

PERFORMANCE REPORT

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FEDERAL AID PROJECT F-30-R-32

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2006 Survey Report

Proctor Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Proctor Reservoir were surveyed in 2006 using electrofishing and trap nets, and in 2007 using gill nets. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Proctor Reservoir is a 4,610-acre flood-control reservoir constructed on the Leon River 10 miles north of Comanche, Texas. It has a history of significant water level fluctuations. The reservoir filled in spring of 2001 after dropping to 20 ft. below conservation level from 1998 to fall 2000. It was 5 ft. below conservation level during sampling in 2006. Habitat features at the time of sampling consisted primarily of nondescript shoreline and rocky areas. Angler and boat access was excellent.
- **Management History:** Important sport fish include largemouth bass, palmetto bass, white crappie, white bass, and channel catfish. Palmetto bass have been stocked almost every year since 1978 to maintain the population. Drought conditions during the period between 1999 and early 2001 combined with reduced stocking rates between 1999 and 2000 (with no stocking in 2001) negatively impacted the abundance of palmetto bass. As water level increased, palmetto bass stocking resumed at a rate of 15/acre. The drought also adversely impacted the largemouth bass population. To help remedy this, Florida-strain largemouth bass were stocked in 2001, and a 16-inch minimum length limit was implemented in 2002.
- **Fish Community**
 - **Prey species:** Electrofishing catch of gizzard shad was good and a high proportion (98%) was available as prey to most sport fish. Electrofishing catch of bluegill was adequate and size structure had improved since 2002.
 - **Catfishes:** The catch rate for channel catfish had improved as had population size structure, resulting in more harvestable-size fish being available to anglers. Fish up to 21 inches in length were recorded. Blue catfish were present in very low numbers.
 - **Temperate basses:** White bass and palmetto bass catch rate, size structure, and proportion of fish over harvestable-size were excellent. This should provide some exceptional fishing opportunities for anglers.
 - **Largemouth bass:** Size structure was adequate and abundance of stock-size fish had improved since 2002, as had the proportion of harvestable-size fish (i.e., ≥ 16 inches in length). These improvements have occurred since the introduction of the 16-inch minimum length limit in 2002.
 - **Crappie:** Abundance and size structure of white crappie were excellent; 81% of the sample consisted of legal-size fish, which should translate to some exceptional angling opportunities. Black crappie were present in low numbers.
- **Management Strategies:** Based on current data, this reservoir should continue to be managed with existing regulations. Continue stocking palmetto bass to maintain the population and evaluate with gill nets. Continue bi-annual electrofishing surveys to evaluate the 16-inch minimum length limit on largemouth bass. A mandatory standard survey is scheduled to be carried out in 2010-2011 with trap nets, gill nets, and electrofishing gear to assess important fish populations.

INTRODUCTION

This document is a summary of fisheries data collected from Proctor Reservoir in 2006-2007. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fish was collected, this report deals primarily with major sport fish and important prey species. Historical data are presented with the 2006-2007 data for comparison.

Reservoir Description

Proctor Reservoir is a 4,610-acre impoundment constructed in 1963 on the Leon River. It is located in Comanche County approximately 10 miles north of the town of Comanche and about 89 miles southeast of Abilene. The reservoir is operated and controlled by the U.S. Army Corps of Engineers. Primary water uses include flood control and recreation. Land use around the reservoir is primarily agricultural and pastureland. Habitat at time of sampling consisted mainly of nondescript shoreline, rocky areas and submerged terrestrial vegetation. There was no significant submerged aquatic vegetation in the reservoir. Water level has been highly variable; the last major decline was from 1999 to early 2001. During this time the water level dropped to 20 ft. below conservation level. By spring 2001, the water level had returned to conservation level, but was down 5 ft. at the time of sampling (Figure 1). Proctor Reservoir was eutrophic based on Carlson's Trophic State Index for Chlorophyll-*a* (TSI Chl-*a*) with a mean TSI chl-*a* of 53.01 and a trend that indicated an increase in algal content (Texas Commission on Environmental Quality 2005). Boat access consisted of seven public boat ramps and there were three fishing piers. Other descriptive characteristics for Proctor Reservoir are shown in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Dumont and Jons 2003) included:

1. Stock palmetto bass annually at 15/acre.
Action: Palmetto bass were stocked at a rate of approximately 15/acre in 2004, 2005 and 2006 to provide a boost to the population previously impacted by drought and a reduced stocking rate. No fish were available for stocking in 2003.
2. Conduct spring/summer creel survey in 2005 and/or 2006 to document presence/absence of palmetto bass fishery.
Action: A creel survey was conducted at three gated access points by park staff of the U.S. Army Corps of Engineers from March through July 2004. The survey revealed that a palmetto bass fishery was present with 17% of anglers targeting this species (N=3,326). This is a significant proportion of this fishery considering that anglers targeted a variety of species with the most popular category being "anything" (25%).
3. Conduct gill net survey every four years to determine status of the palmetto bass population.
Action: A gill net survey was conducted on schedule in 2007, the results of which indicated a significant improvement in the palmetto bass population.
4. Evaluate the 16-inch minimum length limit on largemouth bass with bi-annual fall electrofishing surveys.
Action: Electrofishing surveys were carried out on schedule in 2004 and 2006 to evaluate the 16-inch minimum length limit on largemouth bass, which was implemented in 2002. The data showed a gradual improvement in the proportion of fish above 16 inches in length since the 2002 survey was carried out.

