

# **WEISS RESERVOIR MANAGEMENT REPORT**

2006

Prepared by

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## **Introduction**

Alabama Wildlife and Freshwater Fisheries Division previously sampled largemouth bass from Weiss Reservoir in 1987, 1990-91, 1995, 1999, 2001, and 2003 (Catchings and Floyd 1988; Catchings and Smith 1994, 1996, 1999, 2001; Catchings and Andress 2004). The 2003 sample revealed that the largemouth bass fishery was in great shape as the strong 1998-2000 year classes had recruited to preferred size (RSD-P = 39). However, quality sized bass were not represented well (RSD-Q fell below the statewide lower 25th percentile). Predictions from the 2003 data were for strong 2001-2002 largemouth bass year classes to replenish the fishery as they grew out of the stock-size group (RSD-S = 40%). Growth was exceptional for ages 1 through 5 largemouth (all equaled or exceeded statewide 75th percentile) and relative weights were high (stock through memorable sized fish all exceeded the statewide 75th percentile).

## **Methods**

Weiss Reservoir was sampled 4-6 April 2006 according to the guidelines of the Reservoir Management Program Manual (Cook 1999). Electrofishing target species included largemouth bass, spotted bass, bluegill sunfish, gizzard shad and threadfin shad.

## **Results**

Largemouth bass were represented fairly uniformly across stock to preferred size groups with quality-size bass slightly more abundant (RSD-S=31, RSD-Q=35, RSD-P=31) (Table 2, Figure 2). Numbers of stock-size bass have declined over the past 4 samples and are currently below the statewide 25<sup>th</sup> percentile (Table 2, Figure 2). However, a respectable 54% of the collection were age 1 and age 2 bass (Table 3, Figure 4). Quality-size bass rebounded nicely from the 2003 sample and now exceed the statewide mean (Table 2, Figure 2). Preferred-size fish, comprised mostly of the 1999-2002 year classes (Figure 4), continued to exceed the

statewide 75<sup>th</sup> percentile (Table 2, Figure 2). Memorable-size largemouth bass (3%) were slightly below the statewide average (Table 2, Figure 2).

Catch-per-effort (CPE) for largemouth bass in stock to trophy size classes declined from 44.6 fish/hr to 38.8 fish/hr, a value below both the lake average and statewide mean (Table 2). CPE of preferred through trophy-size fish remained above the statewide mean (Table 2).

Largemouth bass continued to exhibit excellent condition and exceptional growth rates. Relative weight (Wr) values approached or exceeded the 75<sup>th</sup> percentile of statewide values for all RSD size-groups (Table 2 and Figure 2), and growth was exceptional for age 1 through age 5 fish with ages 1-4 exceeding the statewide 75<sup>th</sup> percentile and age 5 fish only slightly below that mark (Figure 6).

Largemouth bass annual mortality for ages 2 through 12 was estimated to be 36% ( $r^2=0.91$ , 95% CI=29-43).

The 2005 Bass Anglers Information Team (B.A.I.T.) report (Haffner 2006) revealed improvements across 4 of the 5 quality fishing indicators from the 2004 report, resulting in a 1<sup>st</sup> place ranking among 23 reservoirs that qualified for the program. Weiss ranked 5<sup>th</sup> in percent success, 6<sup>th</sup> in average weight, 3<sup>rd</sup> in pounds per angler-day, and 3<sup>rd</sup> in hours needed to catch a bass greater than five pounds. Bass per angler-day actually improved from 2.48 in 2004 to 2.72 in 2005, but Weiss fell from 6<sup>th</sup> to 9<sup>th</sup> in this category as compared to the other 22 lakes.

Spotted bass were captured at a rate of 8.6 fish/hr in 2006 compared to 42.0 fish/hr in 2003 (Table 2). The 2006 value is probably more representative as it is closer to catch rates from the 1995, 1999, and 2001 samples. The 2003 sample included two randomly selected sites with prime spotted bass habitat, which explains some CPE variability between samples. Shoreline sampling areas are typically shallow and consist of predominately slow moving water preferred

by largemouth bass making spotted bass harder to sample. However, low catch rates indicate that spotted bass are usually not a significant component of the bass angler's creel. It is noteworthy that RSD values for preferred-size (RSD-P=26) and memorable-size (RSD-M=13) spotted bass exceeded the statewide 75th percentile (Table 2, Figure 3). Quality-size spotted bass were most abundant (RSD-Q=28), but were below the statewide mean (Table 2, Figure 3). Stock-size spotted bass (RSD-S=33) were below the 25th percentile. Catch rates for preferred and memorable-size spotted bass were below the statewide mean while stock and quality-size CPE values were below the statewide 25<sup>th</sup> percentile (Table 2). Growth was exceptional for age 2 through age 4 spotted bass, approximating or exceeding the statewide 75th percentile while age 5 growth dropped to the statewide 25<sup>th</sup> percentile (Table 4, Figure 7). Criteria specified in the Reservoir Sampling Manual for the spotted bass mortality estimate could not be met.

Bluegill sunfish were well represented in the 110 mm to 150 mm (4-6 inches) size range (Figure 8). RSD values for stock and quality-size bluegill exceeded the statewide average and lake average, respectively; while Wr values for both size classes approximated the statewide mean (Table 2). Gizzard shad were well represented in the 140 mm to 190 mm (5.5-7.5 inches) size range and the threadfin shad population exhibited a bi-modal distribution (70 mm and 110 mm), with 70 mm (2.8 inch) fish more dominant (Figures 9 and 10, respectively).

## **Conclusions**

The largemouth bass population remains in great shape. The relatively weak 2005 year class should not be problematic as the 2004 year class was strong, accounting for almost 39% of the 2006 sample. These 2004 fish should replenish the fishery as they continue to grow out of the stock-size group. Growth was exceptional for age 1 through age 5 largemouth bass and

relative weights were high. District II does not recommend any management changes. Weiss largemouth bass will be sampled again in spring 2008.

## **Literature Cited**

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# Appendix A

## Tables and Figures

Table 1. Weiss Reservoir morphometric, physical and chemical characteristics.

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Surface area	30,200	acres
Drainage area	5,273	sq. mi.
Full pool elevation	564.35	feet-msl
Mean annual fluctuation	6.7	feet
Shoreline distance	447	miles
Shoreline development index	18.4	
Mean depth	10.2	feet
Maximum depth	62	feet
Outlet depth	555	feet
Total dissolved solids	509	mg/l
Morphoedaphic index	11.1	TDS/mean depth(ft) (Ryder 1965)
Growing season	190	frost free days (Jenkins 1967)
Year of impoundment	1961	

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Table 2. Relative stock density, catch per effort and relative weight for target species sampled from Weiss Reservoir.

