

GUNTERSVILLE RESERVOIR
MANAGEMENT REPORT
2011

Prepared by

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Introduction:

The Alabama reservoir management program was established in 1986 and Guntersville Reservoir has been sampled 14 times since the program was implemented. The objective of the reservoir program is to collecting baseline information on the major sportfish species of the state's reservoirs. Each reservoir is sampled periodically to follow trends in growth, recruitment and mortality and identify any fisheries problems.

Along with data collected by the Fisheries Section, the Tennessee Valley Authority (TVA) samples Guntersville Reservoir on an annual basis during their spring sport fish survey. Data collected by TVA is often incorporated with the Fisheries Section data and helps fill the gaps during normal sampling rotations.

Guntersville Reservoir is well known for its exceptional largemouth bass fishing. Catches of fifty-plus fish-per-day-per-boat are not uncommon, especially during the spring. These types of catches attract numerous tournament trails, and out-of-state anglers. Thus it is apparent that the fisheries on Guntersville Reservoir are important to the economics of the local area.

Methods:

Guntersville Reservoir was sampled with daytime electrofishing in spring 2011 according to guidelines established in the Alabama Reservoir Management Manual (Cook 1999). Electrofishing consisted of 30-minute samples at each of ten randomly selected one-mile shoreline segments 11-14 April 2011 for a total effort of 5 hours. Gear consisted of a 5.5-meter aluminum boat with bow-mounted electrodes. A Smith-Root 5.0 GPP was used to provide 50-1,000 volts of pulsed direct current. Largemouth bass was the target species. Total length (mm) and weight (g) were recorded for all largemouth

bass collected. Otoliths were taken from 10 largemouth bass per 25 mm length group greater than 150 mm TL. All otoliths were read at the District I Fisheries lab. Data analysis, which included RSD, PSD, length-at-age and relative weight analysis, mortality estimates and von Bertalanffy growth estimates, was conducted with ADWFF Data Analysis and Report Utilities (Slipke, 2004).

An access area creel survey was conducted in conjunction with the standardized sampling. The creel survey consisted of sampling at a single access area one weekend day each week from March through the first two weekends in May. A survey day was eight hours, beginning seven hours before sunset. Catch, harvest and effort data were obtained from angler interviews upon trip completion. Lengths were recorded from harvested black bass in 25 mm length groups and 10 mm groups for crappie.

Access point creels provided the best opportunity to interview the greatest number of anglers. However, these creels are limited to boat anglers that use boat ramps and do not provide the opportunity to interview bank, pier, or resident anglers.

Bass tournament information was collected through the Bass Anglers Information Team (B.A.I.T.) program (Abernethy, 2011). The results were reviewed with regard to Guntersville Reservoir and appropriate comments are included in this report.

Results and Discussion:

The catch-per-unit effort (CPE) for largemouth bass was one of the highest observed to date (Table 2). The CPE for preferred-memorable size bass (35.0 fish/hr) in 2011 was the highest catch rate for this category observed since sampling was initiated on Guntersville Reservoir in 1988. The CPE for memorable-trophy size bass (1.6/hr) was lower than that observed in the past five years, but was equal to the lake average and

similar to the statewide mean. The quality-preferred size catch rates (26.8 fish/hr) decreased from 2010 samples, but were still above statewide averages. Catch rates for stock-quality size largemouth (9.8 fish/hr) decreased from 2010 samples and was well below state wide and lake averages (Table 2).

Relative Stock Density (RSD) for quality-preferred size bass decreased from 2010, whereas the preferred-memorable size showed a substantial increase in RSD values and were well above lake averages (Table 2). The quality-preferred and preferred-memorable values were also above statewide means. Preferred-memorable size fish have always been well represented, exceeding statewide mean values since 2001. RSD value for stock-quality size (13%) decreased and memorable-trophy size (2%) largemouth bass were identical to those observed in 2010. Values for both categories were well below statewide means and were equal to or below the statewide 25th percentile.

Growth, expressed as mean-length-at-age, was acceptable for largemouth bass age 1 – 4 (Table 3). Growth of fish ages 1 through 4 exceeded statewide means and were above or equal to the 75th percentile. Growth for age 5 was slightly below the statewide mean. The time (in years) for largemouth bass to reach specific lengths of 304 mm and 381 mm were above statewide averages and exceeded the 75th percentile (Table 4). Overall growth of Gunter'sville largemouth bass was moderate with some fish entering the fishery (381 mm) as early as age 3 (Table 3; Figure 2).

ADWFF collected nine bass 4 lbs. or larger (1.8 fish/hr) and 6 bass 5 lbs. or larger (1.4 fish/hr) in 5 hours of electrofishing compared to TVA's sampling which yielded 54 bass 4 lbs. or greater (3.0 fish/hr) and 20 bass 5 lbs. or greater (1.1 fish/hr) in 18 hours of electrofishing. TVA's sampling yielded more 4 pounders and a similar catch

rate for fish over 5 lbs. This similarity is also reflected in the RSD catch and length indices distribution (K. Lakin, TVA personal comm.). The catch of largemouth bass ≥ 4 pounds was lower than that observed in 2010 (Floyd et al. 2010) for both organizations.

