POINT A RESERVOIR
CRAPPIE MANAGEMENT REPORT

FALL 2006

Prepared by

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January 24, 2007

Introduction

Point A Reservoir is a 600-acre impoundment located on the Conecuh River in Covington County, Alabama (Table 1; Figure 1). The dam is approximately 4 miles northwest of the city of Andalusia. Trend data is periodically collected on Alabama reservoirs to monitor fish population metrics so that problems with the fishery can be detected, and proper management practices can be implemented. However, the current sample is the first that has been conducted on Point A Reservoir for crappie using trap nets. Therefore, crappie population metrics obtained from Point A reservoir during Fall 2006 can only be compared to statewide averages.

Methods

Crappie were sampled (46 net nights) from November 7, 2006 through November 17, 2006 at Point A reservoir according to guidelines set forth in the Alabama Reservoir Management Manual (Cook 1999). To maximize gear effectiveness, nets that yielded no crappie were set in habitats similar to those where crappie were collected after the first net night. Trap-net sampling locations are depicted in Figure 1.

Total length of all crappie was measured to the nearest millimeter, and weight was recorded to the nearest gram. Sagittal otoliths were removed from crappie and read whole view by District VI personnel for age and growth analysis. Since this was the first crappie sample from Point A reservoir, crappie 125 mm TL and less were aged to verify the cutoff length between young-of-year (YOY) and age-1 crappie in Point A Reservoir.

Catch per effort (CPE) was computed as the number of crappie collected per trap-net night. Stock density indices and relative weight were calculated according to Anderson and

Nuemann (1996). Growth was described using the von Bertalannfy equation, and time to reach stock, quality, and preferred size was calculated by inverting the equation and solving for the time needed to reach each stock length. Total annual mortality was calculated using weighted catch-curve regression where the natural logarithm of the number-at-age was regressed against age.

Results and Discussion

White crappie (N = 146) and black crappie (N = 5) were captured at a rate of 3.3 fish per net night. Catch rate (3.2 per trap-net/night) for white crappie was less than the statewide average of 8.8 crappie per net-night (Table 2). Due to an insufficient sample size, black crappie were only used in CPE analysis, and were eliminated from other population metrics. Nearly all black crappie were young-of-year ranging from 63 to 89 mm TL, except one individual that was 139 mm TL and 1 year old. White crappie ranged in length from 57 to 372 mm TL (Figure 2), and 11 year classes were represented (i.e. 0 + to 10 +; Table 3; Figure 2). The highest percentage of fish was age-2 (35.4 %), and these fish ranged from 151 to 288 mm TL (Table 3; Figure 2).

Relative stock density indices were between the statewide upper 75th and lower 25th percentiles for stock, quality, and preferred size fish, but were slightly below the statewide mean (Figure 3). Relative stock density for memorable size fish was higher than the statewide average, and fell above the statewide 75th percentile. Additionally, proportional stock density (PSD) was high at 70%, indicating that large fish (≥ 200 mm TL) made up a high percentage of the population. Relative weight was low for all size groups of white crappie, and fell below the statewide average for quality, preferred and memorable size fish (Table 2).

The von Bertalannfy equation predicted that it took about 3 years for crappie to reach 229 mm TL (9 inches), which is the statewide minimum length limit for crappie (Figure 4). Predicted time to reach stock, quality, preferred and memorable size was 1.6, 2.4, 3.3 and 4.6 years, respectively (Figure 4). The smallest age-1 white crappie was 140 mm TL, and the largest age-0 white crappie was 88 mm TL. Mean lengths of age-0 and age-1 white crappie were 72 and 166, respectively (Table 3), and it is safe to assume that white crappie less than 125 mm TL are age-0 (YOY's) in Point A Reservoir.

Total annual mortality was 41% ($r^2 = 0.80$) for white crappie using weighted catch-curve regression to deflate the importance of older age classes (Figure 5). Therefore, survival is likely about 59% for white crappie in Point A reservoir. The regression was highly significant ($F = 27.45$; $P < 0.05$), and approximately 80 % of the variation in number-at-age was explained by age ($r^2 = 0.80$; Figure 5). The coefficient of determination (r^2) from the catch-curve regression does not meet the current required adjusted r^2 value of 0.90. Residuals from catch-curve analysis, along with regression diagnostic tools (i.e. Cook's D, DF Betas) indicated that no above average year classes have been produced during the last 10 years (Maceina 1997; Figure 5).

