PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-32

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2006 Survey Report

Buffalo Creek Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Buffalo Creek Reservoir were surveyed in 2006 using trap nets and electrofishing and in 2007 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:** Buffalo Creek Reservoir is a 1,577-acre impoundment located on the North Fork of Buffalo Creek in the Red River Basin approximately 20 miles west of Wichita Falls. It has a primarily rocky shoreline with periodically flooded terrestrial habitat. The reservoir was at least 13 feet below conservation pool (1,048 msl) from January of 2003 through May 2007 (Figure 1) at times as much as 23 feet low. Buffalo Creek water clarity is turbid at times.

- **Management history:** Historically important sport fish include largemouth bass, white crappie, and catfish. In 2005 and 2006, northern largemouth bass fingerlings were stocked at the rate of 100 per acre based on estimated reservoir size at time of stocking. Channel catfish were stocked in 2005. The stockings were in response to extended periods of low water in previous years that adversely impacted fish populations. Buffalo Creek has always been managed with statewide regulations.

- **Fish Community**
  - **Prey species:** The gizzard shad catch rate was extremely high and more than double the historical record rate. The index of vulnerability (IOV) was also very high indicating forage for game fish was plentiful. The catch per unit of effort (CPUE) for bluegill and other sunfishes was relatively low except for green sunfish.

  - **Catfishes:** Blue catfish CPUE has remained constant since the last gill net survey in 2003. Channel catfish CPUE has greatly increased and was probably helped by the 2005 supplemental stocking. Flathead catfish CPUE was down slightly compared to the last two surveys but size structure was improved. All species of catfish had above average body condition. Compared to other district reservoirs, the Buffalo Creek channel and flathead catfish catch rates were the highest. Appendix C shows the impressive 2007 catch rate and size structure for all catfish species combined.

  - **Largemouth bass:** Largemouth bass had the highest electrofishing catch rate ever recorded for the reservoir, with many bass sampled over the minimum length size limit. Body condition was excellent, especially for legal sized fish.

  - **White crappie:** The catch rate greatly improved from the 2005 trap net survey because of a large 2006 year class that developed in response to the increase in water elevation. The CPUE was the highest ever recorded in district history, but the crappie were all below the 10-inch length limit.

- **Management Strategies:** Conduct general monitoring with trap netting, gill netting, and electrofishing surveys in 2010-2011.

INTRODUCTION

This document is a summary of the fisheries data collected from Buffalo Creek Reservoir in 2006-2007. The document purpose is to provide fisheries information and make possible 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 with the 2006-2007 data for comparison.

Reservoir Description

Buffalo Creek Reservoir is a 1,577-acre impoundment constructed in 1964 on the North Fork of Buffalo Creek. It is located in Wichita County approximately 20 miles west of Wichita Falls and is operated and controlled by the City of Iowa Park. The primary use is recreation. Mean depth is 10-feet when the reservoir is at conservation pool, but it has not been near conservation pool the last several years so mean depth was well below that during the fisheries surveys. Conductivity was 747μmhos/cm in July 2006. Habitat at time of sampling consisted of rocky shoreline and flooded terrestrial vegetation. Water level had been very low since 2003, ranging from 13 to 23 feet below conservation pool (Figure 1). Boat access consisted of a single, public two-lane concrete ramp which was unusable when the reservoir was more than 14 feet low. Bank fishing was readily available around the periphery of the reservoir. Other descriptive characteristics for Buffalo Creek Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management issues and actions from the previous survey report issues (Mauk and Howell 2003) included:

1. Physical habitat and fish attracting structure were limited during periods of low water.
   Action: Placed fish attracting structure (donated cinder blocks and mesquite trees cleared from the dam) into reservoir to enhance littoral habitat. The cover served to concentrate crappie and enhanced angler catch rates. During the 2006-2007 survey period, the reservoir was at very low elevations (1,029 -1,033 msl) compared to full pool (1,049 msl).

2. Low water elevations caused the boat ramps to be unusable.
   Action: Monitored water elevations to keep public informed. Worked with city of Iowa Park to improve access and encouraged involvement in the TPWD Boat Ramp Program.

3. Reservoir has the highest relative abundance for flathead catfish in the district but few anglers are aware of this fact.
   Action: Publicized the flathead catfish fishery through the Wichita Falls and Iowa Park newspapers.

4. Blue catfish relative abundance had declined since the 1998 survey with few small fish sampled. Reproduction and recruitment were possible problems as indicated by lack of young fish in survey. This was most likely caused by lack of suitable habitat because of low water levels.
   Action: Because of extremely low reservoir elevations, a previously scheduled 2004 10-net night gill net survey to evaluate the blue catfish population was cancelled. However, the 2007 gill net survey showed that relative abundance had not changed from 2003 and the presence of young blue catfish indicated recent successful reproduction.

Harvest regulation history: Sport fish species in Buffalo Creek Reservoir are currently managed and have always been managed using statewide harvest regulations (Table 2).

Stocking history: In recent years, the reservoir was supplementally stocked with channel catfish and northern largemouth bass in response to increases in water elevation from previous years. Florida largemouth bass were last stocked in 1999. The complete stocking history is in Table 3.

Vegetation/habitat history: Buffalo Creek has no significant aquatic vegetation management history. It had habitat enhancement work completed in the past when the reservoir elevation was higher. Mesquite trees growing on the dam were cut and sunk as fish attractors when water levels were adequate. The resulting brush piles were popular with anglers. The past few years though, this work has ceased because of the extremely low water levels.

METHODS

Fishes were collected by electrofishing (one hour at 12 five-minute stations), gill netting (10 net nights at 10 stations), and trap netting (10 net nights at 10 stations). Catch per unit effort 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 the surveys were conducted according to TPWD Inland Fisheries 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 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. Source for water level data was the United States Geological Survey.

RESULTS AND DISCUSSION

Habitat: No physical habitat survey was conducted during the survey period because extremely low water elevations would not allow for boat launching. It was apparent that the littoral zone habitat consisted primarily of rocky shoreline and flooded terrestrial vegetation. The previous physical habitat survey was conducted in 2002 (Mauk and Howell 2003). Very little or no manmade changes to the physical habitat occurred during the four-year period.

