

LAKE TUSCALOOSA SPRING MANAGEMENT REPORT FY 2008

Prepared by

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Introduction

Lake Tuscaloosa was previously sampled in 1986, 1988, 1990, 1992, and 2004 (Moss et al. 2004). Catch rates of largemouth bass in the 2004 collection were near the lake and statewide averages but growth was slightly below the statewide average. The CPH of spotted bass was the lowest ever observed at Lake Tuscaloosa. Recruitment was variable.

Methods

Largemouth and spotted bass were collected from 12 sites from March 28 to April 22, 2008, according to the guidelines of the Alabama Reservoir Management Manual (1999). Information from bass tournaments was collected through the Bass Angling Information Team (BAIT) and pertinent data was incorporated into this report.

Results and Discussion

Largemouth Bass

Largemouth bass (N=195) were captured at a rate of 32.4 fish/hour, a CPH just slightly below the lake average (Table 2). The PSD for largemouth bass was 53 and the RSD-P was 14. The catch rates of all incremental size categories in 2008 were well below the statewide averages (Figure 3). In addition, the catch rates of substock and S-Q fish were below the lake averages, while all other incremental size categories were at the lake averages. All incremental relative stock density values in 2008 were very similar to the lake averages (Figure 4). Only S-Q and Q-P fish had incremental relative stock density values that were above the statewide averages. Mean W_r values for each incremental RSD size category ranged from 80 to 85 (Table 2).

The largemouth bass sample consisted of seven age classes (Table 3). Three year-classes (2006-07 and 2004) were well represented in the collection. Growth of age-3 and older fish in 2008 was below the lake average (Figure 10); only yearling fish grew faster than the lake average.

Total annual survival of 2 to 7-year old largemouth bass (N=142) was estimated to be 58.0% ($r^2=0.82$) (Figure 5).

Spotted Bass

A total of 199 spotted bass were captured at a rate of 33.0 fish/hour, a rate nearly identical to the lake average (Table 2). The PSD was 43 and the RSD-P was 16. The

CPH of substock and S-Q fish in 2008 though slightly less than the lake averages were above the statewide averages (Figure 7). The catch rates of Q-P, P-M and M-T fish were below the statewide averages. The CPH of P-M fish was well above the lake average (Figure 7).

All incremental RSD values were below the statewide averages, except S-Q fish (Figure 8). The incremental RSD value of P-M fish was well above the lake average in 2008. Mean W_r values for each incremental RSD size category ranged from 94 to 96 and were well above the lake average (Table 2).

The spotted bass sample consisted of five age classes (Table 4). Growth of spotted bass age-3 and older was slightly above the lake average (Figure 10) while one and two year old fish grew at the lake average. Total annual survival of spotted bass ages 2 to 5 (N=150) was estimated to be a modest 28.0% ($r^2=0.98$) (Figure 9).

Unfortunately, BAIT data was reported from only 41 anglers that fished in two tournaments at Lake Tuscaloosa in 2007. The number of bass weighed-in/angler-day was 2.44, similar to previous years, but substantially less than the statewide average (Abernethy 2008). The pounds of bass weighed-in/angler-day slipped to 3.21 and was well below the statewide average of 5.24. No bass 5 pounds or larger were reported from Lake Tuscaloosa in 2007. The average weight of bass weighed-in and the percent success of anglers at Lake Tuscaloosa were well below the statewide average.

Summary

Catch rates for largemouth and spotted bass were near or slightly below lake averages for 2008, but the CPH of largemouth bass was well below statewide means. Growth of spotted bass three years of age and older was slightly above the lake average while largemouth bass had growth rates below mean values. Total annual survival of largemouth and spotted bass was estimated to be 58% and 28%, respectively. Anglers reported BAIT data from only two bass tournaments during 2007, which was similar to previous years, but well below values from other Alabama reservoirs.

Conclusions

1. Resample Lake Tuscaloosa in 2011.

2. Encourage more local bass clubs to participate in the BAIT Program by meeting with tournament sponsors and officials to explain program concepts and objectives.
3. Monitor the reservoir for possible invasive aquatic plants or exotic species and report any findings to the Non-game Coordinator.
4. Data analysis indicates that there is no need to change the current black bass management regulations for Tuscaloosa Reservoir.
5. This reservoir does not meet the criteria for supplemental stockings of Florida largemouth bass, striped bass or hybrid striped bass.

Literature Cited

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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 298-321 in Reservoir Fishery Resources Symposium. Southern Division American Fisheries Society, Bethesda, Maryland, USA.

Moss, J. M., J. Haffner, and J. M. Piper. 2004. Lake Tuscaloosa 2004 management report. Alabama Department of Conservation and Natural Resources, Montgomery, AL.

