

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

Casa Blanca Reservoir

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July 31, 2007

TABLE OF CONTENTS

Survey and management summary	2
Introduction.....	3
Reservoir description.....	3
Management history	3
Methods.....	4
Results and discussion.....	4
Fisheries management plan	6
Literature cited.....	7
Figures and tables.....	8-18
Reservoir characteristics (Table 1).....	8
Harvest regulations (Table 2)	8
Stocking history (Table 3).....	9
Habitat survey (Table 4)	10
Gizzard shad (Figure 1).....	11
Bluegill (Figure 2)	12
Blue catfish (Figure 3)	13
Channel catfish (Figure 4)	14
Palmetto bass (Figure 5)	15
Largemouth bass (Figure 6)	16
White crappie (Figure 7)	17
Proposed sampling schedule (Table 5).....	18
Appendix A	
Reservoir map showing 2006-2007 sample sites for all gear types	19
Appendix B	
Catch rates for all species from all gear types for 2006-2007	20
Appendix C	
Summary of largemouth bass population genetic composition	21

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Casa Blanca Reservoir were surveyed using electrofishing and trap nets in 2004 and 2006, and gill nets in 2003, 2005, and 2007. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Casa Blanca is a 1,680-acre reservoir located near Laredo, Texas, in the Rio Grande River watershed. The reservoir and associated Lake Casa Blanca State Park have been managed by Texas Parks and Wildlife Department since 1990. Water level records are not kept for this reservoir. Maximum water level fluctuation during the study period was observed to be about 2 feet and water level was sufficient providing adequate angler and boat access. Handicap specific facilities were not present. At the time of sampling, the habitat was primarily rocky shoreline, flooded terrestrial vegetation and native emergent vegetation.
- **Management History:** Important sport fishes include largemouth bass, catfishes, white crappie, and palmetto bass. Harvest of all sport fish species except largemouth bass has been regulated according to statewide size and daily bag limits. Largemouth bass harvest is currently regulated with an 18-inch minimum size limit and a 5-fish daily bag limit. Palmetto bass have been stocked regularly with stockings occurring in four years since 2000. Florida largemouth bass fingerlings were last stocked in 2004.
- **Fish Community**
 - **Prey species:** Gizzard shad, threadfin shad, and bluegill form the reservoir's forage base, however gizzard shad abundance was considerably lower in 2006 compared to previous years.
 - **Catfishes:** Population abundance fluctuated during the study period for both blue and channel catfish, with blue catfish more abundant than channel catfish. Population size structure remained poor for channel catfish and some improvement was noted for blue catfish size structure in 2007.
 - **Temperate basses:** The reservoir currently supports an abundant palmetto bass population relative to previous years, which is a result of stockings conducted in 2004 and 2005.
 - **Largemouth bass:** Relative abundance of largemouth bass fluctuated during the survey period with highest abundance in 2004. Although the population was dominated by small fish, 4 fish >13 lbs. were caught from the reservoir and donated as ShareLunkers since 2004.
 - **White crappie:** Relative abundance of white crappie also fluctuated during the survey period. Population size structure remained similar throughout the survey period, with most fish measuring <10 inches in 2004 and 2006.
- **Management Strategies:** Continue to use and evaluate the effectiveness of the 18-inch minimum size limit and 5-fish daily bag limit for largemouth bass. Continue to stock palmetto bass, but at a reduced rate and frequency.

INTRODUCTION

This document is a summary of fisheries data collected from Casa Blanca Reservoir in 2003-2007. 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 in some cases with the 2003-2007 data for comparison.

Reservoir Description

Casa Blanca is a 1,680-acre reservoir located near Laredo, Texas, in the Rio Grande River watershed. The reservoir and associated park were acquired by Texas Parks and Wildlife in 1990 and opened as a State Park in March 1991. Major uses include recreation and irrigation for a golf course. Water levels are not recorded for this reservoir. The reservoir, which is fed by the relatively small 117 mile² drainage area of Chacon and San Ygnacio Creeks, has a history of water level fluctuation; however substantial water level fluctuation (>3 feet) did not occur during the survey period. Angler and boat access is adequate, but no handicap specific facilities are present. At the time of sampling, the habitat was primarily rocky shoreline, flooded terrestrial vegetation and native emergent vegetation with some dead timber. Other descriptive characteristics for the reservoir are contained in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Dean 2002) included:

1. Continue management and monitoring of the largemouth bass population under current special harvest regulation.

Action: Largemouth bass abundance and growth were assessed in 2004 and 2006. A total of 274,896 Florida largemouth bass fingerlings were stocked from 2003 to 2004.

