

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

Diversion (Baylor County)

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July 31, 2005

Table of Contents

Executive Summary	2
Introduction.....	4
Literature Cited	6
Physical and Historical Data	7
Habitat Survey.....	8
Stocking History	9
Location of Sampling Sites	10
Annual Creel Statistics.....	11
Species Information	
Gizzard shad.....	12
Bluegill.....	13
Blue catfish	14
Channel catfish.....	16
White bass.....	18
Striped bass	20
Largemouth bass	21
White crappie	23
Fisheries Management Plan	25
Appendices	
Appendix A Number and catch rate of all species collected from all gear types.....	26
Appendix B Estimated fishing effort	27
Appendix C Estimated catch rates	28

Executive Summary

Diversion was surveyed in 2004-05 using electrofishing, trap netting, and gill netting. The reservoir was surveyed using stratified random sites. The 2004-05 CPUE comparisons made in this summary are compared with the results of Diversion historical averages for the period 1997-2004. A survey of the littoral zone and associated physical habitat types was conducted in 2004 by examining the entire shoreline. A creel survey was conducted from June-November 2002. This report summarizes all survey results and contains a management plan based on the findings.

- Reservoir description:** Diversion is a 3,491-acre reservoir located in Archer (dam) and Baylor counties, and was built in 1924. The reservoir is jointly owned by the City of Wichita Falls and Wichita County Water Improvement District No. 2 and is operated primarily for irrigation purposes. It has also been used as an emergency supplemental water source for the city of Wichita Falls. This municipal use is rare since the water is relatively high in salinity and total dissolved solids (TDS). The Waggoner Ranch based in Vernon, Texas privately owns the land surrounding the reservoir. Vehicle and boat trailer access is through a single tollgate on the northeast side where a \$5 daily access fee per vehicle is charged. This is a reduction from the \$20 daily access fee per vehicle that had been previously charged until January 1, 2004. Annual permits can be obtained for \$200. Diversion is an impoundment of the Wichita River approximately 20 miles below Kemp Reservoir. Controlled releases from Kemp are used to maintain nearly constant water levels at Diversion. This results in reservoir fluctuations of not more than 2 feet a year. The reservoir has a 234 square mile drainage area, which flows through rolling plains and grasslands. Erosion of Permian outcroppings in the watershed and salt springs result in high concentrations of dissolved salts in the reservoir. Diversion is relatively shallow, with moderately clear water and a basic pH. It has a shoreline length of 28 miles, mean depth of 12 feet, and a maximum depth of 35 feet. Protective cover in littoral areas includes standing timber and over 900 acres of submersed vegetation as observed during the 2004 habitat survey.

Diversion serves as the water supply for the Dundee State Fish Hatchery. On March 16, 2001 a heavy bloom of the toxic golden alga *Prymnesium parvum* was confirmed in the lower part of the lake. A fish kill occurred at this time but had little impact to the fishery. However, fish hatchery operations were impacted and significant mortalities occurred. During the early months of 2003, 2004, and 2005 the fishery was adversely affected by toxic golden alga blooms and fish kills throughout the reservoir resulting in significant losses of some game fish and a reduction in angling activity.

- Prey species:** In 2004, the gizzard shad electrofishing catch rate of 94.0/hr was well above Diversion's historical average (43.7/hr). The index of vulnerability (IOV) (DiCenzo et al. 1996) was 100 indicating all gizzard shad are vulnerable to largemouth bass predation. The bluegill electrofishing catch rate of 1.0/hr was well below the historical average (64.4/hr), but may not have been indicative of their abundance as evidenced by the trap net catch rate of 103.0/net night sampled a month later. Threadfin shad were sampled during the 2000 electrofishing survey but were not sampled in 2004.

- **Catfishes:** The 2005 gill netting catch rate for blue catfish was 1.6/net night compared to 2.4 and 3.8 in 2003 and 2001, respectively. The 2005 channel catfish catch rate was 0.7/net night compared to 0.1 and 0.9 in 2003 and 2001 respectively. Both species maintained relative weights near 100. The 2005 survey occurred soon after the golden alga bloom subsided. Most of the fish were sampled near the river indicating that they had not totally redistributed throughout the reservoir. An earlier 2005 gill netting survey, when an active golden alga bloom was occurring resulted in no fish being sampled.
- **Temperate basses:** The 2005 white bass gill netting catch rate decreased to 1.1/ net night compared to 3.8 and 15.7 in 2003 and 2001, respectively. Part of this decline may be attributed to the timing of sampling after the recent toxic golden alga bloom. White bass were only sampled near the river indicating they were starting to migrate back into the reservoir. While Diversion is not managed directly for striped bass through stocking, these immigrant fish do enter the system from above via Kemp Reservoir. Historically, striped bass have been found in low numbers. Striped bass have not been documented since the 2001 golden alga fish kill.
- **Black basses:** The 2004 largemouth bass electrofishing catch rate of 10.0/hr represents the lowest catch rate on record for Diversion. It is a significant decrease from the previous 2000 survey catch rate of 82.0/hr. Much of the decrease can be attributed to the 2003 and 2004 golden alga fish kills. Before these two events, largemouth bass were being caught as evidenced by the 2002 creel survey results. The last Florida bass fingerling stocking was in 1993. Spotted bass were not sampled in 2004. Spotted bass were never an abundant species as evidenced by the historical average electrofishing catch rate of 5.4/hr.
- **White crappie:** The 2004 trap netting catch rate of 0.3/net night was much lower than in 2003 (22.3/net night) and 2000 (1.8/net night). In the 2003 and 2004 surveys, no crappie over 7 inches were sampled. The high 2003 catch rate of small crappie indicates successful reproduction took place after the toxic 2003 golden alga bloom but the 2004 fish kill may have further reduced the abundance of crappie.
- **Walleye:** Historical evidence from the 1970s, points to limited success of stocking walleye fingerlings to produce a fishery at Diversion. During the 1998-2000 time period, walleye fingerlings became available and were stocked. Walleye were sampled in the 2000 electrofishing and in the 2001 gill netting surveys. Walleye have not been documented since the 2001 golden alga fish kill.
- **Management strategies**
Based on current information, the reservoir should be managed with current regulations. Golden alga blooms should be monitored utilizing Dundee fish hatchery incoming water cell counts as an early indicator of possible problems. Perform additional electrofishing (October 2006), trap netting, (November 2006) and gill netting surveys (March 2007) to monitor fish populations. Request 2005 stockings of largemouth bass and channel catfish fingerlings. Conduct a public meeting in 2005 to inform the public of current status of the fishery and future management plans. Because of the persistent golden alga problems and limited success, the walleye stocking program has been discontinued.

Introduction

This document is a summary of fisheries data collected from Diversion Reservoir in 2002-05. The purpose of this 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 important sport fishes and prey species. Management strategies are included to address existing problems or opportunities. Historical data is presented with the 2004-05 data for comparison.

Harvest regulations for Diversion Reservoir in 2004.

Species	Bag Limit	Minimum-Length Limit (inches)
Catfish (blue and channel)	25	12
Flathead catfish	5	18
White bass	25	10
Striped bass	5	18
Spotted bass	5	No limit
Largemouth bass	5	14
White crappie	25	10
Walleye	5	Only two can be less than 16 inches in length

Methods

- Fish were collected by electrofishing (5 minutes per station at 12 sites), gill netting (1 net night each at 10 different sites), and trap netting (1 net nights each at 10 different sites). 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. Access, habitat and largemouth bass electrophoresis samples were collected according to the assessment procedures (TPWD, Inland Fisheries Division, unpublished, revised manual 2004).
- Sampling statistics (CPUE for various length categories) and structural indices (Proportional Stock Density [PSD], Relative Stock Density [RSD]), were calculated for target species according to Anderson and Neumann (1996). Standard weight equations used in assessing condition are from Anderson and Neumann (1996) and Muoneke and Pope (1999). Index of vulnerability (IOV) was calculated for gizzard shad according to DiCenzo et al. 1996.

- Ages were determined for selected fish using the following structures: otoliths for white bass, striped bass, largemouth bass, white crappie, and pectoral spines for blue catfish and channel catfish and compared to ecological region averages from Prentice (1987).
- A survey of the littoral zone and physical habitat was conducted in 2004 in accordance with established procedures (TPWD, Inland Fisheries Division, unpublished, revised manual 2004).
- Eighteen creel days (10 weekend days and 8 week days) were sampled from June through November 2002 to assess angler use and catch in accordance with standardized procedures (TPWD, Inland Fisheries Division, unpublished, revised manual 2004).

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.
- 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.
- Muoneke, M. I., and K. L. Pope. 1999. Development and evaluation of a standard weight (Ws) equation for blue catfish. North American Journal of Fisheries Management 19:878-879.
- 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, Texas.

Physical and historical data for Diversion (Baylor County), Texas, 2004.

