PERFORMANCE REPORT

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FEDERAL AID PROJECT F-30-R-32

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2006 Survey Report

Bachman Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Bachman Reservoir were surveyed in 2006 using electrofishing and trap nets 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:** Bachman Reservoir, a 132-acre reservoir located on Bachman Branch (a tributary of the Trinity River), was constructed in 1903 by the City of Dallas for water supply. It is located in Dallas County near the Love Field Airport. Habitat is composed mainly of rocky habitat and shoreline aquatic vegetation in the form of water willow. Bachman Reservoir was dredged in 2003.

- **Management history:** Important sport fish include largemouth bass and white crappie. All fish species have been managed by statewide regulations.

- **Fish Community**
  - **Prey species:** Electrofishing catch rates of gizzard shad remain average when compared to other district reservoirs. Threadfin shad are present but the population is in very low abundance. The total catch rate of bluegills is above average. Longear sunfish are also present but in low abundance. Other sunfishes including green sunfish and warmouth are present in low numbers.

  - **Catfishes:** Channel catfish are present in the reservoir but they are very low in abundance and only 2 were captured in two gill netting surveys. Blue catfish were stocked in 2004 but none were captured by gill netting in 2007. Flathead catfish are present but none were captured the past two surveys.

  - **White bass:** No white bass have been captured during two gill netting surveys and if they are present in the reservoir, are in very low abundance.

  - **Largemouth bass:** The largemouth bass total catch rates are above average when compared to other district reservoirs. Population structure and body condition of the population are above average.

  - **White crappie:** The white crappie trap netting catch rates are well above average when compared to other district reservoirs with size structure and body conditions being above average.

- **Management Strategies:** This reservoir will be monitored with trap nets, gill nets, and electrofishing in 2010-2011. Because of the age and proximity of the reservoir to industrial development, tissue samples from selected fish will be collected for contaminant analysis. Blue catfish will be requested for stocking in 2008 and 2009 to provide an additional sportfish for anglers and to utilize the abundant forage.

INTRODUCTION

This document is a summary of fisheries data collected from Bachman Reservoir in 2006-2007. 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 are presented with the 2006-2007 data for comparison.

Reservoir Description

Bachman Reservoir is a 132-acre reservoir located on Bachman Branch (a tributary of the Trinity River), was constructed in 1903 by the City of Dallas for water supply. It is located in Dallas County near the Love Field Airport. Habitat is composed mainly of rocky habitat and shoreline aquatic vegetation in the form of water willow. The watershed was primarily industrial with a major airport residing next to the reservoir. A park surrounds the reservoir and provides many different forms of recreation for the citizens of Dallas. Angler bank access is adequate however handicapped fishing access is very limited. There is one boat ramp available for use but parking for boat trailers is limited. Bachman Reservoir was dredged in 2003. At the time of sampling the fishery habitat was primarily of rocky habitat and shoreline aquatic vegetation in the form of water willow. Other descriptive characteristics for Bachman Reservoir are in Table 1.

Management History

Previous management strategies and actions: No previous management strategies and actions for Bachman Reservoir have been proposed.

Harvest regulation history: Sport fish populations in Bachman Reservoir were managed with statewide regulations throughout the history of the Reservoir

Stocking history: Bachman Reservoir has been stocked periodically with channel catfish. Blue catfish were stocked in 2004. The complete stocking history is in Table 3.

METHODS

Fishes were collected by electrofishing (0.5 hours at 6 5-min stations), gill netting (3 net nights at 3 stations), and trap netting (3 net nights at 3 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/hr) 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) with the exception of electrofishing which was conducted during daylight hours. Effort of sampling also deviated from procedures because of the small size of the reservoir.

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. Ages for largemouth bass were determined using otoliths (TPWD, Inland Fisheries Division, unpublished manual revised 2005). No water level data is available for the reservoir.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of rocky habitat and aquatic vegetation in the form of

water willow (Table 4).

Prey species: The electrofishing catch rates of threadfin from 2002 to 2006 have remained well below the district average of 217.0/hr. In fact threadfin shad were only caught during the 2006 survey (84.0/hr). From 2002 to 2006 electrofishing catch rates of gizzard shad were variable and averaged 175.9/hr and ranged from 8.0/hr in 2004 to 364.0/hr in 2003 (Figure 1). Index of vulnerability for gizzard shad from 2002 to 2006 have remained high and have averaged 90 and ranged from 75 in 2004 to 100 in 2002 (Figure 1). Electrofishing catch rates of bluegill were variable from 2002 to 2006 with an average catch rate of 252.7/hr, ranging from 9.3/hr in 2002 to 512.0/hr in 2003 (Figure 2). The bluegill population does not contain large numbers of quality sized fish (>6 inches) as evident in the low PSD values. Longear sunfish catch rates have been variable from 2002 to 2006 averaging 35.1/hr and ranging from 5.3/hr in 2002 to 60.0/hr in 2003 (Figure 3).