Species	No. of samples	SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				CPE		TOTAL		
		No.	CPE	Pct.*	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	S-T	P-T	No.	CPE	
Largemouth	1987	4.0	14	7.0	16	44	22.0	51	95	16	8.0	19	101	22	11.0	26	106	4	2.0	5	111	43.0	31.0	100	50.0
Bass	1990	3.8	28	14.7	27	34	17.8	33	98	44	23.1	42	107	20	10.5	19	108	6	3.1	6	107	54.5	13.6	132	69.5
	1991	6.0	10	3.3	10	27	9.0	27	97	45	15.0	45	105	26	8.7	26	109	2	0.7	2	117	33.4	9.4	110	36.6
	1995	25.0	14	1.1	2	443	34.9	61	94	131	10.3	18	103	123	9.7	17	111	16	1.3	2	111	56.2	11.0	727	57.3
	1999	8.0	12	3.0	8	90	22.5	61	99	32	8.0	22	99	24	6.0	16	100	2	0.5	1	97	37.0	6.5	160	40.0
	2001	15.9	87	10.9	16	298	37.5	56	95	146	18.4	27	104	86	10.8	16	104	7	0.8	1	103	67.5	11.6	624	78.4
	2003	10.0	6	0.8	2	140	17.7	40	99	69	8.7	20	109	136	17.2	39	112	8	1.0	2	111	44.6	18.2	359	45.4
	2006	10.0	15	3.0	8	61	12.2	31	91	67	13.4	35	99	60	12.0	31	101	6	1.2	3	101	38.8	13.2	209	41.8
<b>LAKE AVERAGE</b>			<b>5.5</b>	<b>11</b>		<b>21.7</b>	<b>45</b>	<b>96</b>		<b>13.1</b>	<b>29</b>	<b>103</b>		<b>10.7</b>	<b>24</b>	<b>106</b>		<b>1.3</b>	<b>3</b>	<b>107</b>	<b>46.9</b>	<b>14.3</b>	<b>303</b>	<b>52.4</b>	
STATEWIDE MEAN			11.5	26		20.3	43	88		16.8	33	90		9.9	20	94		1.9	4	97	47.9	11.8			
LOWER 25TH PERCENT			3.9	11		10.8	33	84		8.6	26	85		4.5	13	89		0.7	2	92	29.7	5.5			
UPPER 75TH PERCENT			15.2	33		25.6	53	93		20.7	40	95		13.0	26	98		2.5	5	102	61.1	15.7			
Spotted Bass	1995	9.6	8	1.7	18	22	4.5	49	95	10	2.0	22	102	9	1.8	20	106	3	0.6	7	105	8.9	2.4	53	11.0
	1999	4.0	5	1.2	11	11	2.7	25	100	19	4.7	43	106	10	2.5	23	106	4	1.0	9	104	10.9	3.3	49	12.3
	2001	6.6	4	1.2	15	14	4.2	54	92	7	2.1	27	103	4	1.2	15	114	1	0.3	4	120	7.8	1.5	30	9.0
	2003	2.0	6	6.0	17	11	11.0	31	94	6	6.0	17	91	14	14.0	39	106	5	5.0	14	105	36.0	55.0	42	42.0
	2006	10.0	4	0.8	10	13	2.6	33	94	11	2.2	28	100	10	2.0	26	107	5	1.0	13	116	7.8	3.0	43	8.6
<b>LAKE AVERAGE</b>			<b>2.2</b>	<b>14</b>		<b>5.0</b>	<b>38</b>	<b>95</b>		<b>3.4</b>	<b>27</b>	<b>100</b>		<b>4.3</b>	<b>25</b>	<b>108</b>		<b>1.6</b>	<b>9</b>	<b>110</b>	<b>14.3</b>	<b>13.0</b>	<b>43</b>	<b>16.6</b>	
STATEWIDE MEAN			6.0	32		11.9	49	94		7.7	30	98		4.4	16	100		1.2	5	105	25.3	5.6			
LOWER 25TH PERCENT			2.3	11		6.4	36	87		3.4	21	91		1.4	8	92		0.2	1	97	14.4	1.6			
UPPER 75TH PERCENT			8.7	40		16.5	64	101		11.7	37	103		5.5	23	107		1.6	7	115	33.2	7.0			
Bluegill	2001	2.6	3	2.2	3	103	77.7	87	99	15	11.3	13	94								91.2	0	121	91.6	
Sunfish	2003	2.0	2	6.0	6	29	87.0	94	95	2	6.0	6	85								93.0	0	33	99.0	
	2006	2.4	6	4.9	6	86	70.4	83	86	18	14.7	17	83								85.1	0	110	90.0	
<b>LAKE AVERAGE</b>			<b>4.4</b>	<b>5</b>	<b>73</b>	<b>78.4</b>	<b>88</b>	<b>93</b>		<b>12</b>	<b>10.7</b>	<b>12</b>	<b>87</b>								<b>89.8</b>	<b>0.0</b>	<b>88</b>	<b>93.5</b>	
STATEWIDE MEAN						72.8	78	85		16.7	21	84									90.3				
LOWER 25TH PERCENT						38.2	72	80		7.4	11	79									52.2				
UPPER 75TH PERCENT						94.4	89	90		21.0	27	89									112.5				

\*Substock Pct. is substock ratio: number of substock size fish collected for every 100 fish of stock size and larger.

Table 3. Age composition and mean length of largemouth bass collected from Weiss Reservoir, spring 2006.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range (mm)
1	2005	32	15.3	6.4	196	4.0	156-239
2	2004	81	38.8	16.2	295	2.4	243-349
3	2003	31	14.8	6.2	355	5.2	301-417
4	2002	32	15.3	6.4	417	6.4	328-480
5	2001	7	3.3	1.4	453	12.7	384-485
6	2000	13	6.2	2.6	483	8.2	441-527
7	1999	8	3.8	1.6	487	10.6	423-527
8	1998	2	1.0	0.4	503	17.5	485-520
9	1997	2	1.0	0.4	489	23.5	465-512
12	1994	1	0.5	0.2	468		468
Total		209	100.0	41.8			

Table 4. Age composition and mean length of spotted bass collected from Weiss Reservoir, spring 2006.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range (mm)
1	2005	11	25.6	2.2	168.4	11.5	95-222
2	2004	10	23.3	2.0	275.8	7.6	240-319
3	2003	12	27.9	2.4	348.8	8.4	300-402
4	2002	3	7.0	0.6	406.7	17.9	372-432
5	2001	3	7.0	0.6	418.3	22.5	383-460
6	2000	3	7.0	0.6	457.3	16.3	427-483
9	1997	1	2.3	0.2	490.0		490.0
Total		43	100.0	8.6			

