

ALICEVILLE RESERVOIR CRAPPIE MANAGEMENT REPORT FY 2009

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March 1, 2009

Introduction

Crappies were previously sampled at Aliceville Reservoir in 1988, 1990, 1994, 1999, 2001 and 2005 (Moss et al. 2006). In 2005, white crappies were trap netted at the second highest rate ever recorded at Aliceville. Recruitment was very good. Four strong year classes were present, but seven year-classes contributed to the fishery. Growth of white crappie was slow. White crappies were collected at nearly eight times the rate of black crappie; however, black crappies were collected at their highest CPE ever (3.7 fish/net-night) in 2005. The black crappie collection was composed almost entirely of substock and RSD S-Q fish.

Methods

On November 17, 2008, eight trap nets were set and checked the following day according to the guidelines of the Alabama Reservoir Management Manual (1999).

Results and Discussion

Black and White Crappie

A total of 200 white crappies and 31 black crappies were collected trap netting. The catch rate of white crappie in trap nets was 25.0, the third highest CPE ever recorded at Aliceville (Table 2). The PSD for white crappie was 90 and the RSD-P was 64. Incremental RSD values of P-M and M-T white crappie were above the lake average, while RSD values of S-Q and Q-P fish were below the lake average in 2008 (Table 2).

In 2008, trap net catch rates of substock and S-Q white crappie were below the lake average while the CPE of Q-P, P-M and M-T white crappie were the highest ever recorded at Aliceville and well above the lake average and the 75% percentile of CPE values, statewide (Table 2 and Figure 7).

Four year-classes (2005-08) were abundant and 6 age classes (1+ to 5+ and 7+) contributed to the fishery. Growth of white crappies in 2008 was slightly above the lake average (Figure 3). Young-of-year white crappie composed only 25.0% of the trap net collection. Mean W_r values of white crappie ranged from 73 to 95 and were similar to previous collections. The annual survival rate of "legal-size" white crappie (fish ≥ 229 mm) was estimated to be 49% ($r^2=0.7751$) based on catch curve analysis of 2+ to 7+ year old fish.

The black crappie sample consisted of only 31 fish. They ranged in total length from 95 - 286 mm (Table 5). Six year-classes (2003-08) were represented in the collection. The catch rate of black crappie in trap nets was the highest CPE ever recorded at Aliceville (Table 4). The PSD for black crappie was 50 and the RSD-P was 20. The incremental RSD value of S-Q black

crappies was above the lake and statewide averages, while incremental RSD values of Q-P and P-M were below the lake average, but above the statewide averages (Table 4).

In 2008, trap net catch rates of substock black crappie were well below the lake and statewide averages. CPE of Q-P and P-M black crappie were above the lake average but slightly below the statewide averages (Table 4). Mean W_r values of black crappie ranged from 63 to 78 and were substantially less than previous collections.

Summary

The CPE of white crappie was the third highest ever recorded and the highest for black crappie at Aliceville Reservoir. Recruitment was below average. Four moderately strong year-classes were present in the white crappie collection. Growth of white crappie was satisfactory.

Conclusions

1. Resample the crappie population in 2012.
2. Sampling data indicates there is no need for management changes at this time.
3. Maintain the 9-inch minimum-length limit regulation on all crappie.
4. Encourage an aggressive plant management program by the Army Corps of Engineers directed at preventing the spread of exotic aquatic plant species.

Literature Cited

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Welch , P. S. 1948. Limnological Methods. McGraw-Hill. pp. 93-94.

Appendix 1

Tables and Figures

Table 1. Morphometric, physical and chemical characteristics of Aliceville Reservoir.

Surface area	8,300 acres
Drainage area	5,785 sq. mi.
Full pool elevation	136 feet-msl
Mean annual fluctuation	2 feet
Shoreline distance	148 miles
Shoreline development index	11.3 (Welch 1948)
Mean depth	7.2 feet
Maximum depth	42 feet
Outlet depth	Surface
Thermocline depth	None
Total dissolved solids	68 mg/l
Chlorophyll a	17 mg/m ³
Retention time	4 days
Morphoedaphic index	9.4 TDS/mean depth(ft) (Ryder 1965)
Growing season	235 frost free days (Jenkins 1967)
Year of impoundment	1978

Table 2. Incremental relative stock density (RSD), catch per effort (CPE), and relative weight (Wr) of white crappie trap netted during the fall at Aliceville Reservoir. Effort is in net-nights. SSR denotes substock ratio; the number of substock fish per 100 stock-size fish.

