

**EUFAULA RESERVOIR  
MANAGEMENT REPORT**

**FALL 2005**

**Prepared by**

**Kenneth C. Weathers  
District Fisheries Supervisor**

**Michael P. Holley  
District Fisheries Biologist**

**Robert L. McCarter  
Biologist Aide I/II**

**Fisheries Section  
Wildlife and Freshwater Fisheries Division  
Department of Conservation and Natural Resources**

**September 1, 2006**

## **Introduction**

Largemouth bass and black crappie were sampled during the fall of 2005 in accordance with the guidelines established by the 1999 Alabama Reservoir Management Program (Newman et al. 1999). Spring and fall sampling has been conducted on Lake Eufaula since this program was initiated. Fall sampling for largemouth bass has been important in documenting fluctuating year-class strength and growth rates of young of year (YOY) bass. Sampling for black crappie is critical to document and predict population trends and growth rates. A 16-inch minimum length limit was initiated for largemouth bass in Lake Eufaula in 1992. This was reduced to a 14-inch minimum length limit in 2000. There is not a minimum length limit on crappie from Lake Eufaula.

## **Methods**

Both bass and crappie were collected by electrofishing. Bass were collected from three randomly selected sites in late October, while crappie were collected mostly from the Cowikee Creek area (Figure 1). Adult crappie are collected much more effectively by electrofishing rather than trap netting on Lake Eufaula. Bass 325 mm and smaller were aged by District VI personnel using whole otoliths under 20X magnification. All black crappie collected were aged in the same manner.

## **Results and Discussion**

### **Largemouth Bass**

Largemouth bass (N=126) were captured at a rate of 105 fish per hour, which was higher than the last two years and the lake average of 79 (Table 2). The RSD categories of stock (57%) and quality (39%) were both over the three year lake average, while RSD-P (3%) was well below the lake average of 17%. Relative weights were also typical of bass collected in the fall, ranging from  $Wr=94$  for RSD-S to  $Wr=102$  for RSD-M. YOY bass made up 20.2% of the sample and were captured at a rate of 16.7 fish per hour (Table 3). YOY bass averaged 143 mm in length. The 2005 year class would be considered relatively weak, with abundance and growth rates both below the lake averages (Figures 2 &

3). The last strong bass year class occurred in 2001 (Figure 2 & 3). When the extremely high 1998 year class is excluded, it is evident that the 2003 and 2005 bass year classes were both near average levels (Figure 2).

### **Black Crappie**

Black crappie (N=99) were captured at a rate of 191 fish per hour, which was much higher than the lake average of 102 fish per hour (Table 2). The sample was composed mainly of RSD-Q (66%) fish, which were captured at a rate of 125 fish/hour, compared to the lake average of 53 fish/hour. Larger crappie were still abundant, with RSD-P and RSD-M catch rates both higher than the lake average (Table 2). Relative weights for all RSD categories were higher or nearly equal to the lake averages. Ages ranged from 2 to 8 years old, with the majority of the sample composed of age 3 and 4 year old fish (Table 4). Strong year classes for crappie are apparent in 2002 and 2003. As typical for Lake Eufaula crappie, growth rates fluctuated widely for individual fish of the same age (Figure 6). Using catch curves for Age 3 and older crappie, annual mortality was estimated at 43.7 %, with an r-square value of 0.84 (Ricker 1975).

### **Summary**

This is the fourth sub-par year-class of bass in a row. However, YOY bass numbers and growth rates appear adequate for a stable bass population. This may be attributed to over 90% of bass anglers practicing catch and release. An angler survey at Lake Eufaula conducted in spring 2005 found that catch and release rates are still high, with over 93% of captured bass being released. During that survey 88% of bass anglers approved of the 14-inch minimum length limit, while 8% would have preferred a lower limit. At this time the largemouth bass population appears to be stable and most anglers are satisfied with the current regulations.

Recently, crappie have exhibited several weak year classes, but fall sampling in 2005 indicated that both 2002 and 2003 were fairly strong year classes. Anglers can expect the crappie population to be higher in numbers in 2006, with some large crappie present. Low exploitation rates on this fishery are evident by moderate annual mortality (43.7%) and the high percentages of older fish found in the 2005 sample (Figure 6).