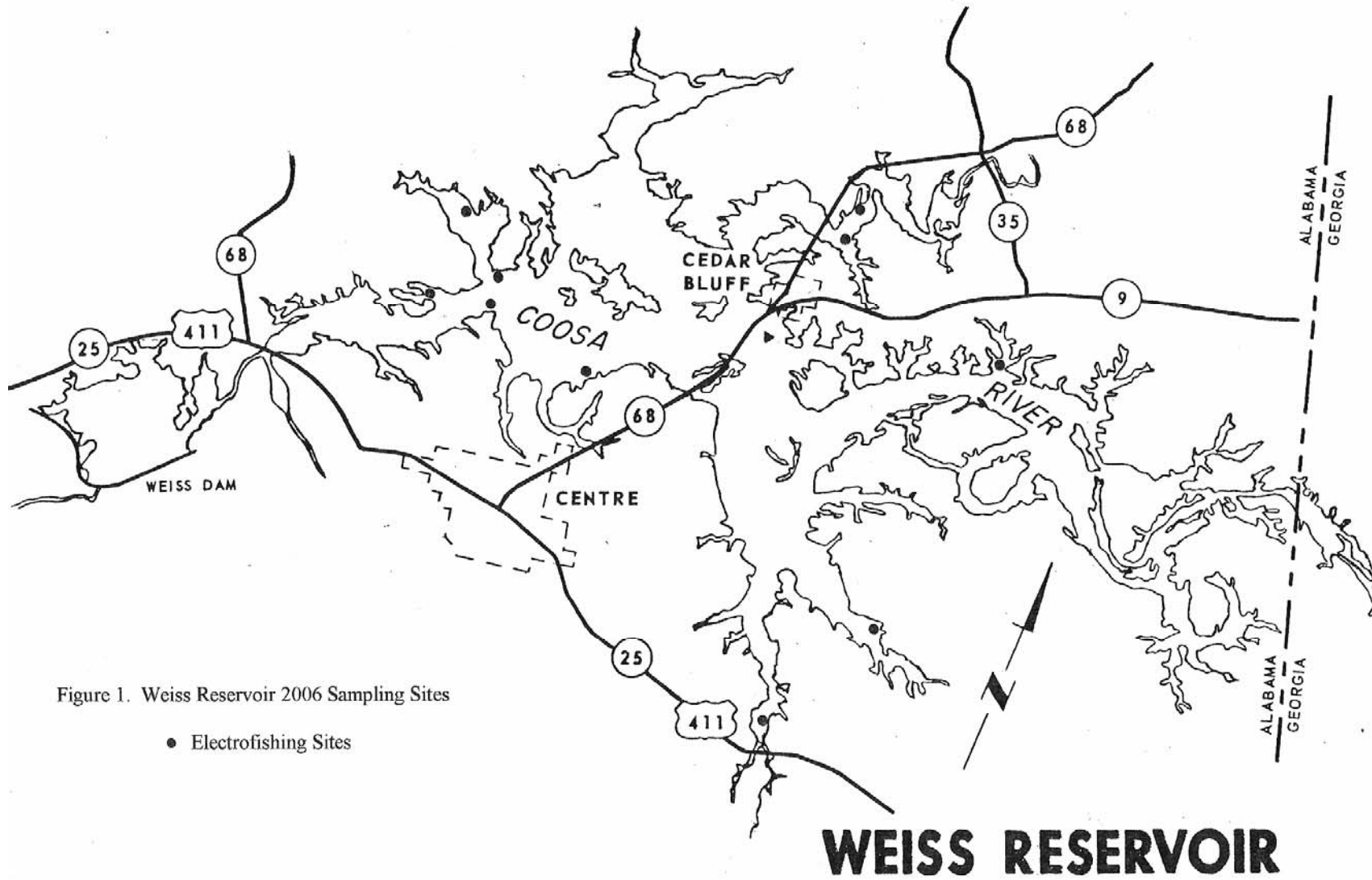


Figure 1. Weiss Reservoir 2006 Sampling Sites

- Electrofishing Sites

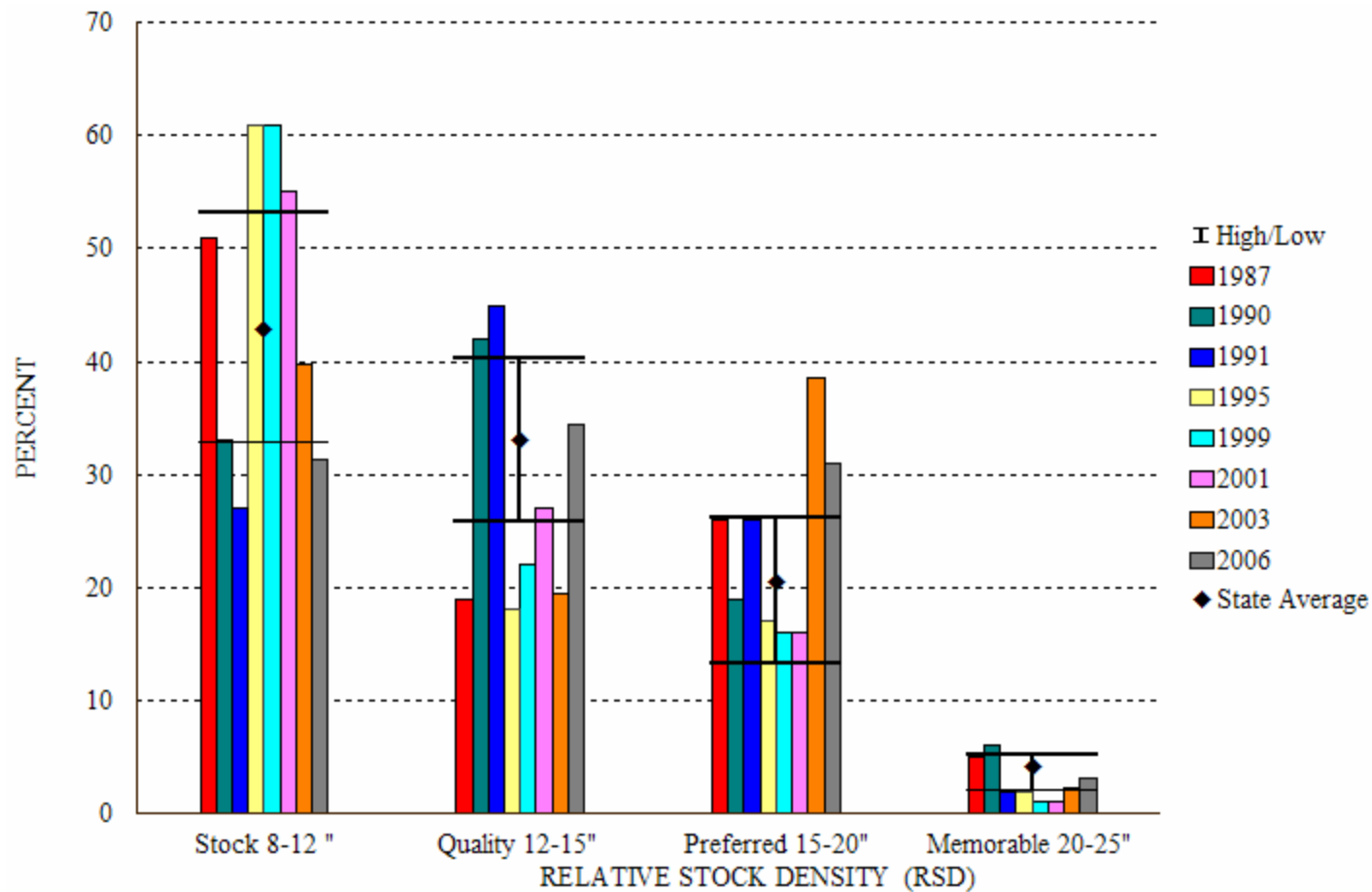


Figure 2. Relative stock density (RSD) of largemouth bass from Weiss Reservoir, spring 1987, 1990, 1991, 1995, 1999, 2001, 2003 and 2006. The I-beam