also appeared to be relatively strong occupying 17% of the sample. The 2008 year-class (age-2+) occupied 27% of the sample and averaged 217 mm. Considering smaller crappie are often under-represented in electrofishing samples, these age-2+ crappie likely represent another strong year-class that should be of harvestable size by spring 2011. Although the 2008 and 2010 samples suggest crappie recruitment has been moderately variable over the last 9 to 10 years, a poor year-class has not been observed. This variable recruitment did not allow a reliable estimate of total annual mortality to be made from the 2010 sample.

As expected in a low-nutrient system, crappie growth is relatively slow when compared to other Alabama reservoirs (Figure 3). It takes most crappie about 3 years to enter the fishery (9 in.), which is about 0.5 years longer than the state average. Although growth is relatively slow, most of the crappie collected fell in the preferred size-group (Figure 5). Average relative weight values for the quality and preferred size-groups were

77 and 86, respectively. The crappie sampling was not standardized, thus an index of relative abundance was not applicable.

Conclusions

- Although crappie growth in Martin Reservoir is below average among other Alabama reservoirs, the production of moderate to strong year-classes appears to be more consistent. This creates more consistent catch rates of harvestable-size crappie each year. The 2003 year-class is still exceptionally strong in the fishery and the 2008 year-class appears to be strong and should produce good catch rates for several more years.
- Because recruitment is typically stable, electrofishing can continue to be used as the primary method to collect a sample of the crappie population in Martin Reservoir. However, trap-nets should be employed if an evaluation of recent year-classes is desired.

Literature Cited

Cook, S. F. 1999. Alabama Reservoir Management Program. Alabama Department of Conservation and Natural Resources, Montgomery.

Greene, J. C., R.G. Lovell, and R.A. McVay. 2008. Martin Reservoir Management Report 2008. Alabama Department of Conservation and Natural Resources, Montgomery.

Jenkins, R. M. 1967. The influence of some environmental factors on the standing crop and harvest of fishes in U.S. reservoirs. Pages 298-321 *in* Reservoir Fishery Symposium. American Fisheries Society, Southern Division, Bethesda, Maryland.

Ryder, R. A. 1965. A method for estimating the potential fish production of north-temperate lakes. Transactions of the American Fisheries Society 94:214-218.

TABLE 1. Morphometric, physical, and chemical characteristics of Martin Reservoir.

Surface area	39,180 surface acres
Drainage area	3,000 square miles
Full pool elevation	490 feet-msl
Mean annual fluxuation	12 feet
Shoreline distance	700 miles
Shoreline development index	25.2
Mean depth	42 feet
Maximum depth	155 feet
Total dissolved solids	36 mg/l (ADEM 2010, unpublished)
Morphoedaphic index	0.86 TDS/mean depth (ft) (Ryder 1965)
Chlorophyll-a	3.44 µg/l (ADEM 2010, unpublished)
Growing season	201-220 frost free days (Jenkins 1967)
Date of Impoundment	1926

TABLE 2. Relative stock density (RSD), catch per effort (CPE), substock ratio (SSR), and relative weight (Wr) of black crappie collected from Martin Reservoir.

Year	Gear	Total	Substock			RSD _{S-Q}				RSD _{Q-P}				RSD _{P-M}				RSD _{M-T}				Total	
		Net-nights	No.	CPE	SSR	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE
1998	TN	20	7	0.35	5	40	2.00	28	73	64	3.20	44	80	36	1.80	25	81	4	0.20	3	80	151	7.55
2000	TN	50		0.00	0	7	0.14	5	76	55	1.10	43	81	64	1.28	50	81	3	0.06	2	87	129	2.58
2003	TN	20	26	1.30	21	46	2.30	37	78	46	2.30	37	81	31	1.55	25	84	1	0.05	1	86	150	7.50
2008	EF	-		-	0	2	-	1	79	60	-	36	78	96	-	57	79	11	-	7	79	169	-
2010	EF	-		-	0	12	-	8	73	62	-	39	77	73	-	46	86	11	-	7	81	158	-

*CPE data for 2008 and 2010 could not be calculated as the fish were not collected in a standardized manner.