Inland Fisheries water body code: 0244

IF District: 2E

Controlling authority: City of Wichita Falls and
Wichita County Water Improvement District No. 2

Counties: Archer (location of dam) and Baylor

Latitude: 33° 49'

Longitude: 98° 56'

Nearest major metropolitan area and distance: Wichita Falls - 30 miles

Reservoir description: Mainstream

River system: Wichita River

Mean depth (ft): 12.0

Maximum depth (ft): 35.0

Shoreline development index: 3.4

Secchi disc range (ft): 2-4

Conductivity (umhos/cm): 5,120

pH: 8.2

Size: 3,491 acres

Chlorides (ppm): 1,166

Total dissolved solids (ppm): 3,019

Average annual fluctuation: 2.0 feet

Total alkalinity (ppm): 65

Access: Boat: Fair

Bank: Fair

Handicap: None

Survey history:

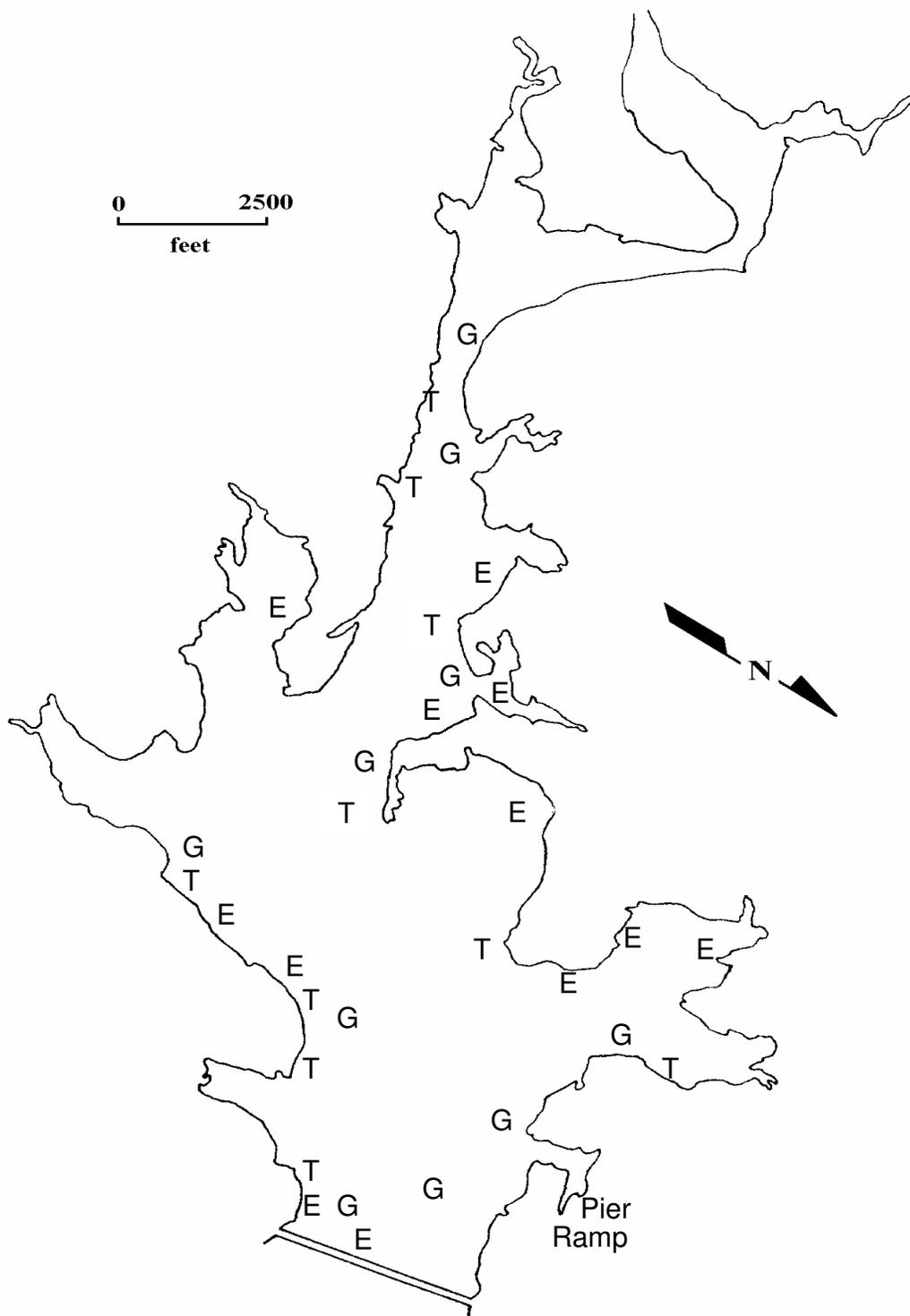
Method	Year							
Gill netting	1987	1990	1994	1997	2000	2001	2003	2005
Electrofishing		1990	1994	1997	2000			2004
Trap netting			1991	1994	1997	2000	2003	2004
Habitat			1994	1997	2000			2004
Creel survey							2002	

Survey of littoral zone and physical habitat types, Diversion Reservoir, Texas on August 10, 2004. A linear shoreline distance (miles) was recorded for each habitat type found. Acreage is listed for non-shoreline habitat types. Reservoir elevation was 1,050.2 feet mean sea level (MSL) at time of survey (1,052 MSL full pool).

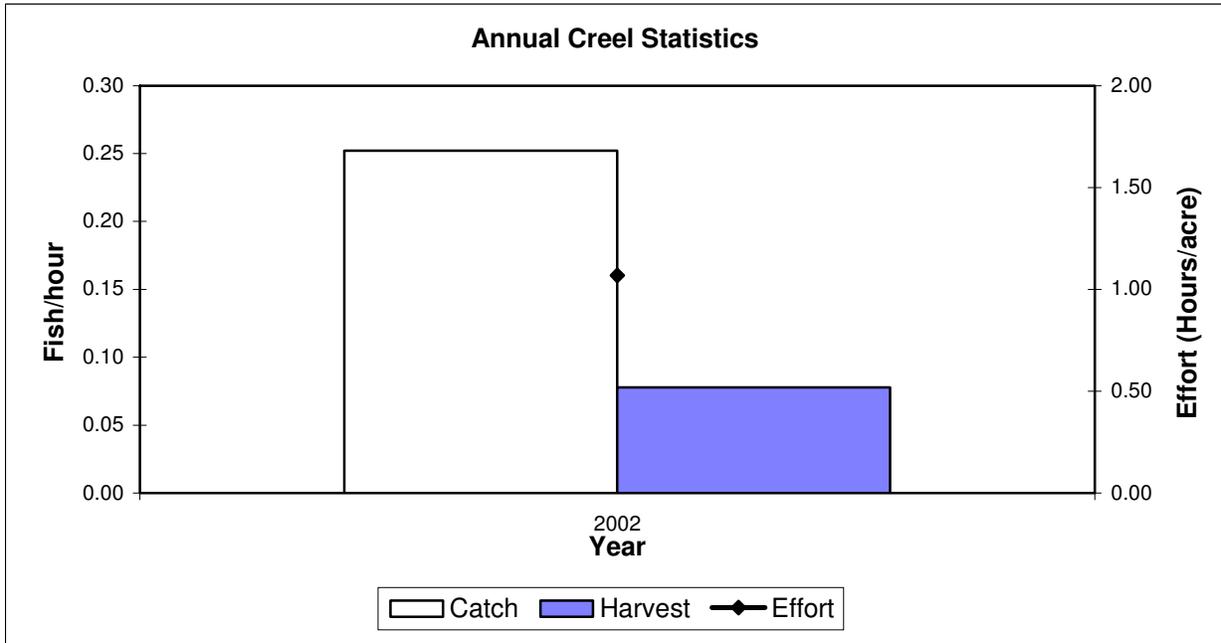
Habitat	Shoreline Distance		Acreage
	Miles	Percent of Total	
Water's Edge			
Featureless	12.6	45	
Large rock	9.8	35	
Small rock	4.5	16	
Riprap	0.5	2	
Bulkhead	0.3	1	
Eroded bank	0.3	1	
Total shoreline length	28.0	100	
Vegetation			
Native emergent	3.8	13.6	2.1
Native submersed	22.8	81.4	962.0
Near Shore			
Boat dock	2.8	10.0	
Open Water			
Standing timber			112.2

Stocking history at Diversion Reservoir, Texas. Size categories are Fry (<1 inch) and FGL for fingerlings (1-3 inches).

Species	Year	Number	Size
Blue catfish	1989	34,315	FGL
	1990	34,620	FGL
	1991	33,099	FGL
	Species total	102,034	
Channel catfish	1969	10,000	FGL
	1970	14,000	FGL
	1981	53,527	FGL
	2005	71,946	FGL
	Species total	149,473	
Florida largemouth bass	1993	177,710	FGL
	2005	177,151	FGL
	Species total	354,861	
Walleye	1969	4,700,030	FRY
	1970	400,000	FRY
	1971	1,450,000	FRY
	1972	435,675	FRY
	1973	1,230,475	FRY
	1974	70,000	FGL
	1989	445,000	FRY
	1993	3,367,368	FRY
	1994	6,847,103	FRY
	1998	75,300	FGL
	1999	38,945	FGL
	2000	170,000	FGL
	Species total	19,229,896	

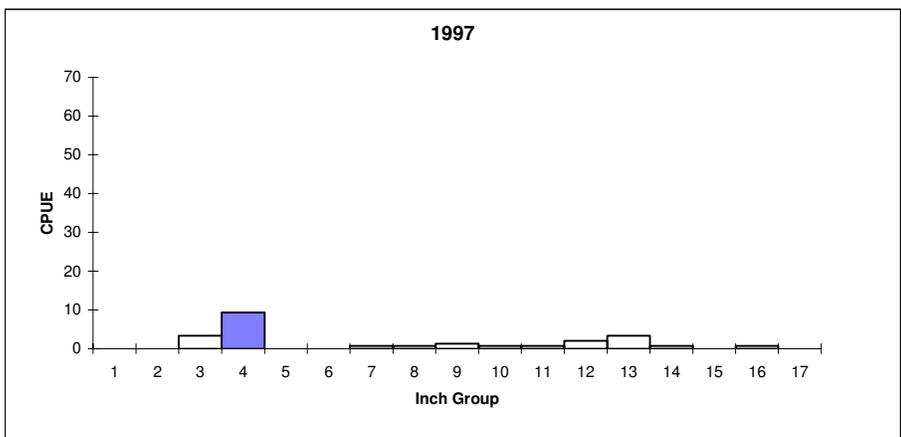


Map of Diversion Reservoir, Texas, showing randomly selected gill netting (G), electrofishing (E), and trap netting (T) sampling sites, 2004-05.

