

WEISS RESERVOIR MANAGEMENT REPORT

FY 2007

FALL 2006

Prepared by

E. Daniel Catchings
District Fisheries Supervisor

Robert O. Andress
District Fisheries Biologist

Kevin W. Baswell
District Biologist Aide

Department of Conservation and Natural Resources

Wildlife and Freshwater Fisheries Division

Fisheries Section

March 1, 2007

Introduction

Weiss Reservoir is called the “Crappie fishing capital of the world”. It attracts a large number of out of state crappie anglers and is of great economic importance to the surrounding area. The Alabama Wildlife and Freshwater Fisheries Division (ADWFF) has sampled 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). Auburn University previously studied the crappie population from 1990 through 2000 through fall trap netting at standardized locations. The ADWFF has continued this yearly standardized trap net sampling on Weiss Reservoir from 2001 to 2006. Auburn and ADWFF results were presented in the aforementioned reservoir management reports.

The reservoir management objective for Weiss Reservoir is to (1) collect quantitative biological data that will assist the district biologists in developing management strategies to enhance the sport fishery; and (2) to evaluate changes to the crappie fishery since the imposition of the 10-inch minimum length limit. A summary of morphometric, physical, and chemical characteristics is listed in Table 1 of this report.

Methods

Weiss Reservoir was sampled in the fall of 2006 according to the guidelines of the Reservoir Management Manual (Cook 1999). ADWFF personnel conducted trap netting for crappie in October and November, 2006. A description of the methodology for trap net sampling is presented in the Weiss 2004 Reservoir Management Report (Catchings and Andress 2004).

Lengths, weights and otoliths were taken from all crappie 100 mm TL and above. Trap netting sites are identified in Figure 1.

Results

Fall trap netting resulted in the capture of 401 black crappie and 194 white crappie in 2006. The 2006 crappie year class (sum of black & white crappie) was moderate as the catch-per-effort (CPE) for young-of-the-year (YOY) was 2.8 (Tables 3 & 5). The stock-trophy (S_T) CPE was 3.7, which approximated the lake average (Table 6) and exceeded the 75th percentile for upland reservoirs (Jim McHugh unpublished data). CPE of stock-size fish (1.3) exceeded the 75th percentile, while CPE of quality-size fish (1.2), preferred-size fish (1.0), and memorable-size fish (0.2) equaled the 75th percentile (Table 6).

The Relative Stock Density (RSD) for both black and white crappie combined (Table 6) indicated that stock-size crappie (34%) surpassed the statewide mean while quality-size crappie (33%) were slightly less than the state mean value, but exceeded the lake average. Preferred (26%) and memorable-size crappie (7%) values exceeded the lake average, but were slightly less than the state mean value.

Growth, expressed as mean length-at-age, was greater than the state average for age 1+ and 2+ black crappie while growth for age 3+ black crappie in the fall of 2006 was slightly below the state average (Table 3). Growth for age 1+, 2+, and 3+ black crappie exceeded the values obtained for Weiss in 2003-2005 (Catchings, unpublished data). Growth for age 1+, 2+, and 3+ white crappie was slightly below the state average (Table 3, Maceina, unpublished data), but growth for age 1+ and age 2+ white crappie exceeded the growth exhibited in 2003 and 2004.

Wr values for black and white crappie exceeded the 75th percentile values for stock, quality, and preferred sizes and equaled the 75th percentile for memorable-size black crappie. Memorable-size white crappie equaled the state mean Wr value (Jim McHugh unpublished data).

The mortality criteria specified in the Reservoir Management Manual could not be met for either species of crappie.

Conclusions

The last strong crappie year class was produced in 2003 and it is providing the majority of the harvestable fish. The 2004 year class was poor, while the 2005 and 2006 year classes were moderate in strength. Some of the crappie are entering the fishery (minimum length limit = 254 mm) in the fall of their 2nd year and by age 3+ most are legal size for harvest. Hopefully, recruitment of the moderate year class of 2005 will sufficiently provide for the fishery until another strong year class is produced.

Literature Cited

- Catchings, E.D. and S.B. Floyd. 1988. Weiss reservoir management report. Alabama Game and Fish Division, Montgomery.
- Catchings, E.D. and S.M. Smith. 1994. Weiss reservoir management report. Alabama Game and Fish Division, Montgomery.
- Catchings, E.D. and S.M. Smith. 1996. Weiss reservoir management report. Alabama Game and Fish Division, Montgomery.
- Catchings, E.D. and S.M. Smith. 1999. Weiss reservoir management report. Alabama Game and Fish Division, Montgomery.
- Catchings, E.D. and S.M. Smith. 2001. Weiss reservoir management report. Wildlife and Freshwater Fisheries Division, Montgomery.
- Catchings, E. D. and R.O. Andress. 2004. Weiss reservoir management report. Wildlife and Freshwater Fisheries Division, Montgomery.
- Cook, S. F. 1999. Reservoir management manual. Alabama Game and Fish Division, Montgomery.
- 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.
- 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.