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.

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Appendix A

Table and Figures

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

Surface area	5,885 acres
Drainage area	418 sq. mi.
Full pool elevation	223 feet-msl
Mean annual fluxuation	1 feet
Shoreline distance	177 miles
Shoreline development index	16.5 (Welch 1948)
Mean depth	22 feet
Maximum depth	92 feet
Thermocline depth	21 feet
Total dissolved solids	46 mg/l
Morphoedaphic index	2.1 TDS/mean depth(ft) (Ryder 1965)
Growing season	235 frost free days (Jenkins 1967)
Year of impoundment	1973

Table 2. Incremental relative stock density (RSD), catch per hour (CPH), and relative weight (Wr) of target species during spring electrofishing surveys at Lake Tuscaloosa.

Species	Year	No. of samples	Total effort ¹	Substock			RSD S - Q				RSD Q - P				RSD P - M				RSD M - T				Total	
				No.	CPH	SSR ²	No.	CPH	Pct.	Wr	No.	CPH	Pct.	Wr	No.	CPH	Pct.	Wr	No.	CPH	Pct.	Wr	No.	CPH
Largemouth bass	2008	12	6.03	36	6.0	23	75	12.4	47	81	62	10.3	39	80	21	3.5	13	83	1	0.2	1	85	195	32.4
Largemouth bass	2004	5	2.36	33	14.0	31	54	22.8	51	80	36	15.2	34	80	13	5.5	12	79	2	0.8	2	81	138	58.4
Largemouth bass	1992	18	9.25	93	10.1	27	210	22.7	61	79	89	9.6	26	77	42	4.5	12	86	4	0.4	1	94	438	47.4
Largemouth bass	1990	10	5.04	36	7.1	37	57	11.3	58	85	23	4.6	23	83	18	3.6	18	83		0.0	0		134	26.6
Largemouth bass	1988	10	5.04	27	5.4	29	40	7.9	43	87	41	8.1	44	84	12	2.4	13	83	1	0.2	1	86	121	24.0
Largemouth bass	1986	5	2.37	35	14.8	54	27	11.4	42	77	37	15.6	57	84	1	0.4	2	86		0.0	0		100	42.2
Lake average				9.5	33		14.8	50	82		10.6	37	81		3.3	12	83		0.3	1	87		38.5	
Spotted bass	2008	12	6.03	46	7.6	30	87	14.4	57	94	42	7.0	27	94	23	3.8	15	96	1	0.2	1	96	199	33.0
Spotted bass	2004	10	5.05	23	4.6	34	39	7.7	58	87	19	3.8	28	90	9	1.8	13	86		0.0	0		90	17.8
Spotted bass	1992	18	9.25	57	6.2	20	165	17.8	57	85	98	10.6	34	85	23	2.5	8	96	2	0.2	1	98	345	37.3
Spotted bass	1990	7	3.16	28	8.9	27	63	19.9	61	94	31	9.8	30	91	9	2.8	9	90		0.0	0		131	41.5
Spotted bass	1988	10	4.47	35	7.8	35	69	15.4	69	78	26	5.8	26	79	5	1.1	5	81		0.0	0		135	30.2
Spotted bass	1986	5	2.54	35	13.8	53	35	13.8	53	75	28	11.0	42	84	3	1.2	5	84		0.0	0		101	39.8
Lake average				8.1	33		14.9	59	86		8.0	31	87		2.2	9	89		0.1	0	97		33.3	

¹ Effort is in hours.

² SSR denotes substock ratio; the number of substock fish per 100 stock-size fish.

Table 3. Age composition and mean total length (mm) of largemouth bass at Lake Tuscaloosa, April 2008.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
1	2007	53	27.2	8.8	189	4	77 - 246
2	2006	56	28.7	9.3	269	4	212 - 380
3	2005	21	10.8	3.5	312	8	255 - 377
4	2004	42	21.5	7.0	350	5	292 - 437
5	2003	15	7.7	2.5	375	8	324 - 427
6	2002	4	2.1	0.7	435	41	369 - 548
7	2001	4	2.1	0.7	455	13	415 - 473
Total		195	100.0	32.4			

Table 4. Age composition and mean total length (mm) of spotted bass at Lake Tuscaloosa, April 2008.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
1	2007	49	24.6	8.1	143	4	81 - 190
2	2006	105	52.8	17.4	251	3	172 - 345
3	2005	30	15.1	5.0	341	4	301 - 385
4	2004	13	6.5	2.2	384	7	344 - 428
5	2003	2	1.0	0.3	418	21	397 - 440
Total		199	100.0	33.0			