Prey species: Electrofishing catch rates of bluegill and gizzard shad were 22.0/h and 1,188.0/h, respectively. Index of vulnerability for gizzard shad was high, indicating that over 99% of gizzard shad were available to existing predators; this was higher than previous survey IOV estimates. Total CPUE of gizzard shad was much higher in 2006 than in 1998 and 2002 (Figure 2). Total CPUE of bluegill in 2006 was much lower than the 1998 and 2002 surveys (Figure 3).

Blue catfish: Blue catfish gill net CPUE was nearly identical to the 2003 survey (4.7/nn and 4.6/nn respectively). The size range was 6 to 29-inches with good numbers of legal fish sampled (Figure 4). Body condition (Wr) was above 100 for almost all fish above stock size.

Channel catfish: The channel catfish gill net CPUE (6.1/nn) in 2007 increased dramatically from the 2003 survey of only 0.6/nn (Figure 5). This increase can be partially explained by a stocking that occurred during 2005 in response to an increase in reservoir elevation and low CPUE results from the 2003 gill net survey. All but one of the stock size inch groups had relative weights over 100. Sampled channel catfish ranged in size from 7 to 24 inches in length.

Flathead catfish: Flathead catfish gill net CPUE decreased from the previous two surveys, but was still

higher than any other district reservoir at 0.9/nn (Figure 6). Larger flathead catfish were sampled than in the past. The range sampled was 20 to 31 inches. Body condition (Wr) was above 100 for all but one inch group. Low reservoir elevations may have adversely affected flathead abundance and reproduction since their preferred rocky habitat was largely out of the water. With increasing elevations, it is expected that their habitat conditions will be improved.

Largemouth bass: The electrofishing CPUE of largemouth bass was 65.0/h in 2006 (Figure 7), an increase from previous surveys in 1998 (8.0/h) and 2002 (37.0/h). RSD-P was 29 indicating a good portion of the stock size bass were $\geq$15 inches. Body condition in 2006 was considered good with most inch groups over 100. However, there was little Florida bass genetic influence since the reservoir was better suited for northern largemouth bass because of existing habitat conditions in recent years (Table 4).

White crappie: The trap net catch rate of white crappie was 222.6/nn in 2006, much higher than the previous surveys of 2005 (0.9/nn) and 2002 (101.9/nn), but the majority were 3 to 4 inches in length (Figure 8). No crappie above 254-mm were sampled. The crappie population had been adversely affected by chronically low reservoir elevations since 1999. With the rise in reservoir elevation, crappie abundance dramatically increased. With good survival and historically good growth (Table 6), crappie angling should improve within one to two years.

Fisheries management plan for Buffalo Creek Reservoir, Texas

Prepared – July 2007

Issue 1: Low water elevations severely impacted angling activity the last several years. The boat ramp was unusable and fish populations declined during this period. Stockings occurred with a rise in reservoir elevations. While fish populations are more abundant, angling effort is not what it once was.

MANAGEMENT STRATEGY

1. During 2007, publicize the fact that largemouth bass and catfish abundance has dramatically increased since the severe drought years. The crappie population also is rebounding, but most of the crappie were below legal length. The boat ramp is once again usable. Publicize with an article in the Wichita Falls Times-Record News and in the Iowa Park Leader newspapers.

Issue 2: Previous periods of low water were largely exacerbated by extensive municipal demand by the city of Iowa Park. Since these extremely low water years, the city now gets all their water from the city of Wichita Falls and no longer puts any demand on the reservoir. This should greatly help maintain future water levels and increase the potential for a good largemouth bass fishery. Currently Florida largemouth bass genetic influence is low.

MANAGEMENT STRATEGY

1. Request a supplemental stocking of Florida largemouth bass fingerlings in 2008 at the standard rate of 100/acre.

Issue 3: Physical habitat and fish attracting structure were limited during periods of low water.

MANAGEMENT STRATEGY

1. When appropriate water levels allow, resume placing fish attracting structure on an annual basis to enhance littoral habitat. The cover provided should concentrate white crappie and enhance angler catch rates. The most suitable and available materials are a combination of donated cinder blocks and mesquite trees cleared from the dam.

SAMPLING SCHEDULE JUSTIFICATION:

There are no special concerns at this point regarding the fishery since the fish populations rebounded and there has been little angling pressure. Standard sampling will be conducted in 2010-2011 to quantify species abundance (Table 7).

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.

Mauk, R., and M. Howell. 2003. Statewide freshwater fisheries monitoring and management program survey report for Buffalo Creek Reservoir, 2002. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin, 24 p.

Prentice, J. A. 1987. Length-weight relationships and average growth rates of fishes in Texas. Inland Fisheries Data Series No. 6. Texas Parks and Wildlife Department, Inland Fisheries Division. Austin.

