

# **INLAND LAKE MANAGEMENT REPORT**

FY 2008

Spring 2008

Prepared by

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## **Introduction**

The objective of the Inland Lake Spring 2008 Management Plan was to collect baseline data on the largemouth bass and spotted bass populations, as the last spring electrofishing sample was conducted 16-18 April 1990. Quantitative biological data collected from Inland Lake allows for assessment of the fishery with regards to catch-per-effort, relative abundance, growth and condition of the major sport fish species. Data from periodic samples assist district biologists in suggesting management strategies to enhance the fishery. Sampling efforts from 1990 to the present have been conducted on an as needed basis due to the smaller size of the lake and the smaller user base as compared to other District II lakes (Guntersville, Weiss, Neely Henry, Logan Martin and Harris). Late fall and winter gill net sampling to assess the striped bass, hybrid striped bass and white bass populations was conducted in the fall of 1994 and January of 2005. Electrofishing during the fall of 2004 was also conducted in response to pacu sightings (pacu are exotic fish common in the aquarium trade that resemble piranha in appearance, but are herbivores). The 1994, 2004 and 2005 samples addressed public and biological concerns, but did not meet the minimum requirements for reporting set in the Fisheries Section's Reservoir Management Manual (Cook 1999). However, the limited data sets are available and discussion is welcomed by District II Fisheries personnel. It is also worth noting that data from the 2004 electrofishing sample did not suggest that there is a reproducing population of pacu in Inland Lake. District II personnel did not observe any pacu in our sample.

Detailed characteristics of Inland Lake can be found in the 1990 management report (Catchings and Floyd 1992). A summary of morphometric, physical, and chemical characteristics is listed in Table 1 of this report.

## **Methods**

Inland Lake was sampled 21-23 April 2008 according to guidelines of the Fisheries Section's Reservoir Management Manual (Cook 1999), with the exception of

sample site selection. Sample sites were divided into backwater sites and main channel reservoir sites in an attempt to increase the probability of adequate representation of both largemouth bass and spotted bass. Night electrofishing consisted of 30-minute samples at each of ten randomly selected one-mile shoreline segments, five from both categories described above, for a total effort of 5 hours (Figure 1). Gear consisted of a 5.5-meter aluminum boat with bow-mounted electrodes. A 5,000-watt generator and a Smith-Root 5.0 GPP were used to provide from 300 to 1000 volts of pulsed direct current. Target species included largemouth bass and spotted bass. Total length (mm) and weight (g) were recorded for each target fish collected. Otoliths were removed from largemouth bass and spotted bass 150 mm in total length and longer for ageing. Data was analyzed with Microsoft Excel software.

Due to lack of spring data from Inland Lake from 1990 to the present, 2008 sample data are compared to black bass collected during spring samples from 2004 to 2007 in R.L. Harris Reservoir. Although Harris is a Tallapoosa River impoundment in which striped bass are not stocked, it is a deep, infertile lake with a dense black bass population. Comparisons should provide insight to the current Inland Lake black bass fishery.

## **Results**

Spring 2008 Inland Lake electrofishing resulted in the capture of 170 spotted bass (Table 2). Sizes ranged from 84 mm to 523 mm, and ages ranged from 1 to 9 years (Table 2). Largemouth bass were less abundant in the sample as only 49 were captured (Table 3). Sizes ranged from 153 mm to 522 mm, and ages ranged from 1 to 11 years (Table 3).

### **Spotted bass**

The spotted bass population in Inland Lake is dense. Total catch-per-effort (CPE) was 34 fish/hour (Table 2), which compares favorably to the Lake Harris average catch rate of 31.7 fish/hour (Andress and Catchings 2007), and is probably conservative when

the morphology of Inland Lake and sampling gear biases are considered. CPE of stock-trophy spotted bass (26.8) was above the state average, with highest numbers/hour in the stock and quality size groups (Table 4, Figure 4, Jim McHugh, unpublished data).

Traditional relative stock density (RSD) indices indicated a spotted bass fishery dominated by stock size fish, followed by an acceptable number of quality size fish as they accounted for 71% and 25% of the sample, respectively (Table 4). Spotted bass in the stock size category exceeded the statewide 75<sup>th</sup> percentile, while all other categories were well below state averages (Figure 4). The tremendous numbers of spotted bass in the smaller size categories further contribute to the dense spotted bass population assessment drawn from CPE analysis, and also reveals that spotted bass recruitment is high. Larger spotted bass were represented in the sample, but did not compare favorably to the 2004-2007 Lake Harris samples in the preferred and memorable size categories (Figure 4). It is likely that gear biases and lake morphology did not allow for adequate representation of larger fish.

Spotted bass growth, measured as mean length-at-age, was slow in Inland Lake and did not compare favorably to Lake Harris (Figures 6 & 7). Growth was well below the statewide 25<sup>th</sup> percentile for fish ages 2 through 5 (Figure 7) and approximately 4 years were required for spotted bass to attain 304.8 mm (12 inches) in length (Table 2, Figure 6).

Despite slow growth rates, relative weight (Wr) values were decent for spotted bass in the stock and quality size groups, exceeding and approximating the statewide 25<sup>th</sup> percentile, respectively (Table 4, Figure 10). Wr values observed for Inland Lake spotted bass were similar to the 2004 Lake Harris spotted bass values (Figure 10).

Mortality estimates could not be determined as outlined in the Reservoir Manual (Cook 1999). Numbers of fish older than age-3 were not sufficient to provide an accurate estimate (Table 2).

## **Largemouth bass**

Largemouth bass numbers were minimal as deeper, infertile, run of the river type reservoirs tend to evolve into spotted bass fisheries. The 2008 sample indicates that this trend is evident in Inland Lake. Despite efforts of tailoring half of the sample sites to shallower, backwater areas, only 48 largemouth bass stock size or larger were collected (Table 5, Figure 1). Largemouth bass abundance in Inland Lake was very low with a CPE of 9.8 fish/hour (Table 5) and did not compare favorably to the Lake Harris average of 21.5 fish/hour (Andress and Catchings 2007).

Traditional relative stock density (RSD) indices were calculated for the Inland Lake largemouth bass population based on the 2008 electrofishing sample and will be useful in the assessment of long term trends of the population. However, due to the small sample size, no inferences should be made regarding this data for short term management. The following discussion should be reviewed with this consideration in mind. Stock and preferred size largemouth bass were most abundant, accounting for 33% and 38% of the sample, respectively (Table 5). It is worth noting that the sample percentages of largemouth bass in the preferred and memorable size categories exceeded the statewide 75<sup>th</sup> percentile (Figure 5).

Largemouth bass growth rates and relative condition were difficult to determine from spring electrofishing data due to the low numbers represented in each year class (Table 3). The observed mean length-at-age values for the few fish evaluated compared unfavorably to Lake Harris as well as the statewide values, with the exception of age-5 fish (Figures 8 & 9). According to the six, age-5 fish collected, growth approximated the statewide average by age 5 (Figure 9). It is also worth noting that observed largemouth bass relative weights (Wr) were below the statewide 25<sup>th</sup> percentile for all size categories, and values appeared similar to Wr values from Lake Harris (Table 5, Figure 11).

