

BARTLETT'S FERRY RESERVOIR

MANAGEMENT REPORT

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Prepared by

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Introduction

Bartlett's Ferry Reservoir, also known as Lake Harding, is a 5,850 acre impoundment on the Chattahoochee River east of Opelika, immediately downstream from the much larger West Point Reservoir. The majority of this reservoir lies within the state of Georgia; however, Halawakee Creek, the largest tributary on the impoundment is located entirely in Alabama. Bartlett's Ferry was previously sampled for largemouth and spotted bass by spring electrofishing in 1983, 1984, 1987, 1990, 1993, 1996, 2000, and 2003 (Thompson and Hornsby 1990, Higginbotham et al. 1991, Higginbotham et al. 1994, Jernigan et al. 1997, Jernigan et al. 2000, and McHugh et al. 2003).

Refer to "An Angler's Guide to Interpreting Alabama Wildlife and Freshwater Fisheries Reservoir Reports" for a detailed description of fisheries terms used in this report. It is available on the Outdoor Alabama website at:

<http://www.outdooralabama.com/fishing/freshwater/where/reservoirs/guide.pdf>.

Methods

Largemouth and spotted bass were collected via spring electrofishing according to the guidelines outlined in the Alabama Reservoir Management Manual (1999). Thirteen sample sites were utilized by District-IV personnel from April 3-6, 2007 for a total of 6.5 hours of pedal down time.

Results and Discussion

The spring electrofishing sample consisted of 339 largemouth bass and 225 spotted bass. Evidence existed in the 2003 sample that the black bass population had shifted from largemouth

bass to spotted bass dominance (McHugh et al. 2003). Reports from Georgia DNR similarly suggest that spotted bass abundance has increased in recent years while largemouth bass abundance has remained stable. This was not apparent in the 2007 spring sample, since largemouth bass comprised 60% of the total black bass catch. It has been documented that larger spotted bass are more difficult to collect by spring electrofishing than are largemouth bass (McHugh et al. 1993); therefore, their overall abundance may not be accurately reflected by CPE data.

Largemouth bass were collected at the rate of 52.2 fish per hour. This value is the highest CPE for this species since 1990 (Higginbotham et al. 1991) and is identical to the statewide mean for fish greater than 8-inches in length. Distribution among the different RSD groups has changed considerably over the last three samples (Figure 4). Stock and quality sized fish have become gradually more abundant; whereas, preferred and memorable sized fish have decreased in abundance. This observation was also recorded in the B.A.I.T. 2006 Annual Report, where bass average weight has gradually declined since 2003 (Abernethy 2007). In 1995, the state of Georgia adapted nutrient standards which decreased phosphorus loading in the Chattahoochee River. Changes in fish size structure are presumably linked to these reductions in reservoir fertility. Similarly, changes in largemouth bass growth have also been observed. When compared to historical samples growth through age three appears to have increased, but slower growth has been observed for age four and older fish. According to the von Bertalanffy growth equation, largemouth bass took 2.47, 4.10, and 10.96 years to reach twelve, fifteen, and twenty inches respectively. Growth to twelve inches was equal to the statewide average, but older fish grew at rates well below this value. Mortality for largemouth bass was calculated at 36% between the ages of 3 and 12 (Figure 6).

Spotted bass were collected at the rate of 34.6 fish per hour during 2007. This rate is similar to the mean five year sampling CPE for spotted bass (Table 2). RSD size distribution for spotted bass expressed no discernable pattern of change over the last three sampling years (Figure 5). Only six year classes were represented in the 2007 sample and all spotted bass collected were less than fifteen inches in total length. Large fish were also noticeably absent from samples obtained in 2003, 2000, 1996, and 1993. Since older fish were not adequately represented in the sample, a growth estimate was difficult to verify. The growth of younger fish appeared adequate, but was noticeably slower than largemouth bass. Mortality for spotted bass between the ages of 3 and 6 was calculated at 64% (Figure 7). This value should be interpreted with caution since larger spotted bass are noticeably more difficult to capture during spring electrofishing samples due to habitat preferences (McHugh et al. 1993).

Data from the B.A.I.T. 2006 Annual Report indicated that Bartlett's Ferry Reservoir ranked poorly in quality indicator groups relating to fish size (Abernethy 2007). In both the average weight and pounds per angler day categories, this reservoir ranked last out of twenty reporting reservoirs statewide. These tournament data are consistent with spring electrofishing results which indicated that recruitment is high and small fish are abundant. The angler harvest rate of black bass in Bartlett's Ferry Reservoir is also low, as indicated by the results of the 2003 angler creel survey (McHugh et al. 2003). This compounds the problem of small bass overabundance.

Observations made by field personnel during the 2006-07 sampling season indicated that boating access improvements are warranted on Bartlett's Ferry Reservoir. The Po Boy's area on the south side of the reservoir has a large parking area, but does not include floating docks or boat slips which are desirable during the peak boating and fishing season. The Halawakee

Creek access area has similar issues with boat docking, as well as a need for additional parking. Future consideration should be given to improving these existing access areas or developing new sites with better accommodations. Similarly, bank angling opportunities are severely limited on Bartlett's Ferry Reservoir and thus new areas should be constructed to provide increased opportunities.

Conclusions

- Bartlett's Ferry Reservoir should be sampled again in 3-4 years according to the Alabama Reservoir Management Manual.
- Since bass recruitment is high, angler harvest rates are low, and the abundance of largemouth bass less than fifteen inches and spotted bass less than fourteen inches is adequate, a length limit is not recommended.
- The need exists to develop or improve existing boating access and bank angling areas.