Year	Effort	Substock			RSD S - Q			RSD Q - P			RSD P - M			RSD M - T			RSD - T			TOTAL no. cpe					
		no.	cpe	SSR	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.		Wr				
1991	32	140	4.4	36	249	7.8	65	79	116	3.6	30	87	10	0.3	3	89	9	0.3	2	92	0	0.0	0	524	16.4
1992	32	53	1.7	30	52	1.6	29	75	44	1.4	25	84	70	2.2	39	87	12	0.4	7	83	0	0.0	0	231	7.2
1993	32	63	2.0	56	46	1.4	41	81	50	1.6	44	92	9	0.3	8	89	8	0.3	7	84	0	0.0	0	176	5.5
1994	32	63	2.0	36	44	1.4	25	71	48	1.5	27	80	66	2.1	38	82	17	0.5	10	88	0	0.0	0	238	7.4
1995	32	9	0.3	20	13	0.4	28	78	26	0.8	57	90	6	0.2	13	84	1	0.0	2	105	0	0.0	0	55	1.7
1996	32	252	7.9	283	19	0.6	21	70	17	0.5	19	86	44	1.4	49	93	9	0.3	10	92	0	0.0	0	341	10.7
1997	32	75	2.3	26	226	7.1	77	78	45	1.4	15	89	10	0.3	3	90	13	0.4	4	90	0	0.0	0	369	11.5
1998	32	405	12.7	555	49	1.5	67	73	12	0.4	16	87	11	0.3	15	91	1	0.0	1	89	0	0.0	0	478	14.9
1999	32	44	1.4	61	40	1.3	56	79	21	0.7	29	89	7	0.2	10	91	4	0.1	6	91	0	0.0	0	116	3.6
2000	32	49	1.5	31	50	1.6	32	81	78	2.4	50	87	25	0.8	16	85	4	0.1	3	93	0	0.0	0	206	6.4
2001	12	475	39.6	516	36	3.0	39	71	25	2.1	27	78	20	1.7	22	91	11	0.9	12	98	0	0.0	0	567	47.3
2005	12	143	11.9	72	67	5.6	34	72	42	3.5	21	75	28	2.3	14	83	57	4.8	29	90	4	0.3	2	341	28.4
2008	8	42	5.3	27	16	2.0	10	73	40	5.0	25	83	46	5.8	29	89	56	7.0	35	95	0	0.0	0	200	25.0
Lake average		7.2	135		2.7	40	75		1.9	30	85		1.4	20	88		1.2	10	92		0.0	0	88		14.3

Table 3. Age composition and mean total length (mm) of white crappie trap netted at Aliceville Reservoir, November 2008.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
0+	2008	50	25.0	6.3	99	3	75 - 160
1+	2007	43	21.5	5.4	218	3	165 - 252
2+	2006	42	21.0	5.3	273	4	187 - 314
3+	2005	47	23.5	5.9	304	4	228 - 344
4+	2004	7	3.5	0.9	328	4	326 - 336
5+	2003	8	4.0	1.0	341	3	339 - 350
6+	2002	0	0.0	0.0			
7+	2001	3	1.5	0.4	353	1	351 - 354
Total		200	100.0	25.0			

Table 4. Incremental relative stock density (RSD), catch per effort (CPE), and relative weight (Wr) of black crappie trap netted during the fall at Aliceville Reservoir. Effort is in net-nights. SSR denotes substock ratio; the number of substock fish per 100 stock-size fish.

Year	Effort	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				
1991	32	13	0.4	33	16	0.5	40	72	10	0.3	25	83	10	0.3	25	92	4	0.1	10	80	53	1.7
1992	32	5	0.2	14	11	0.3	31	74	19	0.6	53	82	4	0.1	11	87	2	0.1	6	85	41	1.3
1993	32	7	0.2	33	15	0.5	71	74	6	0.2	29	83	0	0.0	0		0	0.0	0		28	0.9
1994	32	5	0.2	13	9	0.3	23	71	17	0.5	44	73	10	0.3	26	80	3	0.1	8	83	44	1.4
1995	32	5	0.2	500	0	0.0	0		0	0.0	0		1	0.0	100	97	0	0.0	0		6	0.2
1996	32	19	0.6	76	7	0.2	28	71	12	0.4	48	80	6	0.2	24	88	0	0.0	0		44	1.4
1997	32	12	0.4	24	28	0.9	55	72	18	0.6	35	83	5	0.2	10	90	0	0.0	0		63	2.0
1998	32	72	2.3	480	4	0.1	27	77	6	0.2	40	85	5	0.2	33	94	0	0.0	0		87	2.7
1999	32	24	0.8	120	9	0.3	45	74	8	0.3	40	80	1	0.0	5	96	2	0.1	10	92	44	1.4
2000	32	0	0.0	0	12	0.4	28	77	25	0.8	58	83	6	0.2	14	75	0	0.0	0		43	1.3
2001	12	0	0.0	0	7	0.6	35	73	5	0.4	25	75	7	0.6	35	89	1	0.1	5	93	20	1.7
2005	12	26	2.2	144	17	1.4	94	92	0	0.0	0		1	0.1	6	98	0	0.0	0		44	3.7
2008	8	1	0.1	3	15	1.9	50	63	9	1.1	30	78	6	0.8	20	74	0	0.0	0		31	3.9
Lake average		0.6	111		0.6	41	74		0.4	33	80		0.2	24	88		0.0	3	87		1.8	