Mortality estimates could not be determined as outlined in the Reservoir Manual (Cook 1999). Too few largemouth bass were collected to attain a good estimate.

### **Summary**

The 2008 spring sample indicated that the Inland Lake black bass population is very dense. CPE and RSD analyses revealed that the majority of bass biomass was tied-up in stock and quality size spotted bass. The spotted bass population exhibited high recruitment and slow growth. However,  $W_r$  values were decent for such a dense population in an infertile lake.

The abundance of largemouth bass was very low, indicative of the very limited suitable largemouth bass habitat, but the sample percentages of preferred and memorable size largemouth bass were impressive. The very limited data set suggested that largemouth bass growth was slow and condition was poor, but  $W_r$  values were in line with values from Lake Harris.

### **Conclusions**

1. The 2008 electrofishing sample was conducted in response to public concern that striped bass were decimating the black bass population. In an attempt to address public concern, data from this sample was presented at a public meeting on May 29, 2008 at the Frank Green Building in Oneonta.
2. The current black bass population is very dense with the majority of the biomass tied-up in small, slow growing spotted bass.
3. No changes in bag limit or size limit regulations are recommended at this time. However, the fishery would benefit tremendously from heavy angler harvest of the small, slow growing spotted bass. Possible revision to the spotted bass creel limit will be considered to implement this action.
4. Habitat enhancement was discussed at the public meeting. Fisheries personnel will be available to help stakeholders enhance shorelines and flats with structure of various

types. This issue will need to be further evaluated and joint action will need to be taken as appropriate funding avenues are determined and approved.

5. Striped Bass stocking will be suspended for two years to evaluate black bass population response. Inland Lake will be sampled via electrofishing during the spring of 2010 to monitor black bass population trends in the absence of striped bass.
6. There are no new issues concerning accessibility or aquatic weed nuisances pertaining to Inland Lake.

## **Literature Cited**

- Andress, R. O. and E. D. Catchings, 2007. Lake Harris 2007 reservoir management report. Wildlife and Freshwater Fisheries Division, Montgomery.
- Catchings, E. D. and K. B. Floyd, 1992. Inland Lake 1990 reservoir management report. Alabama Game and Fish Division, Montgomery.
- Cook, S. F. 1999. Reservoir management manual. Alabama Game and Fish Division, 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 Resources Symposium. Southern Division American Fisheries Society, Bethesda, Maryland, USA.
- Ryder, R. A. 1965. A method for estimating the potential fish production of North American temperate lakes. Transactions of the American Fisheries Society. 94:214-218.

# **Appendix A**

## **Tables and Figures**

Table 1. Inland Lake morphometric, physical, and chemical characteristics.

Surface area	1,557 acres
Drainage area	70 sq. mi.
Full pool elevation	784.9 feet-msl
Mean annual fluctuation	16.4 feet
Shoreline distance	32.3 miles
Shoreline development index	5.8
Mean depth	77 feet
Maximum depth	171 feet
Outlet depth	surface
Total dissolved solids (TDS)	54.3 mg/l
Morphoedaphic index	0.7 TDS/mean depth(ft) (Ryder 1965)
Growing season	210 frost free days (Jenkins 1967)
Year of impoundment	1939

Table 2. Age composition and mean length of spotted bass from Inland Lake, spring 2008.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range (mm)
1	2007	17	10.0	3.4	124.9	4.2	84-148
2	2006	79	46.5	15.8	198.6	2.9	151-251
3	2005	65	38.2	13.0	278.6	2.8	222-330
4	2004	5	2.9	1.0	308.6	17.1	257-352
5	2003	3	1.8	0.6	403.7	18.5	369-432
6	2002	0	0.0	0.0	0.0		
7	2001	0	0.0	0.0	0.0		
8	2000	0	0.0	0.0	0.0		
9	1999	1	0.6	0.2	523.0		
Total		170	100.0	34.0			

Table 3. Age composition and mean length of largemouth bass from Inland Lake, spring 2008.

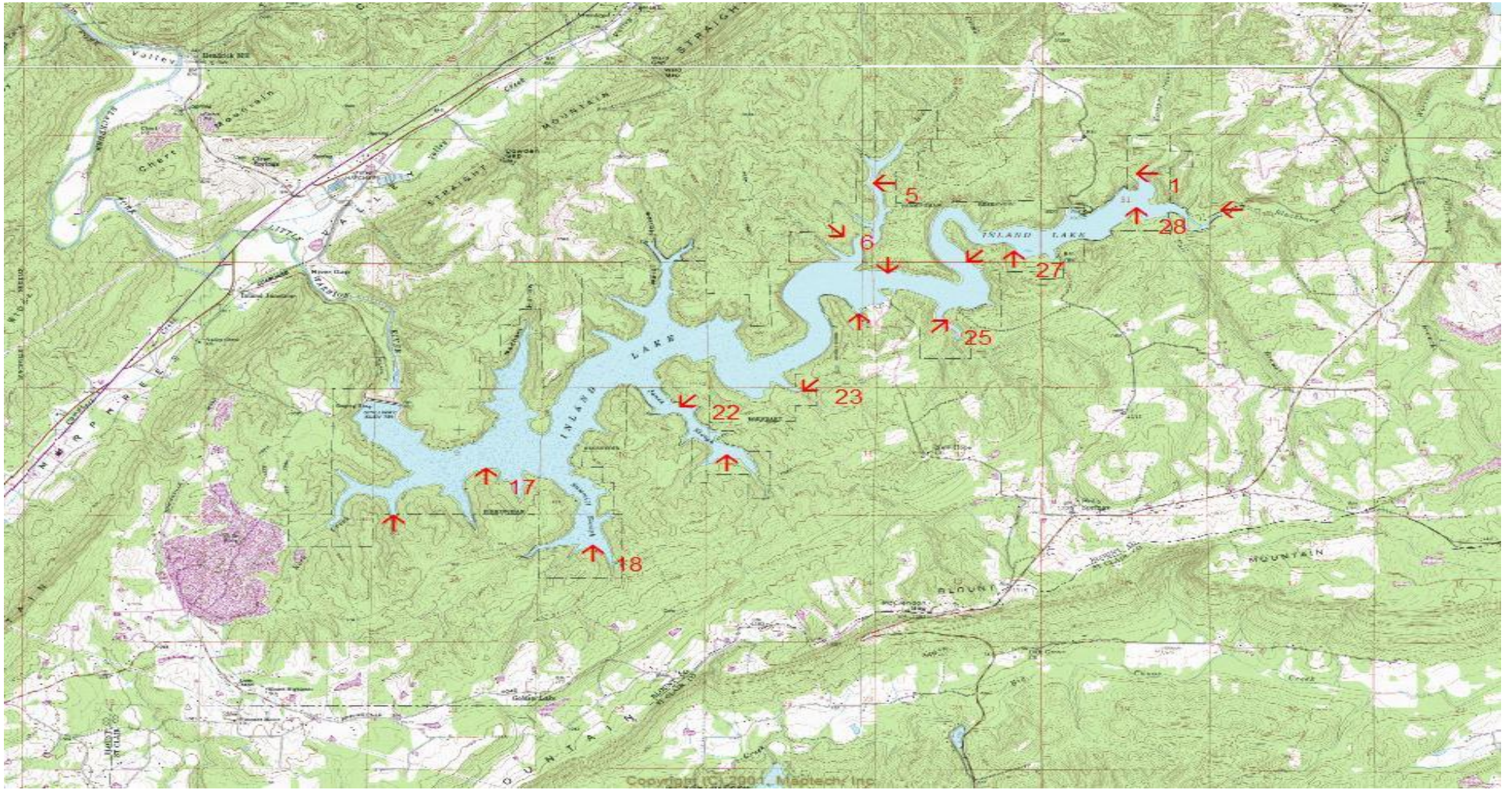
Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range (mm)
1	2007	1	2.0	0.2	153.0		
2	2006	10	20.4	2.0	263.3	6.6	232-287
3	2005	11	22.4	2.2	287.7	8.2	241-317
4	2004	9	18.4	1.8	357.7	13.2	302-431
5	2003	6	12.2	1.2	442.8	9.7	413-473
6	2002	4	8.2	0.8	452.5	22.6	409-511
7	2001	5	10.2	1.0	470.0	14.7	441-522
8	2000	1	2.0	0.2	493.0		
9	1999	1	2.0	0.2	436.0		
10	1998	0	0.0	0.0	0.0		
11	1997	1	2.0	0.2	520.0		
Total		49	100.0	9.8			