Catfish: Only two channel catfish were captured in the 2003 and 2007 gill netting surveys. Both of the catfish were large adults in the 20 and 22 inch length category. Even though blue catfish have been stocked recently, none were captured during the 2007 gill netting survey.

Largemouth bass: The total electrofishing catch rates of largemouth bass have been variable but remained high from 2002-2006 averaging 201.2/hr, ranging from 94.0/hr in 2003 to 368.0/hr in 2005 (Figure 4). The catch rate of largemouth bass > 14 inches in length increased in 2005 (22.0/hr) and 2006 (22.0/hr) when compared to 2002 to 2004. The size structure of the population has varied also but remains average as indicated by PSD values of 35 and 32 for the last two surveys. Growth of largemouth bass in Bachman Reservoir is very fast with fish reaching legal size between 1 and 2 years of age (Figure 5). Body conditions were at or above optimal (relative weight over 90) for nearly all size classes from 2002 to 2006 (Figure 4). Florida largemouth bass influence was low as Florida alleles were 33% in 2002 and Florida genotype was 0 (Table 5).

White crappie: The trap net catch rates of white crappie were very high in 2002 and 2006 averaging 46.5/nn (Figure 6). The size structure remains above average as indicated by the PSD value observed in 2006 (53). However the size structure of the crappie population had declined from 2002 as evident by the decline in the RSDp and the CPUE 10 values from 2002 to 2006. Body conditions were above 90 for all length classes (Figure 6).

Fisheries management plan for Bachman Reservoir, Texas

Prepared – July 2007.

ISSUE 1: Bachman Reservoir's watershed consists of urban and industrial areas. Because of the potential of anglers consuming fish from the reservoir, fish tissues need to be analyzed to determine if human health issues exist.

MANAGEMENT STRATEGY

1. An initial baseline fish tissue sample will be taken from selected fish to determine if there are concerns regarding fish tissue contamination.

ISSUE 2: Bachman Reservoir has abundant forage which could be utilized by another sport fish. The success of the stocking of blue catfish in 2004 was hampered by the presence of hundreds of double crested cormorants. Cormorants were observed eating the fingerlings at the time of stocking.

MANAGEMENT STRATEGY

1. Request the stocking of blue catfish fingerlings at 100/acre if fish tissues analyzed is determined to be same for human consumption.

ISSUE 2: Bachman Reservoir is not on the TPWD website reservoir information page. Information regarding the reservoir and its fisheries could assist in the promotion of fishing in the Dallas Fort Worth area.

MANAGEMENT STRATEGY

1. Contact Austin staff regarding development of a Bachman Reservoir information page.

ISSUE 3: The gillnetting catch rates of channel and blue catfish in Bachman Reservoir have been very low in the past two samples despite stockings. These low catch rates could be caused by the low amount of effort extended during the previous samples.

MANAGEMENT STRATEGY

1. Conduct gillnet sampling at a minimum of 5 nn to determine status of catfish populations in 2010-2011.

SAMPLING SCHEDULE JUSTIFICATION

General monitoring of sport fish species with electrofishing, trap netting, and gill netting, will be conducted every 4 years. Electrofishing will be conducted as needed for the collection of fish tissues. Additional gillnetting effort will be conducted during the 2010-2011 sample year to better determine the status of the catfish population. A creel survey scheduled for 2008-2009 has been canceled due to results of creel surveys conducted on two similar reservoirs. These results do not justify the effort needed to collect creel survey data on Bachman Reservoir.

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. Stimpert. 1996. Relations between Reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16: 888-895.

Table 1. Characteristics of Bachman Reservoir, Texas.

Characteristic	Description
Year Constructed	1903
Controlling authority	City of Dallas
County	Dallas
Reservoir type	Tributary Trinity River
Conductivity	375 umhos/cm

Table 2. Harvest regulations for Bachman Reservoir.

Species	Bag Limit	Length Limit (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 minimum
Catfish, Flathead	5	18 minimum
Bass: White	25	10 minimum
Bass: largemouth	5	14 minimum
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 minimum

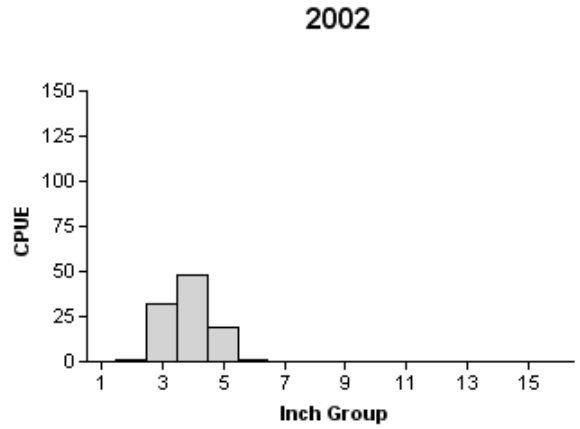
Table 3. Stocking history of Bachman Lake (Dallas), Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage 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	2003	13,313	AFGL	8.1
	Total	13,313		
Channel catfish	1966	6,000	AFGL	7.9
	1969	20,000	AFGL	7.9
	1976	2,000	AFGL	7.9
	1982	180	UNK	UNK
	1996	324	AFGL	11.0
	1997	400	ADL	16.0
	1998	500	ADL	11.4
	1999	400	ADL	15.2
	2000	400	AFGL	11.0
	2002	850	ADL	11.0
	2002	50	AFGL	11.0
	2004	3,807	AFGL	9.2
	2005	662	ADL	11.3
	2006	600	ADL	11.1
	2007	660	ADL	12.2
	Total	36,833		
Florida Largemouth bass	1976	5,450	FGL	3.0
	Total	5,450		
Green sunfish x redear sunfish	1976	6,000		UNK
	Total	6,000		
Largemouth bass	1967	2,500	UNK	UNK
	1976	3,000	UNK	UNK
	1982	185	UNK	UNK
	Total	5,685		
Redear sunfish	1976	6,000		UNK
	Total	6,000		

