

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-29

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2004-2005 Survey Report

Coleman Reservoir

Prepared by:

Mukhtar Farooqi, Assistant District Management Supervisor
and
Spencer Dumont, District Management Supervisor
Inland Fisheries Division
District 1-B, Abilene, Texas



Robert L. Cook
Executive Director

Phil Durocher
Director, Inland Fisheries

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EXECUTIVE SUMMARY

Coleman Reservoir was surveyed in fall 2004 using electrofishing and trap nets, and in spring 2005 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:** Coleman Reservoir is a 2,000-acre impoundment owned and controlled by the city of Coleman, Texas. It was impounded in 1966 on Jim Ned creek, a tributary of the Colorado River. It is located 11 miles north of Coleman. The reservoir provides municipal and industrial water supply for the city of Coleman and is also used for flood control and recreation. Topography grades from gentle to moderate relief. Land use around the reservoir includes residential and agriculture. The habitat in the reservoir at the time of sampling consisted mainly of rocky structure, standing timber, and aquatic vegetation (lotus, stargrass and floating leaf pondweed). Water levels had steadily declined after 1998 to a low not observed since the reservoir was impounded. However, this trend was reversed in July of 2002 when the reservoir filled and has been at or close to conservation level since that time. Coleman Reservoir is a study site for the habitat enhancement initiative, which began in 1998.
- **Prey species:** Electrofishing catch rates of bluegill, sub-stock gizzard shad, and threadfin shad were 224.0/h, 29.5/h, and 210.0/h, respectively. Index of vulnerability (IOV) for gizzard shad was relatively low, indicating that 36% of gizzard shad were available to existing predators. The IOV from the two previous survey years ranged from 86 to 94. In addition, the catch per unit effort (CPUE) of gizzard shad was considerably lower than that recorded in previous surveys. Bluegill CPUE in 2004 increased relative to that recorded in the 2000 survey. In essence the population size structure reflects that observed in 1997, i.e. before the 1999-2002 drought was in effect. Electrofishing catch rate of threadfin shad improved compared to that recorded in 2000 (7.0/h) [Dumont 2001] and 1997 (148.7/h) [Dumont and Jons 1998].
- **Channel catfish:** The gill net catch rate of channel catfish was 2.0/NN in 2005 compared to catch rates ranging from 0.8 to 1.4/NN from the surveys in 1997 and 2001. Relative abundance has been consistently low. Channel catfish were last stocked in 2003.
- **Palmetto bass:** The gill net catch rate of palmetto bass was 10.4/NN in 2005 and is essentially at the same level as that recorded in previous years. Catch rate ranged from 11.8/NN to 12.3/NN from 1997 to 2001. The bulk of the fish were in the 19 inches to 23 inches size range. Relative weight (W_r) estimates were above 90 for the 19 inches to 22 inches size range. There was somewhat of an improvement in W_r compared to the results of the 2001 survey and larger fish were present. Hybrid striped bass were stocked in 2004, and prior to that the last stocking took place in 1998, hence the absence of younger year classes.
- **Largemouth bass:** Overall, the population characteristics for largemouth bass were similar to that recorded in the 2000 survey. The total CPUE of largemouth bass in 2004 was 142.0/h compared to 139.0/h in 2000. The catch rate for stock length largemouth bass (69.0/h) was slightly down from 2000 (78.0/h), continuing the downward trend from 1997. Population size structure was adequate with a proportional stock density (PSD) of 45 and relative stock density (RSD-P) of 6. The body condition of largemouth bass from 8 inches to 18 inches was adequate (W_r generally ranging between 91 to 97), showing some improvement since the 2000 survey was conducted (especially with regard to the 13-inch to 15-inch size group). With the exception of two fish (age 5 and 6) all individuals aged were 2 years old or younger and their growth rate was in line with that recorded from previous surveys. Electrophoresis in 2004 indicated a 46.2% frequency of Florida largemouth bass alleles with 15% having a Florida largemouth bass genotype. The latter has increased since the 2000 (6.7% Florida genotype) and 1997 (3.3% Florida genotype) surveys were conducted.

- **White crappie:** Relative abundance has increased steadily since 1997. In 2004, the trap net catch rate of white crappie was 9.6/NN and stock CPUE was 9.4/NN. The RSD-P was 33; a decrease compared to 2000 (RSD-P=51). Body condition and growth rates were reasonable; Wr ranged from 89 to 97. Mean length at ages 1 and 2 was in line with that of previous surveys. By age 2, crappie were long enough for harvest.
- **Management Strategies:** Stock palmetto bass biennially at a rate of 5/acre. Conduct general monitoring with trap nets, gill nets and electrofishing surveys in 2008-2009.

INTRODUCTION

This document is a summary of fisheries data collected from Coleman Reservoir in 2004-2005. 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 with the 2004-2005 data for comparison.

