

CLAIBORNE RESERVOIR MANAGEMENT REPORT

2004-2005

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Introduction

Claiborne Reservoir is a 5,930-acre reservoir on the Alabama River, impounded by the U.S. Army Corps of Engineers in 1970 (Figure 1, Table 1). Claiborne Reservoir was previously sampled under the Reservoir Management Program in 1987. Results of previous efforts, including a detailed description of the physical and biological characteristics, are summarized by Tucker (1988) and in this report. Management activities described herein include standardized sampling with trapnets and electrofishing gear, as well as stocking of striped bass and hybrid striped bass.

Methods

Sampling methods included trapnetting (7 sites, 30 net-nights) during Fall, 2004, to target black crappie and white crappie. Electrofishing (6 sites, 9277s pedal time) during Spring, 2005, targeted largemouth bass, bluegill sunfish, redear sunfish, gizzard shad, and threadfin shad. Both methods above utilized standardized sampling procedures (Cook 1999). Sampling sites are indicated on the reservoir map (Figure 1). Total length (mm) and weight (g) were recorded for all target fish collected. Species diversity was determined by collecting and enumerating all fish during a portion of 30-minute standard electrofishing samples. Age determination of largemouth bass was done by removing whole otoliths and examining under a compound microscope. Otoliths of fish that were difficult to age were sectioned, ground, and read by two different readers under high magnification. Data analysis was computed using the program ADWFF Data Analysis and Report Utilities (Slipke 2004).

Results and Discussion

Largemouth Bass

Electrofishing produced a sample of 155 largemouth bass, 115 of which were stock-size and larger (Tables 3, 4). Nine age classes were sampled, and ages 1 through 3 comprised 78% of the sample population (Table 5). There is a sharp decline in numbers of bass greater than age 5. Age composition data exhibits a weak 2004 year class compared to the higher numbers from the 2003 year class. Water levels (gage height) in Claiborne Reservoir may explain some of these differences. Gage height in Claiborne Reservoir was above average by 1.9 feet (data based on 10-year mean; USGS 2006) during March through August of 2003. Conversely, gage height was 1.27 feet below average during March through May, 2004. Wetter spring weather and higher water levels during 2003 may have provided additional spawning habitat and foraging areas not found by young bass in 2004.

Relative stock density (RSD) analysis of the sample indicated that stock-size bass were the most abundant size group (50%), followed by substocks (ratio = 35%; Table 4). All bass RSD length groups fell within or exceeded statewide mean values (Figure 3). Catch-per-unit effort (CPE) also fell within or exceeded statewide mean values. Relative weight (W_r) values were low across all groups (range 86-88). Catch-at-age data did not provide statistically valid annual mortality rates.

Historically, this fishery has low angler pressure due to the remote location from major roads and few access points. Despite this, Claiborne Reservoir ranked above average for all bass tournament quality ratings during 2004, according to the B.A.I.T. program (Bass Angler Information Team; Haffner 2005).

Black Crappie and White Crappie

Trapnet samples produced a total of 155 white crappie and 104 black crappie (Figure 1, Table 3). White crappie population size structure fell within or above acceptable values for all RSD groups; however, only stock- and quality-size black crappie were within acceptable statewide mean values (Table 4, Figure 3). Catch rates were below statewide mean values for all RSD groups of black crappie and white crappie. Both species of crappies exhibit slow growth based on mean length-at-age. W_r values were poor for nearly all length groups (Table 4). Age structure of both species exhibits relatively high mortality since few fish (< 1%) older than age 3+ were found (Tables 6, 7). White crappie had a successful spawn during 2004 unlike black crappie which were represented by a comparatively poor year class. Young-of-year differences in abundance may be due to spawning success patterns. Weak age class structure of older fish may be a function of relatively dry years from Spring, 1998 through 2000.

Bluegill Sunfish and Redear Sunfish

Bluegill samples were comprised of 166 stock-size fish and included length groups from 8-24 cm with a slightly bi-modal distribution (Figure 4). Stock-size fish made up 83% of the sample, and all RSD length groups were within acceptable statewide limits for population structure and CPE rates (Table 4, Figure 4). Redear sunfish CPE rates were low compared to that of bluegill, making meaningful comparisons difficult. Both sunfish species from this sample exhibited W_r values that were above average across all RSD groups (Table 4).

Gizzard Shad and Threadfin Shad

Gizzard shad and threadfin shad were incidental collection species in the 1987 sample. Thus, comparison of collections is difficult and CPE rates appear to be average in comparison to the upstream reservoir, Millers Ferry. Gizzard shad sampled (N=113) among six sites exhibited a trimodal length frequency distribution ranging from 9-24 cm. Threadfin shad sampled (N=105) exhibited a length frequency mode at 9 cm (Table 4, Figure 5).