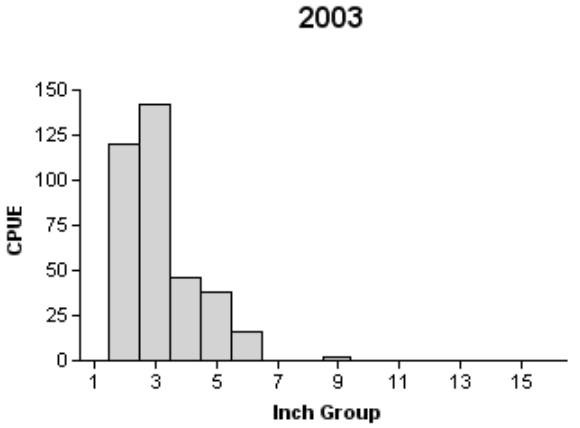
Table 4. Survey of littoral zone and physical habitat types, Bachman Reservoir, Texas, 2006. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Cut bank	1.1	32.0		
Concrete	0.5	15		
Rip rap	>0.1	3		
Bulkhead	0.3	9		
Native emergent	1.1	32		
Overhanging brush	>0.1	3		
Boat docks, piers	>0.1	3		
Nondescript	>0.1	3		

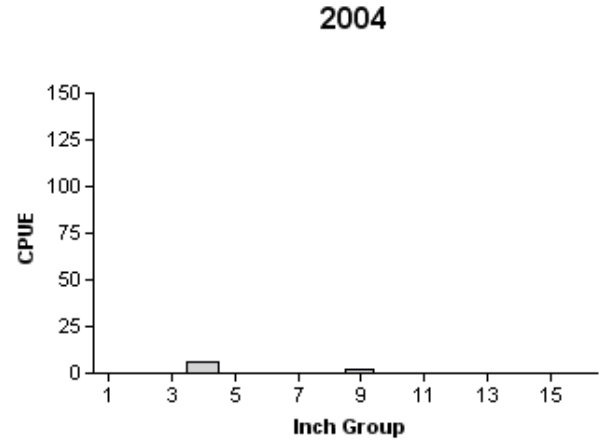
Gizzard Shad



Effort = 0.8
Total CPUE = 101.3 (33; 76)
Stock CPUE = 0.0 (0; 0)
IOV = 100.0 (0)



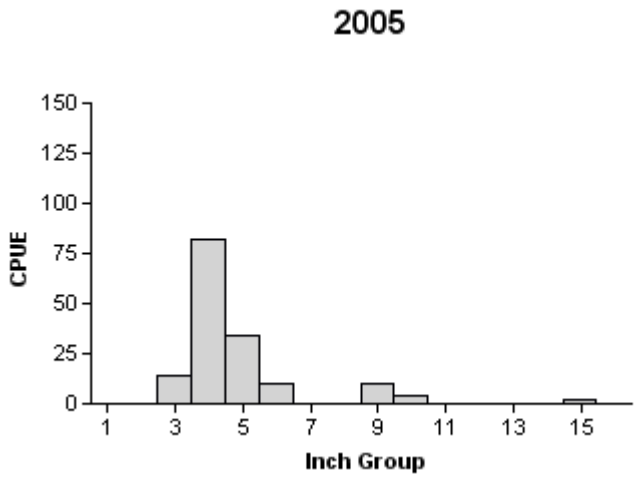
Effort = 0.5
Total CPUE = 364.0 (33; 182)
Stock CPUE = 2.0 (100; 1)
IOV = 99.45 (0.8)



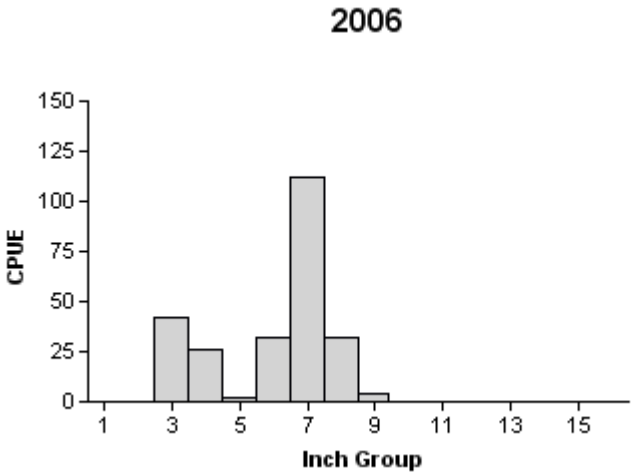
Effort = 0.5
Total CPUE = 8.0 (32; 4)
Stock CPUE = 2.0 (100; 1)
IOV = 75.0 (23.7)

Figure 1. Number of gizzard shad caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Bachman Reservoir, Texas, 2002 - 2004.