TABLE 3. Age composition and mean total length of black crappie from Martin Reservoir, fall 2010.

Age	Year Class	Number	Percent	Mean TL	Standard Error	Length Range
1+	2009	3	1.9	178.3	12.5	-
2+	2008	43	27.2	216.8	3.3	-
3+	2007	25	15.8	242.3	3.7	190 -254
4+	2006	16	10.1	258.7	6.8	208 -294
5+	2005	26	16.5	266.3	3.0	208 - 325
6+	2004	4	2.5	277.5	10.0	257 - 326
7+	2003	38	24.1	283.5	3.9	272 - 337
8+	2002	2	1.3	299.5	1.5	385 - 320
9+	2001	1	0.6	275.0		-
Total		158	100.0			

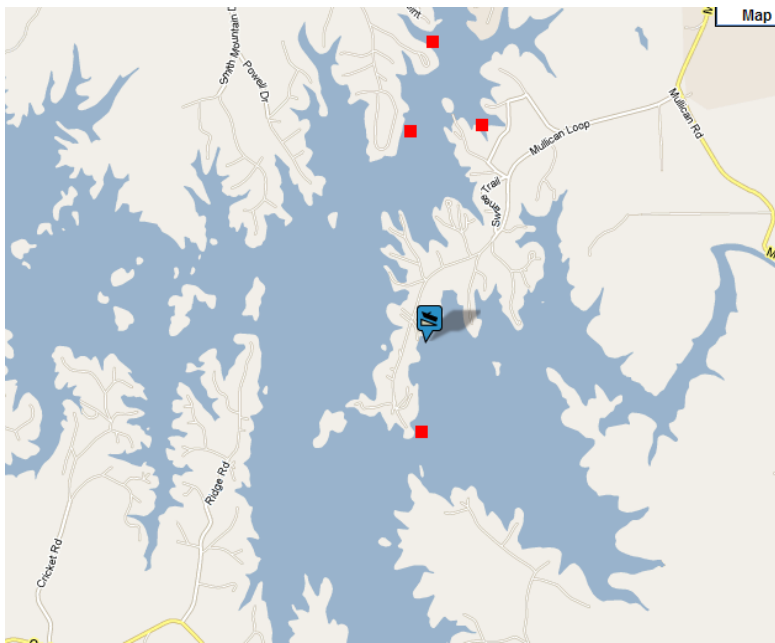
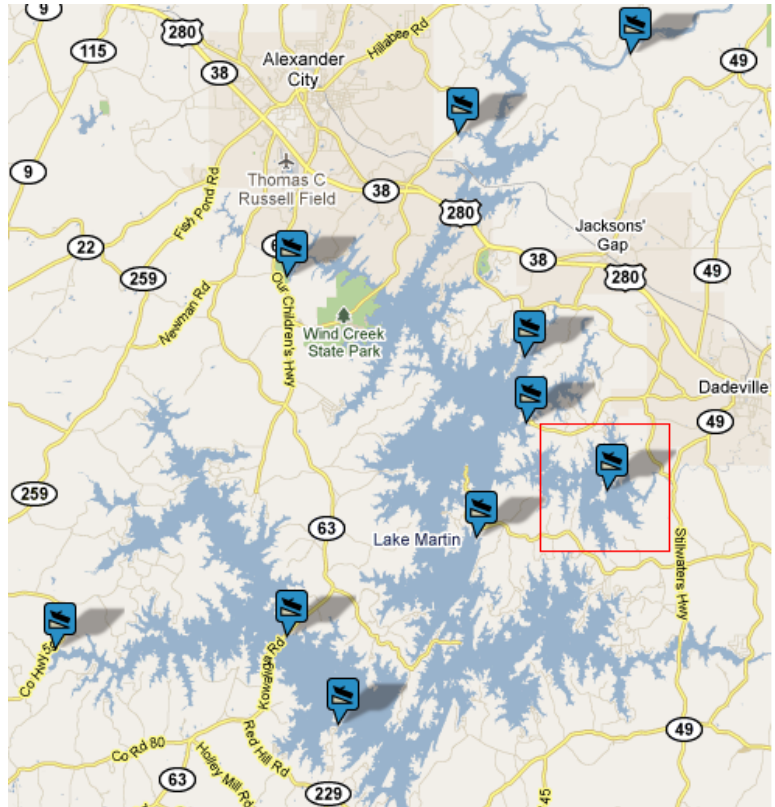