STATUS OF MANAGEMENT ACTIONS FROM 2001 SURVEY REPORT (Dumont 2001)

1. Due to a decline in the forage base, palmetto bass should be stocked at a reduced rate of 5 fish/acre biennially.
Action: 9,998 fingerling palmetto bass were stocked in 2004 at a rate of 5/acre.
2. Continue with habitat enhancement at this reservoir as part of the habitat enhancement initiative.
Action: Supplemental introduction of native aquatic plants was carried out in 2002 and a qualitative assessment of plant habitat has been made every year since 1998.

Harvest regulations for Coleman Reservoir.

Species	Bag Limit	Minimum-Maximum Length (inches)
Bass, palmetto	5	18 - No Limit
Catfish, Channel	25	12 - No Limit
Catfish, Flathead	5	18 - No Limit
Bass, Largemouth	5	14 - No Limit
Crappie, White	25	10 - No Limit

METHODS

- Fishes were collected by electrofishing (2 hours at 24 5-min stations), gill nets (5 net nights at 5 stations), and trap nets (7 net nights at 7 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (#/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (#/NN). All survey sites were randomly selected and surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2004).
- 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).
- Ages were determined for selected species using otoliths.

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.

Dumont, S. C., and G. Jons. 1998. Statewide freshwater fisheries monitoring and management program survey report for Coleman Reservoir, 1998. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Dumont, S. C. 2001. Statewide freshwater fisheries monitoring and management program survey report for Coleman Reservoir, 2001. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

 Physical and historical data for Coleman Reservoir, Texas, 2004-2005.

Inland Fisheries water body code: 0181

IF District: 1-B – Abilene

Controlling authority: City of Coleman

Water Uses: Municipal water supply, recreation, and flood control

Acres: 2,000

Counties: Coleman

Location: 45 miles Southeast of Abilene

Latitude: 32° 25'

Longitude: 99° 27'

Nearest major metropolitan area and distance: Abilene- 45 miles

Reservoir description: Tributary

River: Colorado

Mean depth (ft): 10.0

Maximum depth (ft): 67.0

Shoreline development ratio: 4.05

Watershed (mi²): 292

Secchi disc range (ft): 1-4

Conductivity (umhos/cm): 550

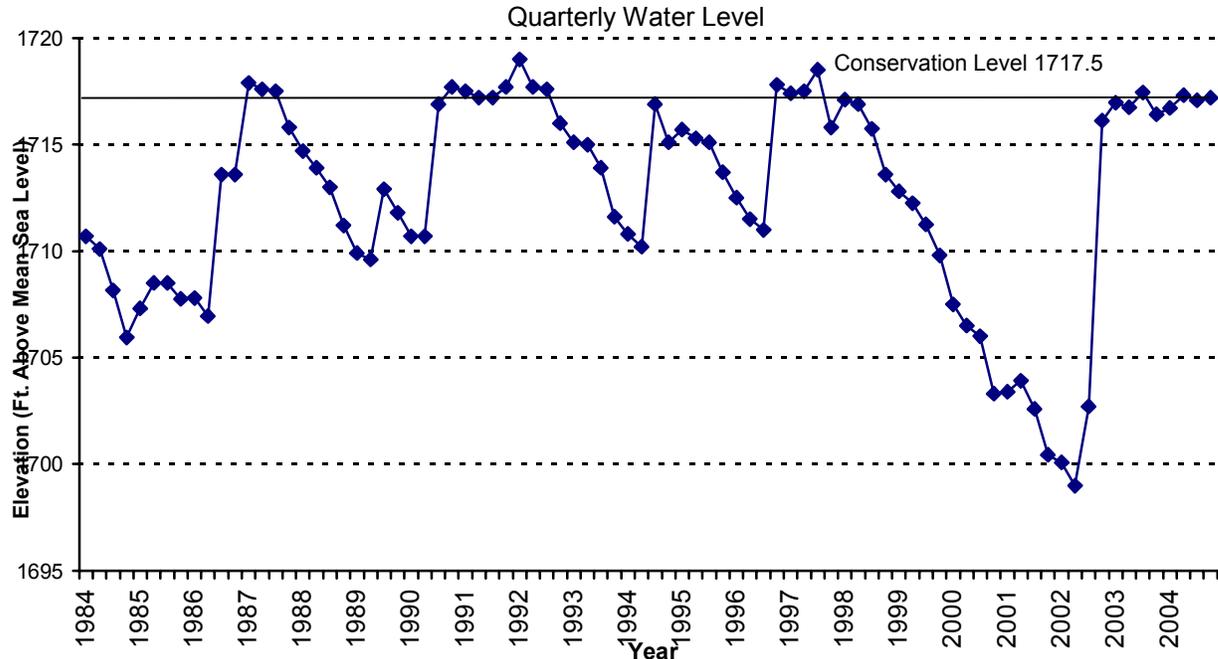
Constructed: 1966

Access: Boat Good – 2 ramps

Bank Poor

Handicap Poor

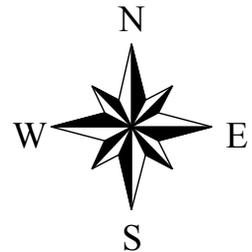
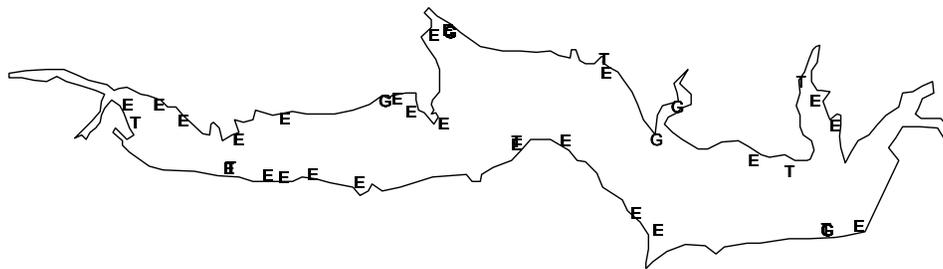
Significant events: Drought from 1999 to 2002