Literature Cited

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TABLE 1. Bartlett's Ferry Reservoir morphometric, physical, and chemical characteristics.

Surface area	5,850 surface acres
Drainage area	4,200 square miles
Full pool elevation	521 feet-msl
Mean annual fluxuation	1.1 feet
Shoreline distance	156 miles
Shoreline development index	14.6
Mean depth	32 feet
Maximum depth	111 feet
Outlet depth	surface
Thermocline Depth	6-7 feet
Total dissolved solids	97.9 mg/l (ADEM 2005)
Chlorophyll-a	8.0 µg/l (ADEM 2005)
Morphoedaphic index	3.06 TDS/mean depth (Ryder 1965)
Growing season	220 frost free days (Jenkins 1967)
Year of Impoundment	1926

TABLE 2. Relative stock density (RSD), catch per effort (CPE), substock ratio (SSR), and relative weight (Wr) of spring collected target species from Bartlett's Ferry Reservoir.

LARGEMOUTH BASS																								
Year	Gear	No. of Samples	Total Effort (hrs.)	Substock			RSD _{S-Q}				RSD _{Q-P}				RSD _{P-M}				RSD _{M-T}				Total	
				No.	CPE	SSR	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE
1993	EF	5	2.4	15	6.20	15	29	11.98	29	85	28	11.57	28	90	32	13.22	32	88	11	4.55	11	95	115	47.52
1996	EF	6	3.0	13	4.33	12	19	6.33	17	84	37	12.33	34	88	42	14.00	38	91	12	4.00	11	94	123	41.00
2000	EF	12	6.0	25	4.17	27	17	2.83	19	82	38	6.33	42	81	30	5.00	33	82	6	1.00	7	84	116	19.33
2003	EF	10	4.9	24	4.90	24	29	5.92	29	81	43	8.78	43	88	23	4.69	23	88	4	0.82	4	96	123	25.10
2007	EF	13	6.5	29	4.46	9	118	18.15	38	87	139	21.38	45	86	45	6.92	15	86	8	1.23	3	92	339	52.15
LAKE AVERAGE					4.81	18		9.04	26	84		12.08	38	87		8.77	28	87		2.32	7	92		37.02

SPOTTED BASS																								
Year	Gear	No. of Samples	Total Effort (hrs.)	Substock			RSD _{S-Q}				RSD _{Q-P}				RSD _{P-M}				RSD _{M-T}				Total	
				No.	CPE	SSR	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE
1993	EF	7	3.5	7	2.00	11	33	9.43	54	102	23	6.57	38	111	5	1.43	8	102					68	19.43
1996	EF	8	4.0	42	10.50	41	28	7.00	27	100	55	13.75	54	101	19	4.75	19	102					144	36.00
2000	EF	12	6.0	37	6.17	48	38	6.33	49	95	35	5.83	45	97	4	0.67	5	96					114	19.00
2003	EF	10	5.0	136	27.20	132	44	8.80	43	102	40	8.00	39	103	19	3.80	18	105					239	47.80
2007	EF	13	6.5	72	11.08	47	67	10.31	44	100	78	12.00	51	98	8	1.23	5	100					225	34.62
LAKE AVERAGE					11.39	56		8.37	43	100		9.23	45	102		2.38	11	101						31.37

TABLE 3. Non-target species observed during routine sampling of Bartlett's Ferry Reservoir, spring 2007.

Species
Black Crappie
Blacktail Shiner
Bluegill
Brook Silverside
Brown Bullhead
Chain Pickerel
Channel Catfish
Common Carp
Gizzard Shad
Green Sunfish
Hybrid Striped Bass
Redbreast Sunfish
Redear Sunfish
Spotted Gar
Spotted Sucker
Threadfin Shad
Warmouth
White Crappie
Yellow Perch

TABLE 4. Age composition and mean length of largemouth bass collected from Bartlett's Ferry Reservoir, spring 2007.

Annulus	Year Class	Number	Percent	CPE	Mean Length	Standard Error	Length Range
1	2006	72	21.2	11.1	196.6	4.4	73 - 252
2	2005	107	31.6	16.5	288.1	2.9	202 - 349
3	2004	78	23.0	12.0	344.8	2.9	293 - 402
4	2003	39	11.5	6.0	355.9	4.7	290 - 428
5	2002	20	5.9	3.1	400.9	7.6	351 - 470
6	2001	2	0.6	0.3	426.0	25.0	401 - 451
7	2000	7	2.1	1.1	464.3	17.9	407 - 522
8	1999	5	1.5	0.8	482.6	32.9	380 - 560
9	1998	5	1.5	0.8	523.8	22.8	467 - 583
10	1997	2	0.6	0.3	488.5	2.5	486 - 491
11	1996	1	0.3	0.2	564.0		564
12	1995	1	0.3	0.2	453.0		453
Total		339	100	52.2			

TABLE 5. Age composition and mean length of spotted bass collected from Bartlett's Ferry Reservoir, spring 2007.

