

NEELY HENRY RESERVOIR MANAGEMENT REPORT

FY 2007

FALL 2006

Prepared by

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Introduction

The objective of the Neely Henry Reservoir management plan is to collect quantitative biological data to assist district biologists in developing management strategies to enhance the fishery. The reservoir is sampled periodically to follow trends in growth, recruitment, and mortality, of its major sport fish species. Fall crappie samples have been collected previously from Neely Henry Reservoir in 1994, 1998, 2001, and 2003 by District II Fisheries personnel.

Detailed characteristics of Neely Henry Reservoir can be found in the 1988 management report (Floyd and Catchings 1989). A summary of morphometric, physical, and chemical characteristics is listed in Table 1 of this report.

Methods

Neely Henry Reservoir was sampled in the fall of 2006 according to guidelines of the Fisheries Section's Reservoir Management Manual (Cook 1999). Trap netting for crappie was conducted November 6, 2006 through November 8, 2006. Gear description and deployment methods can be found in the 2004 management report (Catchings and Andress 2005). Sample sites are shown in Figure 1.

Results

Fall 2006 trap netting resulted in the capture of 67 black crappie. Catch-per-effort of black crappie stock size and larger (1.7) was below the lake average (2.5) and between the 25th percentile (1.0) and mean (2.4) for upland reservoirs, (Table 2, Jim McHugh, unpublished data). CPE of stock-size fish (0.1) was at the 25th percentile for upland reservoirs and below the lake average (0.4), CPE of quality-size fish (1.1) exceeded both the upland mean (0.8) and the lake average (1.0), CPE of preferred-size fish (0.5) exceeded the upland 25th percentile but remained below the lake average (1.0), and memorable-size CPE (0.1) approximated the 25th percentile, and the lake average (Table 2, Jim McHugh, unpublished data).

Relative stock density (RSD) of stock-size fish (3.0%) was well below the lake average (15.1%) and the upland reservoir 25th percentile, 11.0% (Table 2, Figure 3, Jim McHugh, unpublished data). Quality-size black crappie (62.7%) were dominant (Table 2, Figure 3) as RSD-Q surpassed the upland reservoir 75th percentile. Preferred-size crappie RSD (26.9%) was at the mean for upland reservoirs in Alabama, but below the lake average, 36.9% (Table 2, Figure 3, Jim McHugh, unpublished data). Concurrently, memorable-size crappie RSD (7.5%) approximated the mean for upland reservoirs, which exceeds the lake average, 6.3% (Table 2, Figure 3, Jim McHugh, unpublished data).

Growth, expressed as mean length-at-age, for age 1+ and age 2+ black crappie was comparable to growth in upper Coosa Reservoirs (Table 3, Catchings and Andress 2005). Age 1+ growth increased from 187 mm in 2001 to 210 mm in 2006 (Table 3, Catchings and Smith 2002). Age 2+ crappie decreased from 254 mm in 2001 to 241 mm in 2006 (Table 3, Catchings and Smith 2002). Mean length for age 3+ (260 mm) black crappie was at the lower end of the range for upper Coosa Reservoirs, while age 5+ crappie mean length (280 mm) was average (Table 3, Catchings and Andress 2005).

Black crappie condition varied, but fell below lake averages for each RSD category except for quality-size fish (Table 2). Stock-size crappie mean W_r (69) was at the upland reservoir 25th percentile (Table 2, Jim McHugh, unpublished data). Quality-size crappie mean W_r approximated the lake average (91.3) which is slightly below the upland reservoir 75th percentile (Table 2, Jim McHugh, unpublished data). Preferred-size black crappie W_r surpassed the upland reservoir mean; while the memorable-size value fell below the upland 25th percentile (Table 2, Jim McHugh, unpublished data). Due to the low sample size, mortality could not be determined as outlined in the Reservoir Manual. However, it is worth noting that the estimated crappie annual mortality for age 2 through age 4 was 58% ($r^2=0.99$, Figure 4).

