

JONES BLUFF RESERVOIR
MANAGEMENT REPORT
SPRING 2009

Prepared by

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Introduction

Jones Bluff Reservoir, also known as R. E. “Bob” Woodruff Lake, is a 12,510 acre impoundment on the Alabama River near Montgomery. It is operated by the U. S. Army Corps of Engineers as a run-of-river reservoir with limited storage capacity and a very short retention time. Black bass in Jones Bluff Reservoir were previously sampled by the Alabama Department of Conservation in 1986, 1989, 1990, 1993, 1996, 1999, 2002, and 2006 according to management program guidelines. Both largemouth and spotted bass subsist in the Alabama River, but distinct habitat preferences are evident. Largemouth bass prefer backwater areas away from the main river, whereas spotted bass inhabit the more channelized areas with current. There is currently no minimum length limit for either black bass species on this impoundment.

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. The Angler’s Guide is available on the Department’s 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 (Cook 1999). Similar to the 2006 collection (Abernethy et al 2006), sample sites were stratified in an effort to describe the spotted bass population that had not been targeted in years prior. Fourteen sites (7 backwater and 7 riverine) were sampled for 30 minutes each from April 15-23, 2009 by District-IV personnel. To remain consistent with past samples, largemouth bass comparisons include 2006 and 2009 data taken from backwater areas only. Similarly, spotted bass population statistics are derived only

only from collections in riverine areas where their concentrations are highest. Dissolved oxygen and temperature profile data were not collected since this impoundment does not stratify due to short retention time.

Results and Discussion

The spring electrofishing sample consisted of a total of 278 largemouth bass and 185 spotted bass. As expected, the stratification of sample sites yielded a distinct difference in which black bass species was dominant in a given area contingent upon the habitat type sampled. In backwater areas largemouth bass comprised 84% of the black bass sample, while in riverine areas spotted bass made up 77% of the total sample (Table 5). These values are similar to the results observed in 2006 where largemouth bass and spotted bass comprised 80% and 89% of their preferential habitat sites respectively (Abernethy et al. 2006).

Largemouth bass were collected at the rate of 67.7 fish per hour which is very similar to the seven-year lake average (Table 3), but higher than values observed for the last two samples (Rider et al. 2002, Abernethy et al. 2006). This is a 69% increase in catch rates compared to the 2006 sample and ended the downward trend which had been observed since 1996. Quality-sized largemouth bass were much more abundant in 2009, although the abundance of preferred and memorable sized fish was below the lake average. No largemouth bass greater than 20-inches in total length was collected from backwater sites, although one large 22-inch fish was collected from a riverine site.

Mean relative weights of each size category of largemouth bass were excellent and exceeded or equaled values from past collections (Table 3). Growth rates were also fast (Figure 11) when compared to statewide mean length-at-age data. According to the von Bertalanffy

growth equation fish in Jones Bluff Reservoir take approximately 2.19, 3.32, and 7.01 years to reach twelve, fifteen, and twenty inches respectively. Total annual mortality for largemouth bass was estimated at 56% (Figure 9), which is the first valid estimate in recent years.

Spotted bass were collected at the rate of 39.7 fish per hour which is a 50% increase over catch rates observed in 2006 (Abernethy et al. 2006). Catch rates among the different size categories also increased for every group except for memorable (Table 4). Comparisons to statewide CPE data are difficult since most reservoir samples are not stratified for target species. The RSD of quality and preferred-size fish has increased since 2006, while the percentage of stock and memorable-size fish has decreased. When compared to statewide averages, the individual RSD calculations in the 2009 Jones Bluff sample were greater for each size group except for stock. Long term trend data for spotted bass was impossible to determine since they have only been a target species for the last two sample years.

The condition of spotted bass improved in 2009 as mean relative weights increased for every size group (Table 4). Similar to largemouth bass, growth rates of spotted bass were fast (Figure 12) and exceeded the statewide mean total length at each age. Spotted bass took an average of 2.04, 3.09, and 4.59 years to reach twelve, fifteen, and seventeen inches respectively. Total annual mortality for spotted bass was estimated to be 51% (Figure 10), which is similar to the 2006 estimate of 44% (Abernethy et al. 2006).

Significant rainfall during March and April created moderately high water levels on the Alabama River during the spring sampling period of 2009. This caused ordinary bank areas to be underwater and posed problems in the sampling of certain shorelines since flooded timber was difficult to electrofish per normal procedure. In backwater areas, this may have had an impact on the lack of memorable size largemouth bass in the sample since they were able to elude our electric

electric field more easily. Typically, river flows are known to increase the feeding response of many predatory fish species and as an indirect result may explain why mean relative weights and catch rates were higher in 2009 compared to past samples, especially for spotted bass.

According to the 2008 BAIT report, spotted bass comprised 68% of the total black bass tournament catch. The average weight of tournament caught bass has changed little over time, but categories for the number and pounds of bass per angler-day have increased each year since 2006. Jones Bluff did not have enough bass tournament clubs participating in the BAIT program in 2008 to include it in the rankings by quality indicators; therefore, it is important that more bass clubs get involved with reporting their tournament catch data.

Conclusion

- Jones Bluff should be sampled again in 3 to 4 years according to reservoir program guidelines. The stratification of sample sites should be continued in order to accurately describe both the largemouth and spotted bass populations.
- Although restrictive size limits have strong support by bass anglers, a minimum length limit is not recommended due to the current low rates of harvest by anglers.
- Hybrid striped bass stockings should continue at the current rate of 4 per acre annually.

Literature Cited

- Abernethy, D. L., J. C. Greene, and R. A. McVay. 2006. Jones Bluff Reservoir Management Report 2005-2006. Alabama Department of Conservation and Natural Resources, Montgomery.
- Cook, S. F. 1999. Alabama Reservoir Management Manual. Alabama Department of Conservation and Natural Resources, 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. American Fisheries Society, Southern Division, Bethesda, Maryland.
- Rider, S. J., J. J. McHugh, and T. R. Powell. 2002. Jones Bluff Reservoir Management Report 2002. Alabama Department of Conservation and Natural Resources, Montgomery.
- Ryder, R. A. 1965. A method for estimating the potential fish production of north-temperate lakes. *Transactions of the American Fisheries Society* 94:214-218.

TABLE 1. JONES BLUFF RESERVOIR MORPHOMETRIC, PHYSICAL AND CHEMICAL CHARACTERISTICS.

Surface Area	12,510 acres
Drainage Area	3,250 sq. mi.
Full Pool Elevation	125 feet-msl
Mean Annual Fluctuation	2 feet
Shoreline Distance	368 miles
Shoreline Development Index	23.5
Mean Depth	27.8 feet
Maximum Depth	60.0 feet
Outlet Depth	0-43 feet
Thermocline Depth	10 feet
Storage Ratio	55.2
Chlorophyll-a	18.6 (mg/m ³) (ADEM 2008 unpublished)
Total Dissolved Solids	64.8 mg/L (ADEM 2008 unpublished)
Morphoedaphic Index	2.3 TDS/mean depth (ft) (Ryder 1965)
Growing Season	235 frost free days (Jenkins 1967)
Date of Impoundment	1975

TABLE 2. NON-TARGET SPECIES OBSERVED DURING THE
ROUTINE SAMPLING OF JONES BLUFF RESERVOIR, SPRING 2009.

NON-TARGET SPECIES OBSERVED	
Black crappie	<i>Pomoxis nigromaculatus</i>
Blacktail shiner	<i>Campostoma venusta</i>
Blue catfish	<i>Ictalurus furcatus</i>
Bluegill	<i>Lepomis macrochirus</i>
Yellow bullhead	<i>Ameiurus natalis</i>
Channel catfish	<i>Ictalurus punctatus</i>
Flathead catfish	<i>Pylodictis olivaris</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Longear sunfish	<i>Lepomis megalotis</i>
Longnose gar	<i>Lepisosteus osseus</i>
Orangespotted sunfish	<i>Lepomis humilis</i>
Redear sunfish	<i>Lepomis microlophus</i>
Smallmouth buffalo	<i>Ictiobus bubalus</i>
Spotted gar	<i>Lepisosteus oculatus</i>
Spotted sucker	<i>Minytrema melanops</i>
Threadfin shad	<i>Dorosoma petenense</i>
Warmouth	<i>Lepomis gulosus</i>
White bass	<i>Morone chrysops</i>
White crappie	<i>Pomoxis annularis</i>

TABLE 3. RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (W_r) OF LARGEMOUTH BASS COLLECTED BY ELECTROFISHING FROM JONES BLUFF RESERVOIR, SPRING 1990-2009.