Table 4. Relative stock density, catch per effort and relative weight of spotted bass from Inland Lake, spring 2008.

Species	Gear	Year	Number Samples	TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																								
				SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				RSD-T				TOTAL	
				no.	cpe	ratio	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe
Spotted Bass	Electro	2008	10	36	7.2	27	95	19.0	71	89	34	6.8	25	91	3	0.6	2	91	1	0.2	1	87	1	0.2	1	75	170	34.0

Table 5. Relative stock density, catch per effort and relative weight of largemouth bass from Inland Lake, spring 2008.

Species	Gear	Year	Number Samples	TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																								
				SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				RSD-T				TOTAL	
				no.	cpe	ratio	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe
Largemouth Bass	Electro	2008	10	1	0.2	2	16	3.2	33	80	11	2.2	23	81	18	3.6	38	86	3	0.6	6	85			49	9.8		



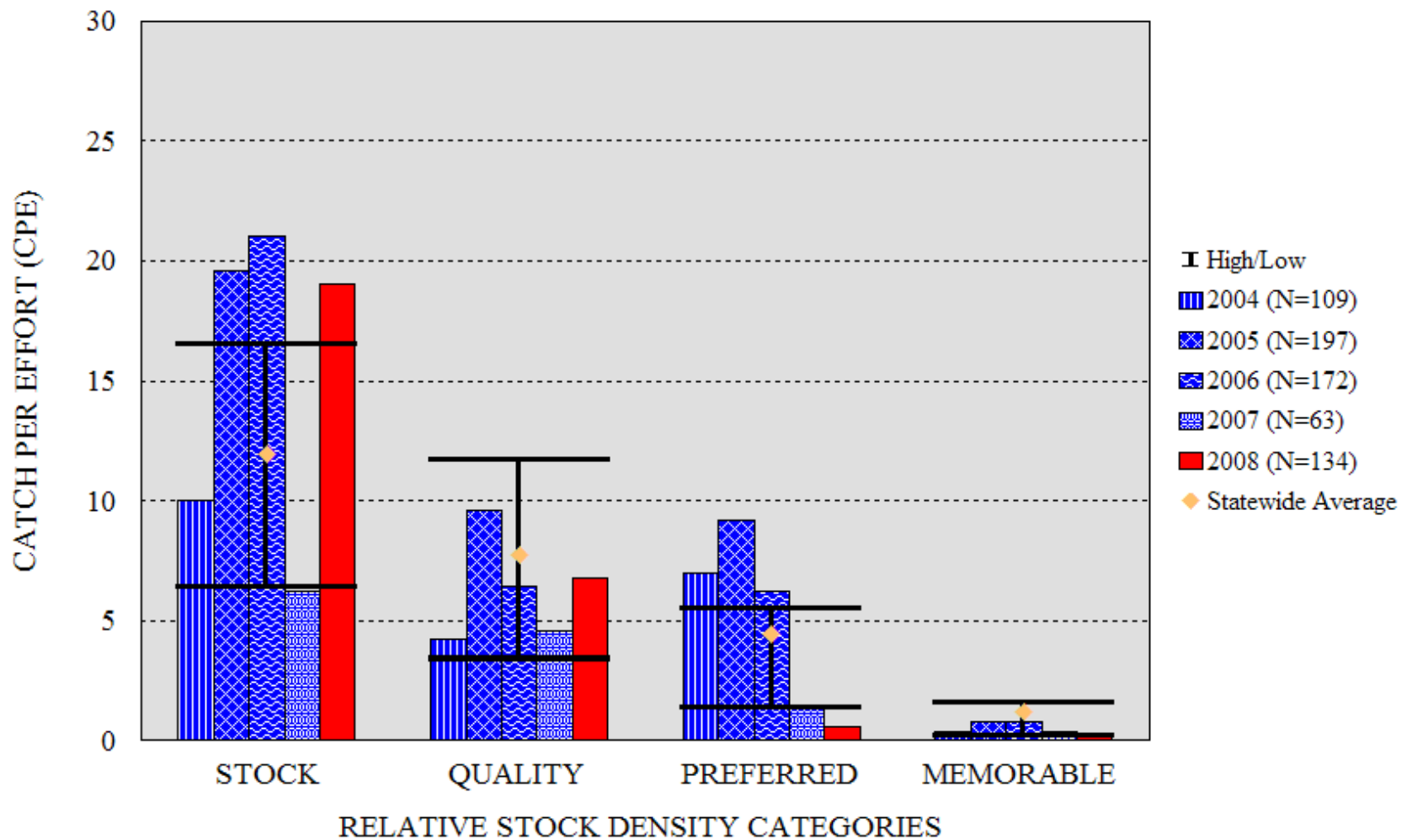


Figure 2. CPE for spotted bass from spring electrofishing at Harris Reservoir, 2004-07, and spring 2008 electrofishing at Inland Lake. The I-beam denotes the 25-75th percentile for spotted bass statewide.