Conclusions

The current crappie fishery is sustained predominately by the 2004 and 2001 year classes, which accounted for 34% and 19% of the 2006 sample, respectively (Table 3). Crappie fishing should continue to be good during 2007 as the 2004 and 2005 year-classes continue to grow. The 2008 crappie fishery will be largely dependent upon the survival, growth and recruitment of the 2005 year class (which accounted for 25% of the 2006 sample), as no young-of-year (YOY) crappie were sampled. Hopefully, the 2007 year class will be much stronger than that of the previous two years. District II fisheries personnel do not recommend any management changes at this time. Crappie will be sampled again in the fall of 2009.

There are currently no new issues concerning public relations or aquatic weed nuisances pertaining to Neely Henry Reservoir. However, it is worth mentioning that a renovation of the Ten Islands Historic Park on the west side of the Neely Henry Dam was completed during the fall of 2006 by Alabama Power.

Literature Cited

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Appendix A

Tables and Figures

Table 1. Neely Henry Reservoir morphometric, physical and chemical characteristics.

Surface area	11,235 acres
Drainage area	6,600 sq. mi.
Full pool elevation	508 feet-msl
Mean annual fluctuation	4 feet
Shoreline distance	339 miles
Shoreline development index	22.83 (Welch 1948)
Mean depth	11 feet
Maximum depth	53 feet
Outlet depth	500 feet (upper) 453 feet (lower)
Total dissolved solids (TDS)	110 mg/l
Morphoedaphic index	10 TDS/mean depth(ft) (Ryder 1965)
Growing season	200 frost free days (Jenkins 1967)
Date of Impoundment	1966

Table 2. Relative stock density, catch per effort and relative weight of black crappie in Neely Henry Reservoir, 1994-2006 .

Species	Gear	Number Samples	TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																						
			SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				S-T	TOTAL		
			no.	cpe	pct*	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	cpe	no.	cpe	
Black Crappie	Fall 1994	Trap	40 n.n.	1	0.0	0.9	13	0.3	11.3	64	34	0.9	29.6	84	59	1.5	51.3	92	9	0.2	7.8	96	2.9	116	2.9
	Fall 1998	Trap	57 n.n.	4	0.1	2.7	37	0.7	24.5	81	76	1.3	50.3	98	32	0.6	21.2	99	6	0.1	4.0	107	2.6	155	2.7
	Fall 2001	Trap	40 n.n.	5	0.1	4.9	22	0.6	21.6	72	25	0.6	24.5	92	49	1.2	48.0	100	6	0.2	5.9	98	2.6	107	2.7
	Fall 2006	Trap	40 n.n.	0	0.0	0.0	2	0.1	3.0	69	42	1.1	62.7	91	18	0.5	26.9	94	5	0.1	7.5	91	1.7	67	1.7
LAKE AVERAGE				0.1	2.1	0.4	15.1	72	1.0	41.8	91	1.0	36.9	96	0.2	6.3	98	2.5			2.5				
STATEWIDE MEAN				1.0	55.0	0.8	29.1	74.1	0.8	36.2	87.2	0.6	27.0	92.8	0.2	7.5	99.5	2.4							
LOWER 25TH PERCENT				0.2	6.7	0.1	11.0	68.5	0.3	25.5	81.0	0.2	14.5	83.8	0.1	3.3	95.0	1.0							
UPPER 75TH PERCENT				1.2	59.5	0.9	42.3	76.5	1.2	48.3	93.5	1.0	34.9	100.0	0.2	11.7	107.0	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 Neely Henry Reservoir, November 6, 2006 - November 8, 2006 trap net sampling.