Harvest regulation history: Sport fish in Proctor Reservoir are currently managed with statewide regulations with the exception of largemouth bass. The minimum length limit for largemouth bass changed from 14 inches to 16 inches in 2002 (Table 2).

Stocking history: Palmetto bass were originally stocked in 1978 and have been stocked nearly every year since then to maintain the population. Florida-strain largemouth bass were first stocked in 1979. They were last stocked in 2001 to bolster the population, taking advantage of the abundant habitat made

available when the reservoir filled after nearly three years of drought. Stockings of largemouth bass were carried out in 1970, green x redear sunfish in 1971, threadfin shad in 1984, and blue catfish in 1991. The complete stocking history is shown in Table 3.

Vegetation/habitat history: Proctor Reservoir has no significant presence of aquatic vegetation. The last habitat survey showed that nondescript shoreline (67.3%) and rocky sections (24.2%) were the dominant habitat features (Dumont and Jons 1999).

METHODS

Fish were collected by electrofishing (1.17 hours at 14, 5-min stations), gill netting (five net-nights at five stations), and trap netting (10 net-nights at 10 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Source for water level data was the United States Geological Survey website.

RESULTS AND DISCUSSION

Habitat: A habitat survey was last conducted in 1998 (Dumont and Jons 1999).

Prey species: Electrofishing catch rates of gizzard shad and bluegill were 879.4/h and 167.1/h, respectively in 2006. The IOV for gizzard shad was excellent, indicating that 98% of gizzard shad were available to existing predators; this was similar to IOV estimates in previous years (Figure 2). Total CPUE of gizzard shad was considerably higher in 2006 than in 2004 and 2002 (Figure 2). Total CPUE of bluegill in 2006 was higher than in 2004 and similar to that recorded in 2002 (Figure 3). Since 2002, there has been a steady increase in bluegill PSD approaching the lower end of the range of values considered desirable for a balanced fishery i.e., PSD of 20 to 60 (Gabelhouse 1984). Threadfin shad were also present (CPUE = 52.0/hr).

Channel catfish: The gill net catch rate of channel catfish was 11.4/nn in 2007. Abundance in general has increased since 2003 (4.2/nn) and 2001 (1.9/nn) and the catch rate of harvestable-size fish has increased to 5.8/nn in 2007 (Figure 4). The population size structure was good for reservoirs in this area.

White bass: The gill net catch rate of white bass was 20.8/nn in 2007, which is considerably higher than in 2003 (6.6/nn) and 2001 (0.1/nn). The population size structure in 2007 was very good with a high proportion of fish being of harvestable size (CPUE-10 = 18.6/nn) (Figure 5). This represents an excellent fishing opportunity for anglers. White bass were first collected in Proctor reservoir in 1995 when two 17-inch fish were recorded during electrofishing surveys (Munger and Dumont 1996).

Palmetto bass: The gill net catch rate of palmetto bass was 38.6/nn in 2007. This was significantly higher than recorded in 2003 (0.8/nn) and 2001 (5.0/nn) and is comparable to that recorded in certain pre-drought surveys, 38.6/nn in 1989 and 26.8/nn in 1995 (Munger and Dumont 1996). With a CPUE of 20.6/nn for harvestable-size fish and specimens up to 25 inches in length being recorded in 2007, the fishing opportunities at this reservoir are outstanding, especially in view of the fact that drought and reduced stocking rates between 1999 and 2001 had significantly impacted the abundance of palmetto bass (Figure 6).

Largemouth bass: The electrofishing catch rate of stock-length and larger largemouth bass was 63.4/h in 2006, showing some improvement from previous surveys in 2004 and 2002 when stock CPUE of 35.5/h and 44.0/h were recorded, respectively. Size structure was adequate as indicated by a PSD of 58 and RSD-P of 24 (Figure 7). For largemouth bass in a balanced fishery, it is generally accepted that PSD should range from 40- to -70 and RSD-P from 10 to 40 (Gabelhouse 1984). The CPUE of harvestable fish (≥ 16 inches) was 8.6/h in 2006 compared to 3.0/h in 2004 and 1.0/h in 2002 (Figure 7). This gradual improvement coincides with the introduction of the 16-inch minimum length limit that was implemented in 2002 to improve the population size structure, which had been negatively impacted by drought (Dumont and Jons 2003). Overall, body condition in 2006 was adequate for fish between 9 and 18 inches in length (W_r ranged from 87- to -95). By contrast, in previous surveys the data was more variable across the size spectrum with certain size classes having a W_r of 100 or more (Figure 7).

White crappie: The trap net catch rate of white crappie was 42.5/nn in 2006, which is higher than that recorded in 2002 (32.9/nn) and 1998 (11.0/nn). The majority of the fish in the sample were of harvestable size (CPUE-10 = 34.5) and this is further reflected by a RSD-P of 81 and a RSD-M of 32 (Figure 8), indicating some exceptional fishing opportunities.

Fisheries management plan for Proctor Reservoir, Texas

Prepared – July 2007.

ISSUE 1: Proctor reservoir supports a popular palmetto bass fishery and stocking is required to maintain this population because palmetto bass do not naturally reproduce.

MANAGEMENT STRATEGY

1. Stock palmetto bass annually at 15/acre.

ISSUE 2: Previous surveys showed that population size structure of largemouth bass was inadequate and consequently a 16-inch minimum length limit on largemouth bass was implemented in 2002 to improve size structure. Some improvement in size structure has occurred since 2002, however further improvement is needed.

