

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-32

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2006 Survey Report

**Fort Parker Reservoir**

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## SURVEY AND MANAGEMENT SUMMARY

Fort Parker Reservoir was surveyed in fall 2006 using a boat electrofisher and trap nets, and spring 2007 with gill nets. This report summarizes survey results and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Fort Parker Reservoir is a 725-acre impoundment located within Fort Parker State Park in Limestone County, Texas. Mean and maximum water depths are 4 and 8 feet respectively, and the reservoir is moderately productive due to Navasota River inflows. Habitat features consisted of rock, native emergent aquatic plants, overhanging brush and woody debris.
- **Management history:** Important sport fish include white bass, largemouth bass, white crappie, and catfish. The 2003 survey report recognized immigration of blue catfish to Fort Parker State Park reservoir from Mexia reservoir just upstream. The blue catfish appeared to be doing well utilizing the abundant forage base, so the 2003 management plan included stocking two-inch blue catfish fingerlings at 100 fish/acre to encourage this new fishery. Advanced fingerlings were actually stocked at approximately 10 fish/acre in fall 2003. Advanced channel catfish fingerlings were stocked at approximately 6 fish/acre in 2004. Northern largemouth bass were also stocked at a rate of 129 fish/acre in 2004. Clarification of the prohibition of trotlines and jug lines within the reservoir was made in the 2003/2004 Outdoor Annual.
- **Fish Community**
  - **Prey species:** Threadfin shad are abundant in the reservoir. Electrofishing catch of gizzard shad was very high, and most were available as prey to sport fish. Electrofishing catch of bluegills was also high, but few were over 6-inches in length. Redear, longear, orangespotted, and warmouth sunfishes were also surveyed in low numbers.
  - **Catfishes:** The blue catfish population is still present with low numbers of legal sized fish available for anglers. The channel catfish population is holding steady with most fish in the quality to preferred size ranges. No flathead catfish were collected in spring 2007.
  - **White bass:** White bass were present in the reservoir in low numbers.
  - **Largemouth bass:** Largemouth bass catch rates were relatively low with few fish in the legal size range; however recruitment and condition appear to be good. Florida largemouth bass genetics remain low as this species has only been stocked once. Northern largemouth bass continue to be stocked and dominate the alleles.
  - **White crappie:** White crappie were present in the reservoir in good numbers. The condition of collected fish was excellent, with good numbers of legal size fish for anglers to keep.
- **Management Strategies:** Continue stocking blue catfish to improve a poor catfish fishery. Conduct habitat/vegetation survey in 2009/2010, and continue general monitoring with trap nets, gill nets, and electrofishing surveys in 2010-2011 (Table 6).

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INTRODUCTION

This document is a summary of fisheries data collected from Fort Parker 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 fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data is presented with the 2006-2007 data for comparison.

### *Reservoir Description*

Fort Parker State Park Reservoir is a 725-acre reservoir located within Fort Parker State Park in Limestone County, Texas. The reservoir was constructed in 1935 by the Civilian Conservation Corps, and serves the dual purpose of flood control and municipal water supply for the town of Groesbeck, Texas. The reservoir is owned by the Texas Parks and Wildlife Department. Fort Parker State Park Reservoir has a shoreline length of approximately 19 miles, and is shallow with mean and maximum depths of 4.0 and 8.0 feet. The town of Groesbeck initiated dredging operations in 1994 to restore original depths to the reservoir by removing silt deposited by the Navasota River; however, these efforts were abandoned in 2002.

There is one public boat ramp on Fort Parker State Park Reservoir, which provides adequate boat access to anglers. A second park boat ramp is just upstream of the reservoir on the Navasota River. Bank access is good since the entire reservoir lies within the boundaries of the state park. Limited handicap-specific facilities are also available. Further information about Fort Parker State Park Reservoir and its facilities can be obtained by visiting the Texas Parks and Wildlife Web page at [www.tpwd.state.tx.us](http://www.tpwd.state.tx.us).

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Baird and Tibbs 2003) included:

1. Stock blue catfish at 100 fish/acre to supplement population.  
**Action:** Advanced fingerlings were stocked at a rate of 10 fish/acre in fall 2003 instead of the requested standard fingerlings. The purpose of this stocking was to supplement a low density blue catfish population – thereby encouraging an additional top predator in the reservoir. Surplus advanced channel catfish fingerlings were also stocked at 6 fish/acre in 2004 to supplement the low density channel catfish fishery. These populations were sampled by gill netting in spring 2007. The channel catfish catch rate showed improvement over previous surveys, but blue catfish catch rates did not. Both should be monitored in 2011.
2. Clarify the trotline/jugline regulations for the reservoir.  
**Action:** Clarification of the prohibition of trotlining and juglining in Fort Parker State Park Reservoir was printed in the 2003-2004 Outdoor Annual. New signage was created and posted near the two park boat ramps (i.e., one on the reservoir boat ramp and one on the Navasota River boat ramp) so that anglers would understand the correct interpretation of the law. Park staff and law enforcement participated in these new efforts.

**Harvest regulation history:** Sportfishes in Fort Parker Reservoir are currently managed with statewide regulations with a few exceptions. Fishing is allowed with pole and line only; all other passive gears (e.g., trotlines and juglines) are illegal. Also, for channel and blue catfish, there is no minimum length limit (mll), and the daily bag for the combined species is 5 fish (Table 2).

