

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-30

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2004 Survey Report

**Austin Reservoir**

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July 31, 2005

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## Executive Summary

Austin Reservoir was surveyed in 2004 and 2005 using gill netting, trap netting and electrofishing. Access and habitat surveys were completed in 2004. The 2004-2005 catch-per-unit-effort (CPUE) for species in this summary was compared with CPUE collected in previous Austin Reservoir surveys. This report summarizes the results of those surveys and contains a fisheries management plan for the reservoir based on those findings.

- **Reservoir description:** Austin Reservoir is a stable level 1,599 acre riverine type impoundment of the Colorado River located in the heart of the City of Austin (COA). It was constructed in 1893 for purposes of hydro-electric power, municipal water supply, water conservation and recreation. The reservoir is used to pass water from Travis Reservoir downstream. The reservoir is operated by the Lower Colorado River Authority (LCRA) and COA. The reservoir lies within the Edwards Plateau vegetational area and has a drainage area of approximately 38,240 square miles. Land surrounding the reservoir is highly developed with commercial and residential property bordering most of the shoreline.
- **Aquatic vegetation management:** Aquatic vegetation management has been a part of the Austin Reservoir ecosystem for over fifty years. A history of aquatic vegetation management efforts through 2000 are found in Tennant and Magnelia (2001). The reservoir has been drawn down 12 feet annually from December to February since 2001 in an attempt to control aquatic vegetation. In 2003 and 2004 triploid grass carp (8,125) were stocked as part of a plan to control hydrilla (*Hydrilla verticullata*). The effects of these control measures on total aquatic vegetation and hydrilla coverage are currently being assessed.
- **Prey species:** Gizzard shad and bluegill electrofishing catch rates were 109.3/hour and 97.3/hour, respectively. Twenty seven percent of the shad were vulnerable to predation, as expressed by the index of vulnerability (IOV), which calculates the percentage of gizzard shad <8 inches in length (DiCenzo et al. 1996). This is higher than previous years. Threadfin shad are also available as forage. Both gizzard and threadfin shad catch rates were higher in 2004 than those historically encountered on this reservoir. The bluegill population was mainly composed of small individuals with 76%  $\leq 4$  inches, indicating good availability to predators. The redbreast sunfish catch rate was 142.7/hour with 49% of the individuals  $\leq 4$ , which indicated good availability as forage.
- **Catfishes:** Gill net catch rates for channel (0.4/net night) and blue (0.2/net night) catfish were extremely low. Blue, flathead and channel catfish have historically been present in low density.
- **Black basses:** Austin Reservoir contained a high quality, moderate density largemouth bass population. Many large bass have been caught in this reservoir since the early 1990's, including six bass over 13 pounds, which were entered into the Texas Parks and Wildlife Sharelunker program. Based on these catches, it is regarded as the area's best trophy bass

fishery. Total electrofishing catch rate (110.0/hour) and population structure have remained similar since 2001. In 2004, 30% of the adult largemouth bass collected were 14 inches or greater, compared with 40% in 2003 and 34% in 2002. Growth has remained almost constant over time with fish reaching legal size between age 2 and 3. Largemouth bass body condition is good with relative weights typically above 90. In 2002, only 19.2% of the individuals sampled were pure Florida largemouth bass. Florida largemouth bass were stocked in 2003 and 2004 in an attempt to increase Florida bass influence. Guadalupe bass are present in extremely low density.

- **Management strategies:** Aquatic vegetation coverage in the 10-40% range will be important for maintaining the quality largemouth bass fishery that currently exists. Aquatic vegetation coverage will be evaluated at least annually. This reservoir has been designated a trophy bass fishery. Florida bass stocking will be recommended when the percentage of pure Florida bass in the population falls below 20%.

## Introduction

This document is a summary of fisheries data collected from Austin Reservoir in 2004 and 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. Management strategies are included to address existing problems or opportunities. Historical data is presented with 2004-2005 data for comparison.

### Harvest regulations for Austin Reservoir in 2004.

Species	Bag Limit	Minimum Length Limit (inches)
Largemouth bass	5	14
Guadalupe bass	5	No length limit
Flathead catfish	5	18
Blue and channel catfish	25	12

## Methods

- Fishes were collected by electrofishing (1.5 hours at 18 stations), gill nets (5 net nights at 5 stations), and trap nets (5 net nights at 5 stations). Catch per-unit-effort (CPUE) for electrofishing was recorded as the number of fish caught per hour of actual electrofishing, and for gill and trap netting as the number of fish caught in one net set overnight. All samples were collected according to the Texas Parks and Wildlife Department Inland Fisheries Assessment Procedures (unpublished, revised manual 2004).
- Access, habitat and aquatic vegetation surveys were collected according to the Texas Parks and Wildlife Department Inland Fisheries Assessment Procedures (unpublished, revised manual 2004).
- Largemouth bass electrophoresis samples were collected according to the Texas Parks and Wildlife Department Inland Fisheries Assessment Procedures (unpublished, revised manual 2004). Electrophoresis samples were not collected in 2003 and 2004 because Florida largemouth bass were stocked in those years.
- Sampling statistics (CPUE for various length categories), structural indices (Proportional Stock Density [PSD], Relative Stock Density [RSD]) were calculated for target species according to Anderson and Neumann (1996).
- Reservoir surface acreage was determined using data provided by the Texas Water Development Board. Surface acreage differs from previous Austin Reservoir reports, when surface acreage was determined using United States Geological Survey quadrangle maps.
- Ages were determined for largemouth bass using otoliths.

