PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-33

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

JB Thomas Reservoir

Prepared by:

Charles Munger
Inland Fisheries Division
District 1- A, Canyon, Texas

Carter Smith
Executive Director

Phil Durocher
Director, Inland Fisheries

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SURVEY AND MANAGEMENT SUMMARY

Fish Populations in J.B. Thomas Reservoir were surveyed in 2007 using electrofishing and trap nets and in 2008 using gill nets. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

Reservoir Description: J.B. Thomas Reservoir is a 7,820-acre impoundment (constructed in 1952) on the main stream of the Colorado River. The dam is located 16 miles southwest of Snyder and west of State Highway 208, in Scurry County, Texas. The reservoir is owned by the Colorado River Municipal Water District and provides water to three member cities. The reservoir has a drainage area of 3,950 square miles, however, it experiences frequent water level fluctuations. Capacity during 2007 was approximately 6% of capacity or 1,000 acres. The reservoir has been at under 20% capacity from 1994 to 2004. Angler access is good and there is one boat ramp. There are limited handicap-specific facilities. Habitat consisted primarily of nondescript mud bank and flooded terrestrial vegetation.

- **Management history:** Important sport fish include largemouth bass, white crappie, and catfish. The sport fish populations have only been managed with statewide regulations.

- **Fish Community**
  - **Prey species:** Gizzard shad were abundant in the reservoir and had an IOV of 97 indicating most were available to existing predators. Electrofishing catch of bluegills was average for the reservoir, but the population was dominated by small individuals.

  - **Catfishes:** Blue catfish were relatively abundant in the reservoir, but growth was poor. Channel catfish had low relative abundance and poor growth. Flathead catfish were present in the reservoir.

  - **White bass:** White bass were present in the reservoir in low numbers with relatively few legal fish. Growth rates were good with fish reaching legal size by age 1.

  - **Largemouth bass:** Stock-length largemouth bass were relatively abundant compared to previous samples. Size structure was good. Largemouth bass had adequate growth rates and legal-size fish were in good condition.

  - **White crappie:** White crappies were very abundant but few fish were of legal size. Growth was poor as no fish reached legal size before age 4.

- **Management Strategies:** Conduct general monitoring with trap nets, gill nets, and electrofishing in 2011-2012. Investigate possible regulation changes on blue catfish and white crappie to alleviate a growth bottlenecks.

INTRODUCTION

This document is a summary of fisheries data collected from J.B. Thomas Reservoir in 2007-2008. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data is presented for comparison.

Reservoir Description

J.B. Thomas Reservoir was built as a 7,820-acre impoundment constructed in 1952 on the main stream of the Colorado River, located 9 miles west of Childress, Texas. The reservoir has averaged less than 2,000 surface acres for most of its existence. The dam is located 16 miles southwest of Snyder and west of State Highway 208, in Scurry County, Texas. The reservoir is owned by the Colorado River Municipal Water District and provides water to three member cities. The reservoir has a drainage area of 3,950 square miles. The reservoir has been under 50% capacity since 1968 and was continuously under 20% from 1994 through 2004 due to drought and reached a record low of 3% in 1999. (Figure 1). Capacity during 2007 was approximately 6% of conservation pool or 1,000 acres. J.B. Thomas Reservoir was mesotrophic with a mean TSI chl-*a* of 51.0 (Texas Commission on Environmental Quality 2008). Angler access is good as most of the shoreline is accessible. There is only one boat ramp. There are limited handicap-specific facilities. Habitat consisted primarily of nondescript mud bank and flooded terrestrial vegetation. Other descriptive characteristics for J.B. Thomas Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Munger and Henegar 2004) included:

1. Stock Florida largemouth bass when drought conditions improve.
   Action: Low water has continued so stocking was not requested. The reservoir appears to have stabilized at a lower water level since 2001.

Harvest regulation history: Sportfishes in J.B. Thomas Reservoir are currently managed with statewide regulations (Table 2).

Stocking history: J.B. Thomas Reservoir has been stocked with channel catfish, bluegill and Florida largemouth bass. The complete stocking history is in Table 3.

Vegetation/habitat history: The last habitat survey was conducted in 2003. Primary habitat in the reservoir was flooded terrestrial vegetation, nondescript shoreline and boulders (Munger and Henegar 2004). Vegetation occupied less than one acre.

METHODS

Fishes were collected by electrofishing (4.2 hours at 48 5-min stations), gill netting (5 net nights at 5 stations), and tandem trap netting (12 net nights at 12 stations). Additional samples were collected by hoop net as part of a special research project with data used for age and growth and to provide supplemental information. Electrofishing effort toward bluegill was lower than for other species as research personnel did not collect data on this species during the first night of sampling. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and condition indices [relative weight (Wr)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Otoliths were collected from a subsample of target species (gizzard shad, blue catfish, channel catfish, white bass, and largemouth bass) of 10 fish per 10 mm length group (each boat independently to 10) with no more than 3 fish of any one 10 mm group per station. For white crappie, otoliths were collected from the first 500 fish from each sampling gear.

RESULTS AND DISCUSSION

Habitat: A habitat survey was last conducted in 2003 when primary habitat in the reservoir was flooded terrestrial vegetation, nondescript shoreline and boulders (Munger and Henegar 2004). Vegetation was limited to less than one acre.

Prey species: Electrofishing catch rates of gizzard shad and bluegill were 278.6/h and 47.2/h, respectively. Index of vulnerability (IOV) for gizzard shad was high, indicating 97% of gizzard shad were available to existing predators; this was similar to IOV estimates in previous years (Figure 2). Most gizzard shad available to predators were age 0 or age 1 (Figure 3). Total CPUE of gizzard shad was similar to catch rates in 1997 and 2003 surveys (Figure 2). Total CPUE of bluegill in 2007 was higher than total CPUE from surveys in 1997 and 2003, and size structure continued to be dominated by small individuals (Figure 4).

Catfishes: The gill net catch rate of blue catfish was 10.4/nn in 2008 which was lower than the catch rate in 2004 of 17.6/nn (Figure 5). The catch rate of stock-size and larger fish increased, but the PSD declined by more than half. Growth of blue catfish was poor as it took seven years for most fish to reach legal size of 12 inches (Figure 6). There appeared to be a growth bottleneck between ages 2-9 where most fish were in the 9-12 inch size group. The channel catfish population continued to have low abundance. The gill net catch rate of channel catfish was 2.4/nn in 2008 which was higher than the 2004 catch rate of 0.4/nn (Figure 7). Fish began reaching legal size (12 inches) at age 4 but the age-class average did not reach 12 inches until age 6 (Figure 8). Flathead catfish were present in the reservoir and were in very good condition (Figure 9). The 2008 gill net catch rate for flathead catfish was 5.8/nn which was an increase from the 2004 catch rate of 1.8/nn.

White bass: White bass continued to be present in the reservoir in low numbers. The gill net catch rate for white bass in 2008 was 0.6/nn which was half the catch rate of 2004 (Figure 10). Only one legal-size (10 inch) white bass was collected by gill nets in 2008. Age and growth samples collected by other means showed that white bass were reaching legal size by age 1 (Figure 11) and that they will survive to age 7. The population was very young as 89% of the aged fish were age 0.

Largemouth bass: The electrofishing catch rate of largemouth bass was 28.1/h in 2007 and was similar to the catch rate in 2003 of 20.0/h (Figure 12). The 1997 electrofishing catch rate was 59.0/h but primarily consisted of fish less than 10 inches in length. A PSD of 82 and RSD-14 of 49 indicated there were low numbers stock to quality length fish. Growth of largemouth bass in J.B. Thomas Reservoir was good as most fish reached 14 inches by age 3 (Figure 13). It was interesting to note that some of the largest fish were aged to 14, 19, and 20 years. Body condition in 2007 was low (relative weight under 100) for all size classes of fish less than 13 inches, but was higher than 100 for most legal-size fish (Figure 12).