**Stocking history:** The most recent species stocked into Fort Parker State Park Reservoir were channel catfish (4,597 advanced fingerlings) and northern largemouth bass (93,331 fingerlings) in 2004. Florida largemouth bass and coppernose bluegill were both stocked once in 1982. Blue catfish were recently introduced in 2003 (7,089 advanced fingerlings). The complete stocking history is in Table 3.

**Vegetation/habitat history:** Shoreline habitat at Fort Parker State Park Reservoir consists mainly of common species such as black willow, bulrush, buttonbush, cutgrass, and water willow. However, American lotus is problematic and dominates three-fourths of the upper reservoir due to shallow water. Over 500 acres of water was estimated to be affected by American lotus during a survey in 2005; although coverage was not 100%. The fact that the reservoir serves as a drinking water source for the town of Groesbeck may complicate the potential for chemical treatments. Other options, such as bow-mounted mechanical trimmers, have been used in small areas (i.e., around fishing piers) by park staff with limited success, but these options require lots of time and effort and are only short-term fixes to a long-term problem. No noxious vegetation exists to date in Fort Parker.

## METHODS

Fishes were collected by electrofishing (1 hour at 12 5-min stations), gill netting (5 net nights at 5 stations), and trap netting (5 net nights at 5 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 ( $RSE = 100 \times SE \text{ of the estimate/estimate}$ ) was calculated for all CPUE statistics and for creel statistics and SE was calculated for structural indices and IOV. No age and growth data were collected for this report, and water level data are unavailable for Fort Parker State Park Reservoir.

## RESULTS AND DISCUSSION

**Habitat:** A habitat survey was last conducted in 1997 (DiCenzo 1998). Water level was approximately 4 feet low during 2006 trap netting and electrofishing, and full during 2007 gill netting. An aquatic vegetation and shoreline habitat survey is scheduled for summer 2010.

**Prey species:** Forage was dominated by threadfin shad, gizzard shad and bluegill, all of which were collected in higher numbers than in 2002. Electrofishing catch rates of threadfin and gizzard shad were 243.0/h and 2,114.0/h respectively, and comprised the majority of available forage. Index of vulnerability (IOV) for gizzard shad was high, indicating nearly 98% of gizzard shad were available to existing predators and was comparable to IOV estimates from previous surveys (Figure 2).

Electrofishing catch rates (352.0/h) of bluegill were nearly double those from the 2002 survey (196.0/h). The bluegill population remains nicely balanced, yet individuals over 6-inches in length are rare. Catch per unit effort (CPUE) for other important sunfishes included longear at 55.0/h, green at 4.0/h, warmouth at 4.0/h, orangespotted at 2.0/h, and redear at 1.0/h.

**Catfishes:** The gill net catch rate of blue catfish was 0.6/nn, comparable to the 2003 (0.8/nn) and 1997 (1.0/nn) catch rates. All individuals collected approached quality size (i.e., 20 inches) (Figure 3).

The 2007 gill net catch rate of channel catfish (3.2/nn) was similar to the previous two surveys. The channel catfish size distribution was also skewed toward larger individuals as those collected exceeded 16

inches in length (Figure 4). No flathead catfish were collected in spring 2007.

**White bass:** The gill net catch rate of white bass was 0.4/nn in 2007, down from 1.4/nn in 2003. All individuals collected approached or exceeded the minimum length limit of 10 inches.

**Largemouth bass:** The electrofishing catch rate of largemouth bass was 39.0/h in 2006, comparable to the 42/h in 2002. Recruitment remained strong in the 2006 sample as size structure was skewed toward sub 10-inch fish. The proportional stock density (PSD) of 20 indicates the population is unbalanced (generally accepted values range from 40 to 70), and few fish are reaching the minimum length limit of 14 inches ( $RSD-14 = 20$ ). Condition of most largemouth bass remains excellent with relative weights (Wrs) averaging over 120. Florida largemouth bass genetics remain low at 14% as this species has only been stocked once in 1982. All other black bass stockings have been northern largemouth bass, including the most recent stocking of 93,331 fingerlings in 2004.

**White crappie:** The trap net catch rate of white crappie was 28.6/nn in 2006, higher than in 2002 (11.8/nn) and far less than in 1997 (350.0/nn). Relative weights (Wrs) were excellent averaging between 100 and 120, and were similar to the 2002 survey. The RSD-10 was also excellent with over 30% of stock-length and larger fish in the preferred size category of 10 inches or better.

## **Fisheries management plan for Fort Parker Reservoir, Texas**

Prepared – June 2007.

**ISSUE 1:** Anecdotal information gathered from park staff points to a good catfish fishery near the Navasota River entrance to Fort Parker reservoir. Gill netting in and around this area is problematic due to shallow water, vegetation growth, and snags in and along the riparian zone. Park staff has expressed an interest in determining the extent of this fishery. Inland fisheries management is anxious to see how comparable it is to sampled portions of the reservoir. No creel data have ever been reported for Fort Parker State Park reservoir. Low angler use limits the utility of a traditional roving creel.

### **MANAGEMENT STRATEGIES**

1. Work with park manager to develop a creel design that can be efficiently administered by park staff in 2008/2009.
2. Evaluate the catfish population in the Navasota River and the main reservoir using experimental low-pulse DC sampling techniques to coincide with park creel.

**ISSUE 2:** The channel catfish population is fair in Fort Parker State Park Reservoir, and the blue catfish population is relatively new (i.e., stocked in 2003). Catfish anglers have expressed interest in developing the blue catfish fishery. This will require supplemental stockings to help establish and maintain a balanced size distribution.