MANAGEMENT STRATEGY

1. Continue with the 16-inch minimum length limit regulation on largemouth bass and evaluate with biannual fall electrofishing surveys.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes additional electrofishing in 2008 and mandatory monitoring in 2010/2011 (Table 4). An additional electrofishing survey in 2008 is necessary to continue with the evaluation of the 16-inch minimum length limit on largemouth bass. Gill net surveys are only necessary every four years at this point to monitor abundance of palmetto bass, white bass, channel catfish and blue catfish. Similarly, trap netting for white crappie at four-year intervals should be adequate.

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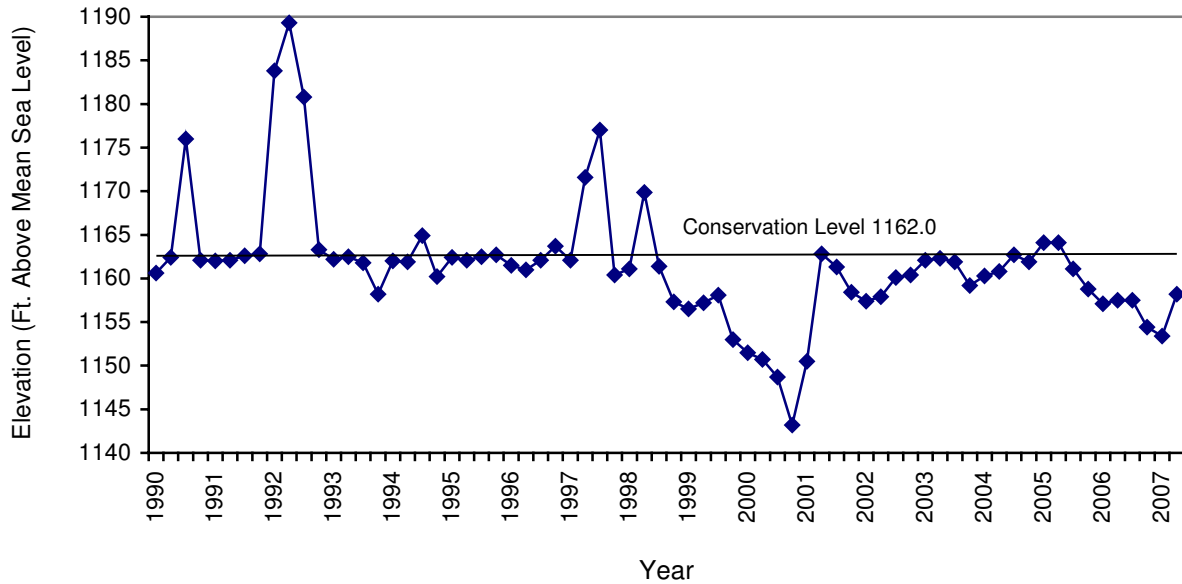


Figure 1. Quarterly water level elevations in feet above mean sea level recorded for Proctor Reservoir, Texas.

Table 1. Characteristics of Proctor Reservoir, Texas.

Characteristic	Description
Year constructed	1963
Controlling authority	U.S. Army Corps of Engineers
County	Comanche
Reservoir type	Tributary
Shoreline Development Index	3.81
Conductivity	470 umhos/cm

Table 2. Harvest regulations for Proctor Reservoir, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass, white	25	10 - No Limit
Bass, palmetto	5	18 - No Limit
Bass, largemouth	5	16 - No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

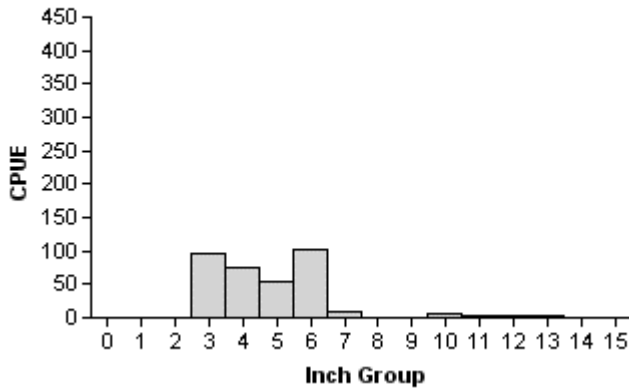
Table 3. Stocking history of Proctor Reservoir, Texas. Size categories are: FGL = 1-3 inches and ADL = adults.

Species	Year	Number	Size
Threadfin shad	1984	1,000	ADL
Blue catfish	1991	46,417	FGL
Palmetto bass	1978	22,850	FGL
	1980	47,440	FGL
	1983	46,773	FGL
	1984	91,090	FGL
	1986	92,000	FGL
	1987	138,462	FGL
	1988	93,044	FGL
	1989	101,700	FGL
	1991	70,080	FGL
	1992	72,322	FGL
	1994	142,526	FGL
	1995	143,261	FGL
	1996	70,218	FGL
	1997	72,100	FGL
	1998	80,496	FGL
	1999	34,656	FGL
2000	34,980	FGL	
2002	34,630	FGL	
2004	67,985	FGL	
2005	67,524	FGL	
2006	66,925	FGL	
2007	62,776	FGL	
	Total	1,653,838	
Largemouth bass	1970	100,000	FGL
Florida largemouth bass	1979	100,215	FGL
	1993	230,621	FGL
	1994	232,436	FGL
	2001	232,002	FGL
	Total	795,274	
Green x redear sunfish	1971	5,000	FGL

