

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-30

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2004 Survey Report

Sam Rayburn Reservoir

Prepared by:

Todd Driscoll, District Management Supervisor

Inland Fisheries Division
District 3-D, Jasper, Texas



Robert L. Cook
Executive Director

Phil Durocher
Director, Inland Fisheries

July 31, 2005

TABLE OF CONTENTS

Executive summary.....	3
Introduction.....	6
Methods.....	6
Literature cited	7
Physical and historical data.....	8
Aquatic vegetation survey.....	9
Stocking history	10
Location of sampling stations	13
Species information	
Gizzard shad.....	14
Blue catfish	15
Channel catfish.....	16
White bass	18
Palmetto bass	19
Bluegill.....	21
Redear sunfish.....	22
Spotted bass	24
Largemouth bass	25
Crappie.....	27
Fisheries management plan.....	28
Appendix 1.....	31
Appendix 2.....	32
Appendix 3.....	33
Appendix 4.....	34
Appendix 5.....	35

EXECUTIVE SUMMARY

Sam Rayburn Reservoir was surveyed in 2004-2005 with electrofishing, gill nets, a creel survey, and an aquatic vegetation survey. This report summarizes the results of these surveys and comparisons are made to historical data (1986-2004). Based on this information, a management plan was developed for the reservoir.

- **Reservoir description:** Sam Rayburn Reservoir is located on the Angelina River in the Neches River basin. The U.S. Army Corps of Engineers (USACE) constructed this reservoir for flood control, generation of hydroelectric power, and for municipal, industrial, agricultural, and recreational uses. At conservation pool, Sam Rayburn Reservoir is 111,422 surface acres, has a shoreline length of 750 miles, and a mean depth of 20 feet. Water level fluctuations average 8 feet annually. Angler and boat access is excellent with 24 boat ramps present. Handicap-accessible facilities are limited to parking spaces at access points. Habitat in the lake consists of aquatic vegetation (primarily American lotus and hydrilla), standing timber, and flooded terrestrial vegetation. Most of the land around the reservoir is used for timber production and agriculture.
- **Prey species:** Primary prey species include gizzard shad, threadfin shad, bluegill, and redear sunfish. Gizzard shad catch rate in 2004 (136.3/hour) exceeded previous years (2002 – 71.8/hour; 2003 – 103.5/hour) and the historical reservoir average (46.3/hour). The 2004 sample included an increased number of fish available as prey (< 7 inches). Historically, threadfin shad catch rates have been highly variable (mean = 77.0; SD = 139.2) and are probably not reflective of population status. The catch rate in 2004 was 97.5/hour. Bluegill catch rates have increased during the last three survey years (2002 – 238.5/hour; 2003 – 440.8/hour; 2004 – 455.3/hour). Redear sunfish catch rates have ranged from 81.8/hour (2002) to 137.0/hour (2003). Prey species abundance appears to be adequate, as historical growth rates are good and relative weights are within desired ranges. Few anglers target sunfish (< 1% of total fishing effort), but they are frequently harvested by anglers seeking other species.
- **Catfishes:** Gill net surveys from 2003 – 2005 reflect a decline in blue catfish and channel catfish recruitment rates. Blue catfish catch rates declined from a historical high in 2003 (10.4/net night) to 4.4/net night in 2004 and 5.3/net night in 2005. Most of this decline is attributed to a reduction of fish < 14 inches. Although few blue catfish > 21 inches are collected, anecdotal information indicates passive gear anglers frequently catch fish > 30 pounds. Relative weights indicate fish condition is good (range = 84 – 113).
Channel catfish catch rates also declined over the same period (2003 – 8.2/net night; 2004 – 4.5/net night; 2005 – 2.5/net night). Population structure and relative weights have remained relatively similar.
Directed rod and reel angler effort, catch, and harvest rates of catfishes were similar in 2002 – 2004. Catfish anglers accounted for 6% of the total fishing effort during all three years. Channel catfish comprised a majority of the harvest in 2003 and 2004. Total

estimated harvest of channel catfish increased by 44% in 2004.

- **White bass and palmetto bass:** Gill net data indicate that the population density of white bass in the reservoir is relatively low, as historical catch rates average 2.6/net night. From 1995 through 2000, palmetto bass fingerlings were stocked annually at low rates (~ 5/acre), but no fish have been stocked since 2000. Gill net catch rates from 2001 – 2003 were relatively low (0.1 – 1.9/net night). Little fishing effort was directed at temperate basses, with most attributed to bank anglers at the reservoir powerhouse.
- **Black bass:** Electrofishing catch rates of spotted bass have been historically low, averaging 5.2/hour. Catch rates were 2.0, 4.0, and 6.3/hour in 2002, 2003, and 2004, respectively. Few spotted bass > 10 inches were collected.

Fall electrofishing catch rates during 2002 – 2004 reflect relatively high and stable largemouth bass recruitment rates (range = 142.3/hour - 170.0/hour). The historical reservoir average is 147.5/hour. Relatively high spring/summer water levels and favorable vegetation coverage during these years likely contributed to high recruitment. Population structure was remarkably similar across years (PSD range = 49 - 55; RSD-14 range = 25 – 27). Relative weights ranged from 89 – 110, indicating largemouth bass were in good condition.

Since 2002, total electrofishing effort was increased from two to four hours in an attempt to reduce data variability. However, coefficients of variation from 1999 – 2001 (range = 64 – 101) were similar to 2002 – 2004 (range = 65 – 94). The re-sampling approach developed by Dumont and Schlechte (2004) will be used to determine total effort of future electrofishing surveys.

Although the reservoir has been stocked with Florida largemouth bass (FLMB) annually since 1994, overall FLMB influence has remained low and relatively stable. Since 2000, FLMB have been successfully stocked at rates of 100 fish/acre in selected embayments (Caney Creek and Ayish Bayou) to increase stocking influence (i.e., achieve \geq 20% pure FLMB). Caney Creek received annual FLMB stockings during 2000 – 2002 and electrophoretic analysis in 2002 revealed 32.5% pure FLMB, compared to 5.8% in the reservoir. In 2003 and 2004, Caney Creek maintained levels of pure FLMB without stockings (25.0% and 34.0%, respectively). The Ayish Bayou embayment received stockings in 2003 – 2005 and electrophoretic analysis will begin in Fall 2005.

The black bass fishery accounts for the majority of annual fishing effort (66%). Creel surveys indicated that directed effort, catch, and harvest rates were similar in 2002 – 2004. Total harvested numbers of largemouth bass increased by 54% in 2004. Length-frequencies of harvested largemouth bass were similar, with the majority of fish ranging from 14 – 18 inches in length.

A tournament-monitoring program was implemented in June 2003 to increase information on fish \geq 14 inches and provide greater insight regarding large (> 20 inches) fish abundance. All monitored tournament variables were relatively similar across 2003 and 2004 survey years, indicating stable population numbers of legal-length fish. Results of Sealy Outdoors McDonald's Big Bass Splash tournaments reflect an initial decline in

large fish catch following the 1998 fish kill attributed to Largemouth Bass Virus (1999 – 2001). From 2002 – 2005, average fish weights increased to levels observed prior to the fish kill.

- **Crappie:** Crappie anglers accounted for 20% of the total annual fishing effort. Creel surveys indicate that directed effort, catch, and harvest rates were similar in 2002 – 2004, reflecting stable population abundance and size structure during these years. A majority of the annual harvest is comprised of black crappie, which increased by 91% in 2004.
- **Management strategies:** Based on current information, this reservoir should continue to be managed with current regulations. Anderson et al. (2002) found that 47% of Sam Rayburn anglers favor more restrictive largemouth bass length limits. In response to angler opinion, an annual exploitation study was conducted from October 2003 – September 2004 to explore potential pros and cons of alternative length limits. Overall annual largemouth bass exploitation was relatively low (11%) and more restrictive length limits would provide little overall fishery benefit.

Considering the reservoir's history of producing trophy largemouth bass (> 10 pounds) and the amount of directed angler effort towards this species, supplemental stocking of FLMB fingerlings should continue until pure FLMB comprise $\geq 20\%$ of the population sample.

Giant salvinia is present in Toledo Bend Reservoir, making accidental transfer to Sam Rayburn Reservoir a strong possibility. Signs warning anglers of ecological impacts of giant salvinia and high likelihood of transfer have been placed at all main access points on the Texas side of Toledo Bend Reservoir. These signs need to be maintained to prevent introduction into Sam Rayburn Reservoir.

INTRODUCTION

This document is a summary of fisheries data collected from Sam Rayburn Reservoir in 2004-2005; data from previous years are included for comparison. The purpose of this document is to provide information on the fishery and make any management recommendations needed to protect and enhance the sport fishery. While information on other fish species was collected, this report deals primarily with major sport fishes and important prey species. Management strategies are included to address existing problems or opportunities.

Harvest regulations for Sam Rayburn Reservoir in 2004 - 2005.

Species	Bag Limit	Minimum – Maximum
		Length Limits (Inches)
Blue and channel catfish	25	12 – None
Flathead catfish	5	18 – None
White bass	25	10 – None
Palmetto bass	5	18 – None
Spotted bass	5 ^a	None
Largemouth bass	5 ^a	14 – None
White and black crappie	25	10 – None

^aBag limit for spotted and largemouth bass is 5 in the aggregate.

METHODS

- Fishes were collected by electrofishing (4.0 hours at 48, 5-minute stations during October) and gill netting (15 net nights during February). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour of actual electrofishing and for gill nets as the number of fish caught in one net set overnight. Largemouth bass electrophoresis samples were collected in accordance with 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] and relative stock density [RSD]), and relative weights were calculated for target fishes according to Anderson and Neumann (1996).

- A roving creel survey (49 days; 18 in summer quarter, 13 in fall quarter, 9 in other quarters) was conducted from June 2004 through May 2005 to assess angler use and catch in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2004).
- A survey of aquatic vegetation was conducted in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2004).
- Results of largemouth bass tournaments collected as part of an approved special project to supplement population information collected from electrofishing and creel surveys are included in the appendix.

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.
- Anderson, D. K., R. B. Ditton, and C. O. Oh. 2002. Characteristics, participation patterns, management preferences, expenditures, and economic impacts of Sam Rayburn Reservoir anglers. Texas A&M University Human Dimensions Research Laboratory. Report HD-622, College Station.
- Dumont, S. C., and W. Schlechte. 2004. Use of re-sampling to evaluate a simple random sampling design for general monitoring of fishes in Texas reservoirs. North American Journal of Fisheries Management 24:408-416.