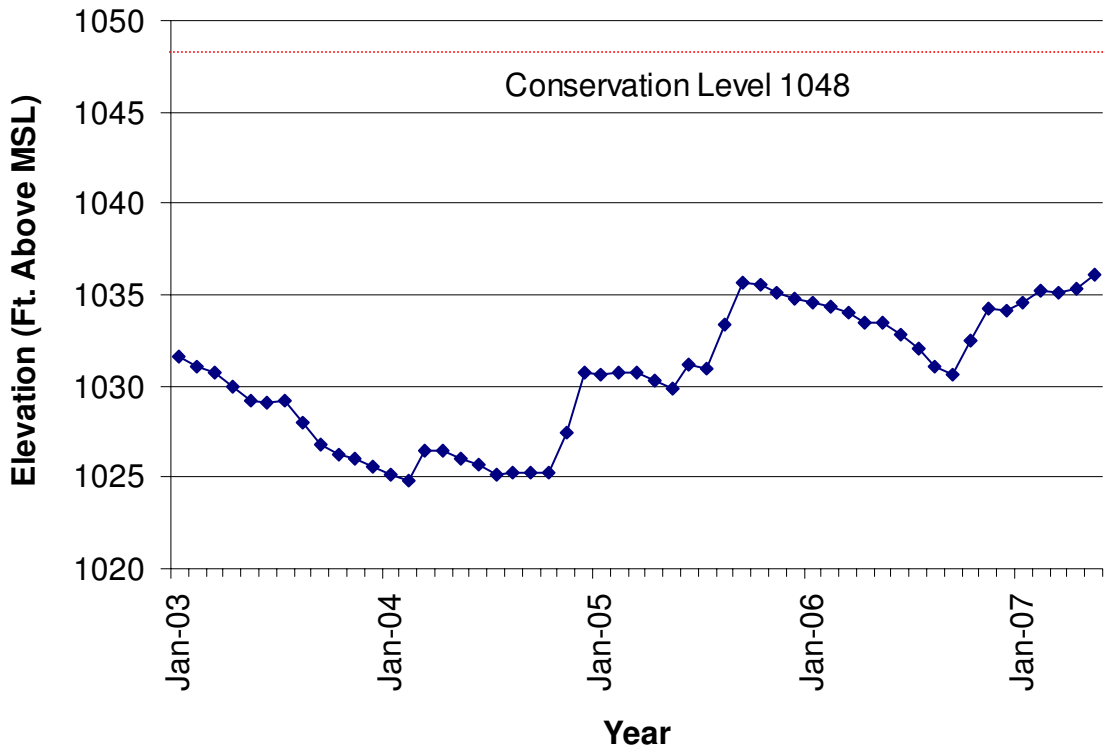


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Buffalo Creek Reservoir, Texas.

Table 1. Characteristics of Buffalo Creek Reservoir, Texas.

Characteristic	Description
Year Constructed	1964
Controlling authority	City of Iowa Park
County	Wichita
Reservoir type	Tributary
Shoreline Development Index (SDI)	3.7
Conductivity	747 μmhos/cm

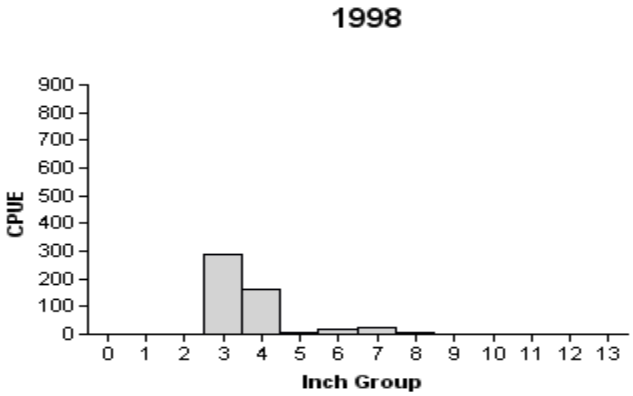
Table 2. Harvest regulations for Buffalo Creek Reservoir.

Species	Bag Limit	Length Limit (inches)
Catfish: Channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 minimum
Flathead catfish	5	18 minimum
Largemouth bass	5	14 minimum
White crappie	25	10 minimum

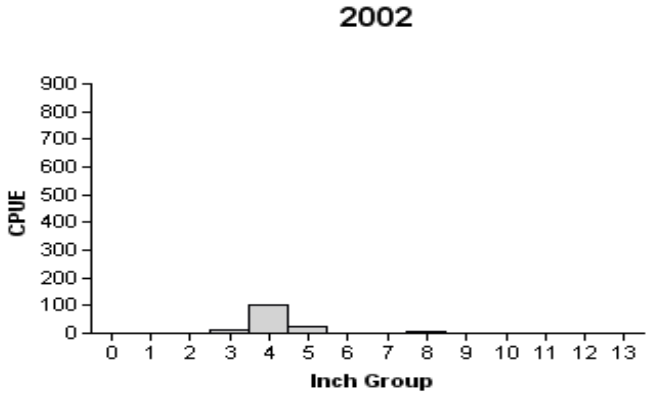
Table 3. Stocking history of Buffalo Creek, Texas. Life stages are fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Blue catfish	1969	25,000	FGL	UNK
	Total	25,000		
Channel catfish	1966	300	ADL	UNK
	1967	20,000	FGL	UNK
	1969	23,100	FGL	UNK
	1971	40,000	FGL	UNK
	1978	16,975	FGL	UNK
	2005	24,059	AFGL	9.9
	Total	124,225		
Florida largemouth bass	1978	1,400	FGL	UNK
	1993	139,987	FGL	1.2
	1999	141,148	FGL	1.4
	Total	282,535		
Largemouth bass	1968	10,159	FGL	UNK
	1969	230,000	FGL	UNK
	1978	5,000	FGL	UNK
	2005	38,460	FGL	1.6
	2006	48,070	FGL	1.9
	Total	331,689		
White crappie	1969	15,350	FGL	UNK
	Total	15,350		

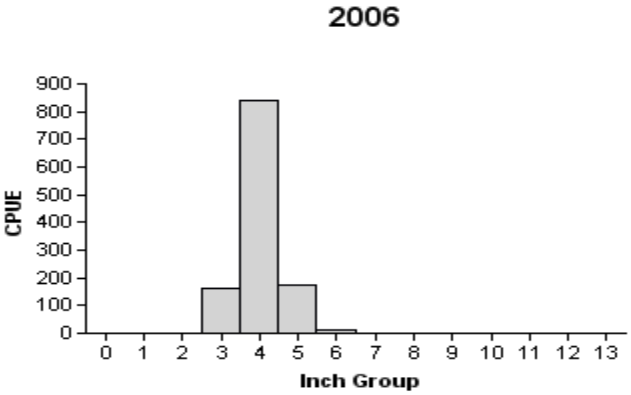
Gizzard Shad



Effort = 1.0
Total CPUE = 512.0 (53; 512)
IOV = 98.05 (1.5)