Annulus	Year Class	Number	Percent	CPE	Mean Length	Standard Error	Length Range
1	2006	84	37.3	12.9	142.1	3.7	80 - 254
2	2005	69	30.7	10.6	258.2	4.5	172 - 340
3	2004	53	23.6	8.2	311.8	3.6	251 - 377
4	2003	10	4.4	1.5	327.6	6.8	281 - 358
5	2002	7	3.1	1.1	351.6	6.0	328 - 379
6	2001	2	0.9	0.3	355.0	9.0	346 - 364
Total		225	100	34.6			

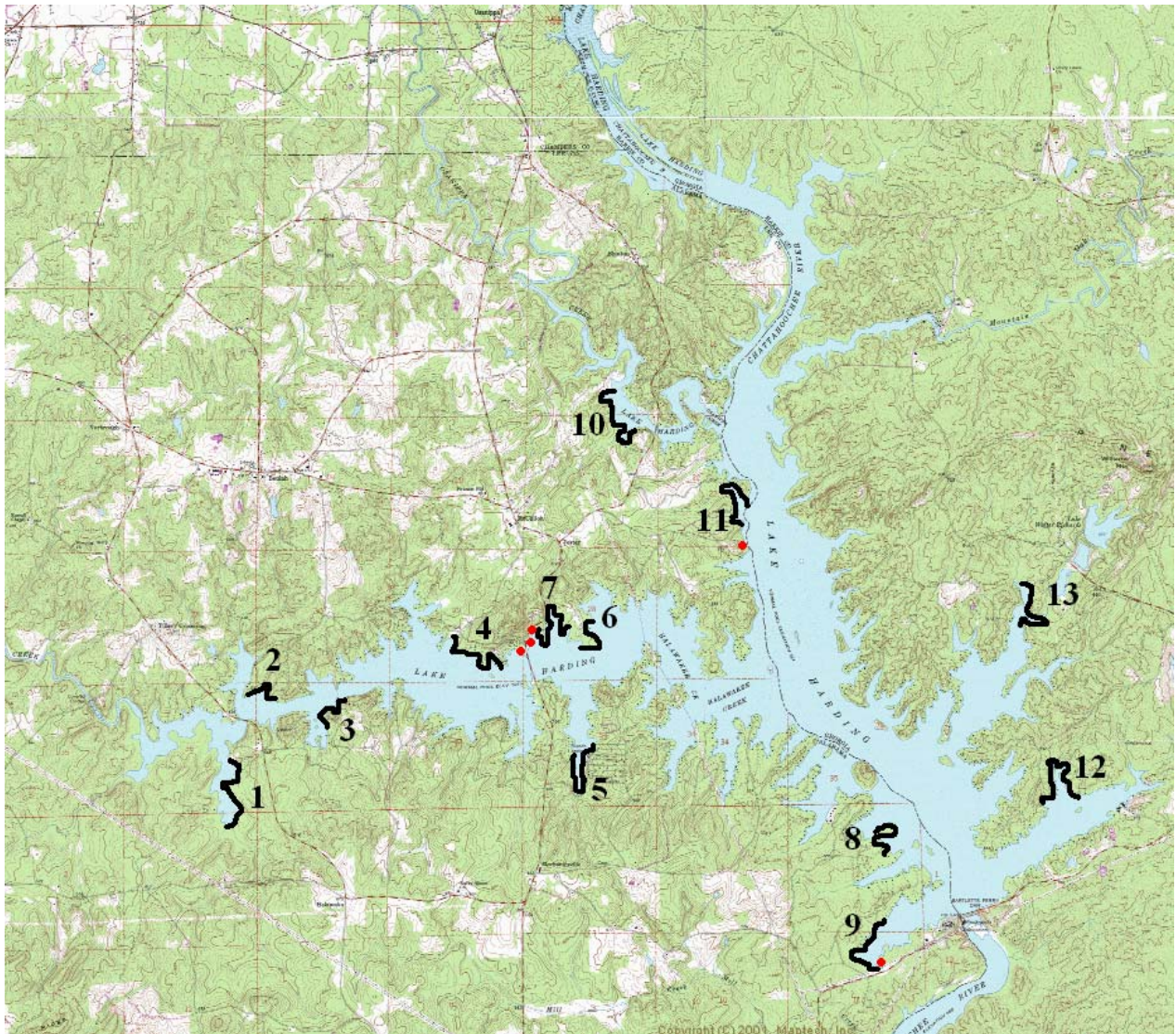


FIGURE 1. Map of Bartlett's Ferry Reservoir with the thirteen spring 2007 electrofishing locations highlighted along the shoreline. Public access areas are marked by a red dot.