Mean Quarterly water level elevations in feet above mean sea level (MSL) recorded for Coleman Reservoir, Texas.

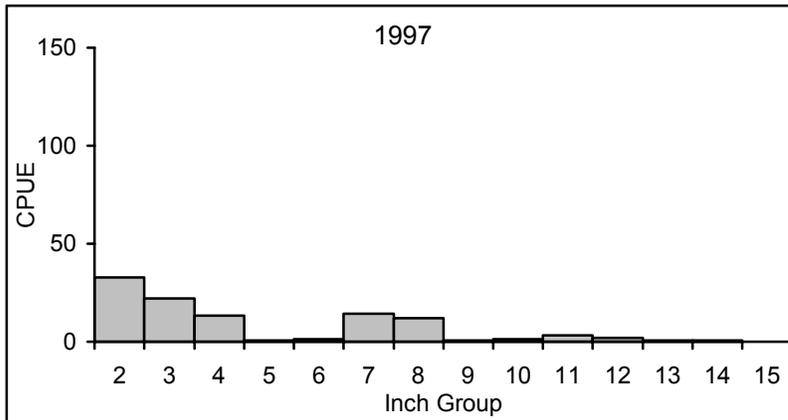
Stocking history of Coleman Reservoir, Texas. Size Categories are: FRY =<1 inch; FGL = 1-3 inches; AFGL = >3 inches, and ADL = adults.

Year	Number	Size	Year	Number	Size
<u>Threadfin shad</u>			<u>Florida largemouth bass</u>		
1984	1,950	ADL	1991	100,465	FGL
1985	<u>1,200</u>	ADL	2001	<u>201,471</u>	FGL
Species Total	3,150		Species Total	301,936	FGL
<u>Channel catfish</u>			<u>Kemp's largemouth bass</u>		
1966	84,000	FGL	1985	102,528	FGL
1967	350	ADL			
2002	1,081	ADL	<u>Black crappie</u>		
2003	<u>16,910</u>	AFGL	1966	2,000	FGL
Species Total	102,341		<u>Green X redear sunfish</u>		
<u>Palmetto bass</u>			1966	10,000	FGL
1976	21,280	FGL	1979	<u>400</u>	ADL
1977	16,656	FGL	Species Total	10,400	
1979	13,950	FGL			
1981	10,575	FGL			
1983	9,999	FGL			
1986	35,180	FGL			
1987	40,050	FGL			
1988	300,000	FGL			
1989	250,000	FGL			
1991	32,030	FGL			
1992	24,400	FGL			
1994	24,786	FGL			
1995	14,950	FGL			
1996	10,096	FGL			
1997	10,235	FGL			
1998	10,087	FGL			
2004	<u>9,998</u>	FGL			
Species Total	834,272				
<u>Largemouth bass</u>					
1966	246,000	FGL			
1967	8,000	FGL			
1970	<u>100,000</u>	FGL			
Species Total	354,000				

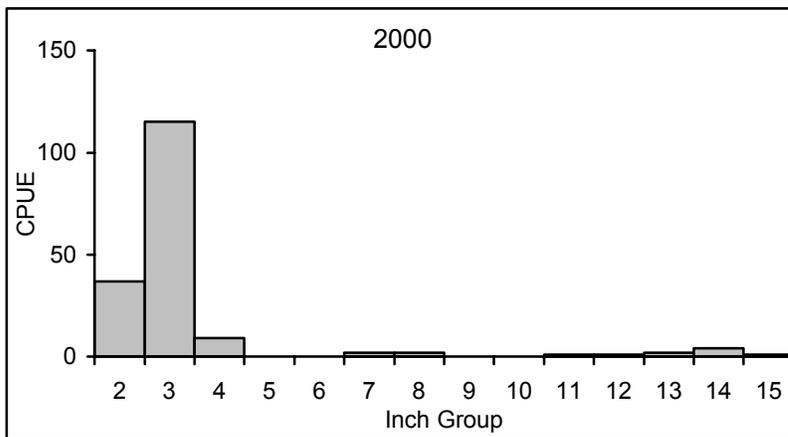


Location of sampling sites, Coleman Reservoir, Texas, 2004-2005. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively.