### **MANAGEMENT STRATEGIES**

1. Stock blue catfish fingerlings at 50/acre or advanced blue catfish fingerlings at 10/acre in 2007 and 2008.
2. Request surplus or retired blue catfish brooders for stocking if available.

**ISSUE 3:** The most recent habitat survey for Fort Parker State Park reservoir is dated 1997.

### **MANAGEMENT STRATEGY**

1. Conduct an aquatic vegetation and shoreline habitat survey in summer 2010.

**ISSUE 4:** Although Fort Parker is a 725-acre community fishing lake (CFL) by definition, the only fishable water occurs in the lower one-third of the reservoir. Fishing access to this part of the reservoir is limited by large stands of cutgrass. Anecdotal information from a few bank anglers suggest good pole and line fishing where access can be had.

### **MANAGEMENT STRATEGY**

1. Work with park staff to develop a plan to clear cutgrass and other limiting shoreline vegetation in selected areas to increase access to fishable water.

### **SAMPLING SCHEDULE JUSTIFICATION:**

The proposed sampling schedule includes a park-administered creel and experimental low-pulse DC electrofishing in 2008/2009, a habitat/vegetation survey in 2009/2010 and mandatory monitoring in 2010/2011 (Table 6). The habitat survey is necessary because the 1997 survey is now obsolete.

## 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, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.
- Baird, M. S. and J. Tibbs. 2003. Statewide freshwater fisheries monitoring and management program survey report for Fort Parker Reservoir, 2002. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.
- DiCenzo, V.J. 1998. Statewide freshwater fisheries monitoring and management program survey report for Fort Parker Reservoir, 1997. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).



Table 1. Characteristics of Fort Parker Reservoir, Texas.

Characteristic	Description
Year Constructed	1935
Controlling authority	Texas Parks and Wildlife Department
Counties	Limestone
Reservoir type	Main Stream
Shoreline Development Index (SDI)	4.80
Conductivity	310 umhos/cm

Table 2. Harvest regulations for Fort Parker Reservoir.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	5 (in any combination)	No Limit
Catfish, Flathead	5	18 - No Limit
Bass, White	25	10 - No Limit
Bass: largemouth and spotted	5	14 – No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 3. Stocking history of Fort Parker State Park, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Blue catfish	2003	7,089	AFGL	9.6
	Total	7,089		
Channel catfish	1966	8,000	AFGL	7.9
	1982	35,000	AFGL	7.9
	1991	283	AFGL	5.2
	2004	4,597	AFGL	8.9
	Total	47,880		
Coppernose bluegill	1982	30,000	UNK	UNK
	Total	30,000		
Florida Largemouth bass	1982	34,900	FRY	1.0
	Total	34,900		
Largemouth bass	1966	3,000	UNK	UNK
	1970	2,000	UNK	UNK
	1974	33,000	UNK	UNK
	1975	35,000	UNK	UNK
	2004	93,331	FGL	1.6
	Total	166,331		

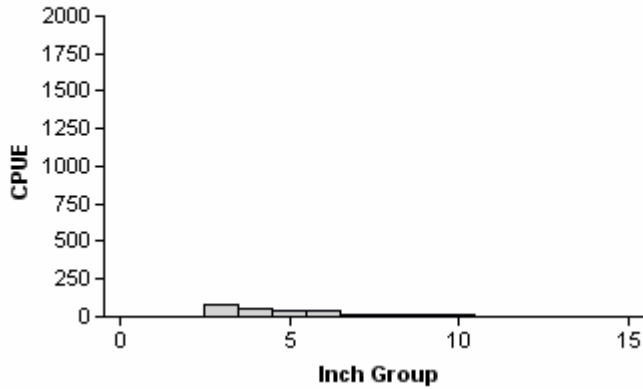
Table 4. Survey of littoral zone and physical habitat types, Fort Parker Reservoir, Texas, 1997. A linear shoreline distance (miles) was recorded for each habitat type found.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of shoreline
Overhanging brush	1.2	6.5		
Dead trees/stumps	0.5	2.7		
Rocky/gravel	0.6	3.2		
Featureless	16.2	87.6		
Native emergent vegetation				

## Gizzard Shad

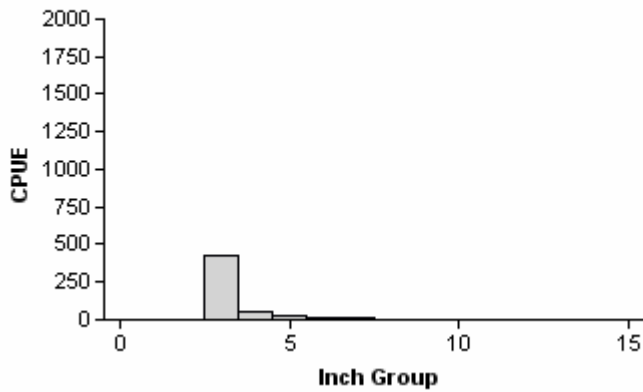
1997

Effort = 1.0  
Total CPUE = 267.0 (19; 267)  
IOV = 85.02 (3.1)



2002

Effort = 1.0  
Total CPUE = 544.0 (39; 544)  
IOV = 98.9 (0.7)



2006

Effort = 1.0  
Total CPUE = 2,114.0 (24; 2,114)  
IOV = 97.97 (0.7)