YEAR	TOTAL	SUBSTOCK			RSD _{S-Q}				RSD _{Q-P}				RSD _{P-M}				RSD _{M-T}				TOTAL	
	EFFORT ^a	NO.	CPE	SSR ^b	NO.	CPE	PCT.	W _r	NO.	CPE	PCT.	W _r	NO.	CPE	PCT.	W _r	NO.	CPE	PCT.	W _r	NO.	CPE
1990 ^c	1.83	36	19.7	36	50	27.3	50	87	22	12.0	22	90	23	12.6	23	91	5	2.7	5	90	136	74.3
1993 ^c	2.67	60	22.5	43	65	24.3	46	90	43	16.1	31	94	32	12.0	23	97					200	74.9
1996 ^c	2.00	57	28.5	46	72	36.0	58	87	24	12.0	19	97	26	13.0	21	99	3	1.5	2	90	182	91.0
1999 ^c	1.44	21	14.6	19	51	35.4	47	90	36	25.0	33	97	19	13.2	17	92	3	2.1	3	90	130	90.3
2002 ^c	3.50	66	18.9	55	43	12.3	36	84	39	11.1	32	86	32	9.1	26	87	7	2.0	6	89	187	53.4
2006 ^d	3.00	19	6.3	19	45	15.0	45	85	19	6.3	19	86	31	10.3	31	87	6	2.0	6	84	120	40.0
2009 ^d	3.50	65	18.6	38	80	22.9	47	99	63	18.0	37	100	29	8.3	17	99					237	67.7
LAKE AVERAGE			18.4	36		24.7	47	89		14.4	28	93		11.2	23	93		2.1	4	89		70.2

^aEffort in hours

^bSSR denotes substock ratio (the number of substock size fish per 100 fish stock size and larger).

^cAll sampling was conducted in backwater areas.

^dSampling data is for fish collected from backwater areas only.

TABLE 4. RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (W_r) OF SPOTTED BASS COLLECTED BY ELECTROFISHING FROM JONES BLUFF RESERVOIR, SPRING 2006 AND 2009.

YEAR	TOTAL	SUBSTOCK			RSD _{S-Q}				RSD _{Q-P}				RSD _{P-M}				RSD _{M-T}				TOTAL	
	EFFORT ^a	NO.	CPE	SSR ^b	NO.	CPE	PCT.	W_r	NO.	CPE	PCT.	W_r	NO.	CPE	PCT.	W_r	NO.	CPE	PCT.	W_r	NO.	CPE
2006 ^c	4.00	24	6.0	29	35	8.8	43	87	23	5.8	28	89	9	2.3	11	94	15	3.8	18	98	106	26.5
2009 ^c	3.50	25	7.1	22	34	9.7	30	106	41	11.7	36	111	30	8.6	26	113	9	2.6	8	115	139	39.7
LAKE AVERAGE			6.6	26		9.2	36	97		8.7	32	100		5.4	19	104		3.2	13	107		33.1

^aEffort in hours

^bSSR denotes substock ratio (the number of substock size fish per 100 fish stock size and larger).

^cAll sampling was conducted in riverine areas.

TABLE 5. RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (Wr) OF LARGEMOUTH AND SPOTTED BASS COLLECTED BY ELECTROFISHING FROM SPECIFIC AREAS OF JONES BLUFF RESERVOIR DURING SPRING 2009.

SPECIES	HABITAT TYPE ^a	TOTAL EFFORT ^b	SUBSTOCK			RSD _{S-Q}				RSD _{Q-P}				RSD _{P-M}				RSD _{M-T}				TOTAL	
			NO.	CPE	SSR ^c	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
LMB	RV	3.50	9	2.6	28	17	4.9	53	97	9	2.6	28	96	5	1.4	16	101	1	0.3	3	72	41	11.7
LMB	BW	3.50	65	18.6	38	80	22.9	47	99	63	18.0	37	100	29	8.3	17	99	0	0.0	0		237	67.7
LMB	BOTH	7.00	74	10.6	36	97	13.9	48	98	72	10.3	35	100	34	4.9	17	99	1	0.1	0	72	278	39.7
SPB	RV	3.50	25	7.1	22	34	9.7	30	106	41	11.7	36	111	30	8.6	26	113	9	2.6	8	115	139	39.7
SPB	BW	3.50	13	3.7	39	18	5.1	55	102	7	2.0	21	112	8	2.3	24	108	0	0.0	0		46	13.1
SPB	BOTH	7.00	38	5.4	26	52	7.4	35	105	48	6.9	33	111	38	5.4	26	112	9	1.3	6	115	185	26.4

^aHabitat type includes riverine (RV), backwater (BW), and combined (BOTH).

^bEffort is in hours

^cSSR denotes substock ratio (the number of substock size fish per 100 fish stock size and larger).

TABLE 6. AGE COMPARISON AND MEAN TOTAL LENGTH (mm) OF LARGEMOUTH BASS COLLECTED FROM JONES BLUFF RESERVOIR DURING SPRING 2009. TOTALS INCLUDE FISH FROM BOTH BACKWATER AND RIVERINE SITES.

Age	Year Class	Number		Percent		CPE		Mean TL		SE		TL Range	
		Total	Backwater	Total	Backwater	Total	Backwater	Total	Backwater	Total	Backwater	Total	Backwater
1	2008	119	103	42.8	43.5	17.0	29.4	183.7	183.2	3.5	3.8	88 - 257	88 - 257
2	2007	103	84	37.1	35.4	14.7	24.0	298.1	298.8	3.2	3.5	208 - 382	208 - 382
3	2006	43	40	15.5	16.9	6.1	11.4	367.0	363.8	6.4	6.5	269 - 452	269 - 452
4	2005	6	5	2.2	2.1	0.9	1.4	413.2	402.4	13.7	10.3	377 - 467	377 - 433
5	2004	4	4	1.4	1.7	0.6	1.1	433.3	433.3	27.1	27.1	380 - 482	380 - 482
6	2003	1	1	0.4	0.4	0.1	0.3	503.0	503.0	-	-	-	-
7	2002	1	0	0.4	0.0	0.1	0.0	560.0	-	-	-	-	-
8	2001	1	0	0.4	0.0	0.1	0.0	417.0	-	-	-	-	-
Total		278	237	100.0	100.0	39.7	67.7						

TABLE 7. AGE COMPARISON AND MEAN TOTAL LENGTH (mm) OF SPOTTED BASS COLLECTED FROM JONES BLUFF RESERVOIR DURING SPRING 2009. TOTALS INCLUDE FISH FROM BOTH BACKWATER AND RIVERINE SITES.