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

 Inland Fisheries (IF) water body code: 0640 IF District: 3D - Jasper

Controlling authority: U.S. Army Corps of Engineers

Waterbody uses: Municipal, industrial, and recreation

County (dam): Jasper

Latitude: 31° 10'

Longitude: 94° 05'

Nearest major metropolitan area and distance: Beaumont/Port Arthur - 100 miles

Reservoir description: Mainstream

River system: Angelina

Mean depth (ft): 20.0

Maximum depth (ft): 80.0

Shoreline development index: 12.0

Watershed (mi²): 3,450

Secchi disc range (ft): 6+

Conductivity (umhos/cm): 120

Size: 111,422 acres

Average annual fluctuation (ft): 8.0

Access: Boat: Adequate - 25 ramps
 Bank: Adequate
 Handicap: Inadequate - 3 areas

Survey History:

Method	Year			
Gill net	1974	1976	1982	1985-2005
Electrofishing	1974	1976	1982	1985-2004
Trap net	1986-1999		2002	
Creel survey	1986-2005			
Habitat	1993-1995	1997	2002	
Vegetation	1992-2004			
Cove rotenone	1976	1982	1986-1990	

Survey of aquatic vegetation, Sam Rayburn Reservoir, Texas, 2000 - 2004. Acreage of each species and percent of total surface area coverage (in parentheses) are presented.

Species	2000	2001	2002	2003	2004
American lotus	175 (<1)	175 (<1)	643 (<1)	1,259 (1)	1,418 (1)
Brazilian elodea	trace	trace			
Buttonbush	trace	trace		trace	trace
Cattail	trace	trace		trace	trace
Chara	250 (<1)	250 (<1)	93 (<1)	446 (<1)	trace
Common salvinia	15 (<1)	trace	trace	180 (<1)	365 (<1)
Coontail	740 (<1)	1,500 (1)	67 (<1)	720 (<1)	14 (<1)
<i>Cyperus spp.</i>	20 (<1)	20 (<1)			
Cypress			trace	trace	trace
Eelgrass	25 (<1)	25 (<1)			trace
Frog's-bit					trace
Giant cutgrass	trace	trace			
Hydrilla	13,125 (12)	8,531 (8)	6,582 (6)	8,026 (7)	2,944 (3)
<i>Ludwigia spp.</i>	10 (<1)	10 (<1)		508 (<1)	trace
Parrot's-feather	trace	trace			
Pennywort					trace
<i>Potamogeton spp.</i>	220 (<1)	475 (<1)	225 (<1)	548 (<1)	376 (<1)
<i>Sagittaria spp.</i>			trace	trace	trace
<i>Salix spp.</i>	trace	trace		trace	trace
<i>Scirpus spp.</i>	trace	trace		trace	
Southern naiad	trace	50 (<1)			
Southern water-grass	trace	trace	trace	753 (<1)	trace
Stonewort	10 (<1)	50 (<1)			
Torpedograss	90 (<1)	125 (<1)	244 (<1)	270 (<1)	293 (<1)
<i>Utricularia spp.</i>	trace	trace			
Water hyacinth	10 (<1)	10 (<1)	15 (<1)	88 (<1)	trace
White water lily				67 (<1)	
Grand total	14,695 (13)	11,231 (10)	7,880 (7)	12,871 (12)	5,415 (5)

Stocking history at Sam Rayburn Reservoir, Texas. Size categories are: FRY < 1 inch; FGL = 1-3 inches; ADL = adults.

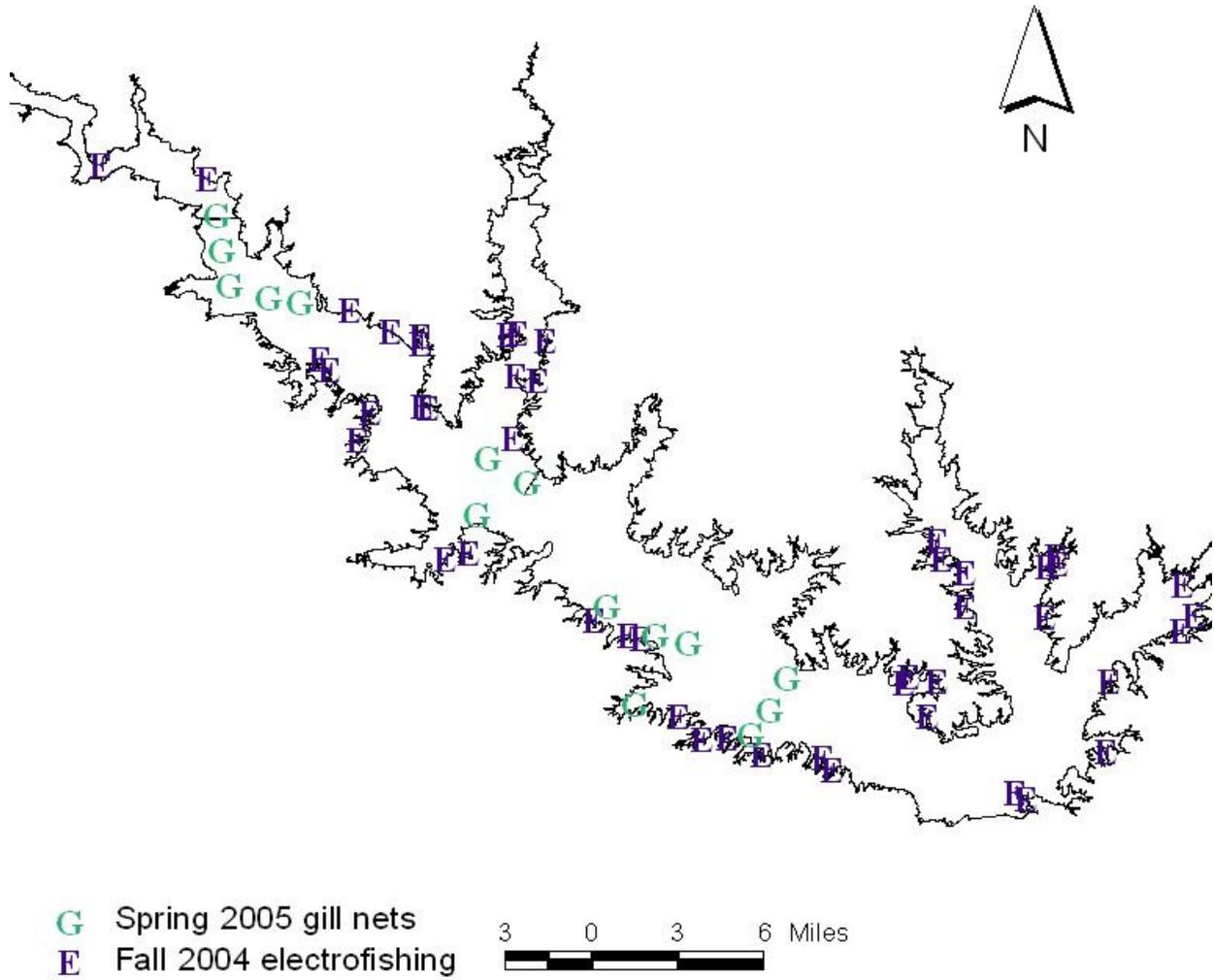
Species	Year	Number	Size
Blue catfish	1966	105,100	FGL
	1987	199,870	FGL
	Total	304,970	
Channel catfish	1966	80,700	FGL
	1973	110,000	FGL
	Total	190,700	
Striped bass	1976	115,108	FGL
	1977	843,161	FGL
	1978	182,800	FGL
	1979	215,490	FGL
	1983	1,000,000	FRY
	Total	2,356,559	
White bass X striped bass	1979	571,400	FRY
	1981	447,528	FRY
	1982	1,000,000	FRY
	1985	1,000,000	FRY
	1987	1,500,000	FRY
	1988	1,100,000	FRY
	1989	1,130,036	FRY
	1989	279,748	FGL
	1991	1,111,683	FRY
	1992	1,347,961	FRY
	1993	1,140,000	FRY
	1994	1,175,000	FRY
	1995	1,469,882	FRY
	1995	943,903	FGL
	1996	116,000	FGL
	1997	186,577	FGL
	1998	574,657	FGL
	1999	289,974	FGL
	2000	290,990	FGL
	Total	15,675,339	
Warmouth	1965	80,000	FGL
	1966	800	FGL
	Total	80,800	

Stocking history (continued).

Species	Year	Number	Size
Longear sunfish	1965	40,000	FGL
	Total	40,000	
Redear sunfish	1966	1,400	FGL
	1967	530,000	FGL
	Total	531,400	
Largemouth bass	1965	364,000	FGL
	1966	97,000	FGL
	1988	21	ADL
	Total	461,021	
Florida largemouth bass	1974	100	ADL
	1975	25,000	FGL
	1976	60,000	FGL
	1977	60,000	FGL
	1978	212,000	FGL
	1980	361,840	FGL
	1983	38,900	FGL
	1987	249,660	FGL
	1990	1,000	ADL
	1994	942,326	FRY
	1995	232,392	FGL
	1996	1,033,017	FGL
	1996	191,051	FRY
	1997	317,729	FRY
	1998	229,200	FGL
	1999	1,406,104	FGL
	2000	510,735	FGL
	2001	500,783	FGL
	2001	273,407	FRY
	2002	1,049,887	FGL
	2003	780,413	FGL
	2003	291,008	FRY
	2004	523,648	FGL
2005	1,026,993	FGL	
Total		10,317,193	

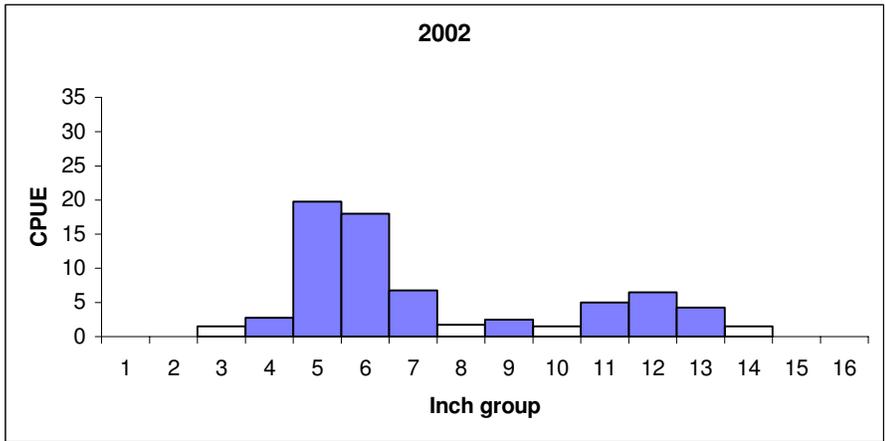
Stocking history (continued).