Gizzard Shad

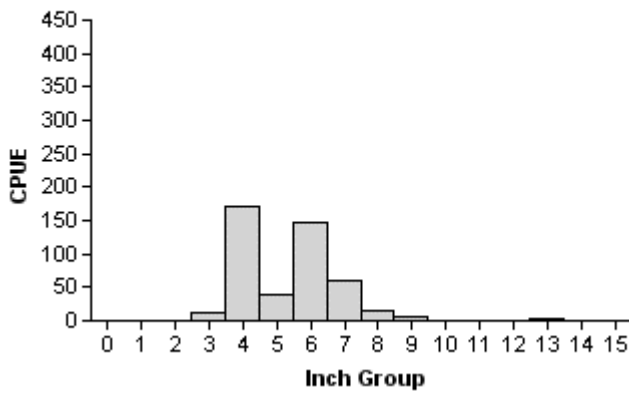
2002

Effort = 1.0
Total CPUE = 352.0 (34; 352)
IOV = 95 (1)



2004

Effort = 2.0
Total CPUE = 453.5 (14; 907)
IOV = 94 (1)



2006

Effort = 1.2
Total CPUE = 879.4 (16; 1026)
IOV = 98 (1)

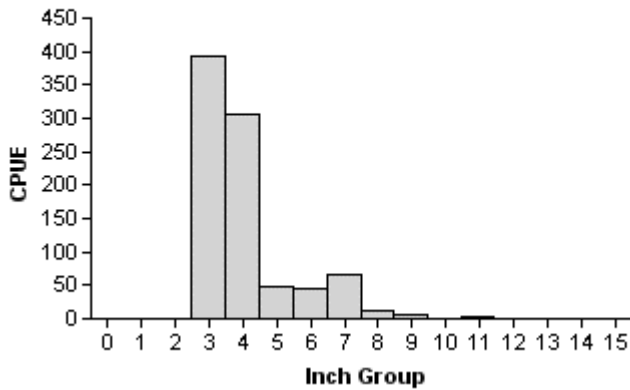
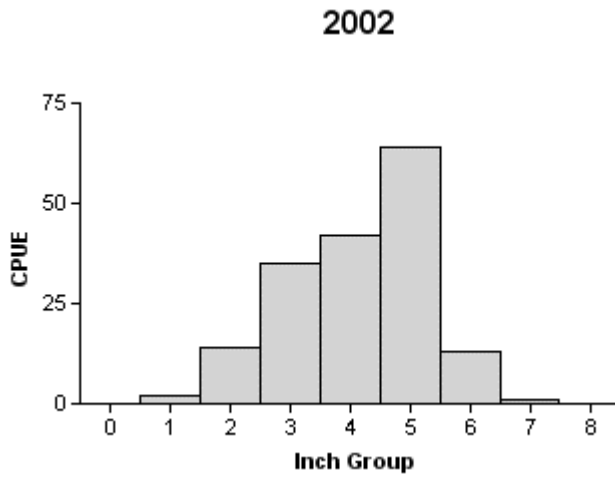
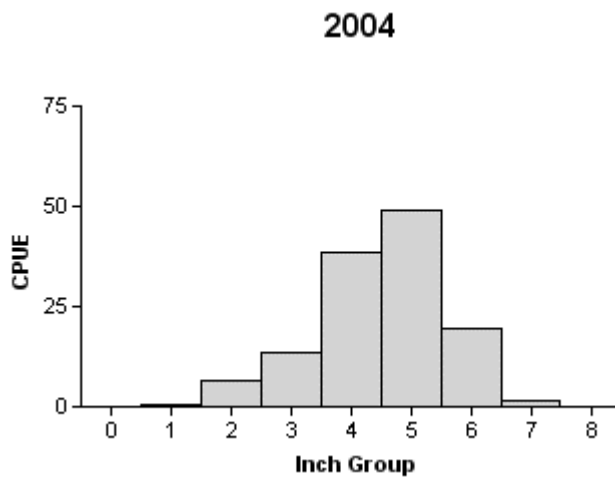


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV and size structure are in parentheses) for fall electrofishing surveys, Proctor Reservoir, Texas, 2002, 2004, and 2006.

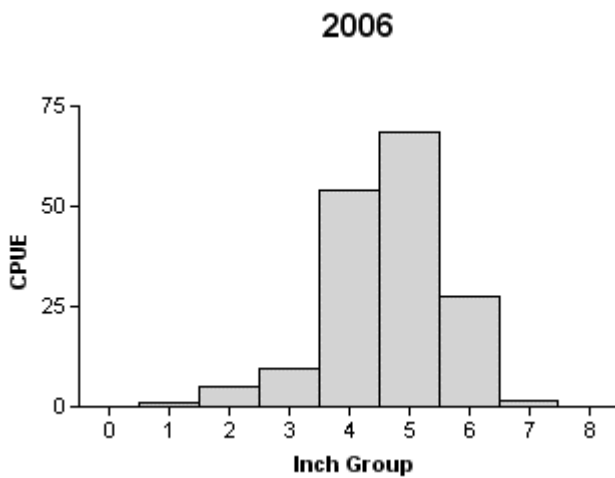
Bluegill



Effort = 1.0
 Total CPUE = 171.0 (27; 171)
 Stock CPUE = 155.0 (31; 155)
 PSD = 9 (2)



Effort = 2.0
 Total CPUE = 129.0 (20; 258)
 Stock CPUE = 122.0 (20; 244)
 PSD = 17 (3)