Conclusions and Recommendations

Sampling during Fall, 2004, and Spring, 2005, yielded a collection of nineteen species or groups of fishes. The largemouth bass population appears stable, though a comparatively weak 2004 year class is evident. Black crappie had a similarly weak 2004 year class but white crappie, which dominate the overall crappie population, exhibited a moderate to strong year class. Any negative trend reflected within populations of these popular sport fish likely won't be observed by anglers until 2007. Sunfish from this system have plumper bodies than crappies and largemouth bass, and this may be a function of water levels. Claiborne Lake is a turbid, flood-control reservoir which has highly variable flows. Variable patterns in seasonal rainfall and flow during 2003, 2004, and 2005, may have allowed sunfishes an advantage of improved limnetic foraging while decreasing efficiency of crappie and bass foraging in open waters. Further examination on how water levels may affect growth and recruitment is warranted. This reservoir has relatively low fishing pressure and little sample history. Therefore, we recommend the following:

1. There are no management recommendations for any sport fish species at this time.
2. Spring electrofishing for bass, sunfishes, and shad species, and fall trapnetting for crappies should be done in 2008 or 2009.

Literature Cited

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APPENDIX A

Tables & Figures

Table 1. Morphometric, physical, and chemical characteristics of Claiborne Reservoir

Surface area	5,930	acres
Drainage area	21,473	sq. mi. (Psinakis et al. 2005)
Full pool elevation	35	feet-msl
Mean annual fluctuation	3	feet
Shoreline distance	204	miles
Shoreline development index	18.9	(Welch 1948)
Mean depth	16.25	feet
Maximum depth	40	feet
Outlet depth	20	feet
Annual mean discharge	32,280	cfs (Psinakis et al. 2005)
Thermocline depth	none	
Total suspended solids	16.9-17.9	mg/L (ADEM, 2003)
Chlorophyll a	5.85-7.99	ug/L (ADEM, 2003)
Growing season	230 - 245	frost free days (Jenkins 1967)
Year of impoundment	1970	

Table 2. Fish stocking in Claiborne Reservoir, 2000-2006

Species	Year	No/Ac	Size (in)	Total
Hybrid striped bass	2000	2	1 - 3	12,062
	2001	2	1 - 3	12,000
	2002	2	1 - 3	14,560
	2003	2	1 - 3	12,000
	2004	2	1 - 2	12,096
	2006	1	1 - 3	6,000
Striped bass (Atlantic)	2001	2	1 - 3	12,000
Striped bass (Gulf)	2003	2	1 - 3	12,000
	2004	2	1 - 3	12,000
	2005	2	1 - 3	12,000
	2006	2	1 - 3	12,000

Table 3. Number of species collected by electrofishing and trapnets from Claiborne Reservoir, Fall, 2004 and Spring, 2005.

Species	No.	Fall 2004		No.	Spring 2005	
		CPE	E (Nights)		CPE	E (Hours)
Black crappie	104	3.5	30	23	34.3	0.67
Blue catfish				1	1.5	0.67
Bluegill sunfish				166	122.1	1.36
Blacktail redhorse				11	16.4	0.67
Common carp				2	3.0	0.67
Channel catfish				11	16.4	0.67
Freshwater drum				23	34.3	0.67
Gizzard shad				113	47.5	2.38
Largemouth bass				155	60.1	2.58
Longear sunfish				1	1.5	0.67
Redear sunfish				27	17.6	1.53
Shiners/Minnows				14	20.9	0.67
Silverside				1	1.5	0.67
Smallmouth buffalo				7	10.4	0.67
Spotted gar				20	29.9	0.67
Spotted sucker				2	3.0	0.67
Threadfin shad				105	68.2	1.54
White crappie	196	6.5	30	68	101.5	0.67
Warmouth sunfish				2	3.0	0.67

Table 4. Relative stock density (pct), catch-per-effort (cpe), number (no), and relative weight (Wr) of target species in Claiborne Reservoir, Spring, 1987; Fall, 2002; Fall, 2004; and Spring, 2005. Lake Averages are only for data available by season comparisons. Note, 1987 white crappie sample includes 5 trophy fish (CPE=0.8, RSD=7, Wr=102).