## Literature Cited

- Anderson, R. O. and R. 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.
- Dibble, E.D., K.J. Killgore, and S.H. Harrel. 1996. Assessment of Fish-Plant Interactions. American Fisheries Society Symposium 16:357-372.
- 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.
- Durocher, P.P., W.C. Provine, and J.E. Kraai. 1984. Relationship Between Abundance of Largemouth Bass and Submerged Vegetation in Texas Reservoirs. North American Journal of Fisheries Management 4:84-88.
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Physical and historical data for Austin Reservoir, Texas, 2004-2005.

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Inland Fisheries water body code: 0033 IF District: 2C

Controlling authorities: COA and LCRA

County: Travis

Latitude: 30° 48' Longitude: 97° 17'

Nearest major metropolitan area and distance: Austin-0 mi.

Reservoir description: Mainstem

River system: Colorado

Size: 1,599 acres

Mean depth (ft): 12 Maximum depth (ft): 40

Shoreline development index: 8.5

Secchi disc range (ft): 4-6 Conductivity (umhos/cm): 700

Survey History:

Method	Year
Gill net	1976, 1986, 1989, 1994, 1997, 2001, 2005
Electrofishing	1976, 1986, 1988, 1989, 1993, 1994, 1997, 2000, 2001, 2002, 2003, 2004
Trap net	1989, 1994, 1997, 2000, 2004
Creel survey	1986, 2000, 2001
Vegetation/Habitat	1989, 1994, 1997, 2000, 2001, 2002, 2003, 2004

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Access Survey for Austin Reservoir, Texas, 2004.

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Boat – adequate

four boat ramps

Bank – inadequate

Most of the shoreline is privately owned. Bank fishing is available in three City of Austin and four Travis County parks.

Challenged – inadequate

No accommodations exist for physically challenged anglers.

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Habitat survey of littoral zone and physical habitat types, Austin Reservoir, Texas, 2004. A linear shoreline distance (miles) was recorded for each habitat type found.

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Habitat type	Shoreline distance	
	Miles	Percent
Boulder	0.12	0.26
Broken rock	2.69	6.03
Bulkhead	18.43	41.33
Concrete	0.68	1.53
Cut bank	0.08	0.17
Dead trees	0.16	0.37
Eroded bank	0.01	0.03
Featureless	0.85	1.90
Overhanging brush	13.94	31.25
Riprap	0.26	0.58
Rock bluff	2.55	5.72
Rock shore	0.68	1.53
Vegetated bank	<u>4.16</u>	<u>9.32</u>
	Total	44.60
		100.00

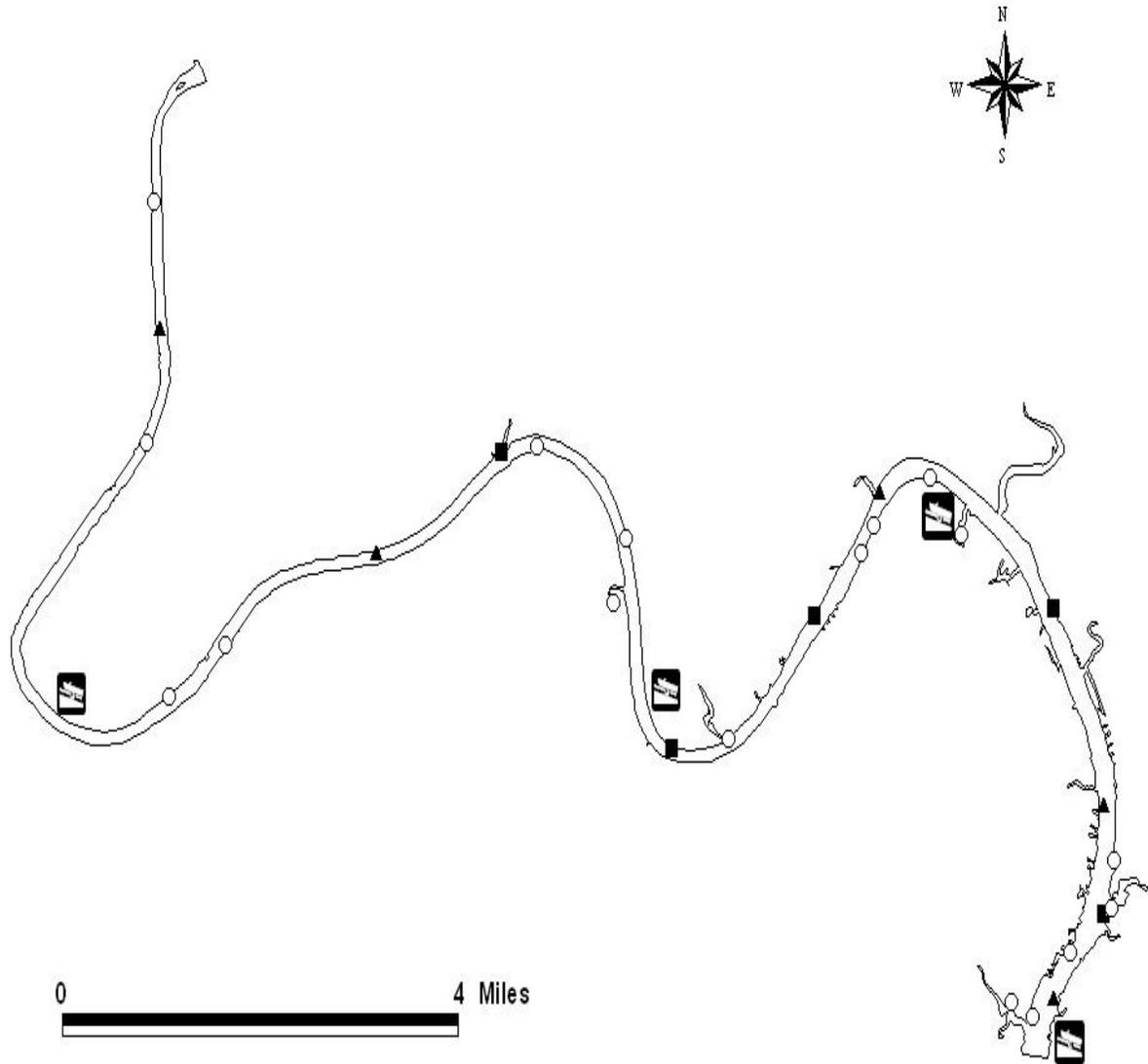
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Aquatic vegetation survey results, Austin Reservoir, Texas, September 2004. Area coverage (acres) was determined for each plant species found.