denotes the 25-75th percentile values of largemouth bass statewide.

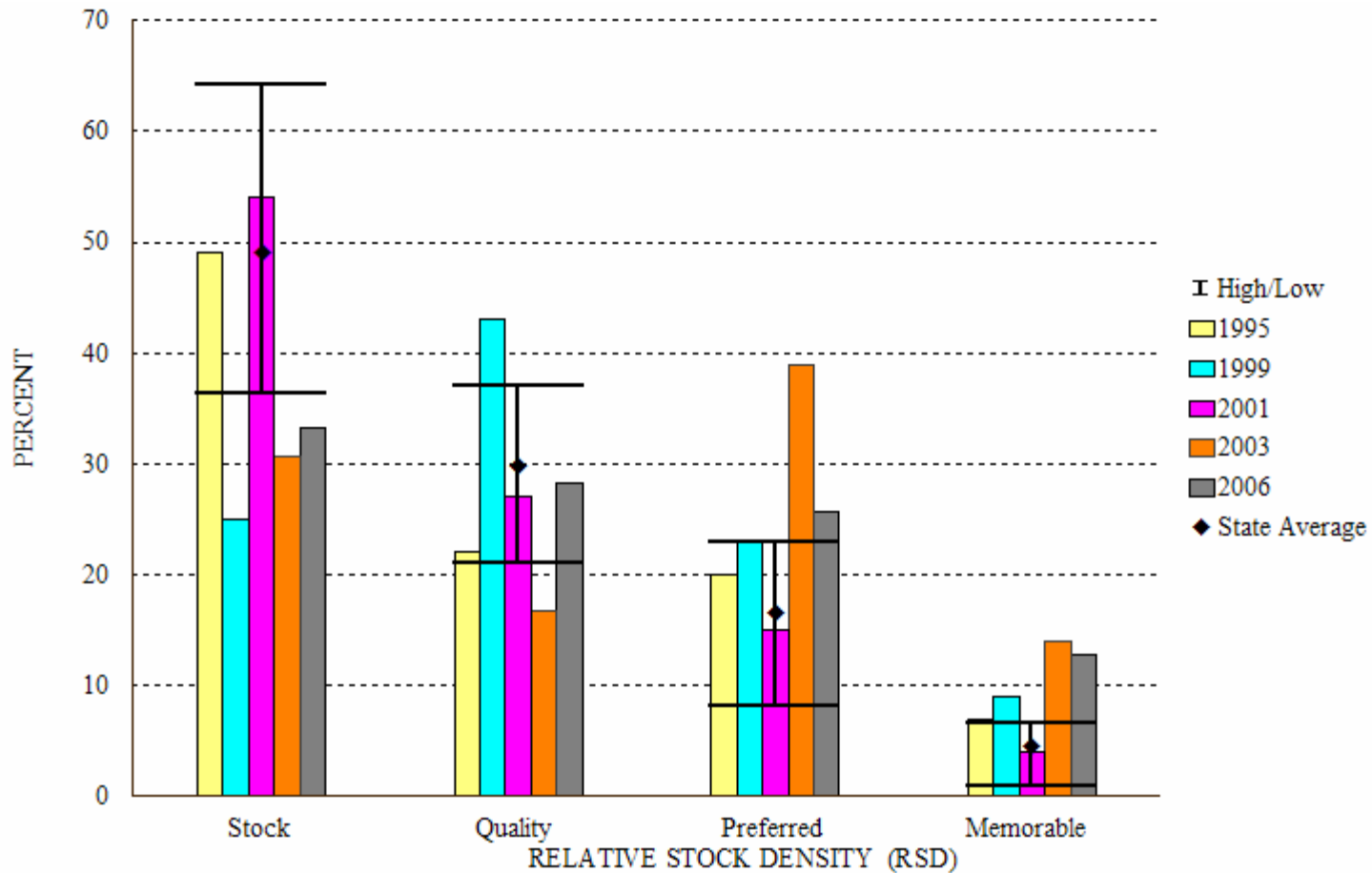


Figure 3. Relative stock density (RSD) of spotted bass from Weiss Reservoir, spring 1995, 1999, 2001, 2003 and 2006. The I-beam denotes the 25-75th percentile values of largemouth bass statewide.