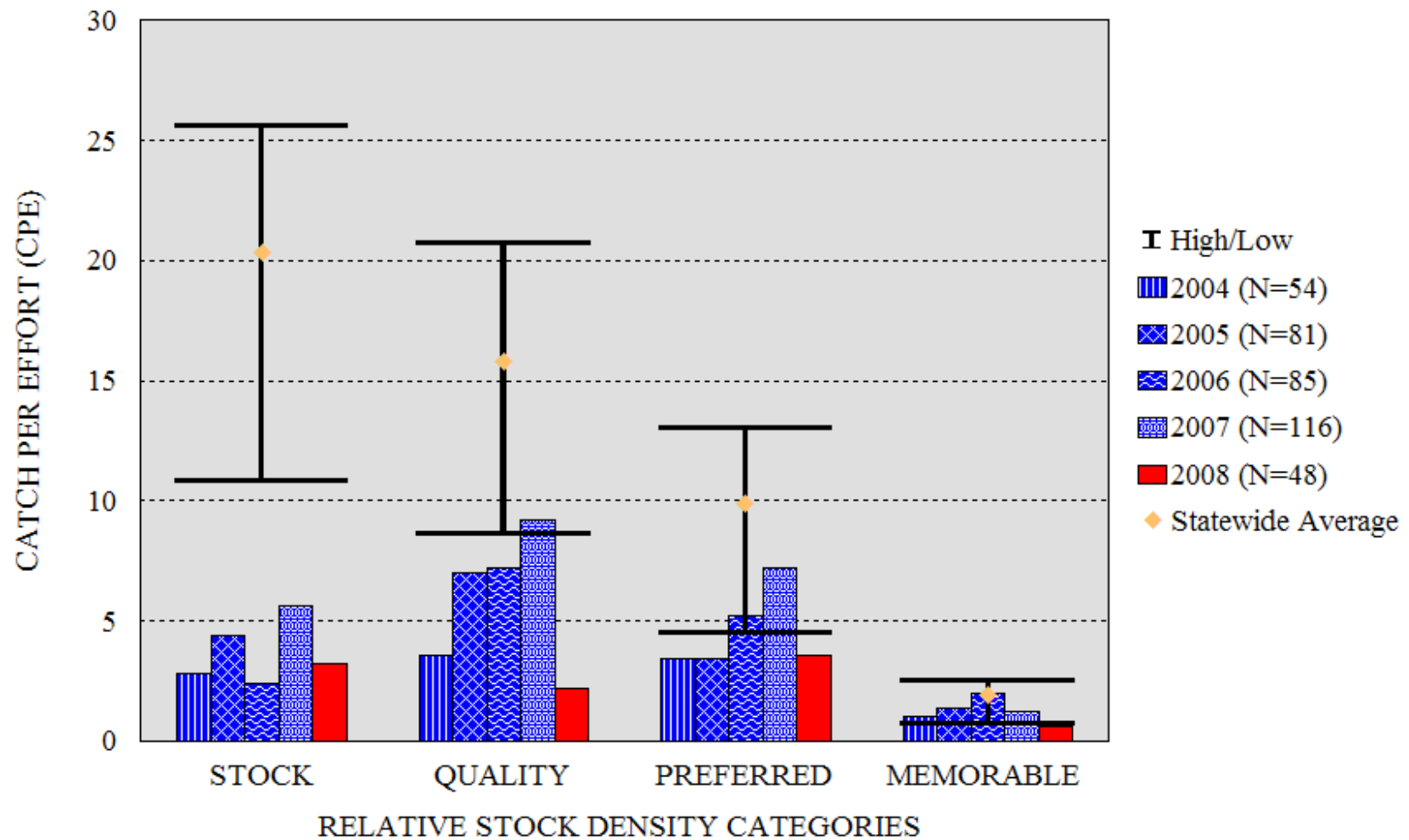


Figure 3. CPE for largemouth bass from spring electrofishing at Harris Reservoir, 2004-07, and spring 2008 electrofishing at Inland Lake. The I-beam denotes the 25-75th percentile for largemouth bass statewide.

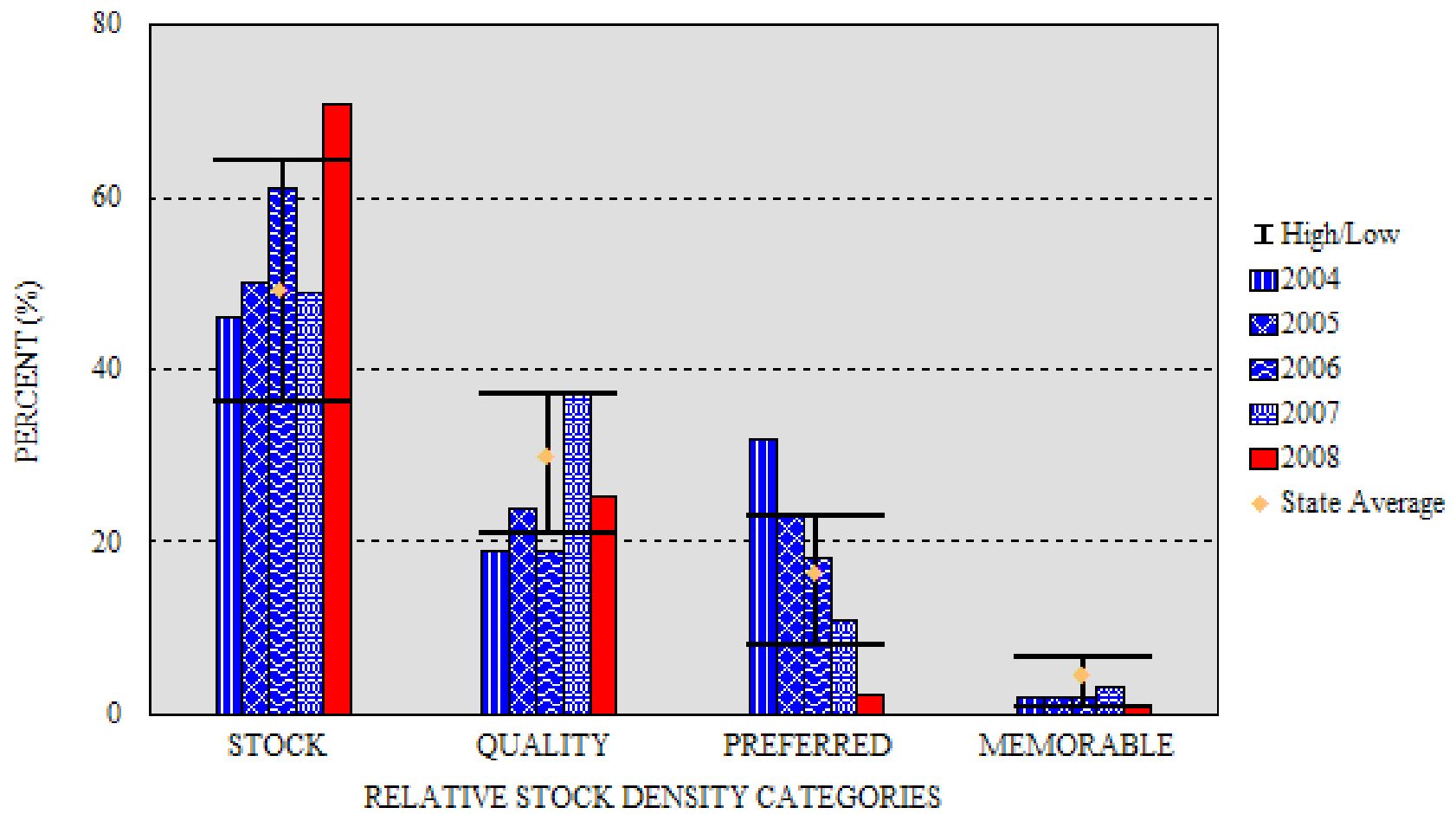


Figure 4. Relative stock density for spotted bass from spring electrofishing at Harris Reservoir, 2004-07, and Inland Lake, 2008. The I-beam denotes the 25-75th percentile for spotted bass statewide.