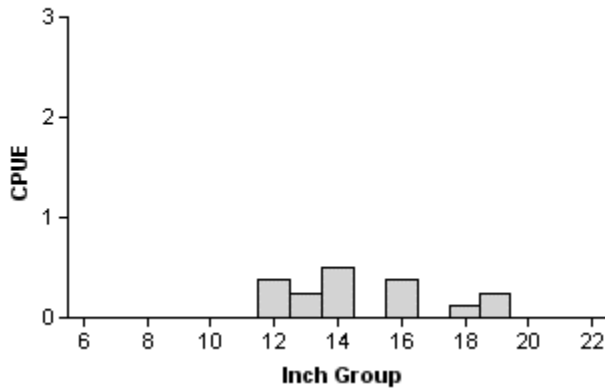


Effort = 1.2
 Total CPUE = 167.1 (18; 195)
 Stock CPUE = 161.1 (18; 188)
 PSD = 18 (3)

Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Proctor Reservoir, Texas, 2002, 2004, and 2006.

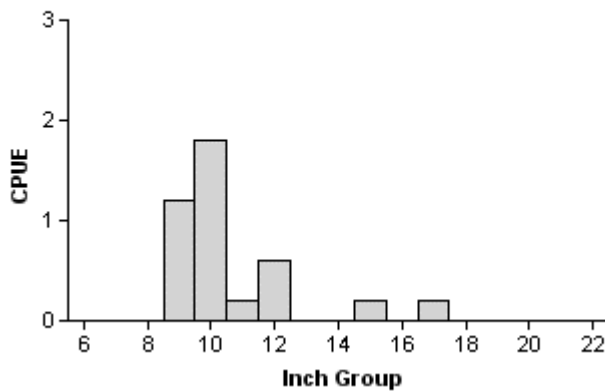
Channel Catfish

2001



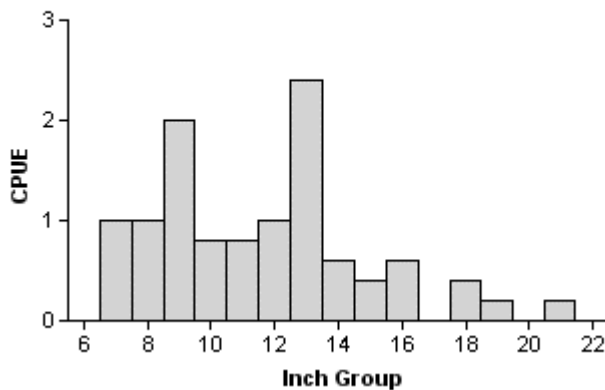
Effort = 8.0
 Total CPUE = 1.9 (27; 15)
 Stock CPUE = 1.9 (27; 15)
 CPUE-12 = 1.9 (27; 15)
 PSD = 40 (18)

2003



Effort = 5.0
 Total CPUE = 4.2 (33; 21)
 Stock CPUE = 1.2 (31; 6)
 CPUE-12 = 1.0 (32; 5)
 PSD = 17 (18)

2007



Effort = 5.0
 Total CPUE = 11.4 (32; 57)
 Stock CPUE = 6.6 (27; 33)
 CPUE-12 = 5.8 (26; 29)
 PSD = 21 (5)

Figure 4. Number of channel catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Proctor Reservoir, Texas, 2001, 2003, and 2007.