Summary

Point A Reservoir is shallow with a substantial amount of aquatic vegetation; and lies in an infertile watershed. Much of the nutrient load is trapped by Gantt Reservoir located directly upstream. Therefore, the reservoir is not expected to produce a high yield of sportfish. Sunfish serve as the primary forage base for sportfish due to low abundances of threadfin and gizzard shad. Point A supports a decent bream fishery as indicated by previous bluegill and redear

samples (Newman et al. 1997; Weathers et al. 2001; Weathers et al. 2005). In a fishery such as this, where crappie are mainly consuming sunfish and fertility is relatively low, crappie would not be expected to be numerous or grow very fast. Crappie abundance and relative weight is low in Point A Reservoir, which indicates that the forage base is not adequate enough to support a healthy sportfish population. One of the most detrimental factors affecting this fishery is the drastic water level changes that occur from draw downs that are conducted by the Alabama Electric Cooperative for periodic dam and turbine maintenance. Water level changes can alter fish populations by concentrating prey species due to loss of littoral zone habitat where they seek refuge (Ploskey 1986). In turn, the prey biomass decreases, and predators are left with less than adequate prey availability when water levels return to normal, which leads to increased predator mortality (Ploskey 1986). The Alabama Division of Wildlife and Freshwater Fisheries has stocked fish into Point A Reservoir on occasion to enhance the fishery. The stocking history for Point A Reservoir can be found in Table 4.

Conclusions

1. Communication and cooperation between AEC and the Wildlife and Freshwater Fisheries Division should be consistent in order to maintain this fishery to the full benefit of the angling public.

2. Crappie are not abundant in Point A Reservoir, but the current population consists of many harvestable size individuals, and anglers should take advantage of the current fishery.

3. No management recommendations are warranted at this time for the crappie fishery.

4. A creel survey will be conducted on Point A Reservoir during Spring 2007, which will provide insight on crappie harvest and angler demographics.

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APPENDIX A

TABLES AND FIGURES

POINT A RESERVOIR 2006

Table 1. Point A Reservoir morphological, physical, and chemical characteristics.

Surface area	600	acres
Drainage area	1,344	sq. mi.
Full pool elevation	170	feet-msl
Mean annual fluctuation	1	feet
Shoreline distance	19	miles
Shoreline development index	5.6	(Welch 1948)
Mean depth	3.3	feet
Outlet depth	35	feet
Total dissolved solids	43	mg/l
Morphoedaphic Index	13	(Ryder 1965)
Growing season	233	frost free days (Jenkins 1967)
Year of Impoundment	1926	

Table 2. Stock density indices, catch per effort, and relative weight of white crappie collected from Point A Reservoir, Fall 2006, compared to statewide averages.

				TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																			
				SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				TOTAL	
Species	Gear	Year	Samples	no.	cpe	ratio	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe
White Crappie	Trap	2006	46	43	0.9	42	33	0.7	32	75	32	0.7	31	81	22	0.5	21	80	16	0.3	16	77	146	3.2
Statewide Average					3.6	74		2.2	36	76		1.5	33	89		1.1	24	94		0.3	7	95		8.8

Table 3. Mean lengths-at-age, and age structure data for white crappie collected from Point A Reservoir, Fall 2006.

Age	Year Class	Number	Percent	CPE	Mean TL (mm)	SE	Range TL (mm)
0	2006	24	18.9	0.5	72.0	1.3	57 - 88
1	2005	25	19.7	0.5	166.4	4.7	140 - 234
2	2004	45	35.4	1.0	223.0	4.4	151 - 288
3	2003	23	18.1	0.5	284.2	5.6	218 - 321
4	2002	4	3.1	0.1	292.3	12.1	270 - 320
5	2001	1	0.8	0.0	372.0		
6	2000	3	2.4	0.1	337.0	10.6	317 - 353
7	1999	1	0.8	0.0	350.0		
8	1998	0	0.0	0.0	0.0		
9	1997	0	0.0	0.0	0.0		
10	1996	1	0.8	0.0	364.0		
Total		127	100.0	2.8			

Table 4. Point A Reservoir stocking history by the Alabama Division of Wildlife and Freshwater Fisheries (1974 – 2006).