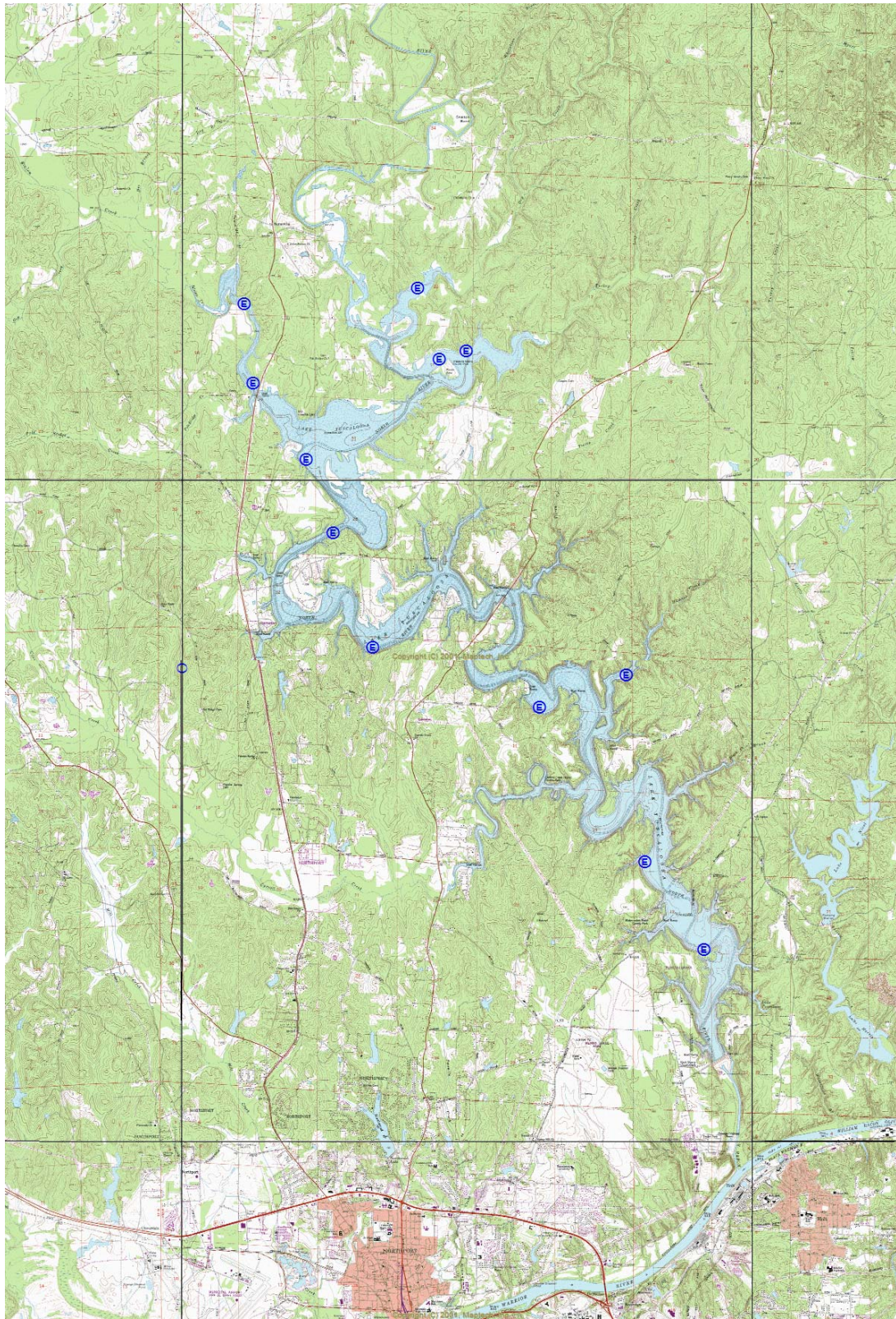


Figure 1. Spring 2008 electrofishing sites at Lake Tuscaloosa.