FIGURE 1. Martin Reservoir showing public access areas and Sandy Creek in red box (top). Locations where crappie were collected in fall 2010 are indicated by red squares (bottom).

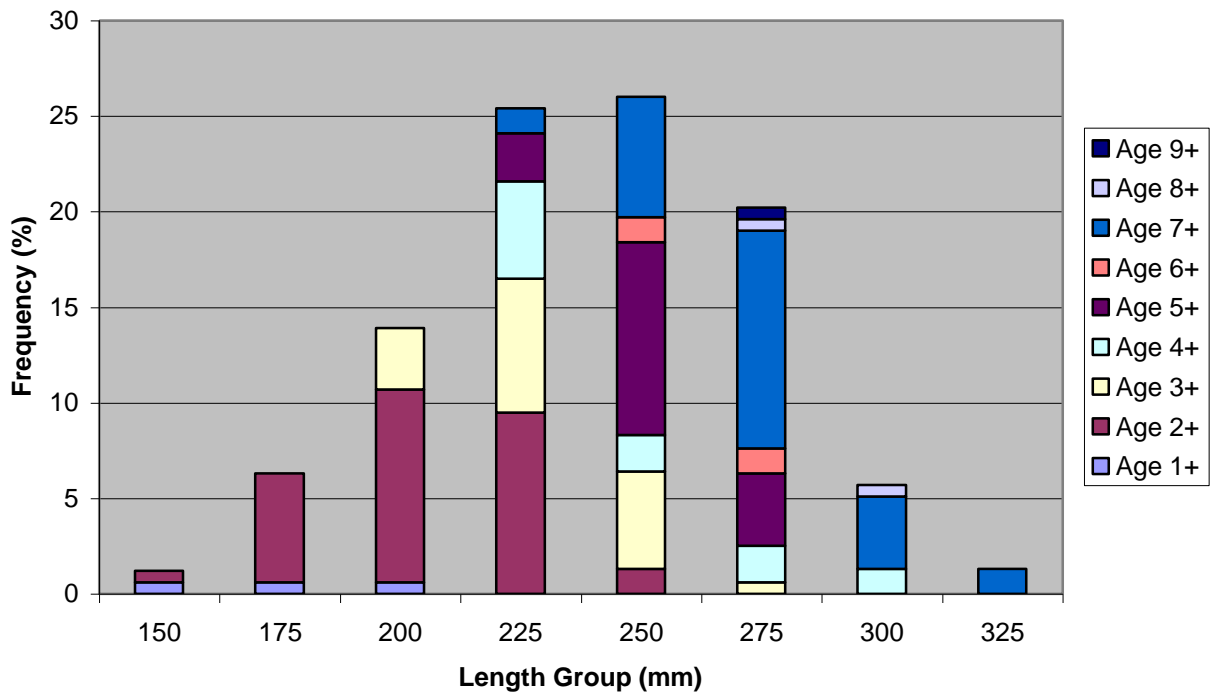


FIGURE 2. Length-at-age frequency of black crappie collected from Martin Reservoir, fall 2010 (N=158).