Species collected by Samples				SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				TOTAL		
Season	Year	Gear	& (Effort)	no.	cpe	pct.	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	
Largemouth bass																									
Spring	1987	E	13 (6.49)	14	2.2	14	20	3.1	20		42	6.5	43		31	4.8	31		6	0.9	6		113	17.5	
Spring	1992	E	1	14		14	36		35	88	37		36	89	24		24	87	5		5	84	116		
Spring	2005	E	6 (2.58)	40	15.5	35	58	22.5	50	88	35	13.6	30	87	19	7.4	17	88	3	1.2	3	86	155	60.1	
LAKE AVERAGE					8.9	21		12.8	35	88		10.1	36	88		6.1	24	87		1.1	5	85		38.8	
Bluegill																									
Spring	1987	E	13 (6.49)				38	5.9	68		17	2.6	30		1	0.2	2						56	8.6	
Spring	2005	E	4 (1.36)				138	101.5	83	118	23	16.9	14	108	5	3.7	3	114					166	122.1	
LAKE AVERAGE								53.7	76			9.8	22			1.9	2							65.4	
Redear																									
Spring	2005	E	5 (1.53)	5	3.3		20	13.1	87	141	1	0.7	4	130	2	1.3	9	144					28	18.3	
Black crappie																									
Fall	2004	T	30	11	0.4		60	2.0	65	70	25	0.8	27	77	6	0.2	7	90	2	0.1	2	90	104	3.5	
White crappie																									
Spring	1987	E	13 (6.49)	1	0.2	1	9	1.4	12	80	4	0.6	5	91	16	2.5	21	101	43	0.8	7	102	78	12.0	
Fall	1992	T		57		124	27		59	64	13		28	75	5		11	90	1		2	86	103		
Fall	2004	T	30	120	4.0		32	1.1	42	68	21	0.7	28	79	18	0.6	24	89	5	0.2	7	102	196	6.5	
LAKE AVERAGE									51	66			28	77			17	89			4	94			
Gizzard shad																									
Spring	2005	E	6 (2.38)	65	27.3		32	13.4	67	85	16	6.7	33	85									113	47.5	
Threadfin shad																									
Spring	2005	E	4 (2.38)																				105	68.2	

Note: Trophy fish category has been eliminated here since no fish within this size group have been collected except for 1987 white crappie (see top).

Table 5. Age composition, catch-per-effort, and mean length of largemouth bass collected from Claiborne Reservoir, Spring, 2005.

Age	Year Class	Number	Percent	CPE	Mean TL	SE
1	2004	39	25.2	15.1	159.6	5.1
2	2003	47	30.3	18.2	245.1	6.9
3	2002	35	22.6	13.6	308.0	4.5
4	2001	16	10.3	6.2	372.8	8.3
5	2000	11	7.1	4.3	411.5	14.9
6	1999	2	1.3	0.8	484.5	24.5
7	1998	2	1.3	0.8	490.5	34.5
8	1997	2	1.3	0.8	521.5	35.5
9	1996	1	0.6	0.4	548.0	
Total		155	100.0	60.1		

Table 6. Age composition, catch-per-effort, and mean length of white crappie collected from Claiborne Reservoir, Fall, 2004.

Age	Year Class	Number	Percent	CPE	Mean TL	SE
0	2004	120	61.2	4.00	90.0	1.4
1	2003	50	25.5	1.67	193.7	4.4
2	2002	17	8.7	0.57	250.1	5.1
3	2001	8	4.1	0.27	285.0	11.9
4	2000	0				
5	1999	0				
6	1998	1	0.5	0.03	370.0	
Total		196	100.0	6.54		

Table 7. Age composition, catch-per-effort, and mean length of black crappie collected from Claiborne Reservoir, Fall, 2004.

Age	Year Class	Number	Percent	CPE	Mean TL	SE
0	2004	9	8.7	0.30	105.0	7.8
1	2003	57	54.8	1.90	160.9	3.4
2	2002	16	15.4	0.53	207.1	6.0
3	2001	21	20.2	0.70	230.0	5.9
4	2000	1	1.0	0.03	311.0	
Total		104	100.0	3.46		