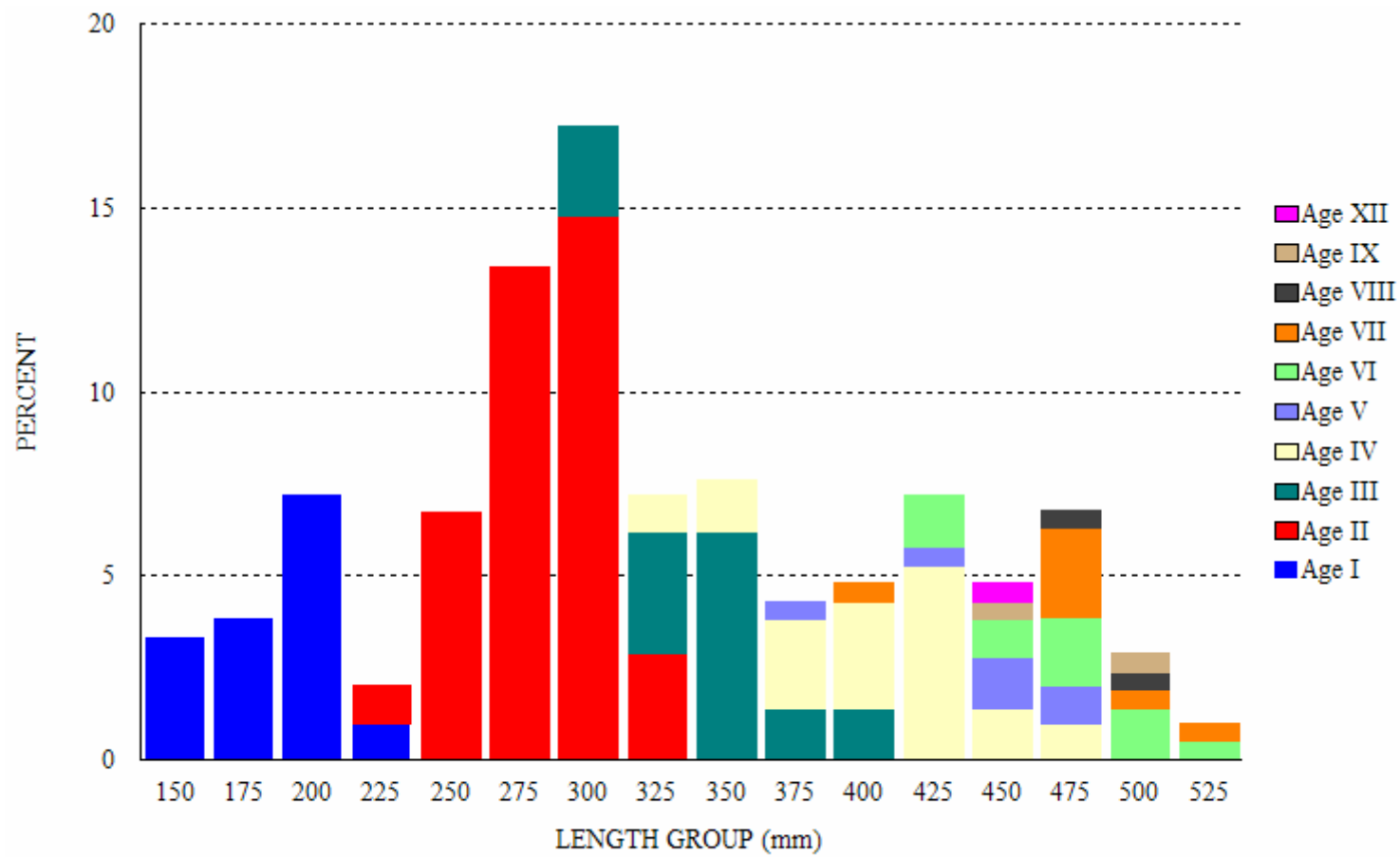


Figure 4. Length-at-age for largemouth bass (N=209) from Weiss Reservoir, spring 2006.

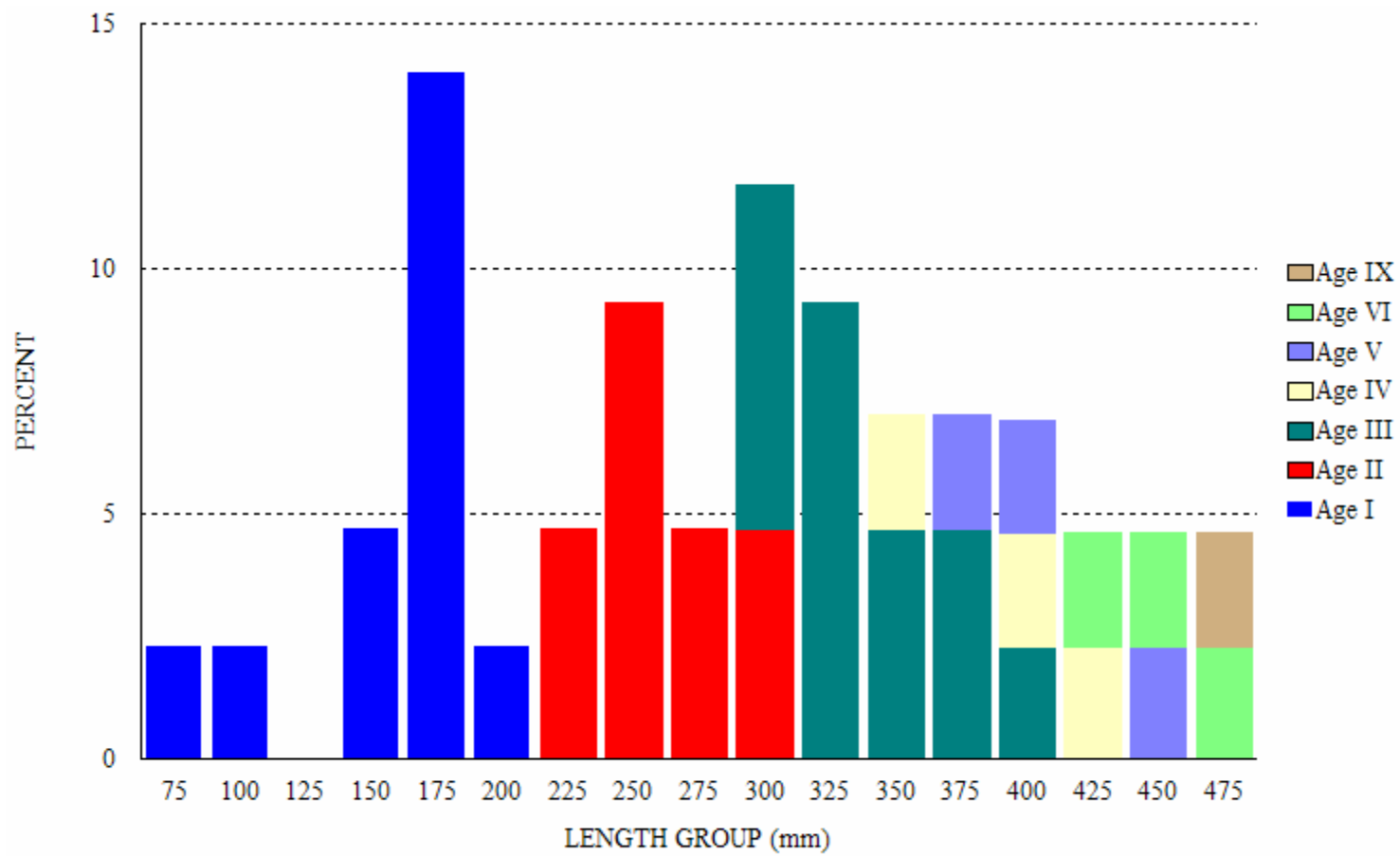


Figure 5. Length-at-age for spotted bass (N=43) from Weiss Reservoir, spring 2006.