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Table 5. Age composition and mean total length (mm) of black crappie trap netted at Aliceville Reservoir, November 2008.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Range
0+	2008	2	6.5	0.3	117	22	95 - 140
1+	2007	16	51.6	2.0	178	4	148 - 209
2+	2006	5	16.1	0.6	219	11	190 - 254
3+	2005	6	19.4	0.8	266	10	233 - 286
4+	2004	1	3.2	0.1	234		
5+	2003	1	3.2	0.1	264		
Total		31	100.0	3.9			

Table 6. Incremental relative stock density (RSD) catch per effort (CPE) and relative weight (Wr) of black and white crappie captured by fall trap netting at Aliceville Reservoir. Effort is in net-nights. SSR denotes substock ratio; the number of substock fish per 100 stock-size fish.

Year	Effort	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				
1991	32	153	4.8	36	265	8.3	63	79	126	3.9	30	87	20	0.6	5	89	13	0.4	3	92	577	18.0
1992	32	58	1.8	27	63	2.0	29	75	63	2.0	29	84	74	2.3	35	87	14	0.4	7	83	272	8.5
1993	32	70	2.2	52	61	1.9	46	81	56	1.8	42	92	9	0.3	7	89	8	0.3	6	84	204	6.4
1994	32	68	2.1	32	53	1.7	25	71	65	2.0	30	80	76	2.4	36	82	20	0.6	9	88	282	8.8
1995	32	14	0.4	30	13	0.4	28	78	26	0.8	55	90	7	0.2	15	84	1	0.0	2	105	61	1.9
1996	32	271	8.5	238	26	0.8	23	70	29	0.9	25	86	50	1.6	44	93	9	0.3	8	92	385	12.0
1997	32	87	2.7	25	254	7.9	74	78	63	2.0	18	89	15	0.5	4	90	13	0.4	4	90	432	13.5
1998	32	477	14.9	542	53	1.7	60	73	18	0.6	20	87	16	0.5	18	91	1	0.0	1	89	565	17.7
1999	32	68	2.1	74	49	1.5	53	79	29	0.9	32	89	8	0.3	9	91	6	0.2	7	91	160	5.0
2000	32	49	1.5	25	62	1.9	31	81	103	3.2	52	87	31	1.0	16	85	4	0.1	2	93	249	7.8
2001	12	475	39.6	424	43	3.6	38	71	30	2.5	27	78	27	2.3	24	91	12	1.0	11	98	587	48.9
2005	12	169	14.1	78	84	7.0	39	72	42	3.5	19	75	29	2.4	13	83	61	5.1	28	90	385	32.1
2008	8	43	5.4	23	31	3.9	16	73	49	6.1	26	83	52	6.5	28	89	56	7.0	30	95	231	28.9
Lake average		7.7	124		3.3	40	75		2.3	31	85		1.6	19	88		1.2	9	92		16.1	