White crappie: The tandem trap net catch rate of white crappie was 171.8/nn in 2008 (Figure 14), higher than in 2003 (29.5/nn) and 1997 (27.8/nn). This difference may be due to different sampling gear. Data from 1997 and 2003 was collected using standard trap nets while data from 2007 was collected from tandem trap nets. The PSD was 2 and was much lower than PSDs from standard trap nets (Figure 14). Growth was poor as no white crappie reached 10 inches in total length (legal size) before age 4 (Figure 15).

Fisheries management plan for J.B. Thomas Reservoir, Texas

Prepared – July 2008.

ISSUE 1: Blue catfish growth was poor with a bottleneck of fish aged 2-9 constrained between 9-12 inches. There was adequate forage for blue catfish once they reach a size where they can become piscivorous (about 11 inches) as the IOV of gizzard shad was over 90. The poor growth may be a result of limited availability of macroinvertebrates and freshwater mussels to smaller fish within the reservoir. Since stocking forage within the system is impractical, the best potential management option to restructure the population may be a regulation change.

MANAGEMENT STRATEGY

1. Investigate the potential for a regulation change designed to allow harvest of smaller blue catfish and possibly increase growth rates.

ISSUE 2: Growth of white crappie was poor. It currently takes 4 years before any fish reach legal size (10 inches) with fish up to 7 years old less than 8 inches long. Adequate forage was available for larger white crappie but there may be limited availability of macroinvertebrates for smaller fish.

MANAGEMENT STRATEGY

1. Investigate the potential for a regulation change to remove length and bag limits for crappie in J.B. Thomas Reservoir.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes conducting mandatory monitoring in 2011/2012 (Table 4).

LITERATURE CITED

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

DiCenzo, V. J., M. J. Maceina, and M. R. Stimert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

Munger, C., and J. Henegar. 2004. Statewide freshwater fisheries monitoring and management program survey report for J.B. Thomas Reservoir, 2003. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Texas Commission on Environmental Quality. 2008. Trophic classification of Texas reservoirs. 2008 water quality inventory and 303(d) list, Austin. 15 pp.

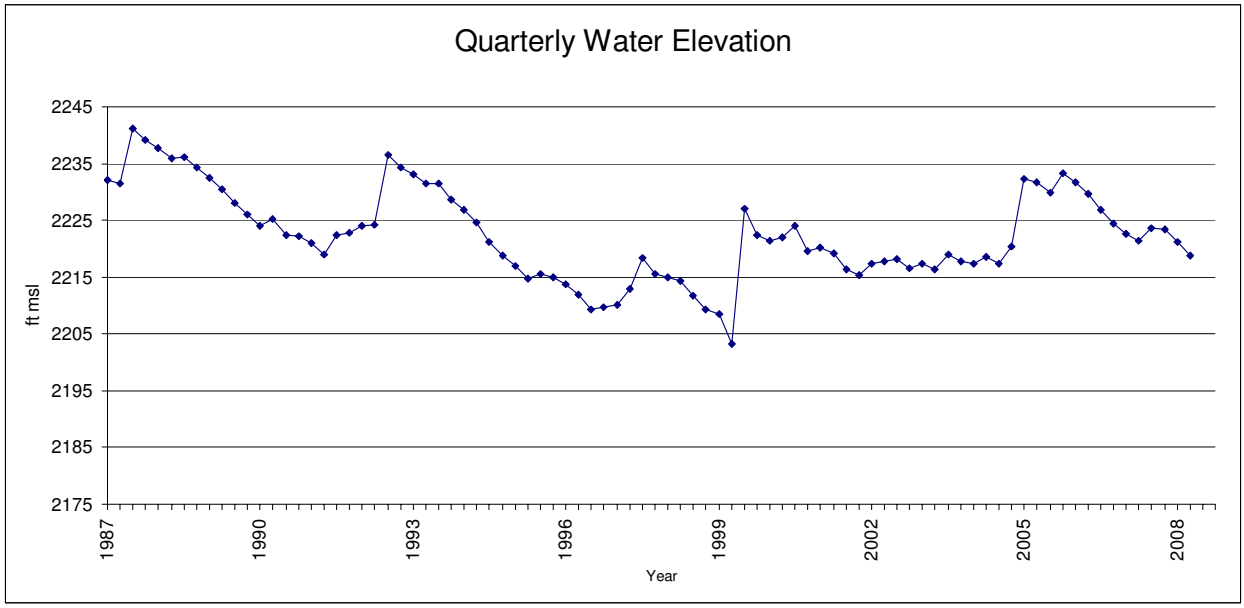


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for J.B. Thomas Reservoir, Texas. Conservation pool elevation is 2,253 feet MSL.

Table 1. Characteristics of J.B. Thomas Reservoir, Texas.

Characteristic	Description
Year constructed	1952
Controlling authority	Colorado River Municipal Water District
County	Scurry
Reservoir type	Main stream
Shoreline Development Index (SDI)	6.05
Conductivity	550

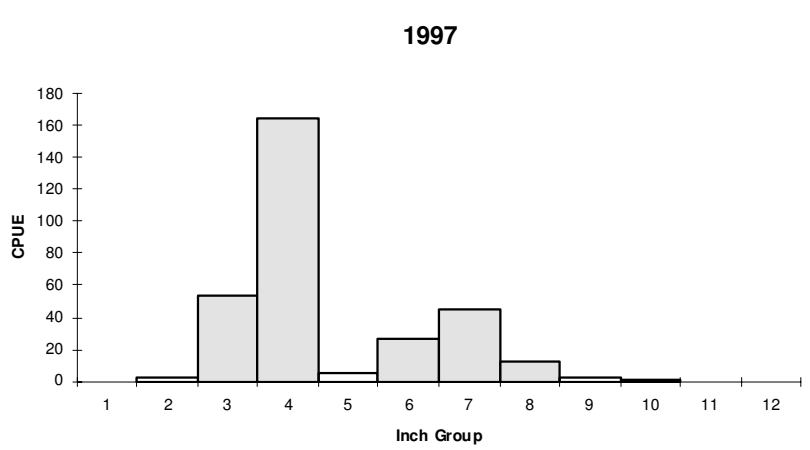
Table 2. Harvest regulations for J.B. Thomas Reservoir.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass: largemouth	5	14 - No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 3. Stocking history of J.B. Thomas, Texas. Size categories are fry (FRY), fingerlings (FGL), and unknown (UNK). Average total length (TL; mm) of each species stocked is given by size category and year.

Species	Year	Number	Life Stage	Length (mm)
Blue catfish	1980	32,928	UNK	UNK
Florida largemouth bass	1980	70,088	FGL	25 - 102
	1999	151,019	FGL	25 - 102
	2004	194,986	FGL	25 - 102
	Total	416,093		
Largemouth bass	1965	20,000	UNK	UNK
	1966	220,000	UNK	UNK
	1968	88,000	UNK	UNK
	1970	40,510	UNK	UNK
	1976	15,000	UNK	UNK
	Total	383,510		
Walleye	1969	500,000	FRY	UNK
	1970	1,350,000	FRY	UNK
	1972	600,000	FRY	UNK
	1973	300,000	FRY	UNK
	Total	2,750,000		

Gizzard Shad



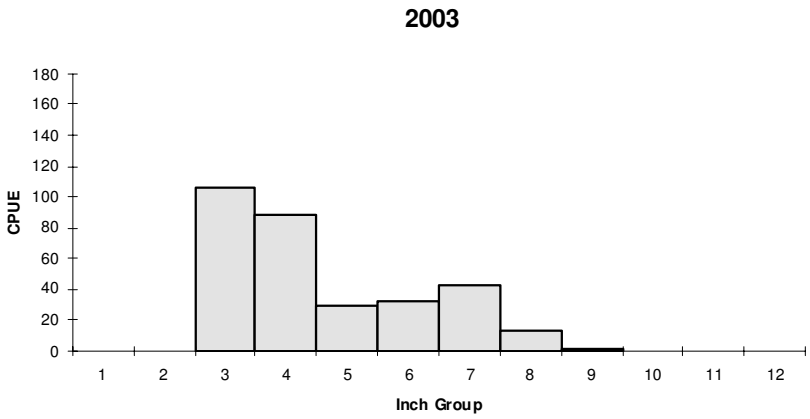


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 1997, 2003 and 2007.