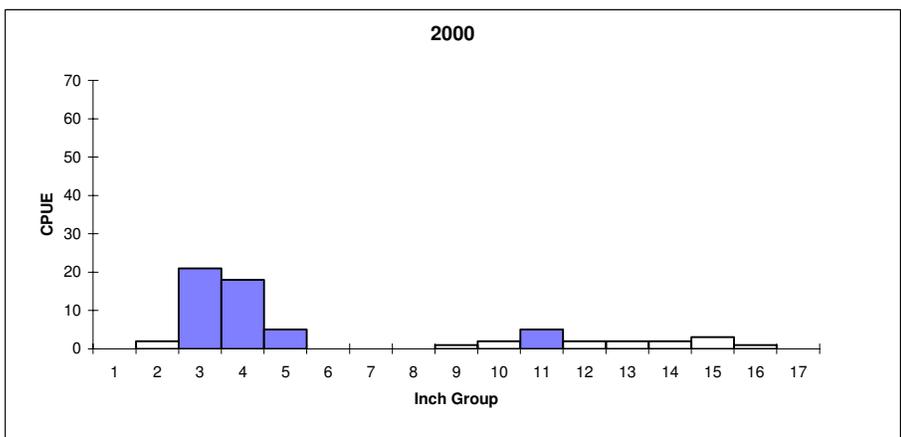


Estimated catch rates (fish/hour), harvest rates (fish/hour), and fishing effort (hours/acre) for all species combined from creel surveys, Diversion Reservoir, Texas, June-November, 2002.

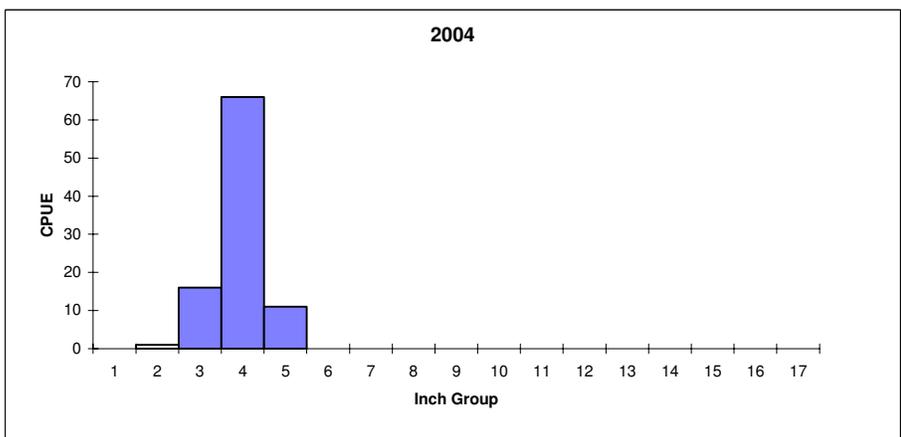
Gizzard Shad



Effort = 1.5
 Total CPUE = 23.3
 Stock CPUE = 10.7
 PSD = 69
 IOV = 57



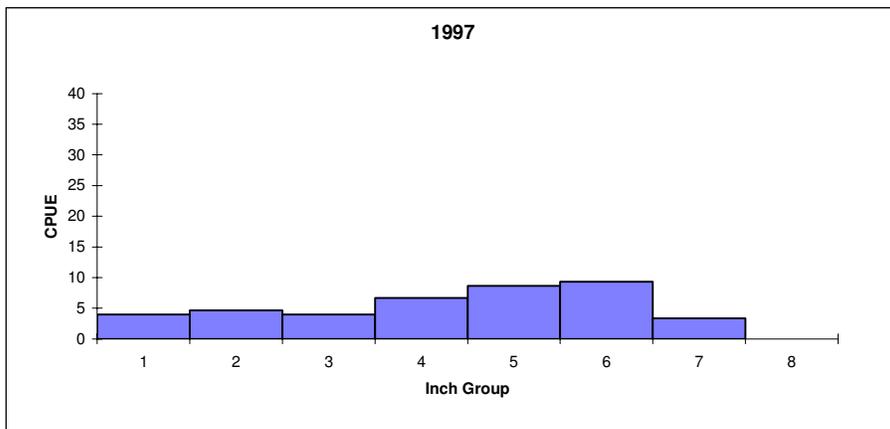
Effort = 1.0
 Total CPUE = 64.0
 Stock CPUE = 18.0
 PSD = 83
 IOV = 72



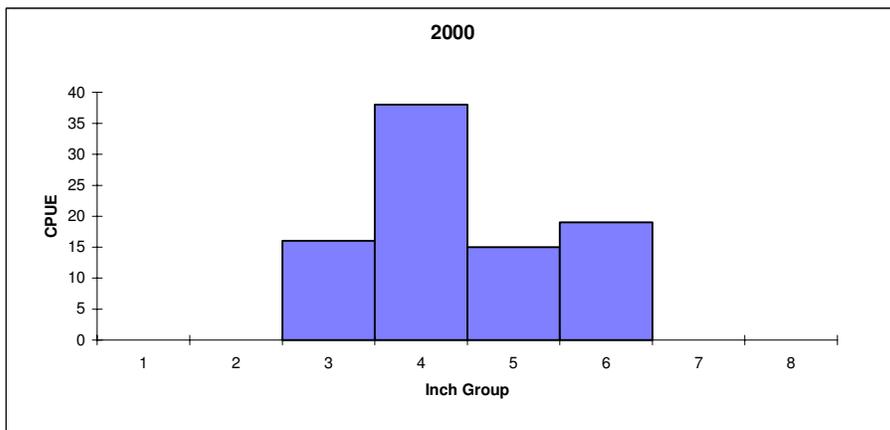
Effort = 1.0
 Total CPUE = 94.0
 Stock CPUE = 0.0
 PSD = 0
 IOV = 100

Comparison of the number of gizzard shad caught per hour (CPUE, bars) and population indices for fall electrofishing surveys, Diversion Reservoir, Texas.

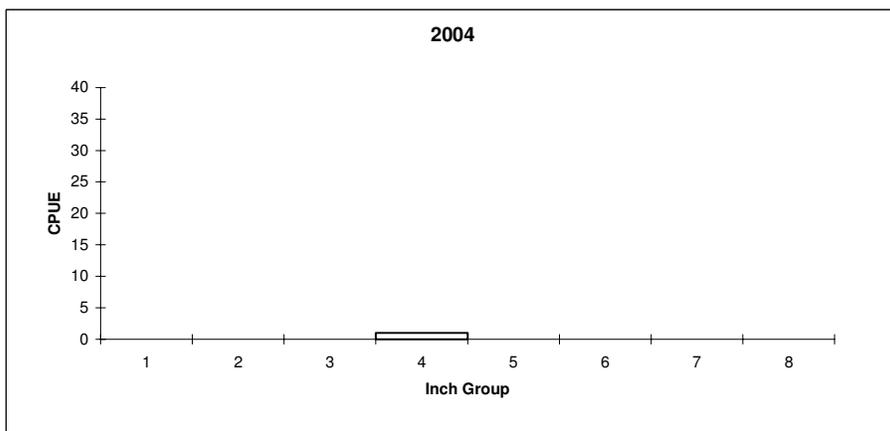
Bluegill



Effort = 1.5
 Total CPUE = 40.7
 Stock CPUE = 32.0
 PSD = 40
 RSD-P = 0



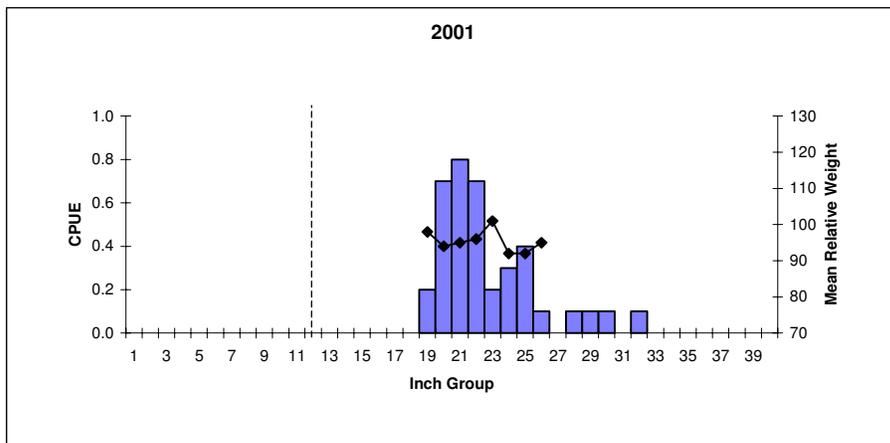
Effort = 1.0
 Total CPUE = 88.0
 Stock CPUE = 88.0
 PSD = 22
 RSD-P = 0



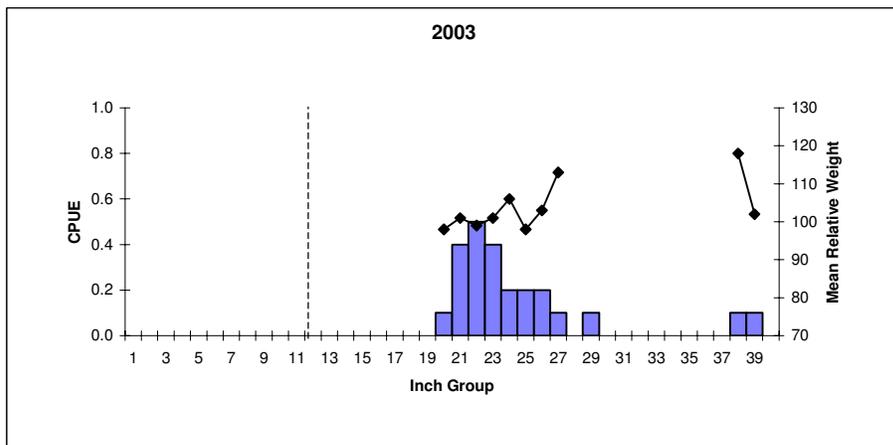
Effort = 1.0
 Total CPUE = 1.0
 Stock CPUE = 1.0
 PSD = 0
 RSD-P = 0