Species	Year	Number	Size
White crappie	1965	7,000	FGL
	Total	7,000	
Walleye	1973	426,000	FGL
	1974	349,400	FGL
	1975	378,376	FGL
	1976	220,000	FGL
	Total	1,373,776	

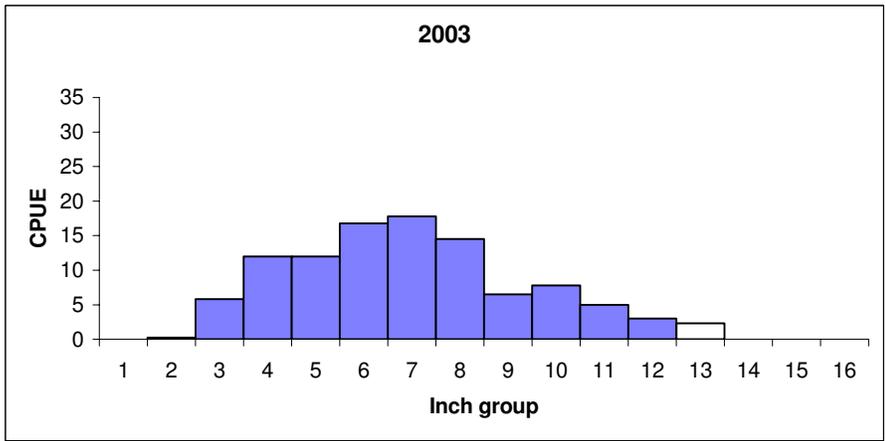


Location of sampling sites, Sam Rayburn Reservoir, Texas, 2004 - 2005.

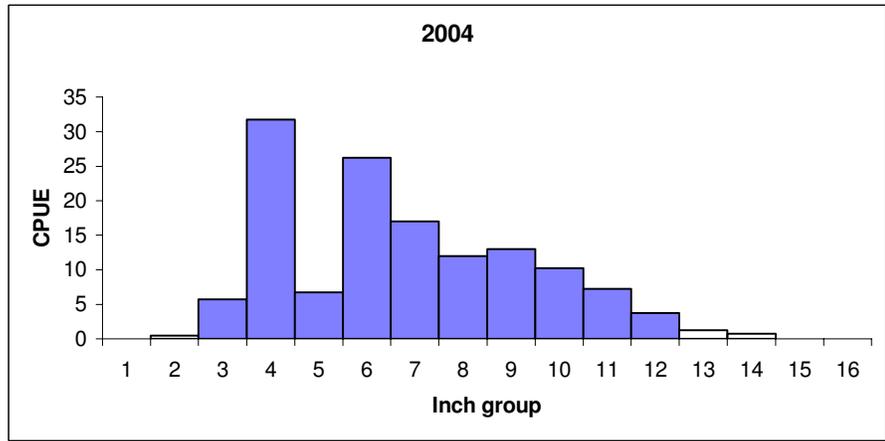
14
Gizzard Shad



Effort = 4
 Total CPUE = 71.8
 Stock CPUE = 29.8
 PSD = 58



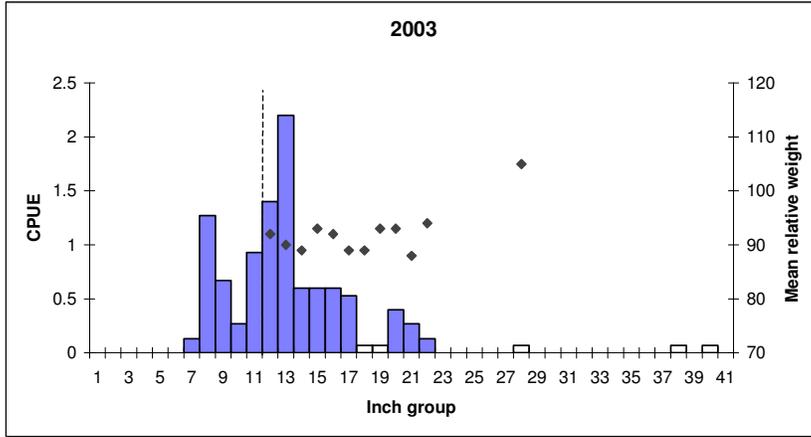
Effort = 4
 Total CPUE = 103.5
 Stock CPUE = 56.9
 PSD = 18



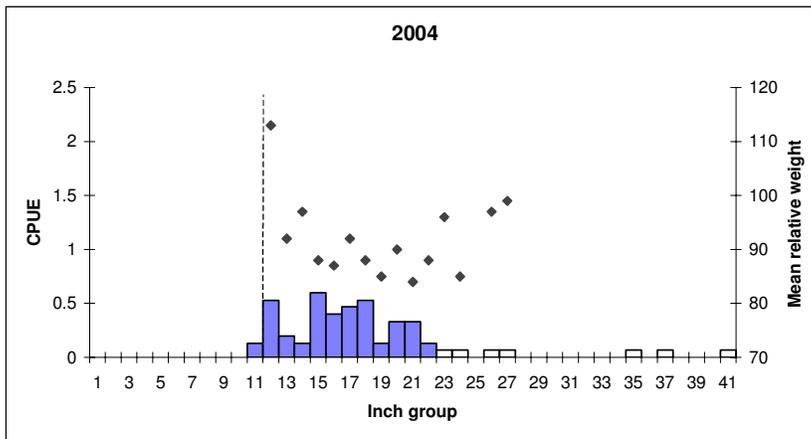
Effort = 4
 Total CPUE = 136.3
 Stock CPUE = 65.3
 PSD = 20

Number of gizzard shad caught per hour (CPUE, bars) and population indices for fall electrofishing surveys, Sam Rayburn Reservoir, Texas.

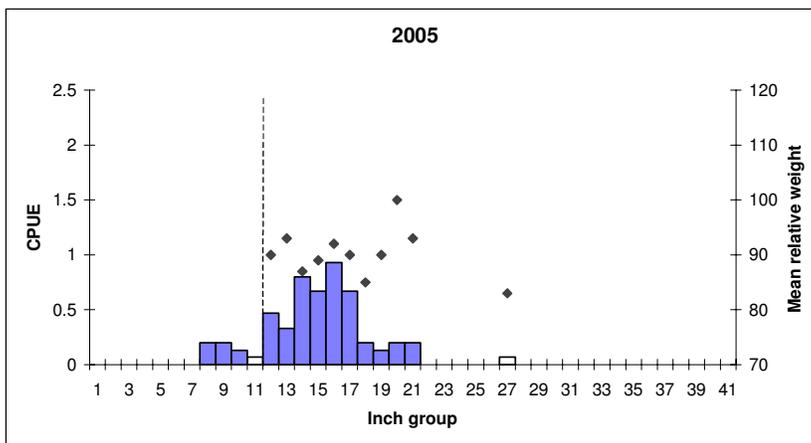
Blue Catfish



Effort = 15
 Total CPUE = 10.4
 Stock CPUE = 7.1
 PSD = 14



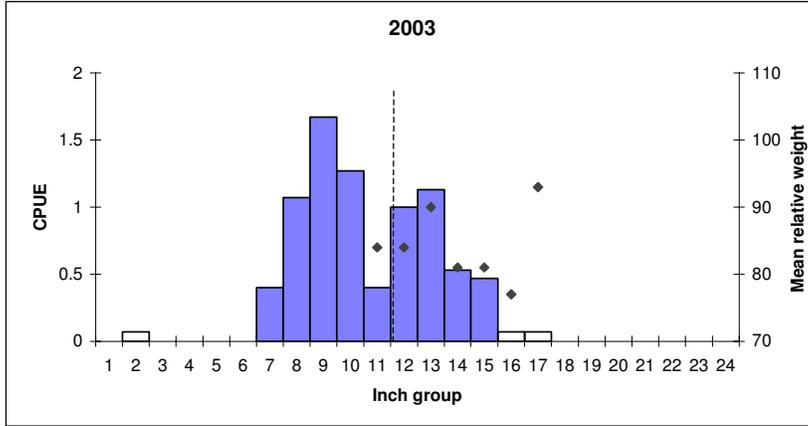
Effort = 15
 Total CPUE = 4.4
 Stock CPUE = 4.3
 PSD = 30



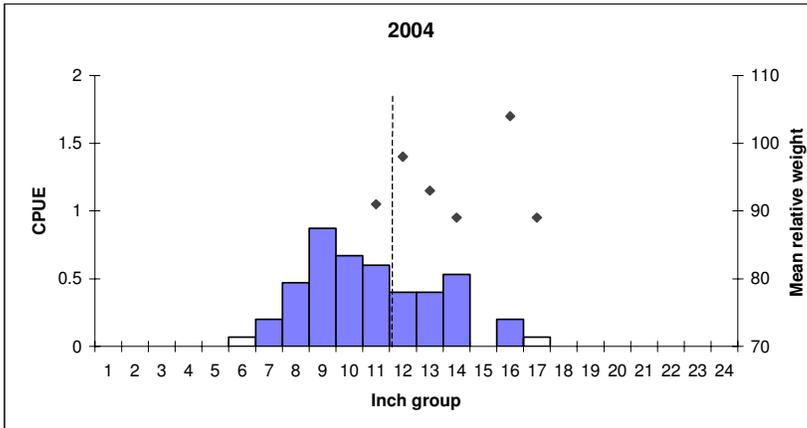
Effort = 15
 Total CPUE = 5.3
 Stock CPUE = 4.7
 PSD = 10

Number of blue catfish caught per net night (CPUE, bars), mean relative weight (lines), and population indices for winter gill net surveys, Sam Rayburn Reservoir, Texas. Broken vertical lines denote minimum legal length.