2. Stock palmetto bass annually.

Action: A total of 43,746 palmetto bass were stocked in 2004, 2005, and 2007. Stockings were not conducted in 2003 and 2006 because of lower-than-anticipated hatchery production.

Harvest regulation history: Harvest of largemouth bass was regulated according to the statewide size and daily bag limits until 1994. In 1994, the largemouth bass harvest regulations were changed to an 18-inch minimum size limit and a 3-fish daily bag limit. The current largemouth bass harvest regulations are an 18-inch minimum size limit and a 5-fish daily bag limit. Harvest of all other sport fish species has been regulated according to statewide size and daily bag limits (Table 2).

Stocking history: Catfish spp., Morone spp., crappie spp., bluegill, and largemouth bass have been stocked into Casa Blanca Reservoir. Stockings of striped bass and crappie spp. were discontinued because of lack of success. Recent stockings (post 2000) included Florida largemouth bass, palmetto bass, channel catfish, and bluegill. Florida largemouth bass were first stocked in 1978 and last stocked in 2004. Palmetto bass were stocked in 12 years since 1977, with stockings more frequent in recent years (6 of the last 10 years). The complete stocking history is contained in Table 3.

Vegetation/habitat history: In 1998, Casa Blanca Reservoir habitat was primarily rocky shoreline, flooded terrestrial vegetation, native emergent vegetation, and some dead timber (Dean 1998). Bullrush and cattails were found to occupy 3.6 acres at that time.

METHODS

All surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005). Fishes were collected by electrofishing (12 5-minute stations), trap netting and gill 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 nets and trap nets, as the number of fish per net night (fish/nn). Electrofishing surveys were conducted during night time and sample sites were randomly selected for all gear types (Appendix A).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and condition indices [relative weight (W_t)] 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 = $100 \times \text{SE of the estimate/estimate}$) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV.

Genetic analysis of largemouth bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Littoral zone/physical habitat, vegetation, angler access, and facility surveys were conducted in accordance with Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

RESULTS AND DISCUSSION

Habitat: Although records are not kept for this reservoir, water level was sufficient during the study period with angler access unimpaired. The primary physical habitat in the reservoir continued to be flooded terrestrial vegetation (Table 4). Native emergent vegetation coverage, primarily cattails and bulrush, was greater in 2006 (6.7 acres) than in 1998 (3.6 acres).

Prey species: Electrofishing CPUE of gizzard shad was considerably lower in 2006 (38.0 fish/h) than in 2004 (328.0 fish/h) and 2002 (211.0.0 fish/h). Gizzard shad IOV was also comparatively low in 2006 indicating that only 26.3% of gizzard shad were available to existing predators (Figure 1). Electrofishing CPUE of bluegill was lower in 2006 (103.0 fish/h) than in 2004 (150.0 fish/h), but greater than in 2002 (58.0 fish/h). Size structure of the bluegill population was favorable for providing forage for adult largemouth bass (Figure 2). Threadfin shad are also important prey species in the reservoir and their relative abundance (34.0 fish/h) was similar to gizzard shad in 2006 (Appendix B).

Blue catfish: Gill net CPUE of blue catfish in 2007 (10.8 fish/nn) was similar to in 2005 (10.6 fish/nn), but lower than in 2002 (20.4 fish/nn). Size structure of the population was improved in 2007 relative to previous years as fish ≥ 25 inches comprised a greater proportion of the population (Figure 3).

Channel catfish: Gill net CPUE of channel catfish in 2007 (6.4 fish/nn) was greater than in 2005 (2.0 fish/nn) and slightly above that found in 2003 (4.6 fish/nn). Size structure of the population remained poor. No fish > 13 inches total length were collected by gill netting during the survey period (Figure 4).

Temperate basses: Gill net CPUE of palmetto bass was greater in 2007 (5.0 fish/nn) than in 2005 (0.6 fish/nn) and 2003 (0.2 fish/nn), which was likely due to more frequent stockings in recent years. Size structure of the population was good with about half of the collected fish having a total length ≥ 18 inches (Figure 5).