Common name	Area	% Coverage
Hydrilla	241.4	15.1
Eurasian watermilfoil	136.5	8.5
Pondweed	17.4	1.1
Bulrush	3.3	<1
<i>Chara sp.</i>	<u>2.2</u>	<u>&lt;1</u>
TOTAL	400.8	24.9

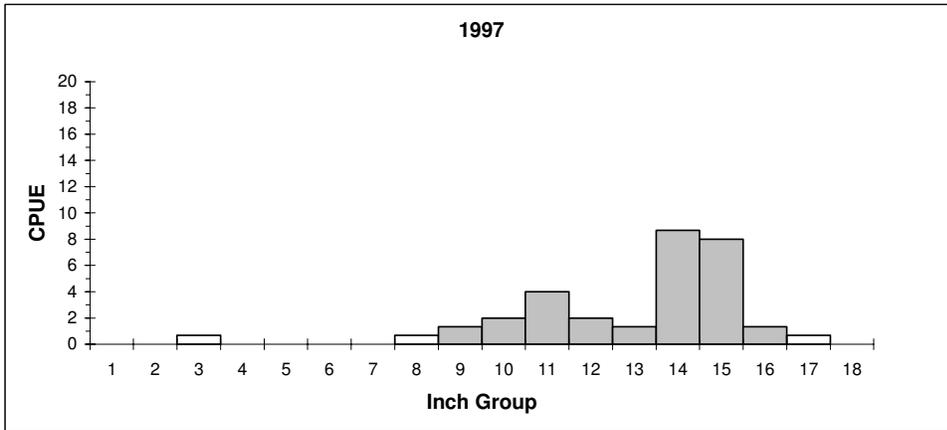
Stocking history of Austin Reservoir, Texas. Size categories are: ADL = adult, FRY = smaller than 1 inch and FGL = 1-3 inches.

Species	Year	Number	Size
Northern pike	1980	88,500	FGL
	1981	<u>34,514</u>	FGL
	Species total	123,014	
Palmetto bass	1975	20,000	FGL
	1977	20,035	FGL
	1981	5,000	FGL
	1983	<u>10,089</u>	FGL
	Species total	55,124	
Walleye	1976	<u>20,200</u>	FGL
	Species total	20,200	
Florida largemouth bass	1996	837,539	FRY
	1996	265,676	FGL
	1997	196,074	FRY
	1998	685,311	FRY
	1998	184,554	FGL
	1999	188,996	FGL
	2003	881,925	FRY
	2003	262,750	FGL
	2004	318	ADL
	2004	431,007	FRY
	2004	<u>162,149</u>	FGL
Species total	4,096,299		
Triploid grass carp	2003	3,825	ADL
	2004	<u>4,300</u>	ADL
	Species total	8,125	