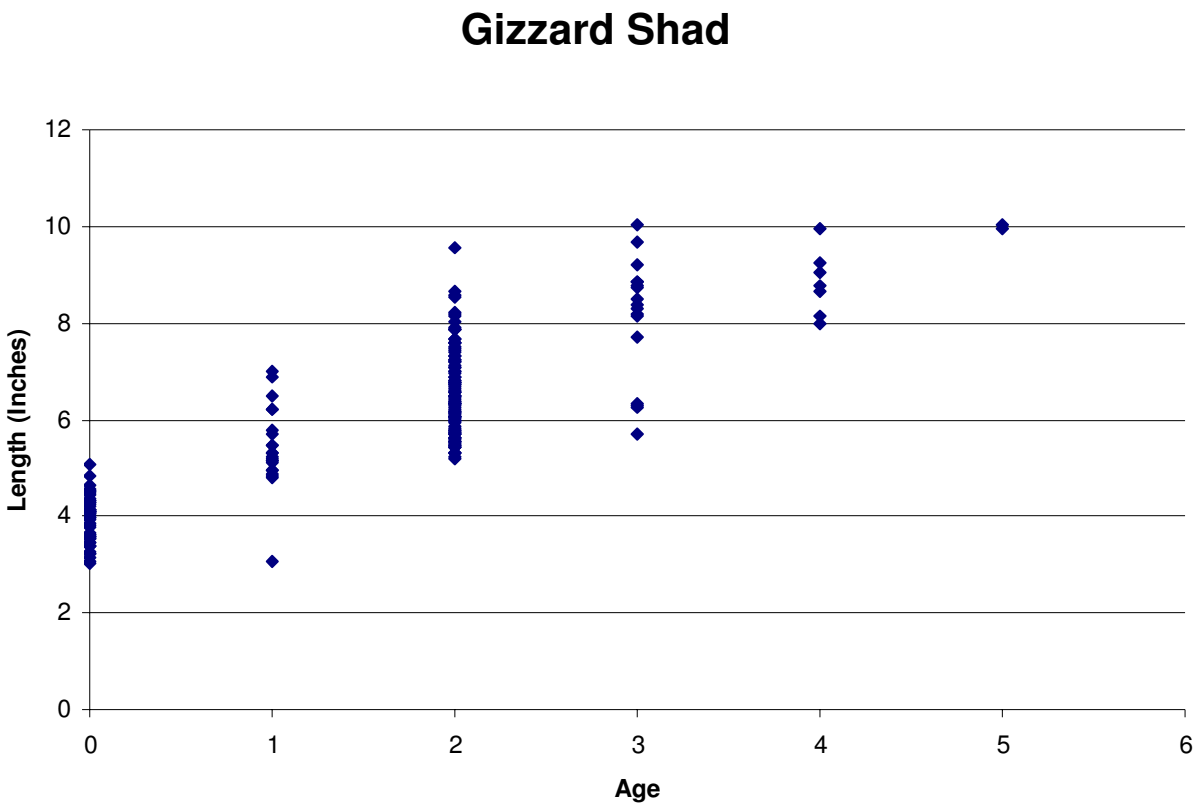


Figure 3. Length at age for 203 gizzard shad collected by tandem trap nets, hoop nets, and electrofishing at J.B. Thomas Reservoir, Texas, October 2007.

Bluegill

Effort =	1.00
Total CPUE =	21.0
Stock CPUE =	16.0
PSD =	0

Effort =	1.00
Total CPUE =	15.0
Stock CPUE =	15.0
PSD =	0

Effort =	3.16
Total CPUE =	47.2
Stock CPUE =	44.9
PSD =	0

Figure 4. Number of bluegill caught per hour (CPUE) and population indices for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 1997, 2003, and 2007.

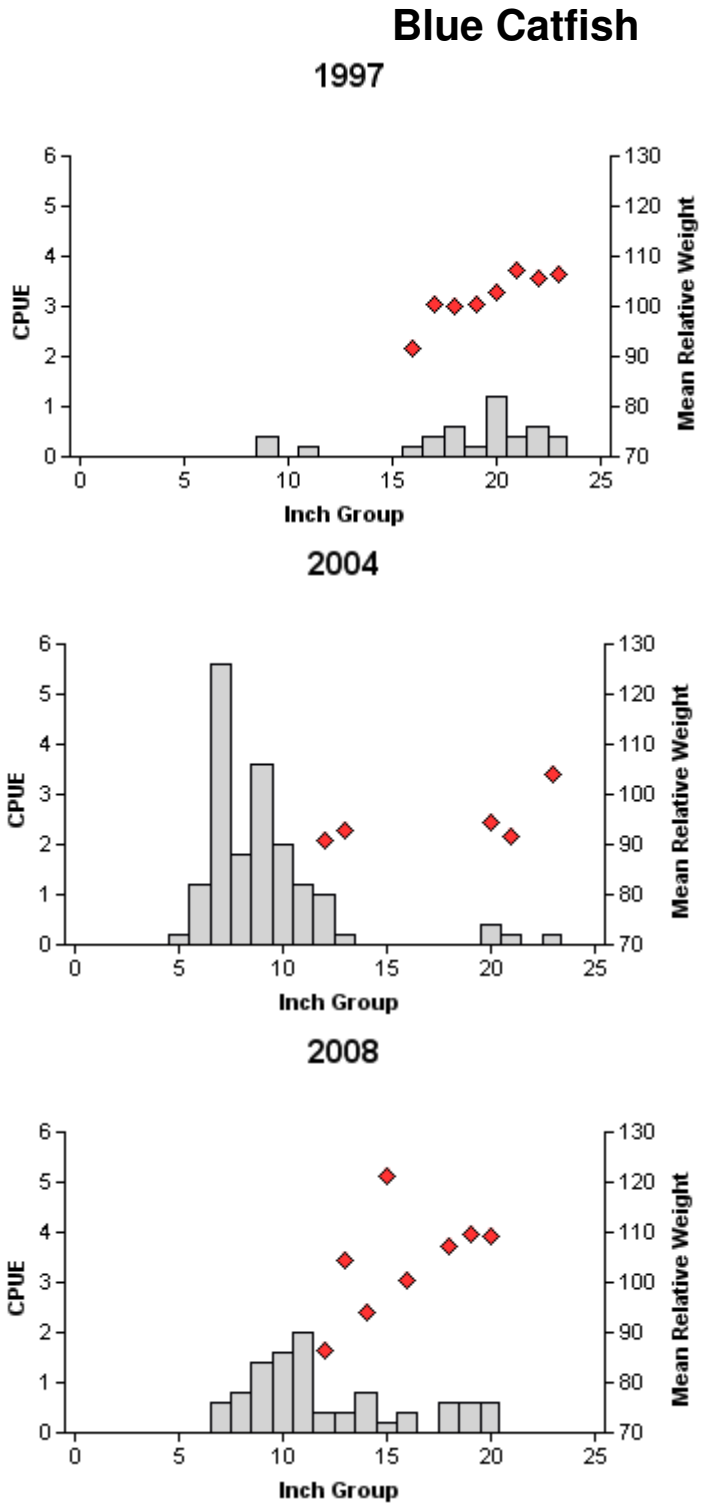


Figure 5. Number of blue catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, J.B. Thomas Reservoir, Texas, 1997, 2004, and 2008.