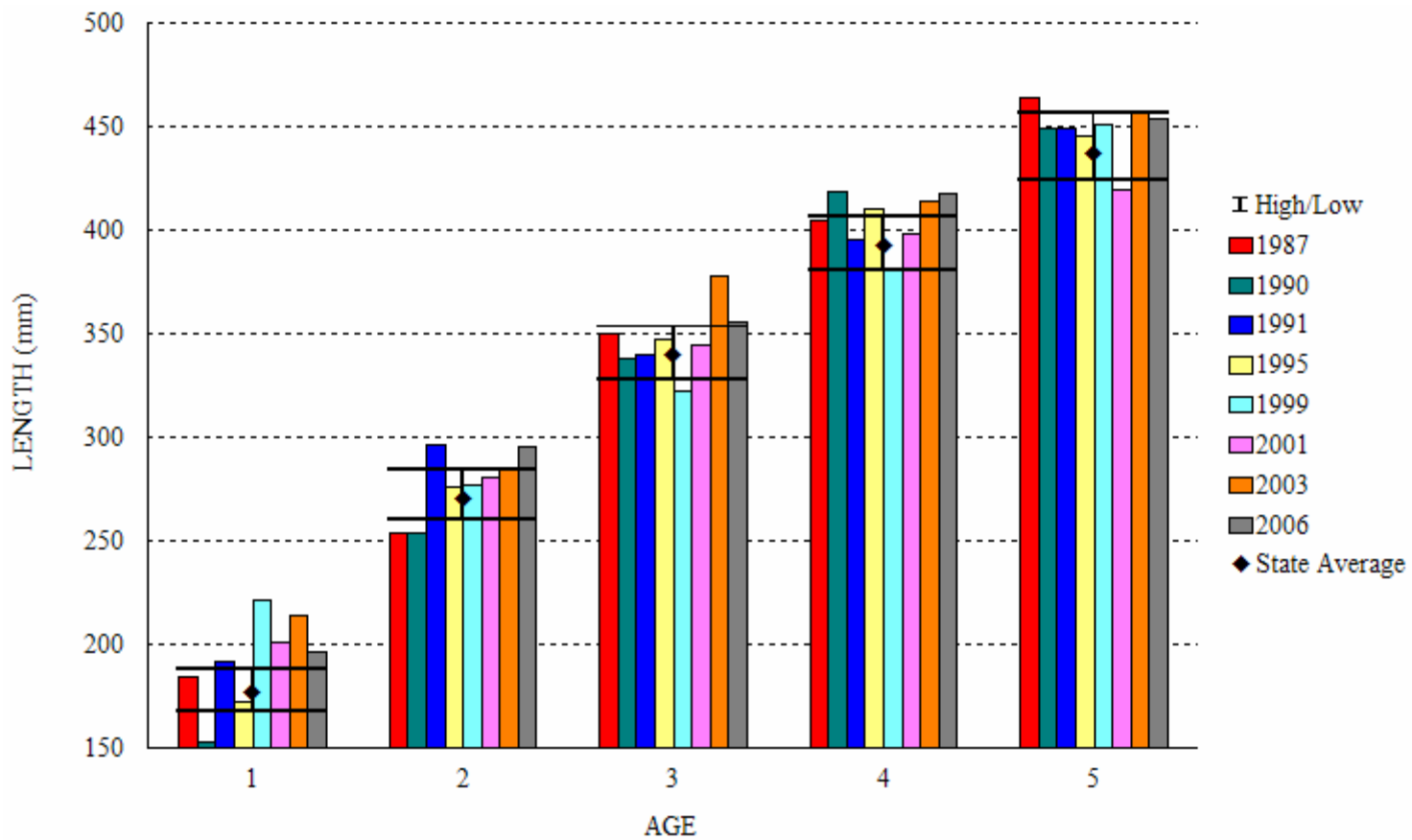


Figure 6. Length-at-age for largemouth bass from spring electrofishing at Weiss Reservoir, 1987, 1990, 1991, 1995, 1999, 2001, 2003 and 2006. The I-beam denotes the 25-75th percentile for largemouth bass statewide.