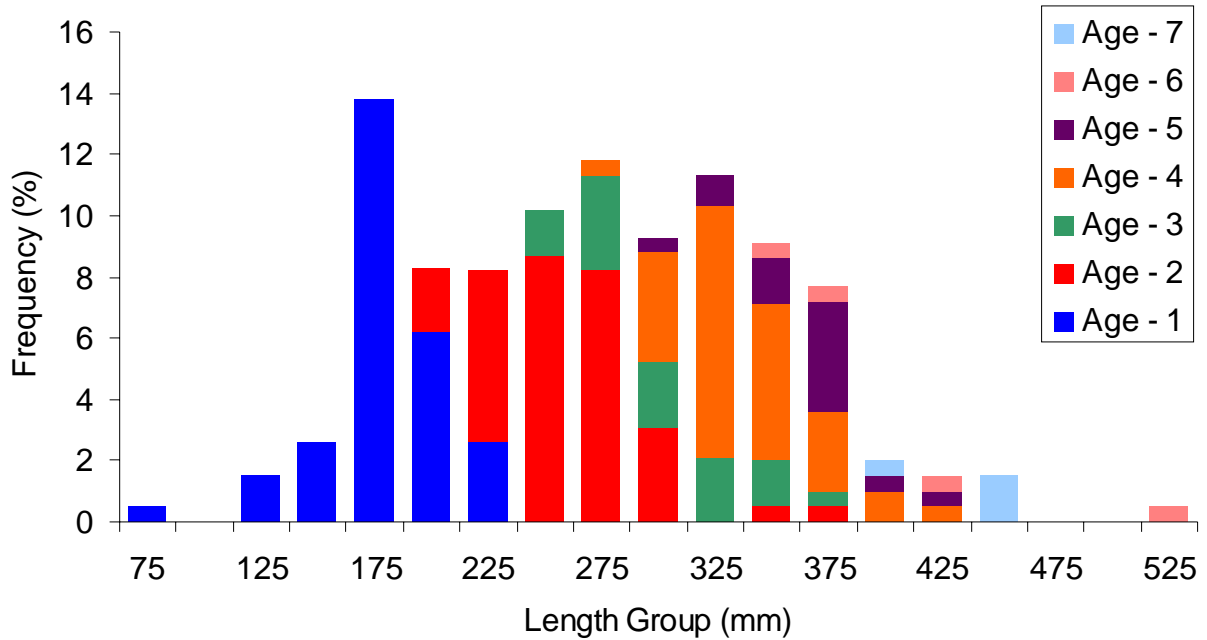


Figure 2. Length at age frequency of largemouth bass (N=195) from Lake Tuscaloosa, April 2008.

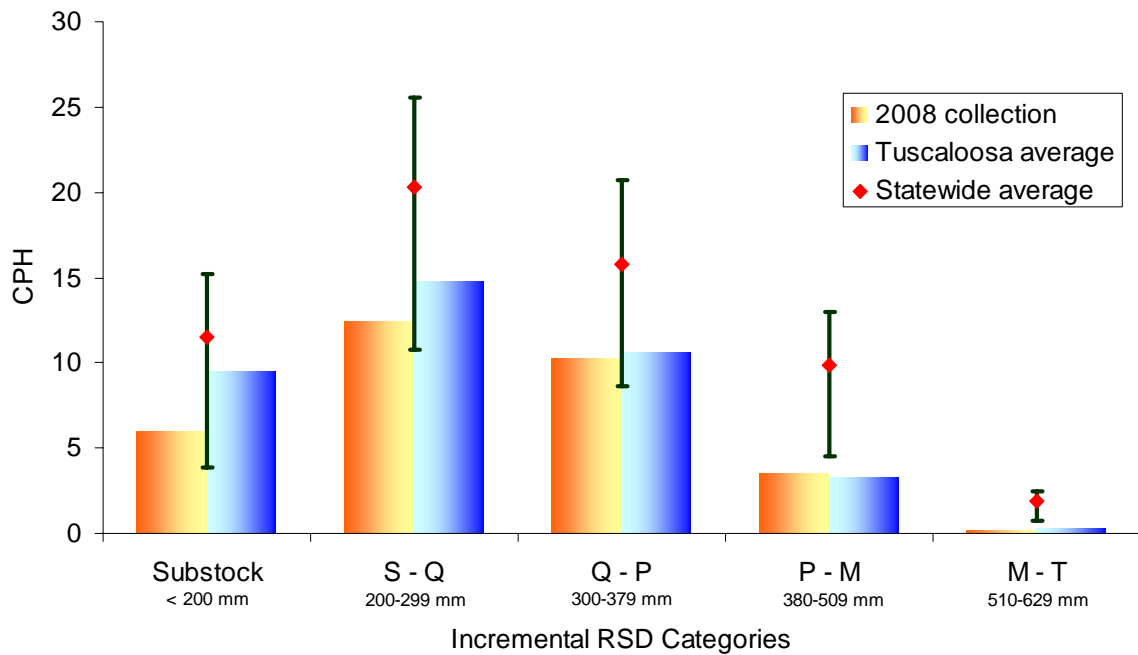


Figure 3. Catch per hour (CPH) of largemouth bass (N=195) at Lake Tuscaloosa, April 2008, and the lake and statewide averages. Error bars represent the 25th and 75th percentile of CPH values, statewide.