### **Conclusions**

1. Continue spring and fall standardized sampling on Lake Eufaula in 2006.
2. Maintain the current 14-inch minimum length limit for largemouth bass.
3. Encourage bass clubs to participate in the B.A.I.T program.
4. Minimum size limits for crappie in Lake Eufaula are not recommended at this time.

## LITERATURE CITED

- 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.
- Newman, M. J., K. C. Weathers, R. McCarter. 1999. Lake Eufaula Reservoir Management Report. Alabama Department of Conservation and Natural Resources, Montgomery, Alabama.
- Ricker, W. E. 1975. Computation and Interpretation of Biological Statistics of Fish Populations. Fisheries Research Board of Canada. Bull. 191.
- Ryder, R. A. 1965. A Method for estimating the potential fish production of north temperate lakes. Trans. Amer. Fish. Soc. 94: 214-218.
- Welch, P. S. 1948. Limnological Methods. McGraw-Hill. pp. 93-94.

Table 1. Morphometric, physical,  
and chemical characteristics of Lake Eufaula, Alabama.

Surface area	45,181 acres
Drainage area	7,460 sq. mi.
Full pool elevation	190 feet-msl
Mean annual fluctuation	6 feet
Shoreline distance	515 miles
Shoreline development index	17.3 (Welch 1948)
Mean depth	20.4 feet
Maximum depth	93 feet
Outlet depth	65 feet
Total dissolved solids	43 mg/l
Morphoedaphic index	2.1 TDS/mean depth(ft) (Ryder 1965)
Growing season	249 frost free days (Jenkins 1967)
Date of Impoundment	1962

Table 2. Relative stock density (RSD), catch per effort (CPE), and relative weight (Wr) of target species for Lake Eufaula, fall 2005.

<b>Largemouth Bass</b>			TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																										
Number			SUBSTOCK				RSD-S				RSD-Q				RSD-P				RSD-M				RSD-T				TOTAL		
Year	Gear	Samples	no.	cpe	ratio	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	E					
2003	E	4	32	21	31	36	23	35	97	37	24	36	92	25	16	24	89	5	3	5	94								
2004	E	4	22	11	21	48	24	46	89	30	15	29	90	26	13	25	95	1	1	1	95								
2005	E	3	20	17	16	60	50	57	94	41	34	39	93	3	3	3	87	2	2	2	102								
<b>LAKE AVERAGE</b>			25	16	23	48	32	46	93	36	24	35	92	18	11	17	90	3	2	3	97	129	85	1.5					

<b>Black Crappie</b>			TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																										
Number			SUBSTOCK				RSD-S				RSD-Q				RSD-P				RSD-M				RSD-T				TOTAL		
Year	Gear	Samples	no.	cpe	ratio	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	E					
2003	E	3				10	8	10	80	31	24	31	83	38	30	38	91	21	17	21	95								
2004	E	3				4	1	4	73	28	10	28	83	40	14	40	87	28	10	28	91	1	0	1	101				
2005	E	3				8	15	8	87	65	125	66	85	15	29	15	89	11	21	11	91								
<b>LAKE AVERAGE</b>						7	8	7	80	41	53	42	84	31	24	31	89	20	16	20	92	100	102	2					

Table 3. Age composition and mean total length of largemouth bass collected during the fall electrofishing sampling on Lake Eufaula, October 2005.

Age	Year Class	Number	Percent	CPE	Mean TL	SE
0	2005	20	20.2	16.7	143.3	7.6
1	2004	41	41.4	34.3	246.2	3.0
2	2003	34	34.3	28.5	292.7	4.1
3	2002	2	2.0	1.7	320.0	0.0
4	2001	2	2.0	1.7	301.5	6.5
Total		99	100.0	82.8		

1. Only bass 325 mm and less were aged.

Table 4. Age composition and mean total length of black crappie collected during the fall electrofishing sample on Lake Eufaula, October 2005.