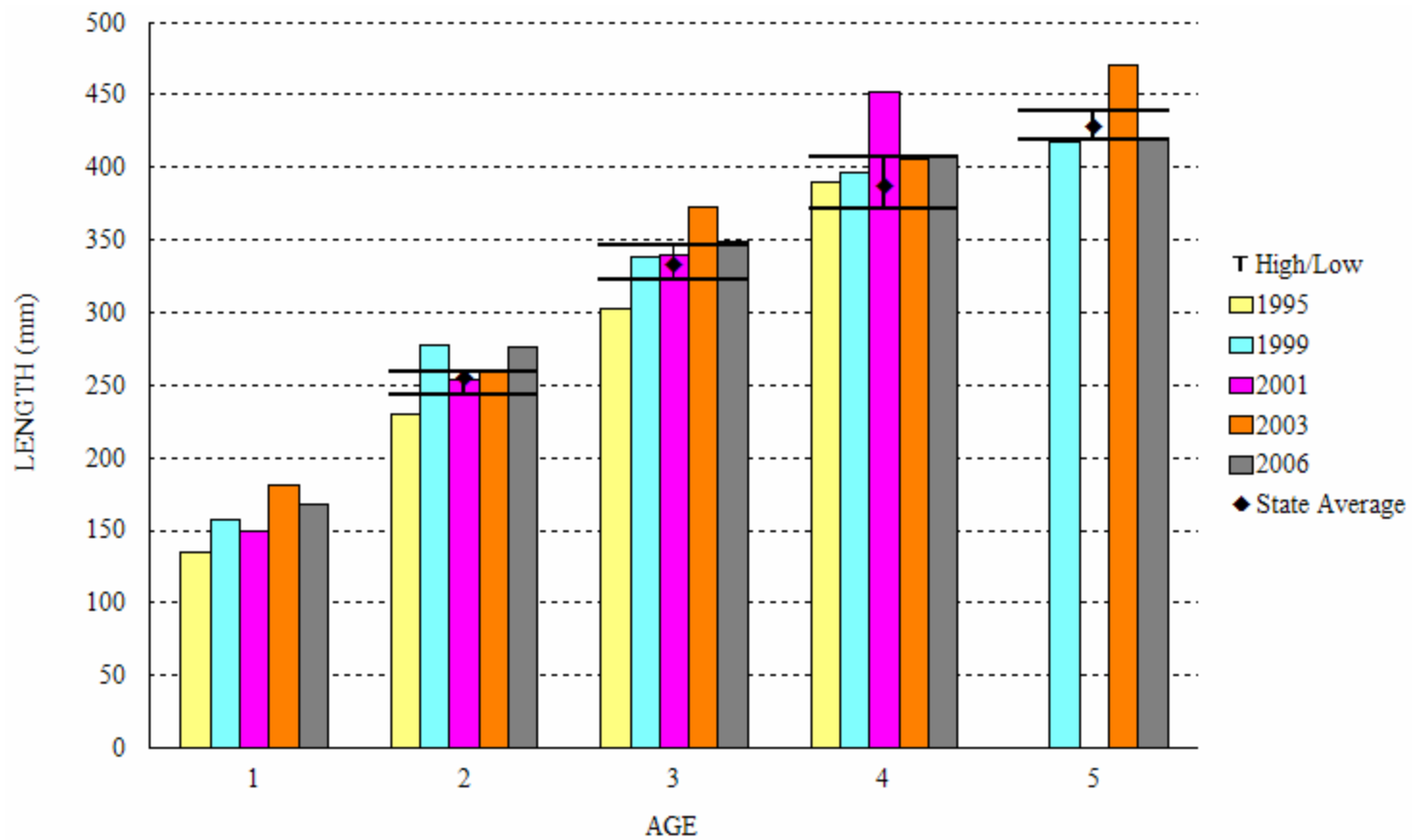


Figure 7. Length-at-age for spotted bass from spring electrofishing at Weiss Reservoir 1995, 1999, 2001, 2003 and 2006. The I-beam denotes the 25-75th percentile for largemouth bass statewide.

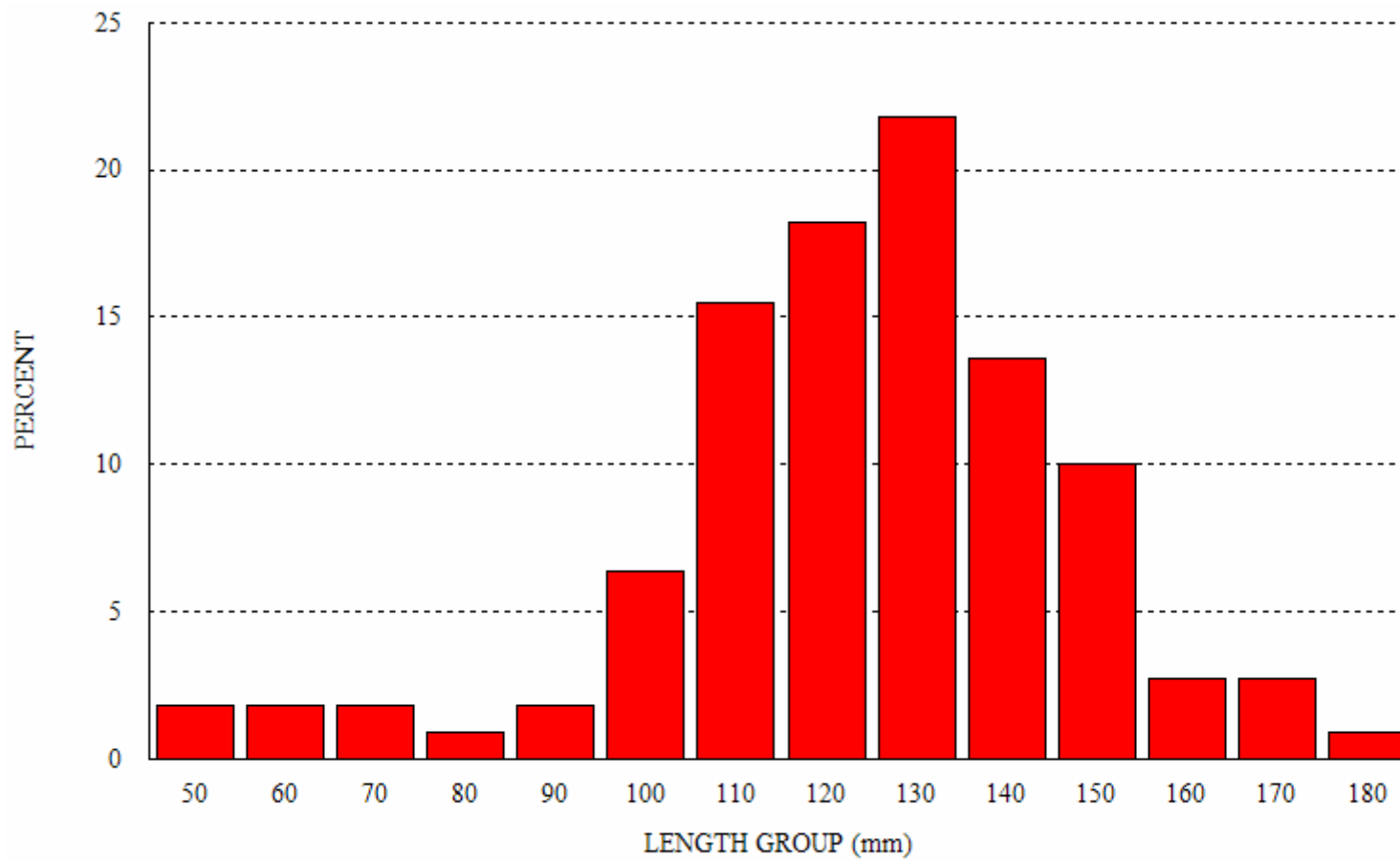


Figure 8. Length frequency distribution of bluegill sunfish (N =110) from Weiss Reservoir, spring 2006.