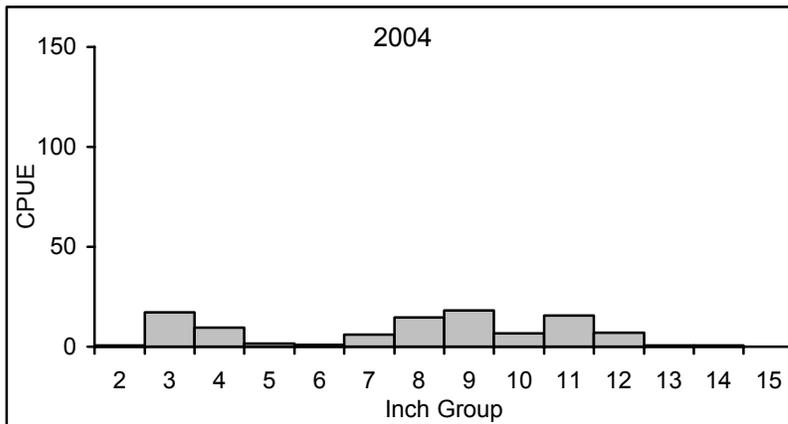
Gizzard Shad



Effort = 1.5
 Total CPUE = 150.0
 Stock CPUE = 35.3
 PSD = 19
 IOV = 86



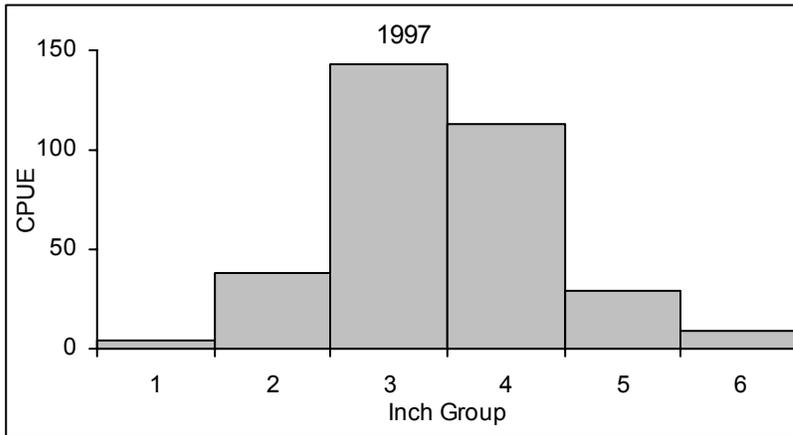
Effort = 1.0
 Total CPUE = 174.0
 Stock CPUE = 13.0
 PSD = 9
 IOV = 94



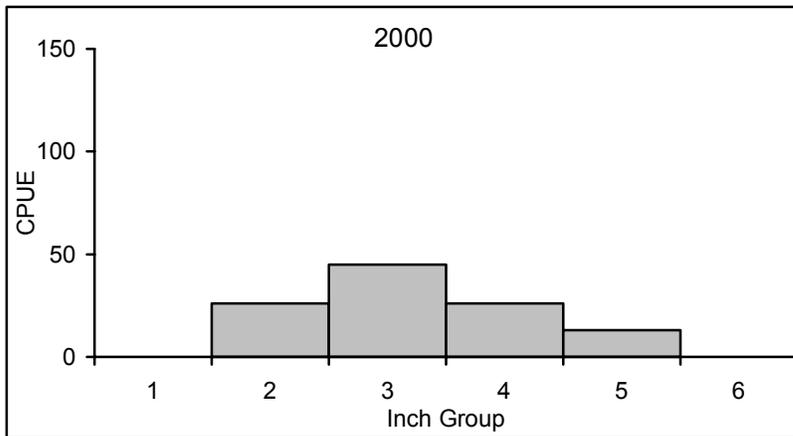
Effort = 2.0
 Total CPUE = 98.0
 Stock CPUE = 68.5
 PSD = 34
 IOV = 36

Comparison of the number of gizzard shad caught per hour (CPUE) and population indices for fall electrofishing surveys, Coleman Reservoir, Texas, 1997, 2000, and 2004.