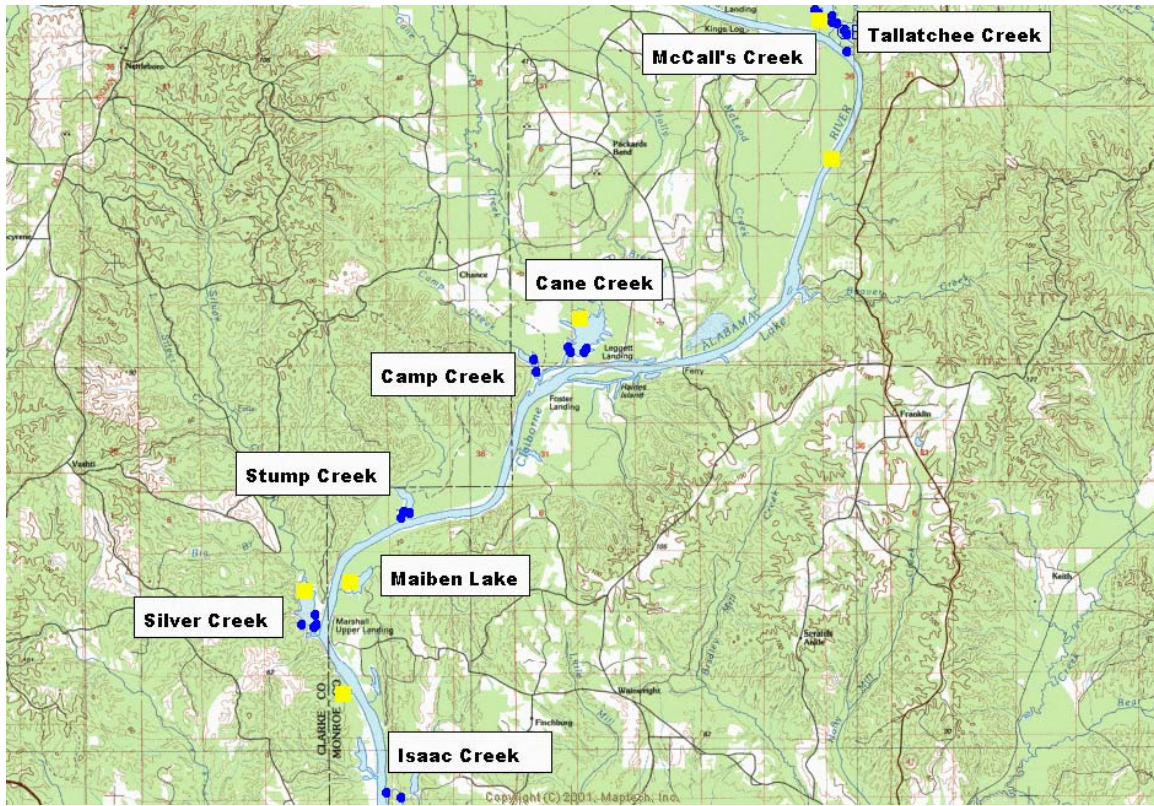


Figure 1. Claiborne Reservoir sample sites during Fall, 2004, trap netting (blue circles) and Spring, 2005, electrofishing (yellow circles).