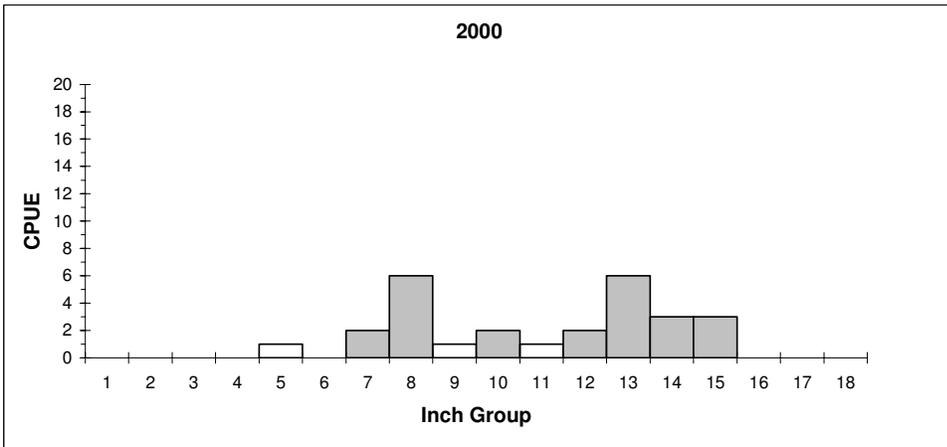


Approximate location of sampling sites and public boat ramps, Austin Reservoir, Texas, 2004 and 2005. Squares denote trap netting sites, triangles denote gill netting sites and circles denote electrofishing sites.

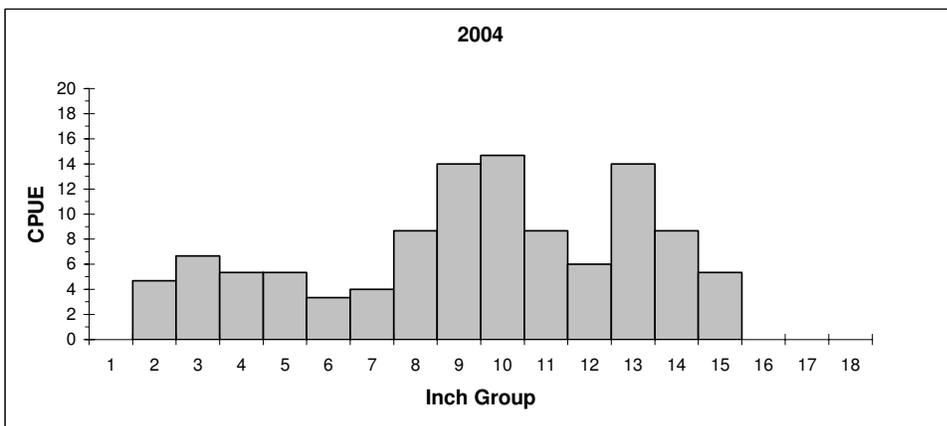
**Gizzard Shad**



Effort = 1.5  
 Total CPUE = 31.3  
 Stock CPUE = 30.7  
 PSD = 87  
 IOV = 2



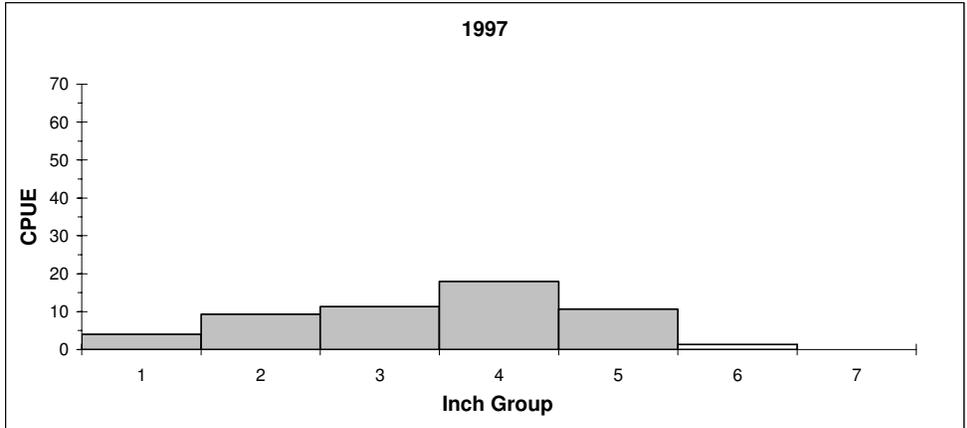
Effort = 1.0  
 Total CPUE = 27.0  
 Stock CPUE = 26.0  
 PSD = 58  
 IOV = 11



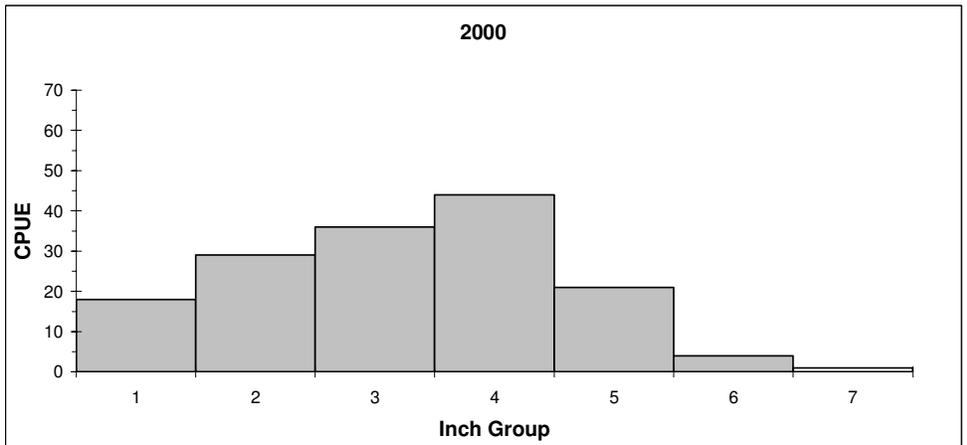
Effort = 1.5  
 Total CPUE = 109.3  
 Stock CPUE = 84.0  
 PSD = 51  
 IOV = 27