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

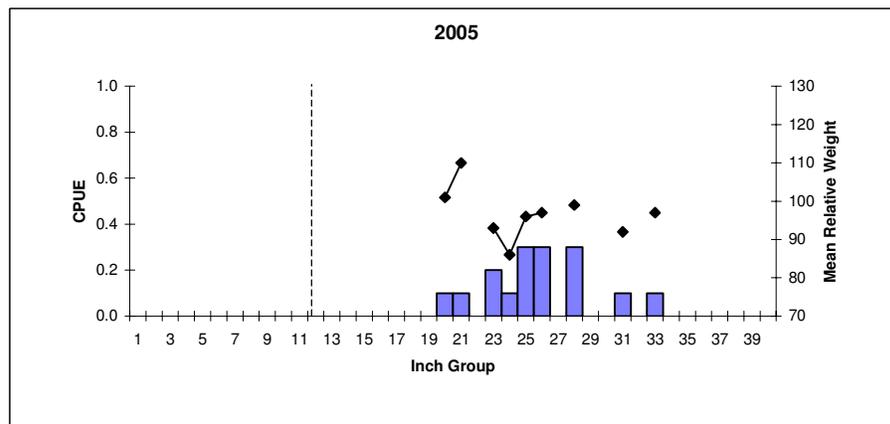
Blue Catfish



Effort = 10
 Total CPUE = 3.8
 Stock CPUE = 3.8
 PSD = 95
 RSD-P = 5



Effort = 10
 Total CPUE = 2.4
 Stock CPUE = 2.4
 PSD = 100
 RSD-P = 8

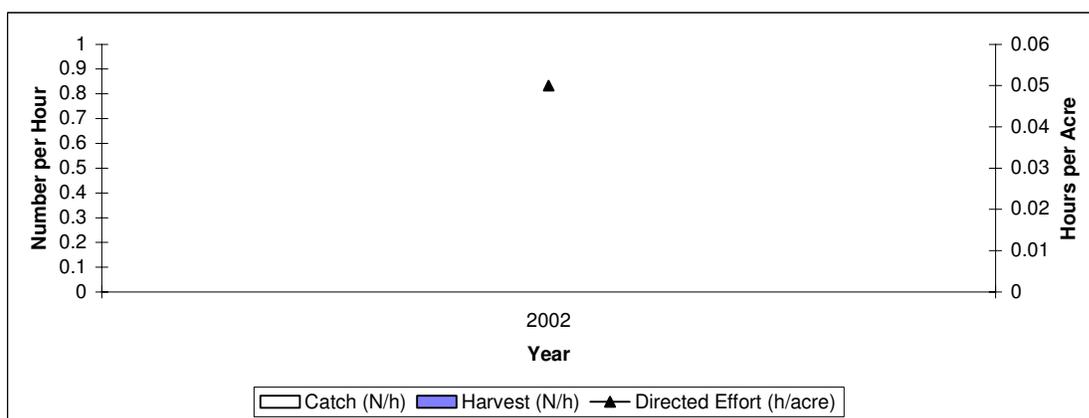


Effort = 10
 Total CPUE = 1.6
 Stock CPUE = 1.6
 PSD = 100
 RSD-P = 13

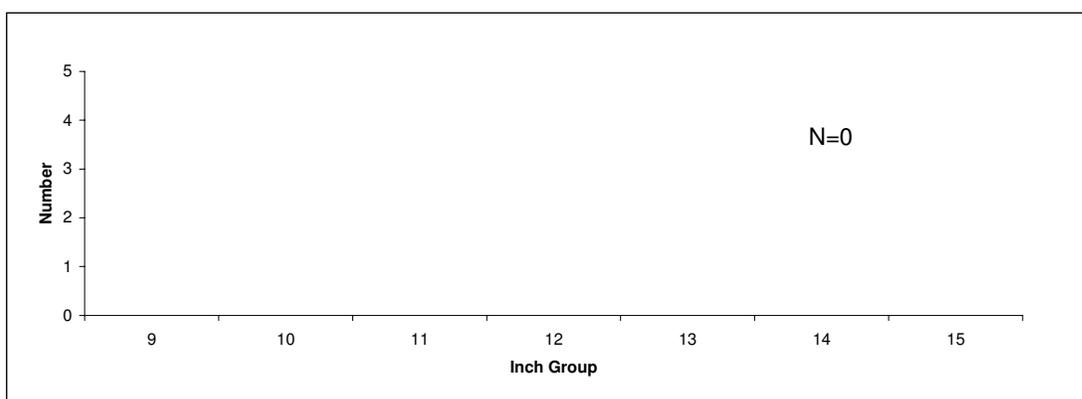
Comparison of the number of blue catfish caught per net night (CPUE, bars), mean relative weight (lines), and population indices for spring gill netting surveys, Diversion Reservoir, Texas. Dashed lines indicate minimum length limit at time of survey.

Mean length at age for blue catfish (sexes combined) collected during March-April gill netting surveys at Diversion Reservoir, Texas. Sample sizes are in parentheses.

Year	Length (inches) at age								
	3	4	5	6	7	8	9	10	
1994	13.5(3)	17.6(4)							
1997			16.5(2)	18.6(13)	23.9(7)				
2000				19.5(2)	20.2(3)	21.6(8)	23.8(6)	26.6(2)	

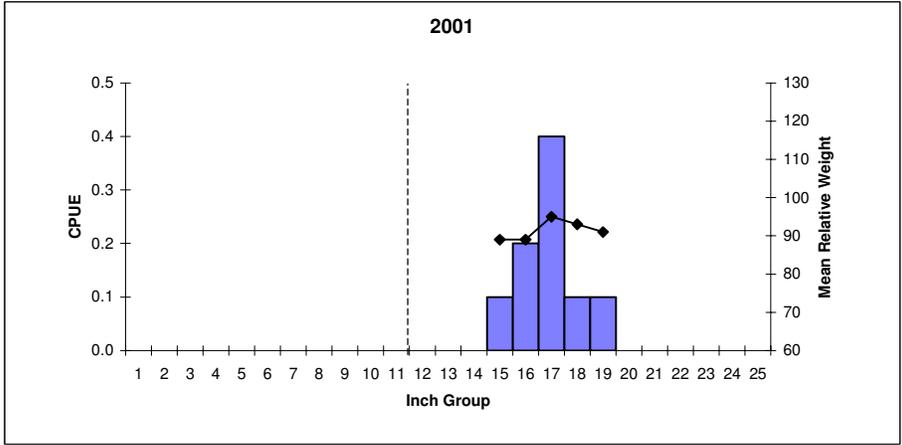


Annual creel statistics for anglers seeking blue catfish at Diversion Reservoir, Texas. Creel periods are from June through November 2002.

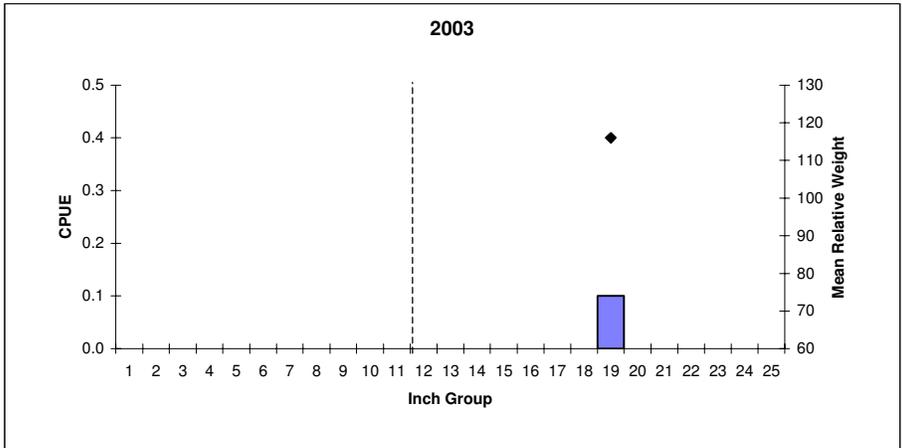


Length frequency of harvested blue catfish observed during creel surveys at Diversion Reservoir, Texas, June through November 2002, all anglers combined. The minimum length limit is 12 inches.