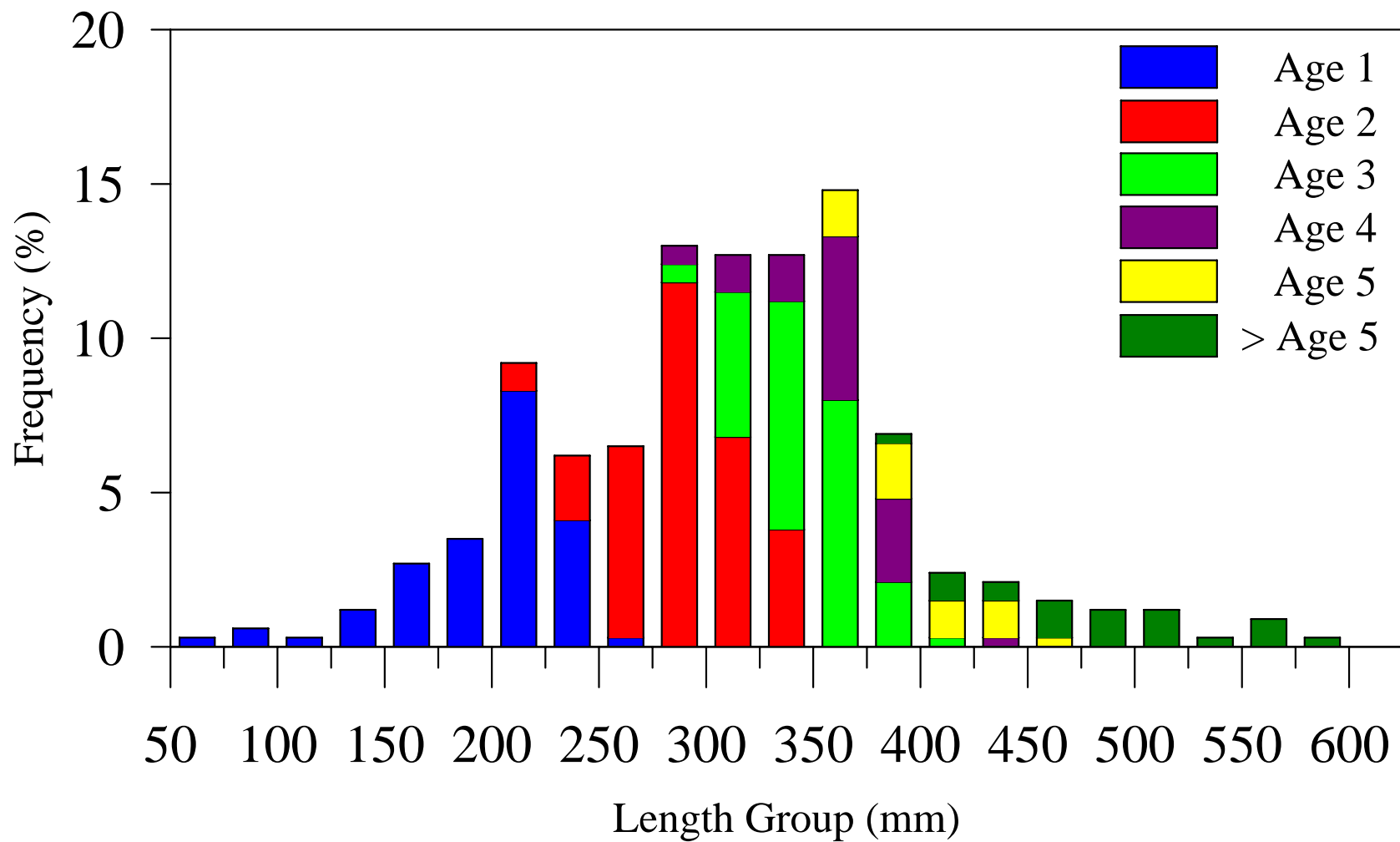


FIGURE 2. Length-at-age frequency of largemouth bass (N=339) collected from Bartlett's Ferry Reservoir, spring 2007.