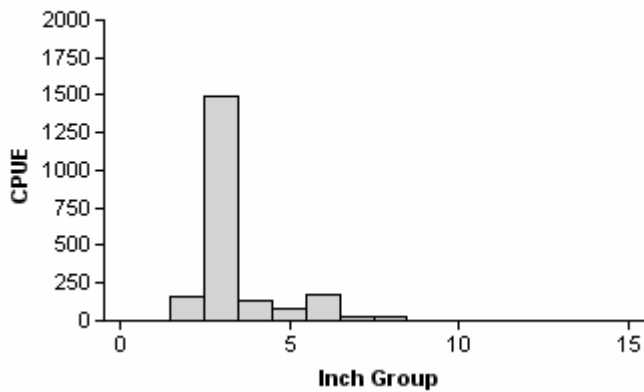
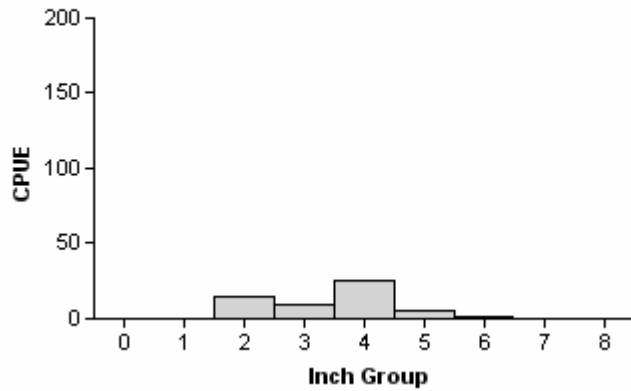
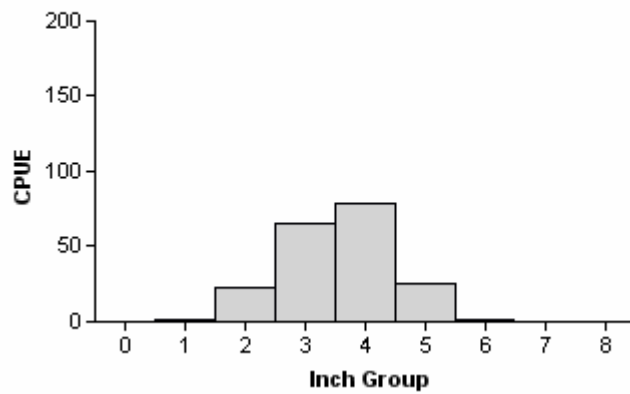


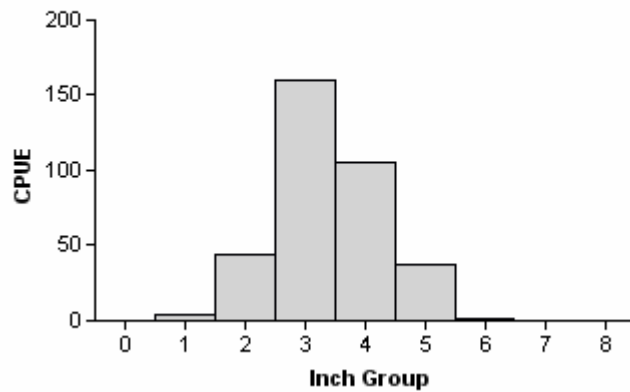
Figure 1. Number of gizzard shad caught per hour (CPUE) and population indices for fall electrofishing surveys, Fort Parker Reservoir, Texas, 1997, 2002, and 2006.

**Bluegill****1997**

Effort = 1.0  
 Total CPUE = 57.0 (18; 57)  
 Stock CPUE = 42.0 (21; 42)  
 PSD = 2 (2.2)

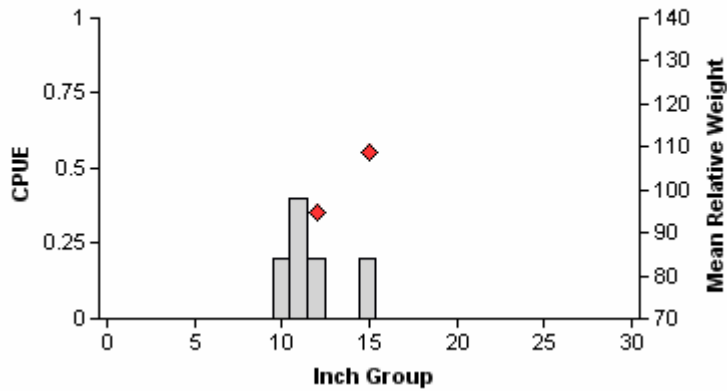
**2002**

Effort = 1.0  
 Total CPUE = 196.0 (41; 196)  
 Stock CPUE = 171.0 (44; 171)  
 PSD = 1 (1.3)

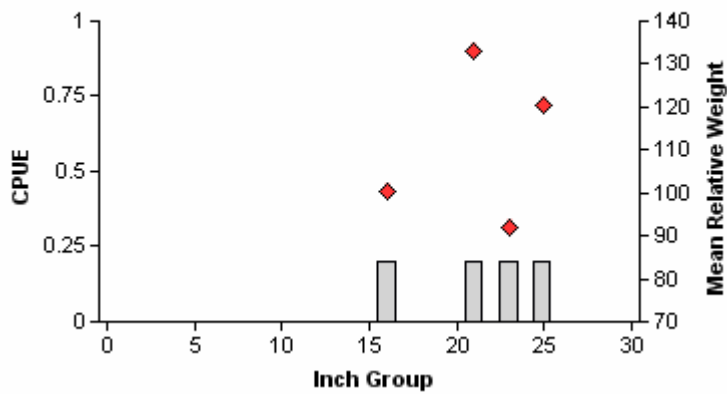
**2006**

Effort = 1.0  
 Total CPUE = 352.0 (26; 352)  
 Stock CPUE = 304.0 (25; 304)  
 PSD = 0 (0.3)