Age	Year Class	Number	Percent	CPE	Mean TL	SE
2	2004	7	7.1	13.5	205.6	2.5
3	2003	25	25.3	48.1	220.0	5.9
4	2002	37	37.4	71.2	243.2	6.3
5	2001	17	17.2	32.7	241.9	9.2
6	2000	8	8.1	15.4	255.8	11.6
7	1999	2	2.0	3.8	258.0	52.0
8	1998	3	3.0	5.8	278.3	44.9
Total		99	100.0	190.5		

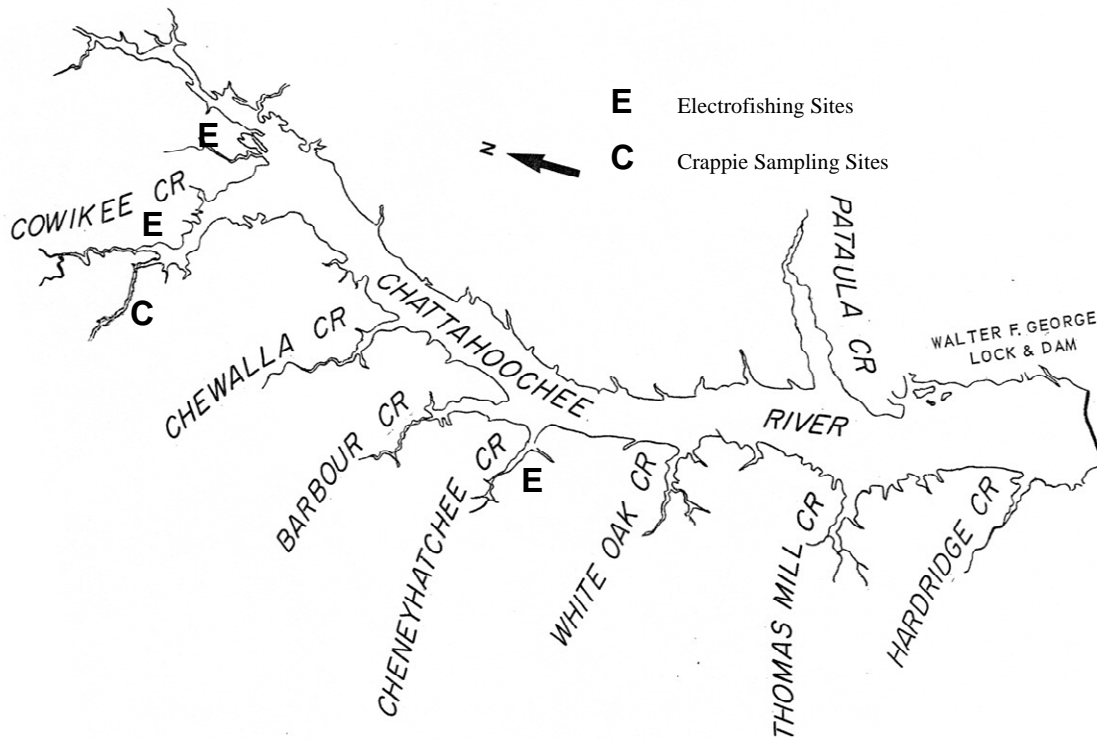


Figure 1. Sample areas on Lake Eufaula, Fall 2005.