Gizzard Shad



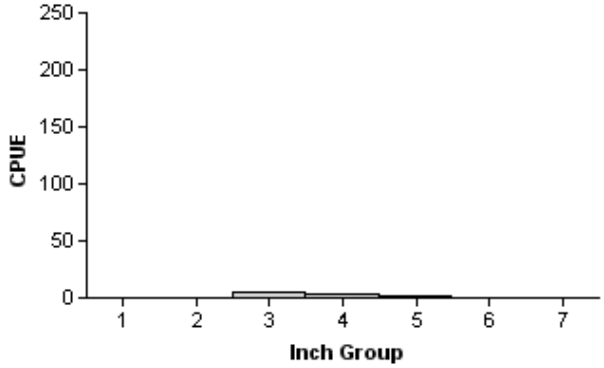
Effort = 0.5
Total CPUE = 156.0 (47; 78)
Stock CPUE = 16.0 (42; 8)
IOV = 89.74 (5.5)



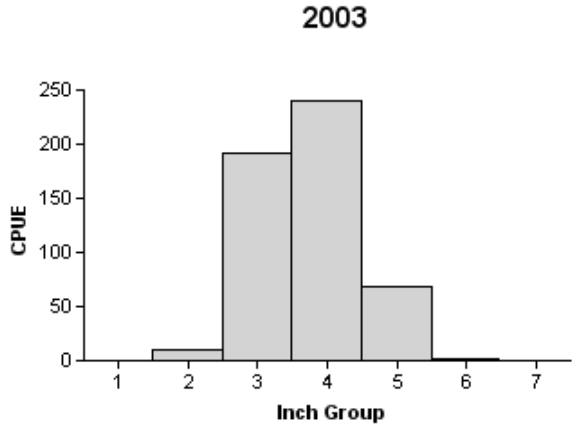
Effort = 0.5
Total CPUE = 250.0 (59; 125)
Stock CPUE = 148.0 (51; 74)
IOV = 85.6 (3.0)

Figure 1. Number of gizzard shad caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Bachman Reservoir, Texas, 2005 - 2006.

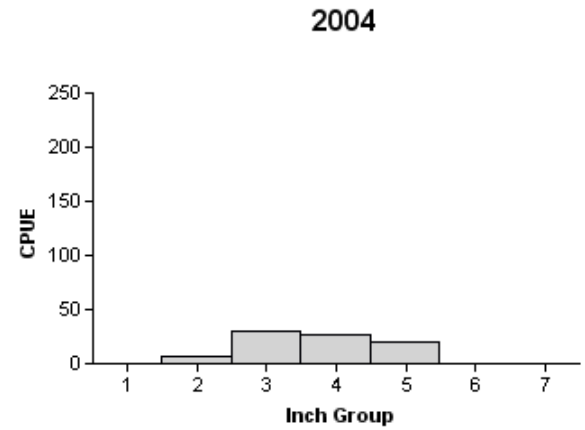
Bluegill



Effort = 0.8
Total CPUE = 9.3 (74; 7)
Stock CPUE = 9.3 (74; 7)
CPUE-6 = 0.0 (0; 0)
PSD = 0 (81.6)



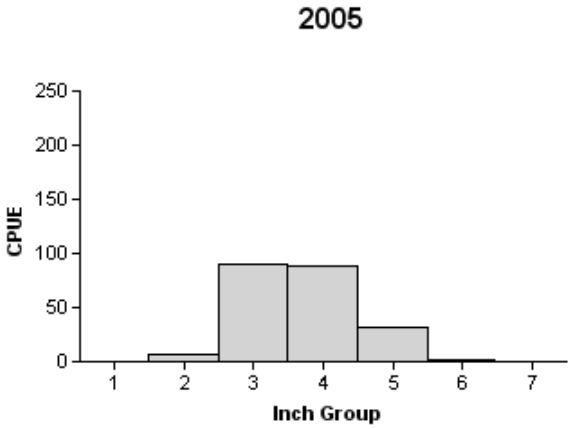
Effort = 0.5
Total CPUE = 512.0 (19; 256)
Stock CPUE = 502.0 (19; 251)
CPUE-6 = 2.0 (100; 1)
PSD = 0 (0.4)