Annulus	Year Class	Number	Percent	CPE	Mean TL (SE)	Length Range (mm)
1	2005	17	25.4	0.4	210.4 4.9	158 - 235
2	2004	23	34.3	0.6	240.8 3.2	220 - 294
3	2003	10	14.9	0.3	260.4 5.1	234 - 291
4	2002	4	6.0	0.1	260.3 11.7	235 - 286
5	2001	13	19.4	0.3	279.8 11.1	219 - 356
Total		67	100.0	1.7		

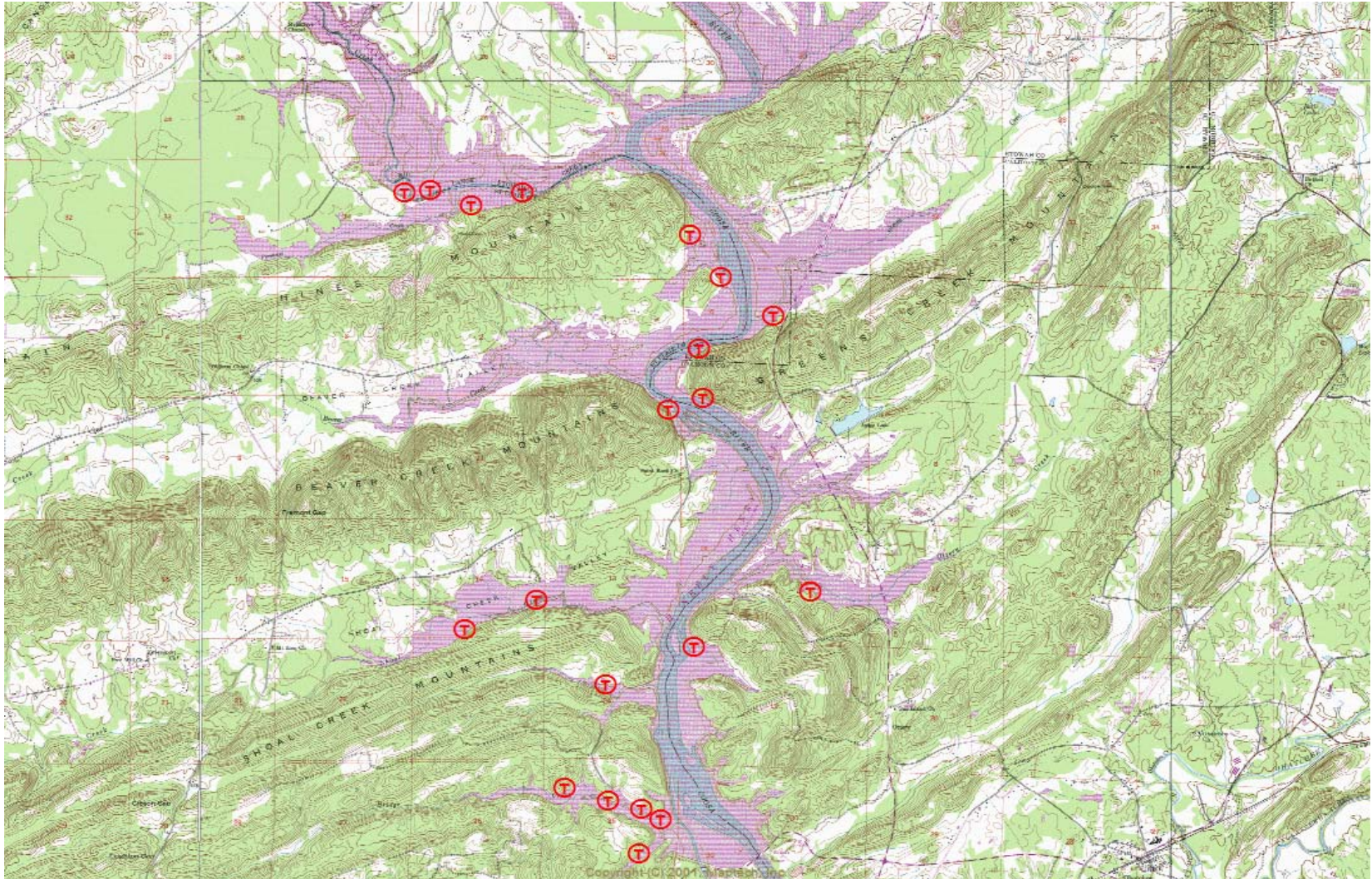


Figure 1. Neely Henry Reservoir fall 2006 trap netting sites = **T**

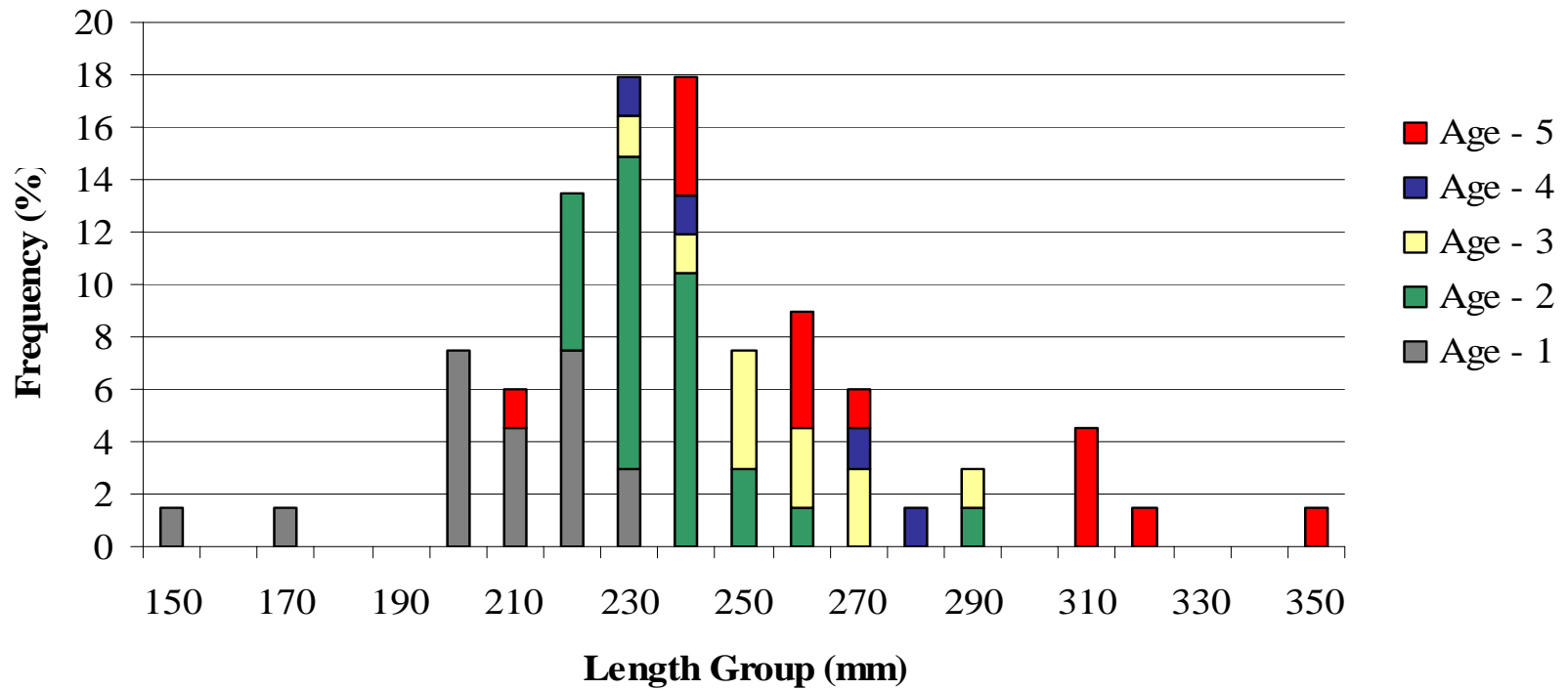


Figure 2. Length at age frequency for black crappie (N=67) from Neely Henry Reservoir, November 6, 2006 - November 8, 2006.