White Bass

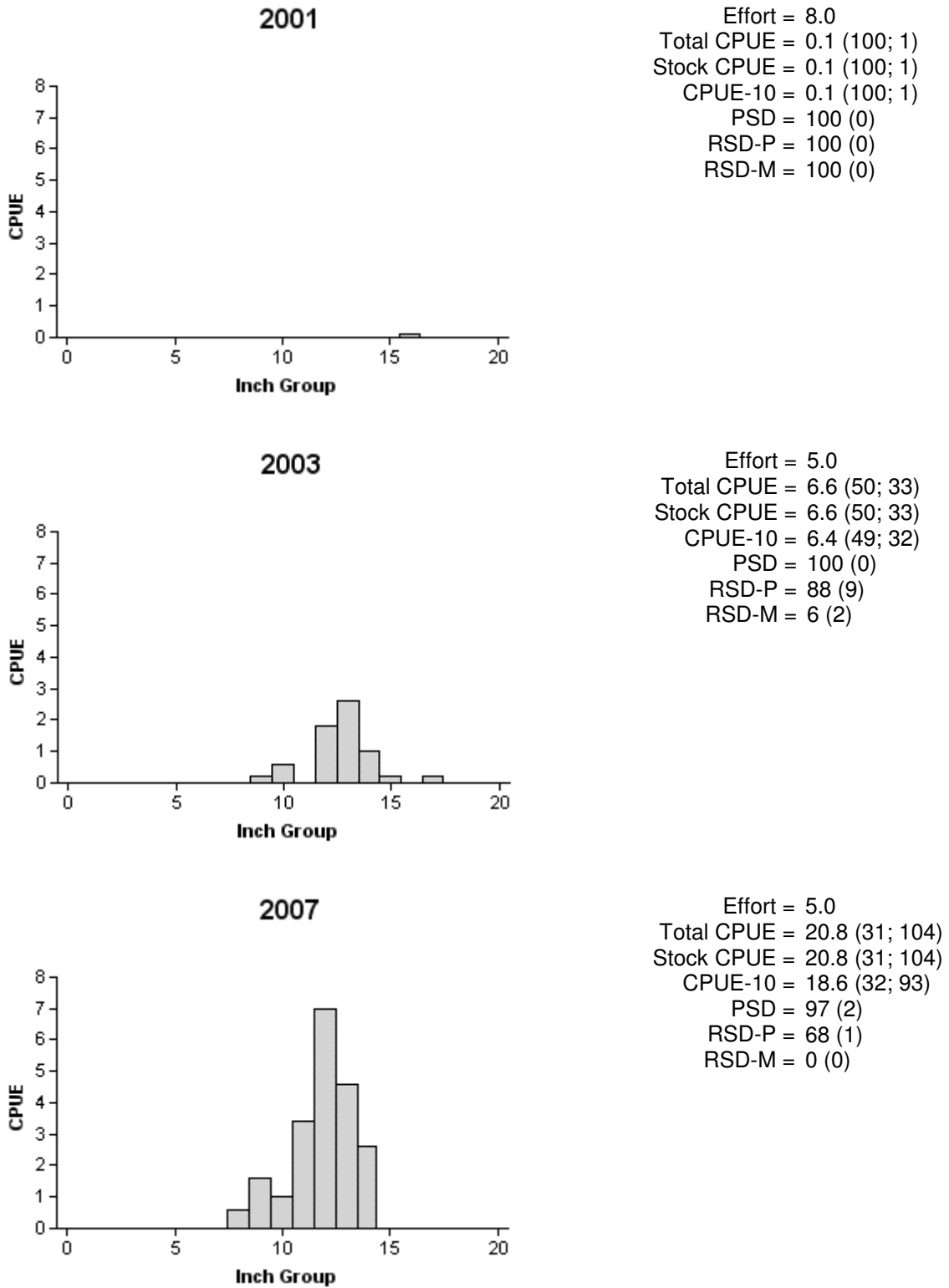
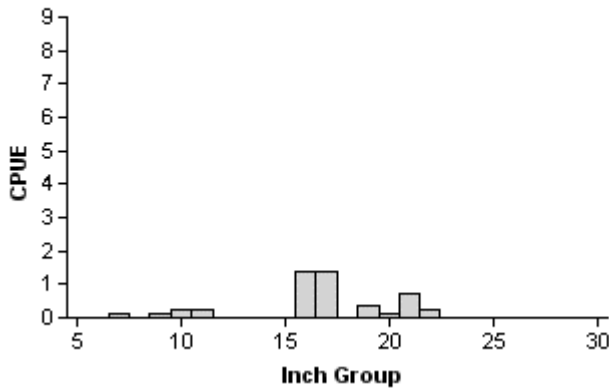


Figure 5. Number of white bass caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Proctor Reservoir, Texas, 2001, 2003, and 2007.

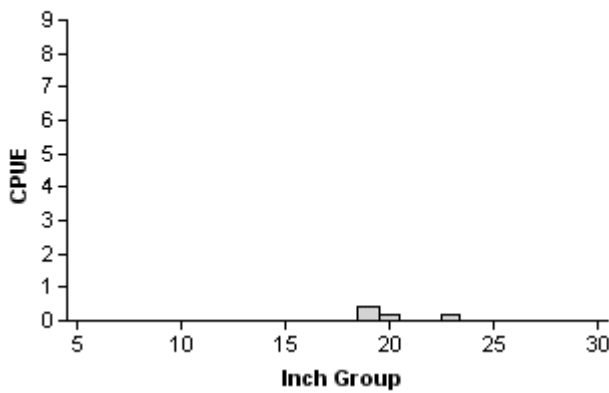
Palmetto Bass

2001



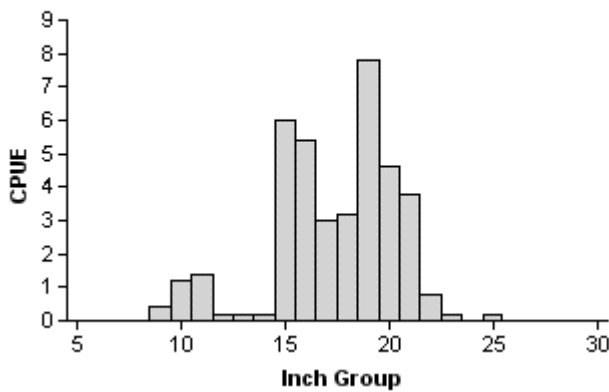
Effort = 8.0
 Total CPUE = 5.0 (50; 40)
 Stock CPUE = 4.9 (49; 39)
 CPUE-18 = 1.5 (42; 12)
 PSD = 87 (7)
 RSD-P = 87 (7)
 RSD-M = 23 (6)
 RSD-T = 0 (0)

2003



Effort = 5.0
 Total CPUE = 0.8 (47; 4)
 Stock CPUE = 0.8 (47; 4)
 CPUE-18 = 0.8 (47; 4)
 PSD = 100 (0.0)
 RSD-P = 100 (0)
 RSD-M = 50 (20)
 RSD-T = 0 (0)