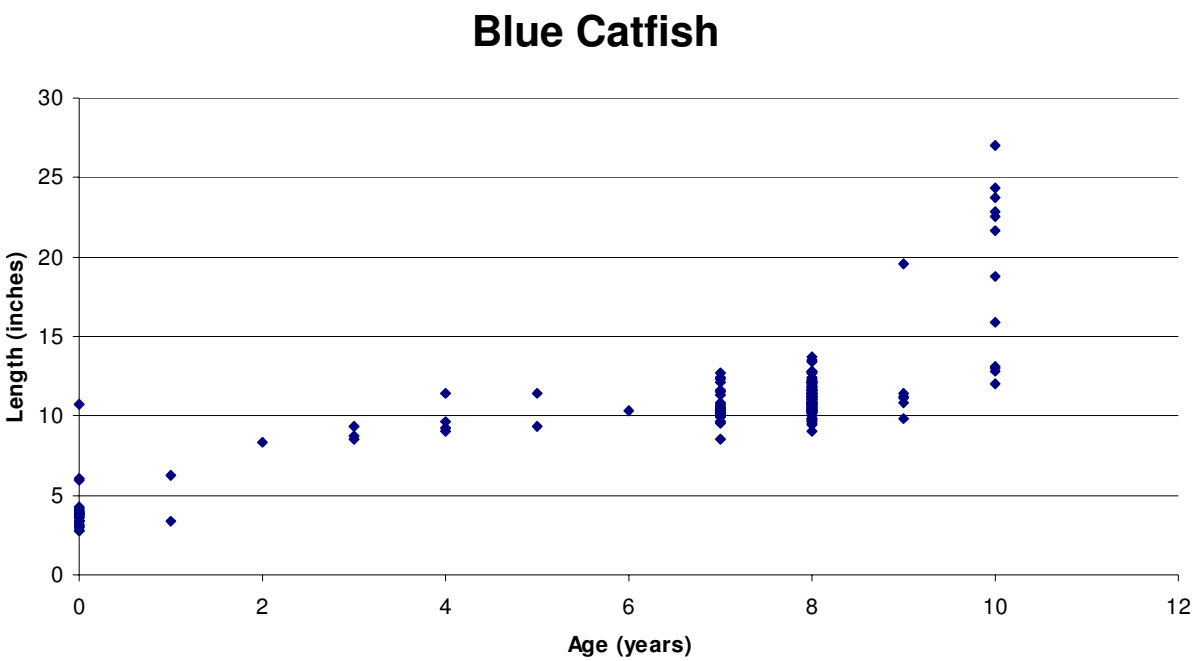


Figure 6. Length at age for 186 blue catfish collected by tandem trap nets, hoop nets, and electrofishing at J.B. Thomas Reservoir, Texas, October 2007.

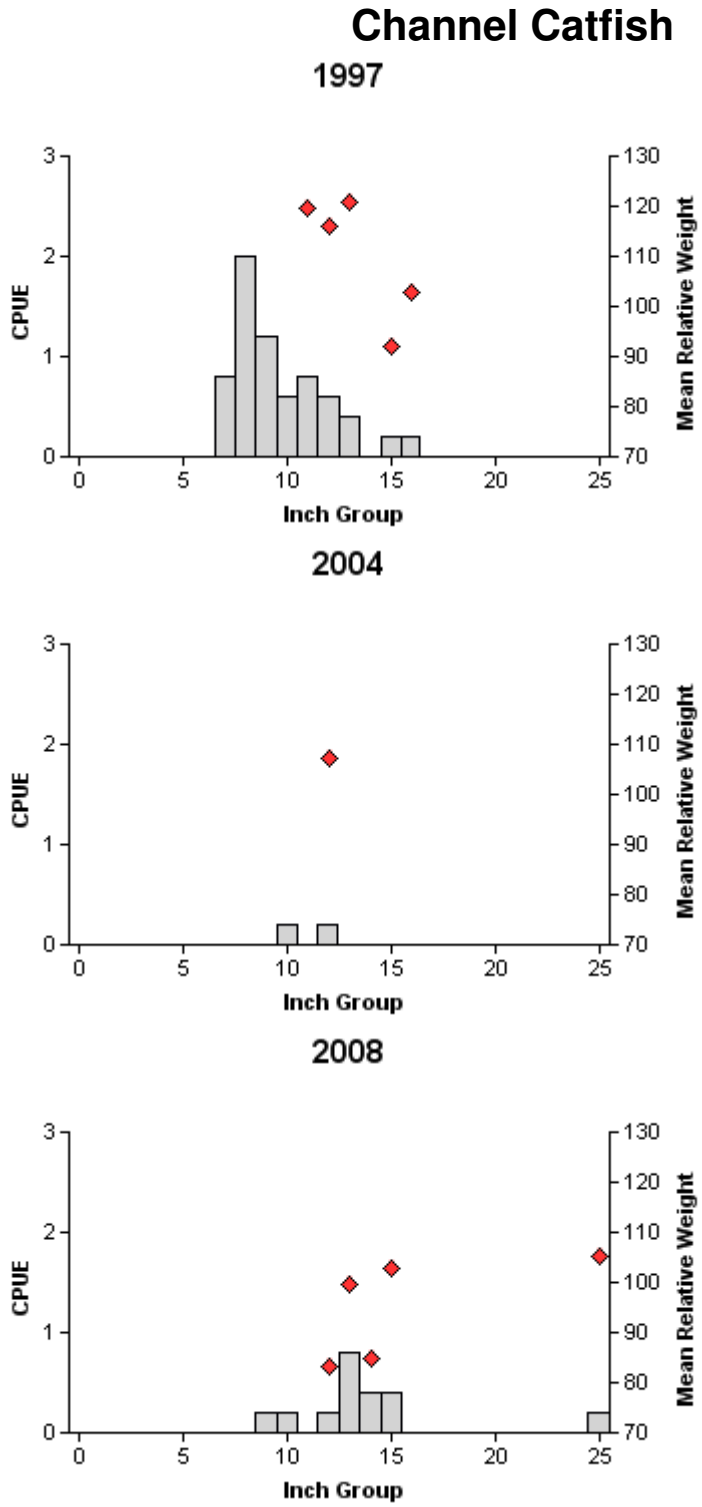


Figure 7. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, J.B. Thomas Reservoir, Texas, 1997, 2004, and 2008.