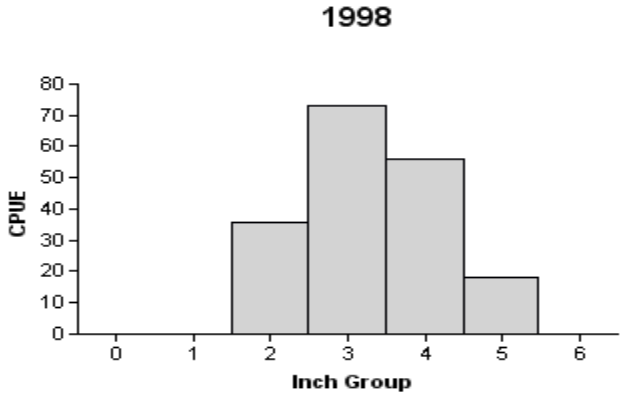
Effort = 1.0
Total CPUE = 146.0 (26; 146)
IOV = 93.84 (3.1)



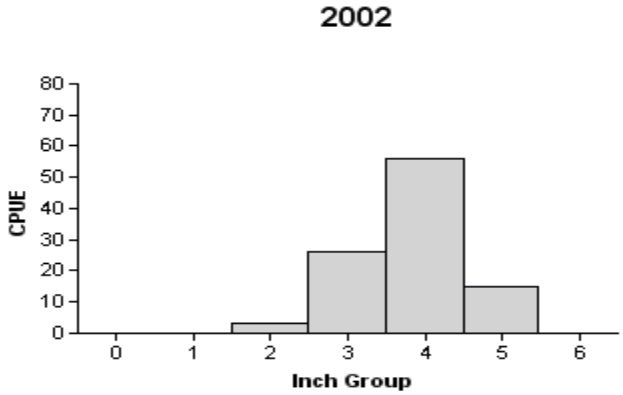
Effort = 1.0
Total CPUE = 1,188.0 (20; 1188)
IOV = 99.83 (0.1)

Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Buffalo Creek Reservoir, Texas, 1998, 2002, and 2006.

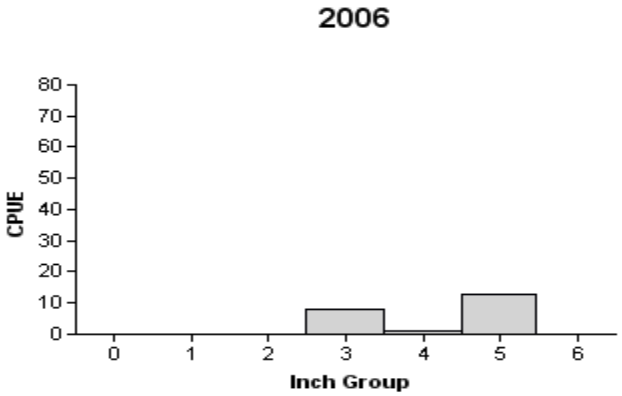
Bluegill



Effort = 1.0
Total CPUE = 183.0 (37; 183)
PSD = 0 (59.3)



Effort = 1.0
Total CPUE = 100.0 (45; 100)
PSD = 0 (56.2)

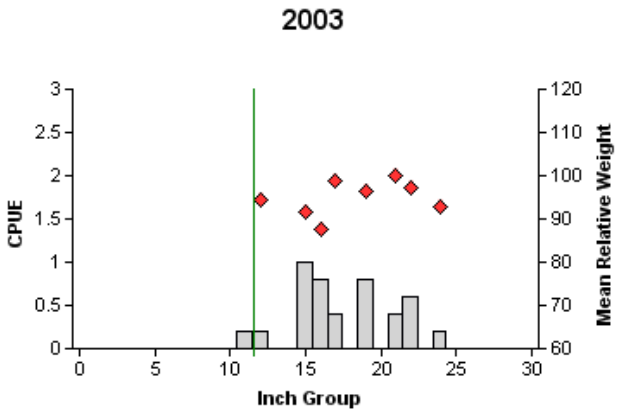


Effort = 1.0
Total CPUE = 22.0 (37; 22)
PSD = 0 (47.5)

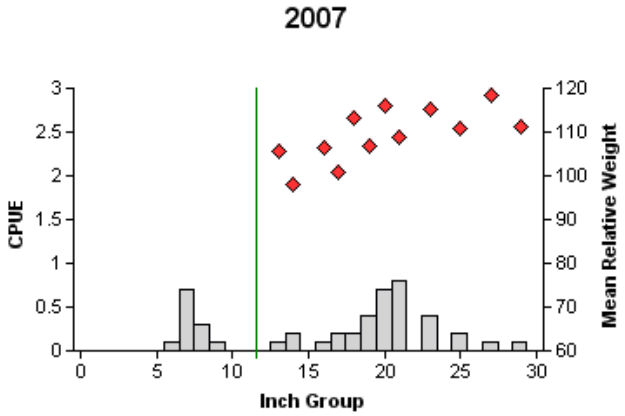
Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Buffalo Creek Reservoir, Texas, 1998, 2002, and 2006.

Blue Catfish

Effort =	5.0
Total CPUE =	12.0 (18; 60)
Stock CPUE =	10.8 (23; 54)
PSD =	7 (2.3)
RSD-P =	0 (0)



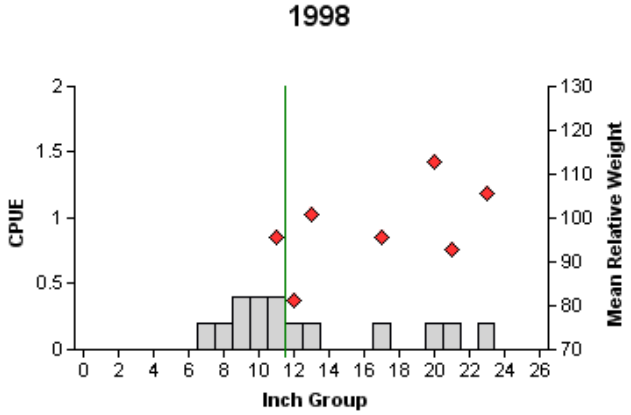
Effort =	5.0
Total CPUE =	4.6 (26; 23)
Stock CPUE =	4.4 (27; 22)
PSD =	27 (9.6)
RSD-P =	0 (0)