Standardized creel survey was conducted at seven access areas from March through mid-May, resulting in 432 angler parties interviewed. Anglers fished a total of 5964.78 hours, with bass and crappie fishing accounting for 5,391.92 hours and 150.1 hours of effort, respectively.

Bass anglers accounted for 92.2% of interviewees. Bass anglers caught bass at a rate of 0.75 bass/hour (Appendix B, No. 48). This is similar to bass catch rates on Wilson Reservoir in 2005 (Floyd et al. 2005), Cedar Creek Reservoir in 2007 (Ekema et al. 2007) and Pickwick in 2008 (Ekema et al. 2009). Anglers harvested bass at a rate of 0.02 bass/hour (Appendix B, No. 45). This harvest rate is similar to that observed on other Tennessee River Reservoirs (personal observation). The bass harvest rate (No. Harvested/No. Caught) was 2.2%.

The 2010 Bass Anglers Information Team report indicates that 52 tournaments took place on Guntersville during 2010 (Abernethy 2011). All quality indicators improved over 2009 and are some of the highest observed in the 25 year history of reporting (Figure 3-5).

Conclusions:

The largemouth bass population has shown variations over the years. Variable recruitment observed on mainstream impoundments of the Tennessee River is predominantly responsible for these changes. Despite these variations, the Guntersville bass population has maintained a quality fishery as evidenced by the number of

professional tournaments that are held on the reservoir each year. The national attention that professional tournaments bring also makes Guntersville one of the heaviest tournament fished reservoirs in the state (Abernethy, personal communication).

Several public issues have arisen over the last several years concerning excessive harvest by out-of-state anglers and delayed mortality of largemouth bass caught during tournaments. Although the access creel survey did not show a high harvest rate of bass, many local anglers feel that harvest is excessive. Also, many anglers observed high numbers of bass mortalities following several tournaments, especially in the late spring.

Our sampling indicated a population with many bass 15 inches or larger. The 2007 year class continues to dominate the population similar to that observed in 2010 (Floyd et al. 2010). The 2008 and 2009 year classes appear to be moderate in size and with the growth rates observed these year classes should provide sufficient recruitment in the future. It appears that a weak year class was produced in 2010 and this condition should be monitored to ensure that recruitment is sufficient to maintain this quality fishery. We recommend that the reservoir be sampled annually or bi-annually to determine if the current length limit restrictions continue to be an effective strategy in managing the structure of the largemouth bass population.

Literature Cited

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- Cook, S.F. 1999. Alabama Reservoir Management Manual. Alabama Department of Conservation and Natural Resources. Montgomery, AL. 77pp.
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Appendix A

Tables and Figures

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

Surface area	67,900	surface acres
Drainage area	24,450	square miles
Full pool elevation	595.0	feet-msl
Mean annual fluctuation	2.0	feet
Shoreline distance	890	miles
Shoreline development index	25	
Mean depth	15	feet
Maximum depth	45.1	feet
Outlet depth	16-43	feet
Thermocline depth		None
Stratification index		None
Total dissolved solids	92.6	mg/l
Morphoedaphic index	6.2	(TDS/mean depth)
Growing season	214	frost free days
Year of Impoundment	1939	

Table 2. Relative stock density, catch per effort, relative weight, and proportional stock density of largemouth bass from Gunterville Reservoir, 1988-2011.