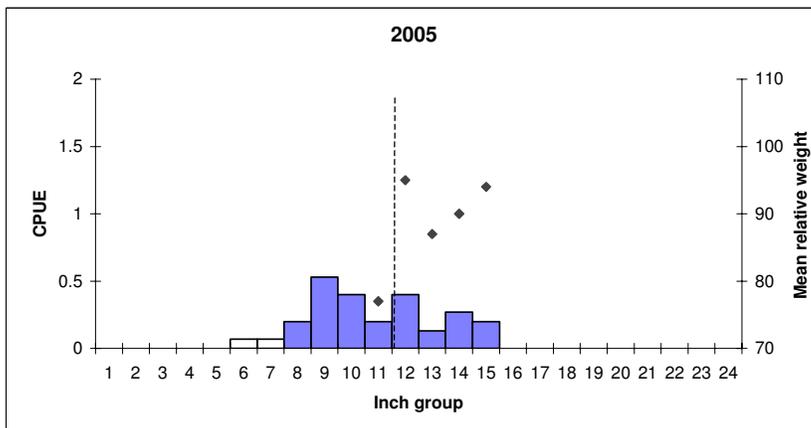
Channel Catfish



Effort = 15
 Total CPUE = 8.2
 Stock CPUE = 3.7
 PSD = 4



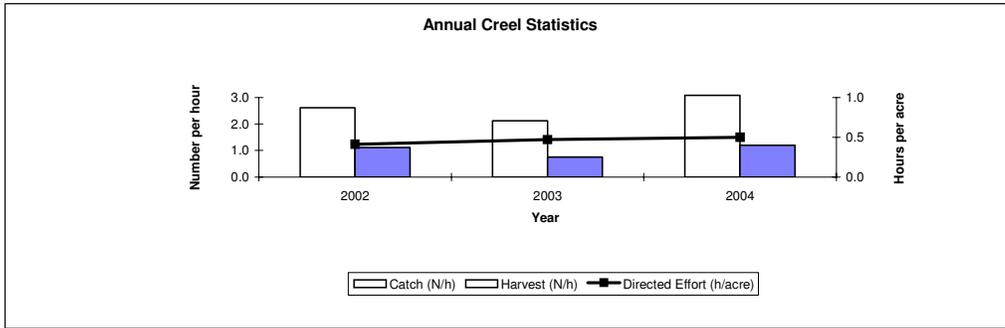
Effort = 15
 Total CPUE = 4.5
 Stock CPUE = 2.2
 PSD = 12



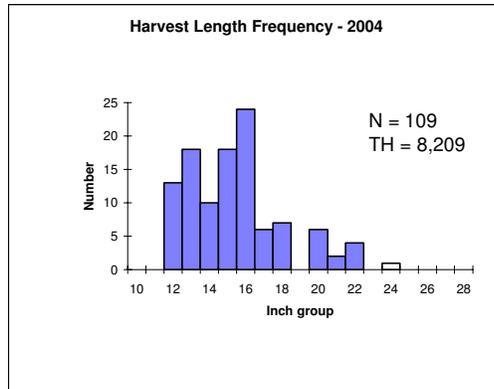
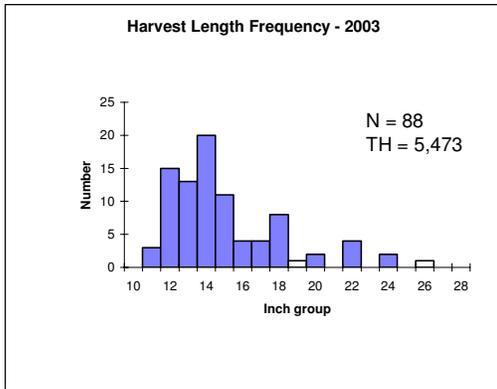
Effort = 15
 Total CPUE = 2.5
 Stock CPUE = 1.2
 PSD = 0

Number of channel catfish caught per net night (CPUE, bars), mean relative weight (lines), and population indices for winter gill net surveys, Sam Rayburn Reservoir, Texas. Broken vertical lines denote minimum legal length.

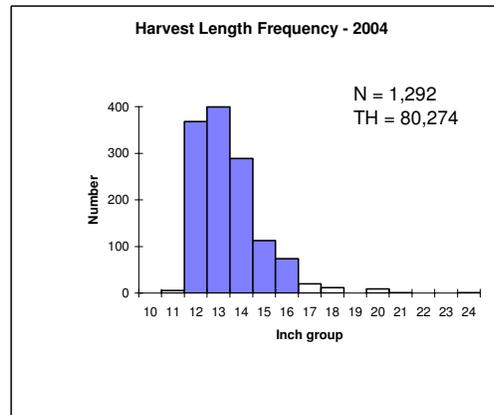
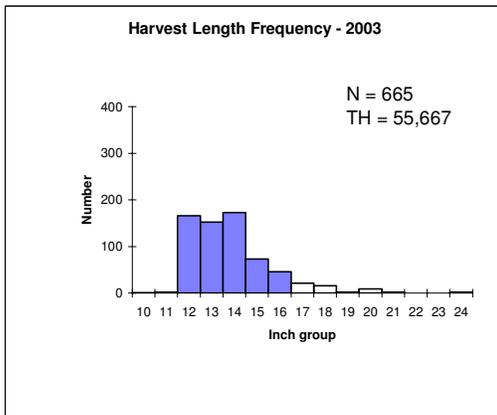
Catfishes



Annual creel statistics for anglers seeking catfishes at Sam Rayburn Reservoir, Texas. Creel periods were from June through May.

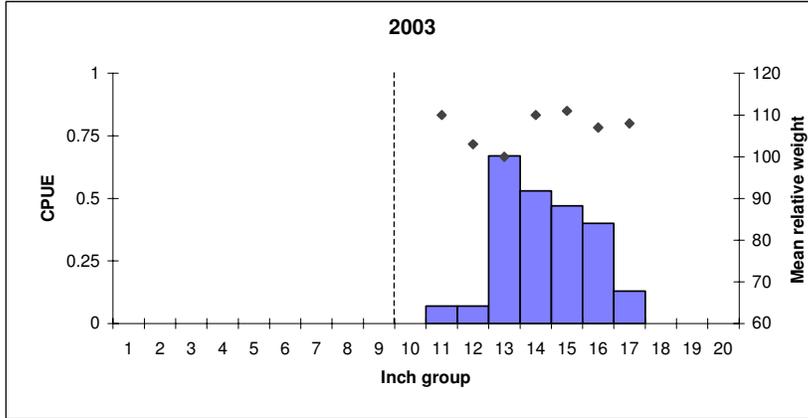


Length frequency of harvested blue catfish observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. The minimum length limit is 12 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

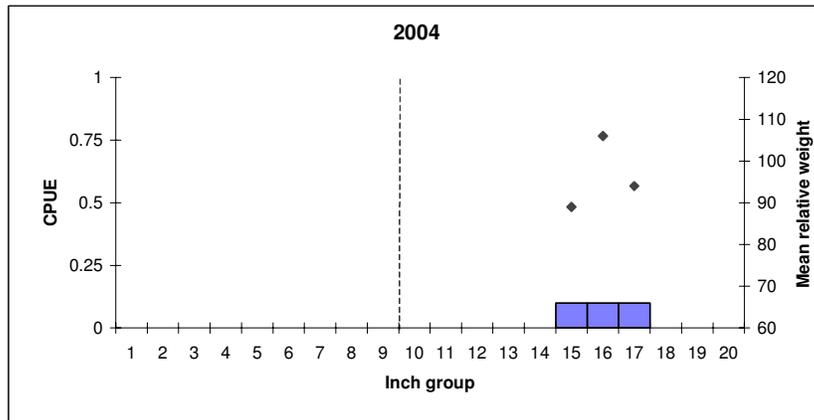


Length frequency of harvested channel catfish observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. The minimum length limit is 12 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

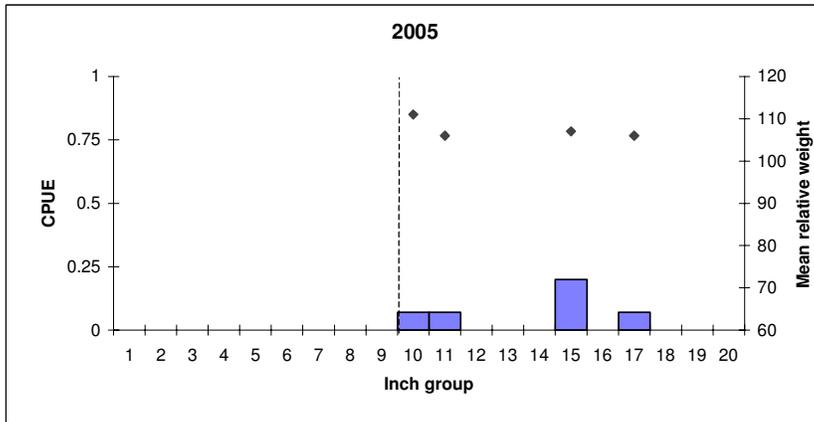
White Bass



Effort = 15
 Total CPUE = 2.4
 Stock CPUE = 2.4
 PSD = 100



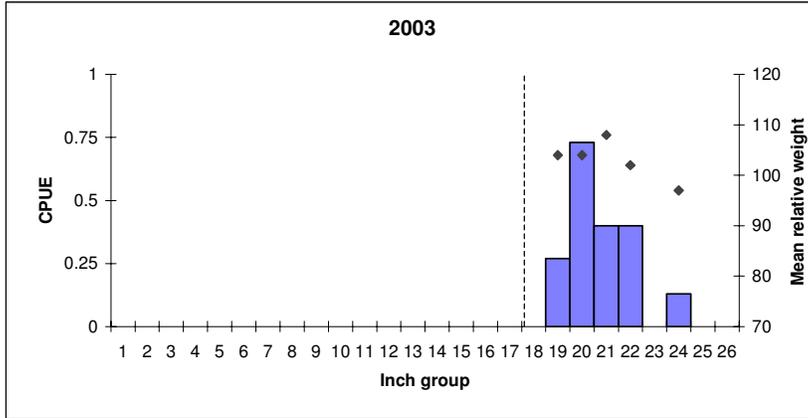
Effort = 15
 Total CPUE = 0.3
 Stock CPUE = 0.3
 PSD = 100



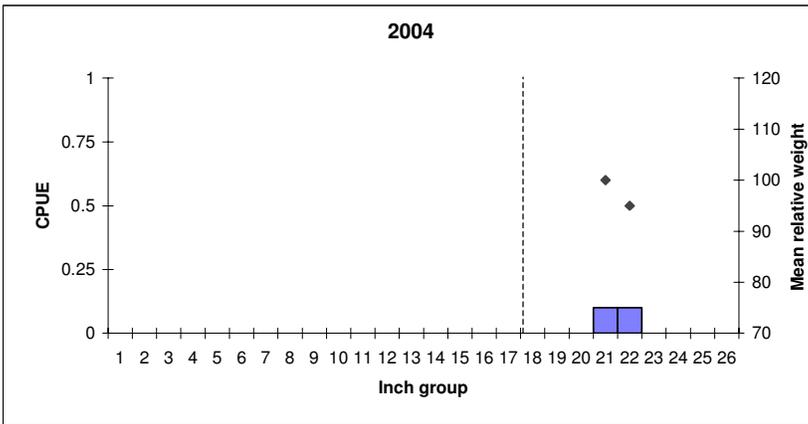
Effort = 15
 Total CPUE = 0.4
 Stock CPUE = 0.4
 PSD = 100

Number of white bass caught per net night (CPUE, bars), mean relative weight (lines), and population indices for winter gill net surveys, Sam Rayburn Reservoir, Texas. Broken vertical lines denote minimum legal length.