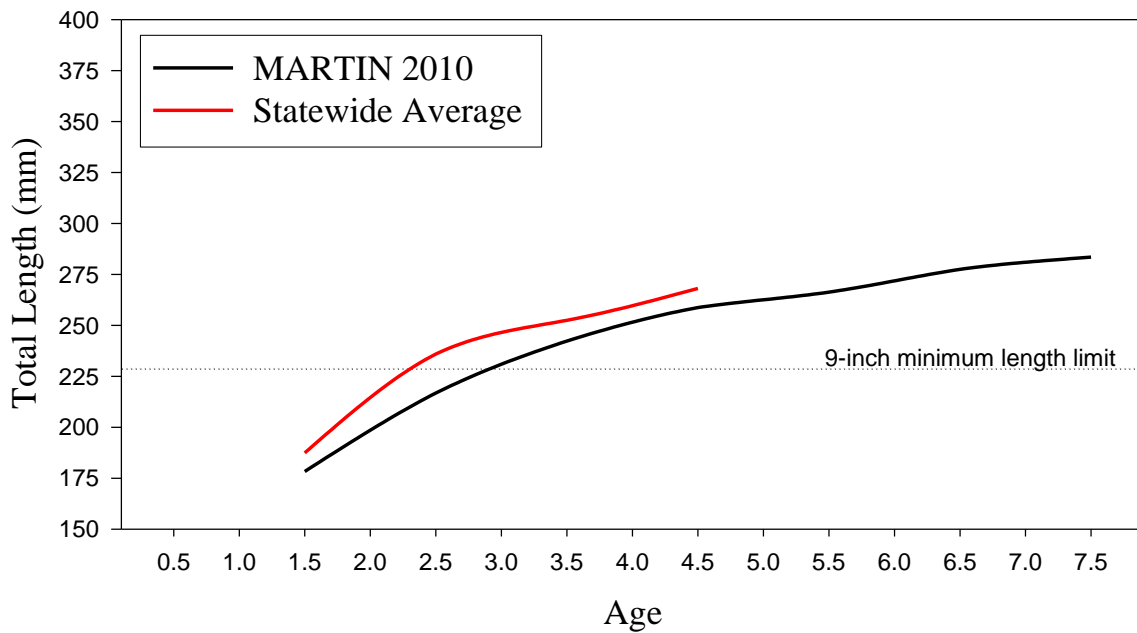


FIGURE 3. Mean length-at-age for black crappie collected from Martin Reservoir fall 2010 (N = 155) versus the statewide average. Statewide data is insufficient past age-4.