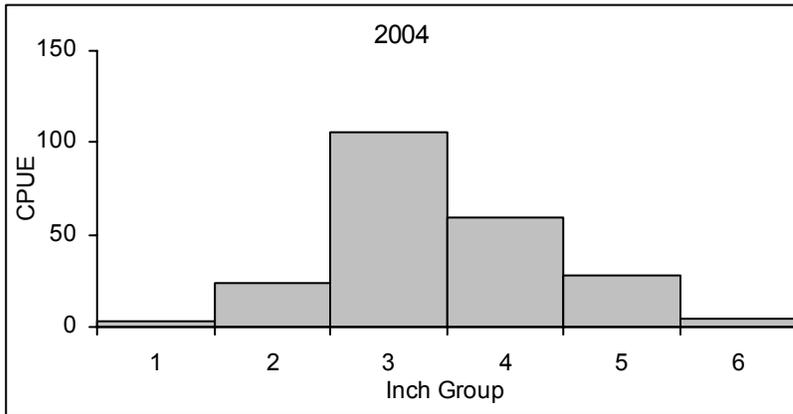
Bluegill



Effort = 1.5
 Total CPUE = 336.0
 Stock CPUE = 294.0
 PSD = 3
 RSD-P = 0



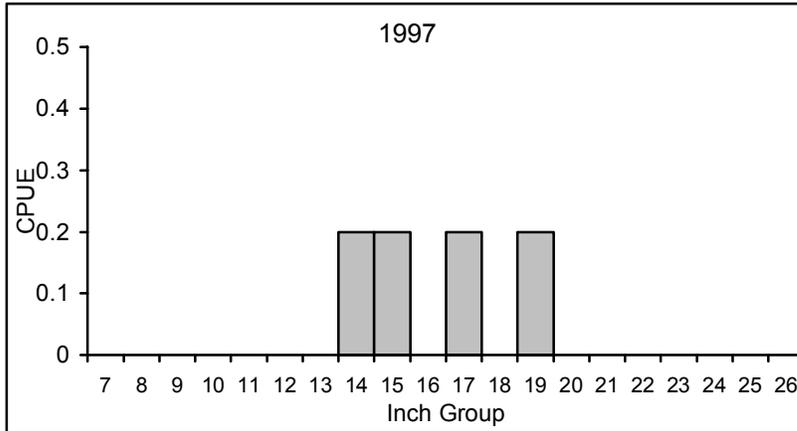
Effort = 1.0
 Total CPUE = 110.0
 Stock CPUE = 84.0
 PSD = 0
 RSD-P = 0



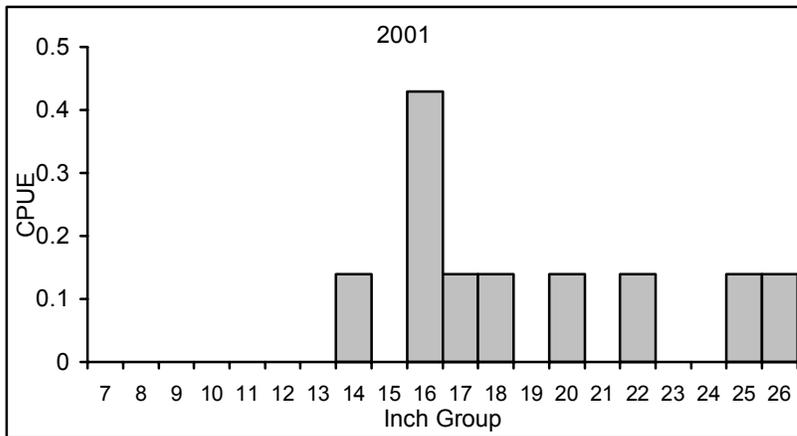
Effort = 2.0
 Total CPUE = 224.0
 Stock CPUE = 197.0
 PSD = 2
 RSD-P = 0

Comparison of the number of bluegill caught per hour (CPUE) and population indices for fall electrofishing surveys, Coleman Reservoir, Texas, 1997, 2000, and 2004.

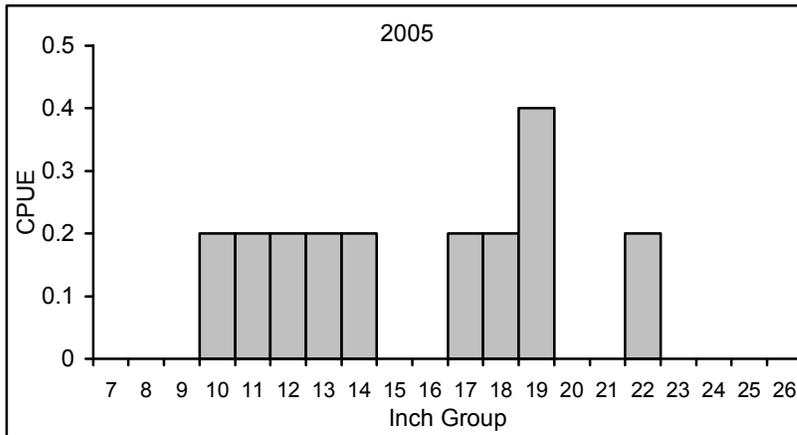
Channel Catfish



Effort = 5.0
 Total CPUE = 0.8
 Stock CPUE = 0.8
 PSD = 50
 RSD-P = 0



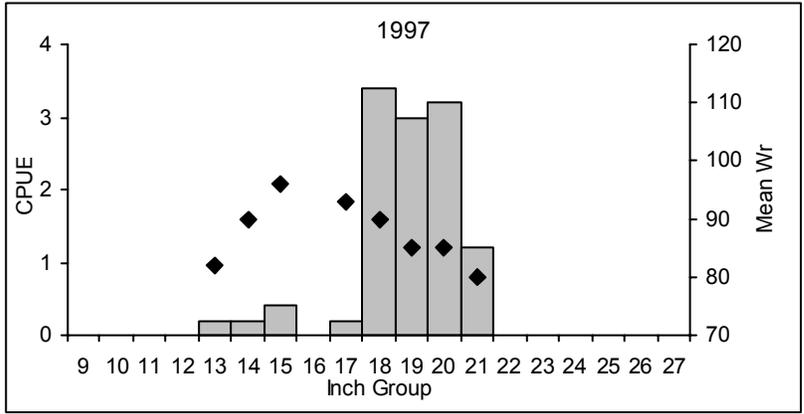
Effort = 7.0
 Total CPUE = 1.4
 Stock CPUE = 1.4
 PSD = 90
 RSD-P = 20