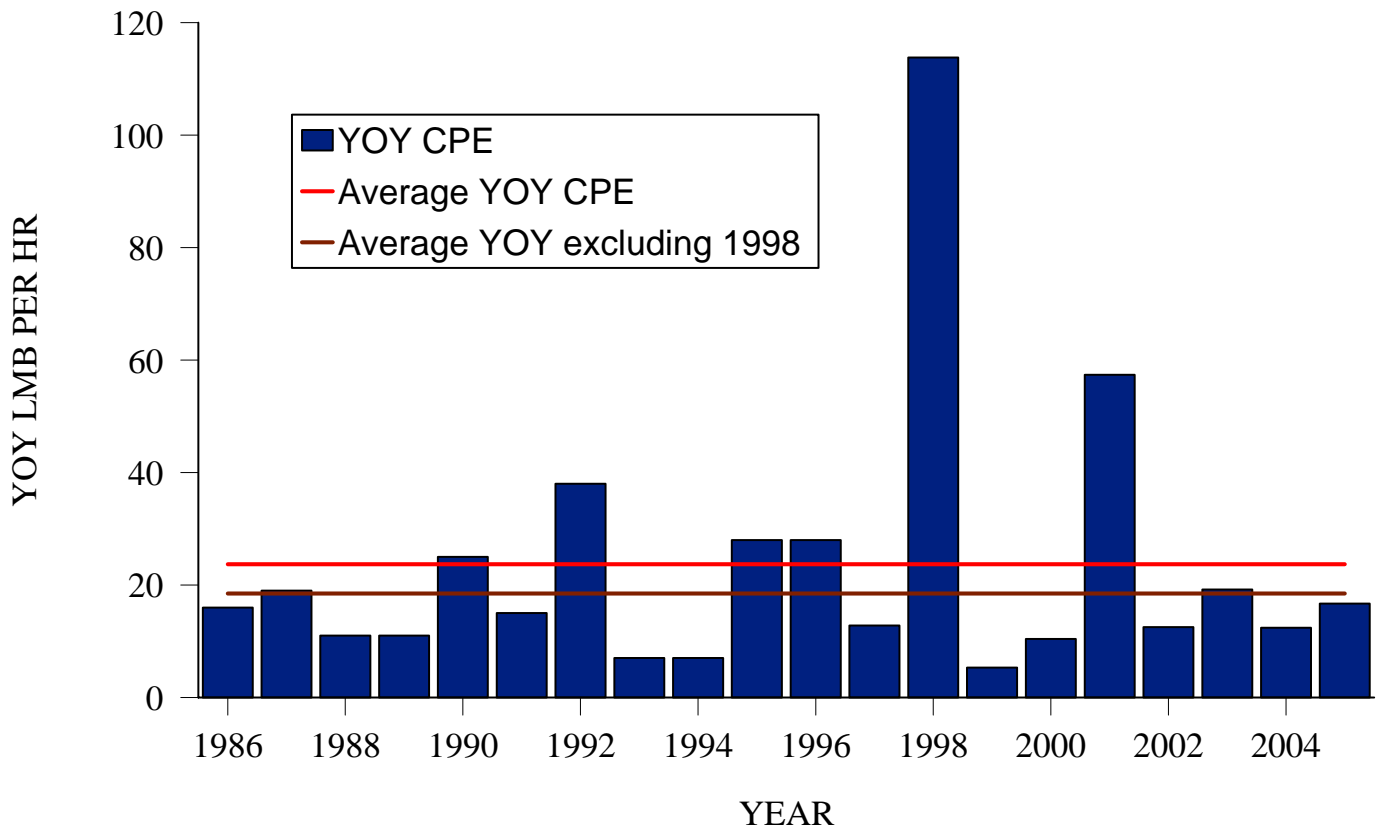


Figure 2. Catch rates (fish per hour) for young of year largemouth bass during fall electrofishing on Lake Eufaula, 1986-2005.