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

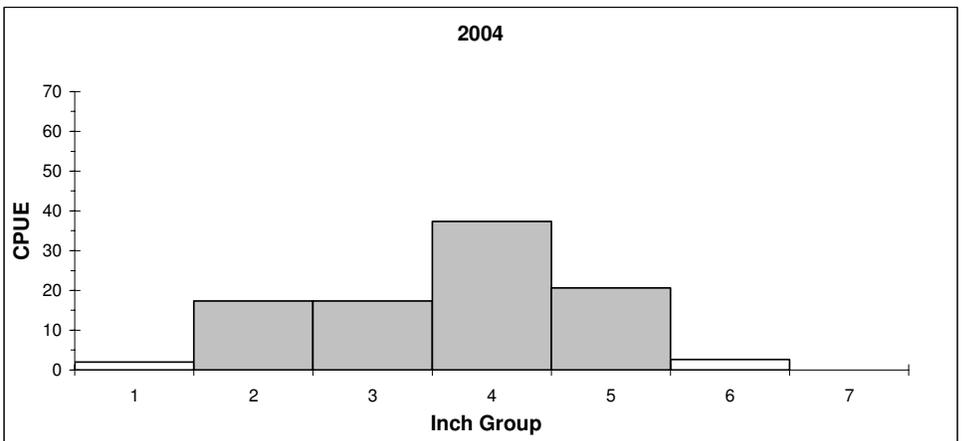
### Bluegill



Effort = 1.5  
 Total CPUE = 54.7  
 Stock CPUE = 41.4  
 PSD = 3



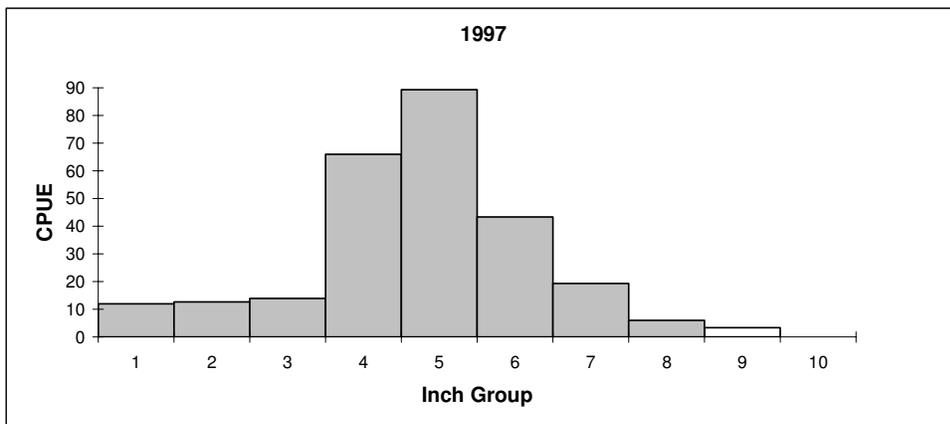
Effort = 1.0  
 Total CPUE = 153.0  
 Stock CPUE = 106.0  
 PSD = 5



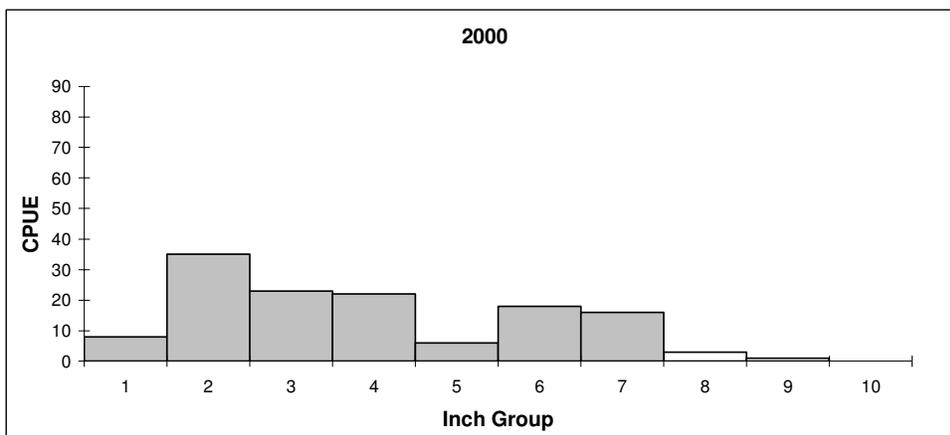
Effort = 1.5  
 Total CPUE = 97.3  
 Stock CPUE = 78.0  
 PSD = 3