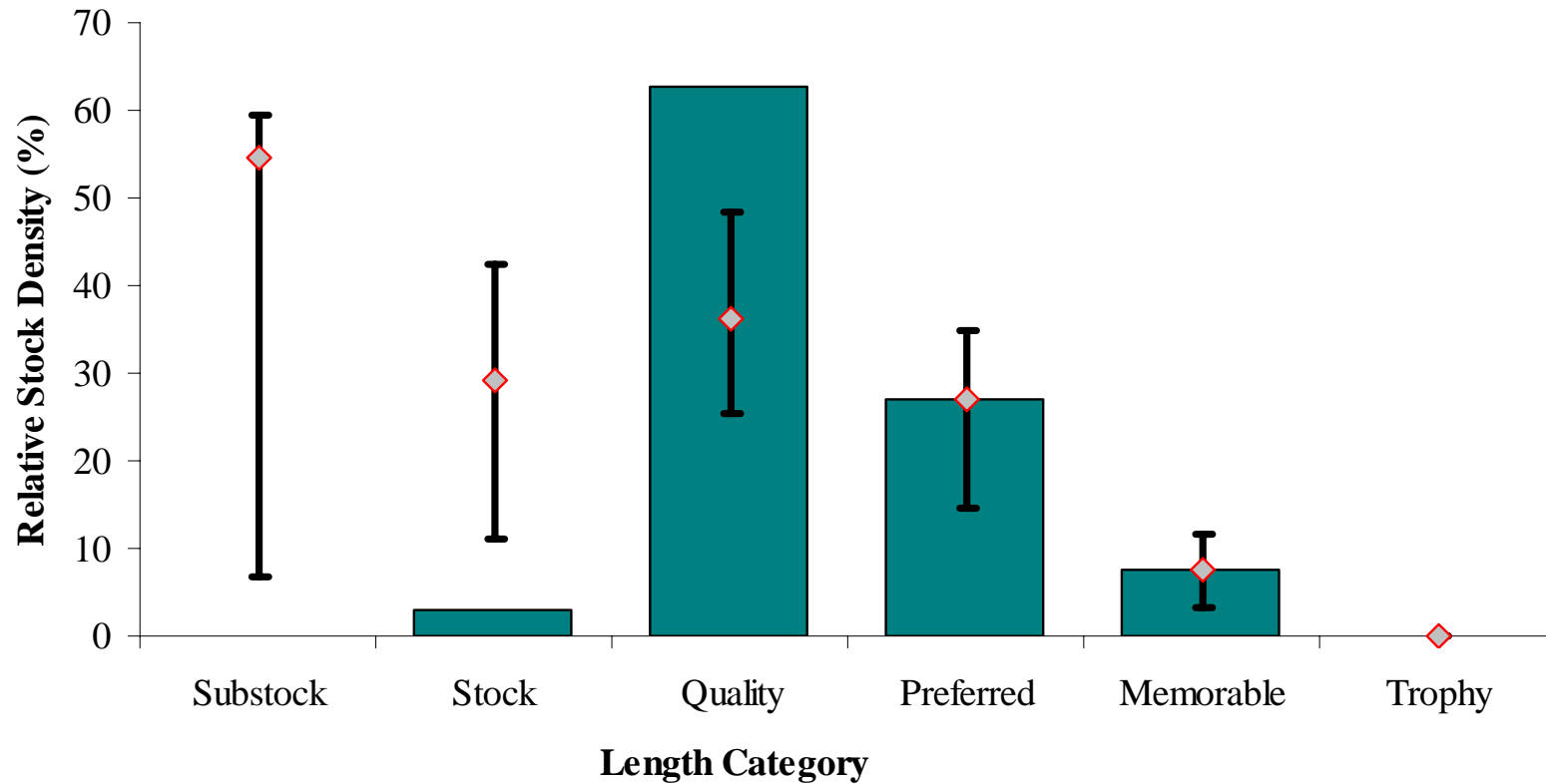


Figure 3. Relative stock density (RSD) of black crappie from Neely Henry Reservoir, fall 2006, with upland reservoir means for each size group. I-beams denote the 25th and 75th percentiles for RSD values in upland reservoirs for black crappie.