Appendix A

Tables and Figures

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

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

TABLE 2. RELATIVE STOCK DENSITY, CATCH-PER-EFFORT, AND RELATIVE WEIGHT OF BLACK CRAPPIE IN WEISS RESERVOIR, 1990-2006.

Species	No. of samples	SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				RSD-T				S-T		TOTAL	
		No.	CPE	Pct.*	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	CPE	No.	CPE	
Black Crappie	1990	80.0	44	0.6	25	73	0.9	42	69	51	0.6	29	85	40	0.5	23	99	10	0.1	6	101	0	0	0	0	2.2	218	2.7
	1991	100.0	30	0.3	9	107	1.1	31	79	137	1.4	40	97	86	0.9	25	105	14	0.1	4	107	0	0	0	0	3.5	374	3.7
	1992	76.0	23	0.3	22	25	0.3	24	77	38	0.5	36	87	36	0.5	34	90	7	0.1	7	99	0	0	0	0	1.4	129	1.7
	1993	76.0	38	0.5	31	54	0.7	45	84	37	0.5	31	93	27	0.4	22	100	2	0.0	2	105	1	0	1	114	1.6	159	2.1
	1994	76.0	57	0.8	30	104	1.4	54	72	35	0.5	18	85	49	0.6	26	95	4	0.1	2	107	0	0	0	0	2.5	249	3.3
	1995	76.0	58	0.8	30	30	0.4	16	75	75	1.0	39	96	73	1.0	38	106	15	0.2	8	107	0	0	0	0	2.5	251	3.3
	1996	73.0	176	2.4	198	24	0.3	27	72	16	0.2	18	84	40	0.6	45	97	8	0.1	9	101	1	0	1	103	1.2	265	3.6
	1997	76.0	80	1.1	20	167	2.2	41	71	149	2.0	37	92	80	1.1	20	98	8	0.1	2	96	0	0	0	0	5.3	484	6.4
	1998	76.0	115	1.5	75	43	0.6	28	76	59	0.8	38	93	48	0.6	31	99	4	0.1	3	104	0	0	0	0	2.0	269	3.5
	1999	76.0	94	1.2	152	18	0.2	29	71	21	0.3	34	91	18	0.2	29	91	5	0.1	8	92	0	0	0	0	0.8	156	2.1
	2000	76.0	90	1.2	78	54	0.7	47	73	37	0.5	32	90	18	0.2	16	96	6	0.1	5	98	0	0	0	0	1.5	205	2.7
	2001	75.0	284	3.8	281	37	0.5	37	82	31	0.4	31	95	25	0.3	25	94	7	0.1	7	91	1	0	1	91	1.3	385	5.1
	2002	74.0	66	0.9	32	90	1.2	44	89	65	0.9	32	96	39	0.5	19	99	12	0.2	6	95	0	0	0	0	2.8	272	3.7
	2003	82	193	2.4	73	119	1.5	45	75	115	1.4	43	81	25	0.3	9	85	6	0.1	2	92	0	0	0	0	3.2	458	5.6
	2004	88	54	0.6	26	98	1.1	47	80	70	0.8	34	93	34	0.4	16	99	6	0.1	3	102	0	0	0	0	2.4	262	3.0
	2005	88	90	1.0	58	76	0.9	49	75	41	0.5	26	86	32	0.4	21	96	6	0.1	4	97	0	0	0	0	1.8	245	2.8
	2006	88	171	1.9	74	68	0.8	30	79	82	0.9	36	96	60	0.7	26	102	20	0.2	9	105	0	0	0	0	2.6	401	4.6
LAKE AVERAGE			1.3	71		0.9	37	76		0.8	33	91		0.5	25	97.1		0.1	5	100		0	0	0	103	2.3		3.5
STATEWIDE MEAN			1.0	55		0.8	29	74		0.8	36	87		0.6	27	98		0.2	8	100						2.4		
LOWER 25TH PERCENT			0.2	7		0.1	11	69		0.3	26	81		0.2	15	84		0.1	3	95						1.0		
UPPER 75TH PERCENT			1.2	60		0.9	42	77		1.2	48	94		1.0	35	100		0.2	12	107						3.1		

*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 black crappie collected from Weiss Reservoir, fall 2006.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range (mm)
0	2006	159	39.7	1.8	89.7	1.3	60-201
1	2005	138	34.4	1.6	186.1	3.4	109-279
2	2004	33	8.2	0.4	255.0	7.2	150-355
3	2003	57	14.2	0.6	267.7	5.6	151-349
4	2002	8	2.0	0.1	241.9	22.7	180-340
5	2001	6	1.5	0.1	284.0	12.5	235-311
Total		401	100.0	4.6			

Table 4. Relative stock density, catch-per-effort, and relative weight of white crappie in Weiss Reservoir, 1990-2006.