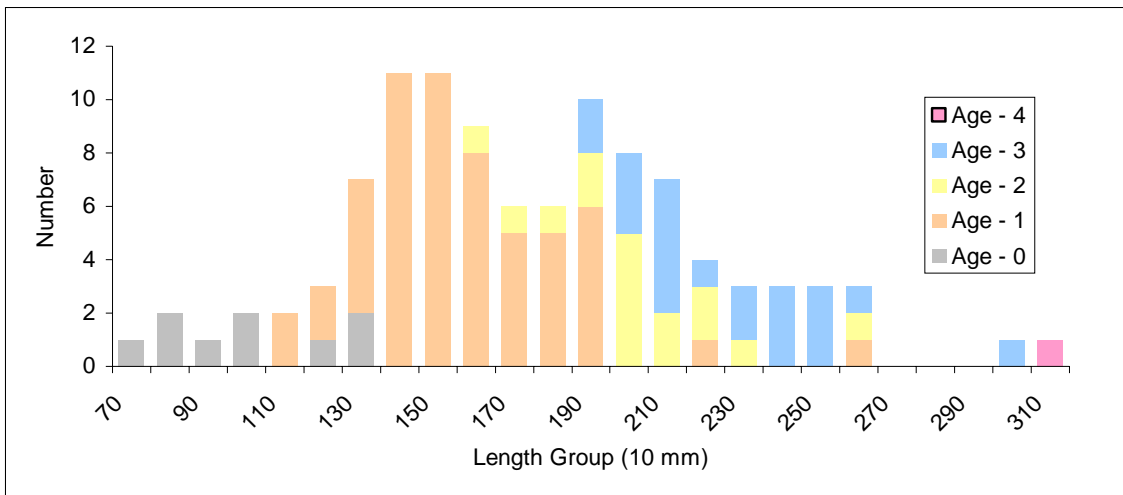
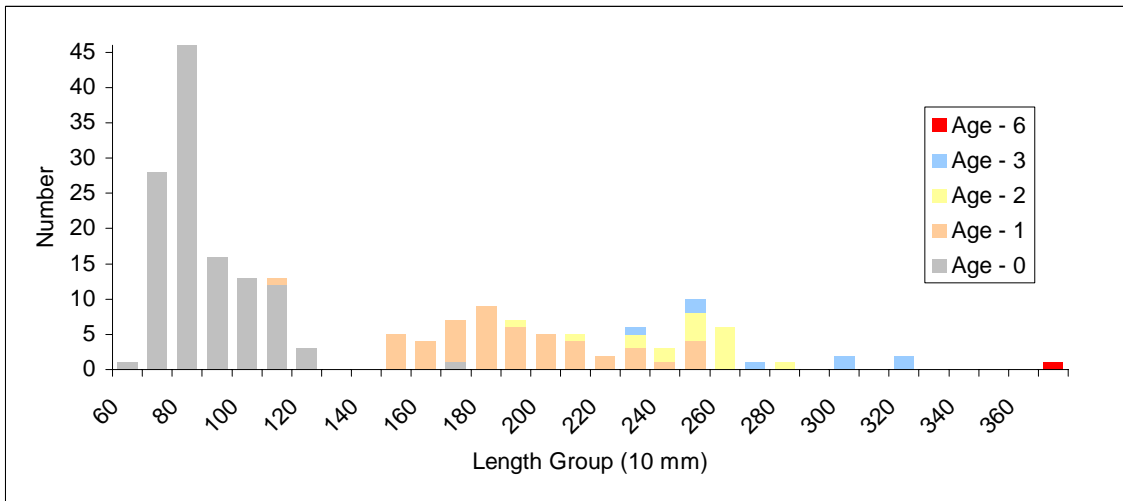
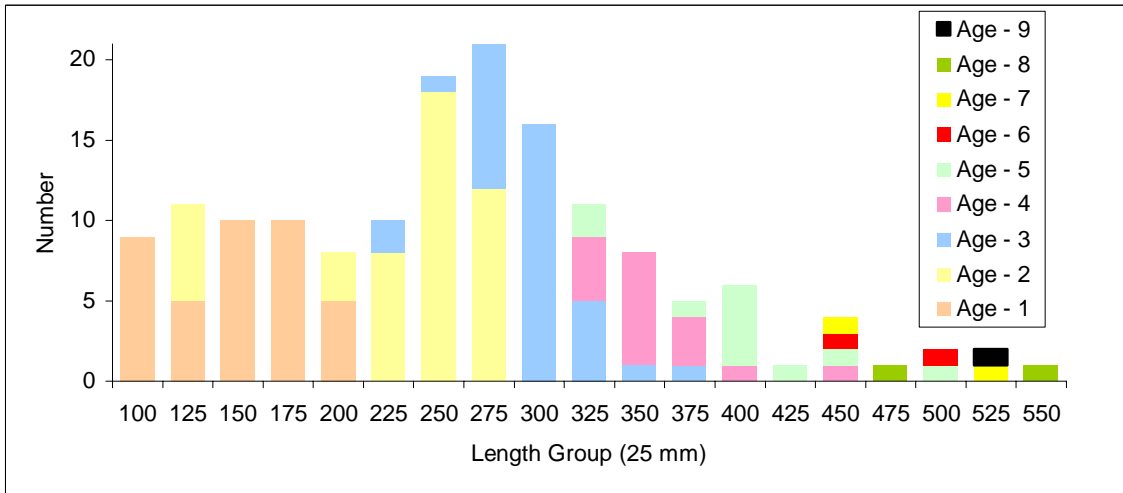


Figure 2. Number-at-age frequency of largemouth bass (top) collected Spring, 2005; white crappie (middle) and black crappie (bottom) collected Fall, 2004, in Claiborne Reservoir.