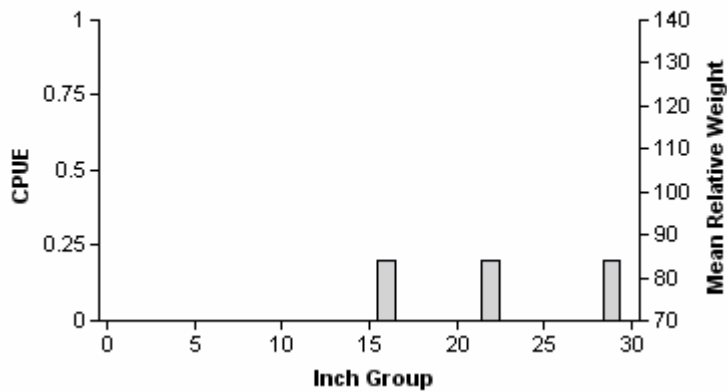
Figure 2. Number of bluegill caught per hour (CPUE) and population indices for fall electrofishing surveys, Fort Parker Reservoir, Texas, 1997, 2002, and 2006.

**Blue Catfish****1997**

Effort = 5.0  
 Total CPUE = 1.0 (55; 5)  
 Stock CPUE = 0.4 (61; 2)  
 PSD = 0 (185.4)  
 RSD-P = 0 (0)

**2003**

Effort = 5.0  
 Total CPUE = 0.8 (47; 4)  
 Stock CPUE = 0.8 (47; 4)  
 PSD = 75 (26.2)  
 RSD-P = 0 (0)

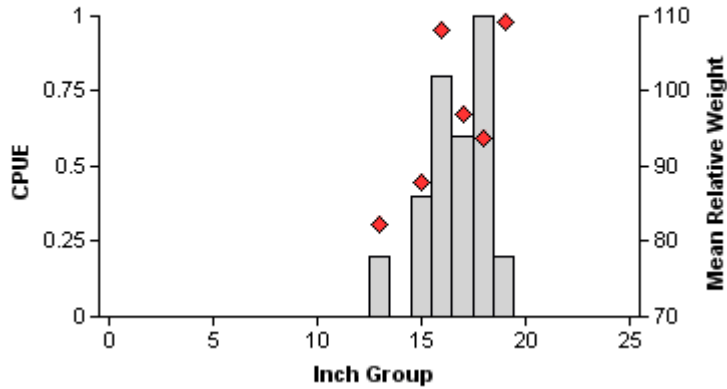
**2007**

Effort = 5.0  
 Total CPUE = 0.6 (41; 3)  
 Stock CPUE = 0.6 (41; 3)  
 PSD = 67 (30.4)  
 RSD-P = 0 (0)

Figure 3. Number of blue catfish caught per net night (CPUE) and population indices for spring gill net surveys, Fort Parker Reservoir, Texas, 1997, 2003, and 2007.

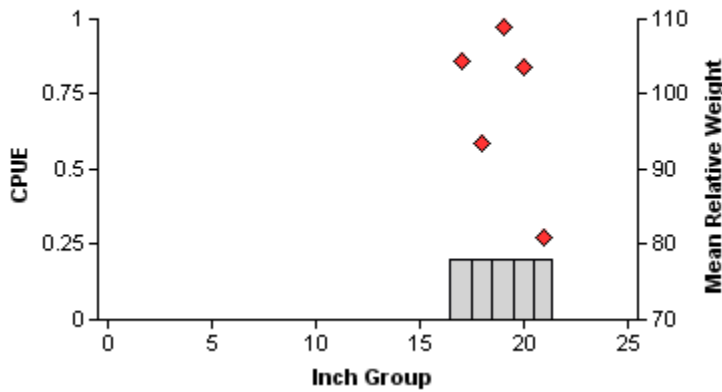
# Channel Catfish

1997



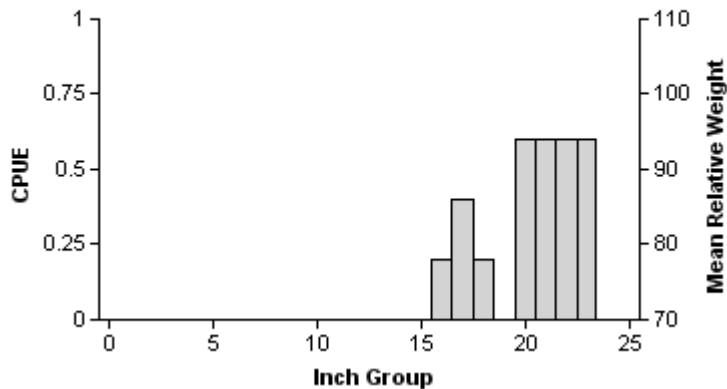
Effort = 5.0  
 Total CPUE = 3.2 (38; 16)  
 Stock CPUE = 3.2 (38; 16)  
 PSD = 81 (8.4)  
 RSD-P = 0 (0)

2003



Effort = 5.0  
 Total CPUE = 1.0 (45; 5)  
 Stock CPUE = 1.0 (45; 5)  
 PSD = 100 (0.0)  
 RSD-P = 0 (0)