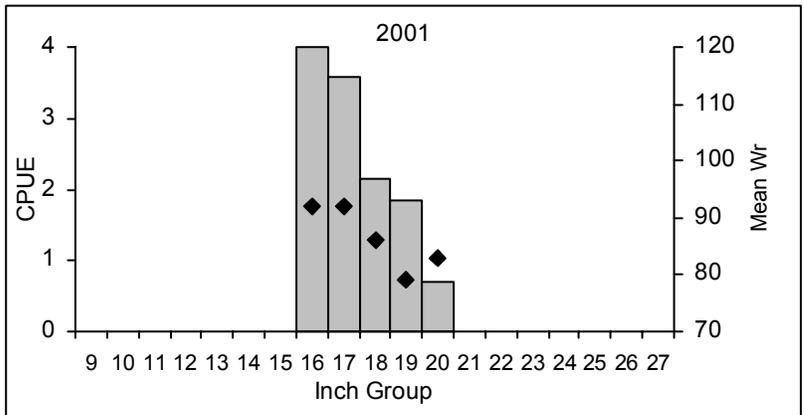
Effort = 5.0
 Total CPUE = 2.0
 Stock CPUE = 1.8
 PSD = 56
 RSD-P = 0

Comparison of the number of channel catfish caught per net night (CPUE) and population indices for spring gill net surveys, Coleman Reservoir, Texas, 1997, 2001, and 2005.

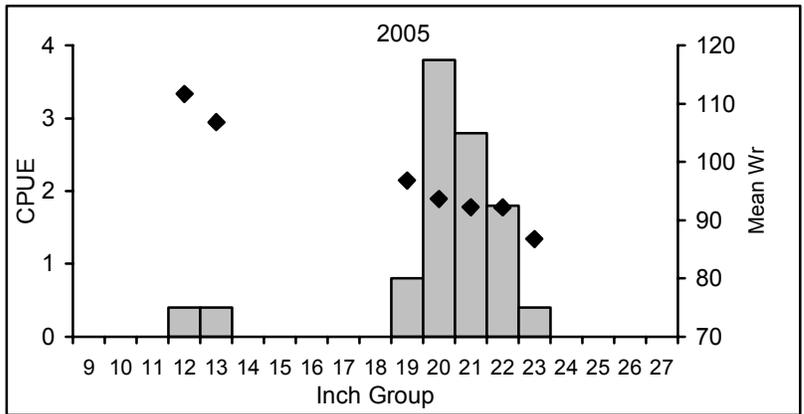
Palmetto Bass



Effort = 5.0
 Total CPUE = 11.8
 Stock CPUE = 11.8
 PSD = 100
 RSD-P = 97



Effort = 7.0
 Total CPUE = 12.3
 Stock CPUE = 12.3
 PSD = 100
 RSD-P = 100



Effort = 5.0
 Total CPUE = 10.4
 Stock CPUE = 10.4
 PSD = 100
 RSD-P = 92

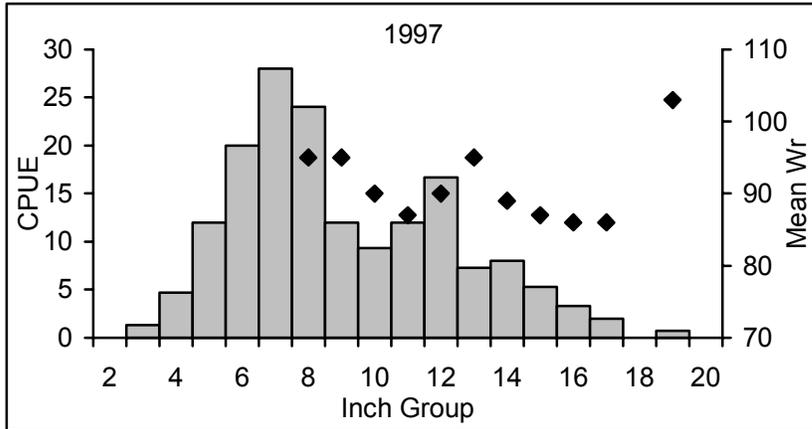
Comparison of the number of palmetto bass caught per net night (CPUE, bars), mean relative weight (Wr, diamonds), and population indices for spring gill net surveys, Coleman Reservoir, Texas, 1997, 2001, and 2005.