Species	No. of samples	SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				RSD-T				S-T	TOTAL		
		No.	CPE	Pct.*	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	No.	CPE	Pct.	Wr	CPE	No.	CPE	
White Crappie	1990	80	64	0.8	68	40	0.5	43	74	23	0.3	24	94	25	0.3	27	110	6	0.1	6	104	0	0.0	0	0	1.2	158	2.0
	1991	100	106	1.1	55	65	0.7	34	79	97	1.0	51	100	23	0.2	12	110	6	0.1	3	104	0	0.0	0	0	1.9	297	3.0
	1992	76	27	0.4	23	28	0.4	24	78	46	0.6	39	88	37	0.5	31	94	7	0.1	6	109	0	0.0	0	0	1.6	145	1.9
	1993	76	66	0.9	92	6	0.1	8	78	26	0.3	36	97	35	0.5	49	102	5	0.1	7	101	0	0.0	0	0	0.9	138	1.8
	1994	76	172	2.3	126	90	1.2	66	78	17	0.2	13	93	23	0.3	17	102	6	0.1	4	100	0	0.0	0	0	1.8	308	4.0
	1995	76	64	0.8	44	35	0.5	24	79	66	0.9	46	103	39	0.5	27	110	4	0.1	3	107	0	0.0	0	0	1.9	208	2.7
	1996	73	533	7.3	692	23	0.3	30	71	16	0.2	21	83	30	0.4	39	91	7	0.1	9	98	1	0.0	1	96	1.1	610	8.4
	1997	76	131	1.7	54	151	2.0	62	76	68	0.9	28	95	22	0.3	9	104	1	0.0	0.4	125	0	0.0	0	0	3.2	373	4.9
	1998	76	182	2.4	256	22	0.3	31	77	27	0.4	38	99	18	0.2	25	106	4	0.1	6	100	0	0.0	0	0	0.9	253	3.3
	1999	76	88	1.2	163	22	0.3	41	77	18	0.2	33	92	11	0.1	20	96	3	0.0	6	97	0	0.0	0	0	0.7	142	1.9
	2000	76	84	1.1	125	19	0.3	28	85	21	0.3	31	95	21	0.3	31	95	6	0.1	9	107	0	0.0	0	0	0.9	151	2.0
	2001	75	247	3.3	405	30	0.4	49	89	10	0.1	16	102	13	0.2	21	103	8	0.1	13	100	0	0.0	0	0	0.8	308	4.1
	2002	74	87	1.2	85	34	0.5	33	93	43	0.6	42	104	19	0.3	19	107	6	0.1	6	109	0	0.0	0	0	1.4	189	2.6
	2003	82	419	5.1	524	54	0.7	68	80	11	0.1	14	94	11	0.1	14	94	4	0.1	5	96	0	0.0	0	0	1.0	499	6.1
	2004	88	71	0.8	60	41	0.5	35	85	56	0.6	47	99	20	0.2	17	102	1	0.0	1	117	0	0.0	0	0	1.3	189	2.1
	2005	88	204	2.3	240	28	0.3	33	77	25	0.3	29	90	23	0.3	27	96	9	0.1	11	96	0	0.0	0	0	1.0	289	3.3
	2006	88	101	1.1	109	43	0.5	46	83	24	0.3	26	105	25	0.3	27	102	1	0.0	1	94	0	0.0	0	0	1.1	194	2.2
LAKE AVERAGE			2.0	184		0.5	39	80		0.4	31	96		0.3	24	101		0.1	6	104		0.0	0	96	1.3		3.3	
STATEWIDE MEAN			1.0	55		0.8	29	78		0.8	36	91		0.6	27	98		0.2	8	97						2.4		
LOWER 25TH PERCENT			0.2	7		0.1	11	74		0.3	26	87		0.2	15	92		0.1	3	91						1.0		
UPPER 75TH PERCENT			1.2	60		0.9	42	81		1.2	48	97		1.0	35	105		0.2	12	104						3.1		

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

Table 5. Age composition and mean length of white crappie collected from Weiss Reservoir, fall 2006.