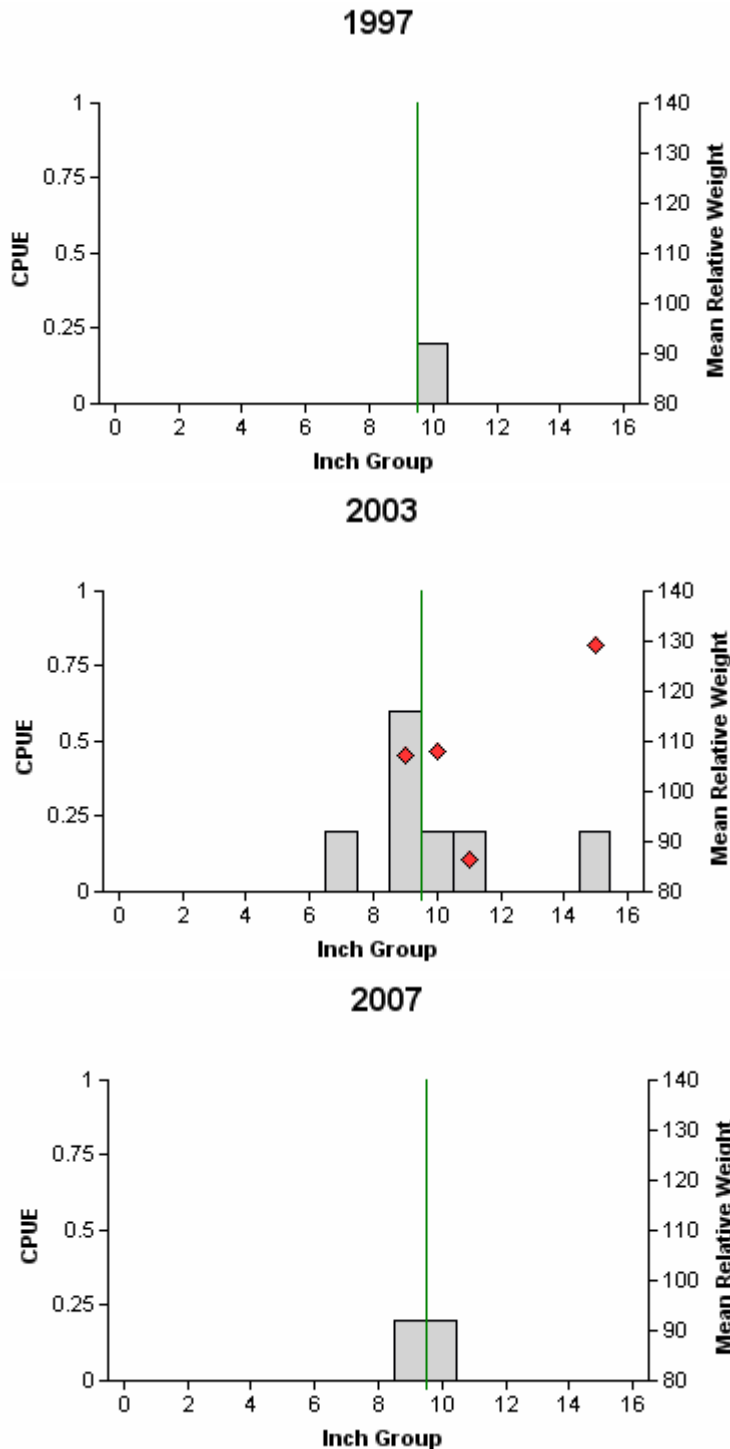
2007



Effort = 5.0  
 Total CPUE = 3.2 (12; 16)  
 Stock CPUE = 3.2 (12; 16)  
 PSD = 100 (0)  
 RSD-P = 0 (0)

Figure 4. Number of channel catfish caught per net night (CPUE) and population indices for spring gill net surveys, Fort Parker Reservoir, Texas, 1997, 2003, and 2007.

## White Bass



Effort = 5.0  
 Total CPUE = 0.2 (100; 1)  
 Stock CPUE = 0.2 (100; 1)  
 PSD = 100 (0)  
 RSD-P = 0 (0)  
 RSD-10 = 100 (0)

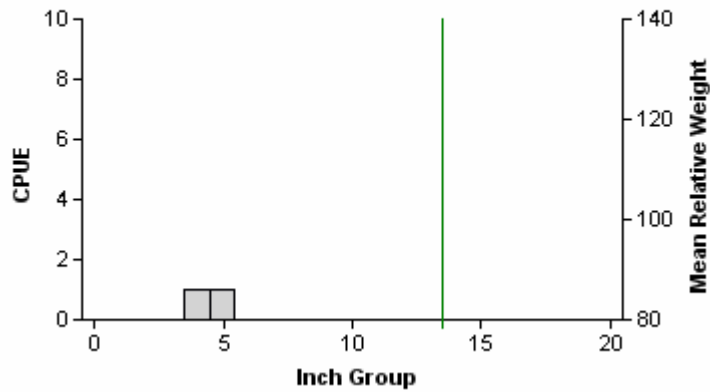
Effort = 5.0  
 Total CPUE = 1.4 (36; 7)  
 Stock CPUE = 1.4 (36; 7)  
 PSD = 86 (10.8)  
 RSD-P = 14 (13.7)  
 RSD-10 = 43 (29.8)

Effort = 5.0  
 Total CPUE = 0.4 (61; 2)  
 Stock CPUE = 0.4 (61; 2)  
 PSD = 100 (0)  
 RSD-P = 0 (0)  
 RSD-10 = 50 (39.5)

Figure 5. Number of white bass caught per net night (CPUE) and population indices for spring gill net surveys, Fort Parker Reservoir, Texas, 1997, 2003, and 2007.