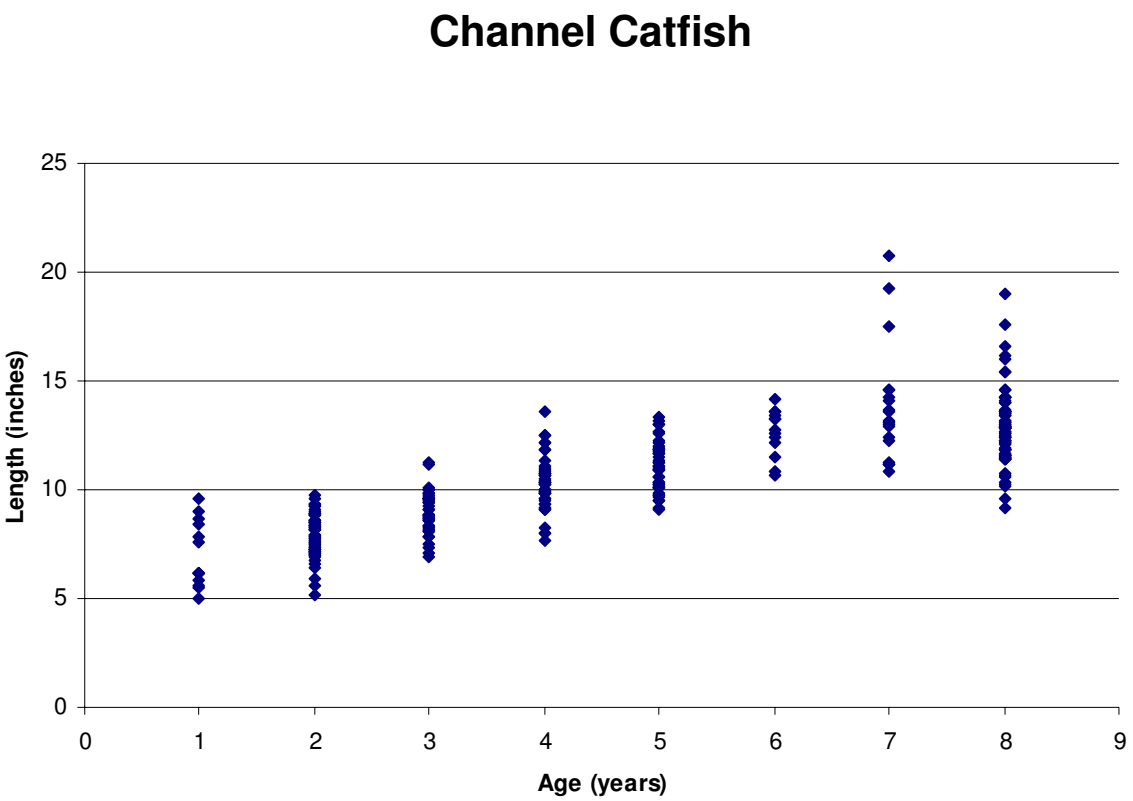


Figure 8. Length at age for 327 channel catfish collected by tandem trap nets, hoop nets, and electrofishing at J.B. Thomas Reservoir, Texas, October 2007.

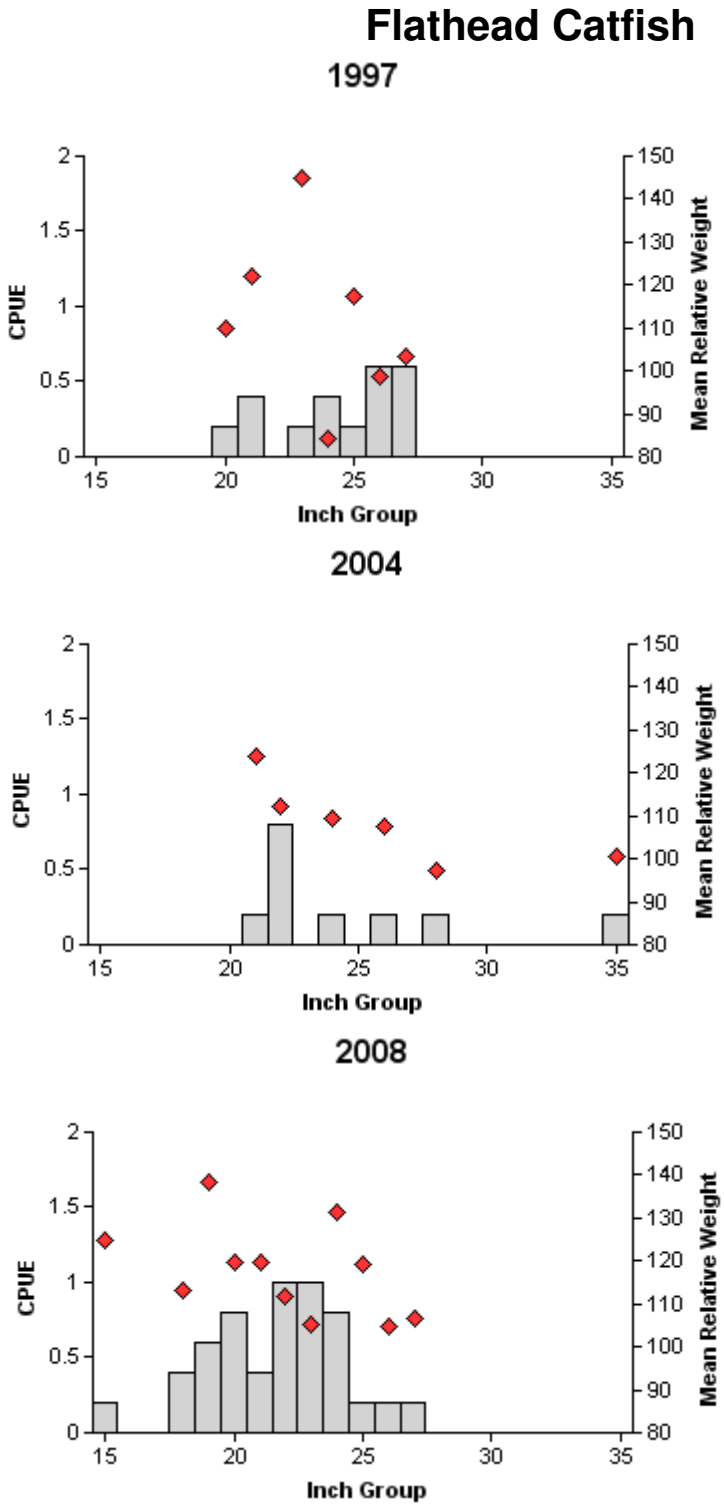


Figure 9. Number of flathead catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, J.B. Thomas Reservoir, Texas, 1997, 2004, and 2008.