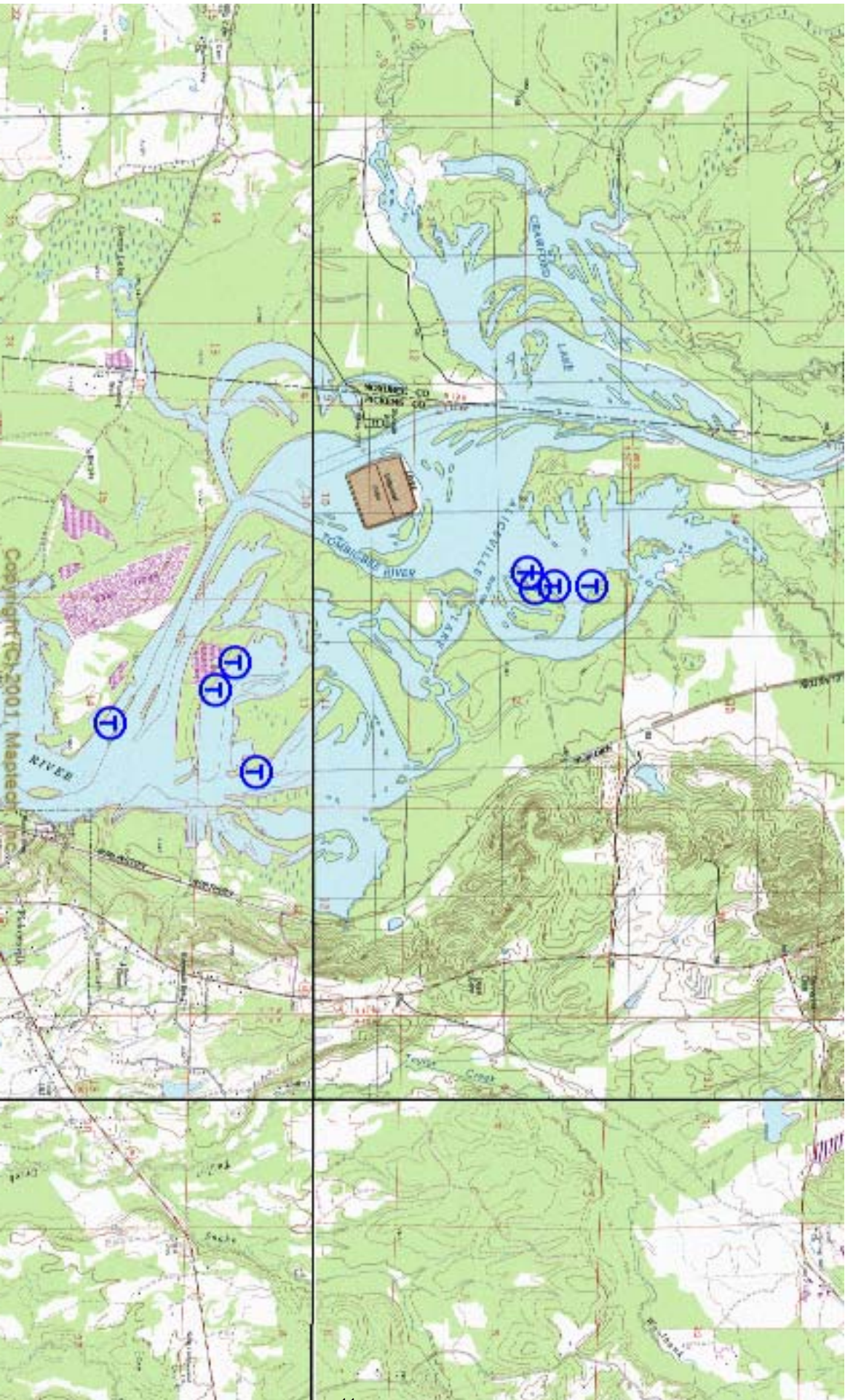


Figure 1. Crappie trap net locations on Aliceville Reservoir, November 2008.