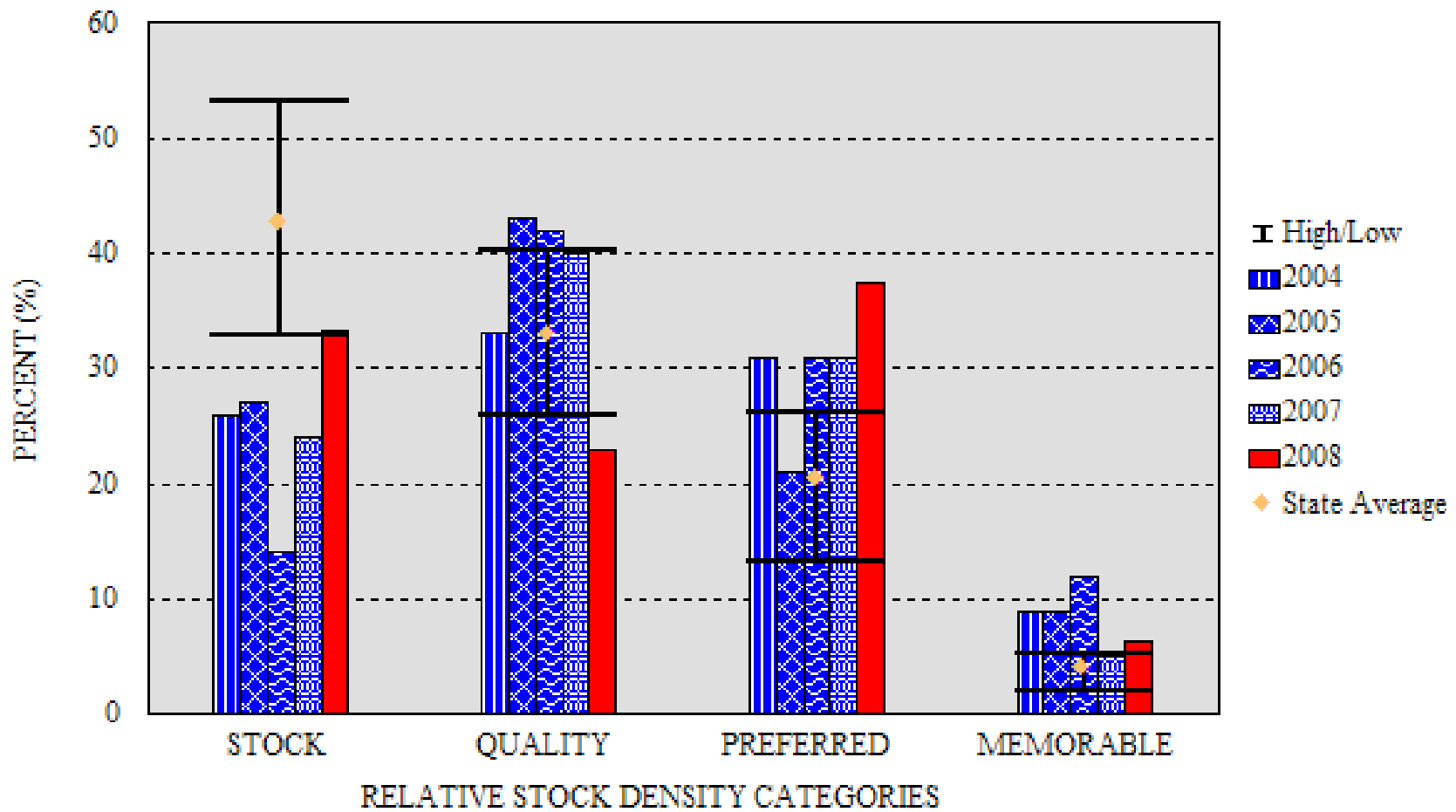


Figure 5. Relative stock density for largemouth bass from spring electrofishing at Harris Reservoir, 2004-07, and Inland Lake, 2008. The I-beam denotes the 25-75th percentile for largemouth bass statewide.