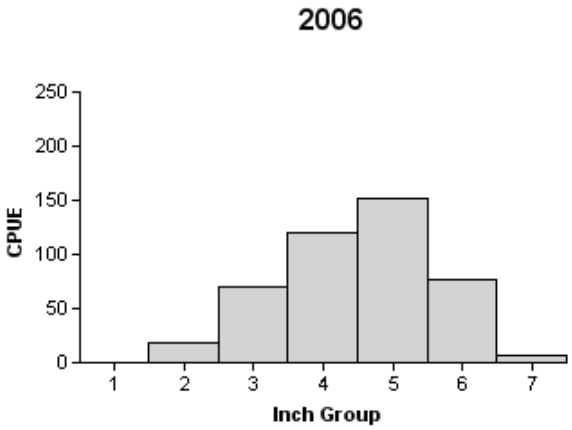
Effort = 0.5
Total CPUE = 82.0 (71; 41)
Stock CPUE = 76.0 (75; 38)
CPUE-6 = 0.0 (0; 0)
PSD = 0 (90.8)

Figure 2. Number of bluegill caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Bachman Reservoir, Texas, 2002 - 2004.

Bluegill



Effort = 0.5
Total CPUE = 218.0 (54; 109)
Stock CPUE = 212.0 (56; 106)
CPUE-6 = 2.0 (100; 1)
PSD = 1 (0.4)

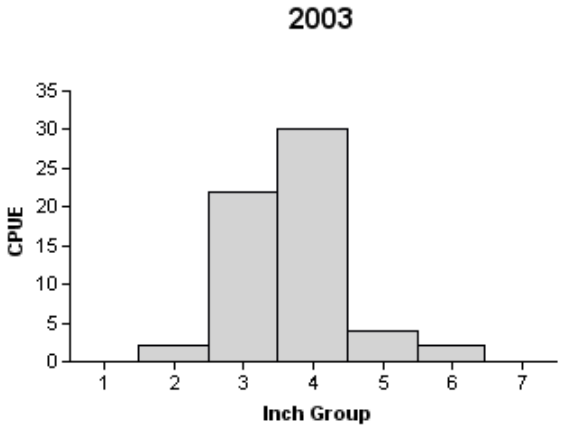


Effort = 0.5
Total CPUE = 442.0 (15; 221)
Stock CPUE = 424.0 (15; 212)
CPUE-6 = 82.0 (22; 41)
PSD = 19 (4.1)

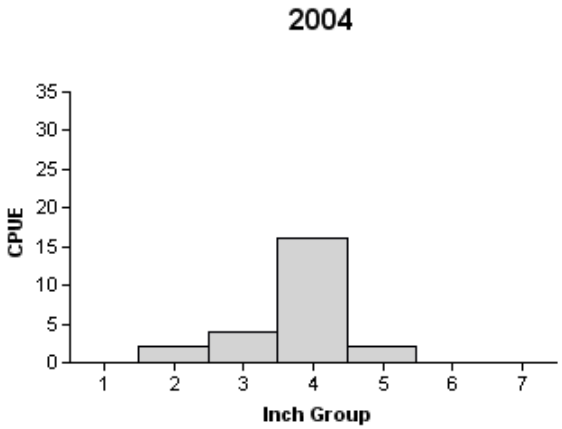
Figure 2. Number of bluegill caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Bachman Reservoir, Texas, 2005 - 2006.

Longear Sunfish

Effort = 0.8
Total CPUE = 5.3 (76; 4)
Stock CPUE = 5.3 (76; 4)



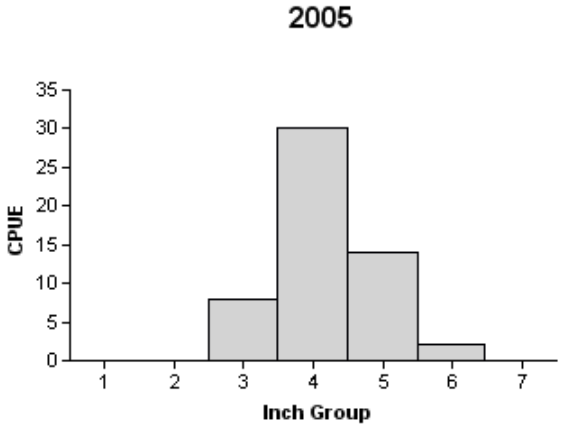
Effort = 0.5
Total CPUE = 60.0 (33; 30)
Stock CPUE = 60.0 (33; 30)



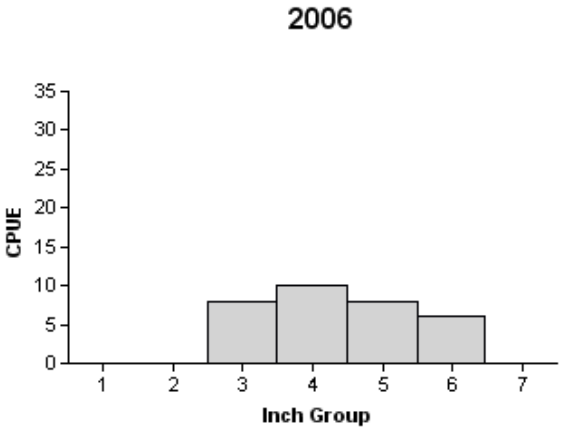
Effort = 0.5
Total CPUE = 24.0 (81; 12)
Stock CPUE = 24.0 (81; 12)

Figure 3. Number of longear sunfish caught per hour (CPUE;bars) (RSE and N for CPUE) for fall electrofishing surveys, Bachman Reservoir, Texas, 2002 - 2004.