Age	Year Class	Number		Percent		CPE		Mean TL		SE		TL Range	
		Total	Riverine	Total	Riverine	Total	Riverine	Total	Riverine	Total	Riverine	Total	Riverine
1	2008	62	34	33.5	24.5	8.9	9.7	158.6	147.1	4.9	6.0	75 - 233	75 - 224
2	2007	75	63	40.5	45.3	10.7	18.0	293.7	290.7	4.3	4.6	210 - 360	210 - 347
3	2006	34	29	18.4	20.9	4.9	8.3	382.4	383.3	4.2	4.9	306 - 423	306 - 423
4	2005	6	6	3.2	4.3	0.9	1.7	419.0	419.0	10.2	10.2	380 - 452	380 - 452
5	2004	5	4	2.7	2.9	0.7	1.1	436.2	442.8	8.3	6.5	410 - 455	430 - 455
6	2003	1	1	0.5	0.7	0.1	0.3	496.0	496.0	-	-	-	-
7	2002	1	1	0.5	0.7	0.1	0.3	483.0	483.0	-	-	-	-
8	2001	0	0	0.0	0.0	0.0	0.0	-	-	-	-	-	-
9	2000	1	1	0.5	0.7	0.1	0.3	467.0	467.0	-	-	-	-
Total		185	139	100.0	100.0	26.4	39.7						

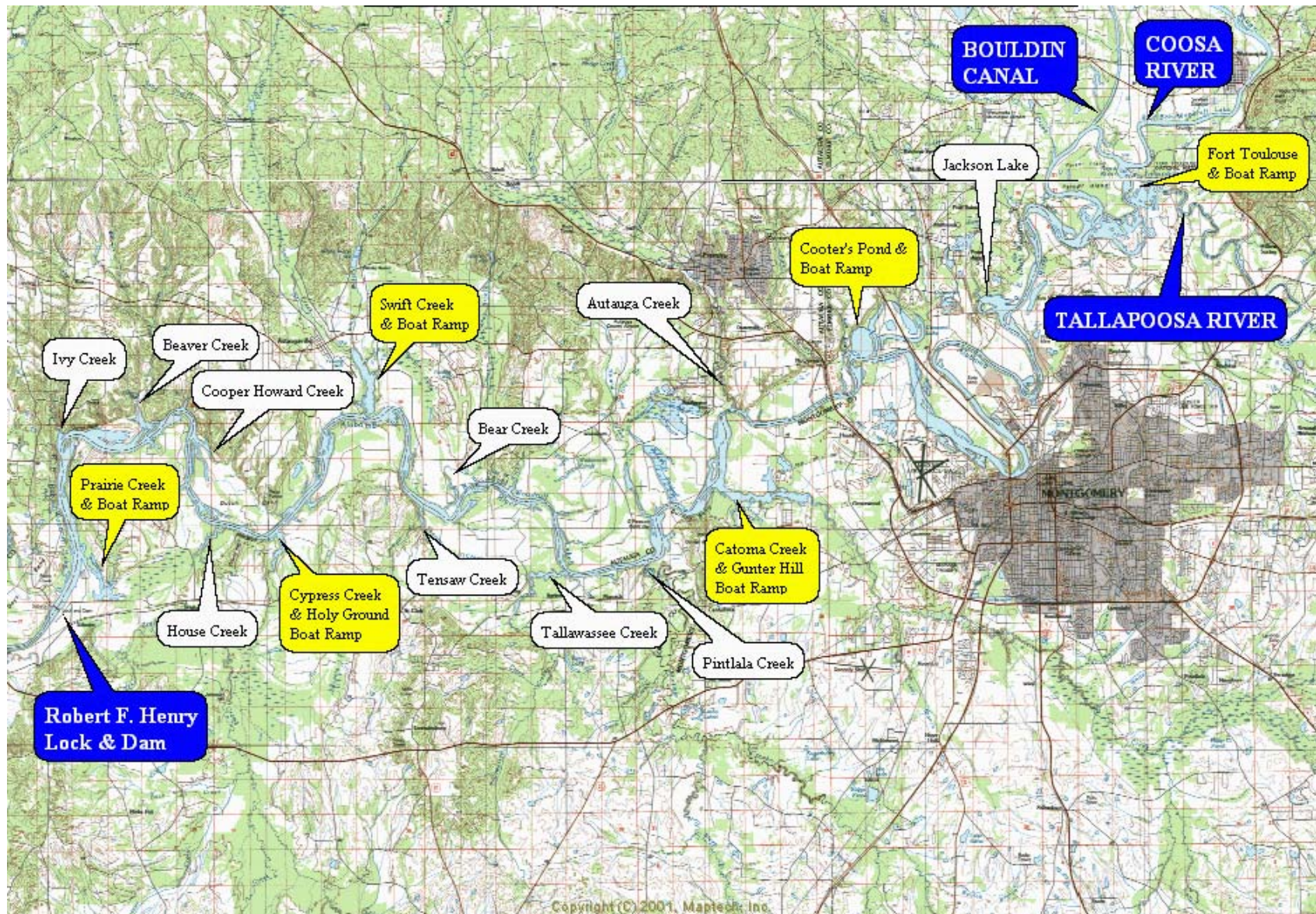


FIGURE 1. Map of Jones Bluff Reservoir with significant creeks, landmarks, and access areas.

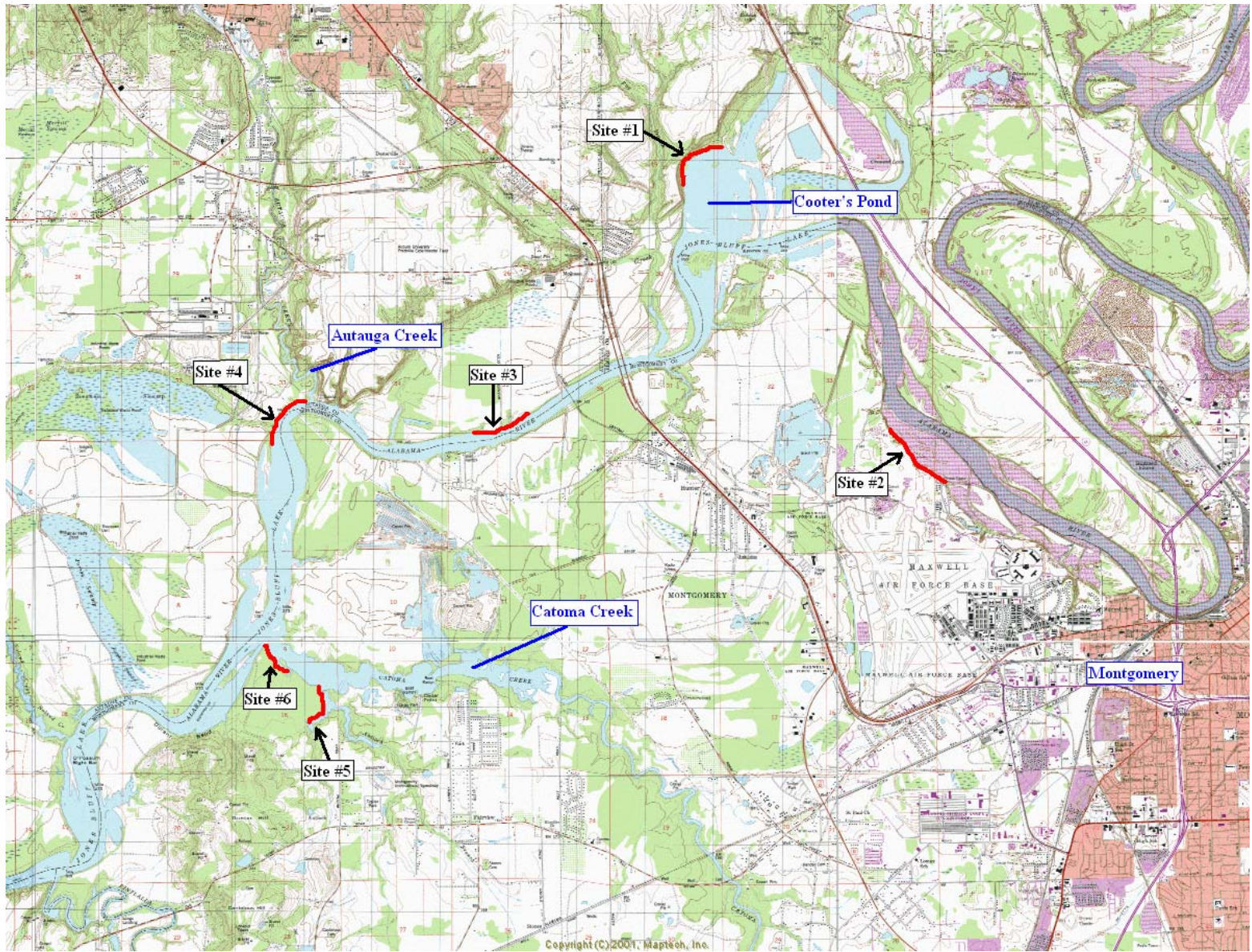


FIGURE 2. Map of upper Jones Bluff Reservoir with spring 2009 sampling sites.