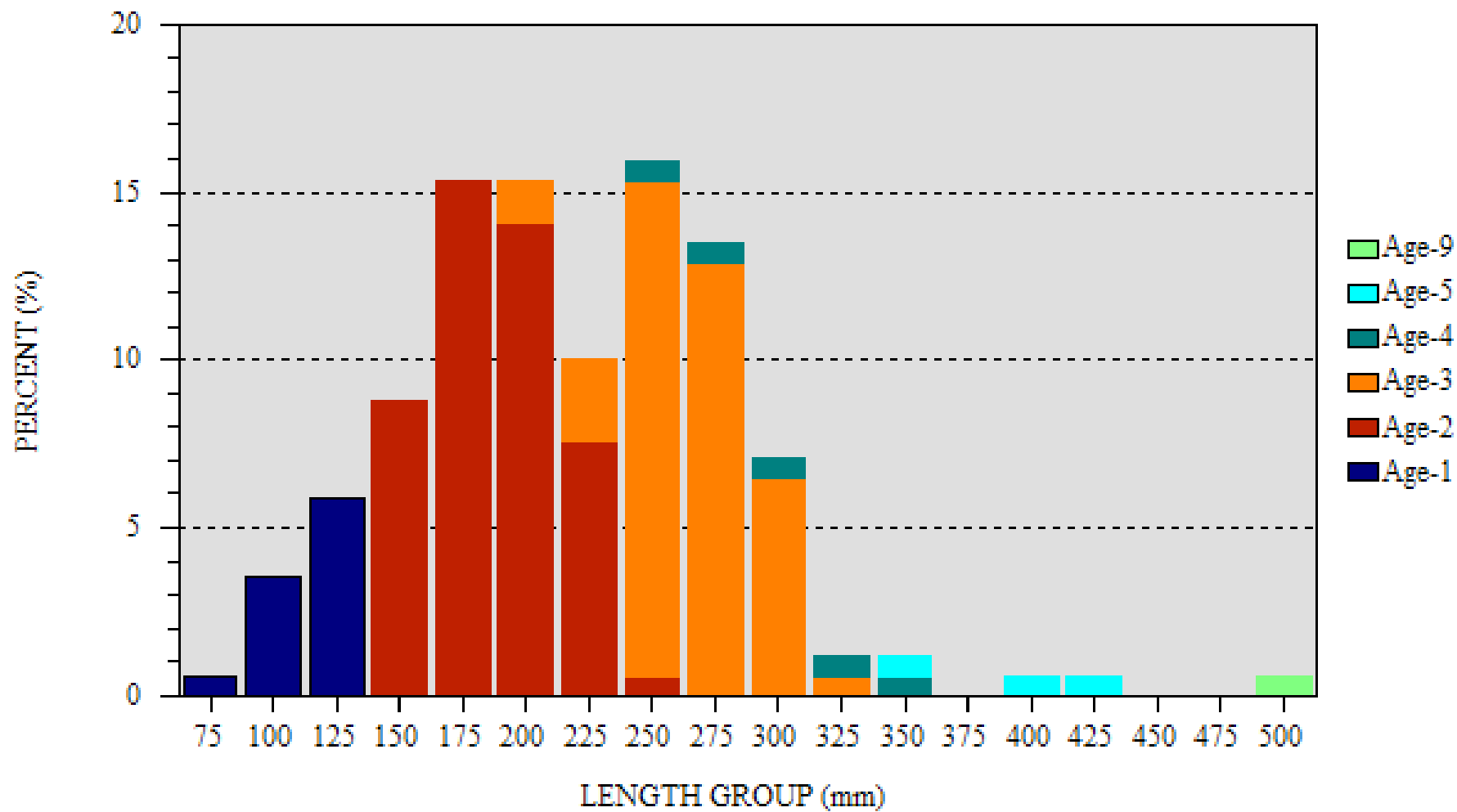


Figure 6. Length-at-age frequency for spotted bass (N=170) collected from Inland Lake, spring 2008.

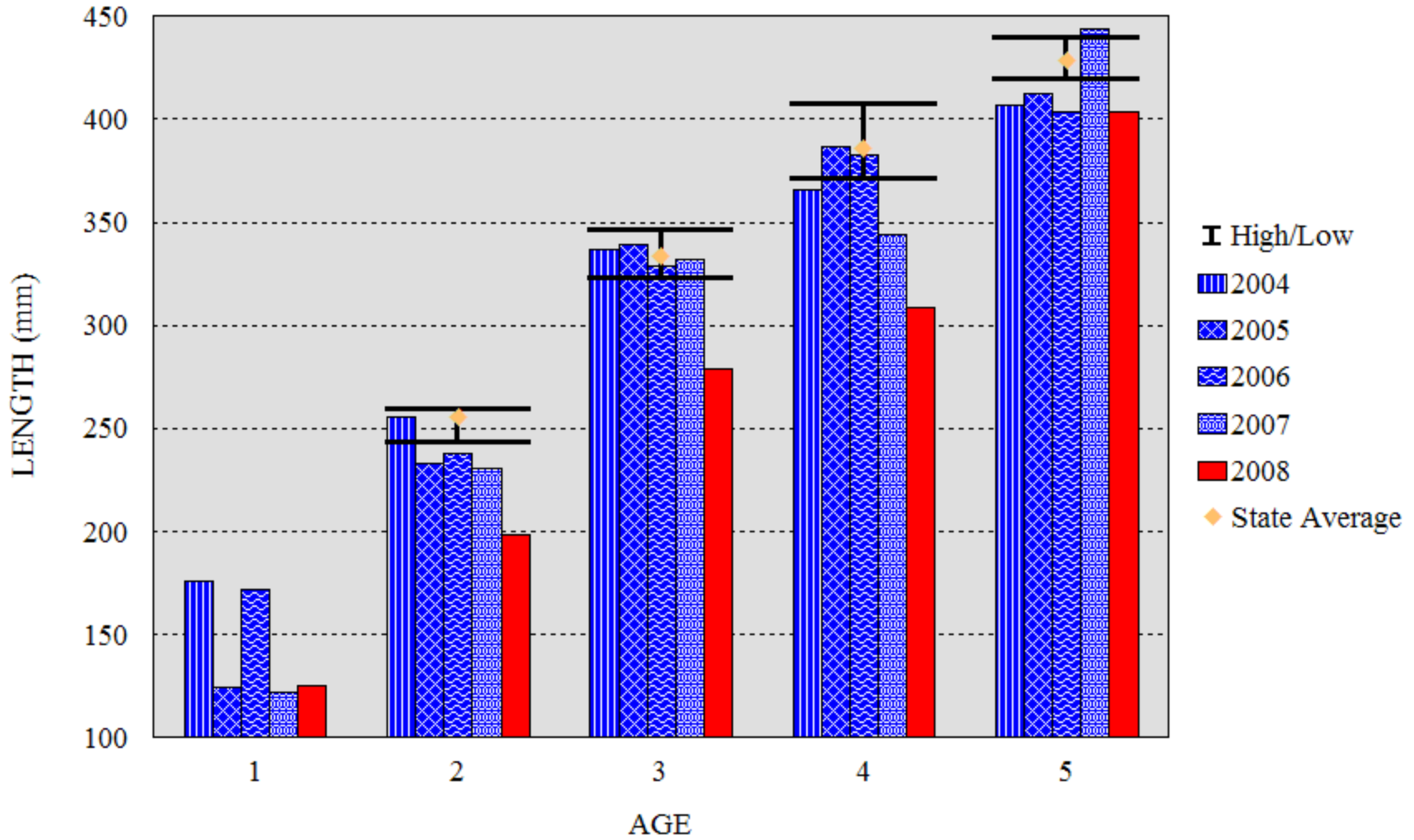


Figure 7. Length-at-age for spotted bass from spring electrofishing at Harris Reservoir, 2004-07, and Inland Lake, 2008. The I-beam denotes the 25-75th percentile for spotted bass statewide.