Year	No. of		SUBSTOCK				RSD S-Q				RSD Q-P				RSD P-M				RSD M-T				TOTAL		
	Samples	Effort (hrs)	NO.	CPE	RATIO	NO.	CPE	PCT	Wr	NO.	CPE	PCT	Wr	NO.	CPE	PCT	Wr	NO.	CPE	PCT	Wr	NO.	CPE	PSD	
1988	20	10	133	13.3	41	177	17.7	54	--	101	10.1	31	--	38	3.8	12	--	10	1.0	3	--	459	45.9	46	
1989	20	10	110	11.1	31	201	20.1	56	--	114	11.4	32	--	35	3.5	10	--	7	0.7	2	--	467	46.7	44	
1990	9	4.5	11	2.4	10	58	12.9	53	96	26	5.8	24	86	20	4.4	18	88	6	1.3	5	104	121	26.9	47	
1993	7	3.5	93	26.6	89	48	13.7	46	85	32	9.1	30	90	14	4.0	13	94	11	3.1	10	98	198	56.6	54	
1995	10	5	86	17.2	40	118	23.6	54	88	51	10.2	24	88	40	8.0	18	89	8	1.6	4	98	303	60.6	46	
1996	10	5	49	9.8	25	78	15.6	40	86	80	16.0	41	88	30	6.0	15	88	6	1.2	3	101	243	48.6	60	
1999	8	4	90	22.5	60	70	17.5	46	102	53	13.3	35	99	24	6.0	16	94	4	1.0	3	98	241	60.3	54	
2001	10	5	26	5.2	12	59	11.8	27	98	89	17.8	40	97	71	14.2	32	96	2	0.4	1	87	247	49.4	73	
2002	9	4.5	17	3.3	11	41	9.1	27	103	55	12.2	36	100	48	10.7	31	100	9	2.0	6	100	170	37.8	73	
2004	10	5	44	8.8	17	88	17.6	34	99	65	13.0	25	101	97	19.4	37	104	10	2.0	4	110	304	60.8	66	
2006	10	5	5	1.0	3	23	4.6	12	101	72	14.4	38	104	85	17.0	45	103	10	2.0	5	99	195	39.0	88	
2008	10	5	29	5.8	13	95	19.0	42	103	44	8.8	20	111	71	14.2	32	107	15	3.0	7	107	254	50.8	58	
2010	10	5	58	11.6	14	112	22.4	27	91	175	35.0	42	95	124	24.8	30	97	9	1.8	2	97	478	95.6	73	
2011	10	5	19	3.8	5	49	9.8	13	96	134	26.8	37	97	175	35.0	48	98	8	1.6	2	97	385	77.0	87	
Lake Average				10.2	26		15.4	38	96		14.6	32	96		12.2	26	97		1.6	4	100		54.0	62	
State Average				11.5	26		20.3	43	88		15.8	33	91		9.9	20	94		1.9	4	97		59.4	57	

Table 3. Age composition and mean length of largemouth bass from Guntersville Reservoir, spring 2011.

Year Class	Number	Percent	CPE	Mean TL	SE
2010	38	9.9	7.6	197.7	6.7
2009	72	18.7	14.4	308.4	5.3
2008	92	23.9	18.4	356.4	3.3
2007	128	33.2	25.6	406.9	2.7
2006	24	6.2	4.8	433.3	9.3
2005	9	2.3	1.8	466.6	12.1
2004	6	1.6	1.2	487.8	23.0
2003	10	2.6	2.0	508.9	10.1
2002	1	0.3	0.2	539.0	**
2001	4	1.0	0.8	414.5	30.4
2000	1	0.3	0.2	494.0	**
	385	100.0	77.0		

Table 4. Time in years for largemouth bass to reach 304, 381
406 and 508 mm TL. NC = not calculated.

Time in years to reach TL(mm)				
Year	304	381	406	508
1995	2.63	3.99	4.55	8.06
1996	2.68	4.08	4.61	7.29
1999	2.79	4.30	4.89	8.15
2001	2.30	3.99	4.74	12.58
2002	2.38	3.99	4.68	10.01
2004	2.46	4.00	4.66	9.78
2006	2.45	3.85	4.47	10.81
2008	2.08	3.57	4.19	8.58
2010	2.69	4.09	4.66	8.10
2011	2.04	3.24	3.80	NC