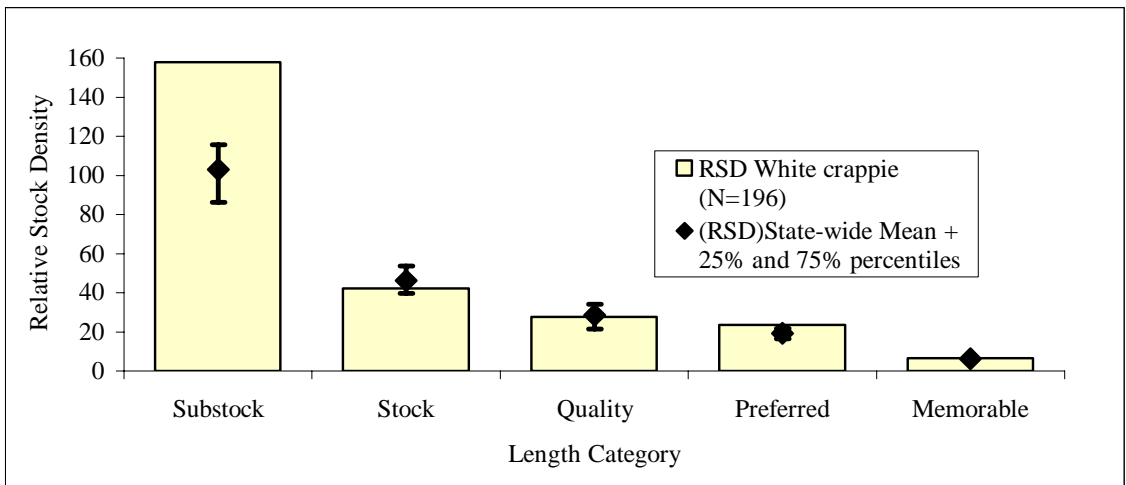
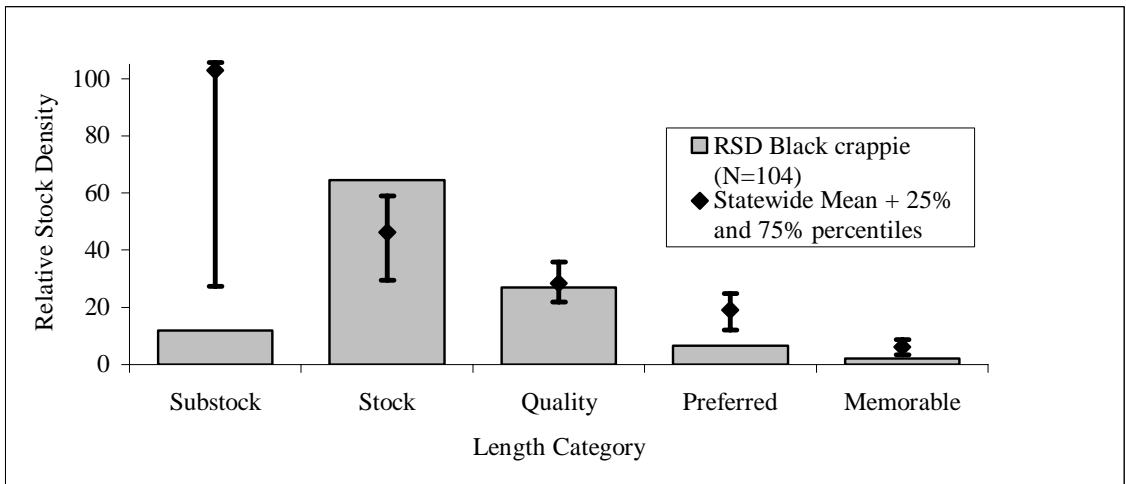
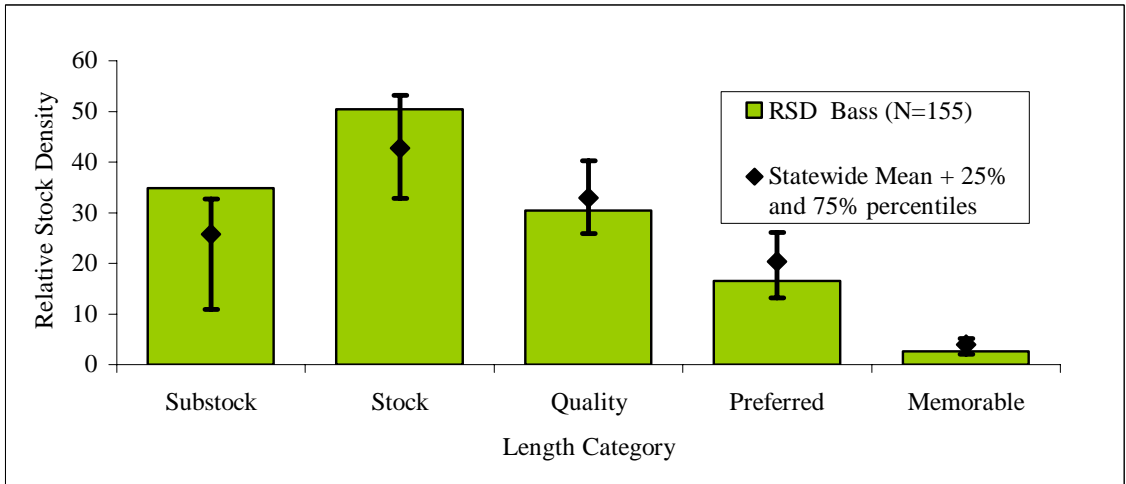


Figure 3. Relative stock density (RSD) of largemouth bass (top) collected Spring, 2005, and black crappie (middle), and white crappie (bottom) collected Fall, 2004, in Claiborne Reservoir.