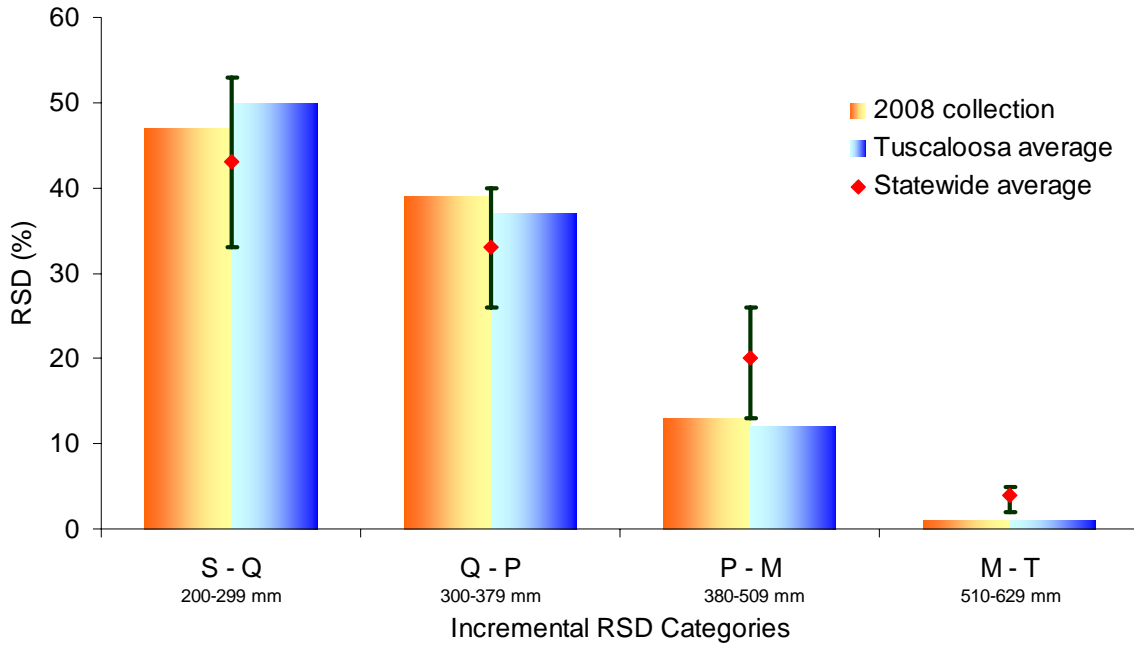


Figure 4. Relative stock density (RSD) of largemouth bass (N=195) at Lake Tuscaloosa, April 2008, and the lake and statewide averages. Error bars represent the 25th and 75th percentile of RSD values, statewide.

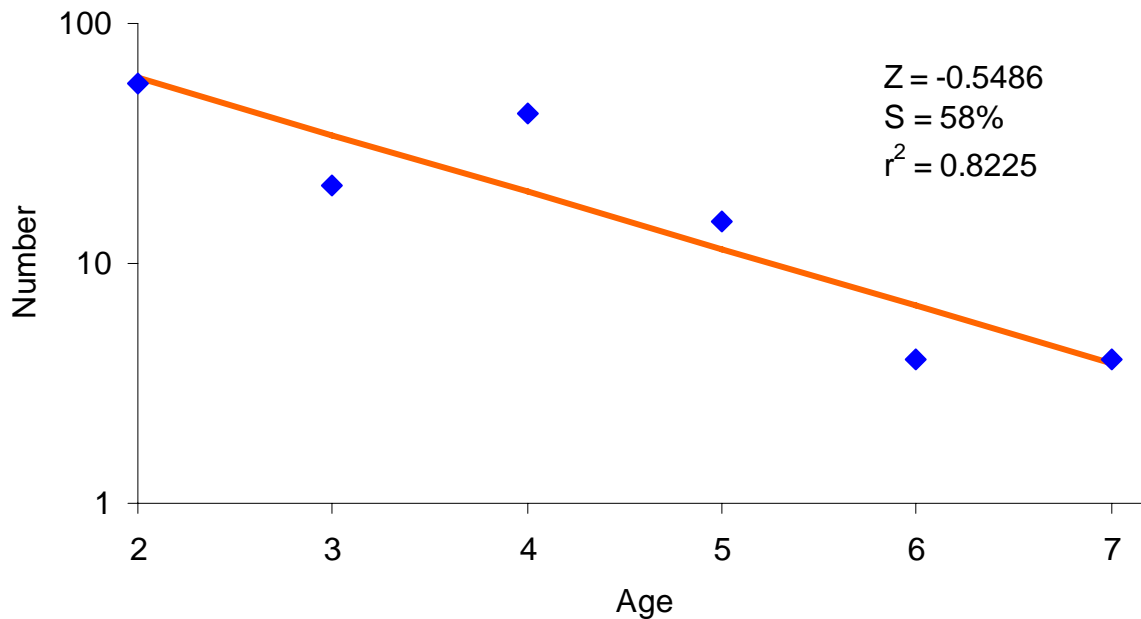


Figure 5. Catch curve regression and annual survival (S) of 2 to 7-year old largemouth bass (N=142) at Lake Tuscaloosa, April 2008.