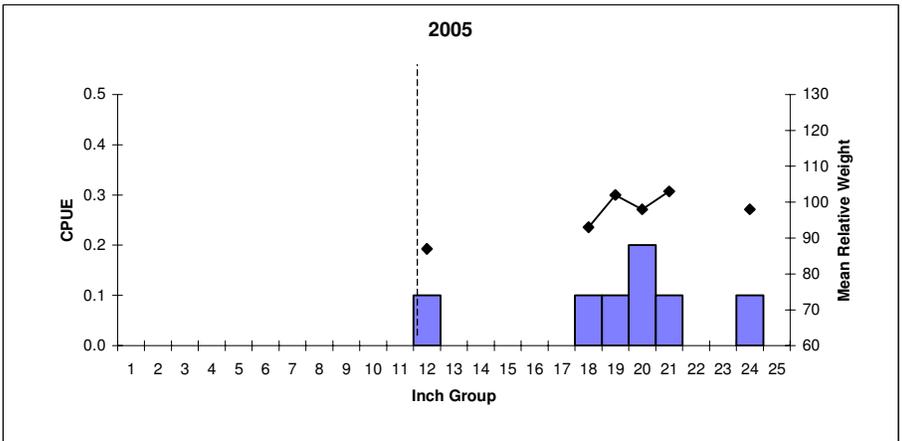
Channel Catfish



Effort = 10
 Total CPUE = 0.9
 Stock CPUE = 0.9
 PSD = 89
 RSD-P = 0



Effort = 10
 Total CPUE = 0.1
 Stock CPUE = 0.1
 PSD = 100
 RSD-P = 0



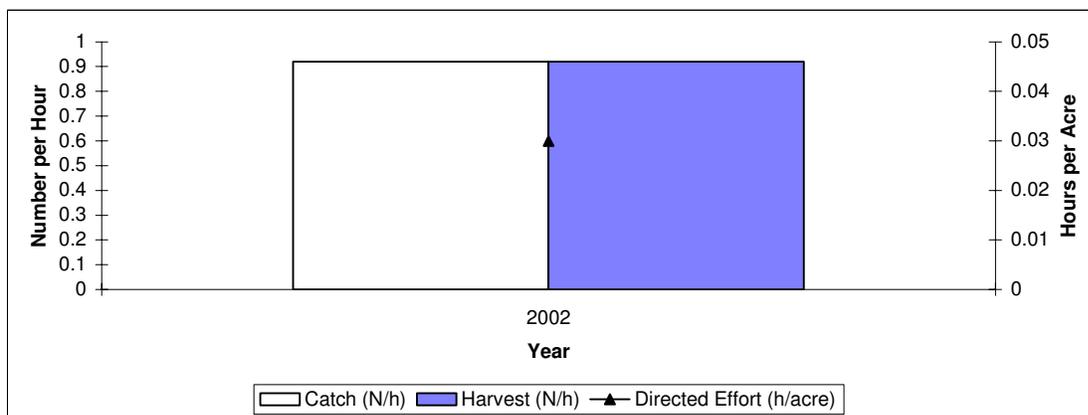
Effort = 10
 Total CPUE = 0.7
 Stock CPUE = 0.7
 PSD = 86
 RSD-P = 14

Comparison of the number of channel catfish caught per net night (CPUE, bars), mean relative weight (lines), and population indices for spring gill netting surveys, Diversion Reservoir, Texas. Dashed lines indicate minimum length limit at time of survey.

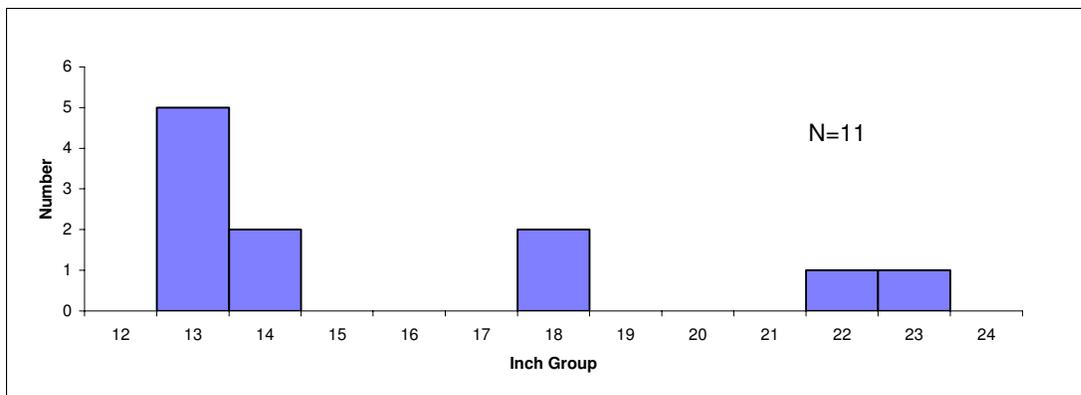
Mean length at age for channel catfish (sexes combined) collected during March-April gill netting surveys at Diversion Reservoir, Texas. Sample sizes are in parentheses.

Year	Length (inches) at age							
	1	2	3	4	5	6	7	8
1990	5.9(4)	8.0(3)	9.5(2)	13.6(5)	17.4(1)	19.9(2)		
1994	9.1(1)	9.8(1)	14.1(2)	15.0(3)	17.6(2)	21.4(6)		
1997				14.7(1)	18.5(1)	20.3(2)		
2000		9.0(3)	10.7(1)	13.0(1)	16.5(5)	18.1(2)	19.6(1)	21.0(1)
Averages*	8.1	11.0	13.1	14.6	15.7	16.5	17.0	17.4

* Ecological region 7 averages from Prentice (1987); lengths derived for March 15.

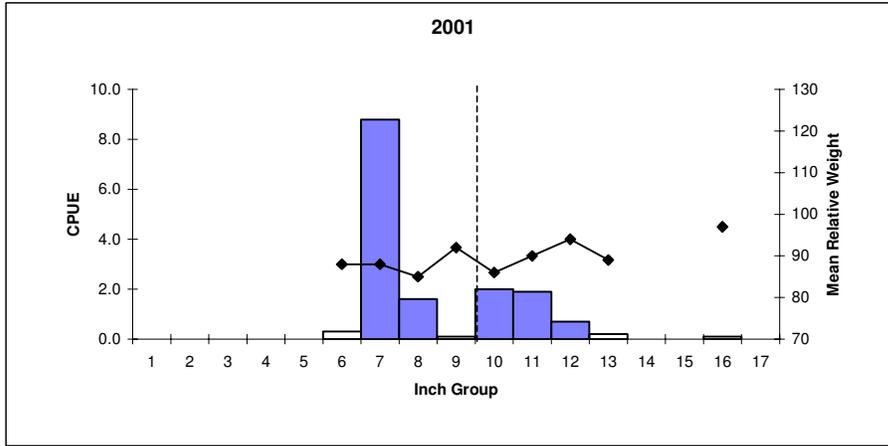


Annual creel statistics for anglers seeking channel catfish at Diversion Reservoir, Texas. Creel periods are from June through November 2002.

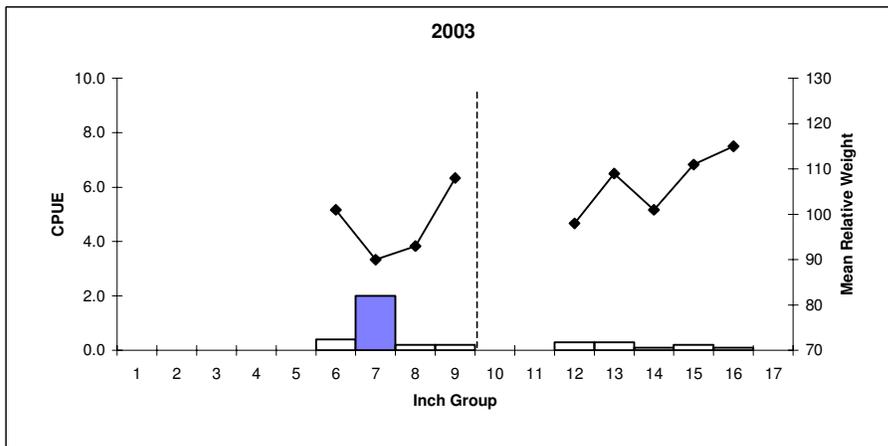


Length frequency of harvested channel catfish observed during creel surveys at Diversion Reservoir, Texas, June through November 2002, all anglers combined. The minimum length limit is 12 inches.

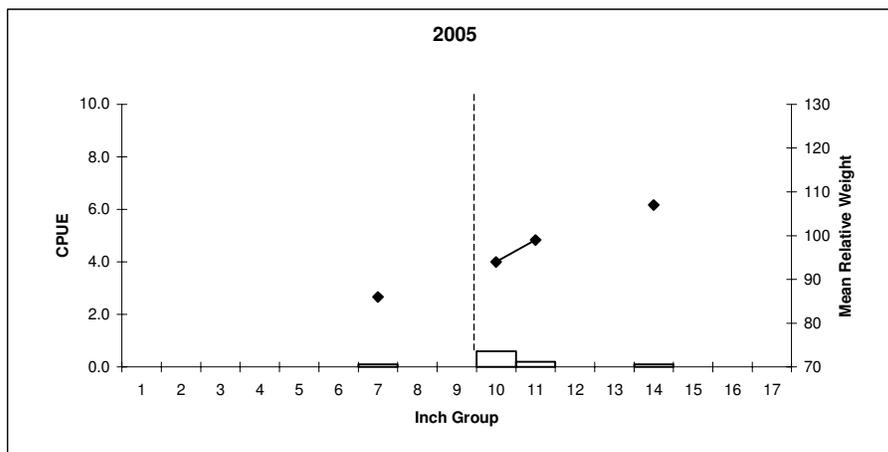
White Bass



Effort = 10
 Total CPUE = 15.7
 Stock CPUE = 15.7
 PSD = 32
 RSD-P = 6



Effort = 10
 Total CPUE = 3.8
 Stock CPUE = 3.8
 PSD = 32
 RSD-P = 26



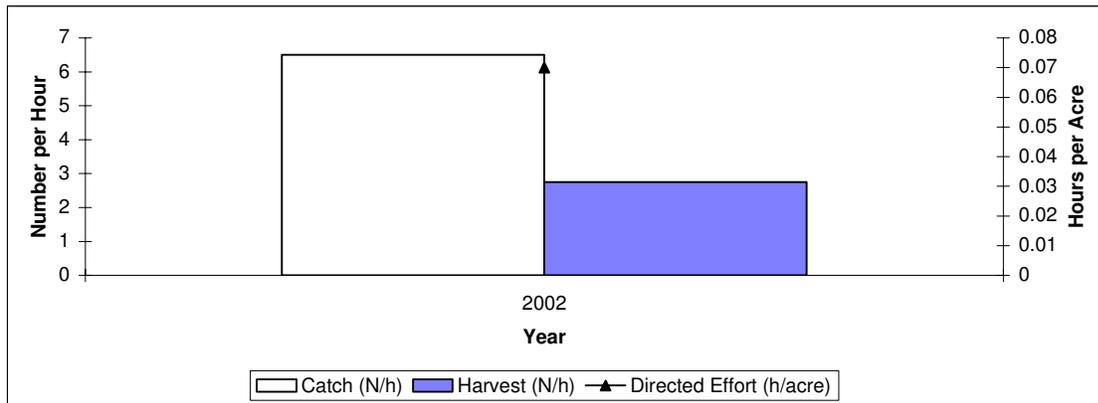
Effort = 10
 Total CPUE = 1.1
 Stock CPUE = 1.1
 PSD = 90
 RSD-P = 10

Comparison of the number of white bass caught per net night (CPUE, bars), mean relative weight (lines), and population indices for spring gill netting surveys, Diversion Reservoir, Texas. Dashed lines indicate minimum length limit at time of survey.