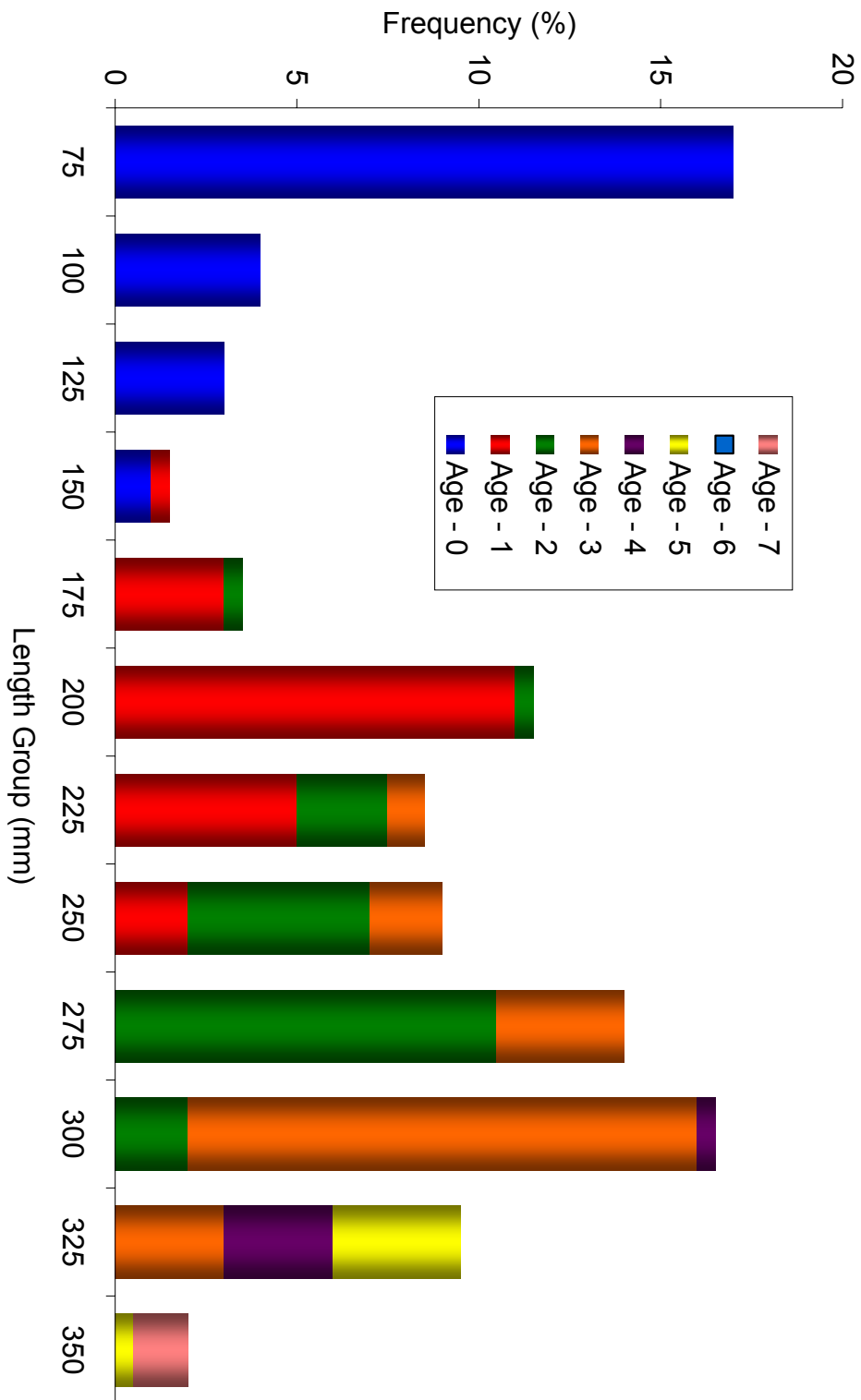


Figure 2. Length at age frequency of white crappie (N=200) trap netted at Aliceville Reservoir, November 2008.