Age	Year Class	Number	Percent	CPE	Mean TL	SE	Length Range (mm)
0	2006	84	43.3	1.0	89.5	2.2	64-183
1	2005	76	39.2	0.9	165.0	5.3	109-282
2	2004	17	8.8	0.2	237.5	7.9	159-283
3	2003	15	7.7	0.2	271.3	4.6	235-296
4	2002	2	1.0	0.0	284.5	30.5	254-315
Total		194	100.0	2.2			

Table 6. Relative stock density, catch-per-effort, and relative weight of crappie in Weiss Reservoir, 1990-2006.

Species	SUBSTOCK		RSD-S				RSD-Q				RSD-P				RSD-M				RSD-T				S-T		Total	
	CPE	Pct.*	CPE	Pct.	B-Wr	W-Wr	CPE	Pct.	B-Wr	W-Wr	CPE	Pct.	B-Wr	W-Wr	CPE	Pct.	B-Wr	W-Wr	CPE	Pct.	B-Wr	W-Wr	CPE	No.	CPE	
CRAPPIE	1990	1.4	40	1.4	42	69	74	0.9	28	69	74	0.8	24	99	110	0.2	6	101	104	0.0	0	0	0	3.4	376	4.7
	1991	1.4	25	1.7	32	79	79	2.3	44	79	79	1.1	20	105	110	0.2	4	107	104	0.0	0	0	0	5.4	671	6.7
	1992	0.7	22	0.7	24	77	78	1.1	38	87	88	1.0	33	90	94	0.2	6	99	109	0.0	0	0	0	2.9	274	3.6
	1993	1.4	54	0.8	31	84	78	0.8	33	93	97	0.8	32	100	102	0.1	4	105	101	0.0	1	114	0	2.5	297	3.9
	1994	3.0	70	2.6	59	72	78	0.7	16	85	93	1.0	22	95	102	0.1	3	107	100	0.0	0	0	0	4.3	557	7.3
	1995	1.6	36	0.9	19	75	79	1.9	42	96	103	1.5	33	106	110	0.3	6	107	107	0.0	0	0	0	4.4	459	6.0
	1996	9.7	427	0.6	28	72	71	0.4	19	84	83	0.9	42	97	91	0.2	9	101	98	0.0	1	103	96	2.3	875	18.0
	1997	2.8	33	4.2	49	71	76	2.9	34	92	95	1.3	16	98	104	0.1	1	96	125	0.0	0	0	0	8.5	857	11.3
	1998	3.9	132	0.9	29	76	77	1.1	38	93	99	0.9	29	99	106	0.1	4	104	100	0.0	0	0	0	3.0	522	6.9
	1999	2.4	157	0.5	34	71	77	0.5	34	91	92	0.4	25	91	96	0.1	7	92	97	0.0	0	0	0	1.5	298	3.9
	2000	2.3	96	1.0	40	73	85	0.8	32	90	95	0.5	21	96	95	0.2	7	98	107	0.0	0	0	0	2.4	356	4.7
	2001	7.1	328	0.9	41	82	89	0.5	25	95	102	0.5	23	94	103	0.2	9	76	100	0.0	1	91	0	2.2	693	9.2
	2002	2.1	50	1.7	40	89	93	1.5	35	96	104	0.8	14	99	107	0.2	6	95	109	0.0	0	0	0	4.2	461	6.2
	2003	7.5	177	2.1	50	75	80	1.5	37	81	80	0.4	10	85	94	0.1	3	92	96	0.0	0	0	0	4.2	957	11.7
	2004	1.4	38	1.6	43	80	85	1.4	39	93	99	0.6	17	99	102	0.1	2	102	117	0.0	0	0	0	3.7	451	5.1
	2005	3.3	123	1.2	43	73	77	0.8	28	84	90	0.6	23	92	96	0.2	6	92	96	0.0	0	0	0	8.7	534	6.1
	2006	3.1	84	1.3	34	79	83	1.2	33	96	105	1.0	26	102	102	0.2	7	105	94	0.0	0	0	0	3.7	595	6.8
LAKE AVERAGE		3.2	111	1.4	38	76	80	1.2	32	88	93	0.8	25	97	101	0.2	5	99	104	0.0	0	103	96	3.6	543	6.8
UPLAND MEAN		1.0	55	0.8	29	74	78	0.8	36	87	91	0.6	27	93	98	0.2	8	100	97					2.4		
LOWER 25TH PERCENT		0.2	7	0.1	11	69	74	0.3	26	81	87	0.2	15	84	92	0.1	3	95	91					1.0		
UPPER 75TH PERCENT		1.2	60	0.9	42	77	81	1.2	48	94	97	1.0	35	100	105	0.2	12	107	104					3.1		