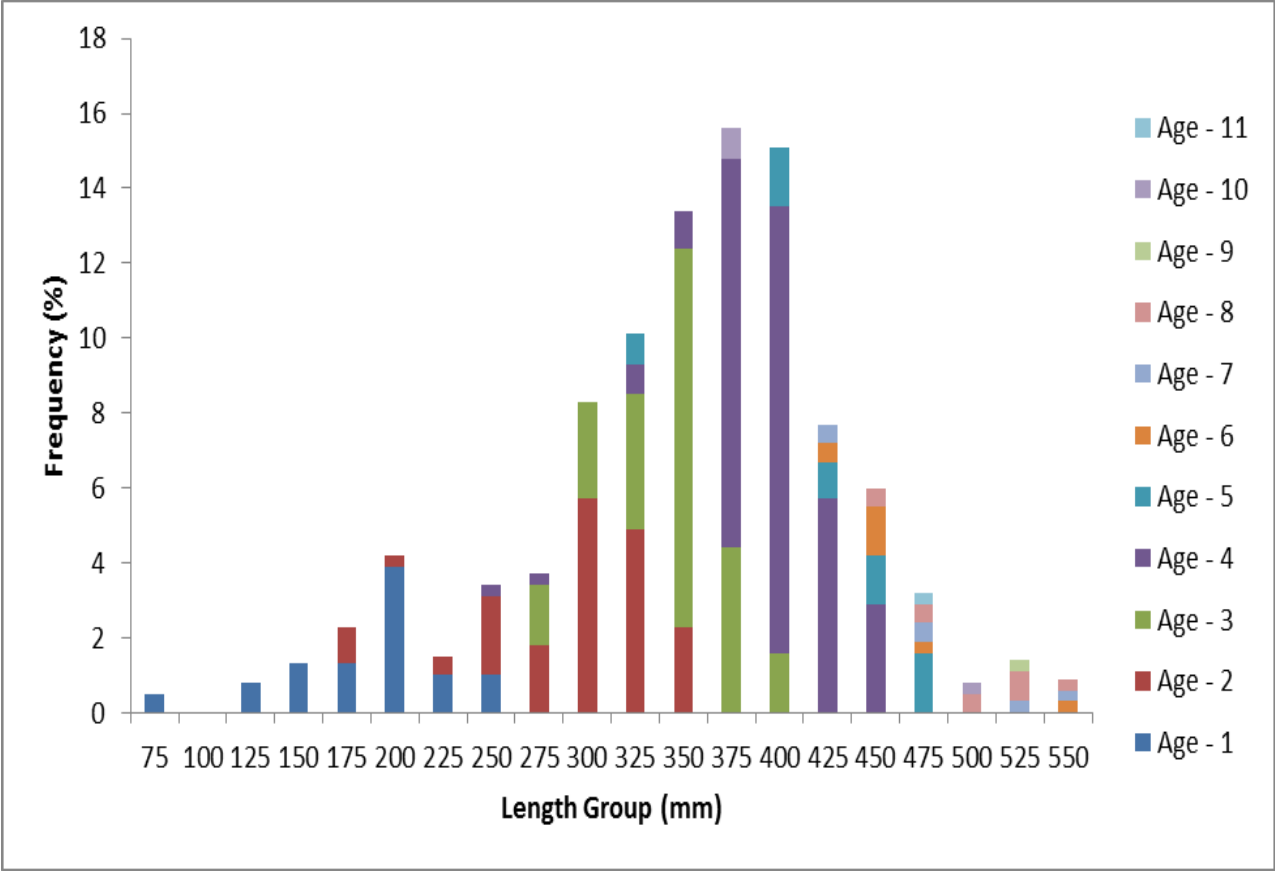


Figure 1. Length-at-age distribution for largemouth bass (N=385) from Gunterville Reservoir, spring 2011.