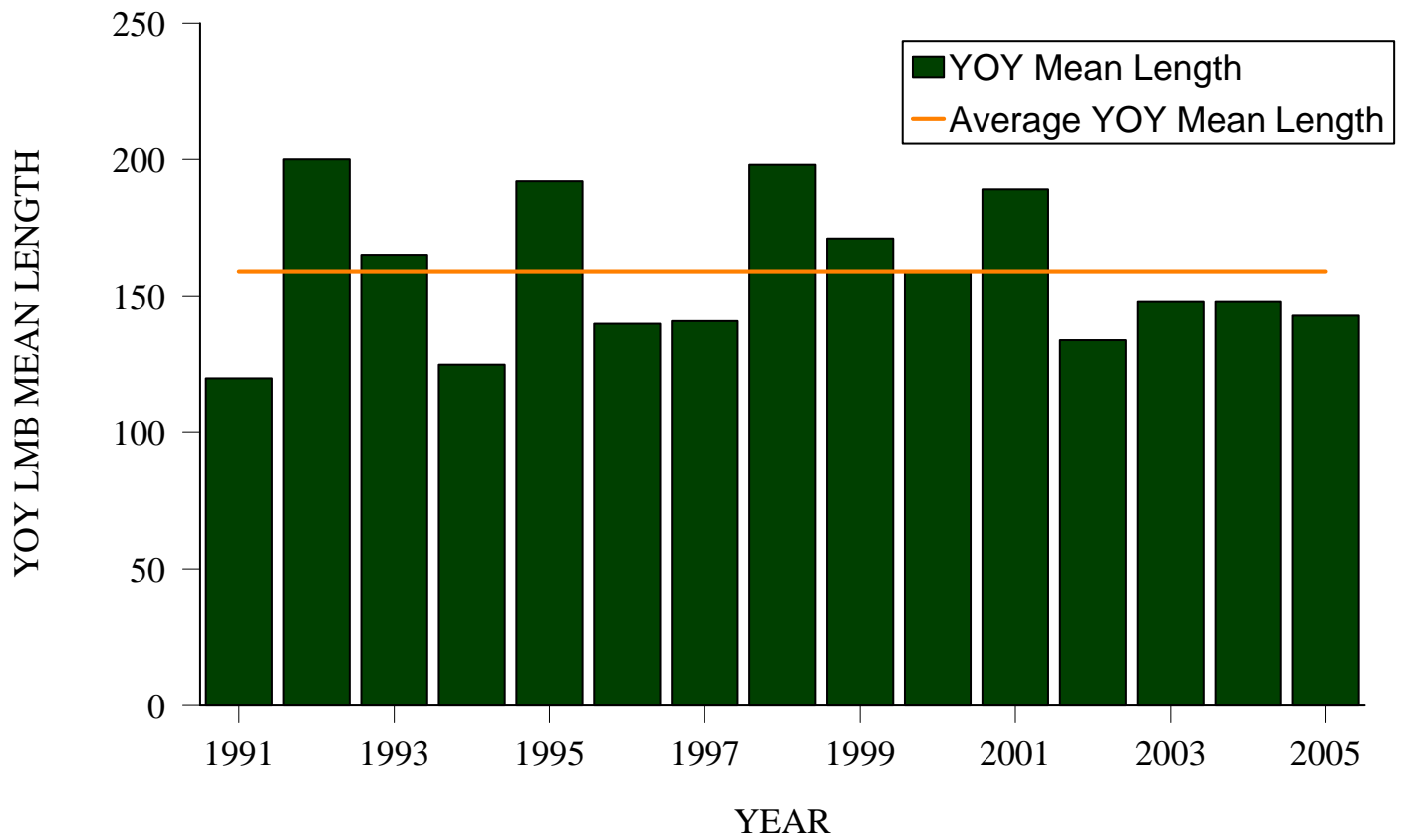


Figure 3. Mean length (mm) for young of year largemouth bass during fall electrofishing on Lake Eufaula, 1991-2005.