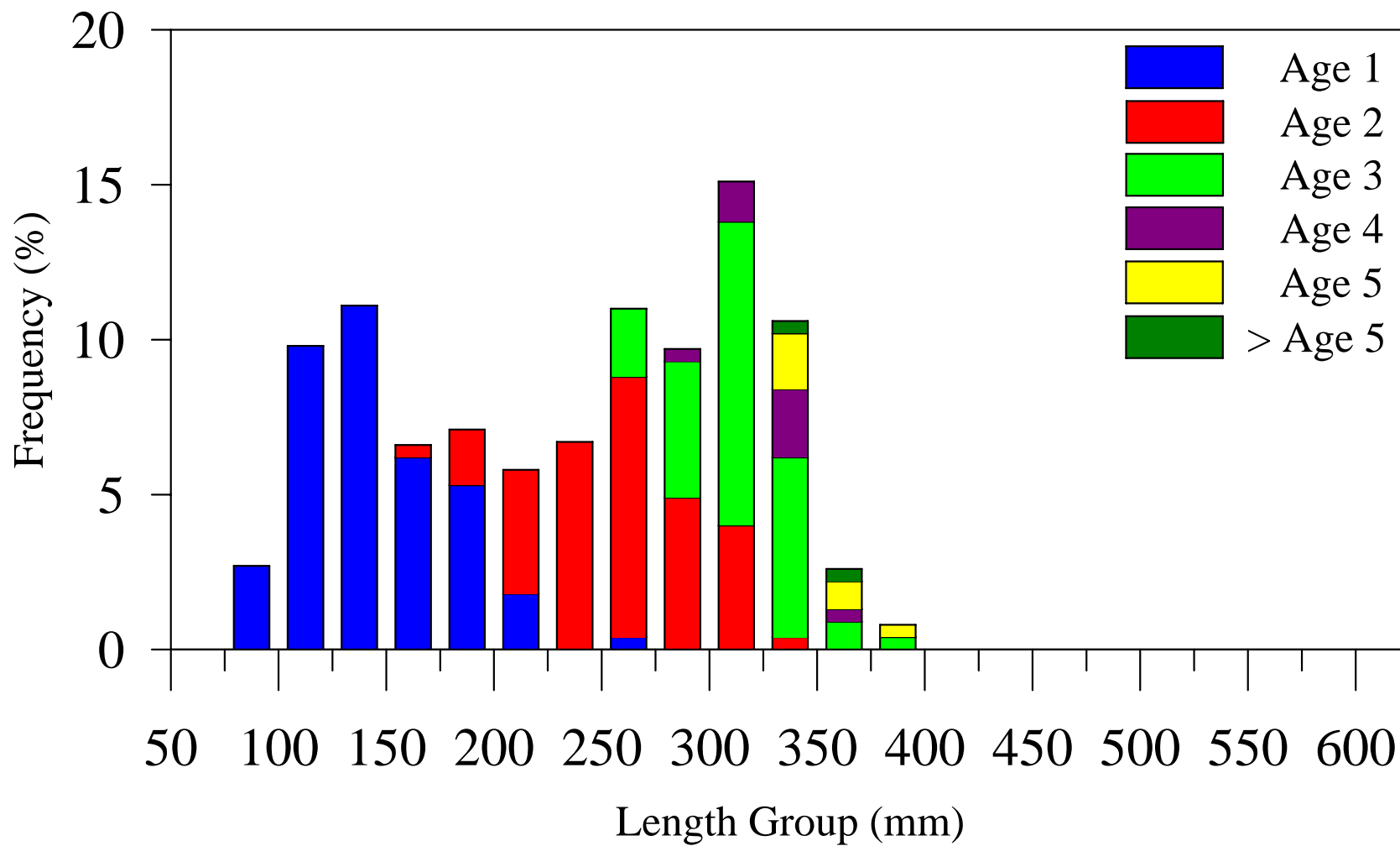


FIGURE 3. Length-at-age frequency of spotted bass (N=225) collected from Bartlett's Ferry Reservoir, spring 2007.

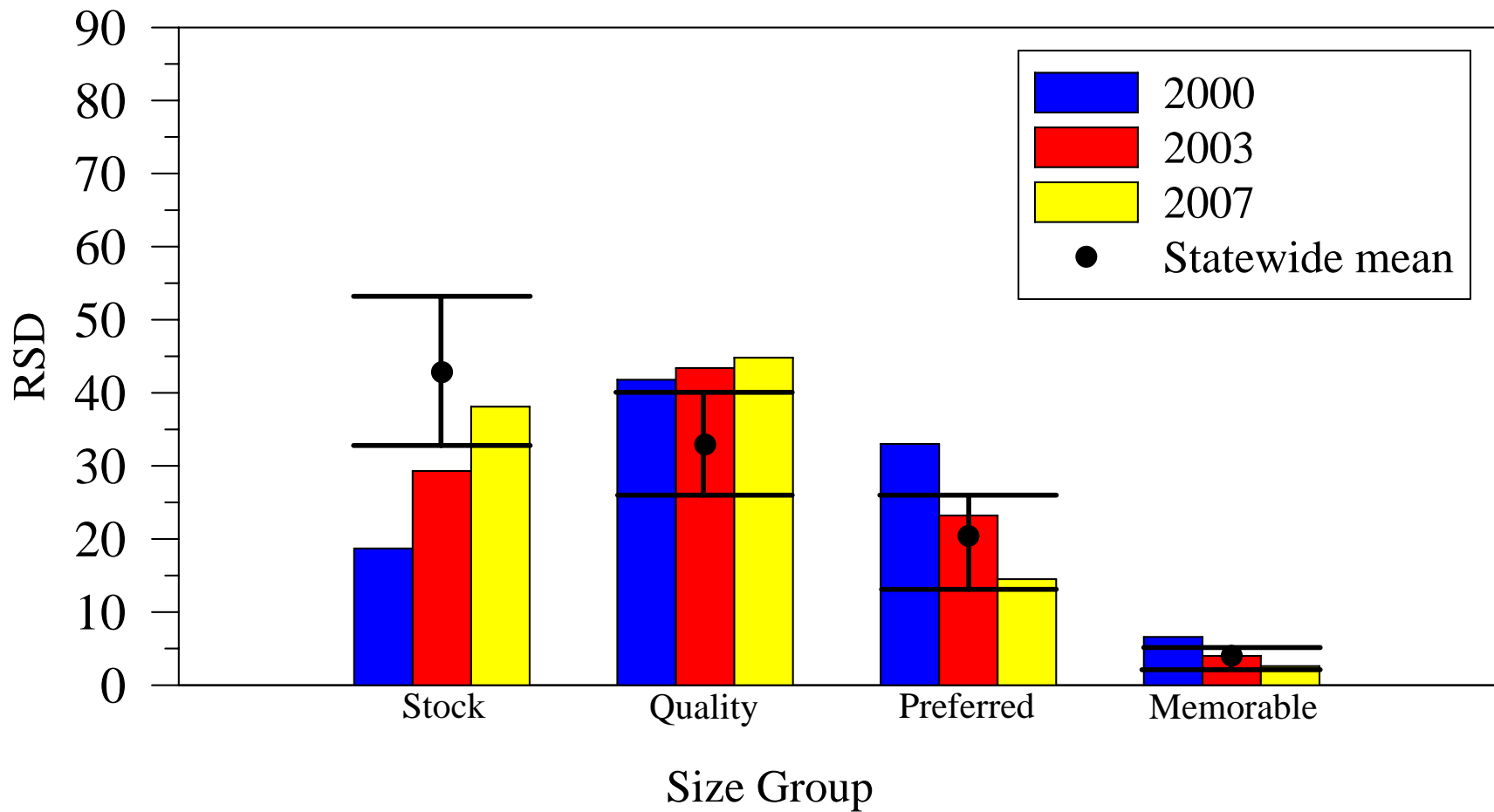


FIGURE 4. The relative stock density (RSD) and statewide mean of largemouth bass in Bartlett's Ferry Reservoir, spring 2000, 2003, and 2007. The I-beam denotes the 25th and 75th percentiles of RSD values of largemouth bass, statewide.