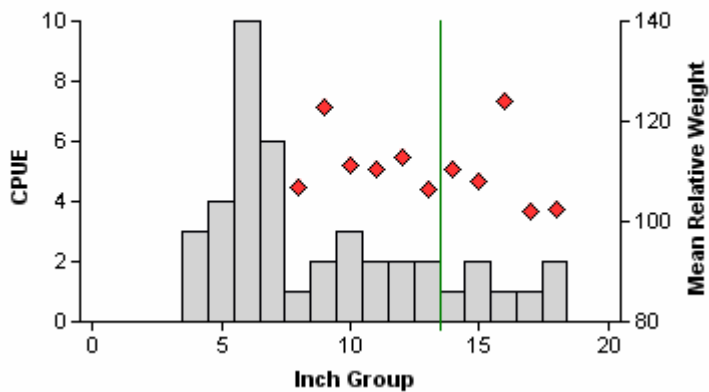
## Largemouth Bass

1997



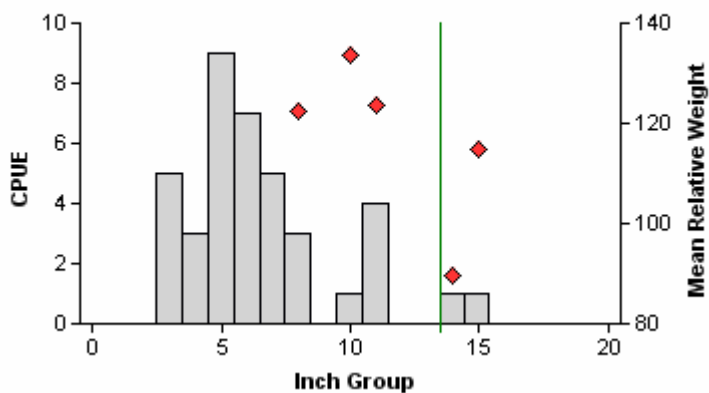
Effort = 1.0  
Total CPUE = 2.0 (67; 2)  
Stock CPUE = 0.0 (0; 0)  
PSD = 0 (147.7)  
RSD-P = 0 (0)  
RSD-14 = 0 (0)

2002



Effort = 1.0  
Total CPUE = 42.0 (38; 42)  
Stock CPUE = 19.0 (43; 19)  
PSD = 58 (11.4)  
RSD-P = 32 (8.2)  
RSD-14 = 37 (6.4)

2006



Effort = 1.0  
Total CPUE = 39.0 (30; 39)  
Stock CPUE = 10.0 (36; 10)  
PSD = 20 (18.7)  
RSD-P = 10 (9.3)  
RSD-14 = 20 (18.7)

Figure 6. Number of largemouth bass caught per hour (CPUE) and population indices for fall electrofishing surveys, Fort Parker Reservoir, Texas, 1997, 2002, and 2006.



Table 5. Results of genetic analysis of largemouth bass collected by fall electrofishing, Fort Parker State Park Reservoir, Texas, 2000, 2002, and 2006. Genetic information was not collected in 1997. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, Hybrid = bass with both FLMB and NLMB alleles.

Year	Sample size	Genotype			% FLMB alleles	% Northern alleles
		%FLMB	%Hybrid	%NLMB		
2000	9	0	33	66	14	86
2002	23	4	39	57	15	85
2006	30	0	60	40	14	86