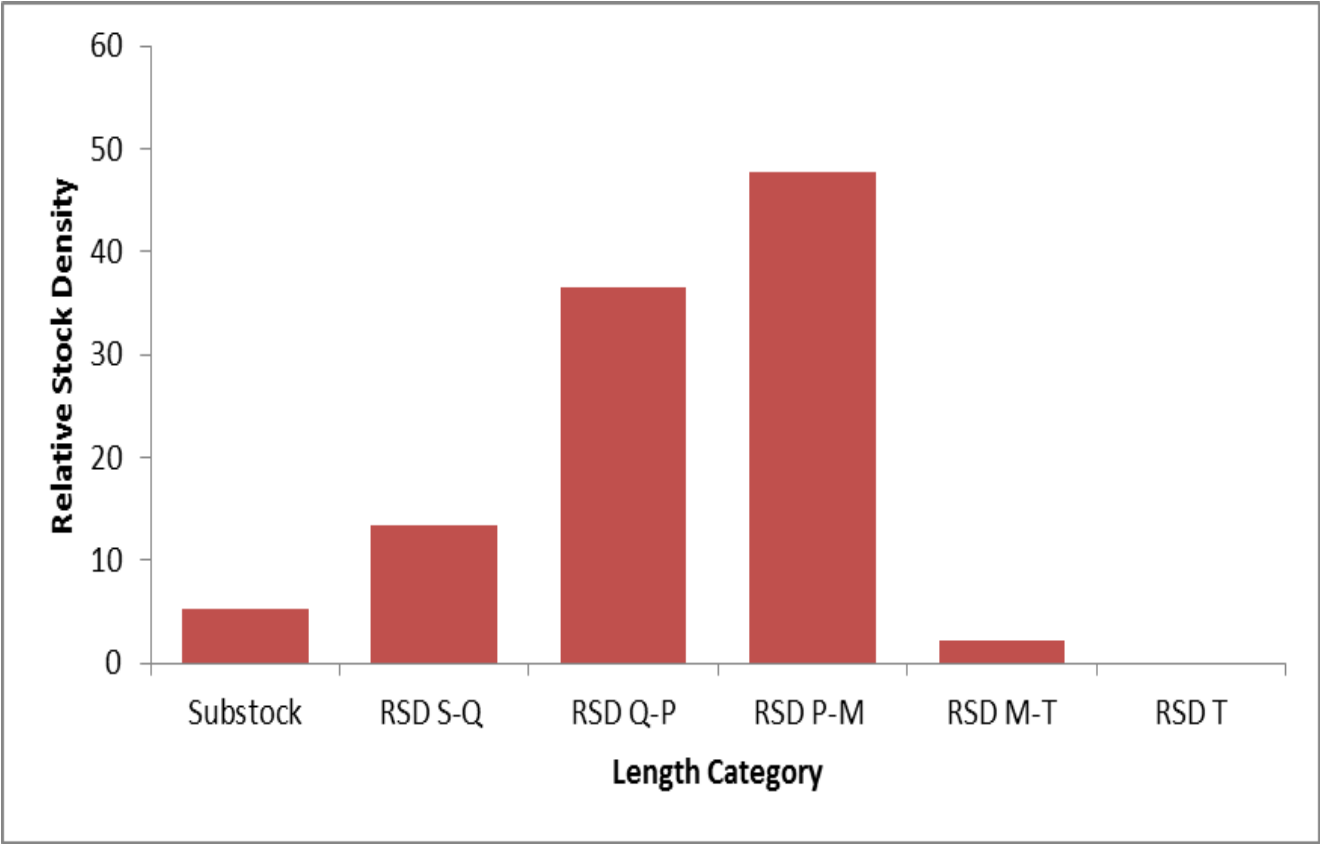


Figure 2. Relative stock density for largemouth bass from Guntersville Reservoir, spring 2011.

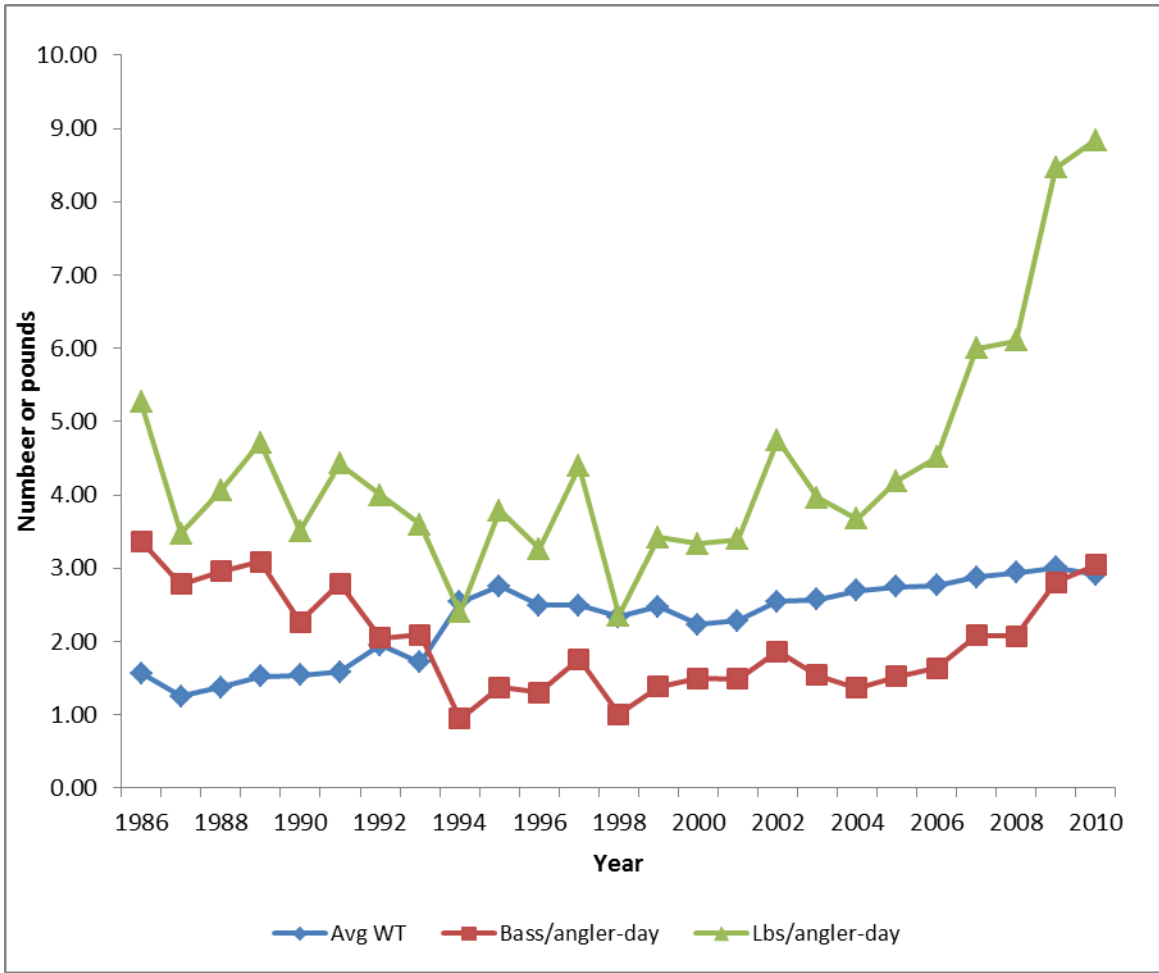


Figure 3. Average weight, bass/angler-day and pounds/angler-day of largemouth bass from Guntersville B.A.I.T. reports, 1986-2010.