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

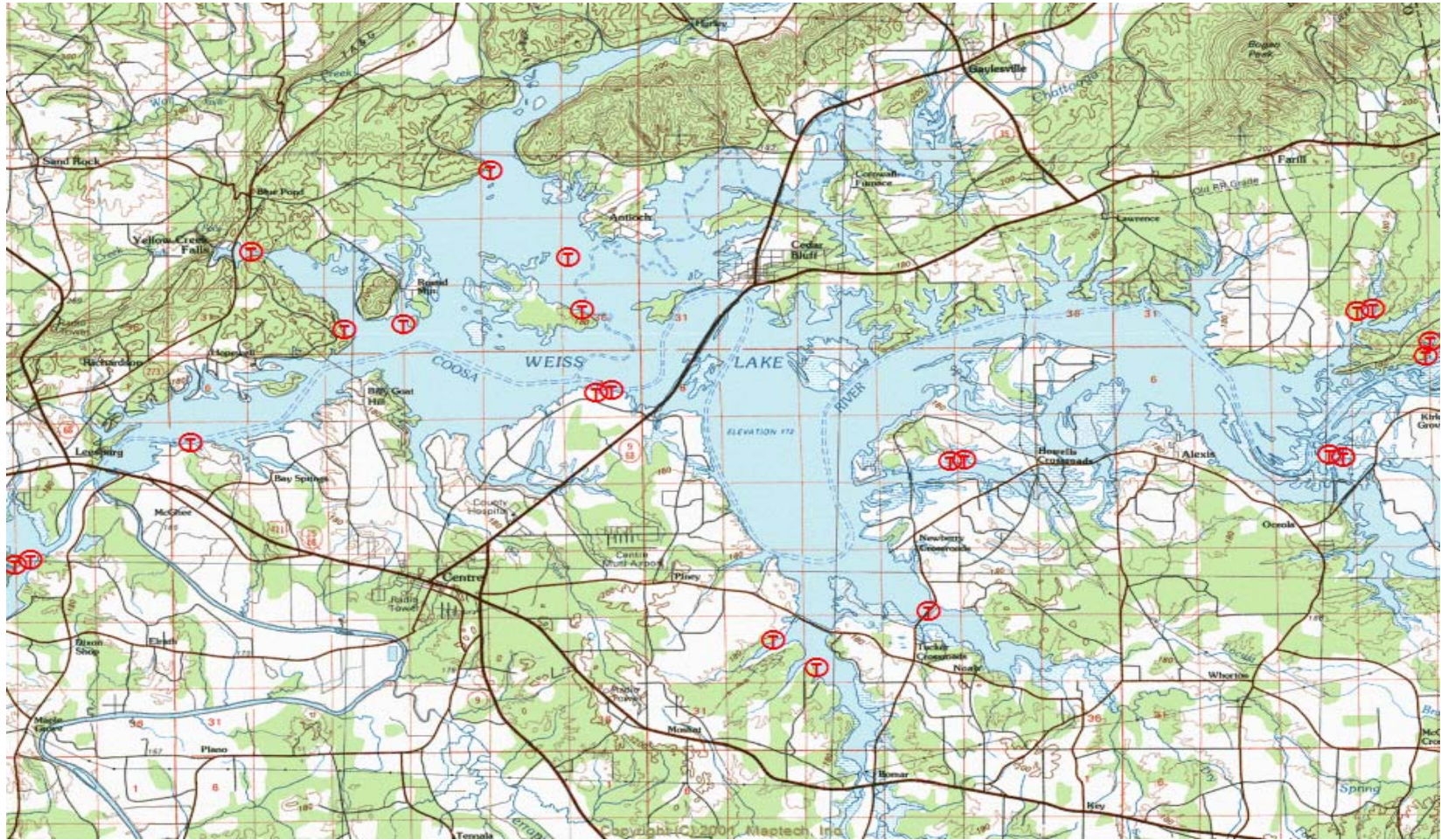


Figure 1. Weiss Reservoir Fall 2005 Trap Netting Sites = T