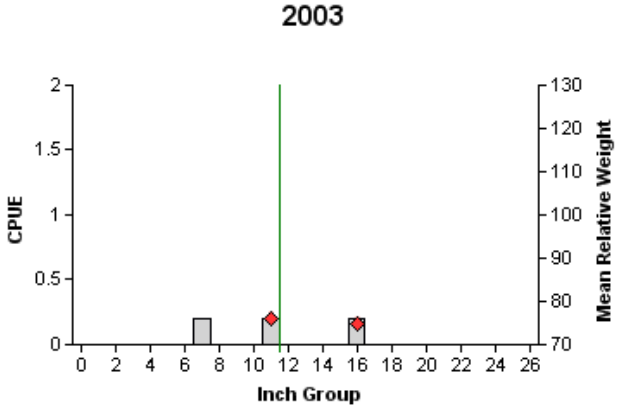
Effort =	10.0
Total CPUE =	4.7 (22; 47)
Stock CPUE =	3.5 (24; 35)
PSD =	66 (8.6)
RSD-P =	0 (0)

Figure 4. 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 netting surveys, Buffalo Creek Reservoir, Texas, 1998, 2003, and 2007. Line indicates minimum size limit at time of sampling.

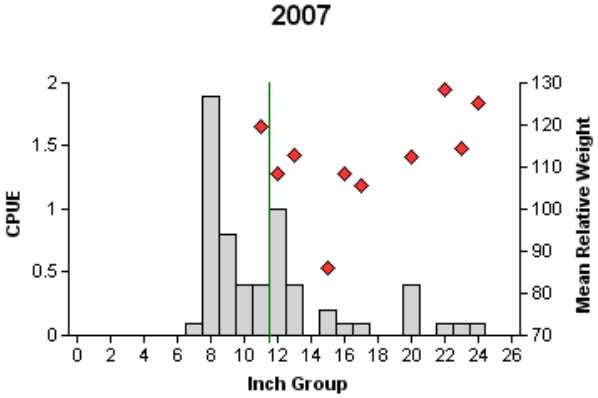
Channel Catfish



Effort = 5.0
Total CPUE = 2.8 (31; 14)
Stock CPUE = 1.6 (38; 8)
PSD = 50 (31.3)
RSD-P = 0 (0)



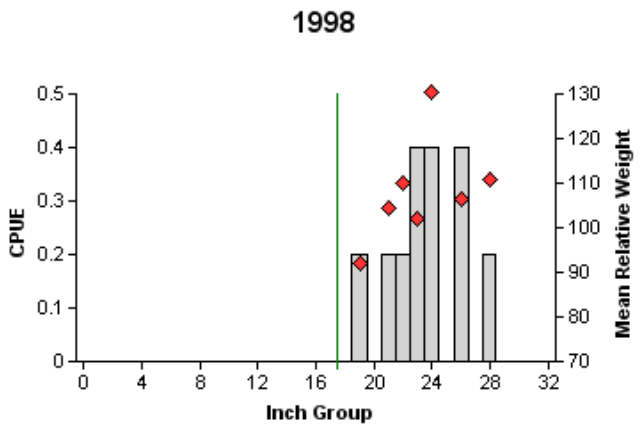
Effort = 5.0
Total CPUE = 0.6 (67; 3)
Stock CPUE = 0.4 (61; 2)
PSD = 50 (39.5)
RSD-P = 0 (0)



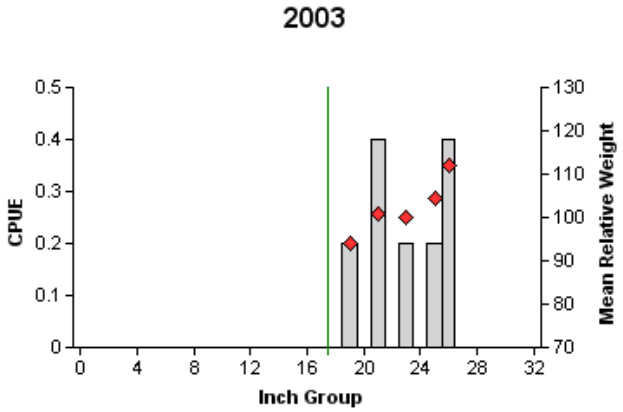
Effort = 10.0
Total CPUE = 6.1 (18; 61)
Stock CPUE = 2.9 (17; 29)
PSD = 31 (9.9)
RSD-P = 3 (3.4)

Figure 5. 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 netting surveys, Buffalo Creek Reservoir, Texas, 1998, 2003, and 2007. Line indicates minimum size limit at time of sampling.

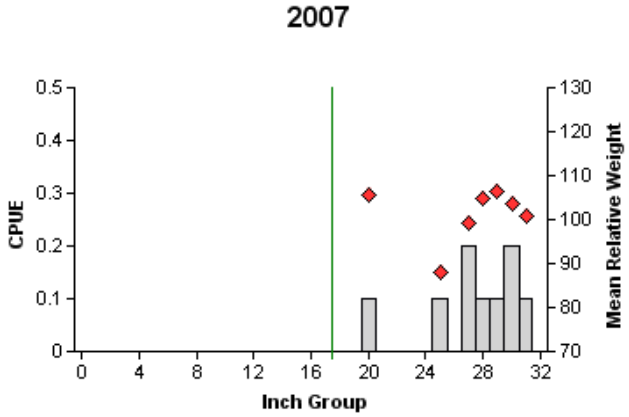
Flathead Catfish



Effort = 5.0
Total CPUE = 2.0 (52; 10)
Stock CPUE = 2.0 (52; 10)
PSD = 90 (11.3)
RSD-P = 10 (11.3)



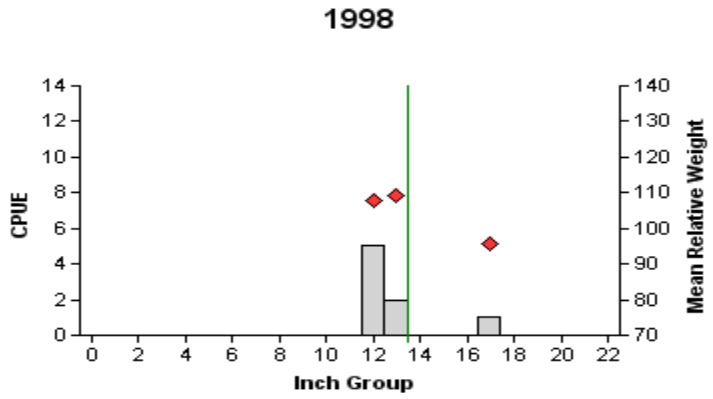
Effort = 5.0
Total CPUE = 1.4 (43; 7)
Stock CPUE = 1.4 (43; 7)
PSD = 86 (14.0)
RSD-P = 0 (0)