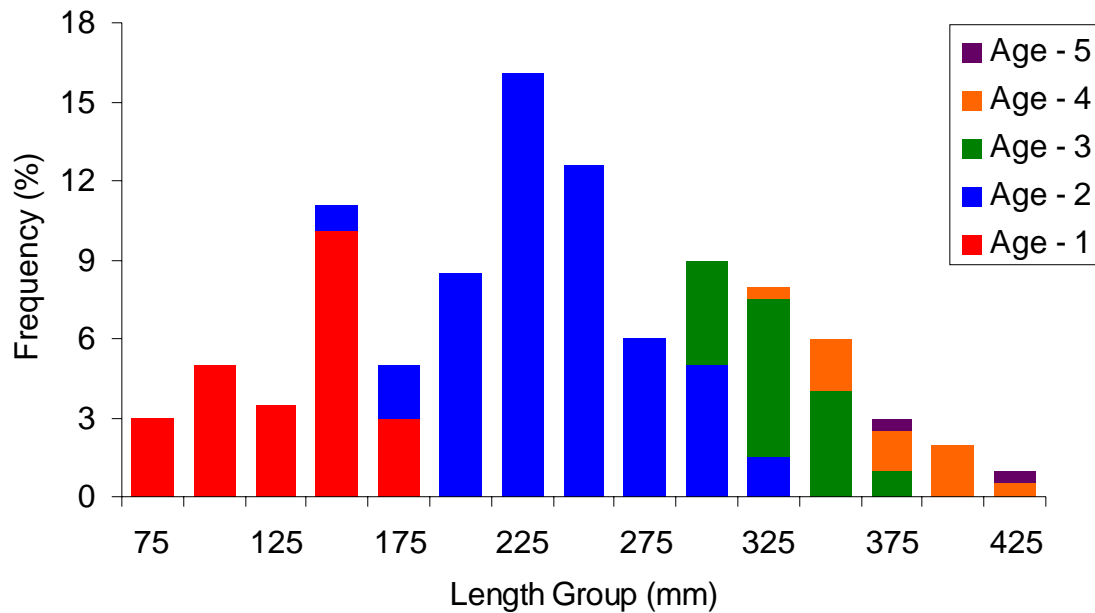


Figure 6. Length at age frequency of spotted bass (N=199) from Lake Tuscaloosa, April 2008.