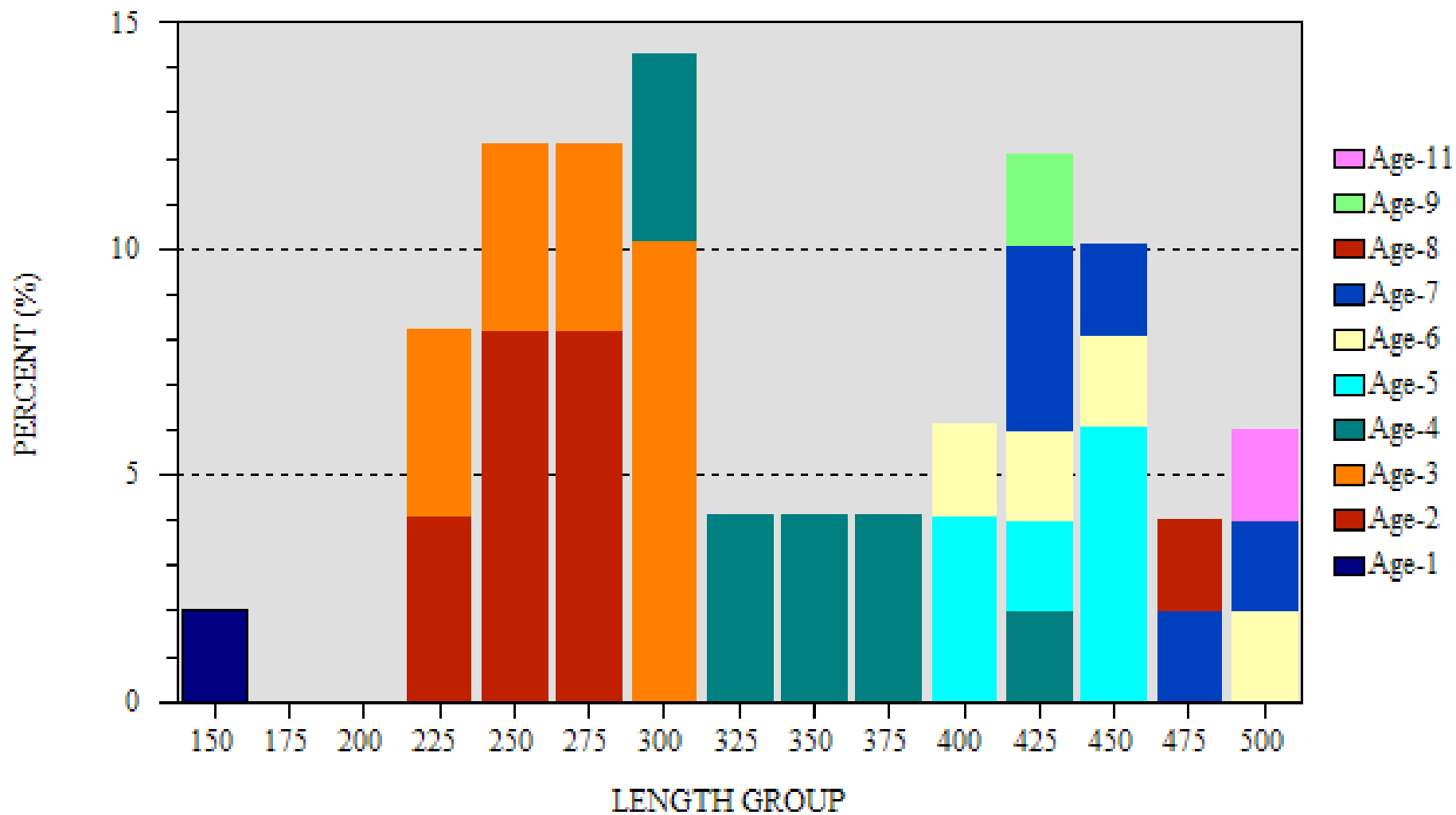


Figure 8. Length-at-age frequency for largemouth bass (N=49) collected from Inland Lake, spring 2008.

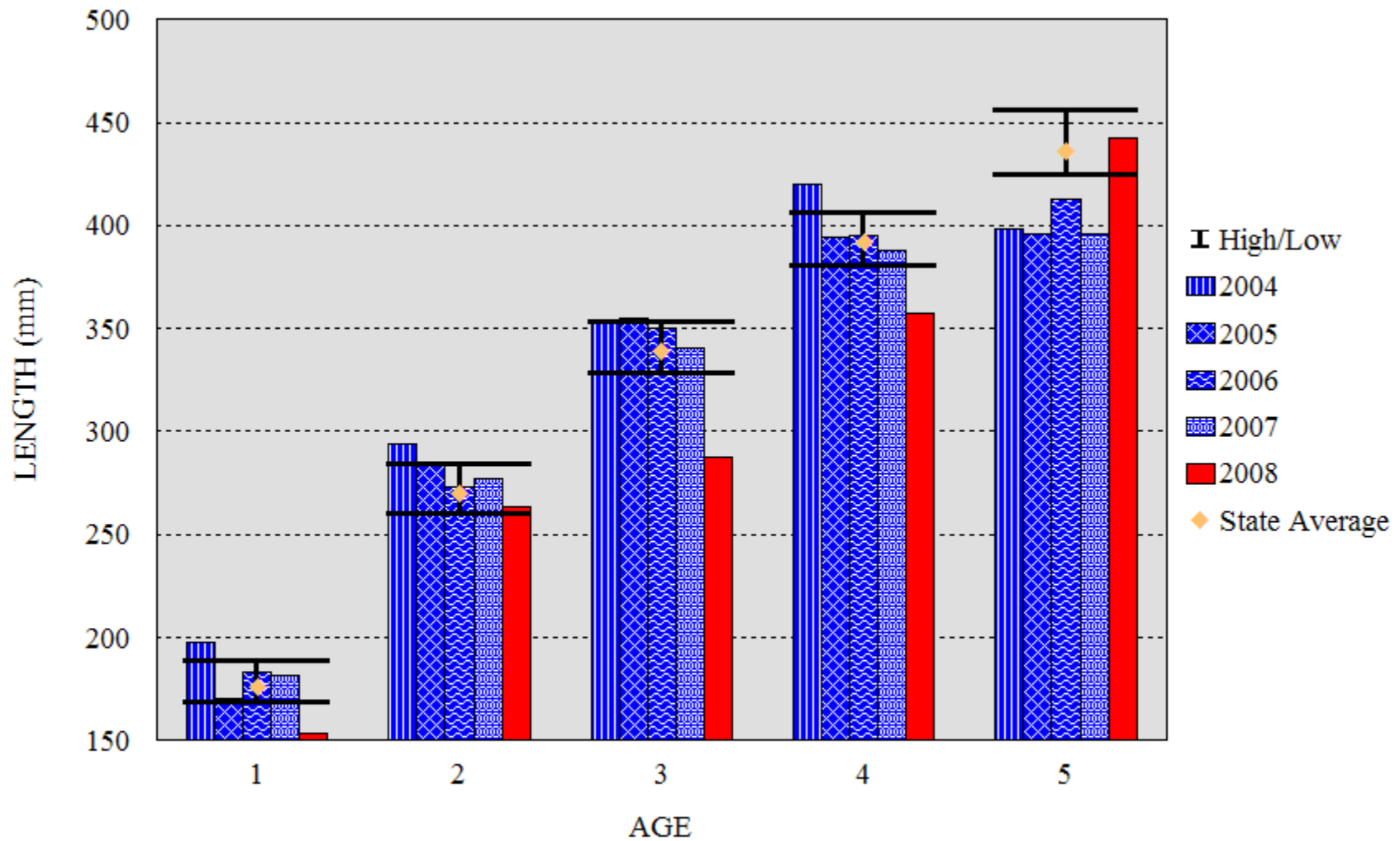


Figure 9. Length-at-age for largemouth bass from spring electrofishing at Harris Reservoir, 2004-07, and Inland Lake, 2008. The I-beam denotes the 25-75th percentile for largemouth bass statewide.