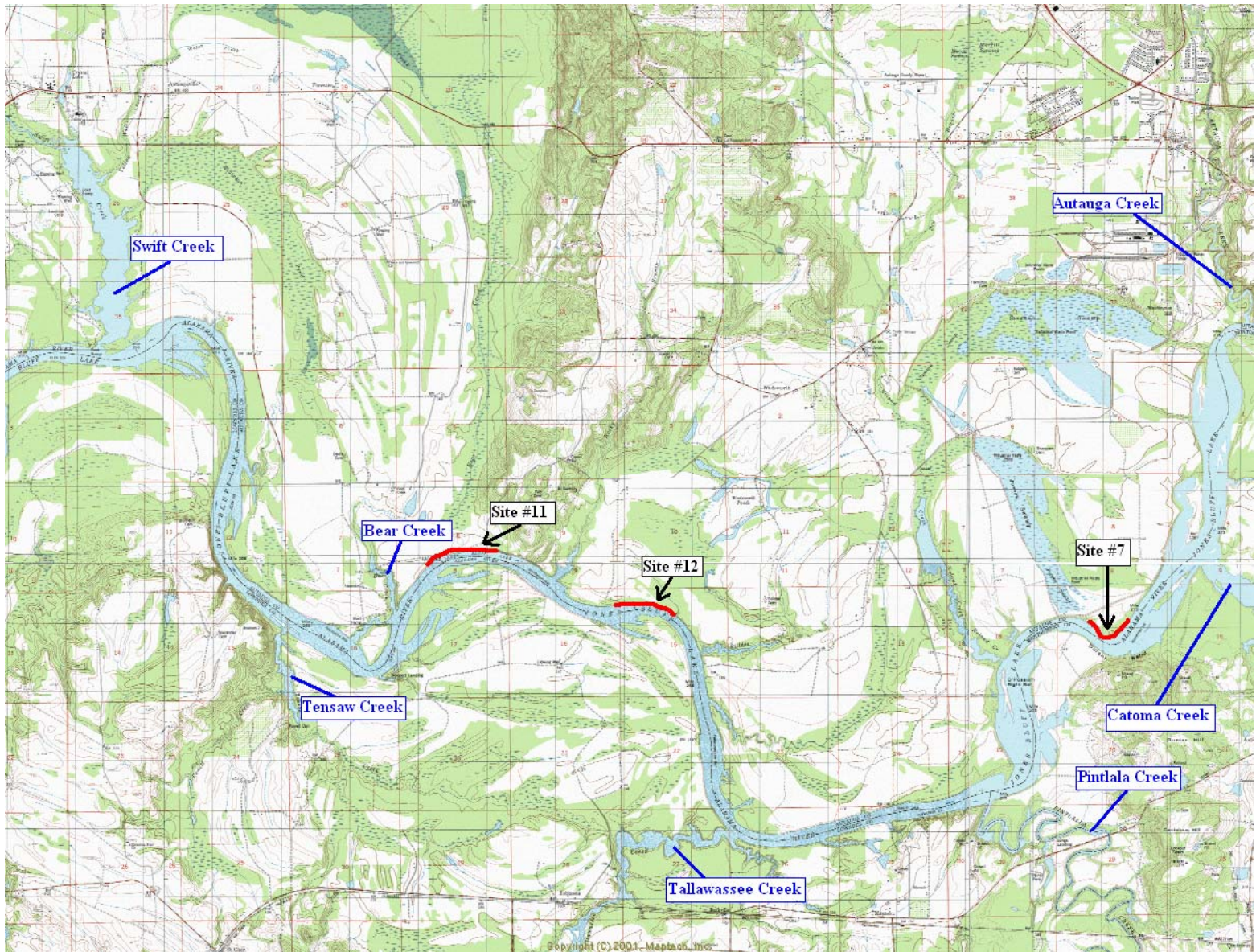


FIGURE 3. Map of middle Jones Bluff Reservoir with spring 2009 sampling sites.

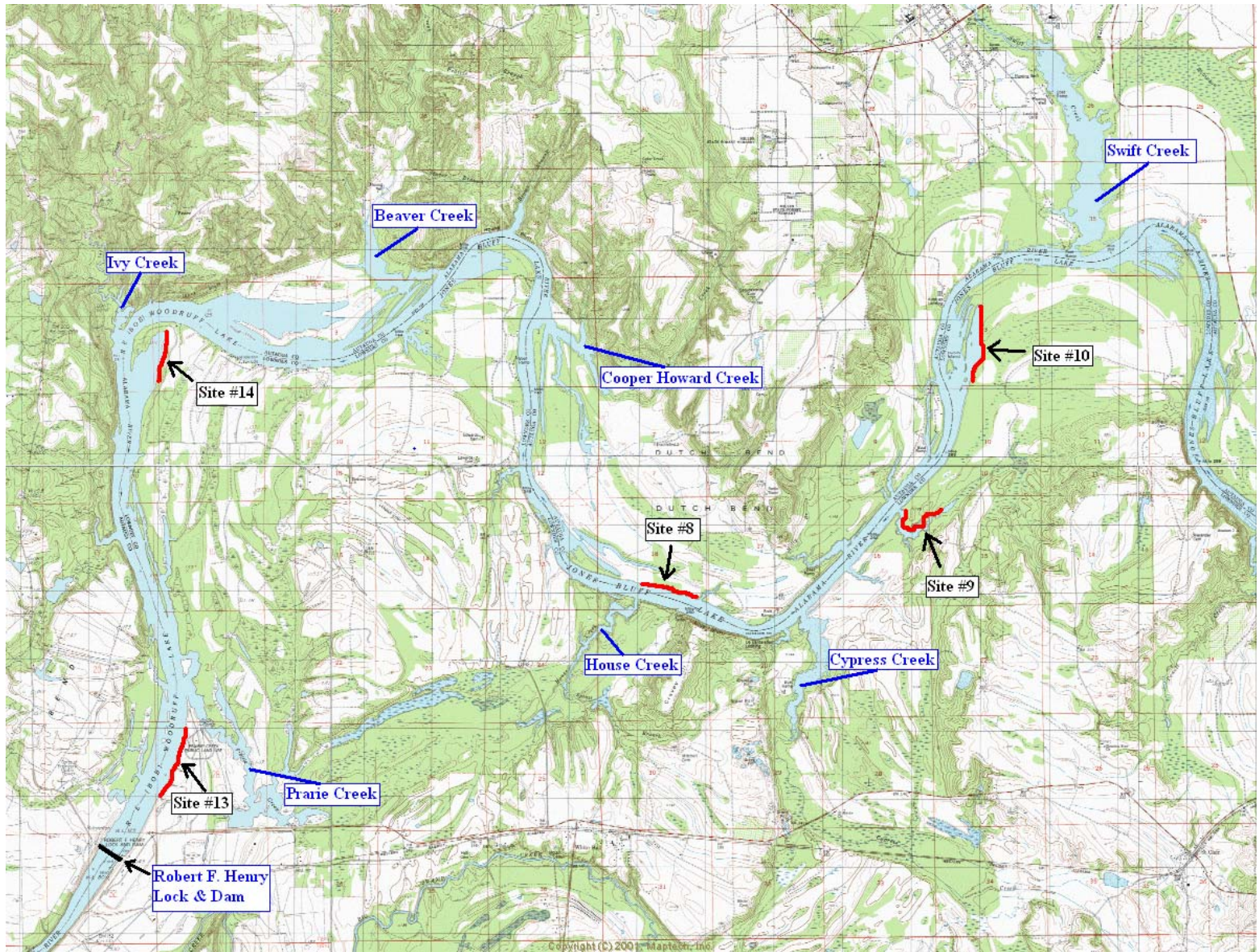


FIGURE 4. Map of lower Jones Bluff Reservoir with spring 2009 sampling sites.