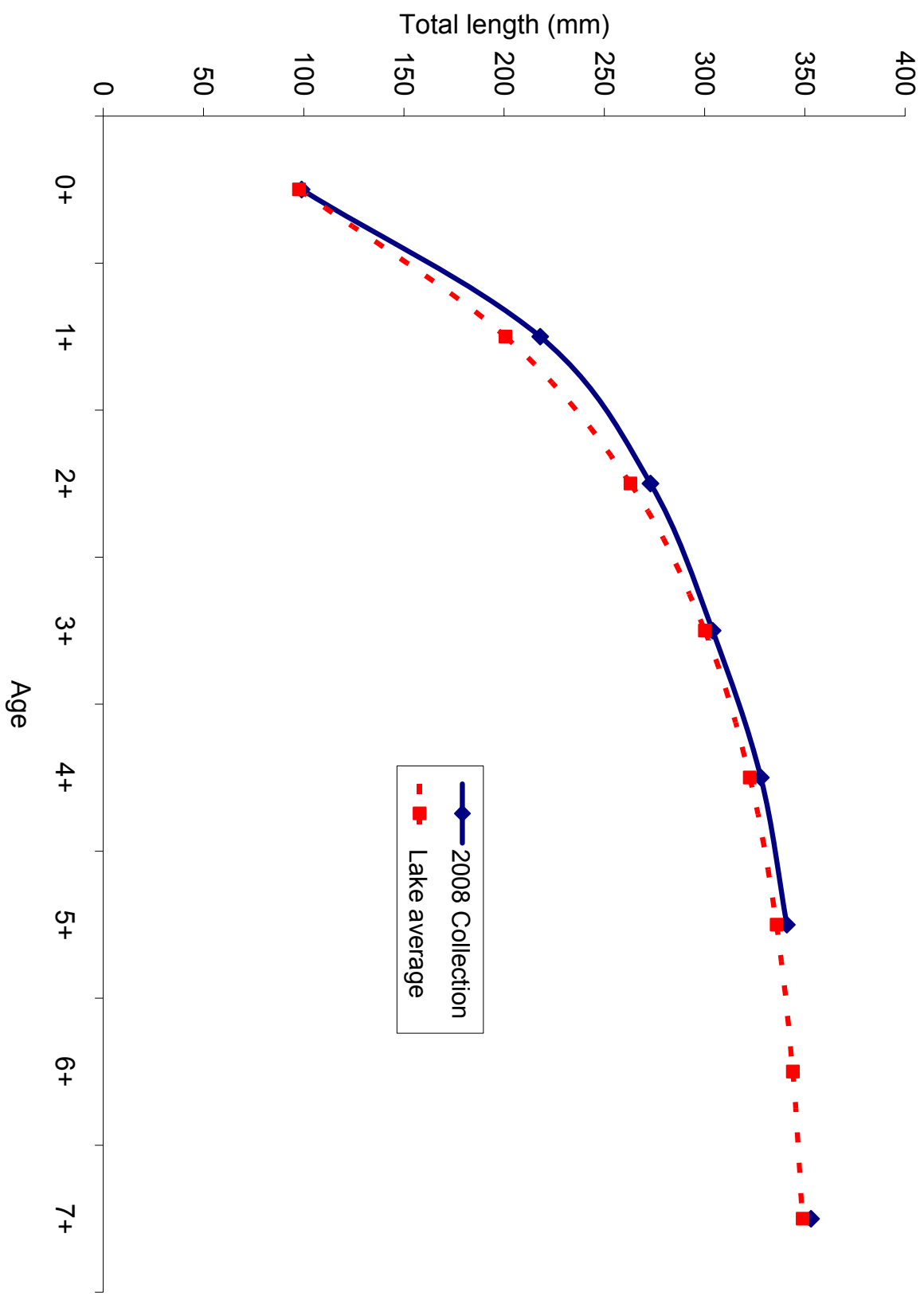


Figure 3. Growth of white crappie at Aliceville Reservoir.