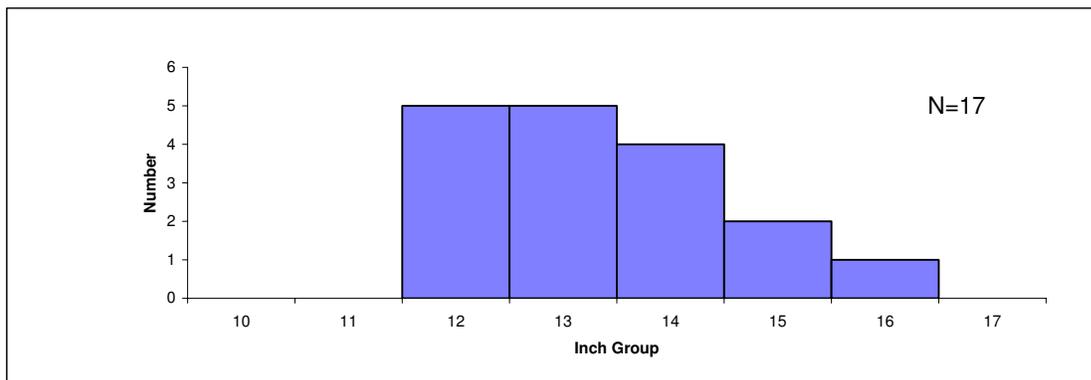
Mean length at age for white bass (sexes combined) collected during March-April 1994, 1997, 2000, 2001 and February 2003 gill netting surveys at Diversion Reservoir, Texas. Sample sizes are in parentheses.

Year	Length (inches) at age					
	1	2	3	4	5	6
1994		10.8(4)	11.8(5)			
1997	7.1(1)	10.8(3)	11.7(3)			
2000	7.8(4)	11.0(7)			15.2(1)	
2001	7.7(13)	11.1(10)	12.5(6)			16.4(1)
2003	7.6(13)	13.0(5)	14.5(3)	15.3(1)	16.7(1)	
Averages*	7.7	9.9	11.6	12.9	13.9	15.6

* Ecological region 7 averages from Prentice (1987); lengths derived for March 15.

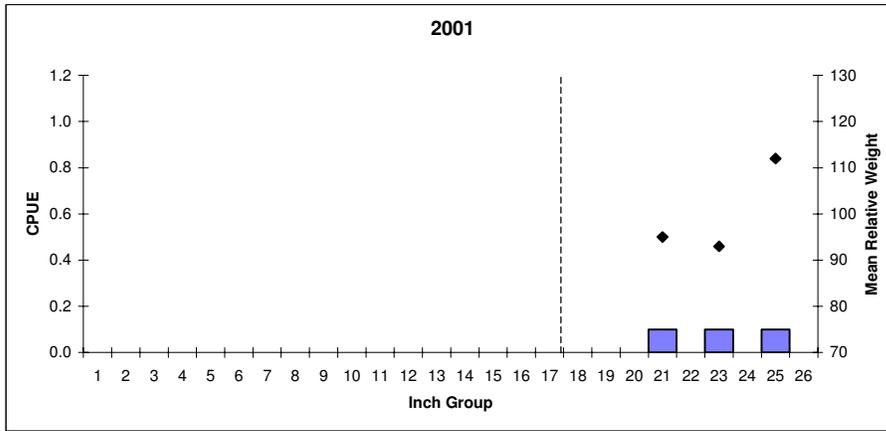


Annual creel statistics for anglers seeking white bass at Diversion Reservoir, Texas. Creel period is from June through November 2002.

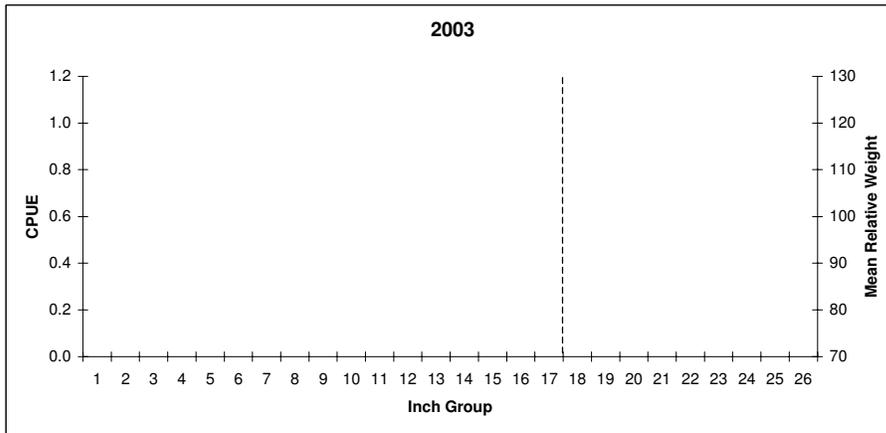


Length frequency of harvested white bass observed during creel surveys at Diversion Reservoir, Texas, June through November 2002, all anglers combined. The minimum length limit is 10 inches.

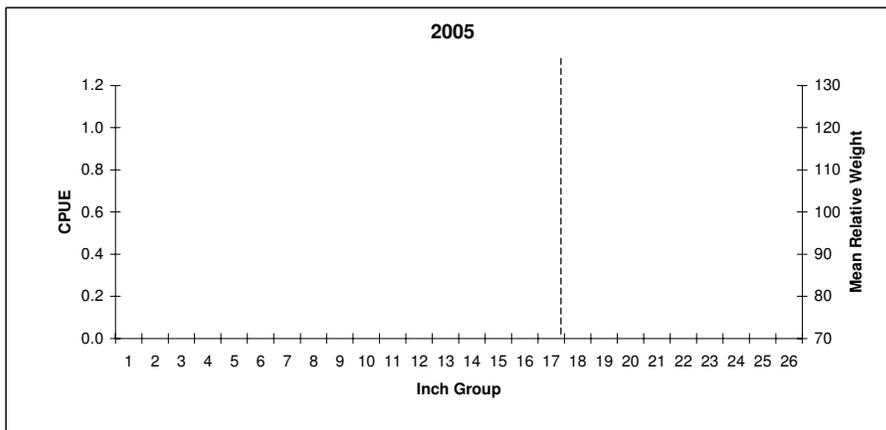
Striped Bass



Effort = 10
 Total CPUE = 0.3
 Stock CPUE = 0.3
 PSD = 100
 RSD-P = 0



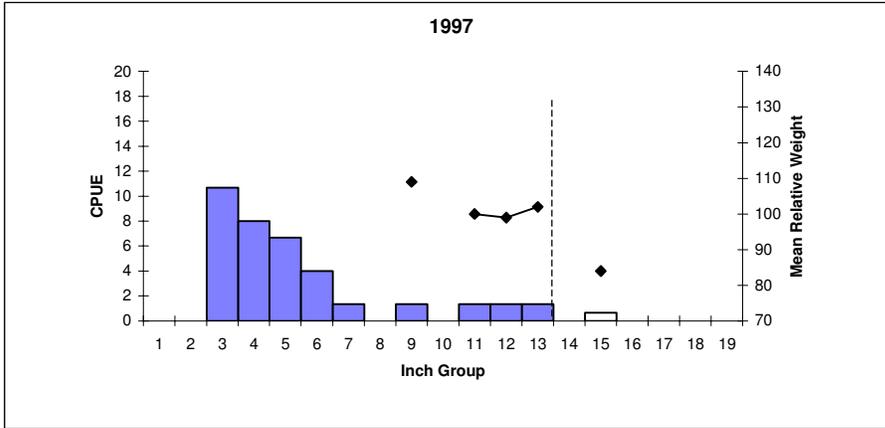
Effort = 10
 Total CPUE = 0
 Stock CPUE = 0
 PSD = 0
 RSD-P = 0



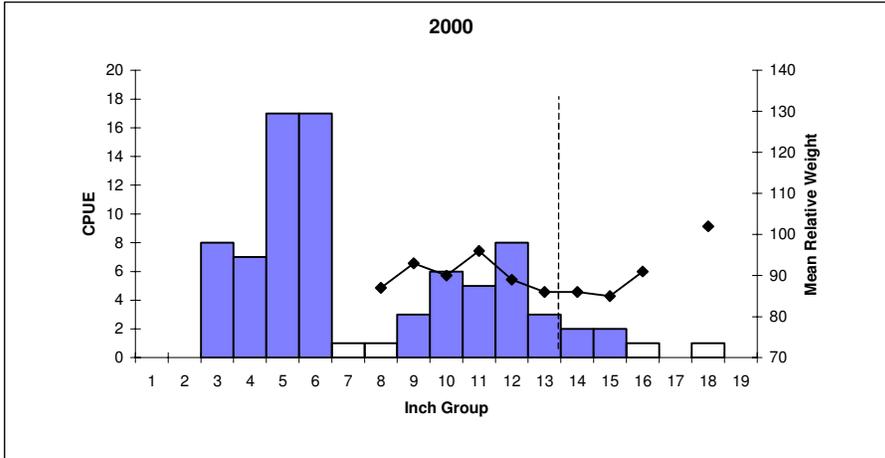
Effort = 10
 Total CPUE = 0
 Stock CPUE = 0
 PSD = 0
 RSD-P = 0

Comparison of the number of striped bass caught per net night (CPUE, bars), mean relative weight (lines), and population indices for spring gill netting surveys, Diversion Reservoir, Texas. Dashed lines indicate minimum length limit at time of survey.