## White Crappie

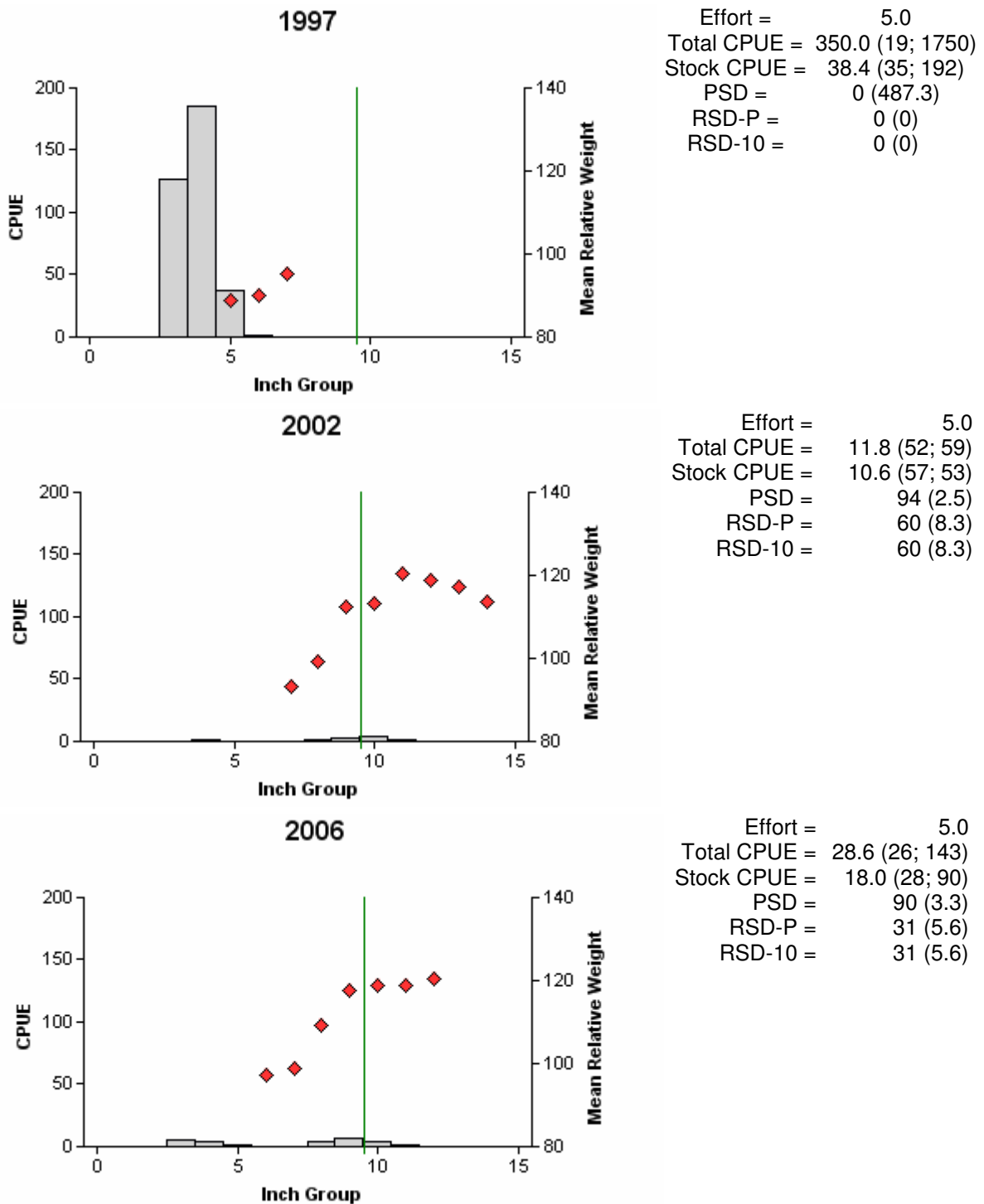


Figure 7. Number of white crappie caught per net night (CPUE) and population indices for fall trap net surveys, Fort Parker Reservoir, Texas, 1997, 2002, and 2006.

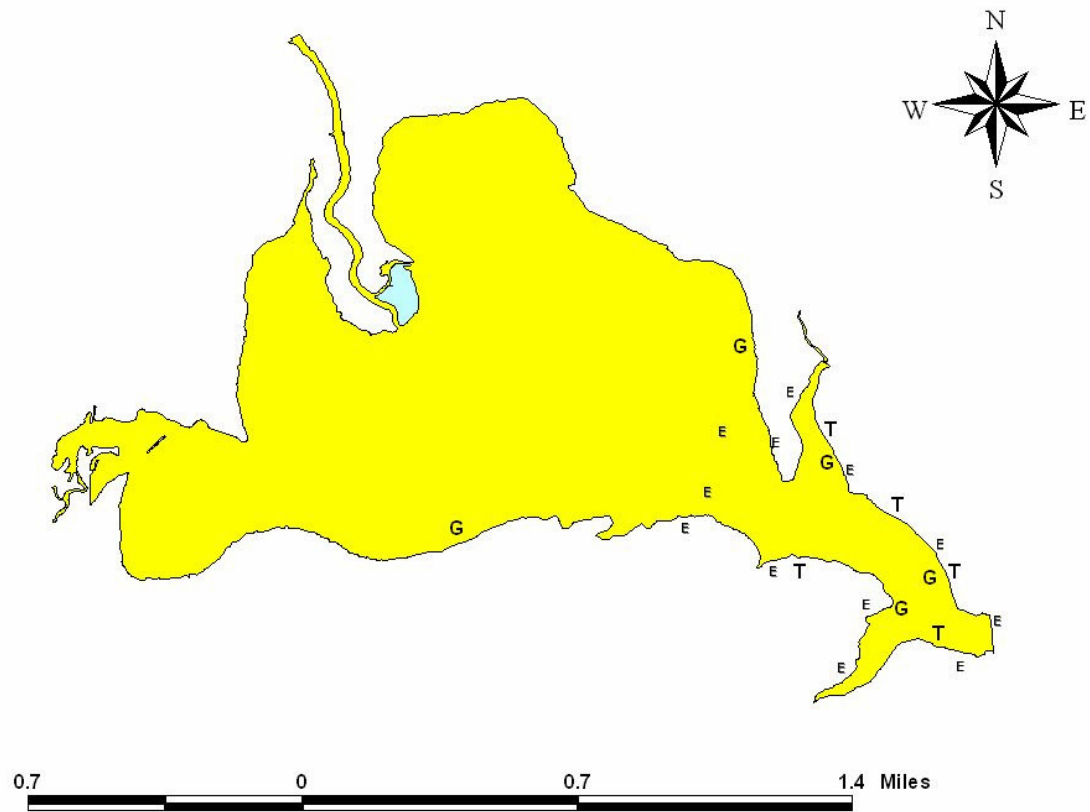
Table 6. Proposed sampling schedule for Fort Parker State Park Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S, Creel by C, and additional survey denoted by A.

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

**APPENDIX A**

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

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					2,114	2,114.0
Threadfin shad					243	243.0
Blue catfish	3	0.6				
Channel catfish	16	3.2				
White bass	2	0.4				
Green sunfish					4	4.0
Warmouth					4	4.0
Orange spotted sunfish					2	2.0
Bluegill					352	352.0
Longear sunfish					1	55.0
Redear sunfish					1	1.0
Largemouth bass					39	39.0
White crappie			143	28.6		

**APPENDIX B**

Location of sampling sites, Fort Parker Reservoir, Texas, 2006-2007. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was approximately 4 feet low during trap netting and electrofishing, and full during gill netting.