Longear Sunfish



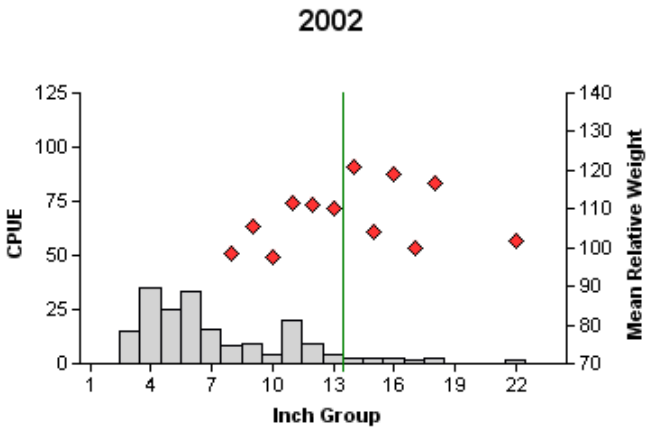
Effort = 0.5
Total CPUE = 54.0 (48; 27)
Stock CPUE = 54.0 (48; 27)



Effort = 0.5
Total CPUE = 32.0 (49; 16)
Stock CPUE = 32.0 (49; 16)

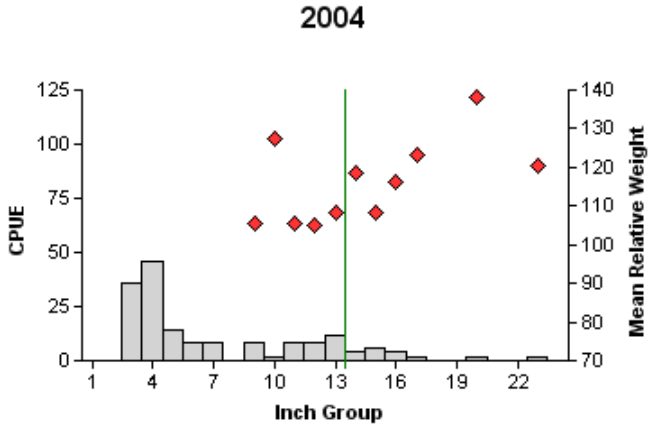
Figure 3. Number of longear sunfish caught per hour (CPUE;bars) (RSE and N for CPUE) for fall electrofishing surveys, Bachman Reservoir, Texas, 2005 - 2006.

Largemouth Bass



Effort = 0.8
Total CPUE = 192.0 (29; 144)
Stock CPUE = 68.0 (25; 51)
CPUE-14 = 13.3 (35; 10)
PSD = 39 (7.7)

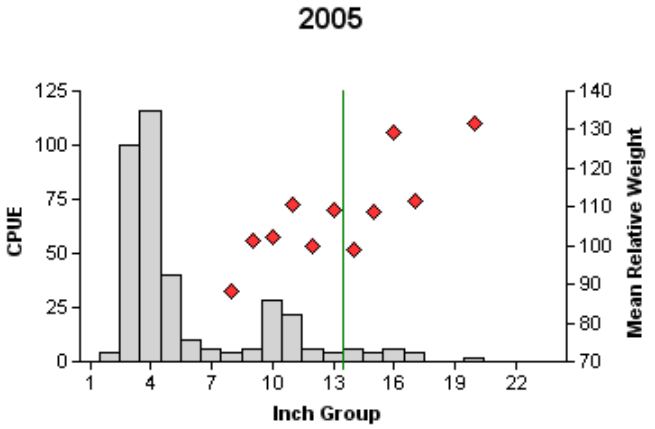
Effort = 0.5
Total CPUE = 94.0 (20; 47)
Stock CPUE = 50.0 (14; 25)
CPUE-14 = 14.0 (41; 7)
PSD = 44 (12.7)



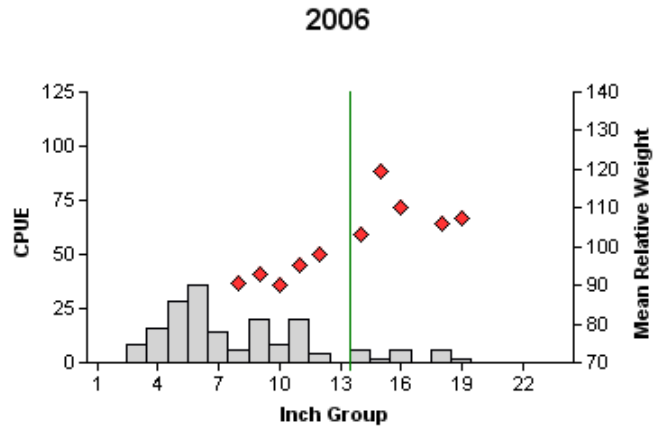
Effort = 0.5
Total CPUE = 170.0 (19; 85)
Stock CPUE = 58.0 (25; 29)
CPUE-14 = 20.0 (59; 10)
PSD = 69 (7.9)

Figure 4. 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, Bachman Reservoir, Texas, 2002 - 2004. Vertical lines represent length limit at time of sampling.