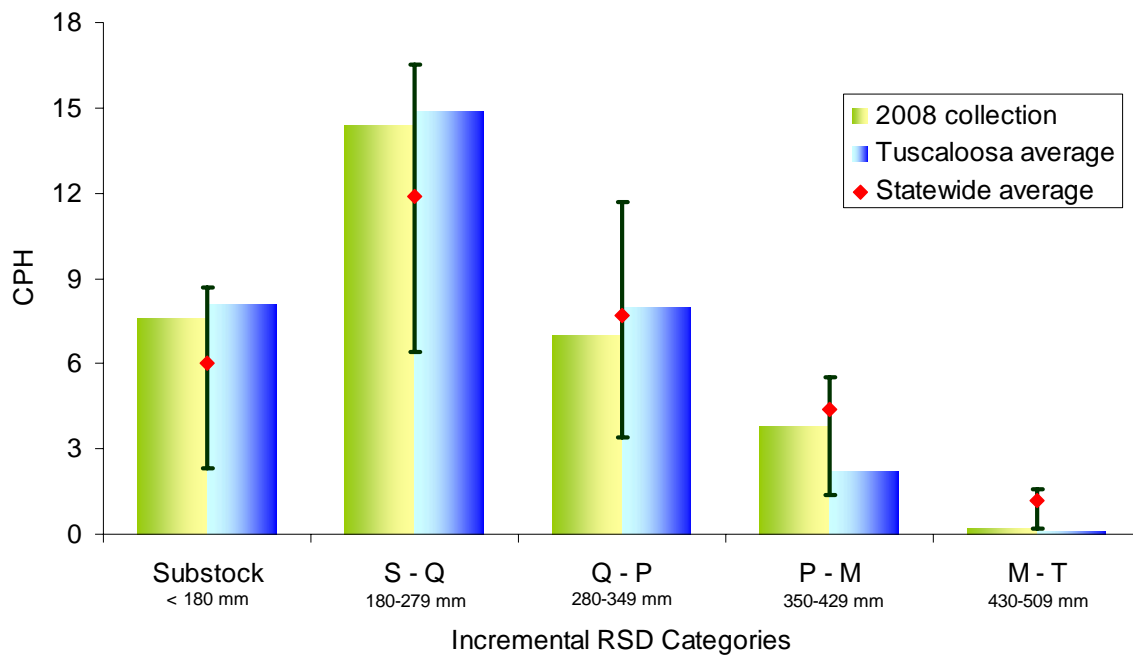


Figure 7. Catch per hour (CPH) of spotted bass (N=199) at Lake Tuscaloosa, April 2008, and the lake and statewide averages. Error bars represent the 25th and 75th percentile of CPH values, statewide.

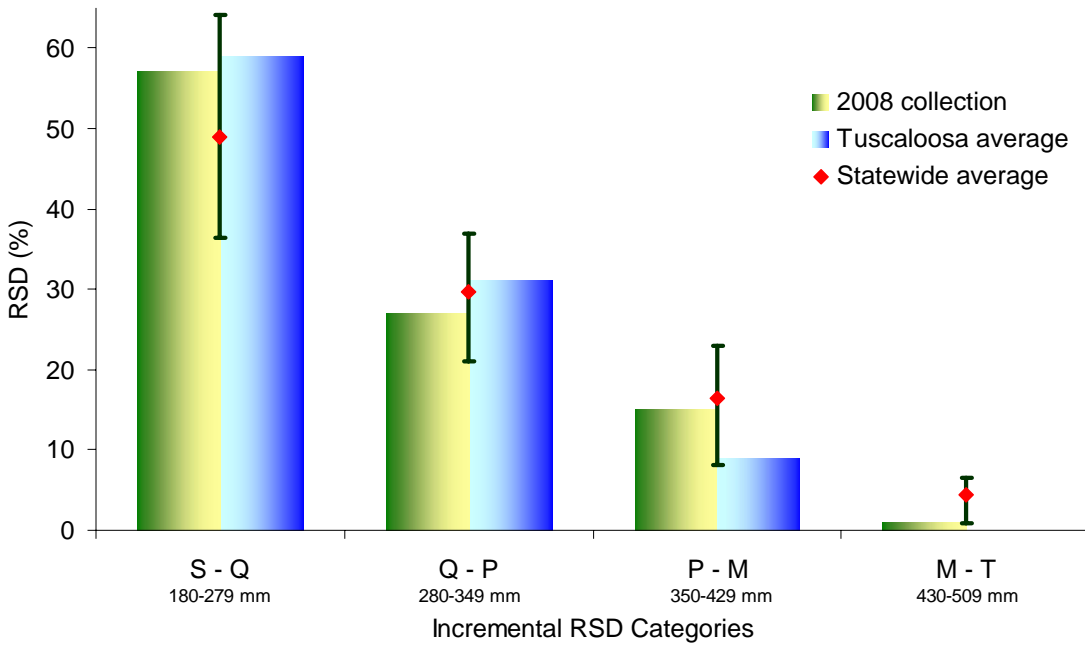


Figure 8. Relative stock density (RSD) of spotted bass (N=199) at Lake Tuscaloosa, April 2008, and the lake and statewide averages. Error bars represent the 25th and 75th percentile of RSD values, statewide.