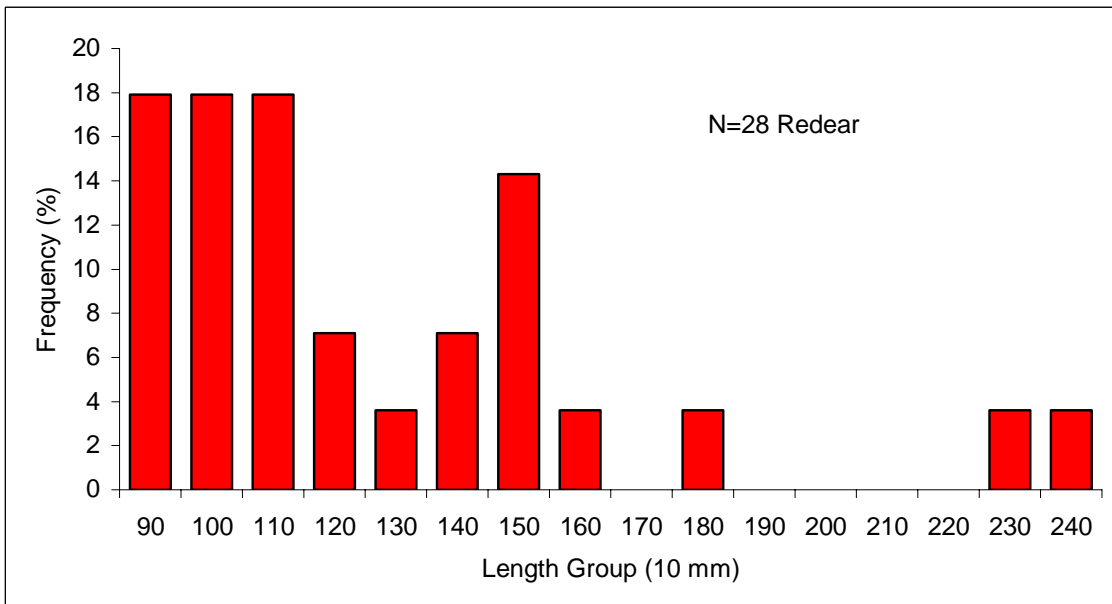
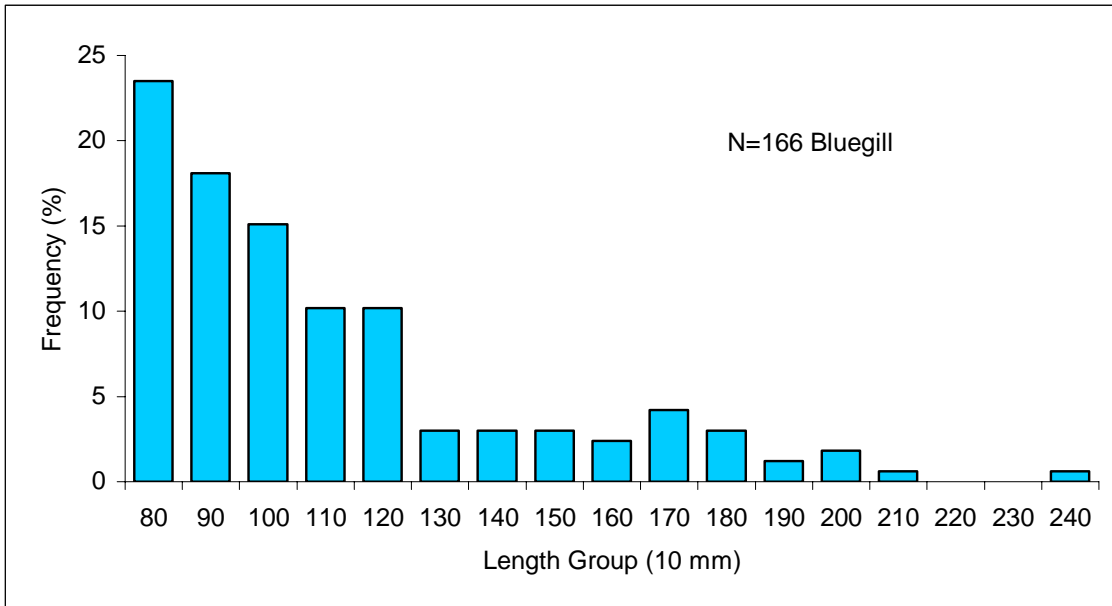


Figure 4. Percent length frequency of bluegill sunfish (top panel) and redear sunfish (bottom panel) collected in Claiborne Reservoir, Spring, 2005.