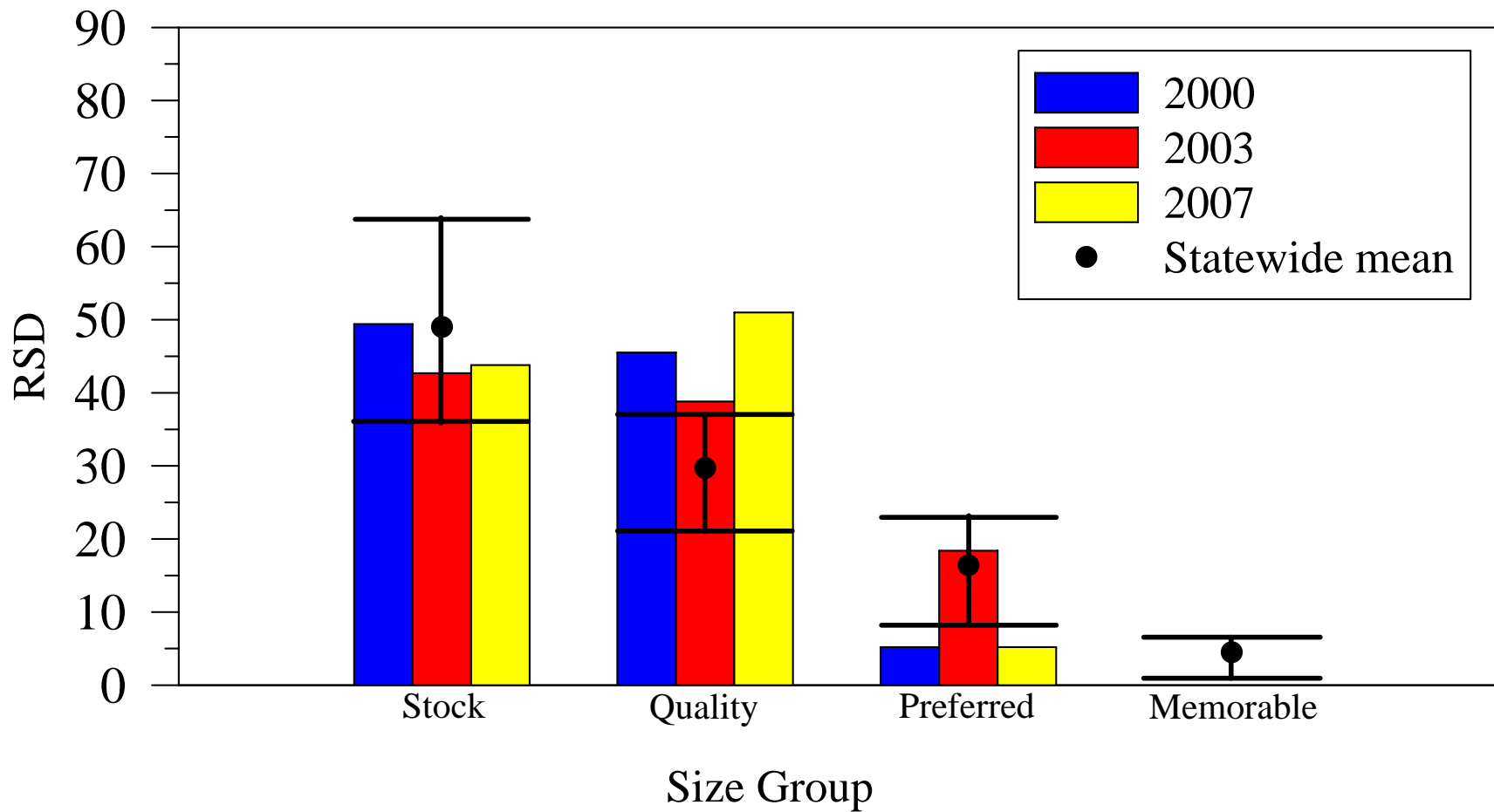


FIGURE 5. The relative stock density (RSD) and statewide mean of spotted bass in Bartlett's Ferry Reservoir, spring 2000, 2003, and 2007. The I-beam denotes the 25th and 75th percentiles of RSD values of spotted bass, statewide.