Largemouth bass: Electrofishing CPUE of largemouth bass was considerably lower in 2006 (58.0 fish/h) than in 2004 (131.0 fish/h), but greater than in 2002 (35.0 fish/h). Size structure of the population was generally similar in 2006 and 2004, with few fish over 14 inches in total length. However, the proportion of

fish ≥ 12 inches in the population was greater in 2006 than in 2004 (Figure 6). Although, the population is dominated by small fish, the reservoir produced 4 ShareLunkers (fish ≥ 13 lbs.) since 2004. These frequent catches of very large fish suggest that the special largemouth bass 18-inch minimum length has been effective in limiting harvest to the extent that the reservoir can produce trophy size fish. Genetic introgression of FLMB into the population remains high (Appendix C). In 2006, FLMB alleles and pure FLMB was 88% and 50%, respectively.

White crappie: Trap net CPUE of white crappie was less in 2006 (5.0 fish/nn) than in 2004 (11.6 fish/nn), and similar to in 2002 (4.8 fish/nn). Population size structure remained similar among years during the survey period with a modal peak at 10-11 inches in annual length frequency distributions (Figure 7).

Fisheries Management Plan for Casa Blanca**Reservoir, Texas**

Prepared – July 2007

ISSUE 1: The reservoir supports a trophy largemouth bass fishery. Since 2004, 4 fish >13 lbs have been documented caught from the reservoir and entered into the ShareLunker program.

MANAGEMENT STRATEGY

1. Continue use and evaluation of the 18-inch minimum size and 5-fish daily bag limits. Conduct additional largemouth bass-only electrofishing in fall 2008 to monitor the population.

ISSUE 2: The reservoir currently supports an abundant palmetto bass population and a popular fishery for this species. However, gizzard shad abundance has declined considerably in recent years suggesting a possible predator-prey imbalance.

MANAGEMENT STRATEGY

2. Maintain the palmetto bass population and fishery by stocking, but stock at a reduced frequency and rate. Stock palmetto bass fingerlings at 10 fish/acre in 2009 and 2010. Conduct additional gill net sampling in spring 2009 to monitor the population.

SAMPLING SCHEDULE JUSTIFICATION:

Biennial fall electrofishing (2008 and 2010) is necessary to monitor the largemouth bass and gizzard shad populations, and biennial gill net sampling (spring 2009 and 2011) is needed to monitor the palmetto bass population.

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.
- Dean, W. J., Jr. 1998. Statewide freshwater fisheries monitoring and management program survey report for Casa Blanca Reservoir, 2001. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Dean, W. J., Jr. 2002. Statewide freshwater fisheries monitoring and management program survey report for Casa Blanca Reservoir, 2001. 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.

Table 1. Characteristics of Casa Blanca Reservoir, Texas.

Characteristic	Description
Year constructed	1951
Controlling authority	Webb County and TPWD
County	Webb
Reservoir type	Off-stream
Shoreline Development Index	2.3
Conductivity	600 umhos/cm

Table 2. Harvest regulations for Casa Blanca Reservoir.

Species	Bag Limit	Length Limit (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 minimum
Catfish, flathead	5	18 minimum
Bass, palmetto (striped X white hybrid)	5	18 minimum
Bass, largemouth	5	18 minimum
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 minimum

Table 3. Stocking history of Casa Blanca Reservoir, Texas. Size categories are: FRY =<1 inch, FGL = 1-3 inches, ADL = adults, and NR = size not recorded.

Species	Year	Number	Size
Blue catfish	1966	10,000	FGL
	1988	15	ADL
	Total	10,015	
Channel catfish	1966	38,700	NR
	1972	1,200	NR
	2003	800	ADL
	Total	40,700	
Flathead catfish	1966	12	NR
Striped bass	1996	24,840	FGL
Palmetto Bass	1977	35,000	NR
	1979	21,975	NR
	1981	23,550	NR
	1982	159,000	NR
	1994	41,040	FGL
	1995	37,161	FGL
	1997	24,930	FGL
	1998	25,038	FGL
	2000	21,582	FGL
	2004	16,966	FGL
	2005	16,061	FGL
	2007	10,719	FGL
	Total	433,022	
Bluegill	2003	105,072	FGL
Largemouth bass	1966	68,430	NR
White crappie	1966	2,050	NR
	1994	94	ADL
	1994	80,165	FRY
	Total	82,309	
Black crappie	1966	23,000	NR
Florida largemouth bass	1978	1,693	FGL
	1982	100,625	FGL
	1983	80,050	FGL
	1992	81,807	FGL
	1994	82,434	FGL
	1995	82,487	FGL
	2003	106,326	FGL
	2004	168,570	FGL
	Total	703,992	