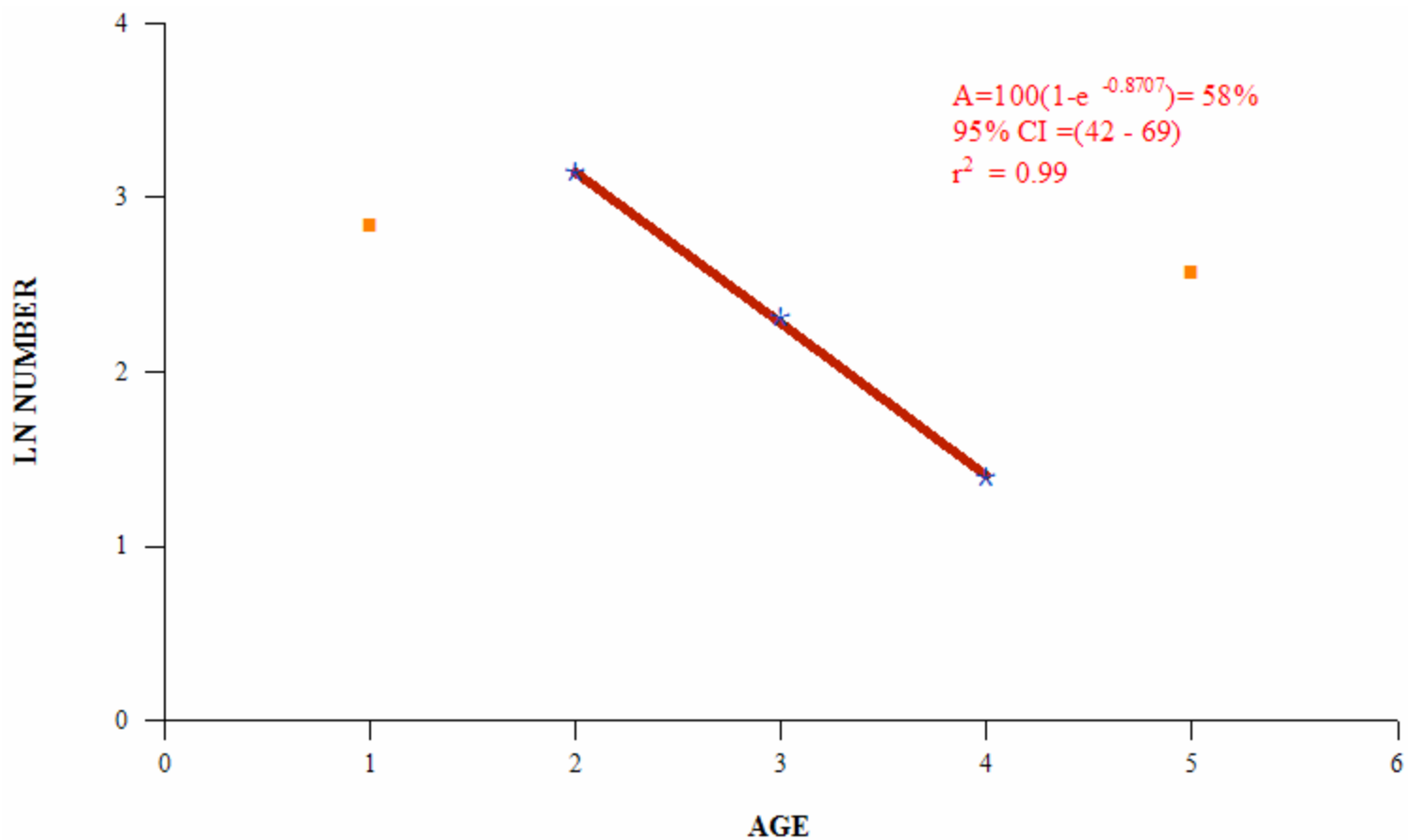


Figure 4. Total annual mortality (A) of black crappie (Ages 2-4) from Neely Henry Reservoir 2006 fall trap netting.