2007

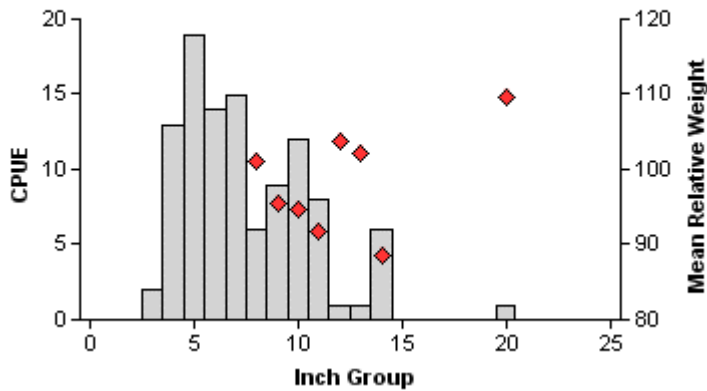


Effort = 5.0
 Total CPUE = 38.6 (16; 193)
 Stock CPUE = 38.6 (16; 193)
 CPUE-18 = 20.6 (28; 103)
 PSD = 92 (6)
 RSD-P = 91 (7)
 RSD-M = 25 (3)
 RSD-T = 1 (1)

Figure 6. Number of palmetto bass caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Proctor Reservoir, Texas, 2001, 2003, and 2007.

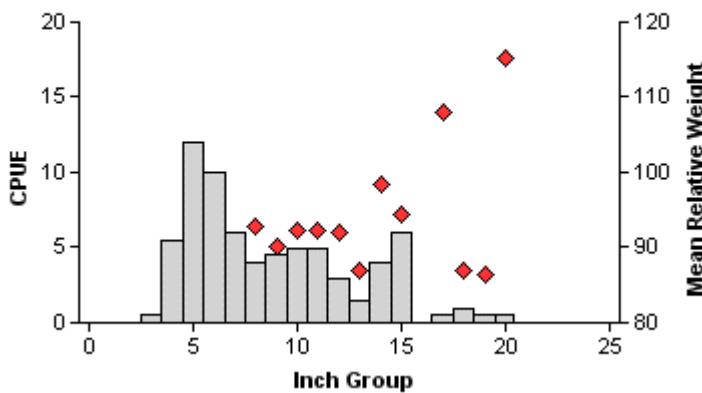
Largemouth Bass

2002



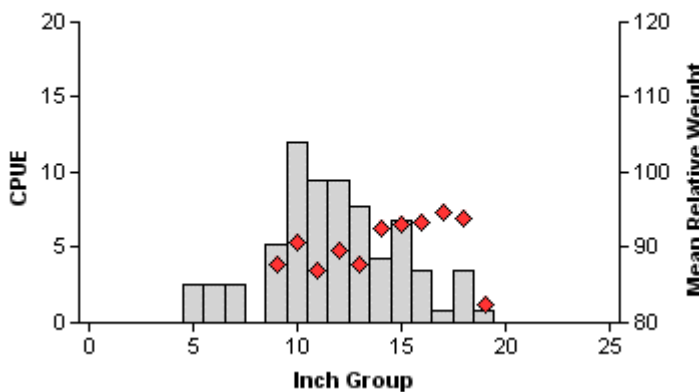
Effort = 1.0
 Total CPUE = 107.0 (20; 107)
 Stock CPUE = 44.0 (21; 44)
 CPUE-16 = 1.0 (100; 1)
 PSD = 20 (6)
 RSD-P = 2 (2)
 RSD-M = 2 (2)

2004



Effort = 2.0
 Total CPUE = 69.5 (20; 139)
 Stock CPUE = 35.5 (24; 71)
 CPUE-16 = 3.0 (43; 6)
 PSD = 48 (7)
 RSD-P = 24 (4)
 RSD-M = 1 (1)

2006



Effort = 1.2
 Total CPUE = 71.1 (25; 83)
 Stock CPUE = 63.4 (24; 74)
 CPUE-16 = 8.6 (43; 10)
 PSD = 58 (7)
 RSD-P = 24 (8)
 RSD-M = 0 (0)

Figure 7. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Proctor Reservoir, Texas, 2002, 2004, and 2006.