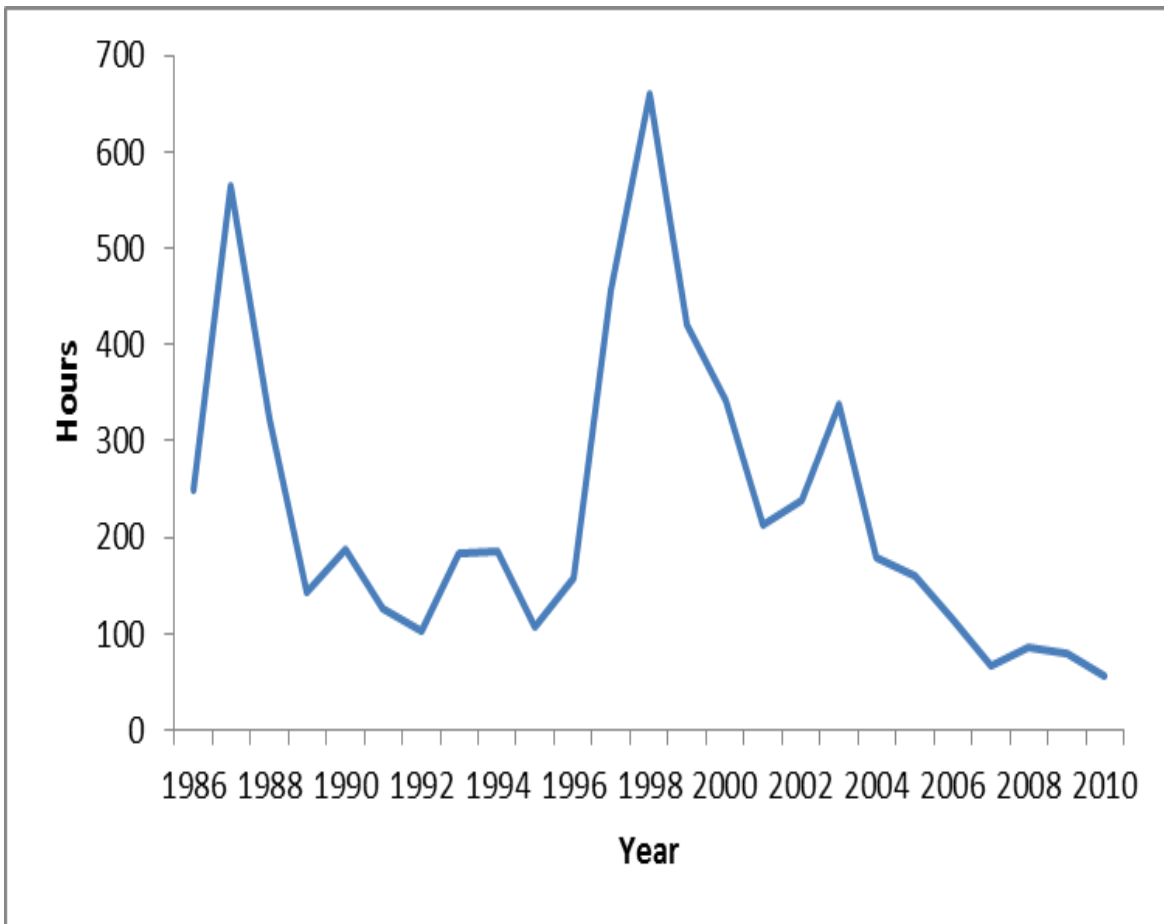


Figure 4. Number of hours to catch a largemouth bass ≥ 5 pounds from Guntersville Reservoir B.A.I.T. reports 1986-2010.