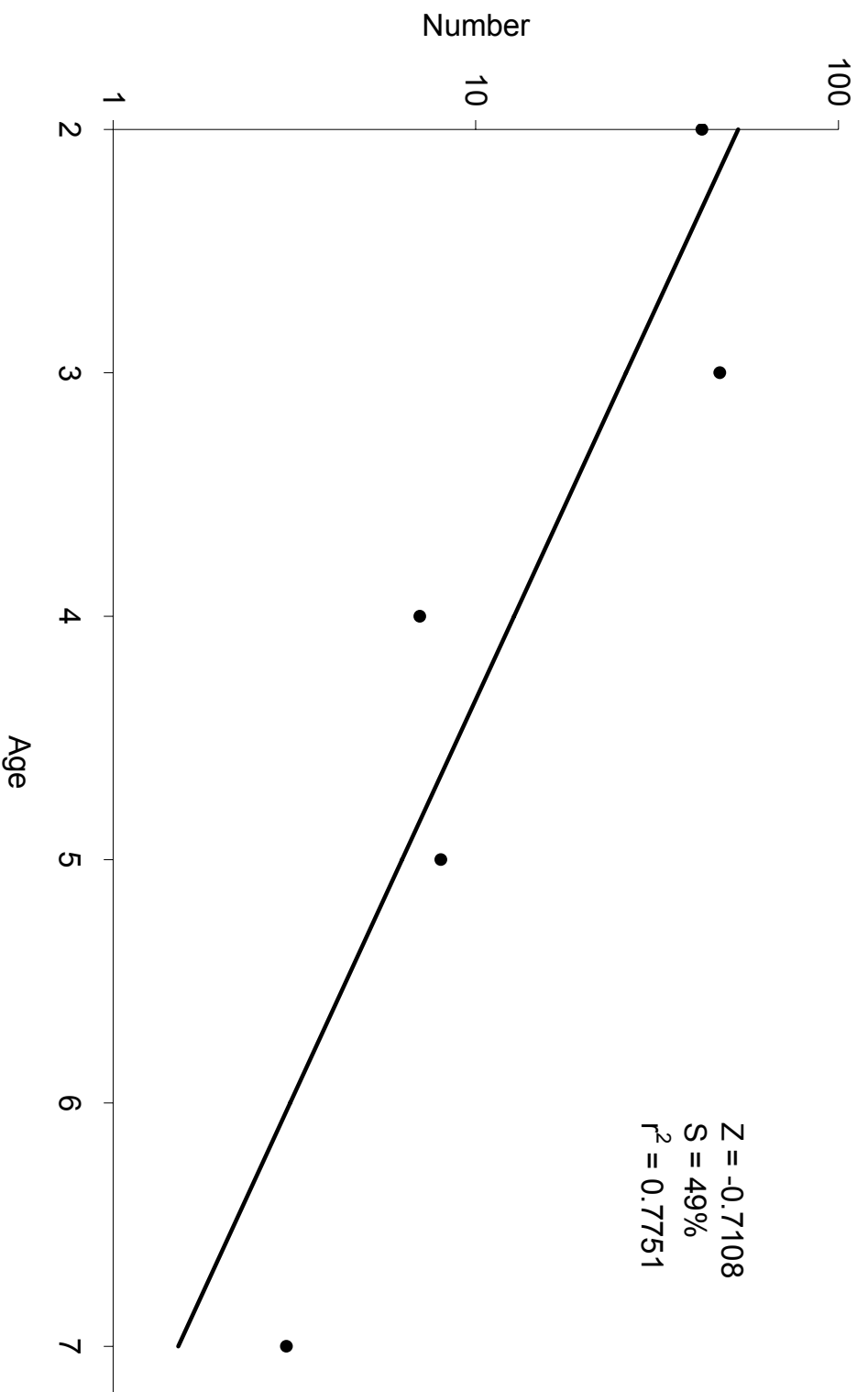


Figure 4. Catch curve regression of legal-size white crappie (N=200) at Aliceville Reservoir, November 2008.

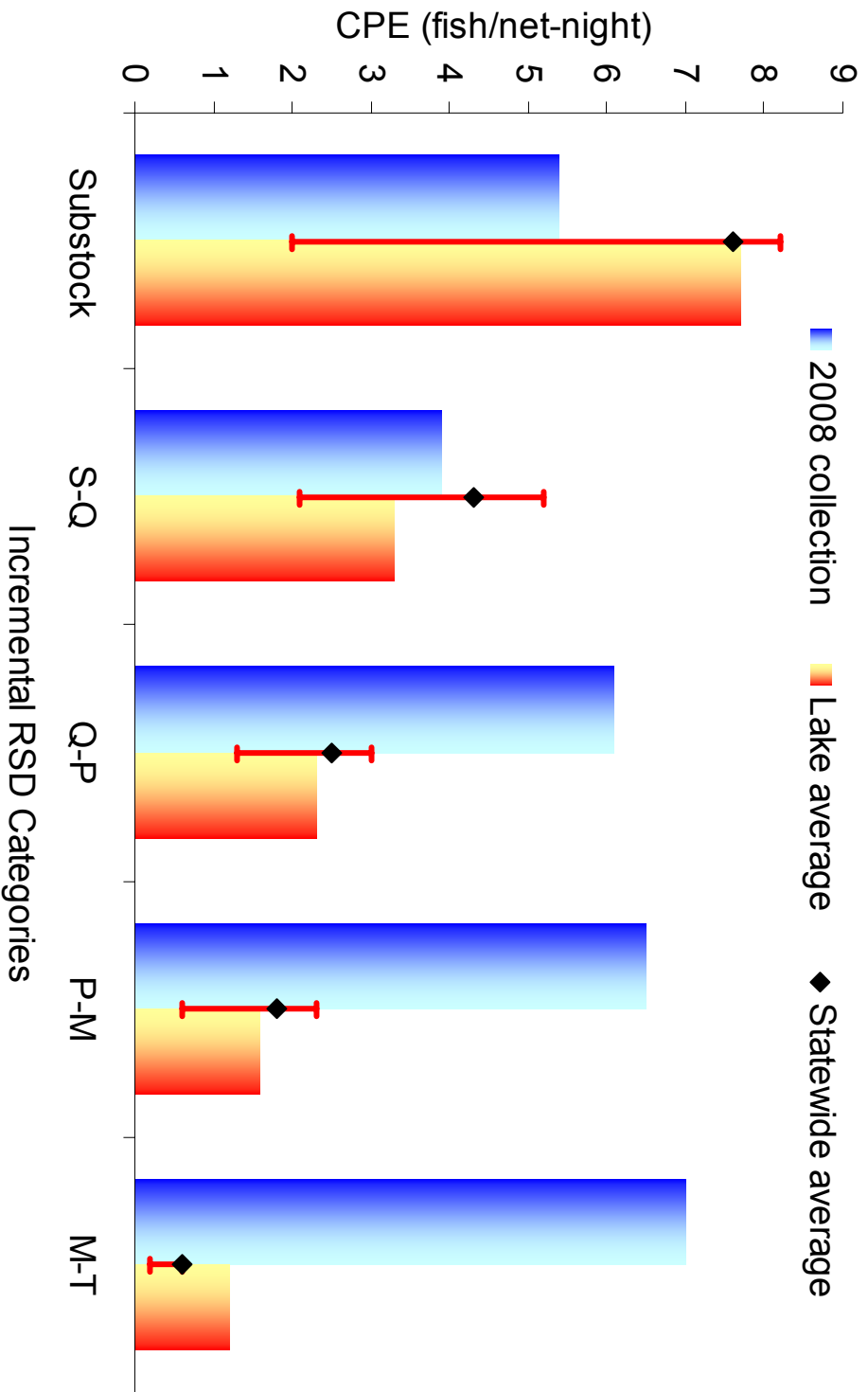


Figure 5. Catch per effort (CPE) of black (N=31) and white crappie (N=200) at Aliceville Reservoir, November 2008. Error bars represent the 25th and 75th percentile of CPE values in lowland reservoirs, statewide.