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

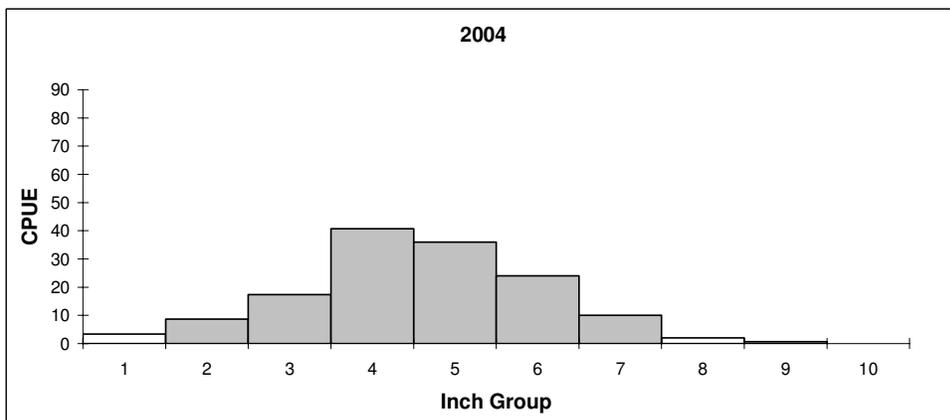
### Redbreast Sunfish



Effort = 1.5  
 Total CPUE = 266.0  
 Stock CPUE = 241.3



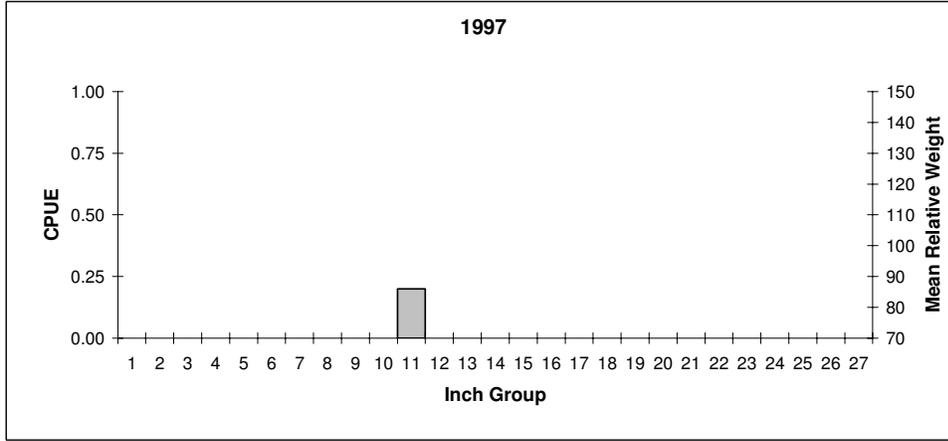
Effort = 1.0  
 Total CPUE = 132.0  
 Stock CPUE = 66.0



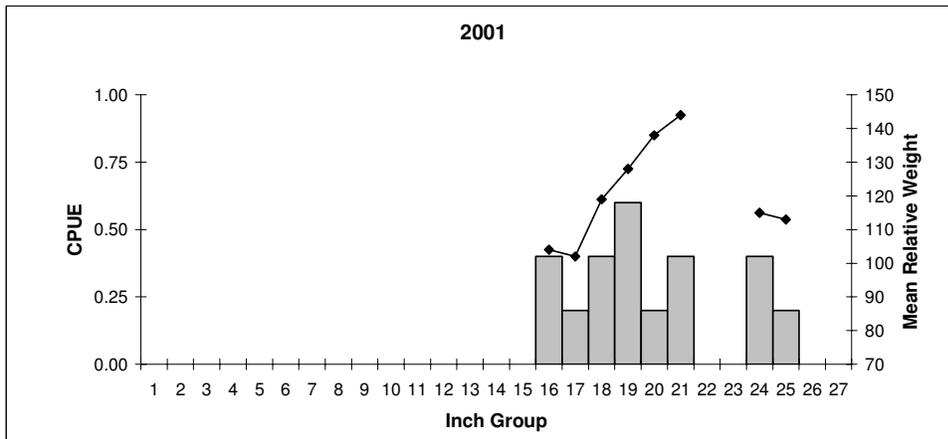
Effort = 1.5  
 Total CPUE = 142.7  
 Stock CPUE = 130.7