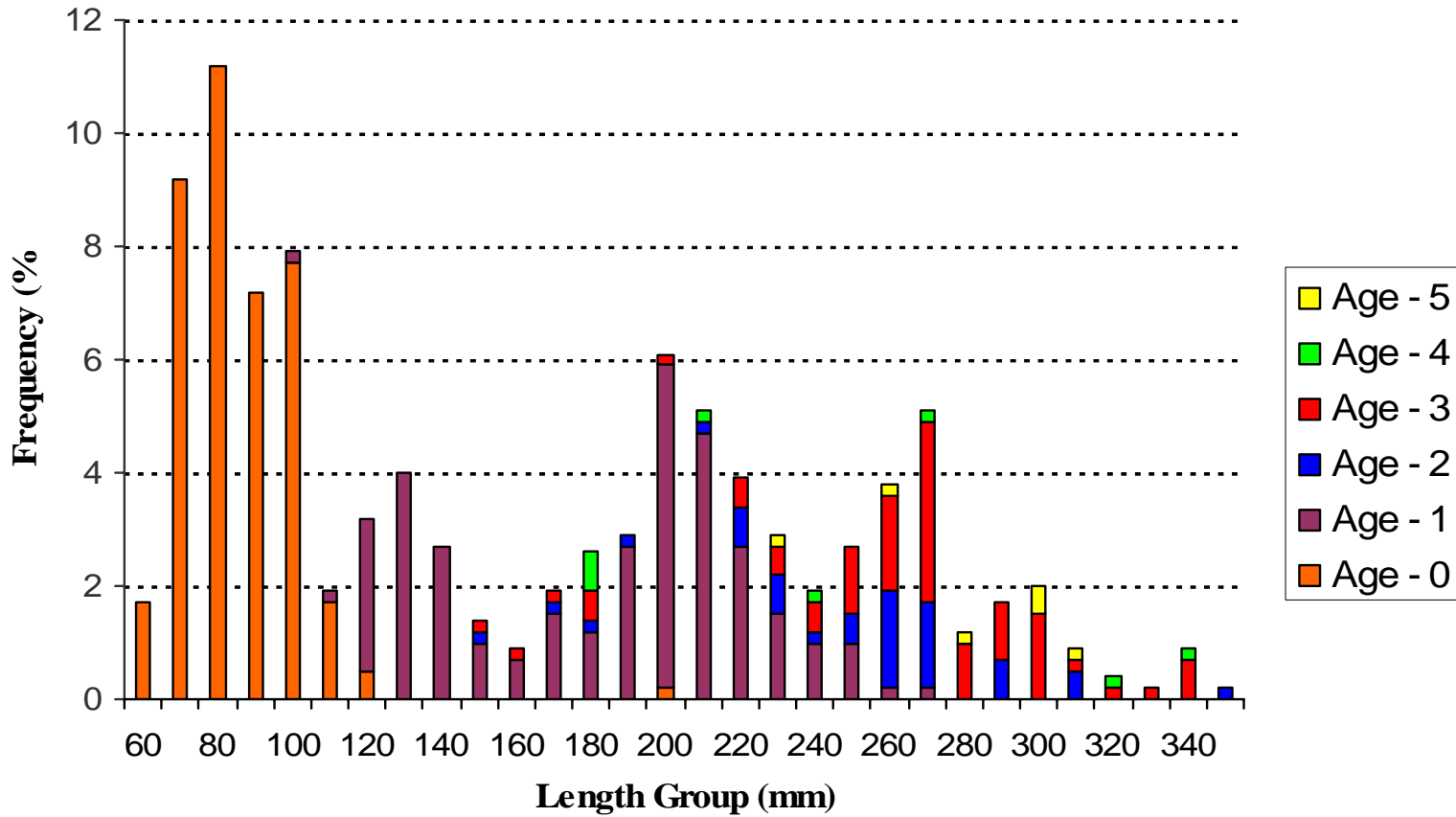


Figure 2. Length at age frequency of black crappie (N = 401) from Weiss Reservoir, fall 2006.