Largemouth Bass



Effort = 0.5
Total CPUE = 368.0 (17; 184)
Stock CPUE = 92.0 (17; 46)
CPUE-14 = 22.0 (43; 11)
PSD = 35 (6.7)



Effort = 0.5
Total CPUE = 182.0 (15; 91)
Stock CPUE = 80.0 (16; 40)
CPUE-14 = 22.0 (33; 11)
PSD = 32 (9.8)

Figure 4. 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, Bachman Reservoir, Texas, 2005 - 2006. Vertical lines represent length limit at time of sampling.

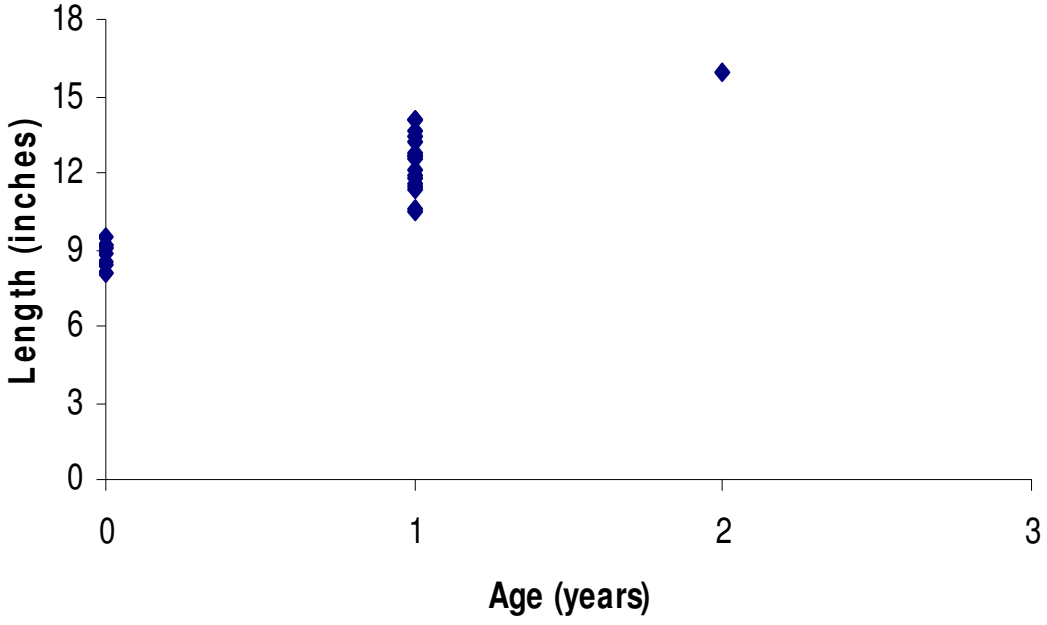
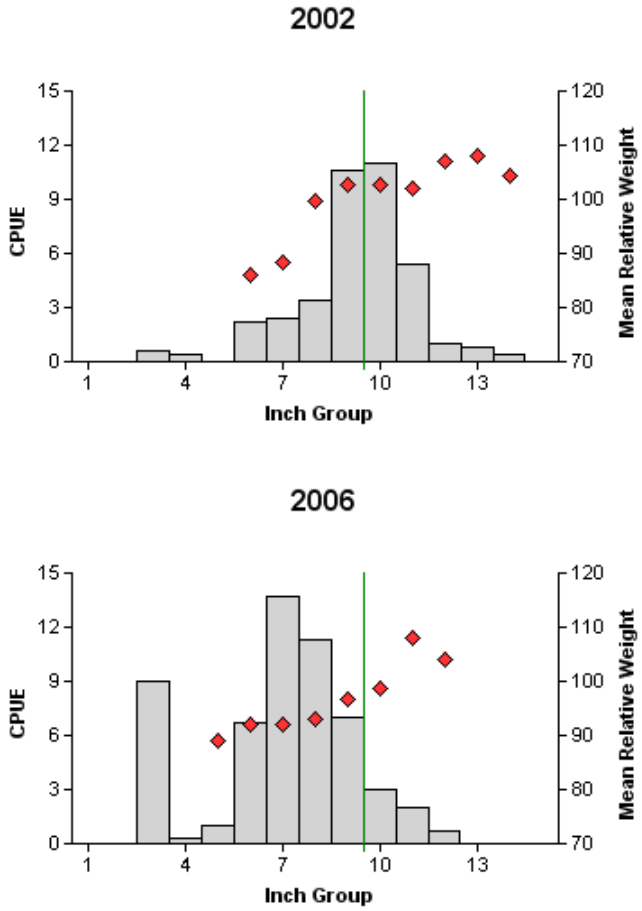


Figure 5. Length at age for largemouth bass (sexes combined) collected from electrofishing at Bachman Reservoir, Texas, for fall 2002. (N=28).