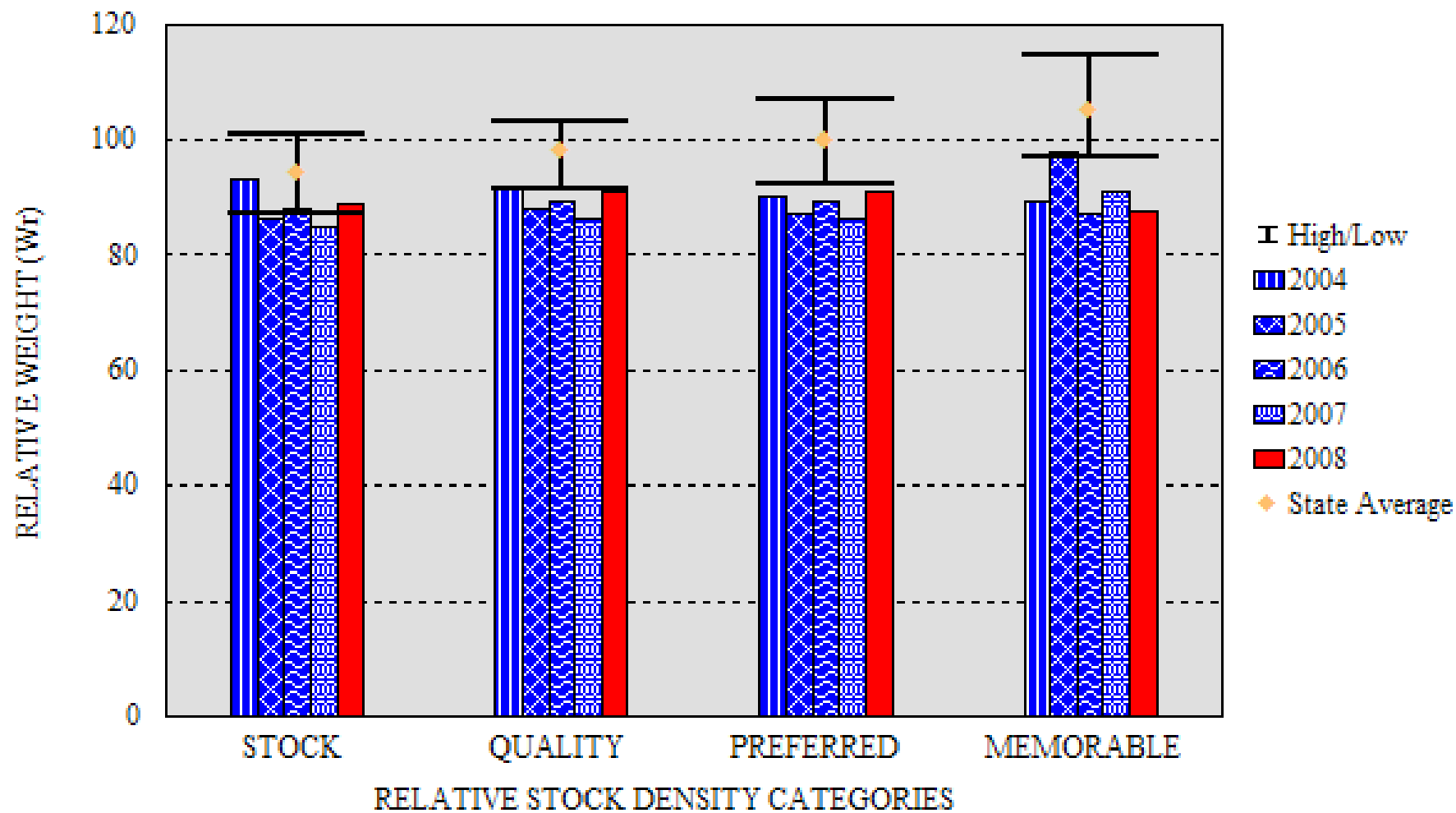


Figure 10. Relative weight values for spotted bass from spring electrofishing at Harris Reservoir, 2004-07, and Inland Lake, 2008. The I-beam denotes the 25-75th percentile for spotted bass statewide.

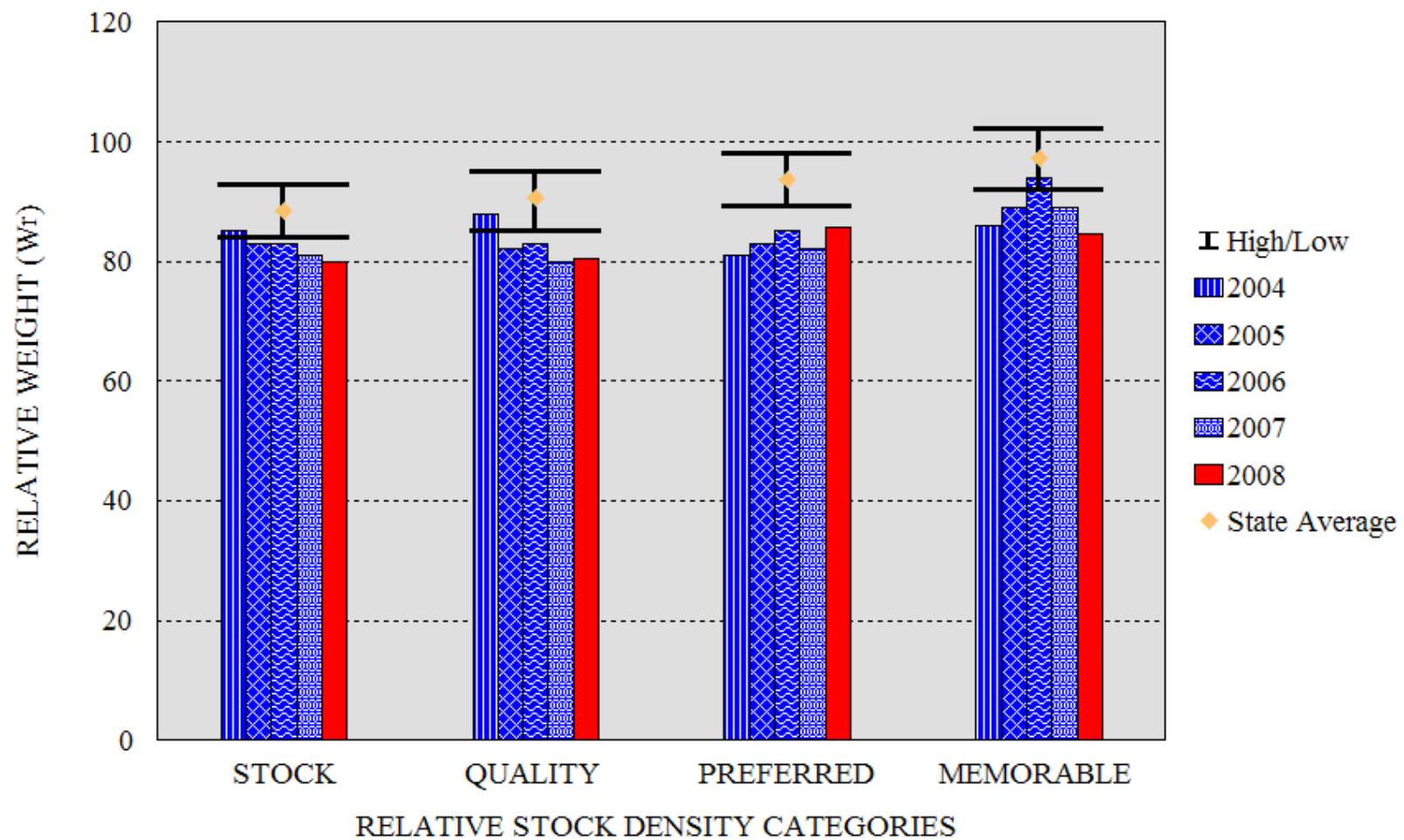


Figure 11. Relative weight values for largemouth bass from spring electrofishing at Harris Reservoir, 2004-07, and Inland Lake, 2008. The I-beam denotes the 25-75th percentile for largemouth bass statewide.