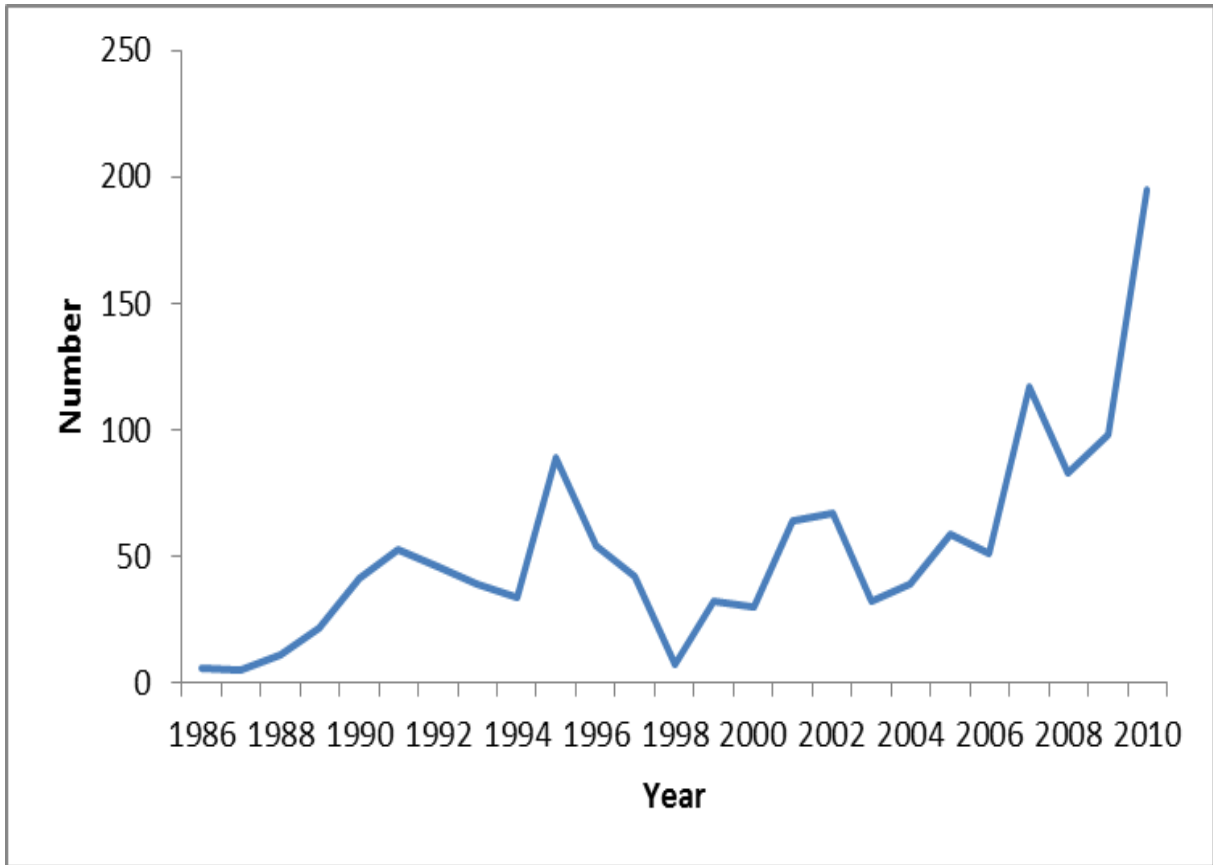


Figure 5. Number of largemouth bass ≥ 5 pounds reported from B.A.I.T tournaments on Gunter'sville Reservoir, 1986-2010.

Appendix B

Creel Survey

GUNTERSVILLE RESERVOIR 2011 ANGLER SURVEY REPORT

1	Number of parties interviewed	=	432
2	Number of anglers interviewed	=	823
3	Total fishing effort (hours)	=	5964.78
4	Mean trip length (hours)	=	7.25
5	Number of parties fishing for bass	=	405
6	Percent of parties in survey fishing for bass	=	93.80
7	Number of bass anglers	=	759
8	Percent of anglers in survey fishing for bass	=	92.20
9	Fishing effort for bass (hours)	=	5391.92
10	Percent effort for bass	=	90.40
11	Mean trip length for bass anglers (hours)	=	7.10
12	Number of parties fishing for crappie	=	14
13	Percent of parties in survey fishing for crappie	=	3.24
14	Number of crappie anglers	=	31
15	Percent of anglers in survey fishing for crappie	=	3.80
16	Fishing effort for crappie (hours)	=	150.10
17	Percent effort for crappie	=	2.52
18	Mean trip length for crappie anglers (hours)	=	4.84
19	Number of parties fishing for anything	=	3
20	Percent of parties in survey fishing for anything	=	0.70
21	Number of anglers fishing for anything	=	6
22	Percent of anglers in survey fishing for anything	=	0.73
23	Fishing effort for anything (hours)	=	26.08
24	Percent effort for anything	=	0.44
25	Number of parties fishing for other species	=	14

26	Percent of parties in survey fishing for other species	= 3.24
27	Number of anglers fishing for other species	= 26
28	Percent of anglers in survey fishing for other species	= 3.20
29	Fishing effort for other species (hours)	= 145.70
30	Percent effort for other species	= 2.44
31	Number of LMB <15" released by all anglers	= 1788
32	Number of LMB >15" released by all anglers	= 2231
33	Number of LMB <15" released by bass anglers	= 1708
34	Number of LMB >15" released by bass anglers	= 2138
35	Number of SMB <12" released by all anglers	= 1
36	Number of SMB >12" released by all anglers	= 0
37	Number of SMB <12" released by bass anglers	= 1
38	Number of SMB >12" released by bass anglers	= 0
39	Number of SPB <12" released by all anglers	= 41
40	Number of SPB >12" released by all anglers	= 47
41	Number of SPB <12" released by bass anglers	= 41
42	Number of SPB >12" released by bass anglers	= 47
43	Number of bass harvested by all anglers	= 91
44	Number of bass harvested by bass anglers	= 90
45	Bass harvest rate (bass/hr.) for all anglers	= 0.02
46	Bass catch rate (bass/hr.) for all anglers	= 0.70
47	Bass harvest rate (bass/hr.) for bass anglers	= 0.02
48	Bass catch rate (bass/hr.) for bass anglers	= 0.75
49	Modal length group (25mm) of black bass harvested	= 400
50	Number of crappie < 9" released by all anglers	= 45