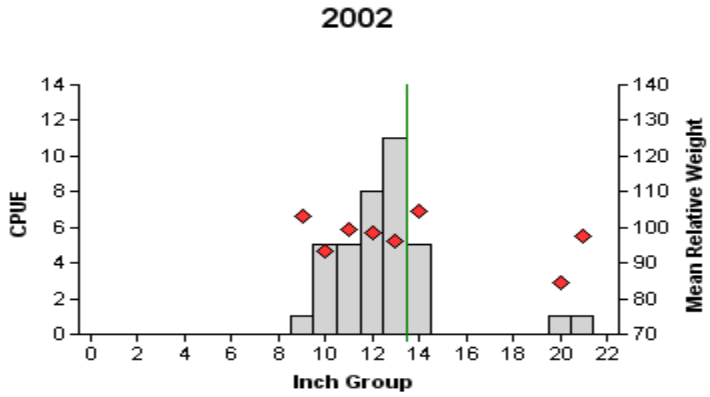
Effort = 10.0
Total CPUE = 0.9 (54; 9)
Stock CPUE = 0.9 (54; 9)
PSD = 100 (0)
RSD-P = 56 (18.8)

Figure 6. 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 netting surveys, Buffalo Creek Reservoir, Texas, 1998, 2003, and 2007. Line indicates minimum size limit at time of sampling.

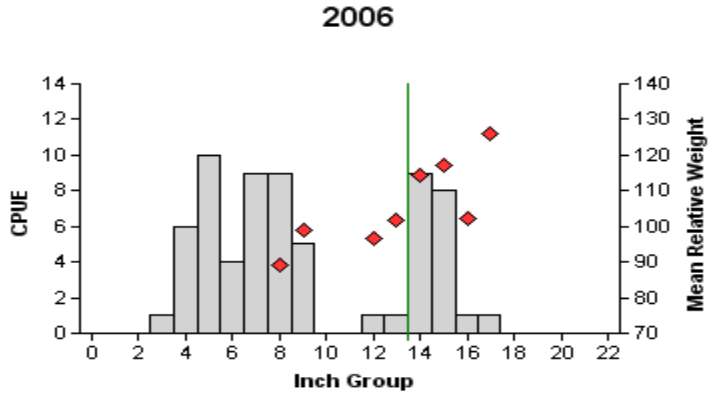
Largemouth Bass



Effort =	1.0
Total CPUE =	8.0 (43; 8)
Stock CPUE =	8.0 (43; 8)
PSD =	100 (0)
RSD-P =	12 (13)



Effort =	1.0
Total CPUE =	37.0 (36; 37)
Stock CPUE =	37.0 (36; 37)
PSD =	70 (5.2)
RSD-P =	5 (2.2)



Effort =	1.0
Total CPUE =	65.0 (24; 65)
Stock CPUE =	35.0 (22; 35)
PSD =	60 (8)
RSD-P =	29 (7.6)

Figure 7. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Buffalo Creek Reservoir, Texas, 1998, 2002, and 2006. Line indicates minimum size limit at time of sampling.

Largemouth Bass

Table 4. Results of genetic analysis of largemouth bass collected by fall electrofishing, Buffalo Creek Reservoir, Texas, 1998, 2002, and 2006. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB.

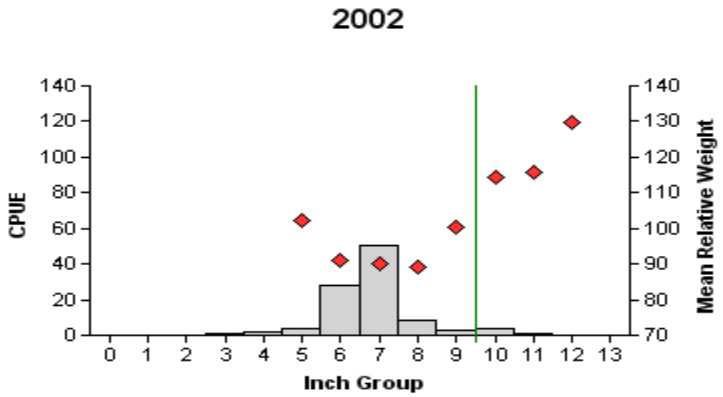
		Genotype				
Year	Sample size	FLMB	F1 or Fx	NLMB	% FLMB alleles	% pure FLMB
1998	9	0	1	8	2.8	0
2002	29	2	16	11	32.2	6.9
2006	30	0	1	29	2.0	0.0

Table 5. Mean length at age of capture for largemouth bass (sexes combined) collected by electrofishing, Buffalo Creek Reservoir, Texas, November 1992, October 1995, September 1998 and 2002. Sample sizes are in parentheses. Ages determined using otoliths.

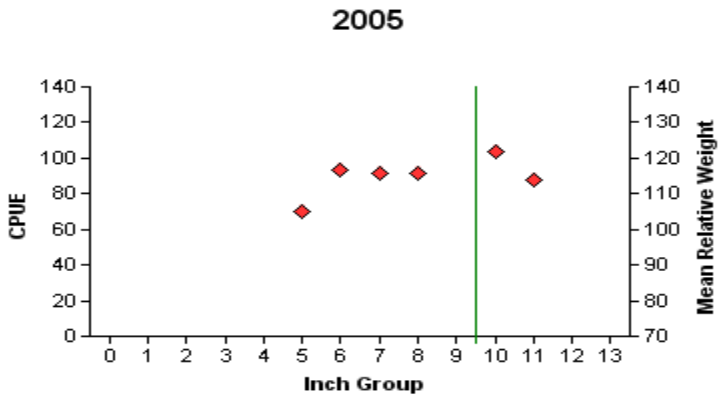
	Length (inches) at age of capture		
Year	1	2	3
1992	8.2(8)	14.4(2)	
1995	12.7(2)	15.2(1)	15.6(1)
1998	12.6(7)	13.4(2)	15.7(1)
2002	11.8(38)		
Averages[a]	8.7	11.0	12.9

[a]Ecological region 7 averages from Prentice (1987); lengths derived for October 1.