Catch Curve Regression

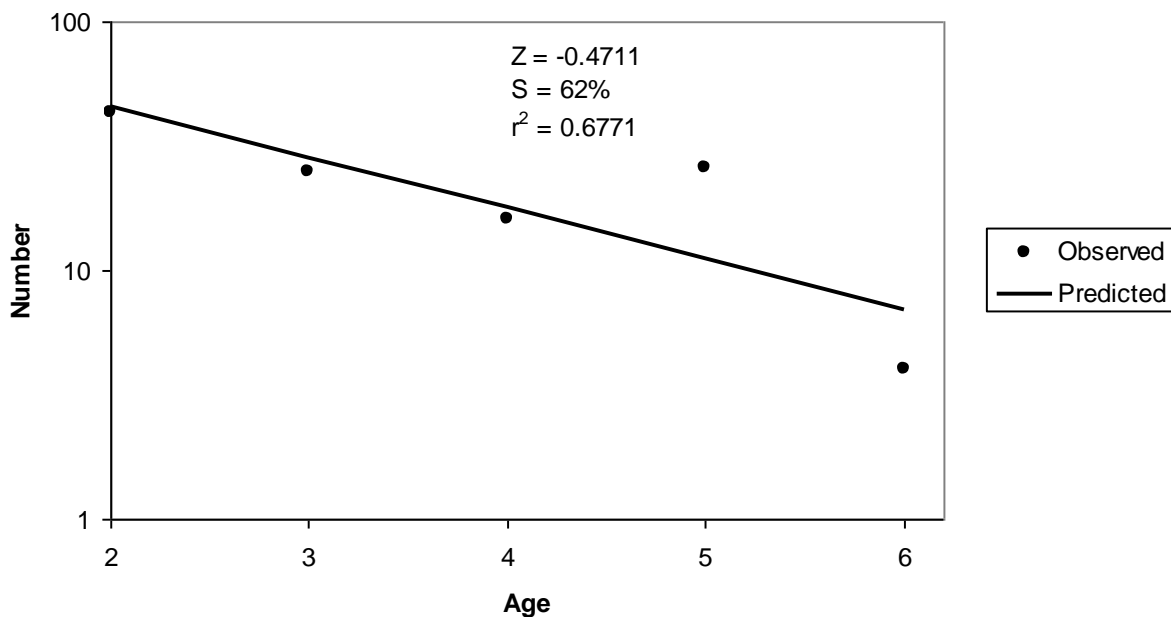


FIGURE 4. Catch-curve analysis of black crappie ages 2 through 6 in Martin Reservoir, fall 2010 (N=114).

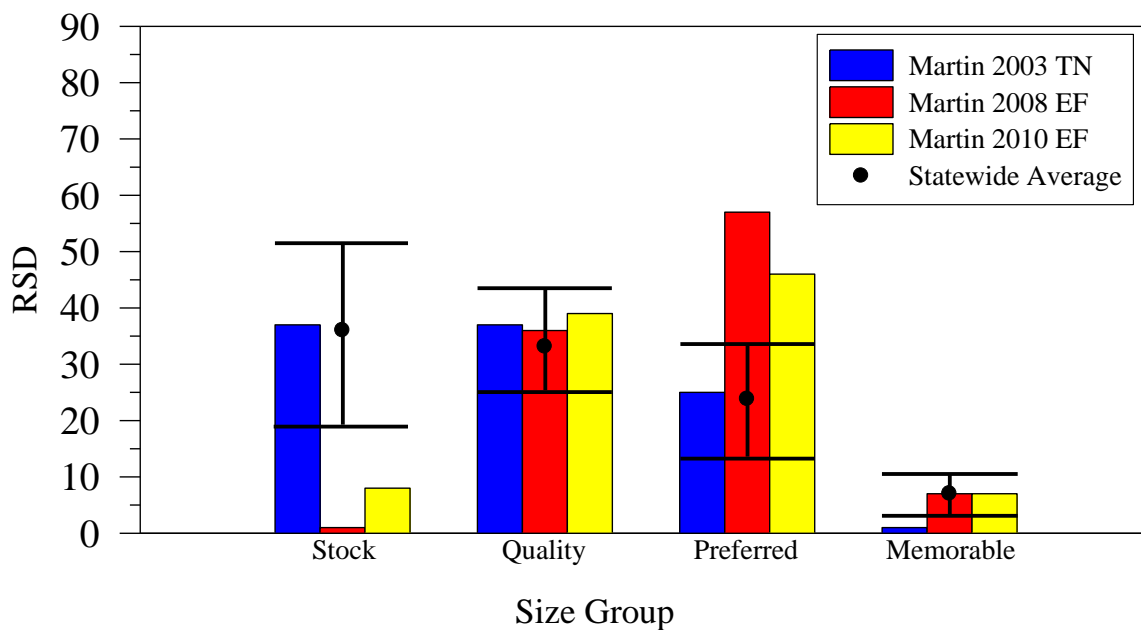


FIGURE 5. Relative stock density (RSD) of black crappie collected by trap-netting in fall 2003 (N=150), electrofishing in spring 2008 (N=169), and electrofishing in fall 2010 (N=158) in Martin Reservoir. The I-beam denotes the 25th and 75th percentiles of RSD values for black crappie, statewide.