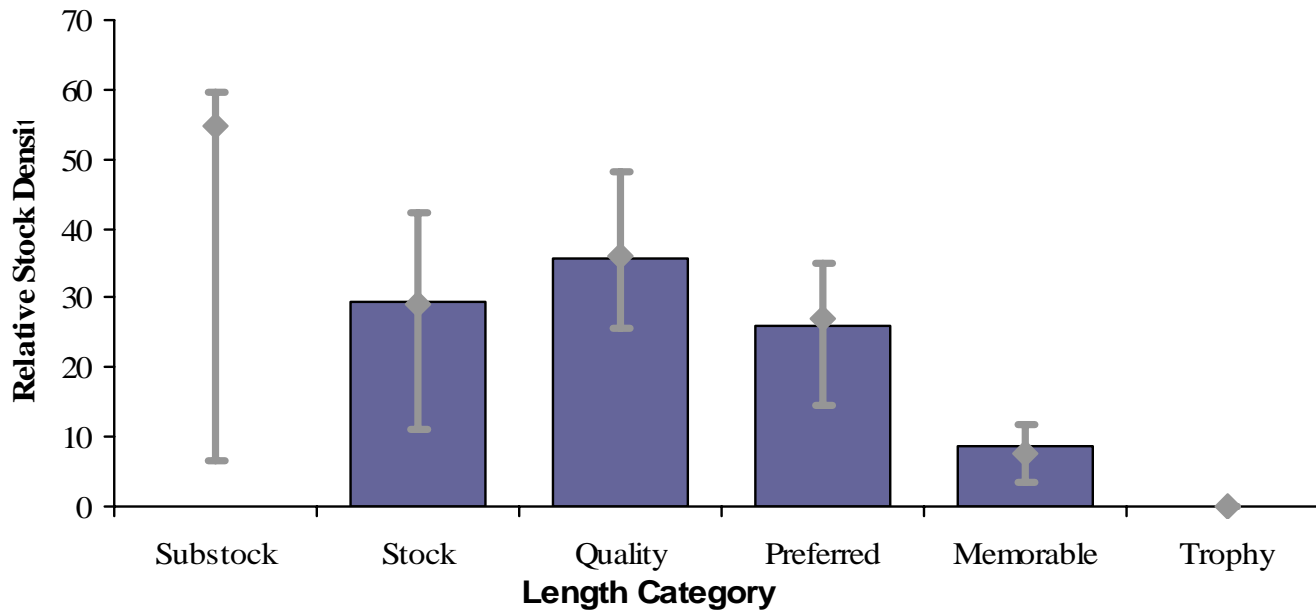


Figure 3. Relative stock density (RSD) of black crappie from Weiss Reservoir, fall 2006, with upland reservoir means for each size group. I-beams denote the 25th and 75th percentiles for RSD values in upland reservoirs for black crappie.