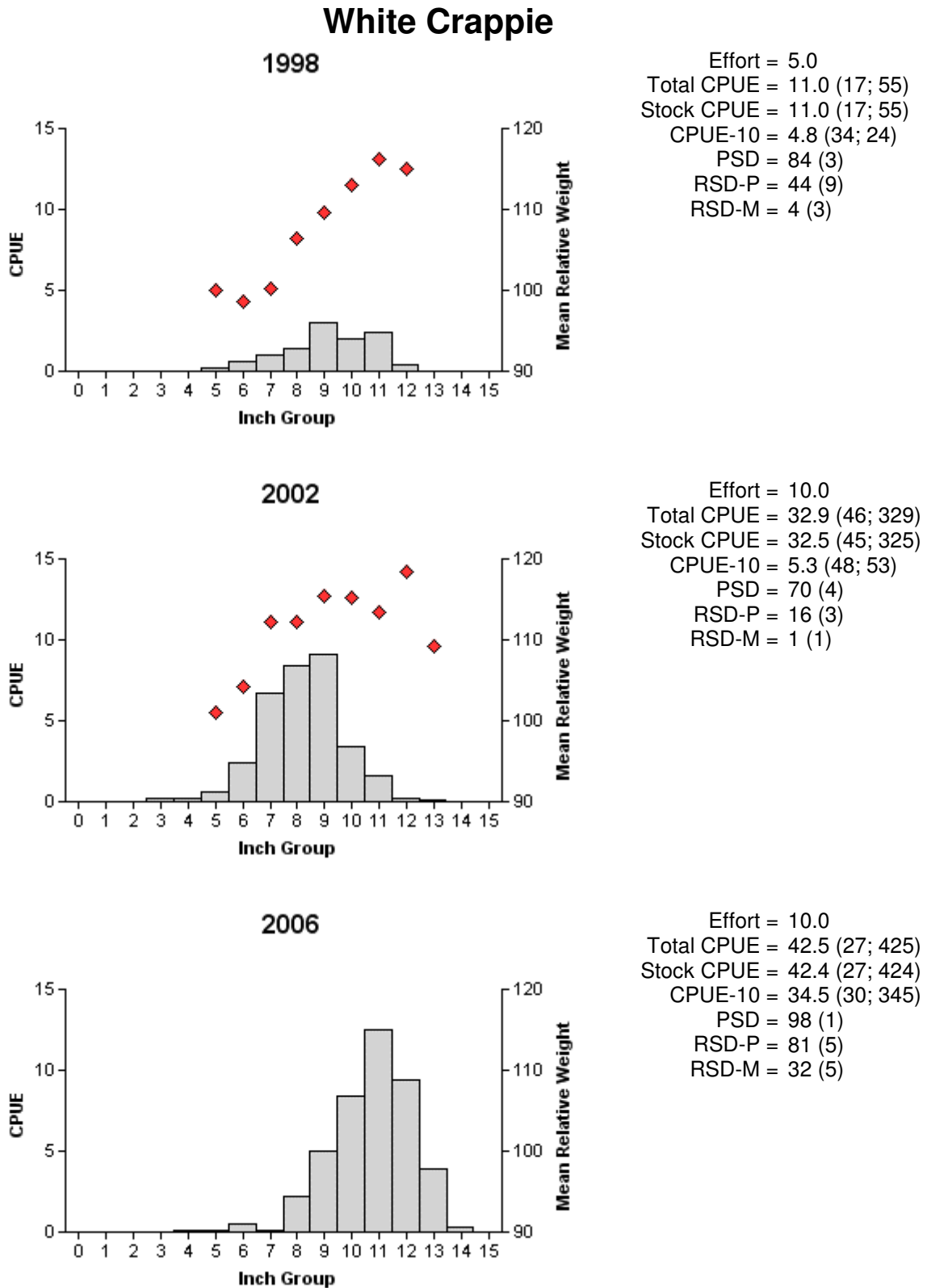


Figure 8. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Proctor Reservoir, Texas, 1998, 2002, and 2006.

Table 4. Proposed sampling schedule for Proctor Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

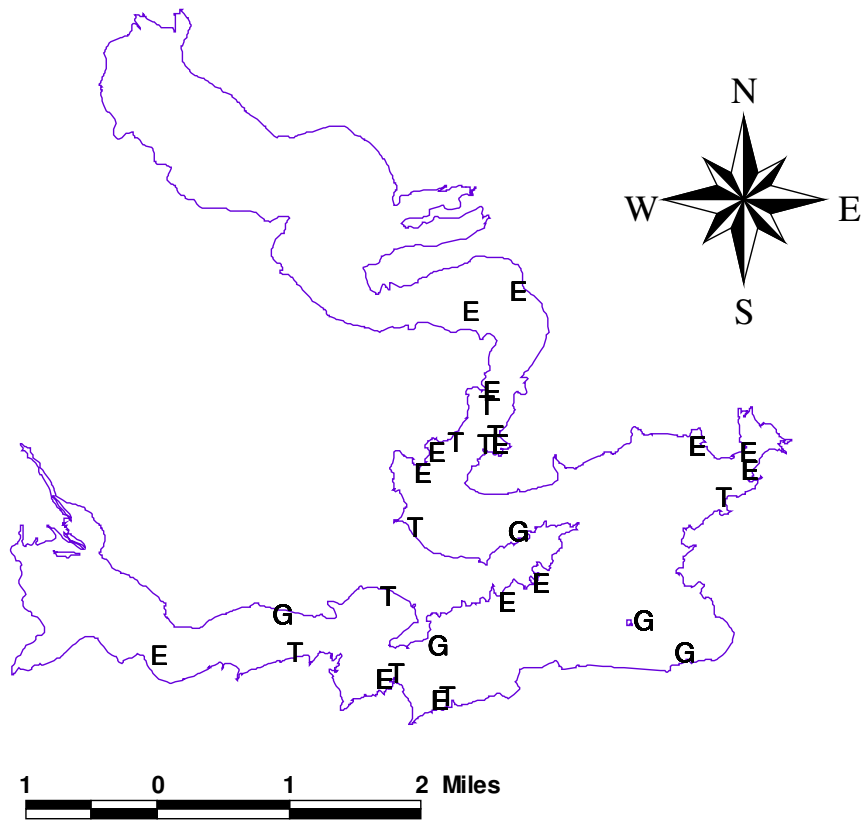
Survey Year	Electrofisher	Trap Net	Gill Net	Creel Survey	Report
Fall 2007-Spring 2008					
Fall 2008-Spring 2009	A				
Fall 2009-Spring 2010					
Fall 2010-Spring 2011	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of target species collected from Proctor Reservoir, Texas, 2006-2007.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					1026	879.0
Threadfin shad					61	52.0
Blue catfish	3	0.6				
Channel catfish	57	11.4				
White bass	104	20.8				
Palmetto bass	193	38.6				
Green sunfish					4	3.0
Bluegill					195	167.0
Longear sunfish					50	43.0
Largemouth bass					83	71.0
Black crappie			12	1.2		
White crappie			425	42.5		

APPENDIX B



Location of sampling sites, Proctor Reservoir, Texas, 2006-2007. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was approximately 5 ft. below conservation level at the time of sampling.