Palmetto Bass

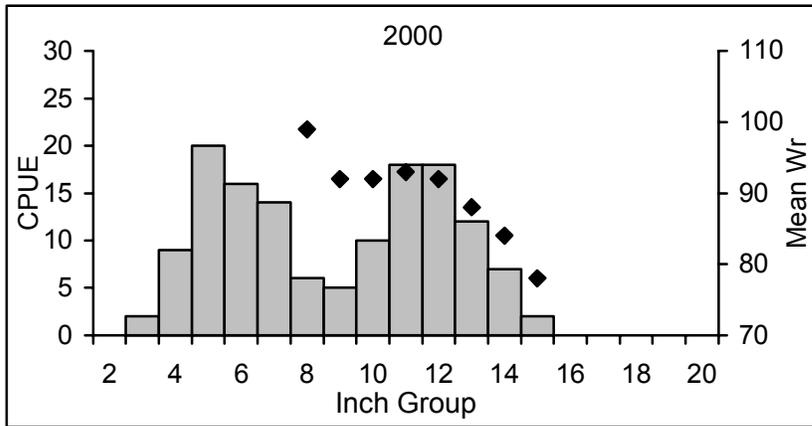
Mean length (inches) at age at time of capture for palmetto bass (sexes combined) collected in spring gill net surveys, Coleman Reservoir, Texas, 1997, 2001, and 2005. Number aged in parentheses. N/A = not applicable, due to small sample size.

Year	Age										
	1	2	3	4	5	6	7	8	9	10	11
1997	--	N/A	18.9(6)	--	20.4(14)	N/A	--	--	--	--	--
2001	--	--	17.3(20)	17.7(20)	18.6(8)	18.8(8)	N/A	--	N/A	N/A	--
2005	N/A	--	--	--	--	--	21.1(7)	20.9(5)	21.7(5)	N/A	N/A

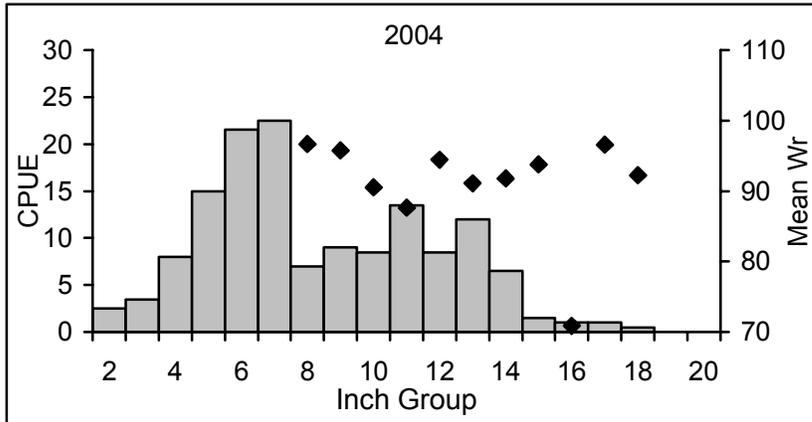
Largemouth Bass



Effort = 1.5
 Total CPUE = 166.7
 Stock CPUE = 100.7
 PSD = 43
 RSD-P = 11
 % Florida alleles = 31.7
 % Florida genotype = 3.3



Effort = 1.0
 Total CPUE = 139.0
 Stock CPUE = 78.0
 PSD = 50
 RSD-P = 3
 % Florida alleles = 48.3
 % Florida genotype = 6.7



Effort = 2.0
 Total CPUE = 142.0
 Stock CPUE = 69.0
 PSD = 45
 RSD-P = 6
 % Florida alleles = 46.2
 % Florida genotype = 15.2

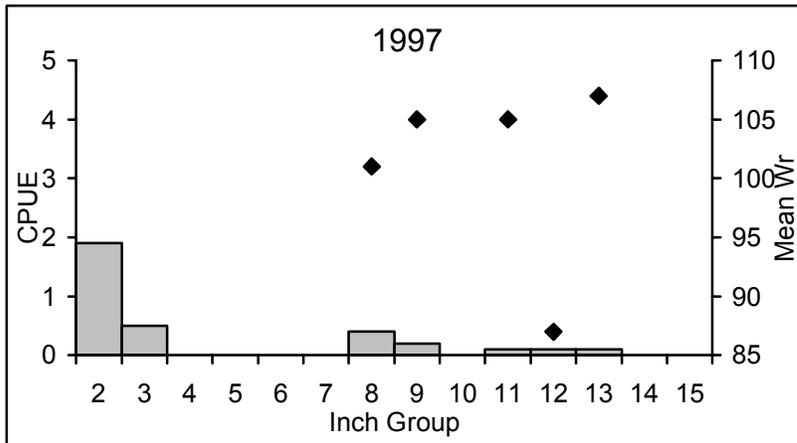
Comparison of the number of largemouth bass caught per hour (CPUE, bars), mean relative weight (Wr, diamonds), and population indices for fall electrofishing surveys, Coleman Reservoir, Texas, 1997, 2000, and 2004.