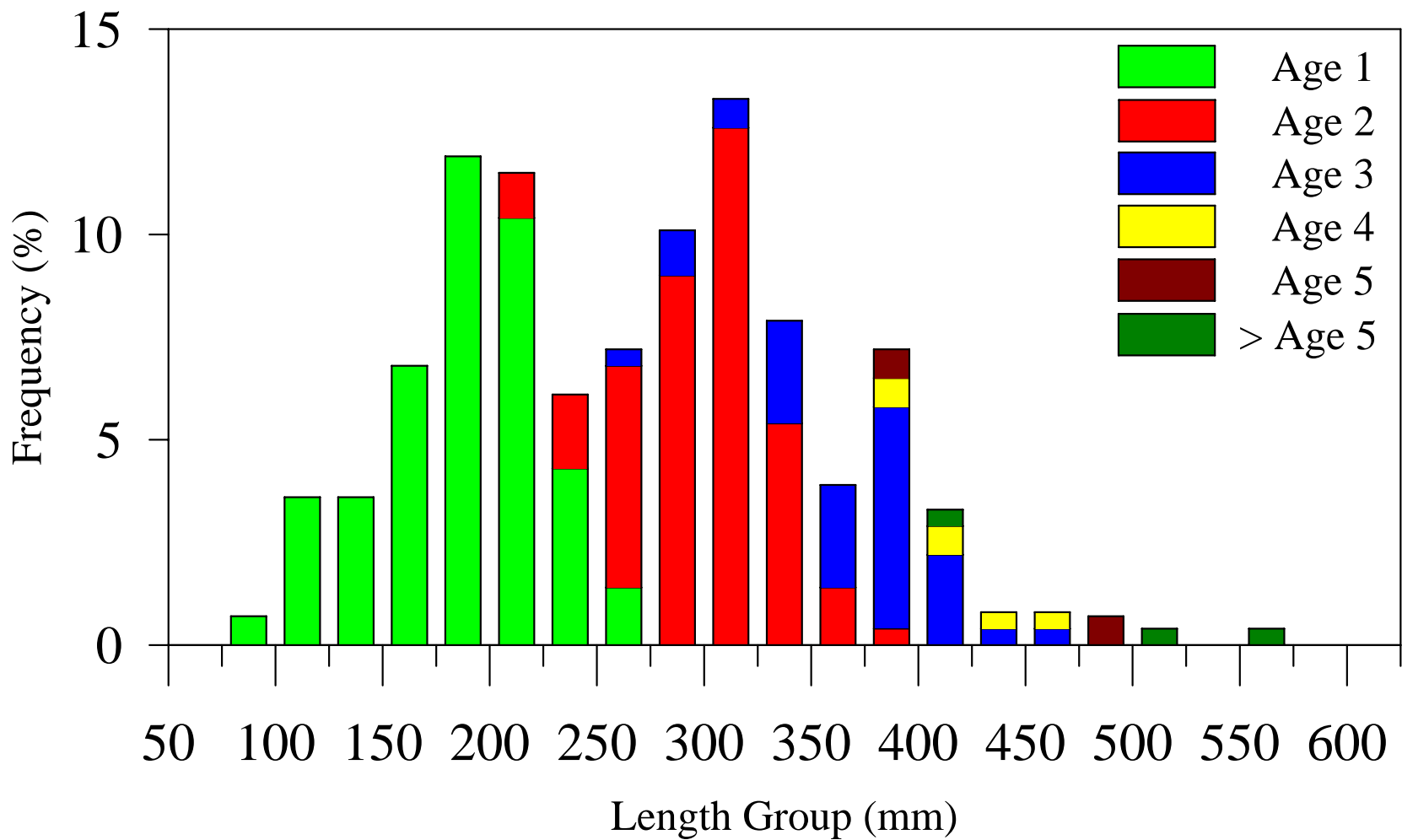


FIGURE 5. Length-at-age frequency of largemouth bass (N=278) taken from Jones Bluff Reservoir, spring 2009.

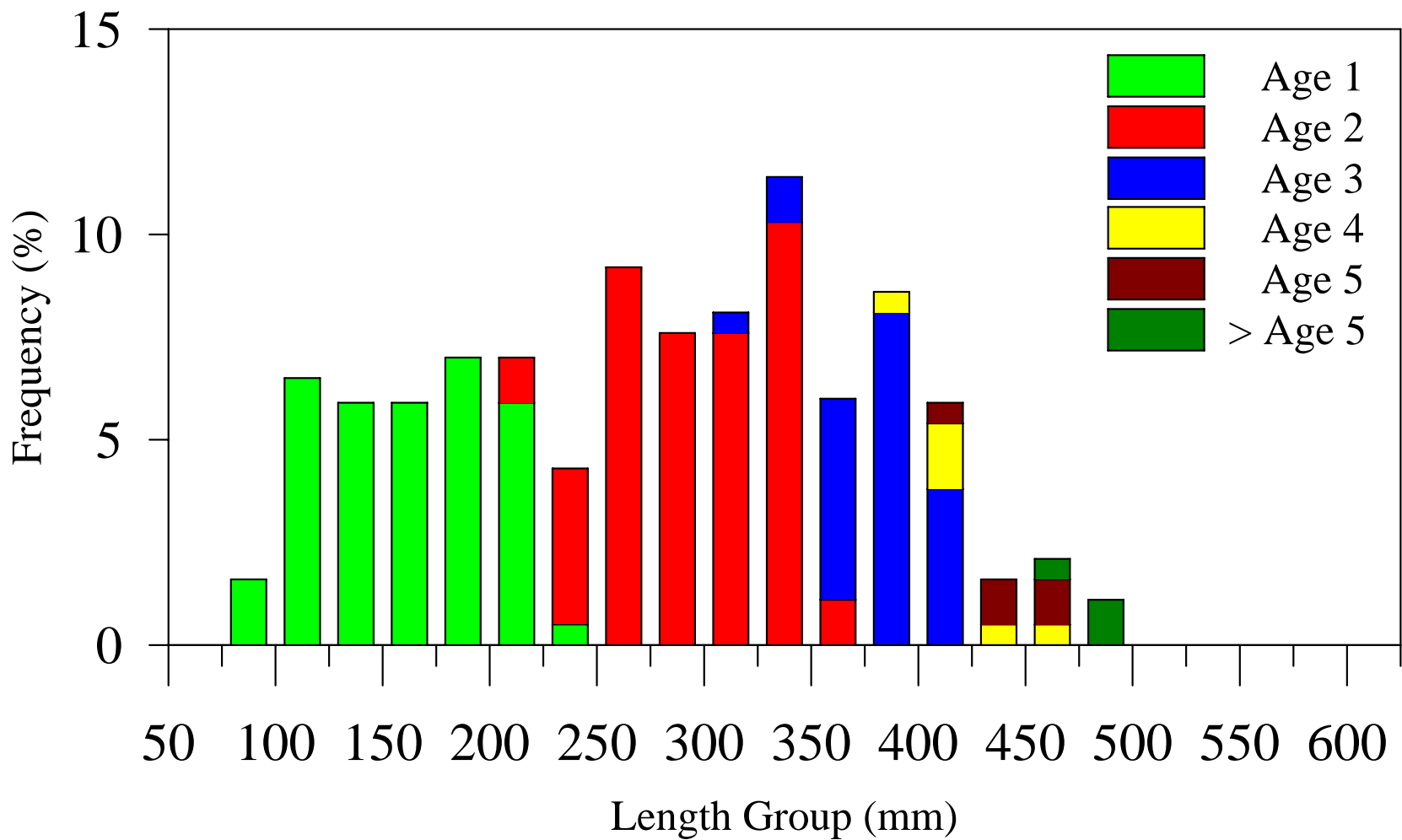


FIGURE 6. Length-at-age frequency of spotted bass (N=185) taken from Jones Bluff Reservoir, spring 2009.