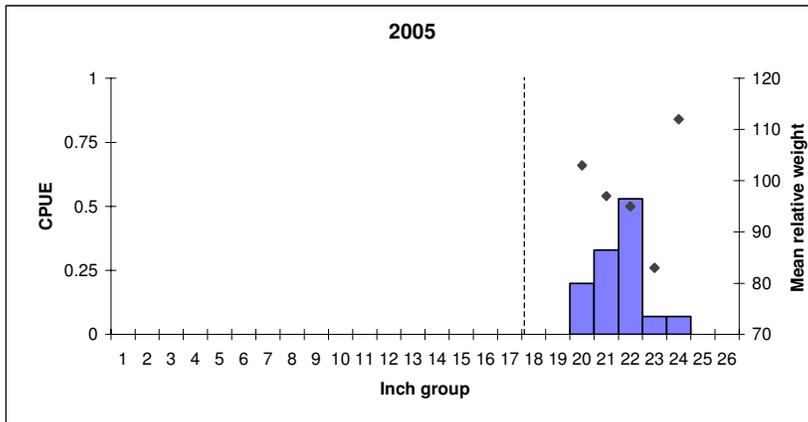
Palmetto bass



Effort = 15
 Total CPUE = 1.9
 Stock CPUE = 1.9
 PSD = 100



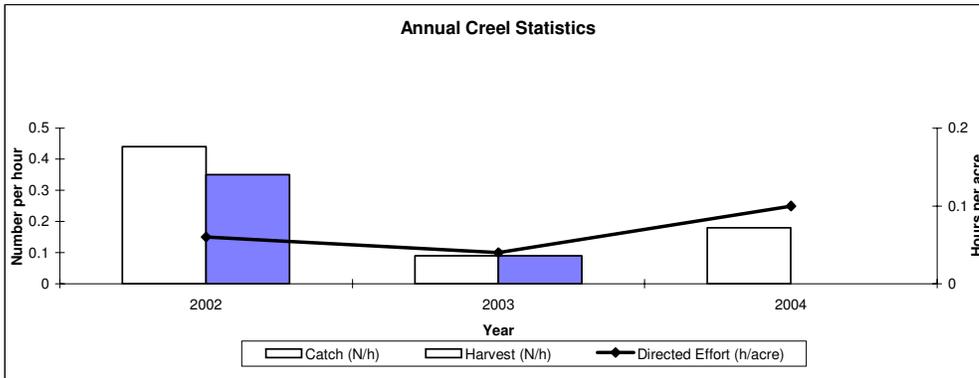
Effort = 15
 Total CPUE = 0.1
 Stock CPUE = 0.1
 PSD = 100



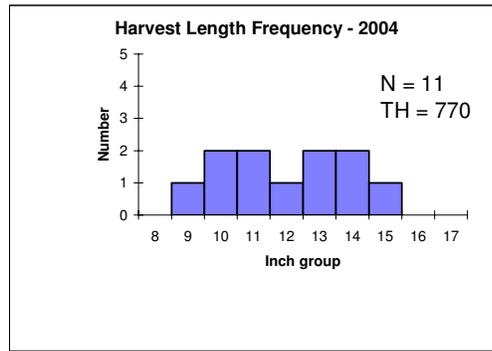
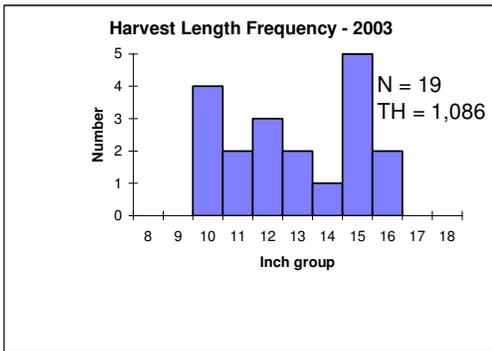
Effort = 15
 Total CPUE = 1.2
 Stock CPUE = 1.2
 PSD = 100

Number of palmetto bass caught per net night (CPUE, bars), mean relative weight (lines), and population indices for winter gill net surveys, Sam Rayburn Reservoir, Texas. Broken vertical lines denote minimum legal length.

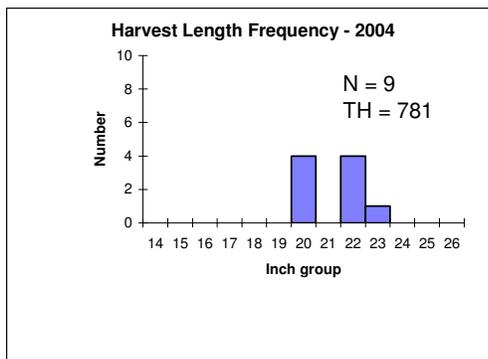
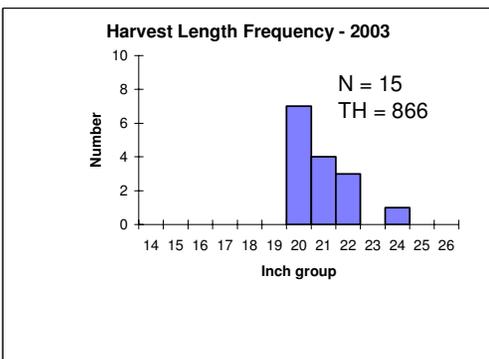
Temperate Basses



Annual creel statistics for anglers seeking temperate basses at Sam Rayburn Reservoir, Texas. Creel periods were from June through May.

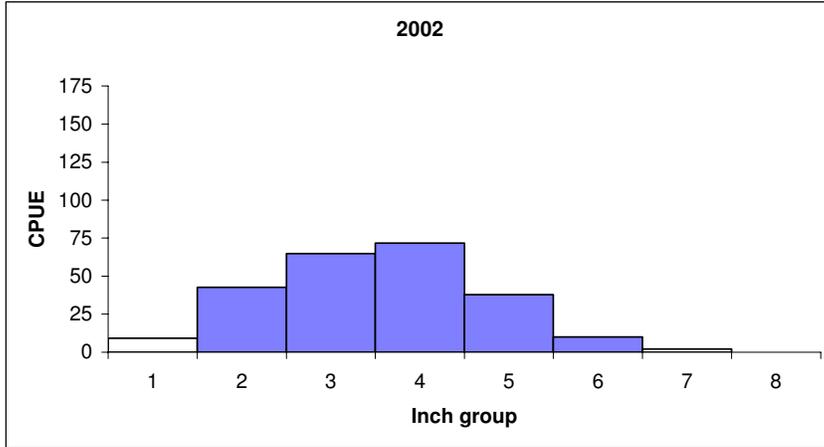


Length frequency of harvested white bass observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. The minimum length limit is 10 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

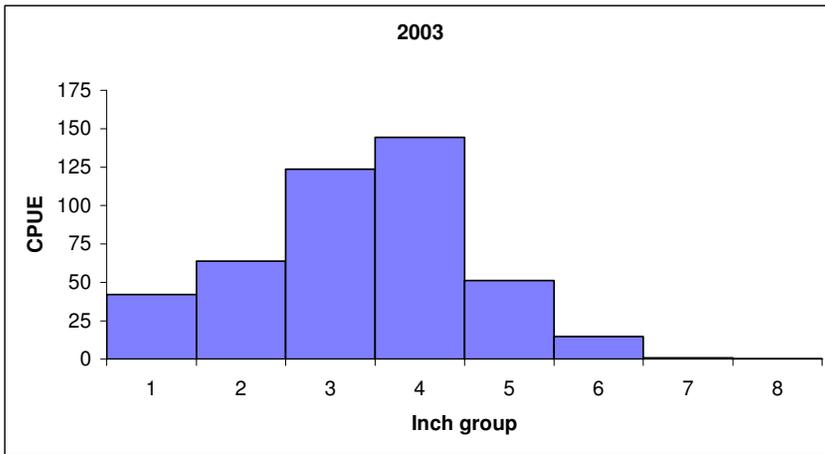


Length frequency of harvested palmetto bass observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. The minimum length limit is 18 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

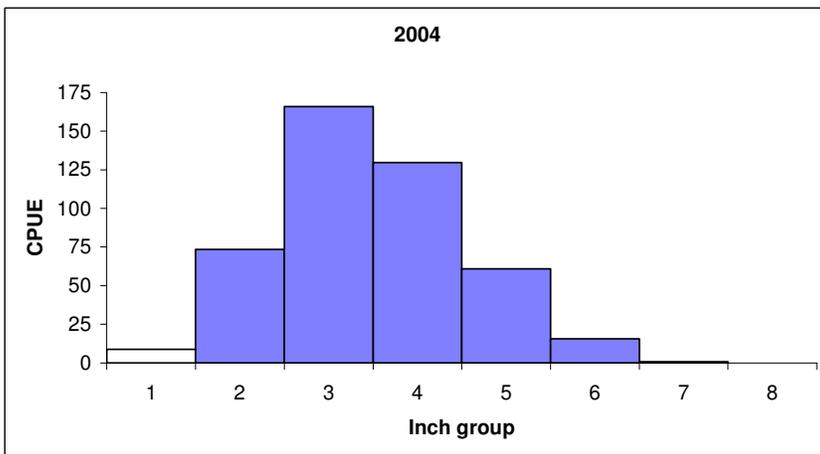
Bluegill



Effort = 4
 Total CPUE = 238.5
 Stock CPUE = 186.5
 PSD = 6



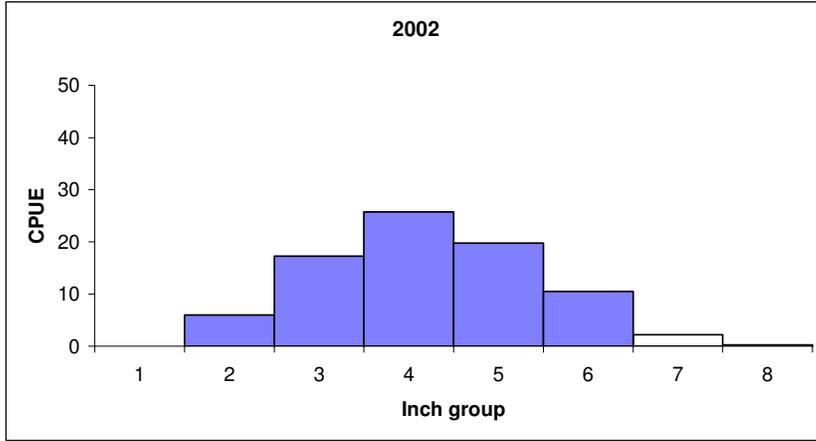
Effort = 4
 Total CPUE = 440.8
 Stock CPUE = 335.5
 PSD = 5



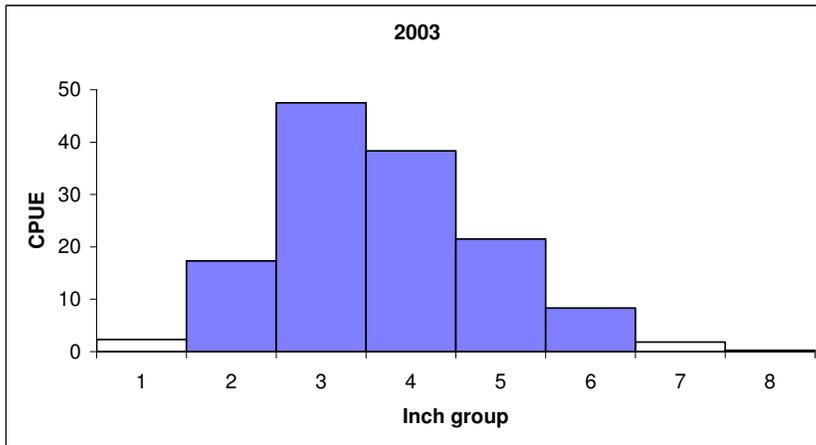
Effort = 4
 Total CPUE = 455.3
 Stock CPUE = 373.0
 PSD = 4

Number of bluegill caught per hour (CPUE, bars) and population indices for fall electrofishing surveys, Sam Rayburn Reservoir, Texas.