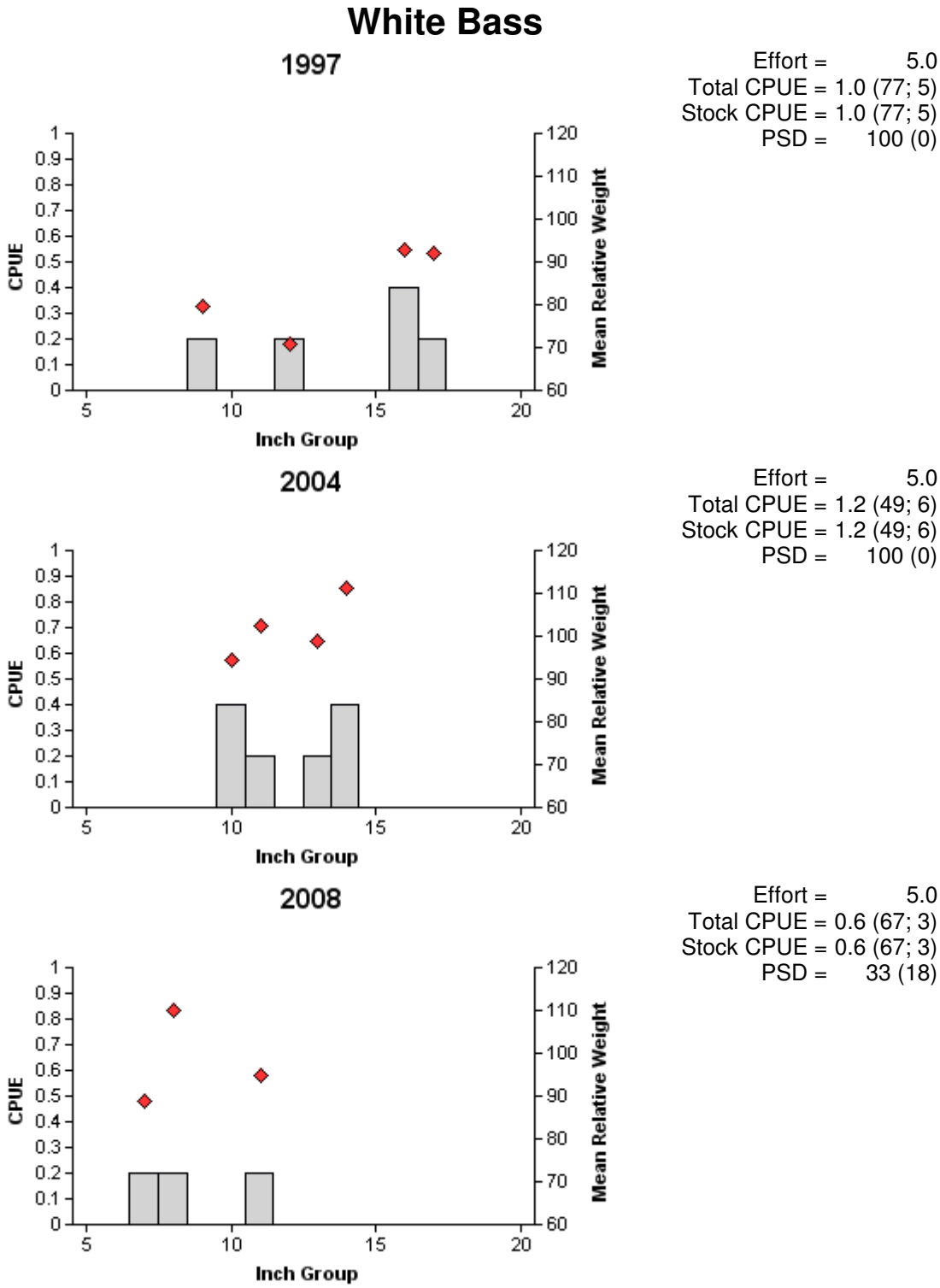


Figure 10. Number of white bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, J.B. Thomas Reservoir, Texas, 1997, 2004, and 2008.

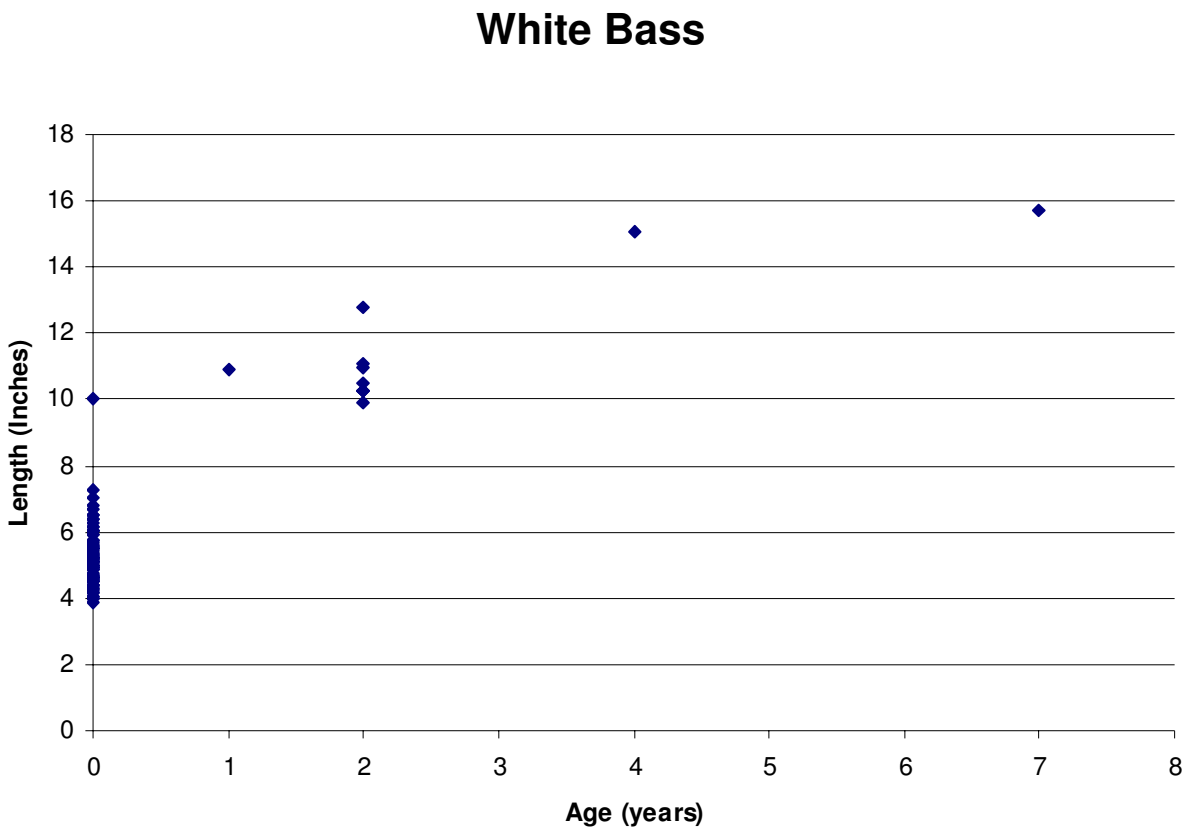
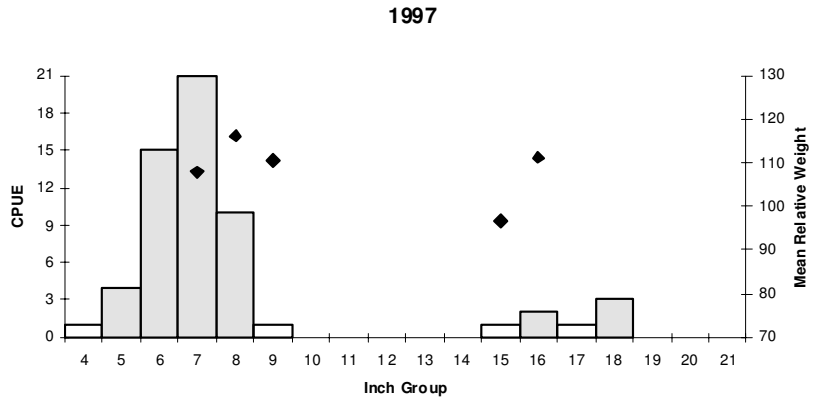


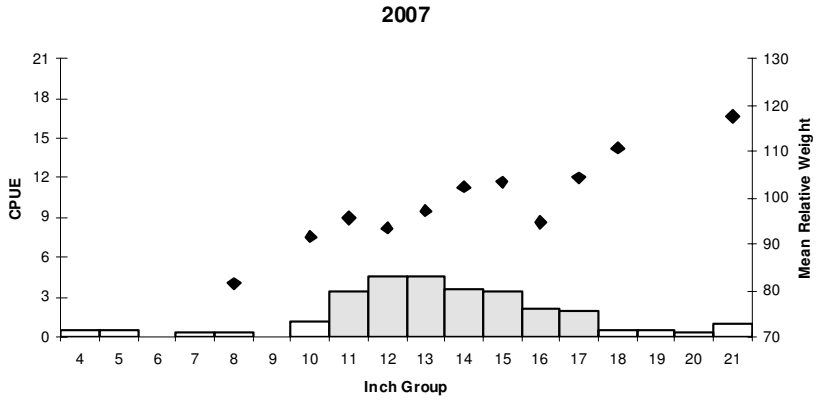
Figure 11. Length at age for 97 white bass collected by tandem trap nets, hoop nets, and electrofishing at J.B. Thomas Reservoir, Texas, October 2007.

Largemouth Bass



Effort =	1.0
Total CPUE =	59.0
Stock CPUE =	18.0
PSD =	39
RSD-14 =	39

Effort =	1.0
Total CPUE =	20.0
Stock CPUE =	20.0
PSD =	90
RSD-14 =	80



Effort =	4.2
Total CPUE =	28.1
Stock CPUE =	26.9
PSD =	82
RSD-14 =	49

Figure 12. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 1997, 2003, and 2007.