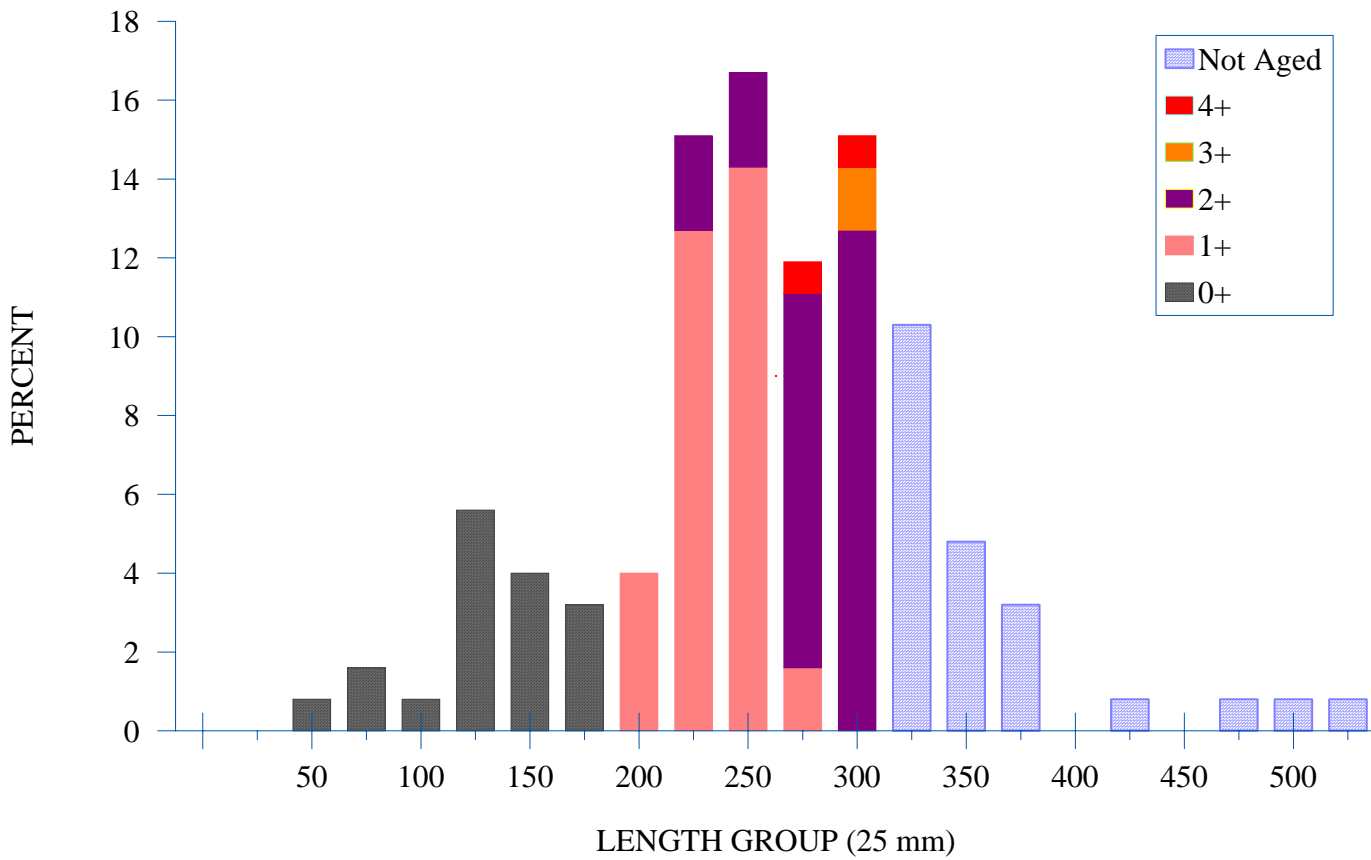


Figure 4. Length at age frequency for largemouth bass (N=126) collected by electrofishing from Lake Eufaula, fall 2005.