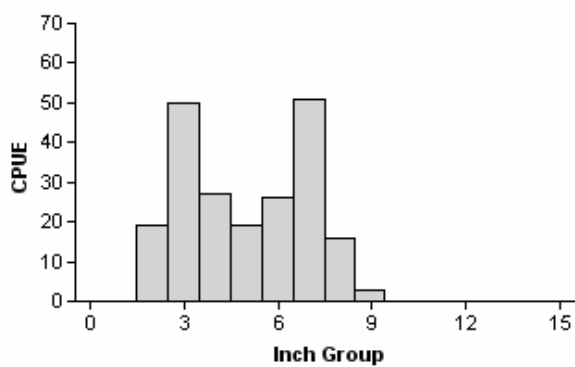
Table 3 continued. Stocking history of Casa Blanca Reservoir, Texas. Size categories are: FRY \leq 1 inch; FGL = 1-3 inches, ADL = adults, and NR = size not recorded.

Species	Year	Number	Size
Walleye	1973	30,000	NR
Green sunfish X redear sunfish	1966	3,000	NR
ShareLunker largemouth bass	2006	4,517	FGL
Red drum	1963	490	FGL

Table 4. Survey of littoral zone and physical habitat types, Casa Blanca Reservoir, Texas, 2006. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each aquatic vegetation type.

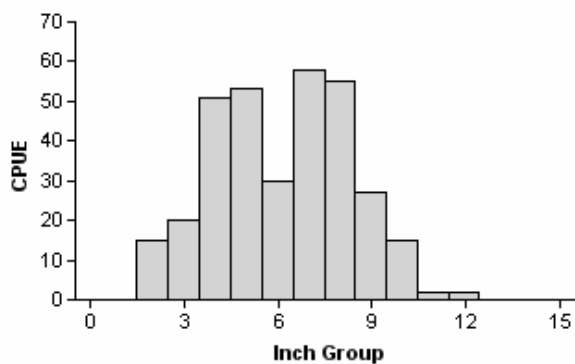
Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Flooded dead terrestrial vegetation	12.7	55.9		
Flooded dead terrestrial vegetation with native emergent vegetation	7.0	30.6		
Flooded dead terrestrial vegetation with boat docks	0.2	0.9		
Flooded dead terrestrial vegetation with boat docks and native emergent vegetation	0.4	1.8		
Rock or gravel	0.6	2.7		
Rip rap with native emergent vegetation	1.0	4.5		
Non-descript	0.8	3.6		
Native emergent vegetation			6.7	0.6

Gizzard Shad 2002



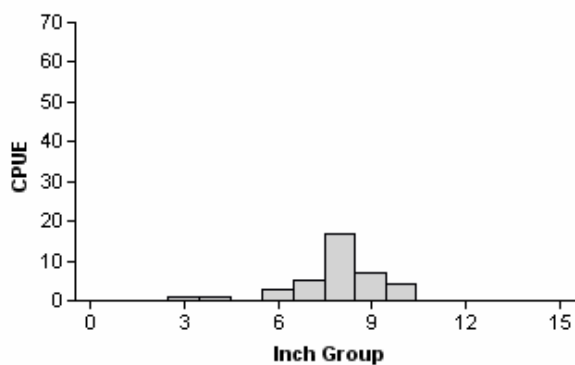
Effort = 1.0
 Total CPUE = 211.0 (30; 211)
 IOV = 91 (4)

2004



Effort = 1.0
 Total CPUE = 328.0 (24; 328)
 IOV = 69 (7)

2006

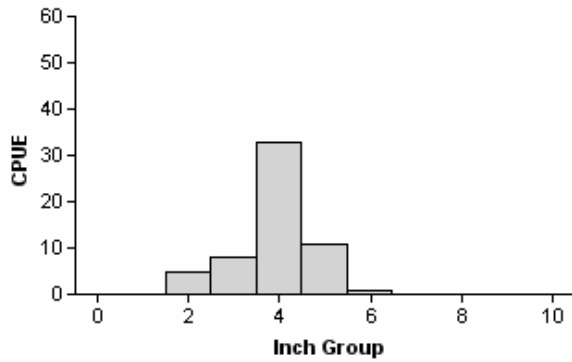


Effort = 1.0
 Total CPUE = 38.0 (23; 38)
 IOV = 26 (8)

Figure 1. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Casa Blanca Reservoir, Texas, 2002, 2004, and 2006.