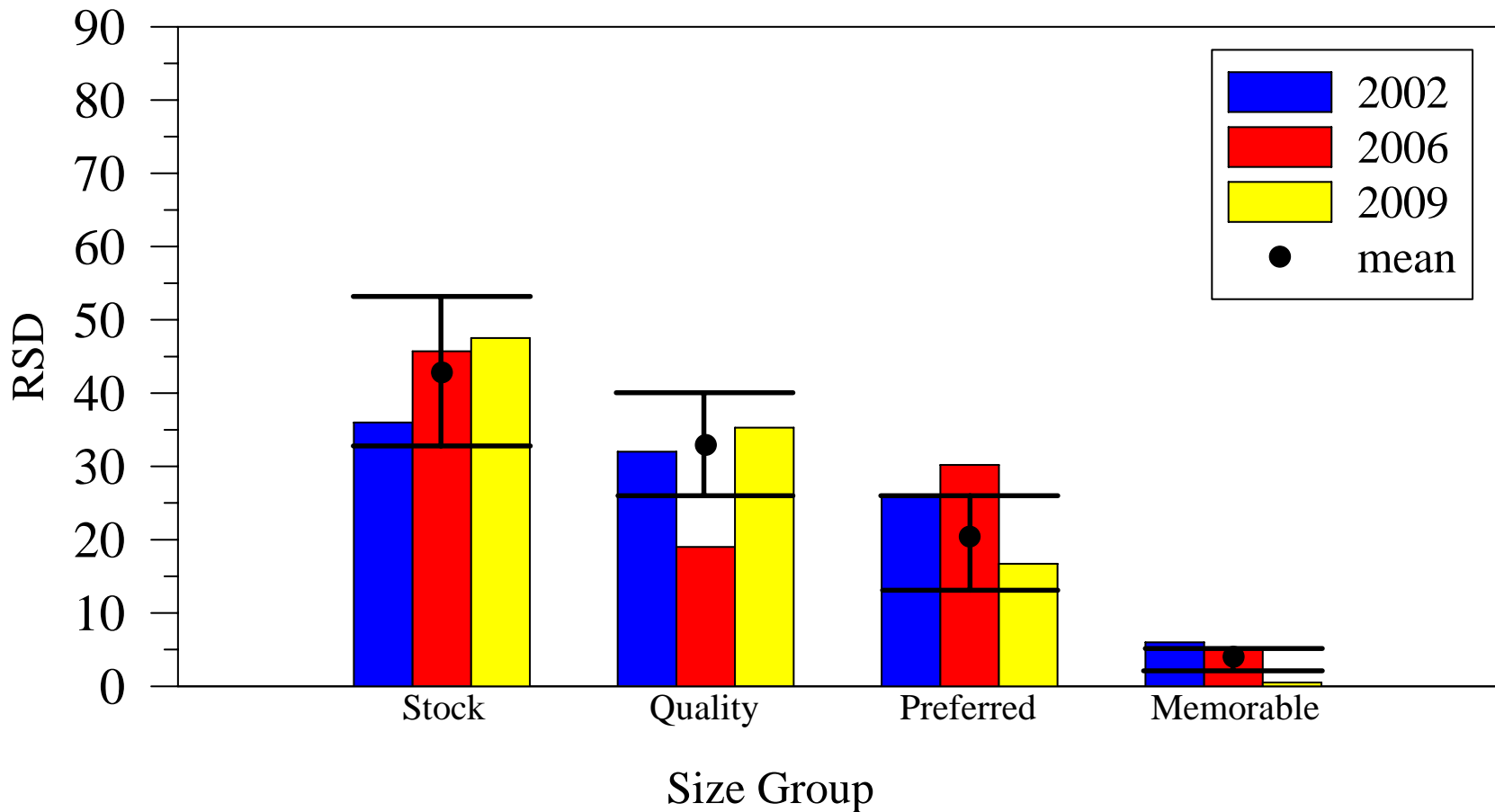


FIGURE 7. The relative stock density (RSD) and statewide mean of largemouth bass collected from all habitat types in Jones Bluff Reservoir, 2002, 2006, and 2009. The I-beam denotes the 25th and 75th percentiles of RSD values of largemouth bass, statewide.

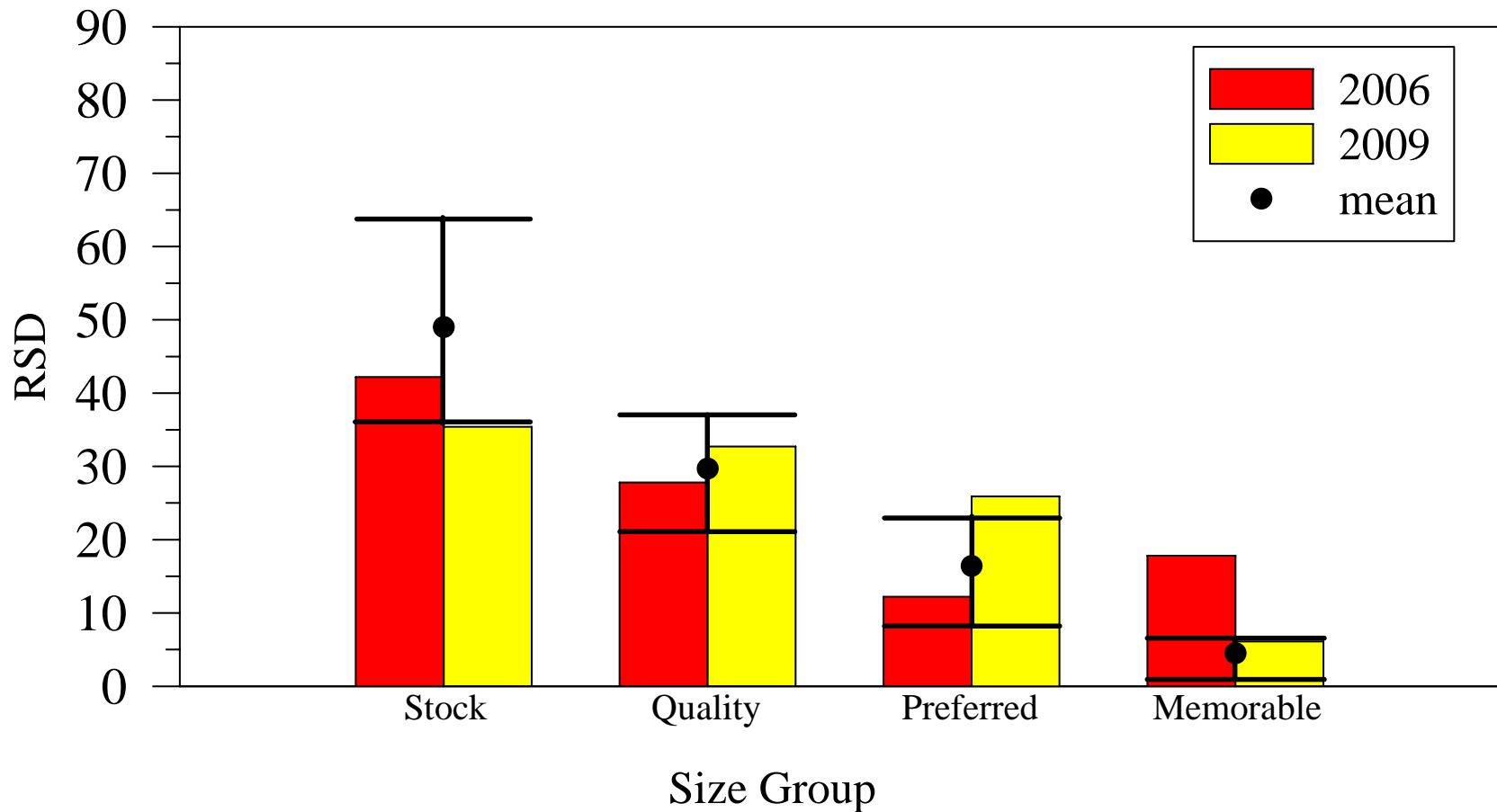


FIGURE 8. The relative stock density (RSD) and statewide mean of spotted bass collected from all habitat types in Jones Bluff Reservoir, 2006 and 2009. The I-beam denotes the 25th and 75th percentiles of RSD values of spotted bass, statewide.