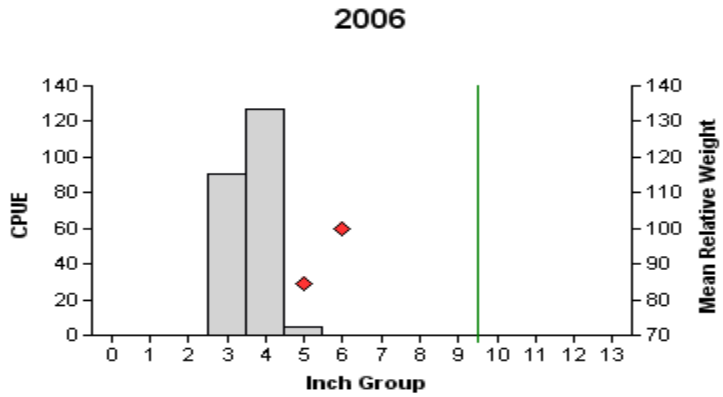
White Crappie



Effort =	10.0
Total CPUE =	101.9 (14; 1019)
Stock CPUE =	99.7 (14; 997)
PSD =	17 (3.1)
RSD-P =	5 (2.2)



Effort =	8.0
Total CPUE =	0.9 (34; 7)
Stock CPUE =	0.9 (34; 7)
PSD =	57 (20.9)
RSD-P =	29 (20.3)



Effort =	10.0
Total CPUE =	222.6 (42; 2226)
Stock CPUE =	4.8 (24; 48)
PSD =	0 (2468.7)
RSD-P =	0 (0)

Figure 8. Number of white crappie 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 fall trap netting surveys, Buffalo Creek Reservoir, Texas, 2002, 2005, and 2006. Line indicates minimum size limit at time of sampling.

Table 6. Mean length at age of capture for white crappie (sexes combined) collected with trap nets, Buffalo Creek Reservoir, Texas, September 1992, November 1995, 1998, and 2002. Sample sizes are in parentheses. Ages determined using otoliths.

	Length (inches) at age of capture			
Year	1	2	3	4
1992	7.1(10)	10.8(20)		13.9(2)
1995	6.8(15)	10.4(17)	12.2(5)	
1998	8.8(19)	11.8(7)	12.1(7)	
2002	8.6(36)	12.3(3)		12.7(1)
Averages[a]	5.7	7.0	8.2	9.2

[a]Ecological region 7 averages from Prentice (1987); lengths derived for November 1.

Table 7. Proposed sampling schedule for Buffalo Creek Reservoir, Texas. Gill net surveys are conducted in the spring, while electrofishing and trap net surveys are conducted in the fall. S denotes standard survey.

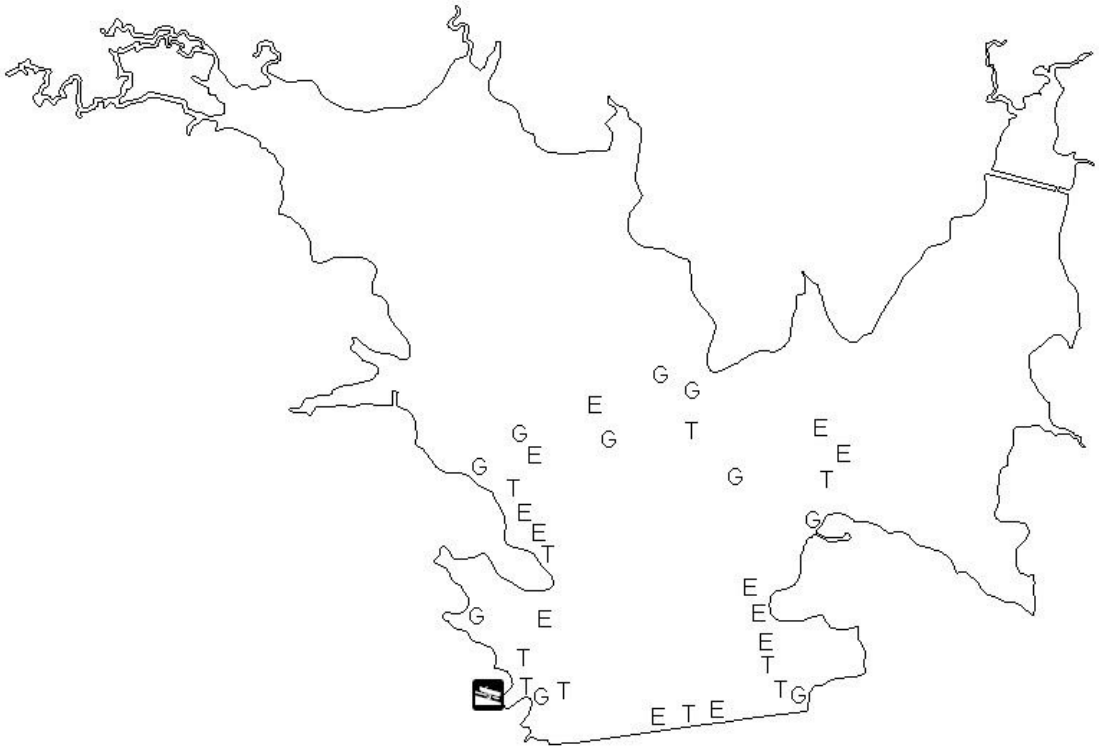
Survey Year	Electrofish	Trap Net	Gill Net	Creel	Report
Fall 2007-Spring 2008					
Fall 2008-Spring 2009					
Fall 2009-Spring 2010					
Fall 2010-Spring 2011	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from gill nets (2007), trap nets (2006) and electrofishing (2006) from Buffalo Creek Reservoir, Texas.