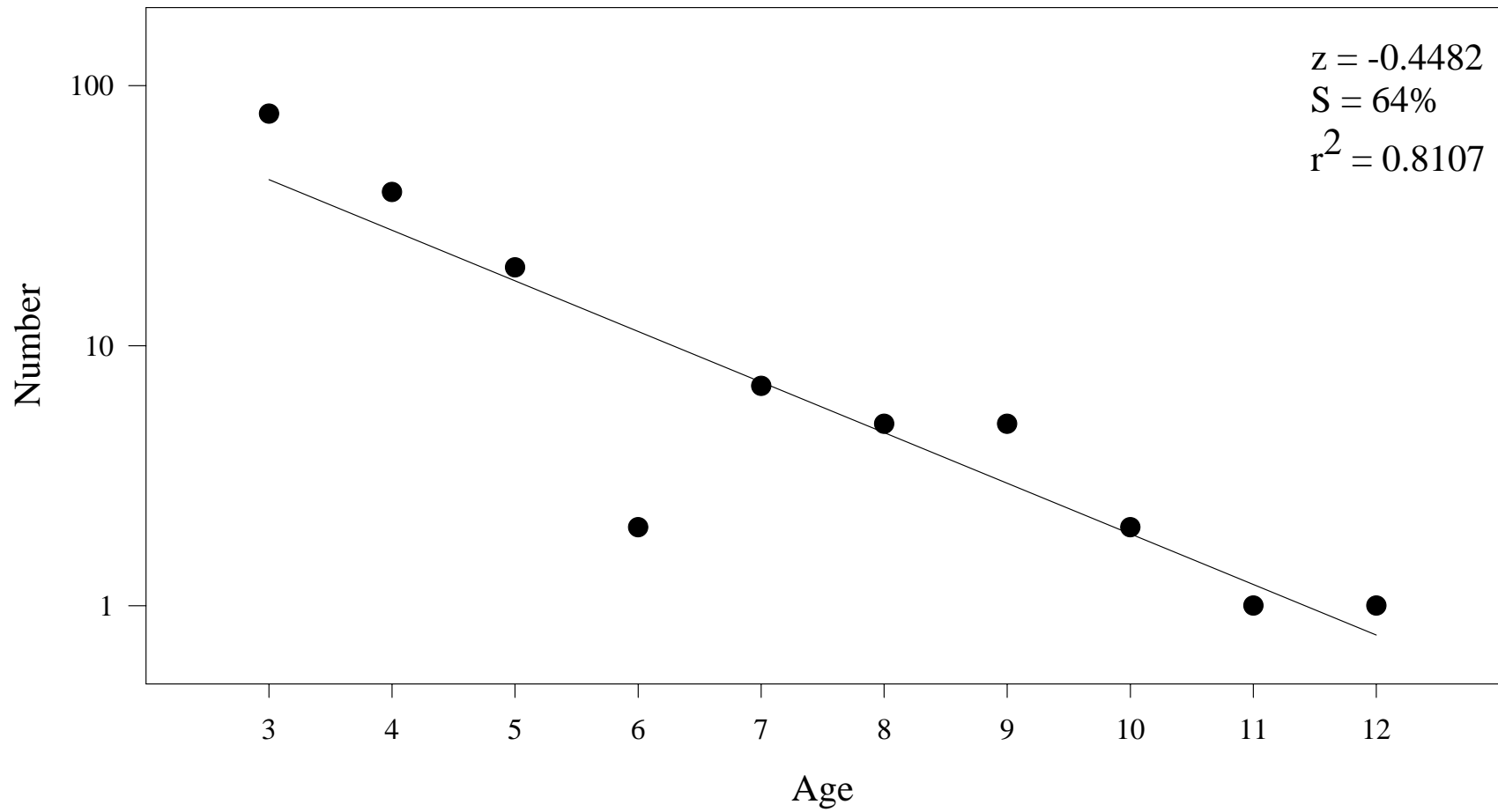


FIGURE 6. Total annual mortality regression for largemouth bass (ages 3-12) collected from Bartlett's Ferry Reservoir, spring 2007.