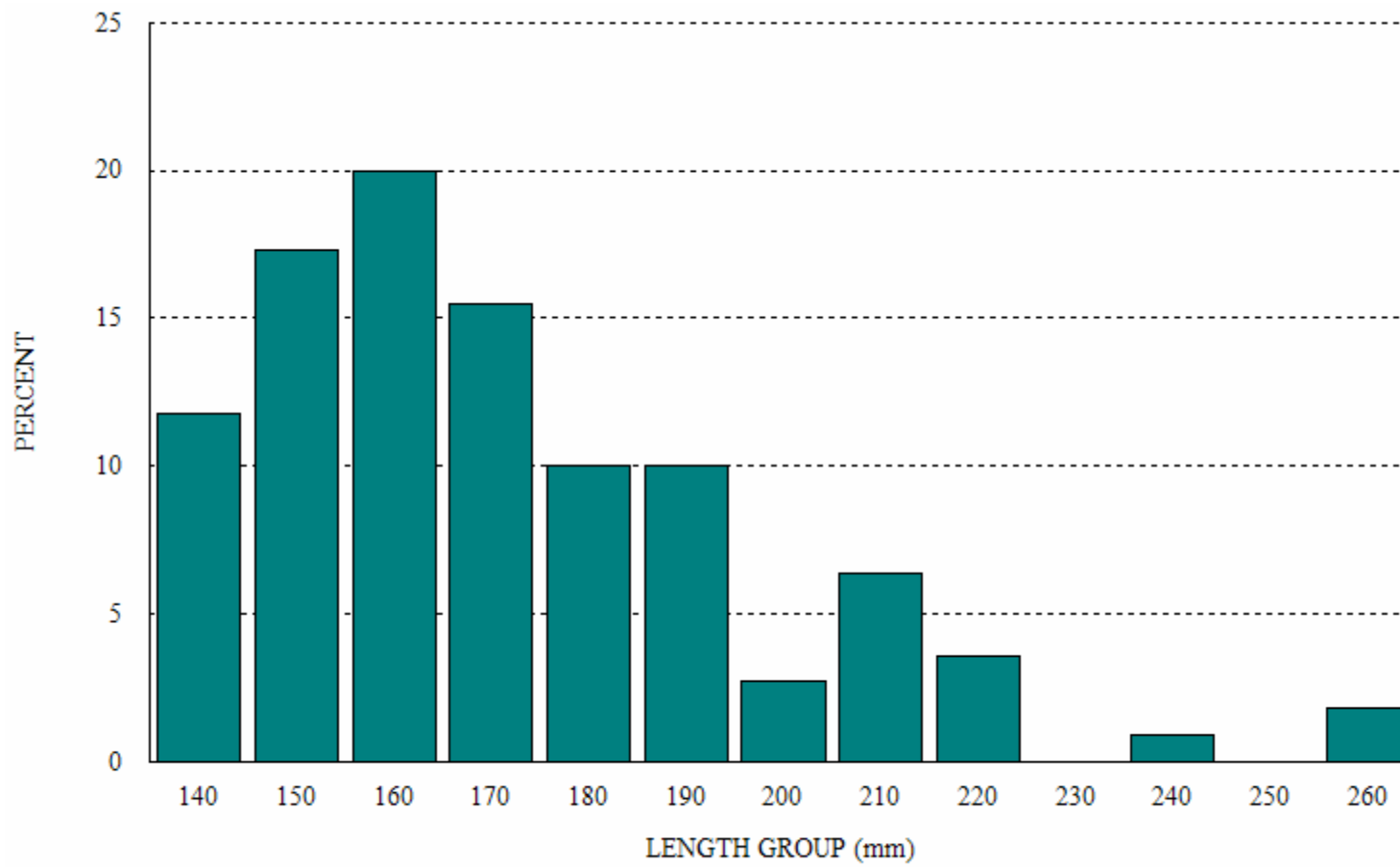


Figure 9. Length frequency distribution of gizzard shad (N=110) from Weiss Reservoir, spring 2006.

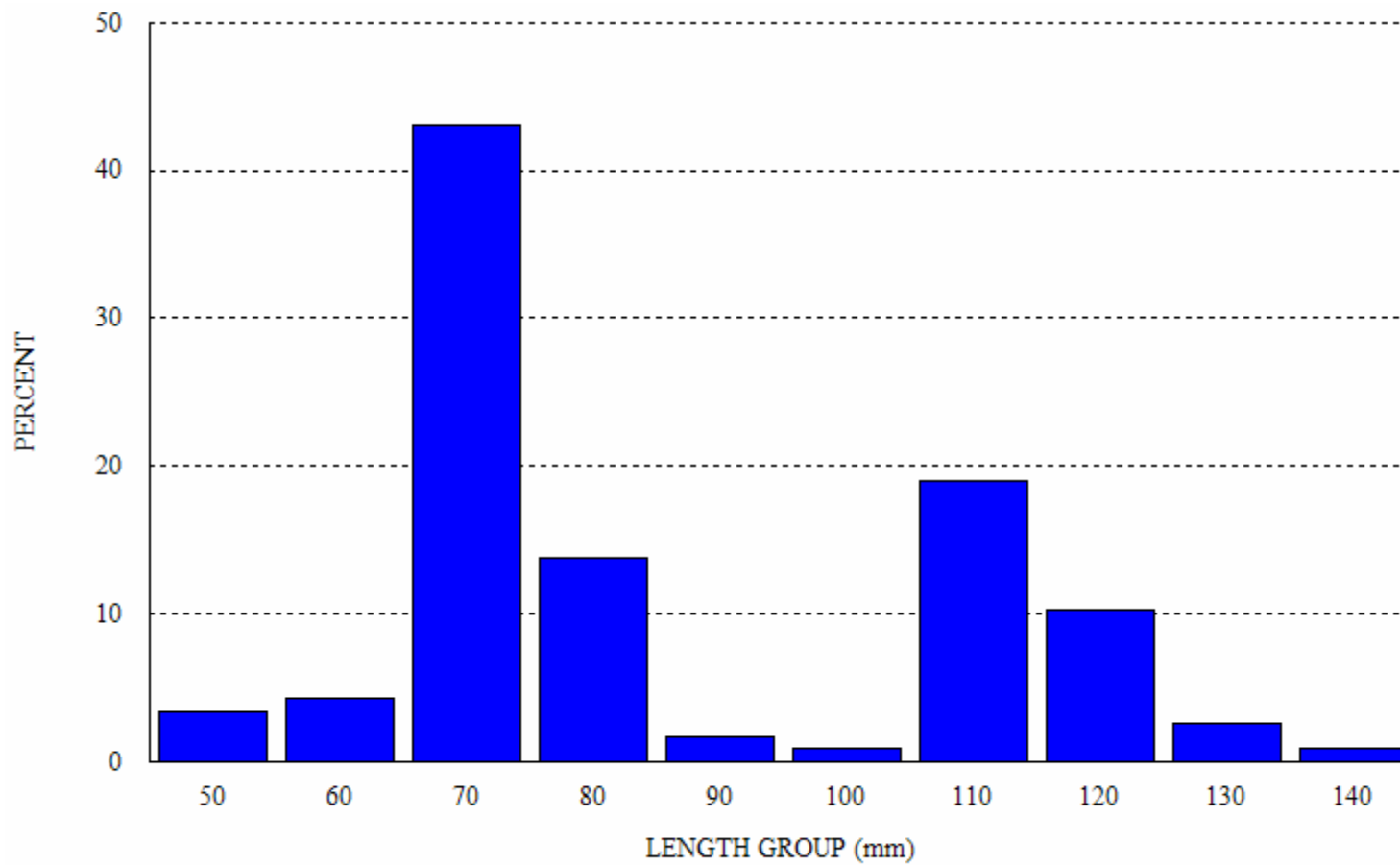


Figure 10. Length frequency distribution of threadfin shad (N =116) from Weiss Reservoir, spring 2006.