Species	Year	Number/Acre	Size (inches)	Total
Black Crappie	2006	189.0	1	113,520
	2006	10.5	2 - 4	6,312
Bluegill Sunfish	1991	234.2	1 - 2	140,500
	1992	87.5	1 - 2	52,500
	1994	20.0	1 - 2	12,000
	2005	102.0	1	61,000
	2006	313.0	1	188,040
Channel Catfish	1982	50.0	2 - 3	30,000
	1992	52.5	3 - 5	31,500
	2005	10.5	8 - 16	6,300
	2006	12.5	4 - 5	7,520
Florida Largemouth Bass	1974	48.3	1 - 2	29,000
	1986	2.3	1 - 2	1,400
	2005	10.5	1	6,300
	2006	25.0	1 - 2	15,130
Hybrid Striped Bass	1982	10.0	2 - 3	6,000
Redear Sunfish	1994	10.0	1 - 2	6,000

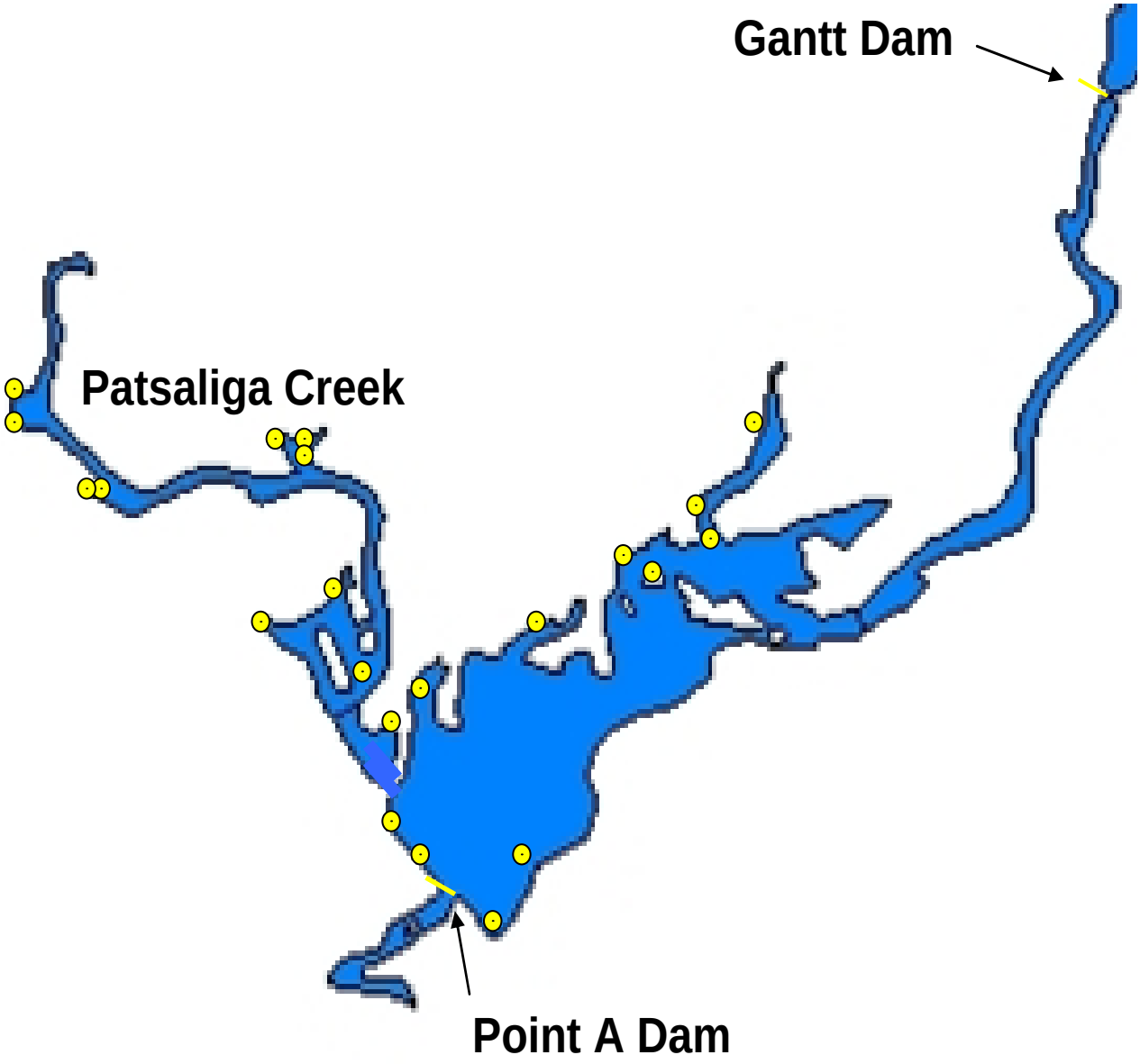

Figure 1. Map of Point A Reservoir with trap-net sampling locations indicated by yellow circles.