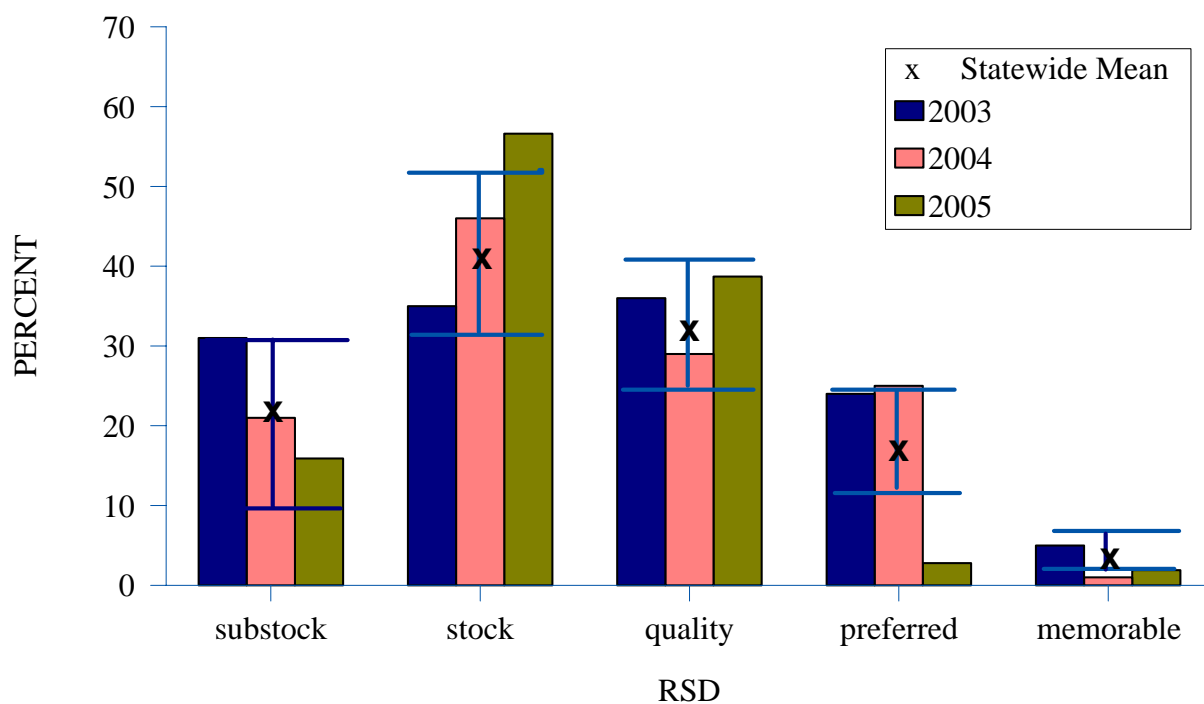


Figure 5. Three year relative stock density (RSD) for largemouth bass from Lake Eufaula , fall 2003-2005 (I-beam = 25 to 75 percentile).