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

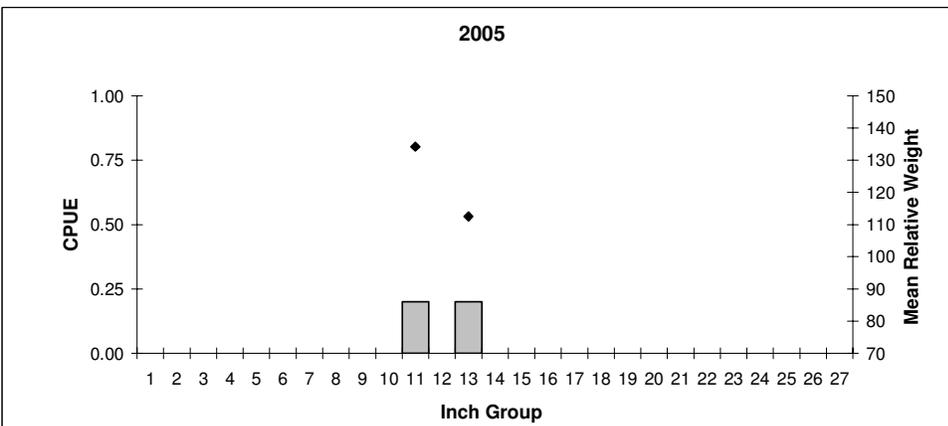
### Channel Catfish



Effort = 5  
 Total CPUE = 0.2  
 Stock CPUE = 0.2  
 PSD = 0  
 RSD-14 = 0



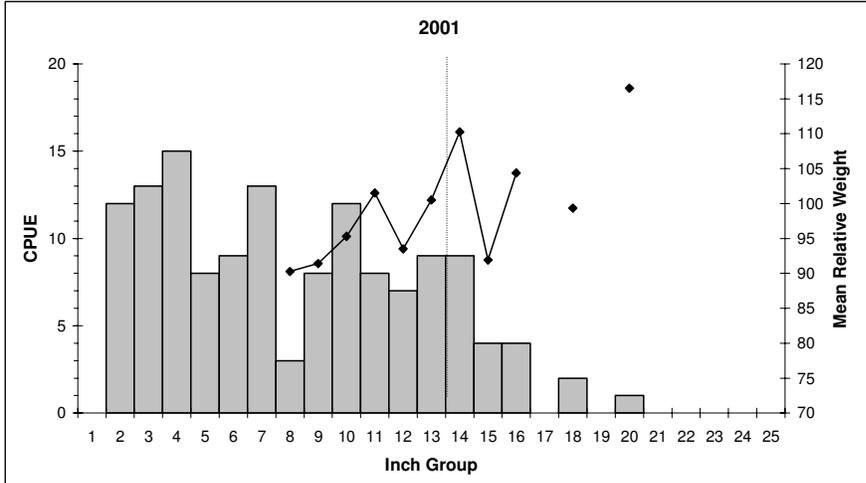
Effort = 5  
 Total CPUE = 2.8  
 Stock CPUE = 2.8  
 PSD = 100  
 RSD-14 = 100



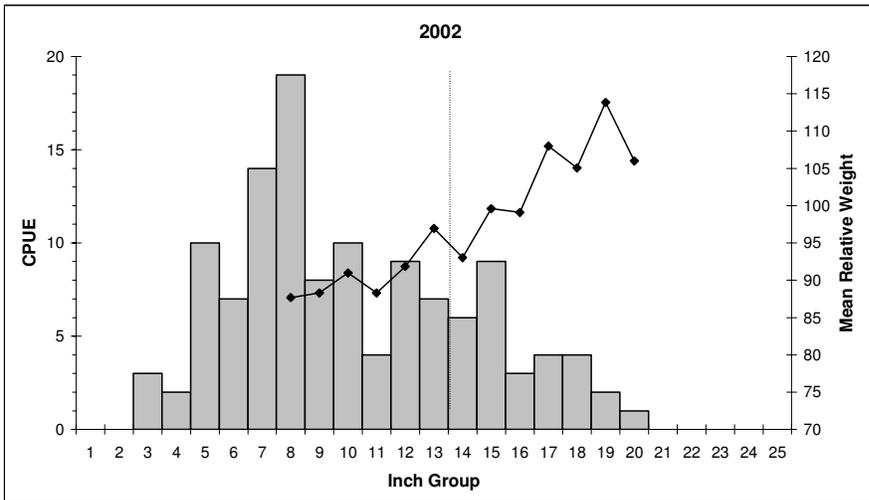
Effort = 5  
 Total CPUE = 0.4  
 Stock CPUE = 0.4  
 PSD = 0  
 RSD-14 = 100

Comparison of the number of channel catfish caught per net night (CPUE, bars), mean relative weight (lines), and population indices for spring gill net collections, Austin Reservoir, Texas, 1997, 2001 and 2005.

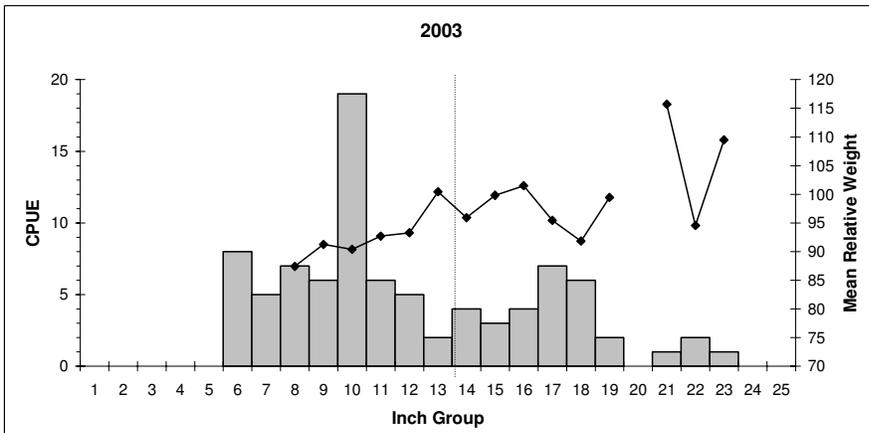
**Largemouth Bass**



Effort = 1.0  
 Total CPUE = 137.0  
 Stock CPUE = 67.0  
 PSD = 54  
 RSD-14 = 30  
 % FLMBA = 75.8  
 %FLMB = 43.3