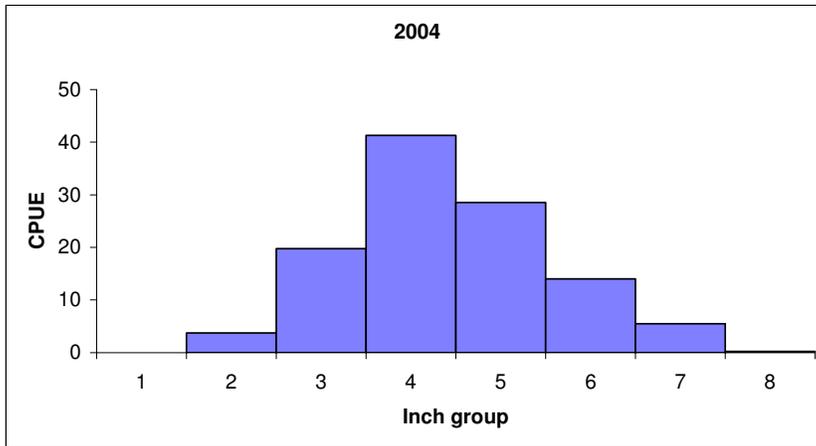
Redear Sunfish



Effort = 4
 Total CPUE = 81.8
 Stock CPUE = 58.5
 PSD = 4



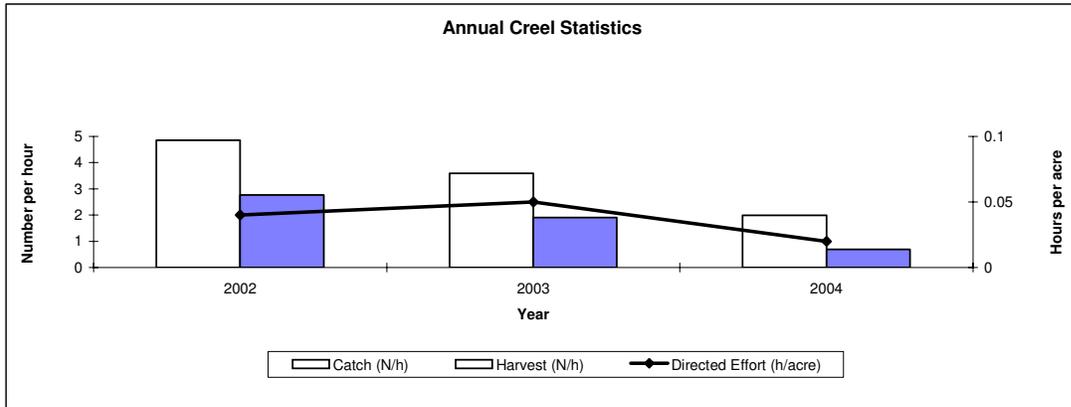
Effort = 4
 Total CPUE = 137.0
 Stock CPUE = 70.2
 PSD = 3



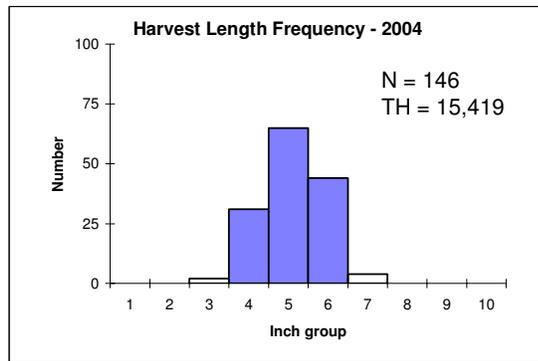
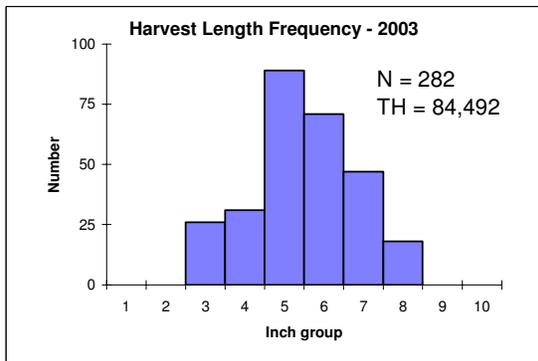
Effort = 4
 Total CPUE = 113.0
 Stock CPUE = 89.5
 PSD = 6

Number of redear sunfish caught per hour (CPUE, bars) and population indices for fall electrofishing surveys, Sam Rayburn Reservoir, Texas.

Sunfishes

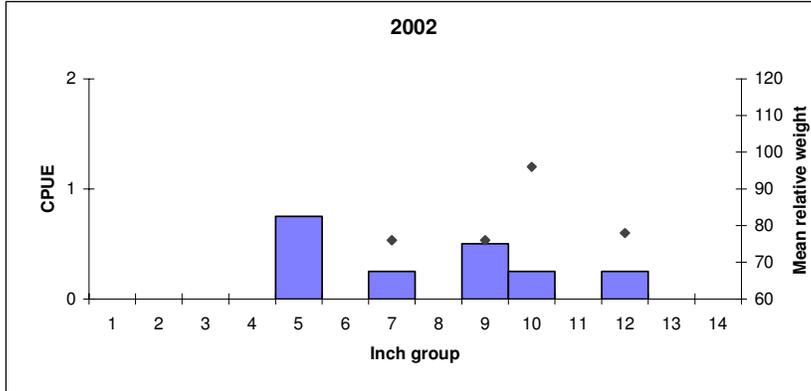


Annual creel statistics for anglers seeking sunfishes at Sam Rayburn Reservoir, Texas. Creel periods were from June through May.

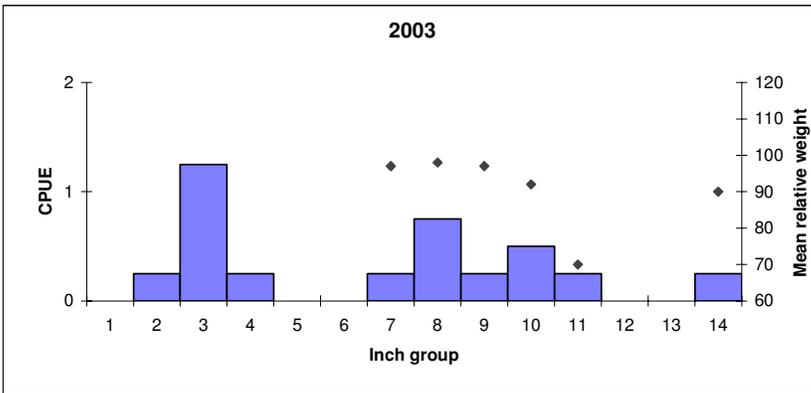


Length frequency of harvested bluegill observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

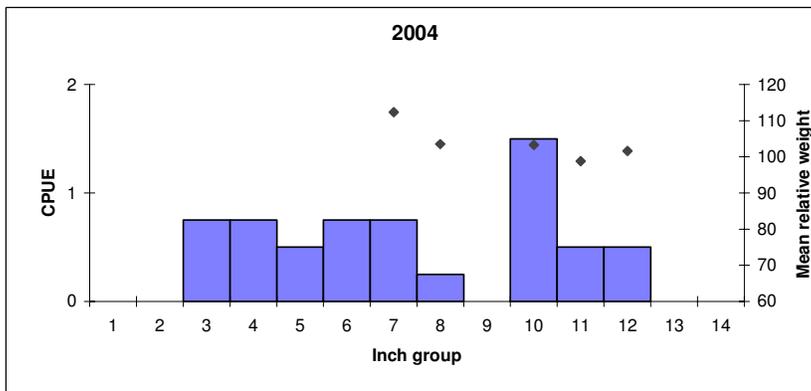
Spotted Bass



Effort = 4
 Total CPUE = 2.0
 Stock CPUE = 1.3
 PSD = 20



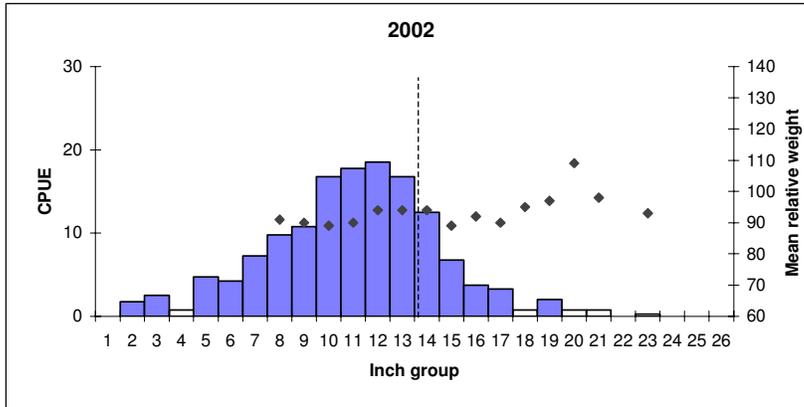
Effort = 4
 Total CPUE = 4.0
 Stock CPUE = 2.3
 PSD = 22



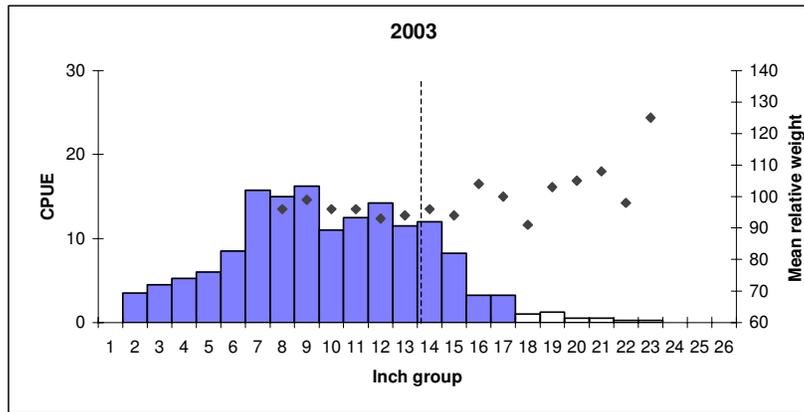
Effort = 4
 Total CPUE = 6.3
 Stock CPUE = 3.5
 PSD = 29

Number of spotted bass caught per hour (CPUE, bars), mean relative weight (lines), and population indices for fall electrofishing surveys, Sam Rayburn Reservoir, Texas.