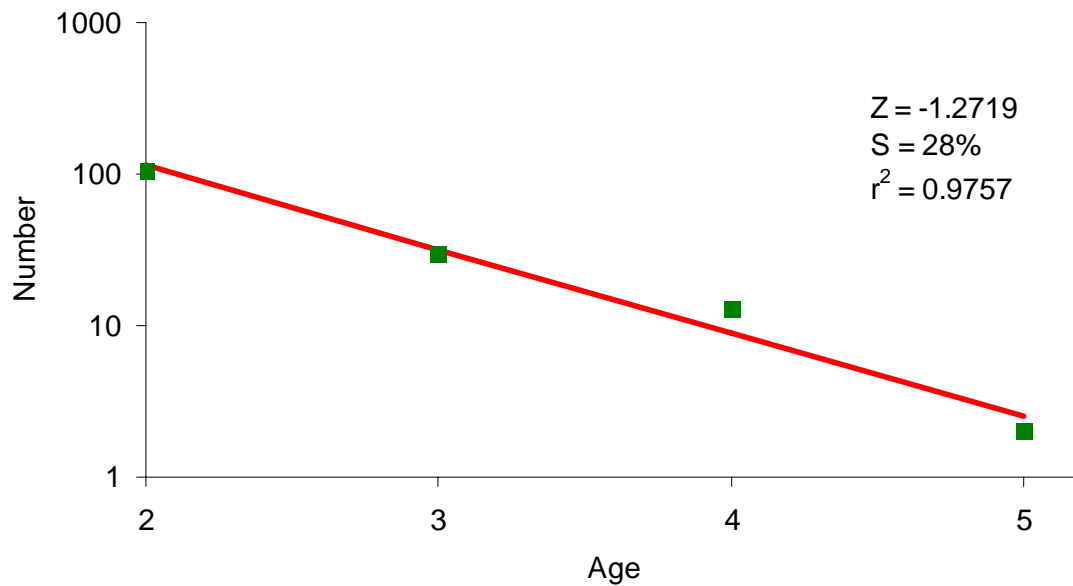


Figure 9. Catch curve regression and annual survival (S) of 2 to 5-year old spotted bass (N=150) at Lake Tuscaloosa, April 2008.

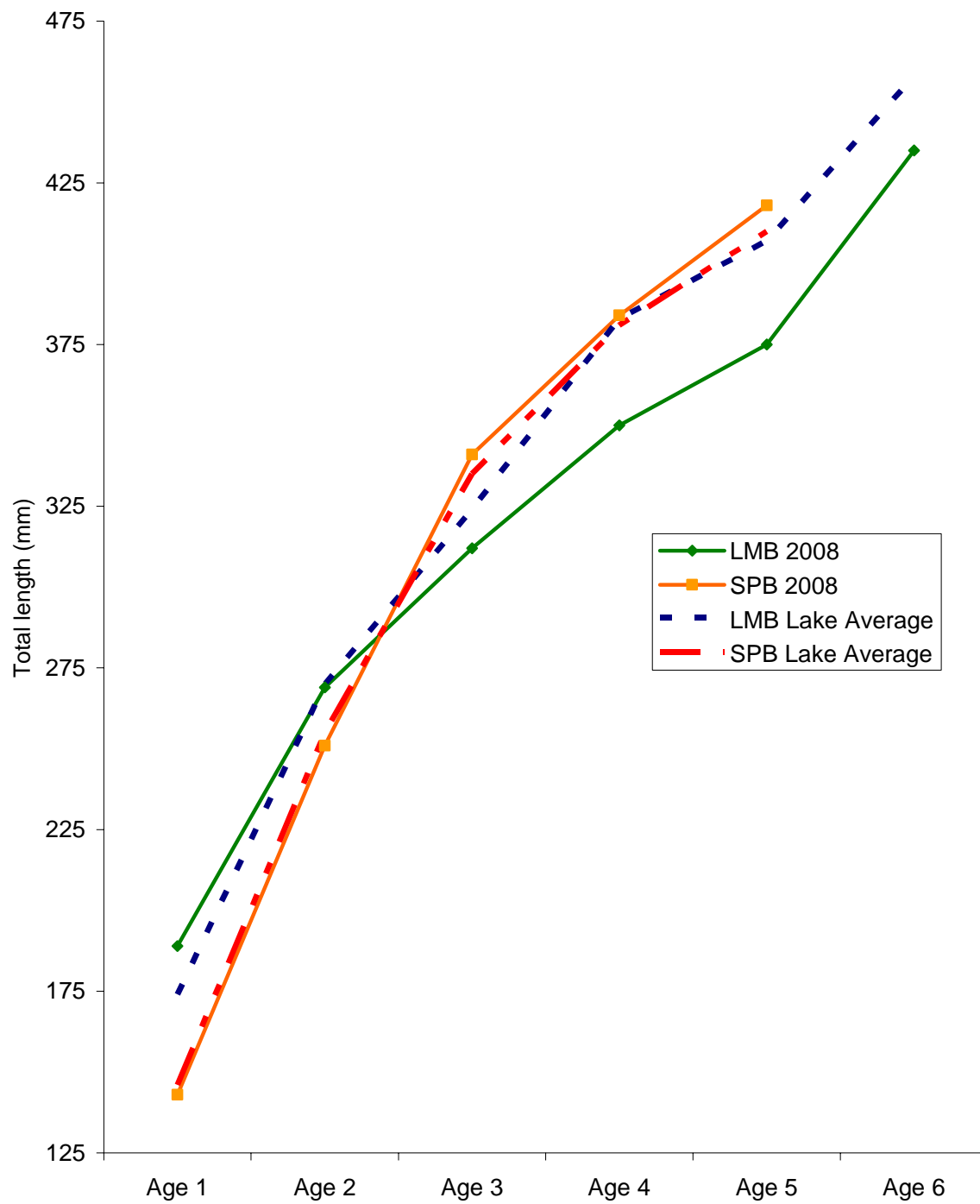


Figure 10. Growth of largemouth and spotted bass at Lake Tuscaloosa.