51	Number of crappie > 9" released by all anglers	= 9
52	Number of crappie < 9" released by crappie anglers	= 45
53	Number of crappie > 9" released by crappie anglers	= 7
54	Number of crappie harvested by all anglers	= 28
55	Number of crappie harvested by crappie anglers	= 28
56	Crappie harvest rate (crappie/hr.) for all anglers	= 0.01
57	Crappie catch rate (crappie/hr.) for all anglers	= 0.01
58	Crappie harvest rate (crappie/hr.) for crappie anglers	= 0.19
59	Crappie catch rate (crappie/hr.) for crappie anglers	= 0.53
60	Modal length group (10mm) of crappie harvested	= 310

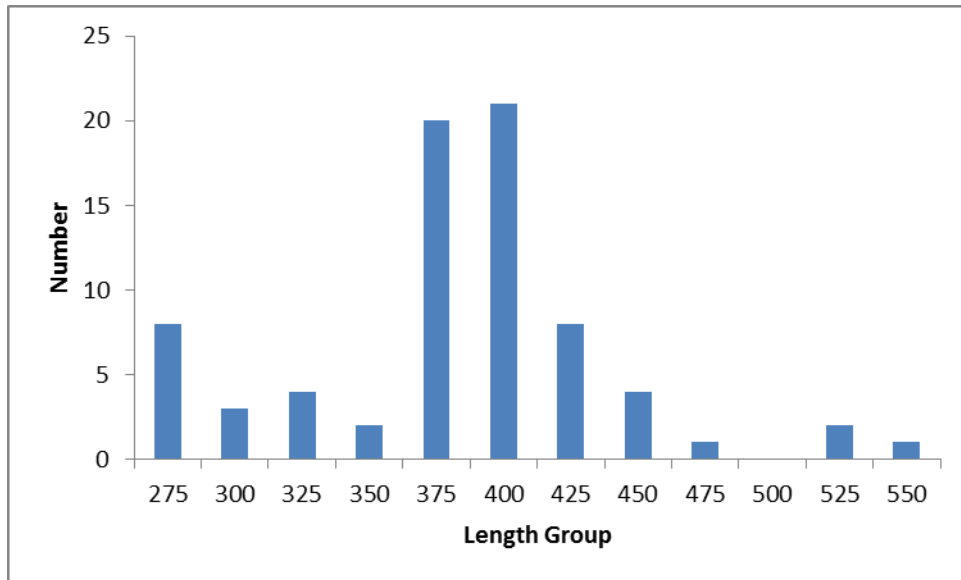


Figure 1. Number of black bass harvested (N=74) by 25 mm group from Guntersville Reservoir, spring 2011.

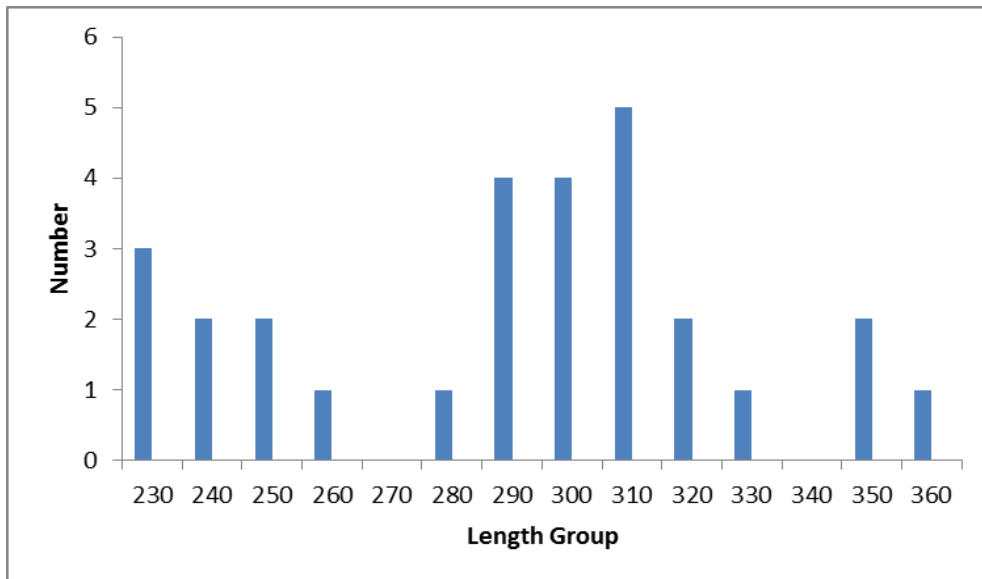


Figure 2. Number of crappie harvested (N=28) by 10 mm group from Guntersville Reservoir, spring 2011.