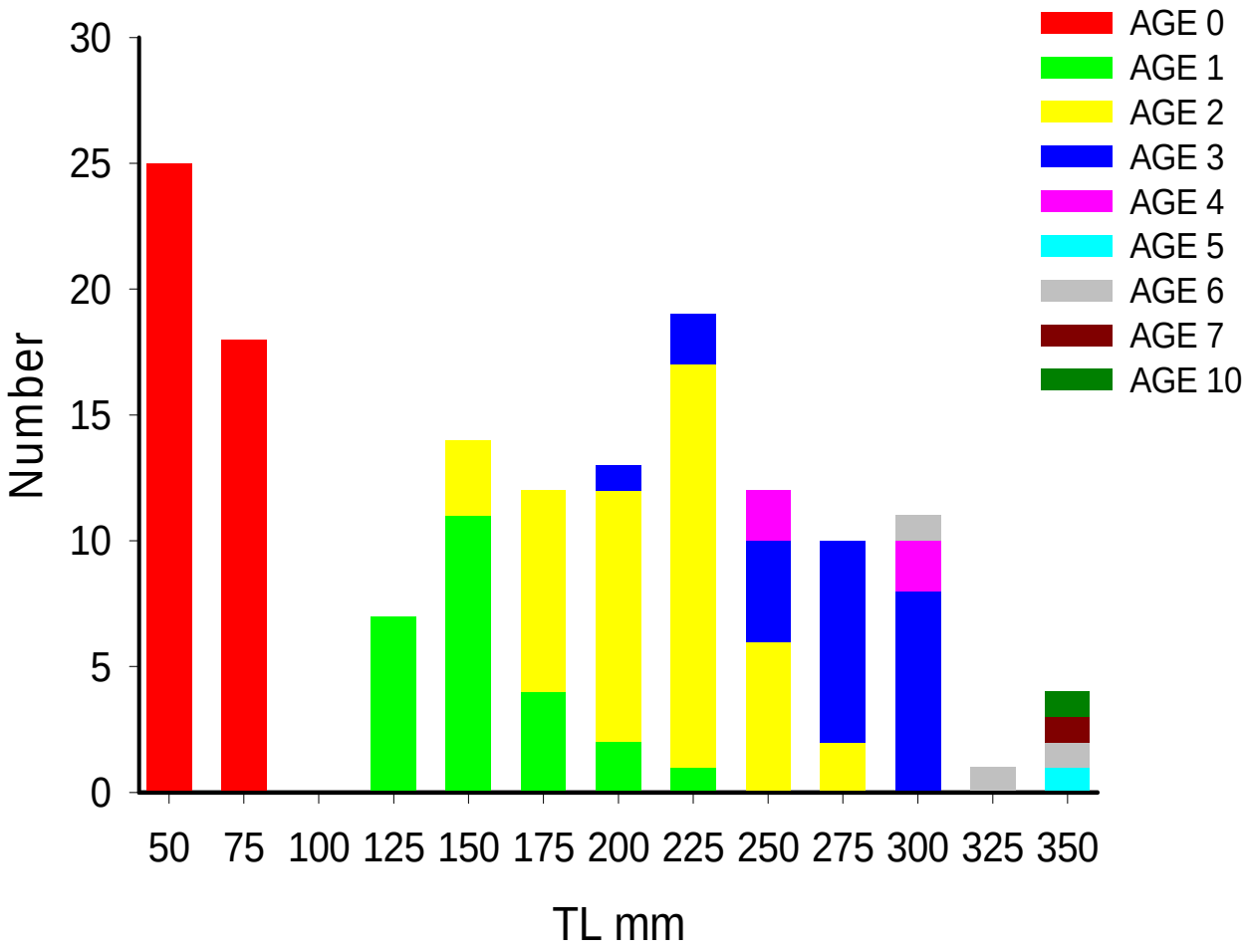

Figure 2. Length-at-age frequency for white crappie collected from Point A Reservoir, Fall 2006.

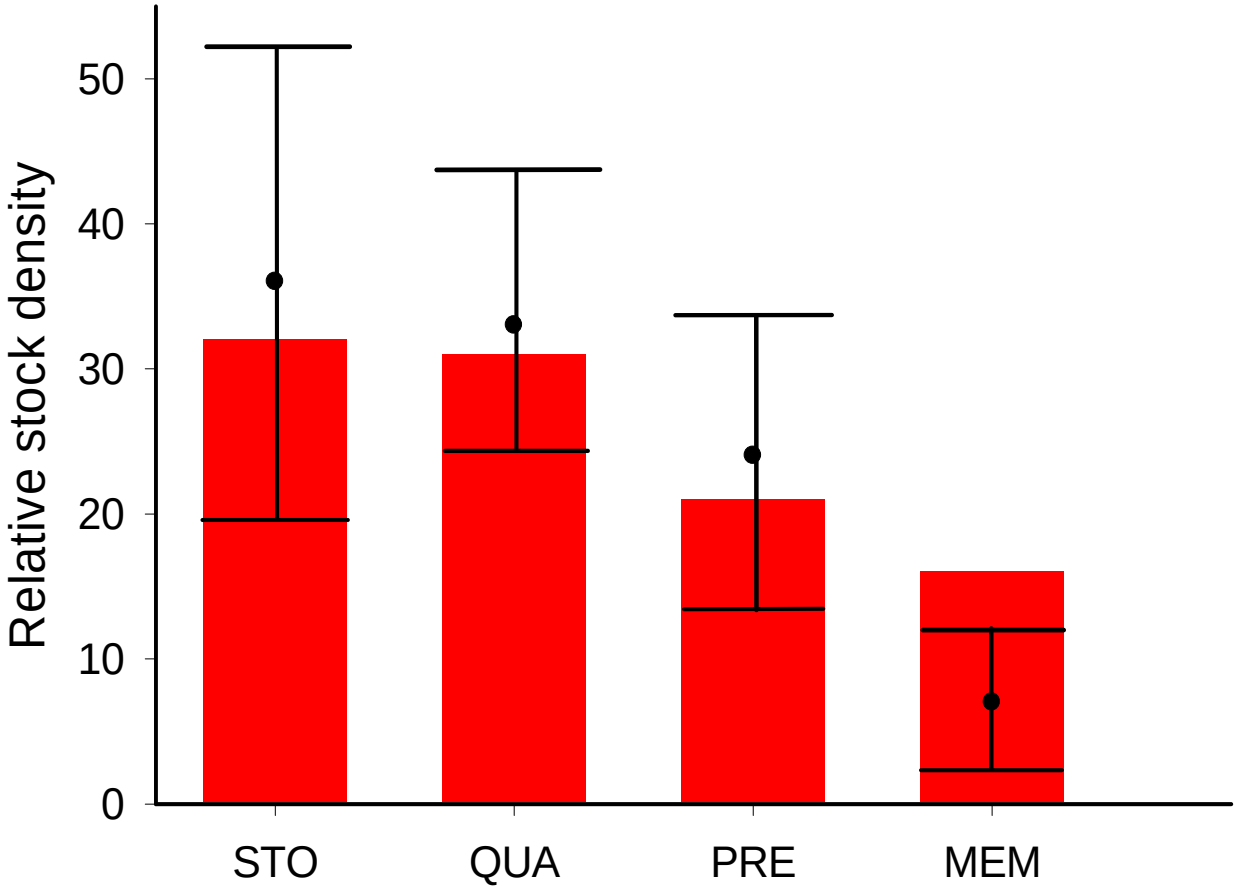

Figure 3. Relative stock densities for white crappie collected from Point A Reservoir, Fall 2006. Circles represent the statewide mean and bars represent the upper 75th and lower 25th percentiles for each relative stock density.