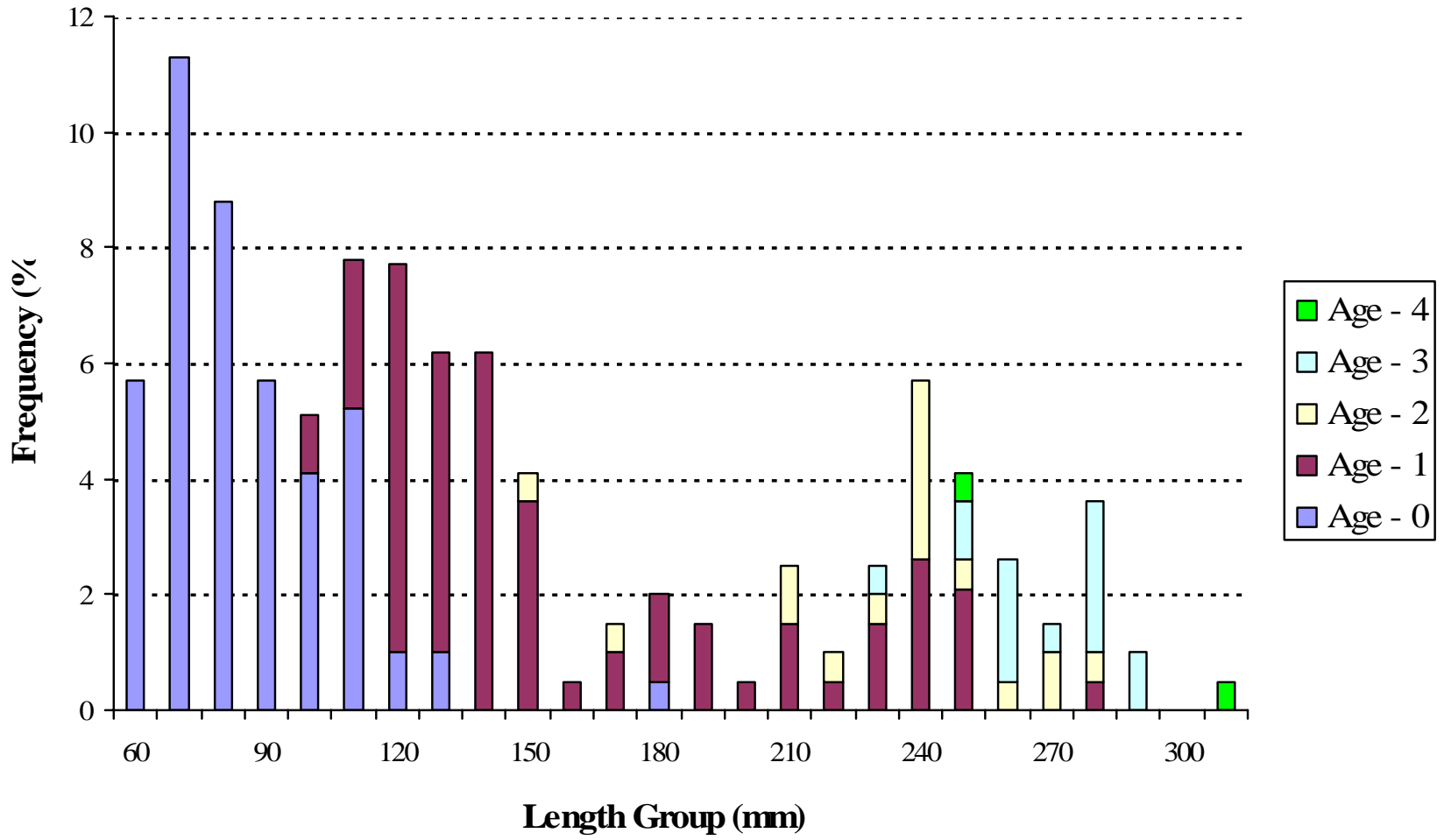


Figure 4. Length at age frequency of white crappie (N =194) from Weiss Reservoir, fall 2006.

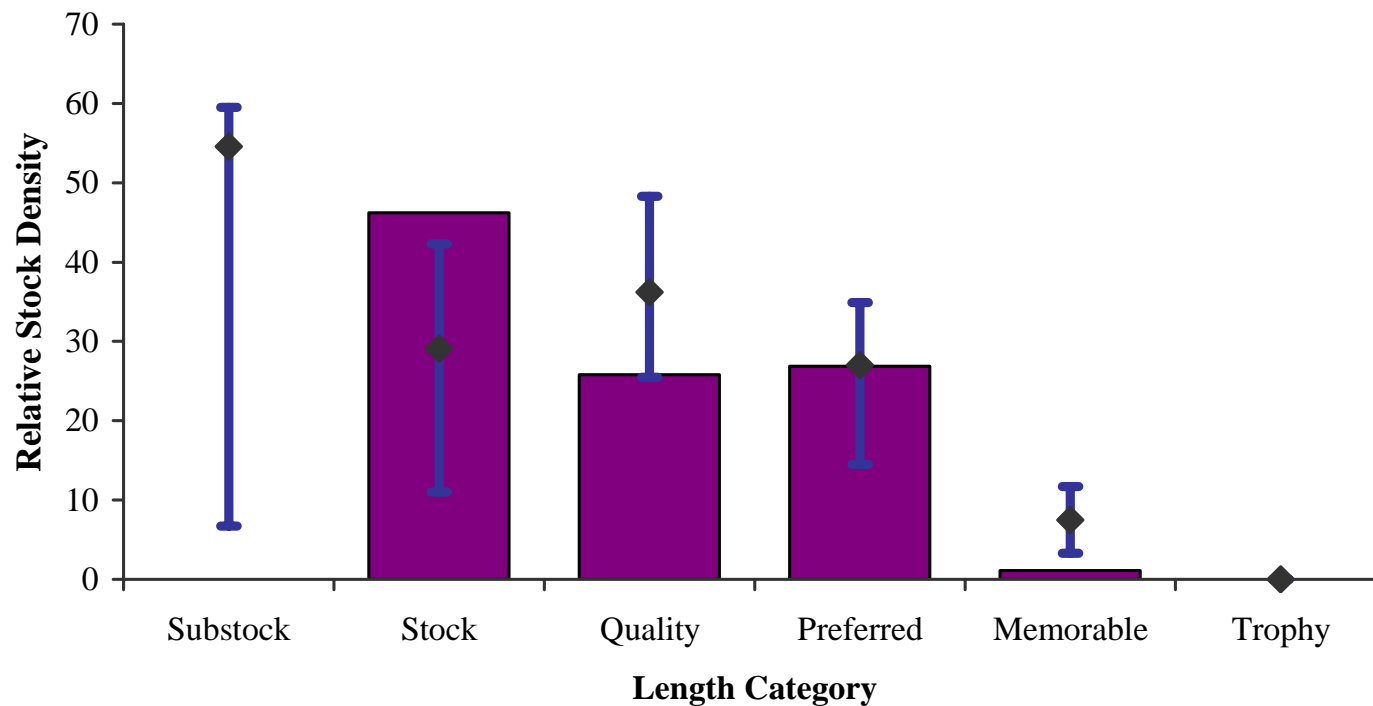


Figure 5. Relative stock density (RSD) of white crappie from Weiss Reservoir, fall 2006, with upland reservoir means for each size group. I-beams denote the 25th and 75th percentiles for RSD values in upland reservoirs for white crappie.