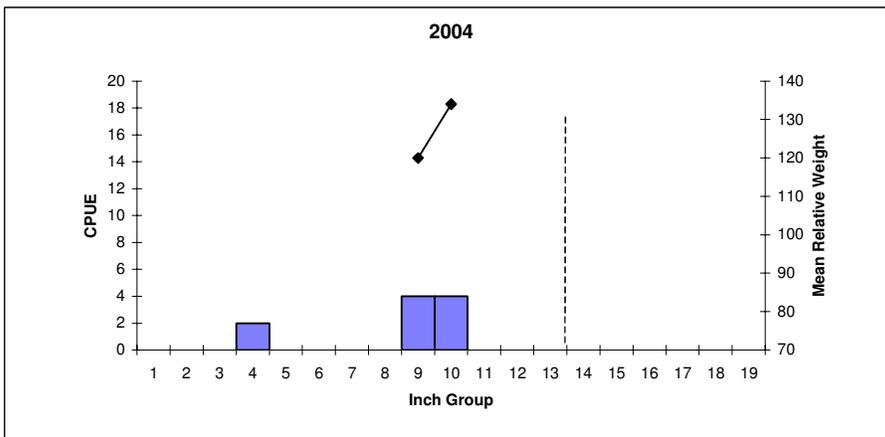
Largemouth Bass



Effort =	1.5
Total CPUE =	36.7
Stock CPUE =	6.0
PSD =	56
RSD-14 =	11
% FLMBA=	51.8
% FLMB=	6.7



Effort =	1.0
Total CPUE =	82.0
Stock CPUE =	32.0
PSD =	53
RSD-14 =	19
% FLMBA=	30
% FLMB=	0



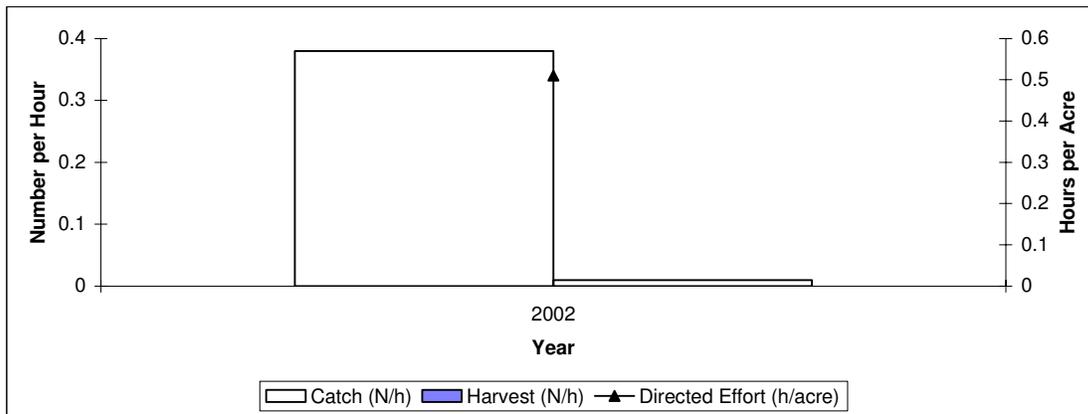
Effort =	1.0
Total CPUE =	10.0
Stock CPUE =	8.0
PSD =	0
RSD-14 =	0
% FLMBA=	25
% FLMB=	0

Comparison of the number of largemouth bass caught per hour (CPUE, bars), mean relative weight (lines), and population indices for fall electrofishing surveys, Diversion Reservoir, Texas. Dashed lines indicate minimum length limit at time of survey. The percentages of Florida largemouth bass alleles (% FLMBA) and pure Florida largemouth bass (%FLMB) collected in the sample are given.

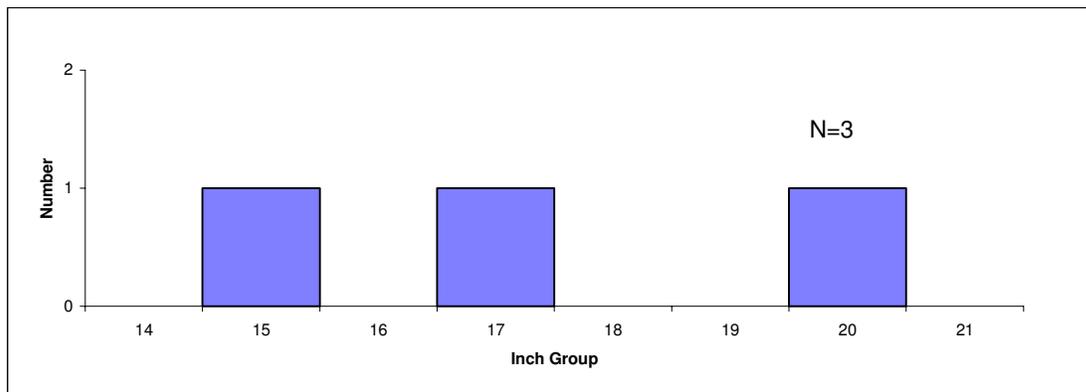
Mean length at age for largemouth bass (sexes combined) collected during fall electrofishing surveys at Diversion Reservoir, Texas. Sample sizes are in parentheses.

Year	Length (inches) at age			
	1	2	3	4
1994	10.8(8)	12.3(2)	12.6(8)	14.1(2)
1997	10.6(2)	12.3(2)	13.0(3)	
2000	10.4(14)	12.8(7)	13.9(3)	16.1(1)
Averages*	8.7	11.0	12.9	14.5

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

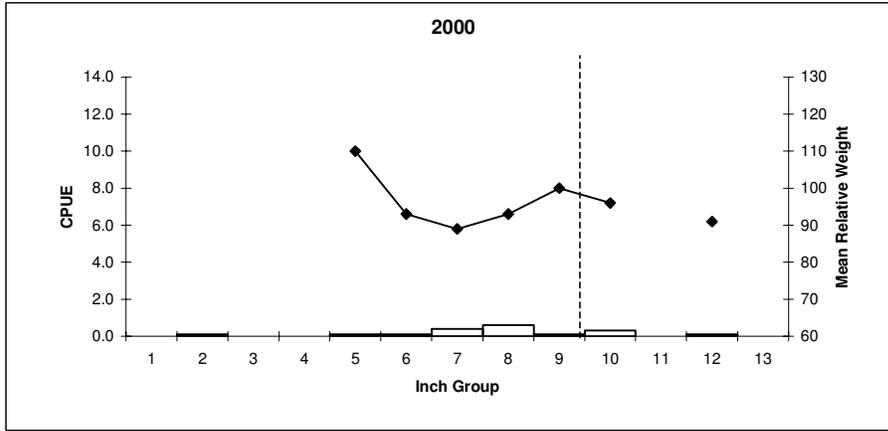


Annual creel statistics for anglers seeking largemouth bass at Diversion Reservoir, Texas. Creel period was from June through November 2002.

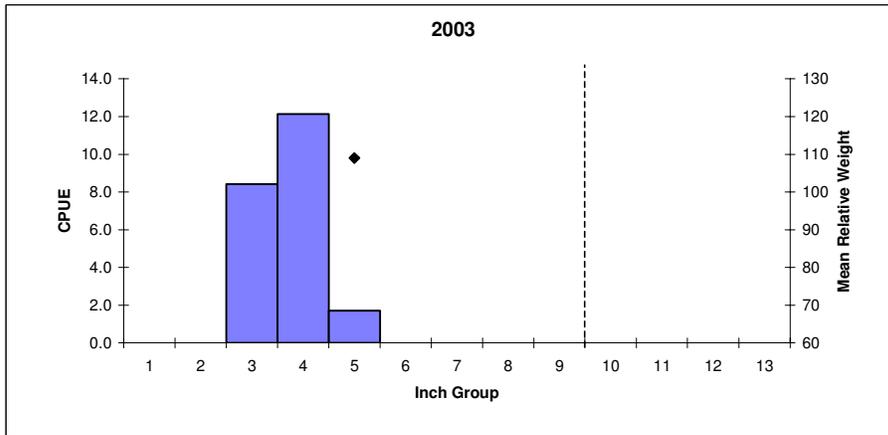


Length frequency of harvested largemouth bass observed during creel surveys at Diversion Reservoir, Texas, June through November 2002, all anglers combined. The minimum length limit was 14 inches.