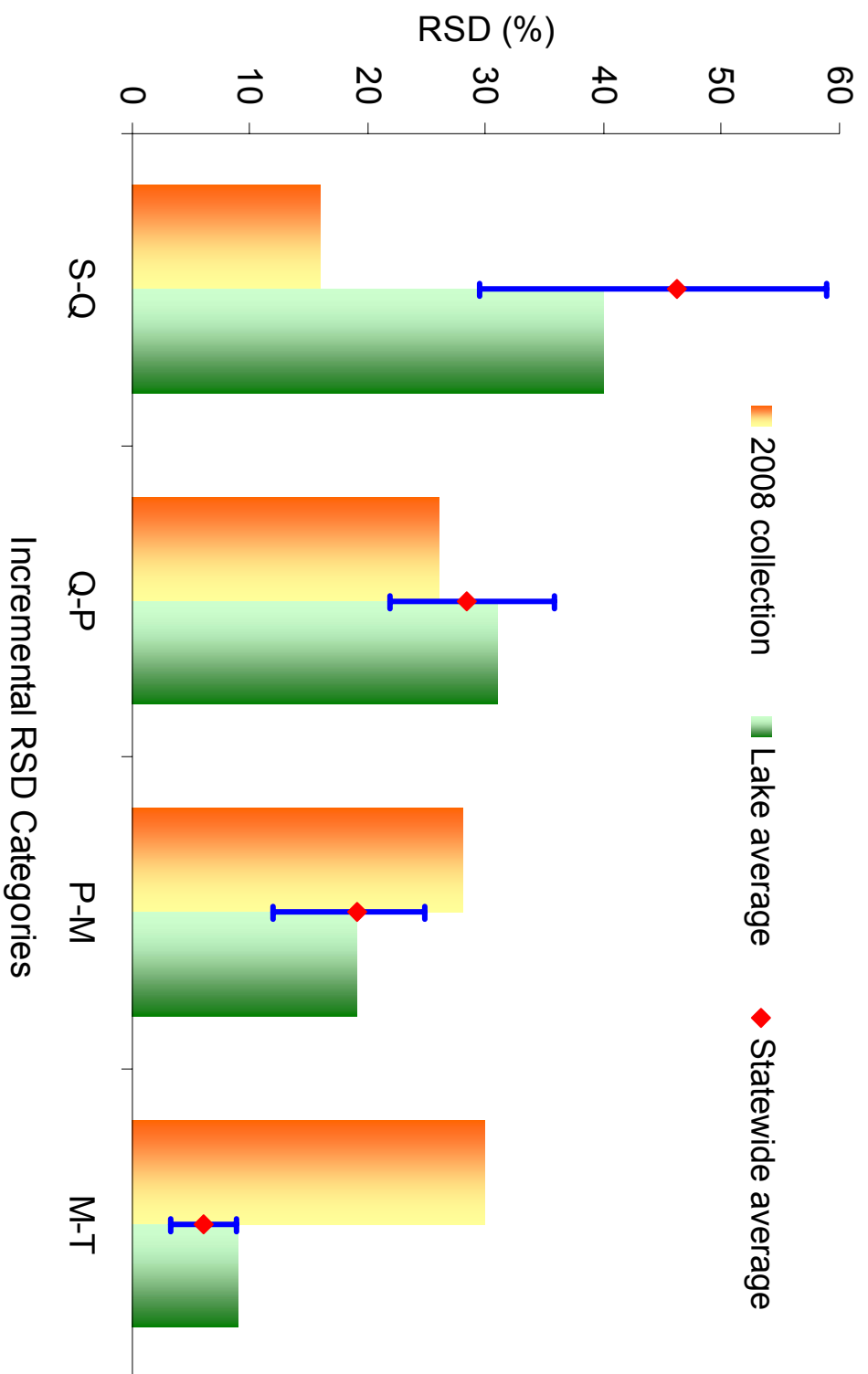


Figure 6. Incremental relative stock density (RSD) of black (N=31) and white crappie (N=200) at Aliceville Reservoir 2008. Error bars represent the 25th and 75th percentile of RSD values in lowland reservoirs, statewide.