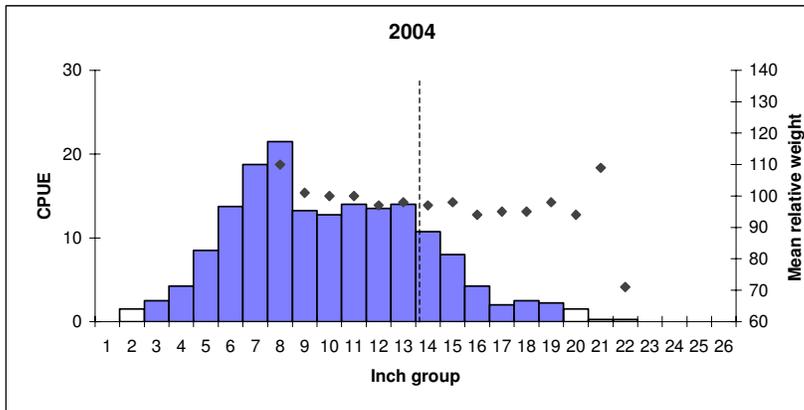
Largemouth Bass



Effort = 4
 Total CPUE = 142.3
 Stock CPUE = 121.0
 PSD = 55
 RSD-14 = 25
 % FLMB = 5.8



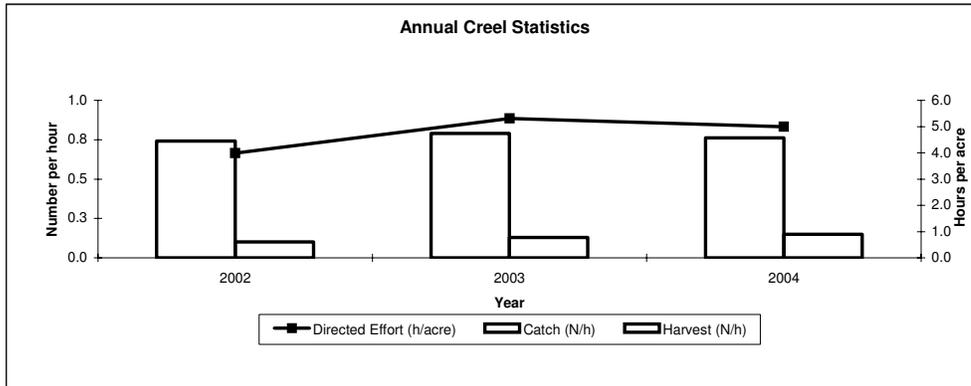
Effort = 4
 Total CPUE = 154.5
 Stock CPUE = 111.0
 PSD = 50
 RSD-14 = 27
 % FLMB = 10.1



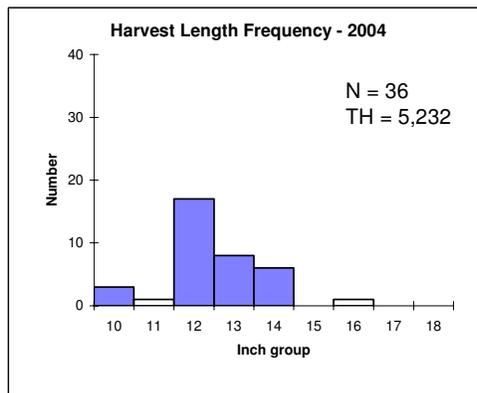
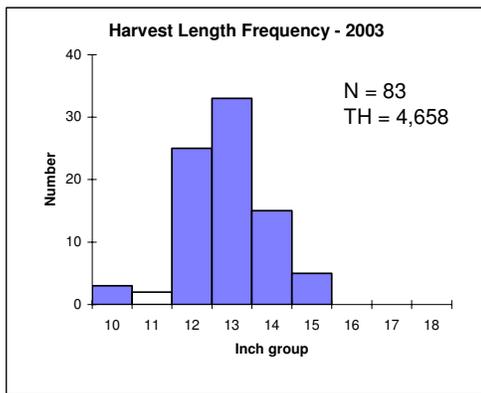
Effort = 4
 Total CPUE = 170.0
 Stock CPUE = 120.8
 PSD = 49
 RSD-14 = 26
 % FLMB = 9.8

Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (lines), and population indices for fall electrofishing surveys, Sam Rayburn Reservoir, Texas. % FLMB = percent of pure Florida largemouth bass present in a subsample of age-0 fish. Broken vertical lines denote minimum legal length.

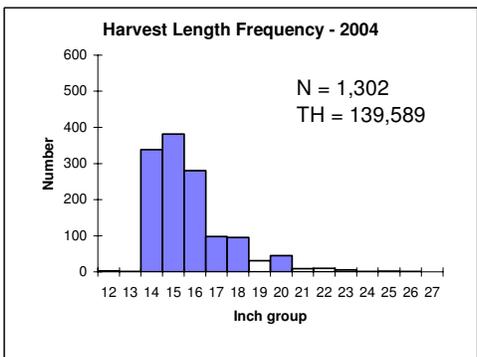
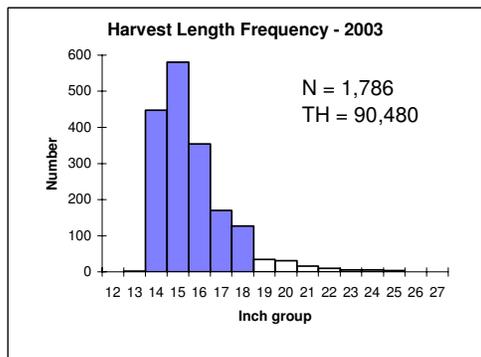
Black Bases



Annual creel statistics for anglers seeking black basses at Sam Rayburn Reservoir, Texas. Creel periods were from June through May.

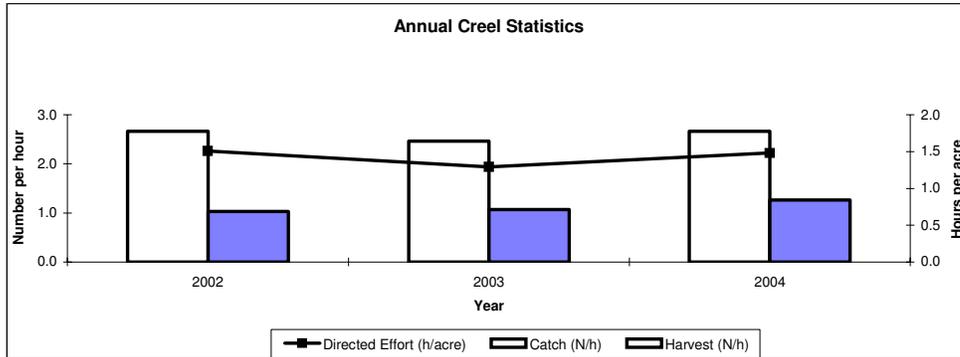


Length frequency of harvested spotted bass observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

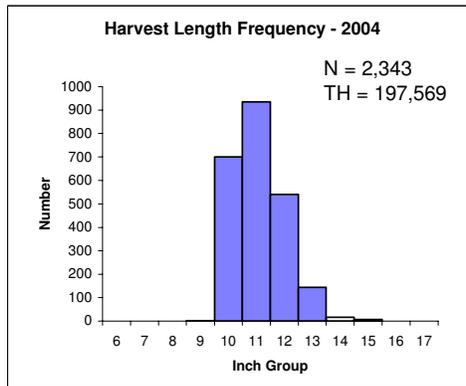
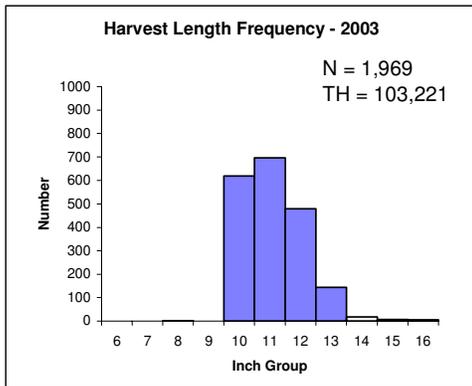


Length frequency of harvested largemouth bass observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. The minimum length limit is 14 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

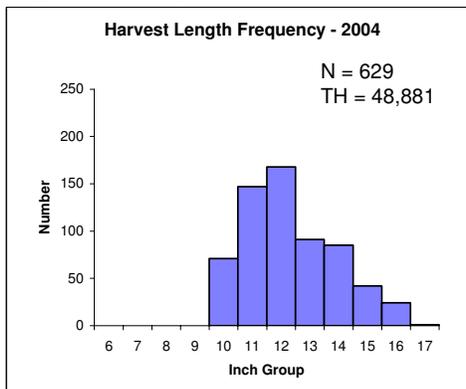
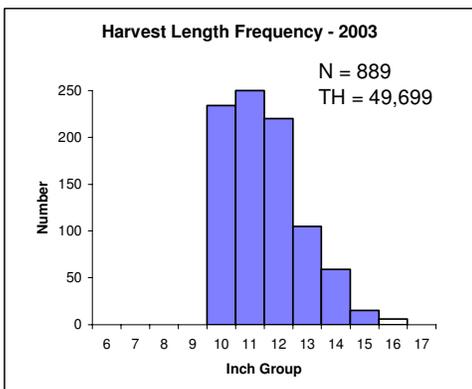
Crappie



Annual creel statistics for anglers seeking crappie at Sam Rayburn Reservoir, Texas. Creel periods were from June through May.



Length frequency of harvested black crappie observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. The minimum length limit is 10 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.



Length frequency of harvested white crappie observed during creel surveys at Sam Rayburn Reservoir, Texas, June through May, all anglers combined. The minimum length limit is 10 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

Fisheries Management Plan
Sam Rayburn Reservoir, Texas
Prepared - July 2005

ISSUE 1

Sam Rayburn Reservoir supports a nationally recognized largemouth bass fishery and its contribution to the local economy is likely high, as the total economic value of the reservoir has been estimated at \$15,100,401 (Anderson et al. 2002). Creel surveys indicate that 66% of anglers pursue black bass and the reservoir supports a substantial number of bass tournaments annually. Questions were incorporated into the Anderson et al. (2002) economic impact study to obtain angler opinions regarding alternative largemouth bass regulations (i.e., 16-inch minimum and 14 - 18-inch slot length limits). Almost half (47%) of Sam Rayburn anglers preferred a more restrictive length limit. In response to angler opinion, an annual largemouth bass exploitation study was completed in October 2004. Annual exploitation was relatively low (11%) and population modeling revealed that more restrictive length limits would provide little fishery benefit.