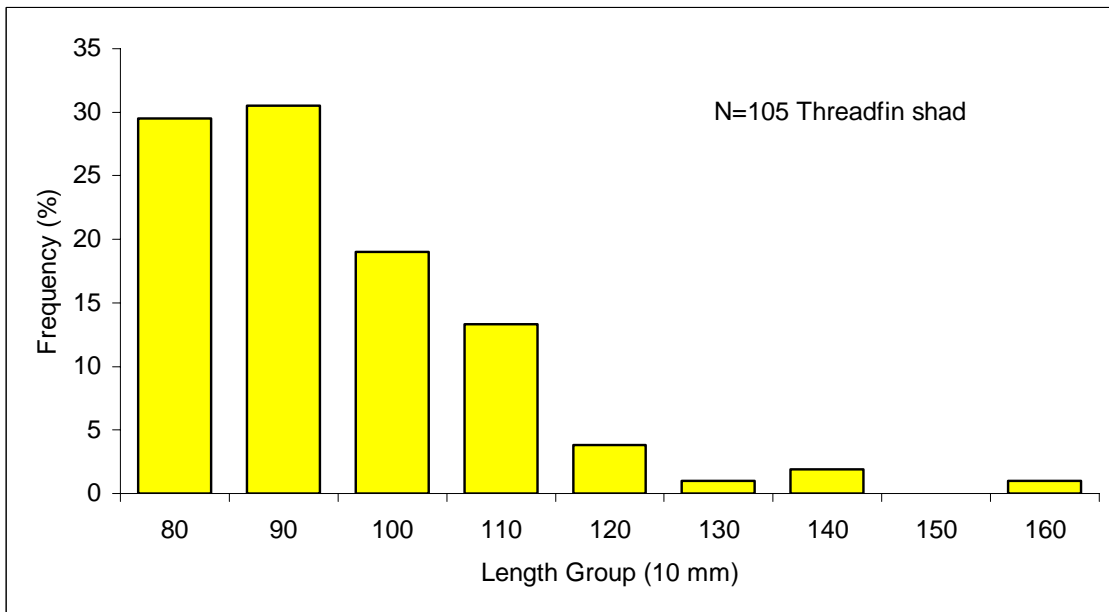
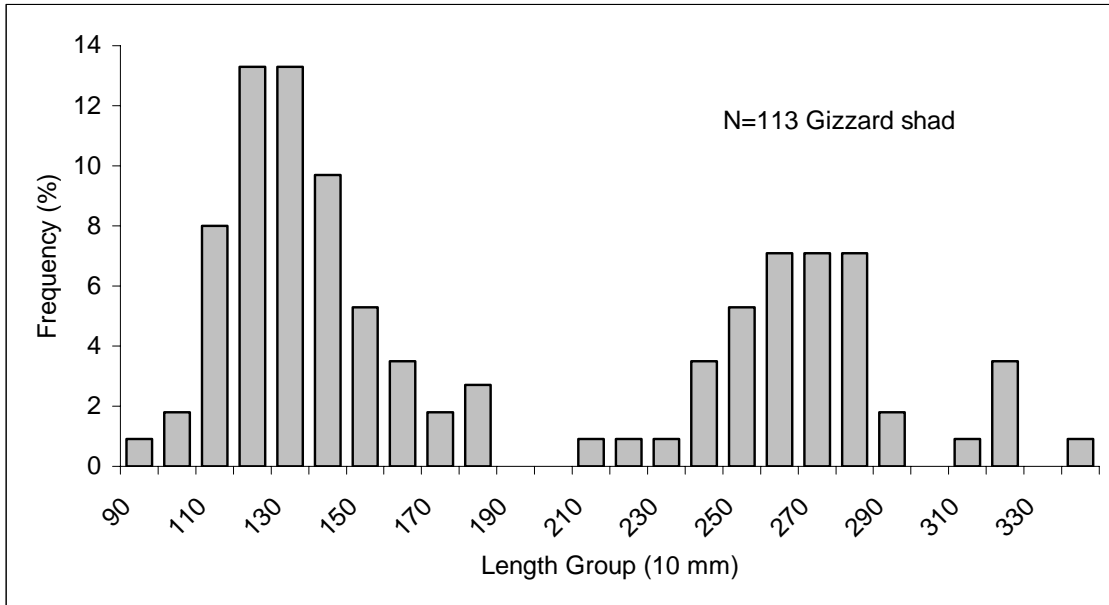


Figure 5. Percent length frequency of gizzard shad (top panel) and threadfin shad (bottom panel) collected in Claiborne Reservoir, Spring, 2005.