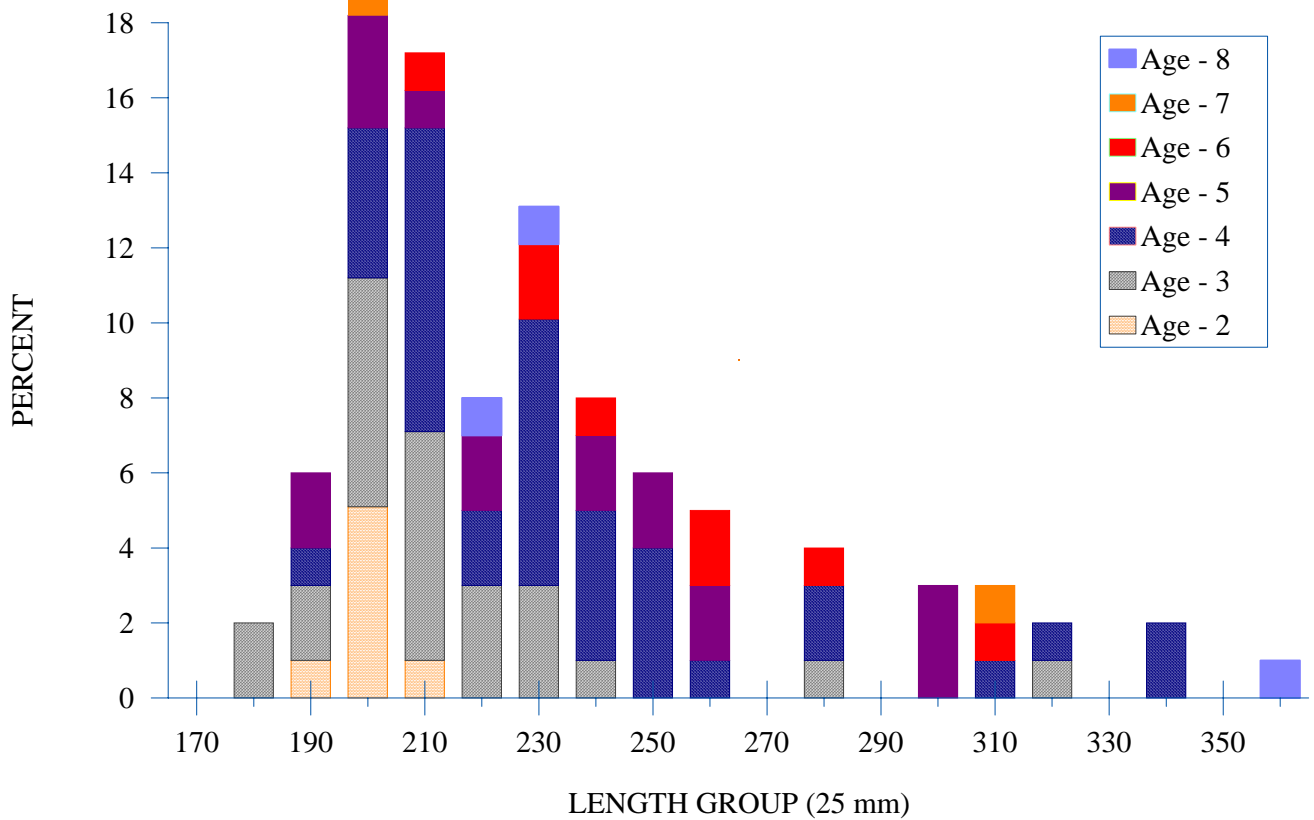


Figure 6. Length at age frequency for black crappie (N=99) collected by electrofishing from Lake Eufaula, fall 2005.

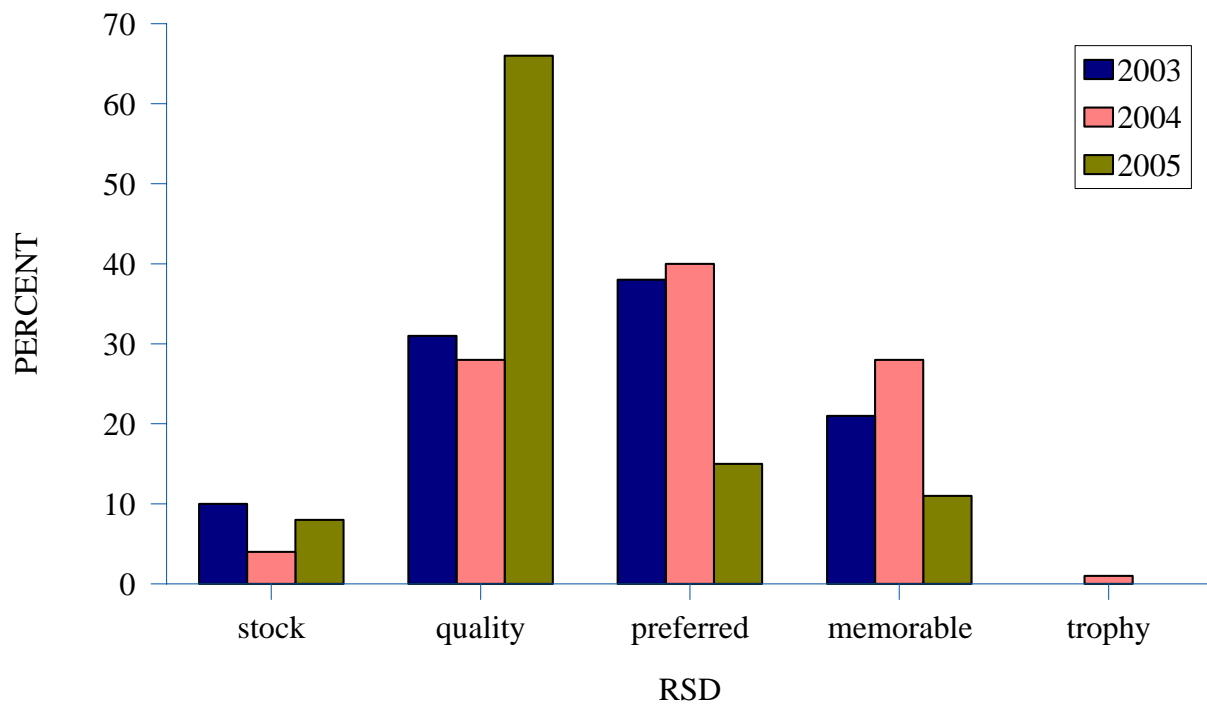


Figure 7. Three year relative stock density (RSD) for black crappie from Lake Eufaula, fall 2003-2005.