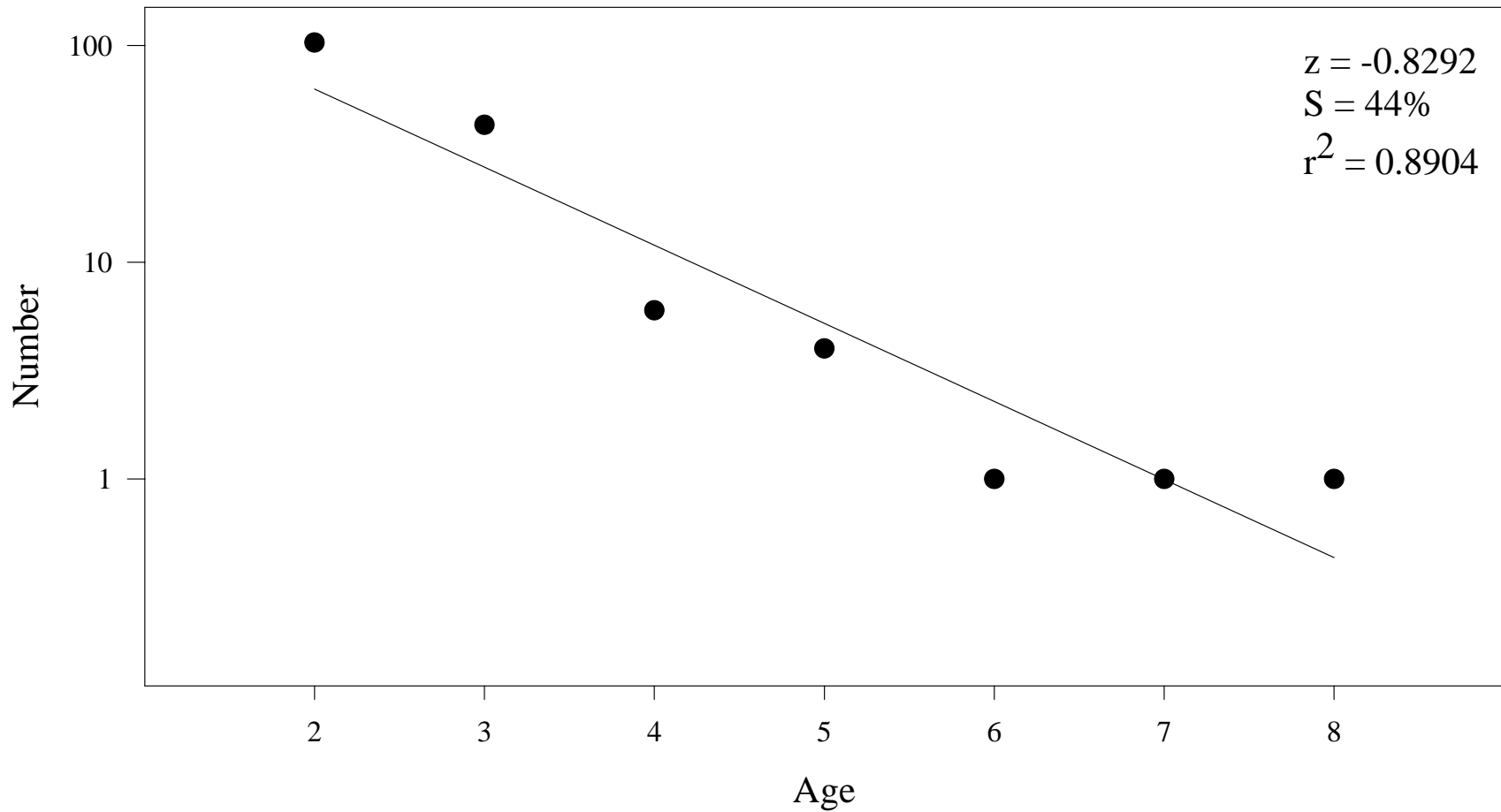


FIGURE 9. Total annual mortality regression for largemouth bass (ages 2-8) collected from Jones Bluff Reservoir, spring 2009.

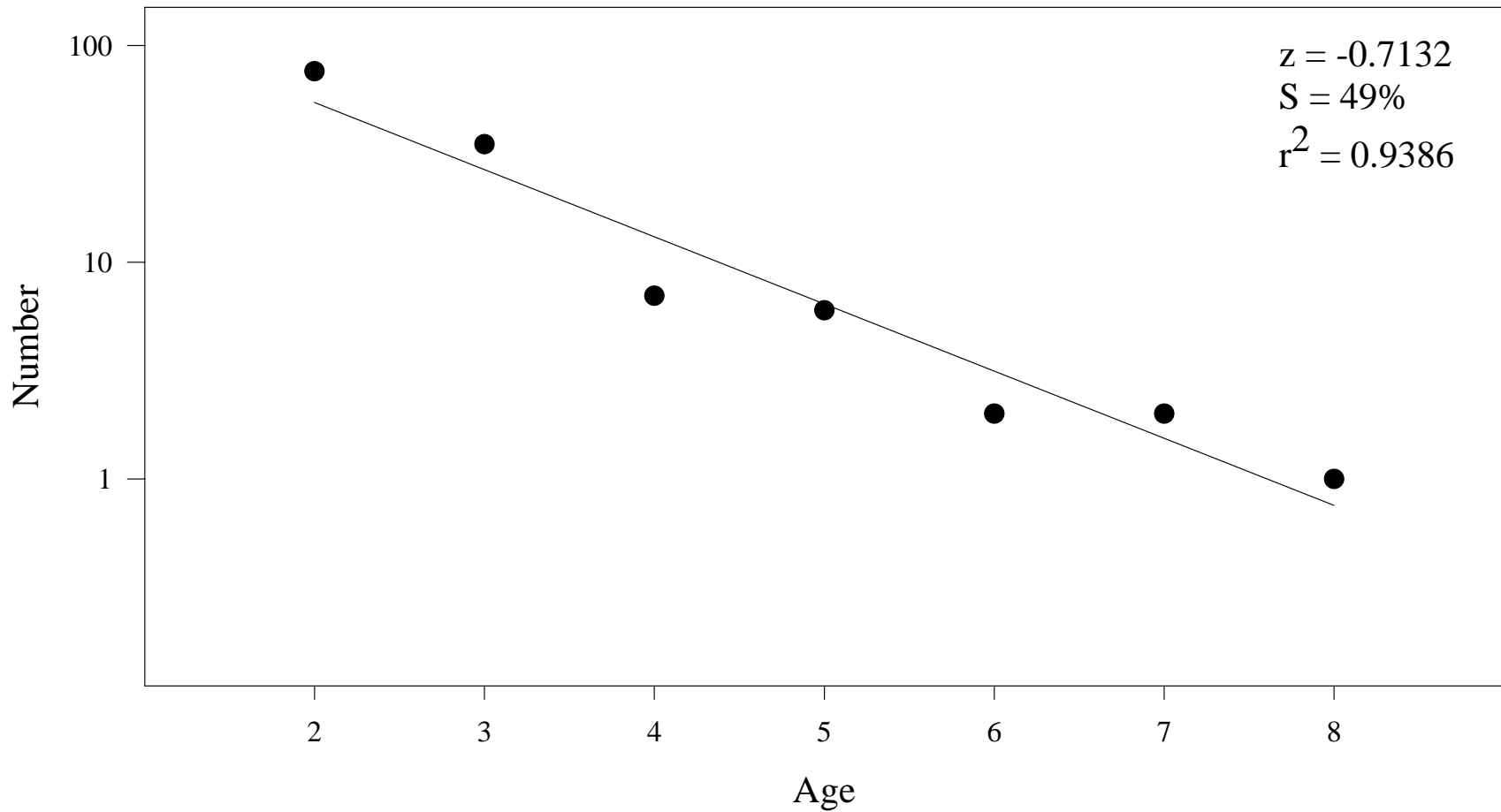


FIGURE 10. Total annual mortality regression for spotted bass (ages 2-8) collected from Jones Bluff Reservoir, spring 2009.