MANAGEMENT STRATEGIES

1. Continue the management of the largemouth bass fishery under the current harvest regulations. Examine largemouth bass growth every four years.
2. Publish results and conclusions of exploitation study in local media outlets and scientific journals.
3. Continue to stock Florida largemouth bass annually to maintain and improve the trophy largemouth bass population. Embayment stockings (100 fish/acre stocked in a 5,000-acre area) initiated in 2000 have been successful. The Caney Creek embayment has maintained > 20% pure FLMB two years post-stocking. Monitoring of the Ayish Bayou embayment will begin in Fall 2005.
4. Both electrofishing and creel surveys provide limited information on the relative abundance of large (>20 inches) bass. Due to the substantial number of bass tournaments held at the reservoir, the tournament-monitoring program is providing reliable trend information for larger fish and will continue.
5. Although the annual largemouth bass exploitation study indicated that only 5% of the largemouth bass population > 14 inches are handled by tournament anglers, promoting fish handling procedures that minimize

tournament-related mortality could reduce conflicts with non-tournament anglers. Continue to distribute this information to tournament anglers and organizers.

6. Conduct electrofishing and creel surveys annually to monitor status of largemouth bass population. Use re-sampling program developed by Dumont and Schlechte (2004) to determine effort for electrofishing surveys.

ISSUE 2 Giant salvinia is present in nearby Toledo Bend Reservoir. Transport to Sam Rayburn Reservoir is likely.

MANAGEMENT STRATEGIES

1. In an attempt to educate the public about giant salvinia and discourage introduction into Sam Rayburn Reservoir, warning signs have been posted at all major Toledo Bend Reservoir-Texas access points.
2. If giant salvinia is found at Sam Rayburn Reservoir, aggressive treatment with herbicides should be initiated to eradicate this plant.

ISSUE 3 The crappie fishery at Sam Rayburn Reservoir is significant, accounting for 20% of the total annual fishing effort. During June 2004 – May 2005, estimated harvest was approximately 250,000 fish.

MANAGEMENT STRATEGIES

1. Due to the ineffectiveness of trap netting at Sam Rayburn Reservoir, annual creel surveys will be conducted to monitor crappie populations and the fishery.

ISSUE 4 A considerable catfish fishery exists at Sam Rayburn Reservoir. Based on directed effort from rod and reel anglers, only largemouth bass and crappie are sought more frequently. In addition, the majority of the actual directed catfish effort is likely due to passive gear anglers.

MANAGEMENT STRATEGIES

1. Conduct gillnetting surveys every two years to monitor the status of catfish populations and examine growth every four years to ensure the 12-inch minimum length limit is appropriate.

ISSUE 5 Area constituents are passionate about Sam Rayburn Reservoir. As a result,

these anglers are interested in any departmental activities and management actions directed at the reservoir.

MANAGEMENT STRATEGIES

1. Since March of 2000, monthly popular articles have been submitted to the Lakecaster, a newsletter distributed to approximately 30 counties and parishes in both Texas and Louisiana. Article topics are focused on departmental activities on Sam Rayburn and Toledo Bend reservoirs. Public feedback has been positive. Continue to submit popular articles on a monthly basis.

APPENDIX 1

Number (N) and catch per unit effort (CPUE) of species collected from fall electrofishing (October 2004) and gill nets (February 2005), Sam Rayburn Reservoir, Texas. Electrofishing CPUE is the number of fish per hour, while gill net CPUE is the number of fish per net night. Only data from targeted species were recorded from electrofishing.

Species	<u>Gill net</u>		<u>Fall electrofishing</u>	
	N	CPUE	N	CPUE
Spotted gar	3	0.2		
Longnose gar	1	0.1		
Gizzard shad	89	5.9	545	136.3
Threadfin shad			390	97.5
Spotted sucker	4	0.3		
Blue catfish	79	5.3		
Channel catfish	37	2.5		
White bass	6	0.4		
Palmetto bass	18	1.2		
Yellow bass	5	0.3		
Redbreast sunfish			48	12.0
Warmouth			83	20.8
Bluegill			1,821	455.3
Longear sunfish			75	18.8
Redear sunfish			452	113.0
Spotted sunfish			13	3.3
Spotted bass	18	1.2	25	6.3
Largemouth bass	17	1.1	680	170.0
White crappie	2	0.1		
Black crappie	19	1.3		
Freshwater drum	28	1.9		

APPENDIX 2

Results of electrophoretic analysis of largemouth bass collected by electrofishing from Sam Rayburn Reservoir, Texas, 2000-2004.

Year	Sample size	Genotype				% Florida largemouth bass alleles	%Pure Florida largemouth bass
		Florida	F1	FX	Northern		
2000	49	1	13	26	9	35.1	2.0
2001	54	3	17	31	3	46.1	5.6
2002	69	4	14	44	7	44.5	5.8
2002 ^a	50	16	9	25	0	57.1	32.5
2003	89	9	21	46	13	44.2	10.1
2003 ^a	40	8	10	20	2	62.4	25.0
2004	91	9	18	46	18	40.0	9.8
2004 ^a	50	17	10	22	1	70.5	34.0

^aResults from stocking embayment

APPENDIX 3

Results from individual and team format bass tournaments at Sam Rayburn Reservoir, 2003 - 2004. Only tournaments with 5-fish bag limits and > 50 participants or teams were included. Weights are expressed in pounds.

Year	N	1 st place weight	2 nd place weight	3 rd place weight	% total weights > 15 lbs.	% catching limit	Big bass weight
<u>Individual</u>							
2003	9	20.6	19.0	17.5	5.5	29.3	8.2
2004	13	21.0	19.2	18.0	7.8	37.7	8.3
<u>Team</u>							
2003	14	21.9	20.3	18.7	11.0	44.5	9.5
2004	20	22.6	20.6	19.0	10.8	39.0	8.5

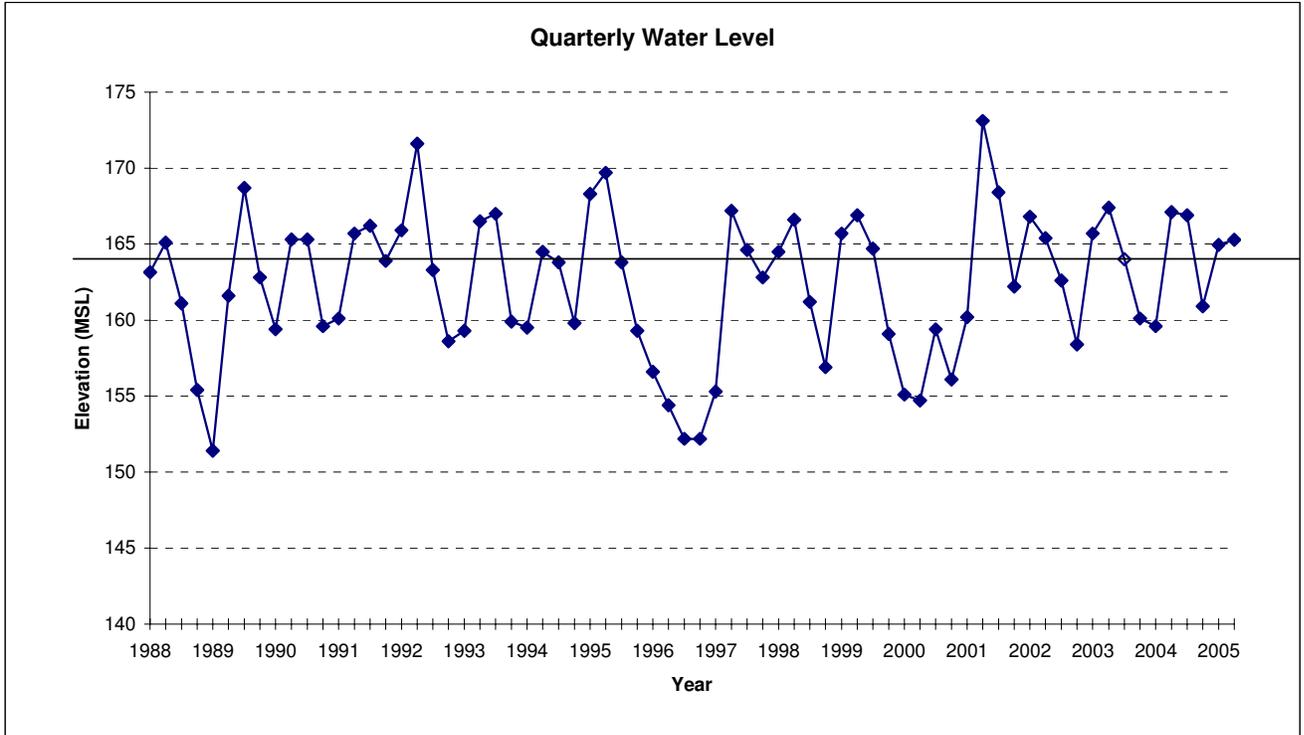
APPENDIX 4

Results of Sealy Outdoors McDonald's Big Bass Splash tournaments, Sam Rayburn Reservoir, 1997 – 2005. Number of participants exceeded 2,500 each year. Weights are expressed in pounds. Sample sizes are in parentheses.

Year	Average Weight of Top 10 Fish/Hour/Day	Average Weight of Top 10 Fish/Day	Average Weight of Overall Top 10 Fish	Weight of Overall Big Fish
1997 ^a	6.42 (240)	8.35 (30)	9.07 (10)	10.58
1998 ^a	5.99 (239)	9.33 (30)	10.57 (10)	12.10
1999	4.92 (240)	7.21 (30)	8.16 (10)	8.84
2000	5.71 (240)	8.06 (30)	9.08 (10)	10.02
2001	4.80 (240)	6.99 (30)	7.99 (10)	9.64
2002	5.95 (240)	8.21 (30)	9.28 (10)	10.52
2003	6.07 (240)	8.52 (30)	9.32 (10)	10.18
2004	6.80 (240)	8.95 (30)	9.98 (10)	11.83
2005	6.45 (240)	8.81 (30)	9.93 (10)	11.57

^a1997 and 1998 were pre-LMBV fish kill

APPENDIX 5



Quarterly water level elevations in feet above mean sea level (MSL) recorded for Sam Rayburn Reservoir, Texas. Horizontal line represents conservation level (164.4 feet MSL).