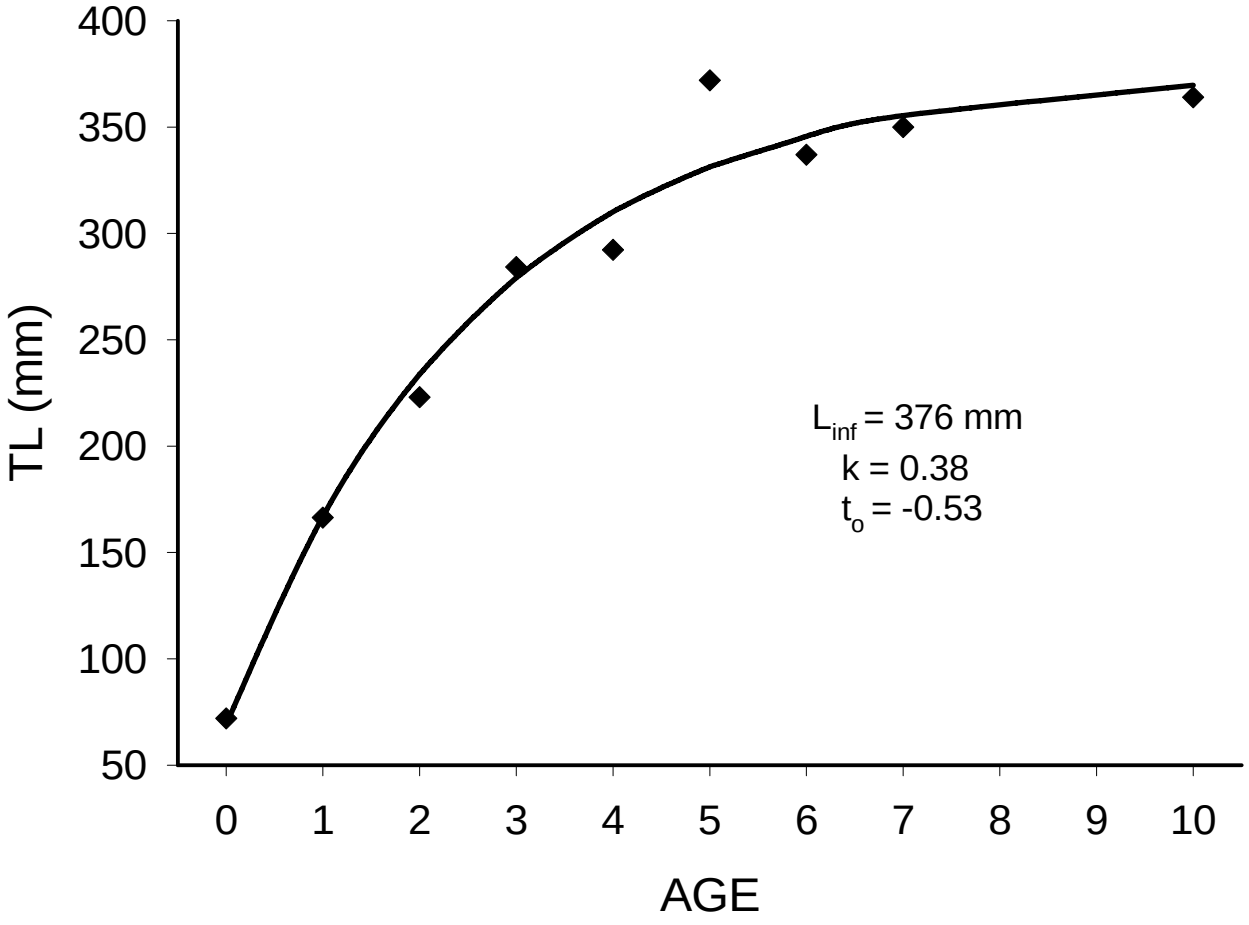

Figure 4. Mean lengths-at-age (diamonds) and the predicted growth curve (line) from the von Bertalannfy growth equation. Note: Ages represent the age at capture during Fall 2006, i.e. age 0 is 0+, 1 is 1+, 2 is 2+ etc., since fish were collected during the fall, and have almost completed the current growth year.