Figure 13. Length at age for 170 largemouth bass collected by electrofishing, tandem trap nets, and hoop nets at J.B. Thomas Reservoir, Texas, October 2007.

White Crappie

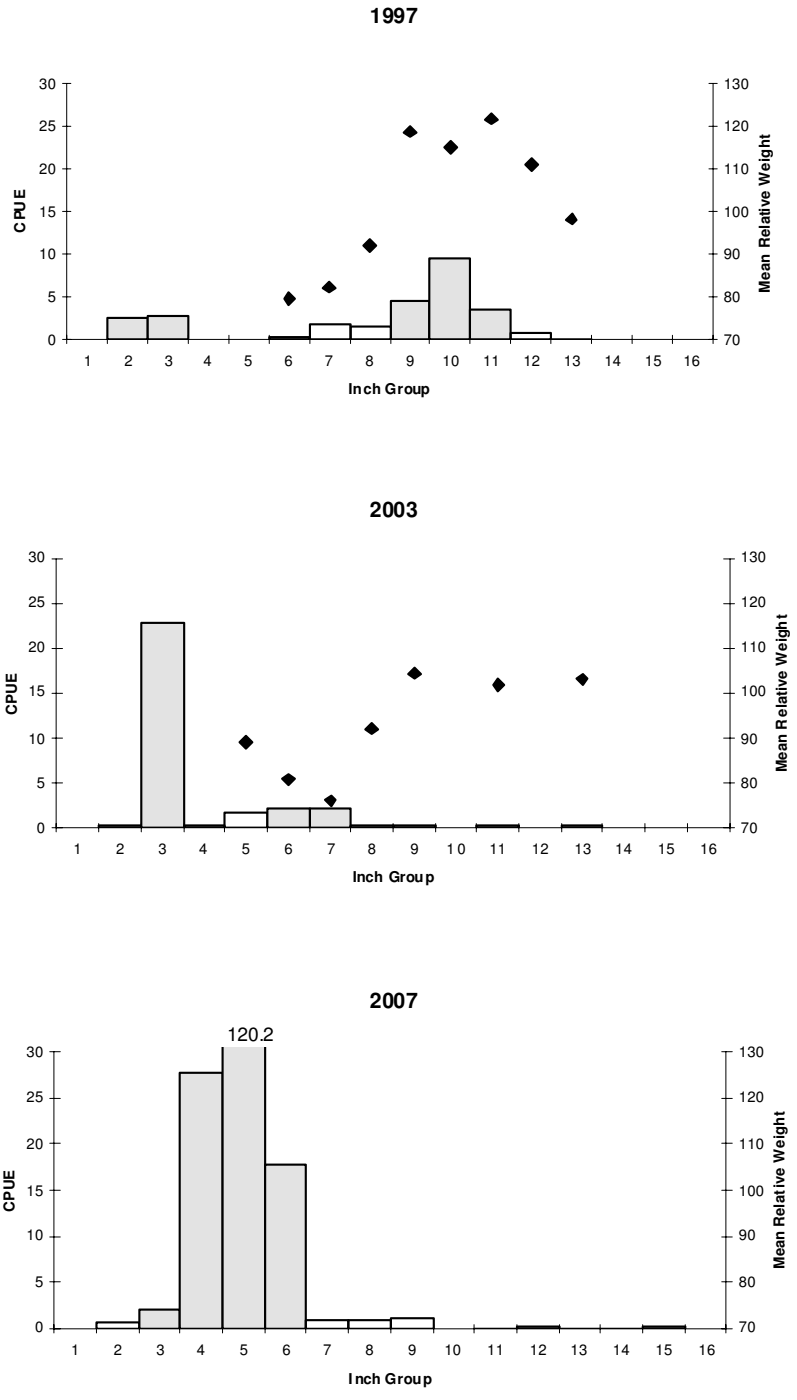


Figure 14. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices for fall trap net surveys, J.B. Thomas Reservoir, Texas, 1997, 2003, and 2007. Data from 1997 and 2003 was collected using standard trap nets while the 2007 data was collected using tandem trap nets. No weight data was collected in 2007.

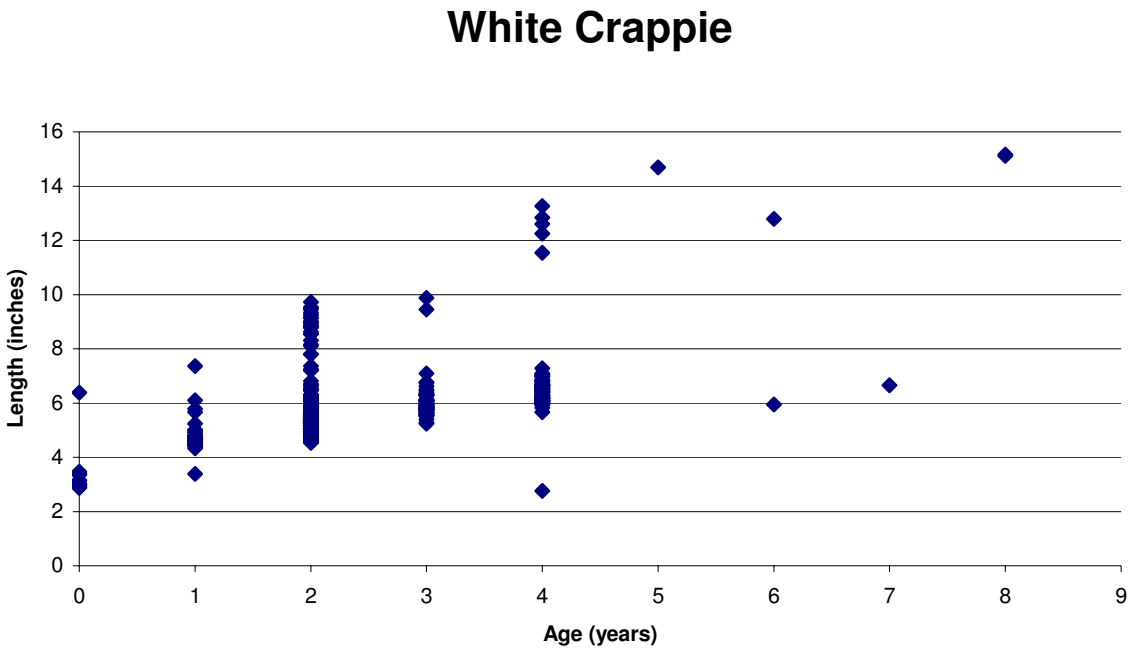


Figure 15. Length at age for 754 white crappie collected by tandem trap nets, electrofishing, and hoop nets at J.B. Thomas Reservoir, Texas, October 2007.