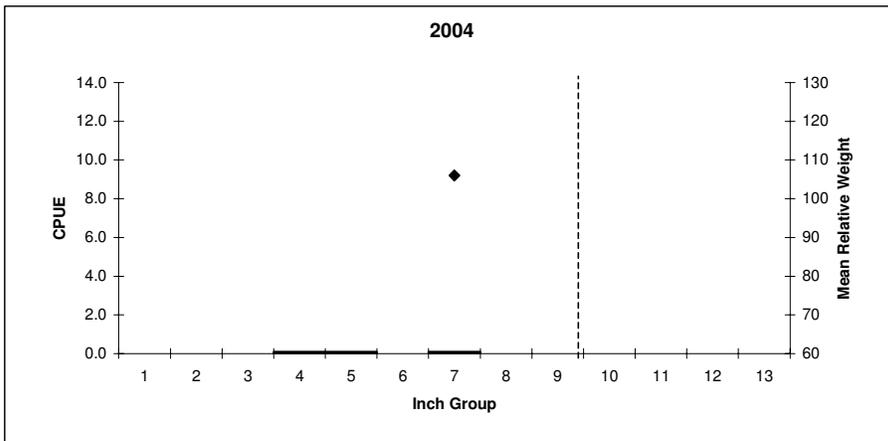
White Crappie



Effort = 10
 Total CPUE = 1.8
 Stock CPUE = 1.7
 PSD = 65
 RSD-P = 24



Effort = 7
 Total CPUE = 22.3
 Stock CPUE = 1.7
 PSD = 0
 RSD-P = 0



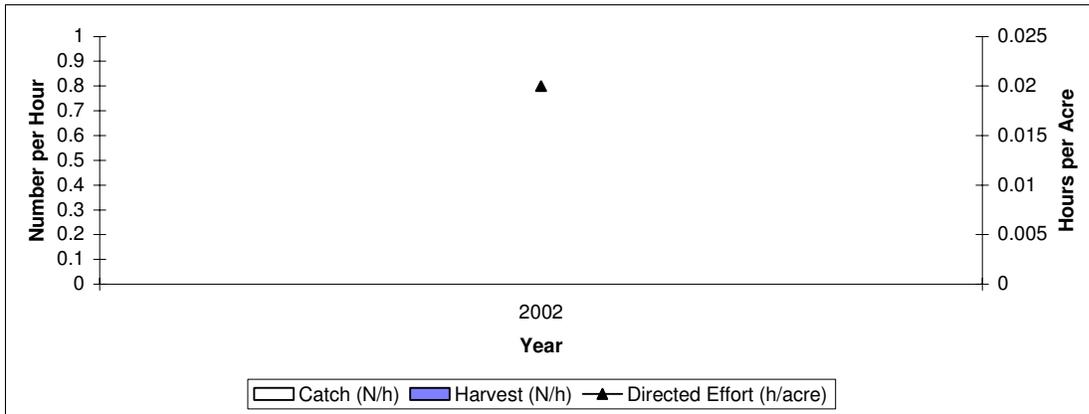
Effort = 10
 Total CPUE = 0.3
 Stock CPUE = 0.2
 PSD = 0
 RSD-P = 0

Comparison of the number of white crappie caught per net night (CPUE, bars), mean relative weight (lines), and population indices for fall trap netting surveys, Diversion Reservoir, Texas. Dashed lines indicate minimum length limit at time of survey.

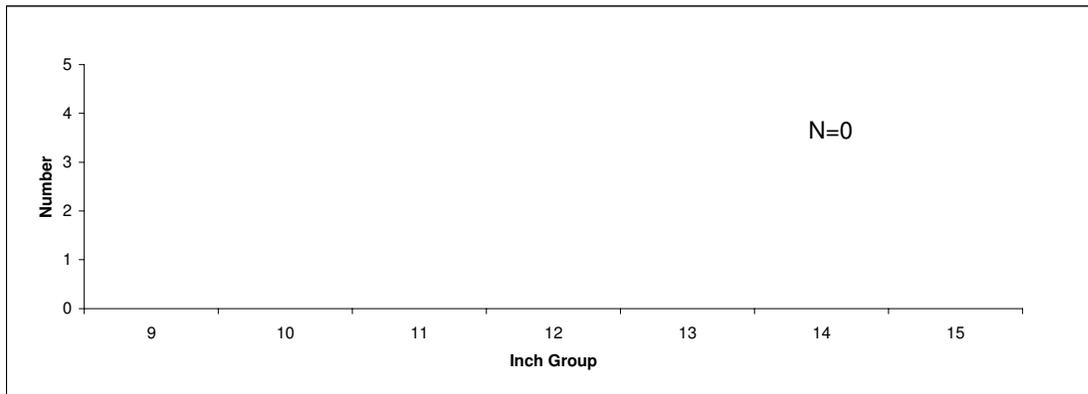
Mean length at age for white crappie (sexes combined) collected during fall trap netting surveys at Diversion Reservoir, Texas. Sample sizes are in parentheses.

Year	Length (inches) at age			
	1	2	3	4
1994	7.7(10)	9.2(3)	10.1(4)	
1997	7.8(1)	11.0(7)	12.2(2)	12.6(3)
2000	8.0(12)		11.2(3)	10.9(1)
Average*	5.8	7.1	8.2	9.3

* Ecological region 7 averages from Prentice (1987); lengths derived for November 15.



Annual creel statistics for anglers seeking white crappie at Diversion Reservoir, Texas. Creel period was from June through November 2002.



Length frequency of harvested white crappie observed during creel surveys at Diversion Reservoir, Texas, June through November 2002, all anglers combined. The minimum length limit is 10 inches.

**Fisheries Management Plan
Diversion (Baylor County), Texas**

Prepared - July 2005

Issue 1 Golden alga fish kills have occurred every year at Diversion since 2001. The fish populations have been adversely affected and angler use has declined.

Management Strategies

1. Monitor reservoir for golden alga blooms. Utilize Dundee fish hatchery incoming water cell counts as an early indicator of future problems.
2. Perform additional electrofishing (October 2006), trap netting, (November 2006) and gill netting surveys (March 2007) to more closely monitor fish populations.
3. Stock reservoir with Florida largemouth bass fingerlings during 2005 at the rate of 50 per acre.
4. Stock reservoir with channel catfish fingerlings during 2005 at the rate of 20 per acre.
5. Provide public with information about current fishery status and future management plans by conducting a public meeting in 2005.
6. Discontinue future walleye fingerling stockings because of recurring golden alga problems and limited historical success.

Appendix A

Number (N) and catch per unit effort (CPUE) of all species collected from all gear types from Diversion Reservoir, Texas, 2004-05. Gill netting and trap netting CPUE is the number of fish per net night, while electrofishing CPUE is the number of fish per hour. For electrofishing, only target species were collected.

Species	Gill netting		Trap netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Longnose gar	30	3.0	1	0.1		
Shortnose gar	2	0.2				
Gizzard shad	1	0.1	5	0.5	94	94.0
Carp	6	0.6	32	3.2		
River carpsucker	2	0.2				
Smallmouth buffalo	11	1.1	4	0.4		
Blue catfish	16	1.6				
Channel catfish	7	0.7	2	0.2		
White bass	11	1.1	3	0.3		
Green sunfish			7	0.7	2	2.0
Warmouth			6	0.6		
Orangespotted sunfish			5	0.5		
Bluegill			1,030	103.0	1	1.0
Longear sunfish			44	4.4	2	2.0
Largemouth bass	1	0.1			10	10.0
White crappie			3	0.3		

Appendix B. Estimated fishing effort (Hours) and percentage of time (% Time) an individual fish species was being sought at Diversion Reservoir, June 2002 through November 2002. Relative standard errors are in parentheses.

Quarter	Species	Hours	Hrs/acre	% Total Effort
JUNE-AUGUST				
	Catfish spp.	166.0 (88.1)	0.05	5.6
	Largemouth bass	1,783.8 (77.0)	0.51	60.7
	White crappie	72.6 (132.5)	0.02	2.5
	Any species	918.2 (42.0)	0.26	31.2
	All fishes	2,940.6 (53.0)	0.84	
SEPT. – NOV.				
	Blue catfish	177.3 (70.6)	0.05	22.5
	Channel catfish	99.7 (99.2)	0.03	12.7
	White bass	239.3 (58.1)	0.07	30.4
	Any species	270.4 (53.3)	0.08	34.4
	All fishes	786.7 (12.6)	0.23	
TOTAL				
	Catfish spp.	166.0 (88.1)	0.05	4.5
	Blue catfish	177.3 (70.7)	0.05	4.8
	Channel catfish	99.7 (99.2)	0.03	2.7
	White bass	239.3 (58.1)	0.07	6.4
	Largemouth bass	1,783.8 (77.0)	0.51	47.9
	White crappie	72.6 (132.5)	0.02	1.9
	Any species	1,188.5 (34.7)	0.34	31.9
	All fishes	3,727.2 (41.9)	1.07	

Appendix C. Estimated catch rates (number of fish) for all fishes caught, and the percentage of fish from Diversion Reservoir, June through November 2002. Relative standard errors are in parentheses.

Species	Number of Fish					% of Fish		
	Harvested	Released	Released Above Limit	Released Below Limit	Total	Harvested	Released	Caught
Carp	0	3.4(100.0)			3.4(100.0)	0.0	0.5	0.4
Smallmouth buffalo	0	3.4(100.0)			3.4(100.0)	0.0	0.5	0.4
Channel catfish	73.1(81.3)	3.3(152.0)	3.3(100.0)	0	76.4(78.1)	25.2	0.5	8.1
White bass	201.4(37.2)	312.2(96.9)	4.9(99.1)	307.3(98.4)	513.6(60.7)	69.5	48.0	54.7
Spotted bass	11.8(422.6)	1.6(257.1)			13.5(372.8)	4.1	0.3	1.4
Largemouth bass	3.4(100.0)	325.9(77.4)	0	325.9(77.4)	329.3(76.6)	1.2	50.2	35.1
All fishes	289.8(31.1)	649.8(84.5)			939.6(59.1)			