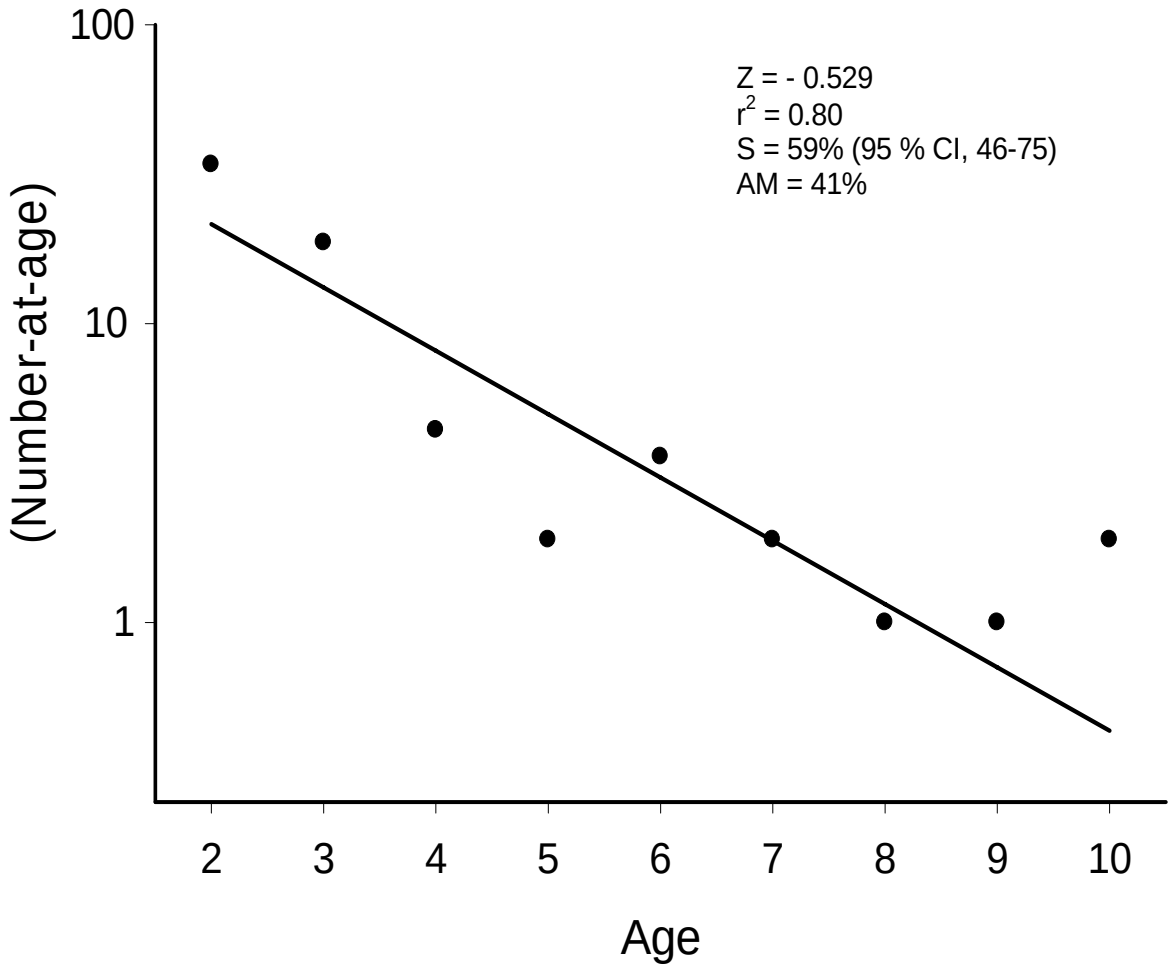

Figure 5. Catch-curve regression for white crappie collected from Point A Reservoir, Fall 2006. Circles represent the number-at-age, and the line is the predicted slope (Z) from regressing the natural log of the number-at-age against age.