Table 4. Proposed sampling schedule for J.B. Thomas Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

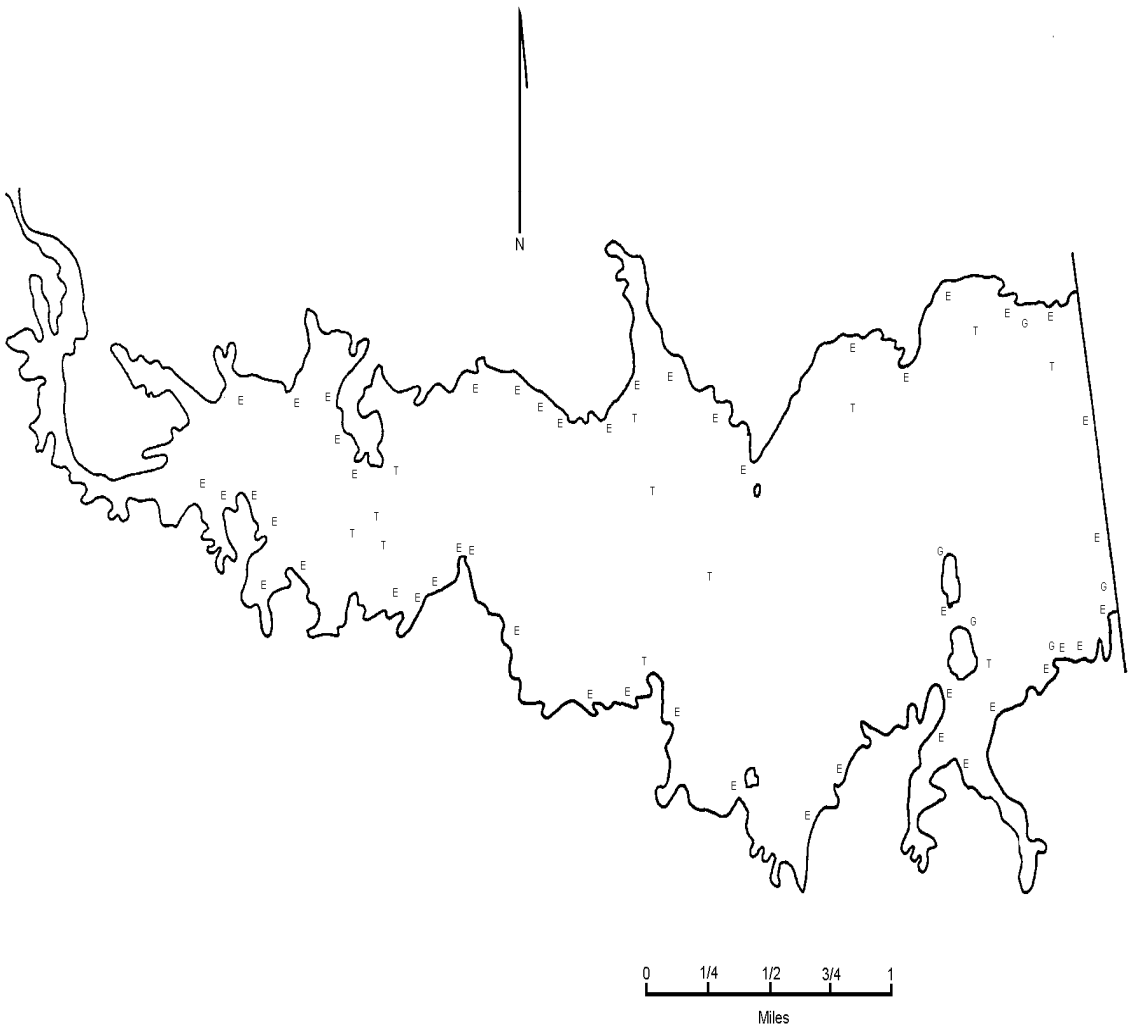
Survey Year	Electrofisher	Trap Net	Gill Net	Creel Survey	Report
Fall 2008-Spring 2009					
Fall 2009-Spring 2010					
Fall 2010-Spring 2011					
Fall 2011-Spring 2012	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from all gear types from J.B. Thomas Reservoir, Texas, 2007-2008. Sampling effort was 5 net nights for gill netting, 12 net nights for tandem trap netting and 4.2 hours for electrofishing. Electrofishing effort for bluegill was 3.16 hours.

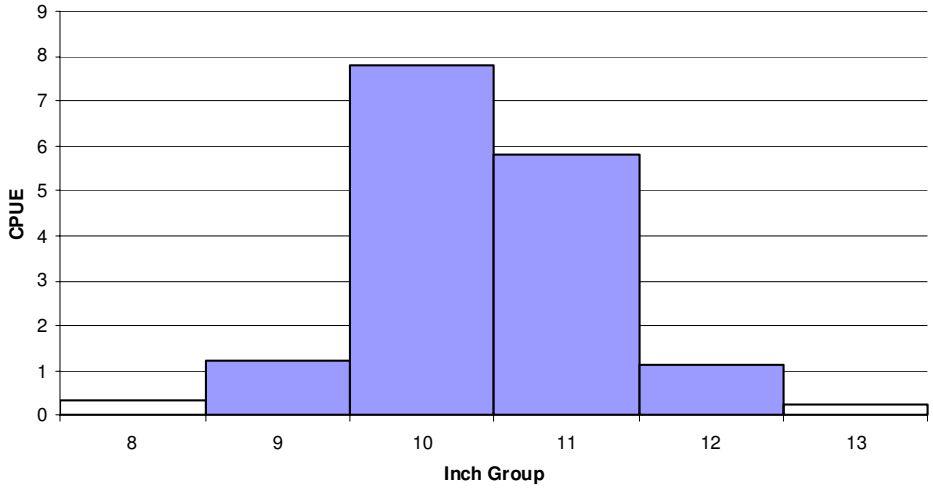
Species	Gill Netting		Tandem Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad	71	14.2	31	2.6	1,170	278.6
Goldfish					1	0.2
Common carp	34	6.8	6	0.5	41	9.8
Golden shiner					1	0.2
River carpsucker	84	16.8	3	0.2		
Smallmouth buffalo					1	0.2
Bigmouth buffalo					10	2.4
Grey redhorse					3	0.7
Blue catfish	52	10.4	41	3.4	14	3.3
Yellow bullhead			1	0.1	2	0.5
Channel catfish	12	2.4	7	0.6	38	9.0
Flathead catfish	29	5.8			5	1.2
White bass	3	0.6			109	26.0
Redbreast sunfish					1	0.2
Bluegill	23	4.6	3	0.2	149	47.2
Longear sunfish	1	0.2	3	0.2	8	1.9
Largemouth bass	12	2.4			118	28.1
White crappie	52	10.4	2,061	171.8	52	12.4
Freshwater drum	3	0.6			12	2.9

APPENDIX B

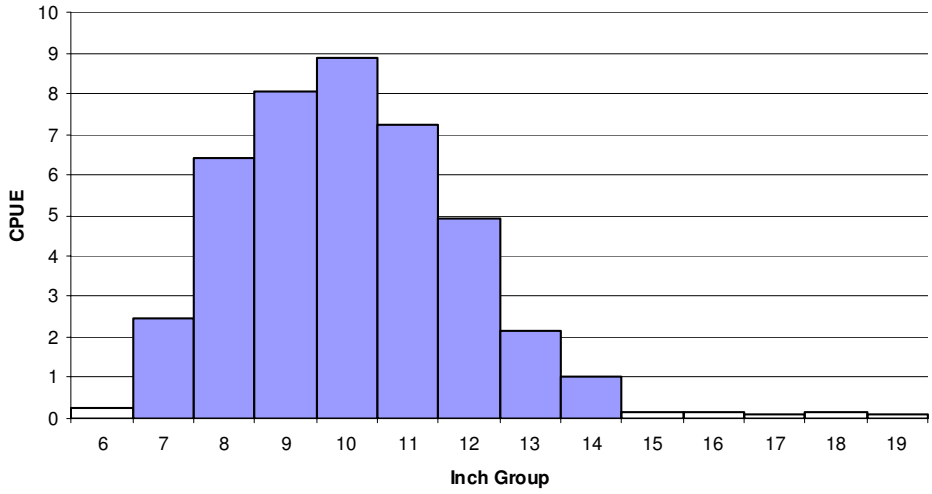


Location of sampling sites, J.B. Thomas Reservoir, Texas, 2007-2008. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was near 2217 feet mean sea level at time of sampling.

APPENDIX C



Number of blue catfish caught per 3 net series set for 3 nights (CPUE, bars), and population indices for fall hoop net surveys, J.B. Thomas Reservoir, Texas, 2007.



Number of channel catfish caught per 3 net series set for 3 nights (CPUE, bars), and population indices for fall hoop net surveys, J.B. Thomas Reservoir, Texas, 2007.