Table 5. Results of genetic analysis of largemouth bass collected by fall electrofishing, Bachman Reservoir, Texas, 2002. 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	Fx	NLMB	% FLMB alleles	% pure FLMB
2002	27	0	5	17	5	33.3	0.0

White Crappie



Effort = 5.0
Total CPUE = 38.2 (25; 191)
Stock CPUE = 37.2 (24; 186)
CPUE-10 = 18.6 (20; 93)
PSD = 88 (3.3)

Effort = 3.0
Total CPUE = 54.7 (34; 164)
Stock CPUE = 45.3 (33; 136)
CPUE-10 = 5.7 (51; 17)
PSD = 53 (1.9)

Figure 6. 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 net surveys, Bachman Reservoir, Texas, 2002,and 2006. Vertical line represents length limit at time of sampling.

Table 6. Proposed sampling schedule for Bachman Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard surveys are denoted by S.

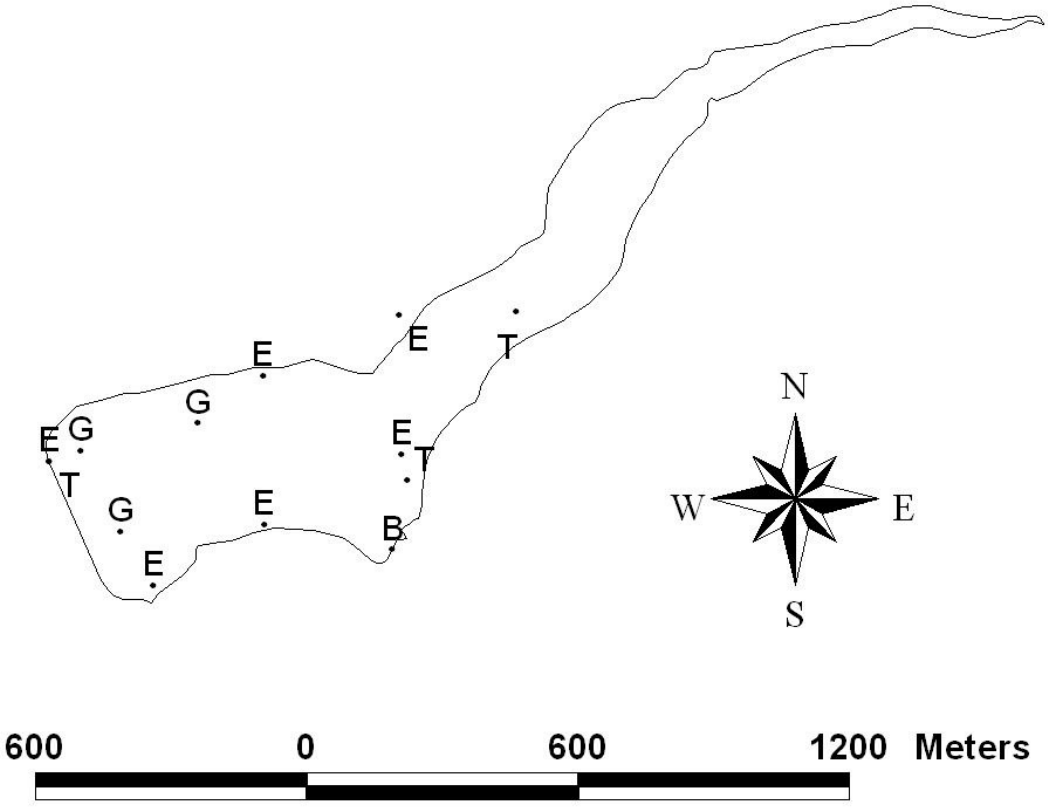
Survey Year	Electrofisher	Trap Net	Gill Net	Creel Survey	Report
Fall 2007-Spring 2008					
Fall 2008-Spring 2009					
Fall 2009-Spring 2010					
Fall 2010-Spring 2011	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of species collected from all gear types from Bachman Reservoir, Texas, 2006-2007.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad		22.3			125	250.0
Threadfin shad					42	84
Blue catfish	0	0				
Channel catfish	2	0.67				
White bass	0	0				
Bluegill					221	442.0
Longear sunfish					16	32.0
Largemouth bass					91	182.0
White crappie			164	54.7		
Spotted gar	8	2.67				
Common carp	12	6.0				

APPENDIX B



Location of sampling sites, Bachman Reservoir, Texas, 2006-2007. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Boat ramps are indicated with a B. Water level was near full pool at time of sampling.