Largemouth Bass

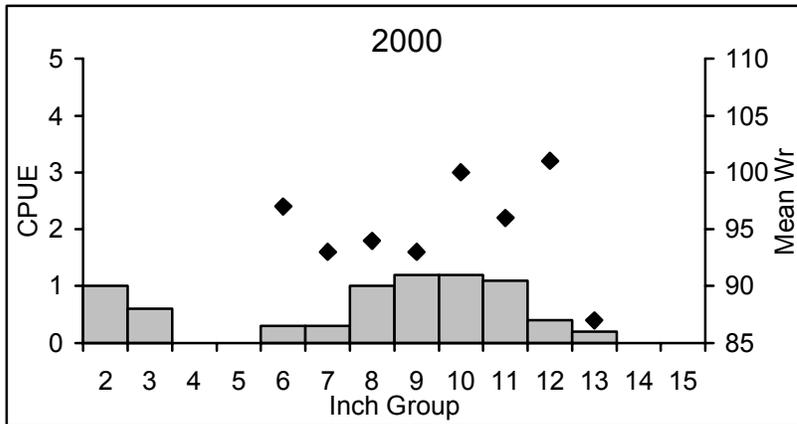
Mean length (inches) at age at time of capture for largemouth bass (sexes combined) collected in fall electrofishing surveys, Coleman Reservoir, Texas, 1997, 2000, and 2004. Number aged in parentheses. N/A = not applicable, due to small sample size.

Year	Age					
	1	2	3	4	5	6
1997	11.3(20)	N/A	14.5(6)	15.8(6)	N/A	--
2000	10.4(25)	13.0(12)	13.6(6)	14.3(5)	--	--
2004	9.7(43)	13.6(36)	--	--	N/A	N/A

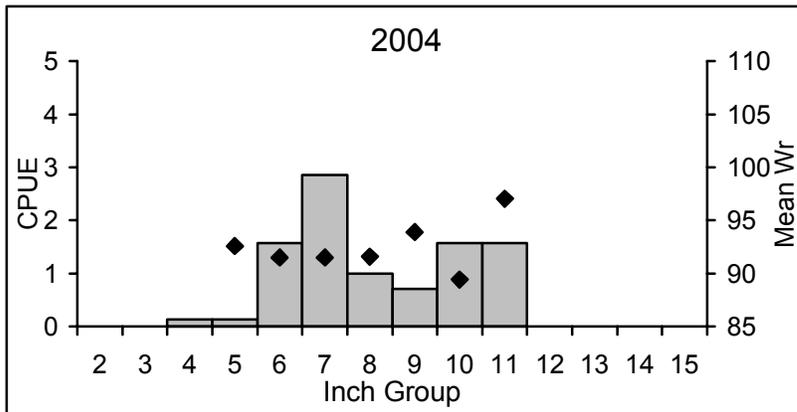
White Crappie



Effort = 10.0
 Total CPUE = 3.3
 Stock CPUE = 0.9
 PSD = 100
 RSD-P = 33



Effort = 10.0
 Total CPUE = 7.3
 Stock CPUE = 5.7
 PSD = 89
 RSD-P = 51



Effort = 7.0
 Total CPUE = 9.6
 Stock CPUE = 9.4
 PSD = 52
 RSD-P = 33

Comparison of the number of white crappie caught per net night (CPUE, bars), mean relative weight (Wr, diamonds), and population indices for fall trap net surveys, Coleman Reservoir, Texas, 1997, 2000, and 2004.

White Crappie

Mean length (inches) at age at time of capture for white crappie (sexes combined) collected in fall trap net surveys, Coleman Reservoir, Texas, 1997, 2000, and 2004. Number aged in parentheses. N/A = not applicable, due to small sample size.

Year	Age					
	1	2	3	4	5	6
1997	8.4(12)	N/A	--	N/A	--	--
2000	8.9(29)	10.9(13)	11.7(11)	--	N/A	N/A
2004	7.3(38)	10.7(27)	--	--	--	--

Fisheries management plan for Coleman Reservoir, Texas

Prepared – June 2005.

ISSUE 1 Palmetto bass are popular among some anglers. Creel surveys from the late 80s through mid 90s showed directed effort for palmetto bass to be around one hour/acre (Dumont and Jons 1998). However, there is evidence of insufficient forage to support all predator sport-fish populations in Coleman Reservoir. Palmetto bass condition is poor, growth is slow, and shad abundance is historically low.

MANAGEMENT STRATEGIES

1. Continue palmetto bass stockings at the reduced rate of 5 fish/acre biennially.

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from all gear types from Coleman Reservoir, Texas, 2004-2005.

Species	Gill Nets		Trap Nets		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					196	98.0
Threadfin shad					421	210.0
Golden shiner					3	1.50
Inland silverside					4	2
Channel catfish	10	2.0				
Flathead catfish	2	0.4				
Palmetto bass	52	10.4				
Green sunfish					47	23.5
Warmouth					6	3
Orangespotted sunfish					1	0.5
Bluegill					448	224.0
Longear sunfish					31	15.5
Redear sunfish					12	6.0
Largemouth bass					284	142.0
Freshwater drum					1	0.5
White crappie			67	9.6		

APPENDIX B

Proposed sampling schedule for Coleman 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 and A denotes additional survey.

Survey Year	Electrofishing	Trap Net	Gill Net	Creel	Report
Fall 2005-Spring 2006					
Fall 2006-Spring 2007	A				
Fall 2007-Spring 2008					
Fall 2008-Spring 2009	S	S	S		S