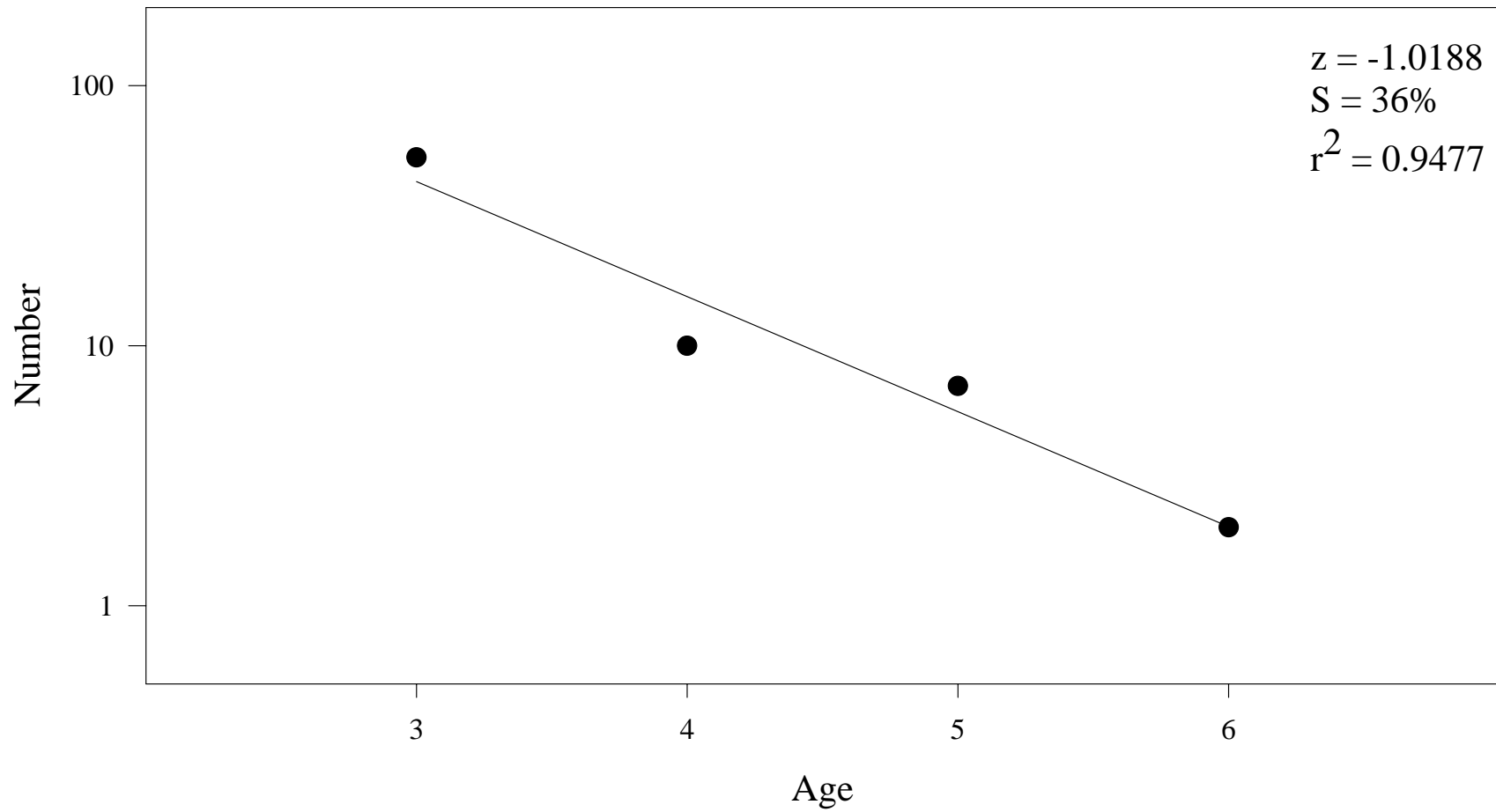


FIGURE 7. Total annual mortality regression for spotted bass (ages 3-6) collected from Bartlett's Ferry Reservoir, spring 2007.

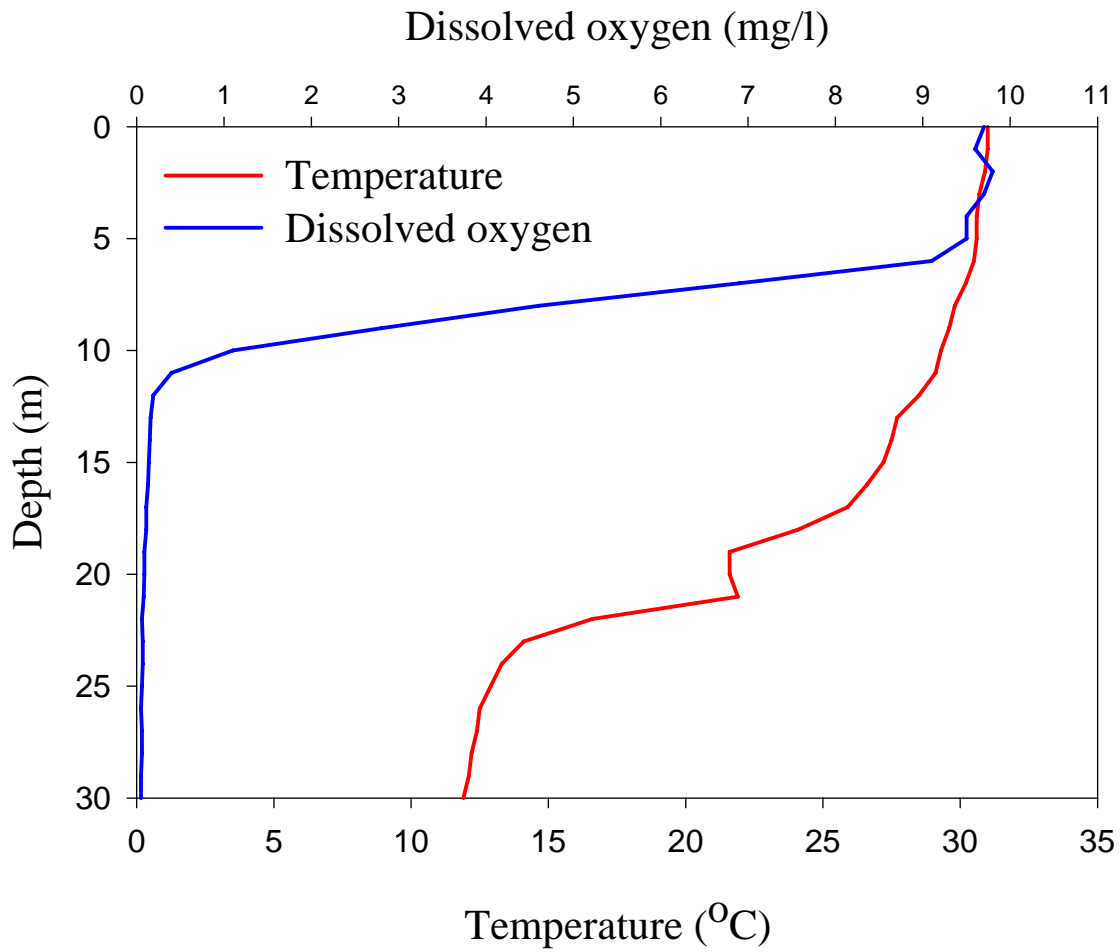


FIGURE 8. Temperature and dissolved oxygen profiles in Bartlett's Ferry Reservoir forebay, August 21, 2007.