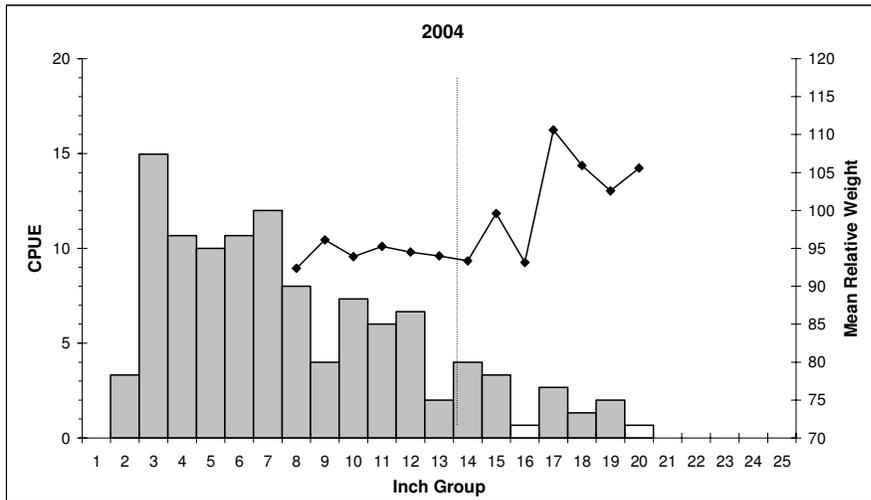
Effort = 1.0  
 Total CPUE = 122.0  
 Stock CPUE = 86.0  
 PSD = 52  
 RSD-14 = 34  
 % FLMBA = 70.9  
 %FLMB = 19.2



Effort = 1.0  
 Total CPUE = 88.0  
 Stock CPUE = 75.0  
 PSD = 49  
 RSD-14 = 40

Comparison of the number of largemouth bass caught per hour (CPUE, bars), mean relative weight (lines), and population indices for fall electrofishing surveys, Austin Reservoir, Texas, 2001 2002 and 2003. Dashed lines indicate length limit at the time of survey. When assessed, the percentage of Florida largemouth bass alleles (%FLMBA) and pure Florida bass (%FLMB) are given.

Largemouth Bass



Comparison of the number of largemouth bass caught per hour (CPUE, bars), mean relative weight (lines), and population indices for fall electrofishing surveys, Austin Reservoir, Texas, 2004. Dashed line indicates length limit at the time of survey.

Mean length at age of capture for largemouth bass (sexes combined) collected by electrofishing, Austin Reservoir, Texas, November 1986, 1988, 1989, 1994, 1997, 2000 and 2004. Sample sizes are in parentheses.

Year	Length (inches) at capture for age					
	1	2	3	4	5	6
1986	8.8(13)	11.5(8)	13.6(5)			
1988	8.2(28)	12.0(15)	13.1(5)	14.8(3)		
1989	9.4(17)	12.2(13)	13.9(7)	18.5(2)		
1994	9.4 (20)	12.6 (14)	15.7(3)	16.9(4)	20.0(2)	20.0(2)
1997	10.1(18)	13.9(15)	15.8(12)	18.2(6)	18.1(1)	19.8(2)
2000	9.2(14)	13.0(15)	16.3(4)			
2004	10.0(28)	12.4(12)	13.5(16)	17.7(2)	15.7(4)	18.5(6)

**Fisheries Management Plan  
Austin Reservoir, Texas**

**Prepared - June 2005**

ISSUE 1      Aquatic vegetation covered 24.9% of the reservoir in summer 2004. This was within the recommended aquatic vegetation coverage range for optimal largemouth bass production (10-40%) (Durocher et al. 1984, Dibble et al. 1996). Aquatic vegetation provided habitat for largemouth bass and important forage species. Decreased aquatic vegetation coverage may have detrimental effects on the largemouth bass population.

**MANAGEMENT STRATEGIES**

1. Evaluate the effects of any aquatic vegetation control measures used through annual aquatic vegetation and electrofishing surveys.

ISSUE 2      This reservoir has been designated a trophy largemouth bass fishery. Greater than 20% of the individuals sampled should be pure Florida bass.

**MANAGEMENT STRATEGIES**

1. Stock Florida largemouth bass if pure Florida bass influence, as determined through electrophoresis, drops below 20%.

## Appendix A:

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

Species	Gill netting		Trap netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					164	109.3
Threadfin shad					1,093	728.7
Golden shiner					45	30.0
Bullhead minnow					10	6.7
Inland silverside					27	18.0
Blacktail shiner					25	16.7
Blue catfish	1	0.2				
Channel catfish	2	0.4				
White bass	2	0.4				
Bluegill					146	97.3
Longear sunfish					11	7.3
Redbreast sunfish					214	142.7
Redear sunfish					13	8.7
Spotted sunfish					25	16.7
Warmouth					16	10.7
Largemouth bass					165	110.0
Guadalupe bass					1	0.7
Logperch					1	0.7
Blue tilapia					1	0.7