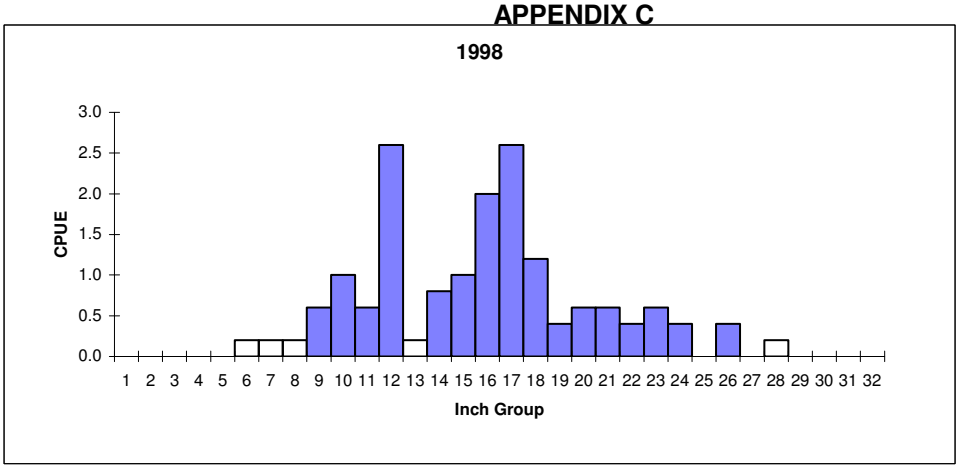
	Gill Nets		Trap Nets		Electrofishing	
Species	N	CPUE	N	CPUE	N	CPUE
Gizzard shad	12	1.2	439	43.9	1,188	1,188.0
Goldfish	1	0.1	11	1.1		
Common carp	100	10.0	24	2.4		
River carpsucker	8	0.8	5	0.5		
Smallmouth buffalo	31	3.1				
Blue catfish	47	4.7	5	0.5		
Black bullhead	3	0.3	19	1.9		
Channel catfish	61	6.1	31	3.1		
Flathead catfish	9	0.9				
Green sunfish			21	2.1	148	148.0
Orangespotted sunfish			98	9.8	16	16.0
Bluegill			71	7.1	22	22.0
Longear sunfish					2	2.0
Largemouth bass	13	1.3	9	0.9	65	65.0
White crappie	8	0.8	2,226	222.6		

APPENDIX B

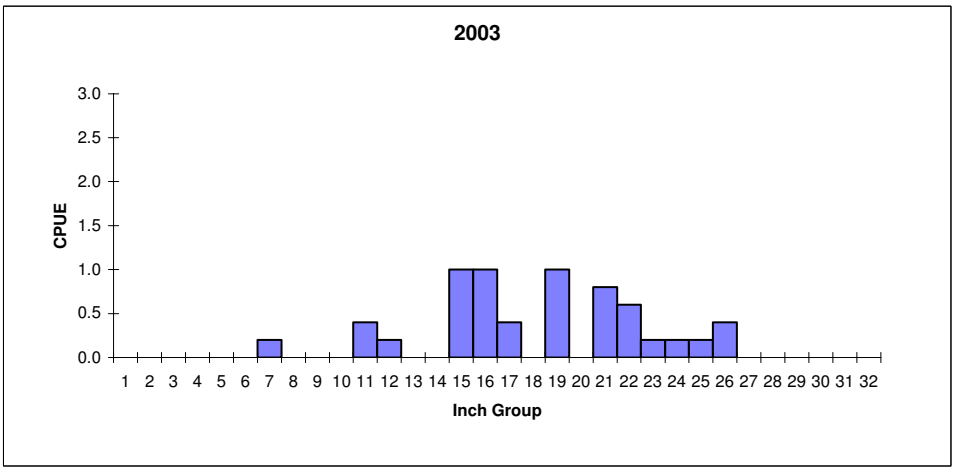


Location of sampling sites, Buffalo Creek Reservoir, Texas, 2006-2007. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Electrofishing and trap netting were completed along the shoreline as it existed at time of sampling.

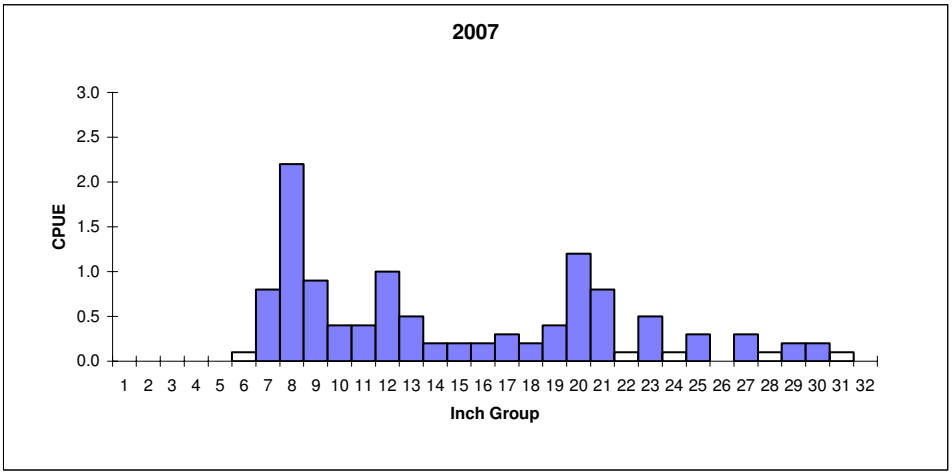
APPENDIX C



Effort =	5
Total CPUE =	16.8
Stock CPUE =	14.6



Effort =	5
Total CPUE =	6.6
Stock CPUE =	6.4



Effort =	10
Total CPUE =	11.7
Stock CPUE =	7.3

Number of combined catfish (blue, channel and flathead) caught per net night (CPUE, bars),and population indices for spring gill netting surveys, Buffalo Creek Reservoir, Texas, 1998, 2003, and 2007.