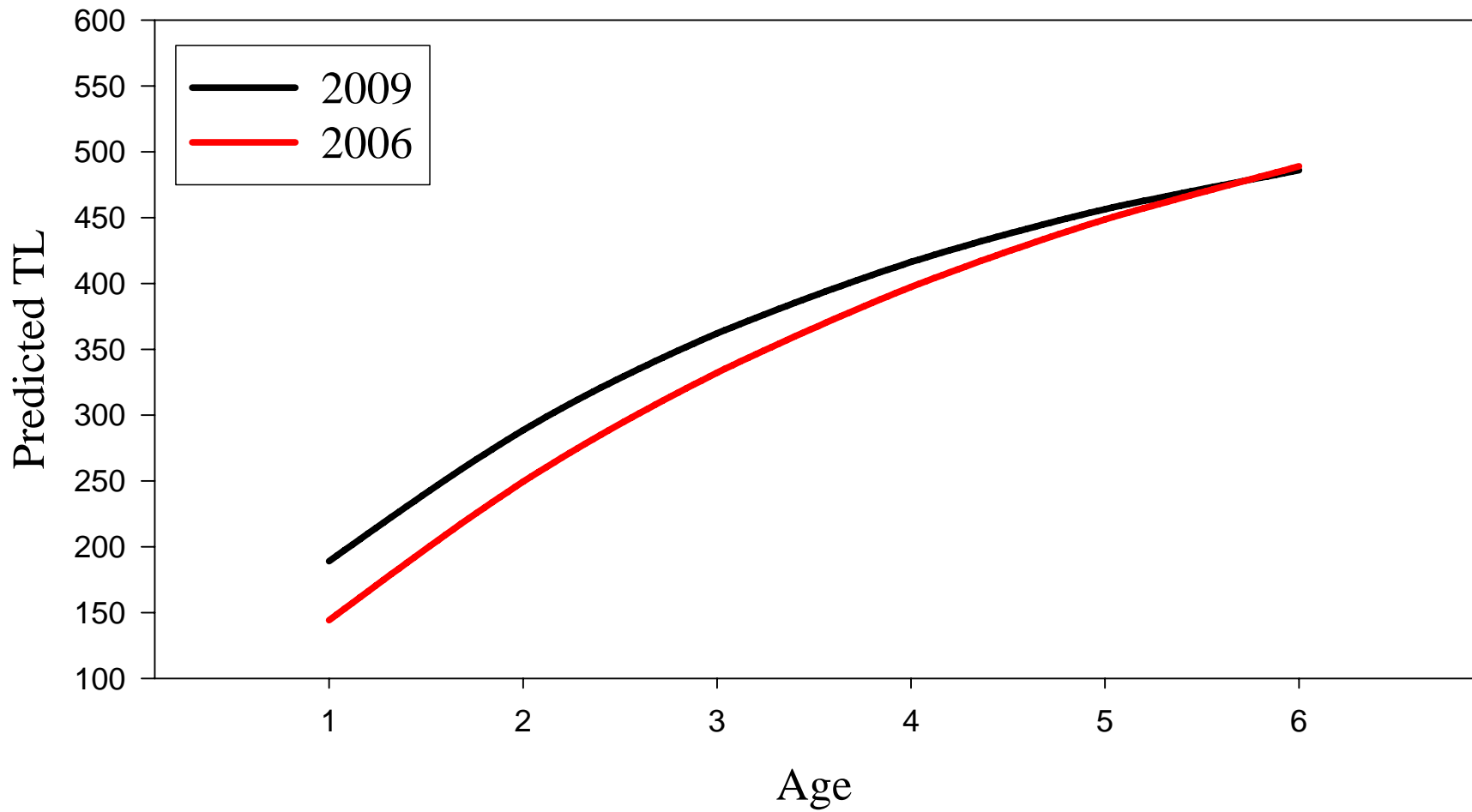


FIGURE 11. Predicted total length-at-age from the von Bertalanffy growth equation for largemouth bass collected from Jones Bluff Reservoir.

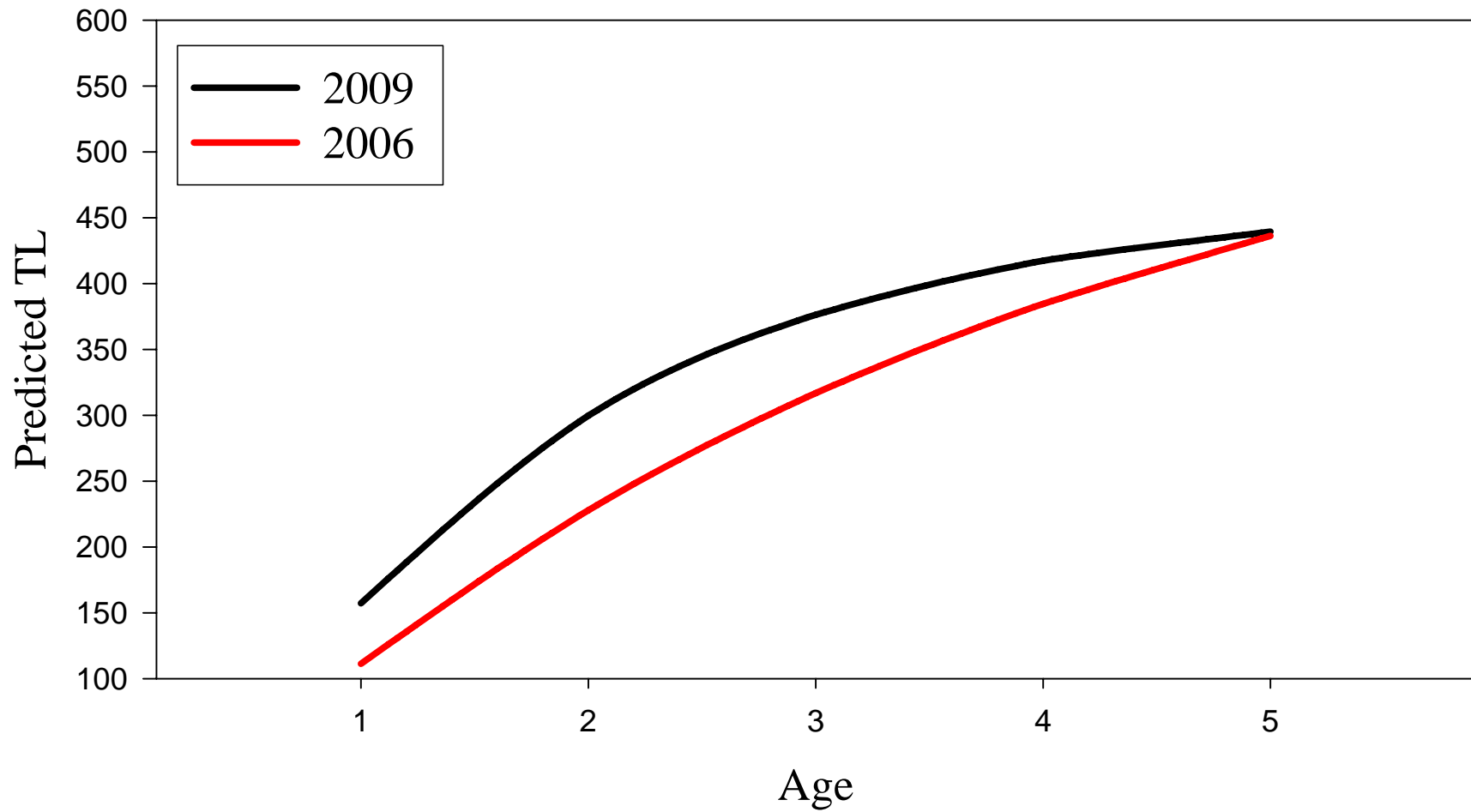


FIGURE 12. Predicted total length-at-age from the von Bertalanffy growth equation for spotted bass collected from Jones Bluff Reservoir.