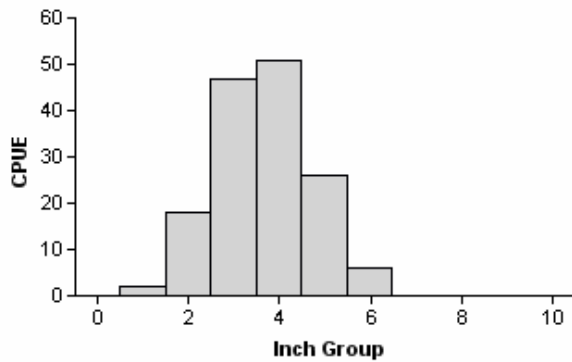
Bluegill

2002



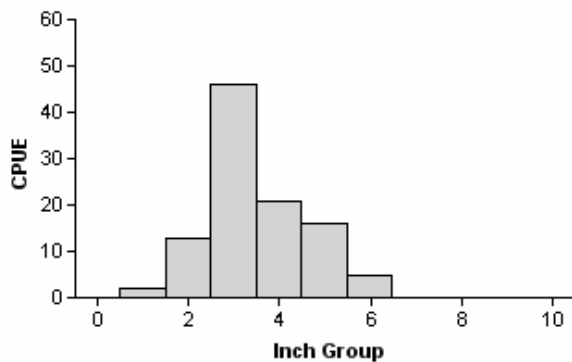
Effort = 1.0
Total CPUE = 58.0 (39; 58)
PSD = 2 (2)

2004



Effort = 1.0
Total CPUE = 150.0 (48; 150)
PSD = 5 (3)

2006



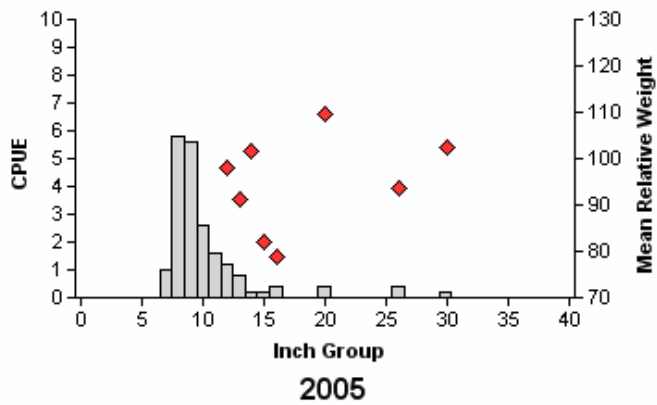
Effort = 1.0
Total CPUE = 103.0 (33; 103)
PSD = 6 (3)

Figure 2. 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, Casa Blanca Reservoir, Texas, 2002, 2004, and 2006.

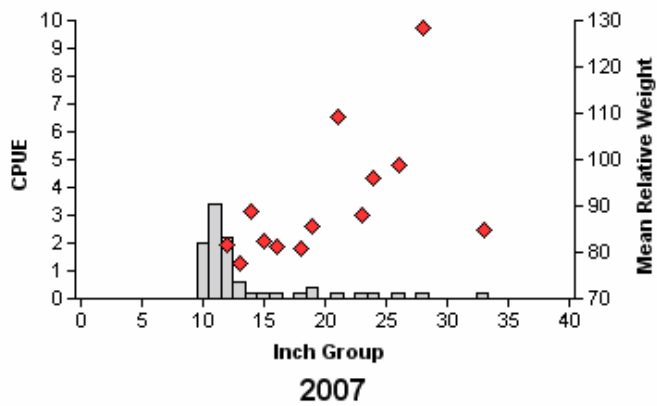
Blue Catfish

2003

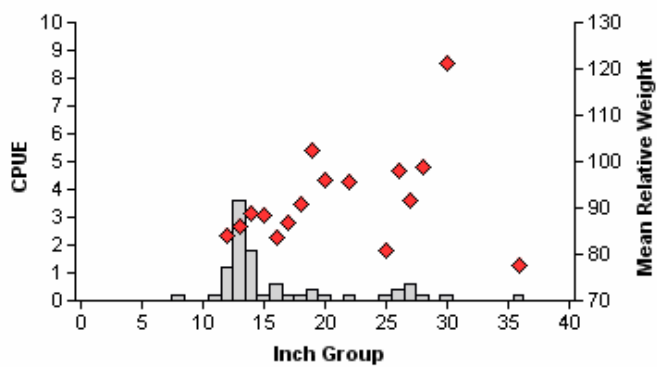
2005, and 2007.



Effort = 5
Total CPUE = 20.4 (29; 102)
PSD = 26 (13)



Effort = 5
Total CPUE = 10.6 (16; 53)
PSD = 23 (6)



Effort = 5
Total CPUE = 10.8 (29; 54)
PSD = 21 (6)

Figure 3. Number of blue catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2003,

Channel Catfish

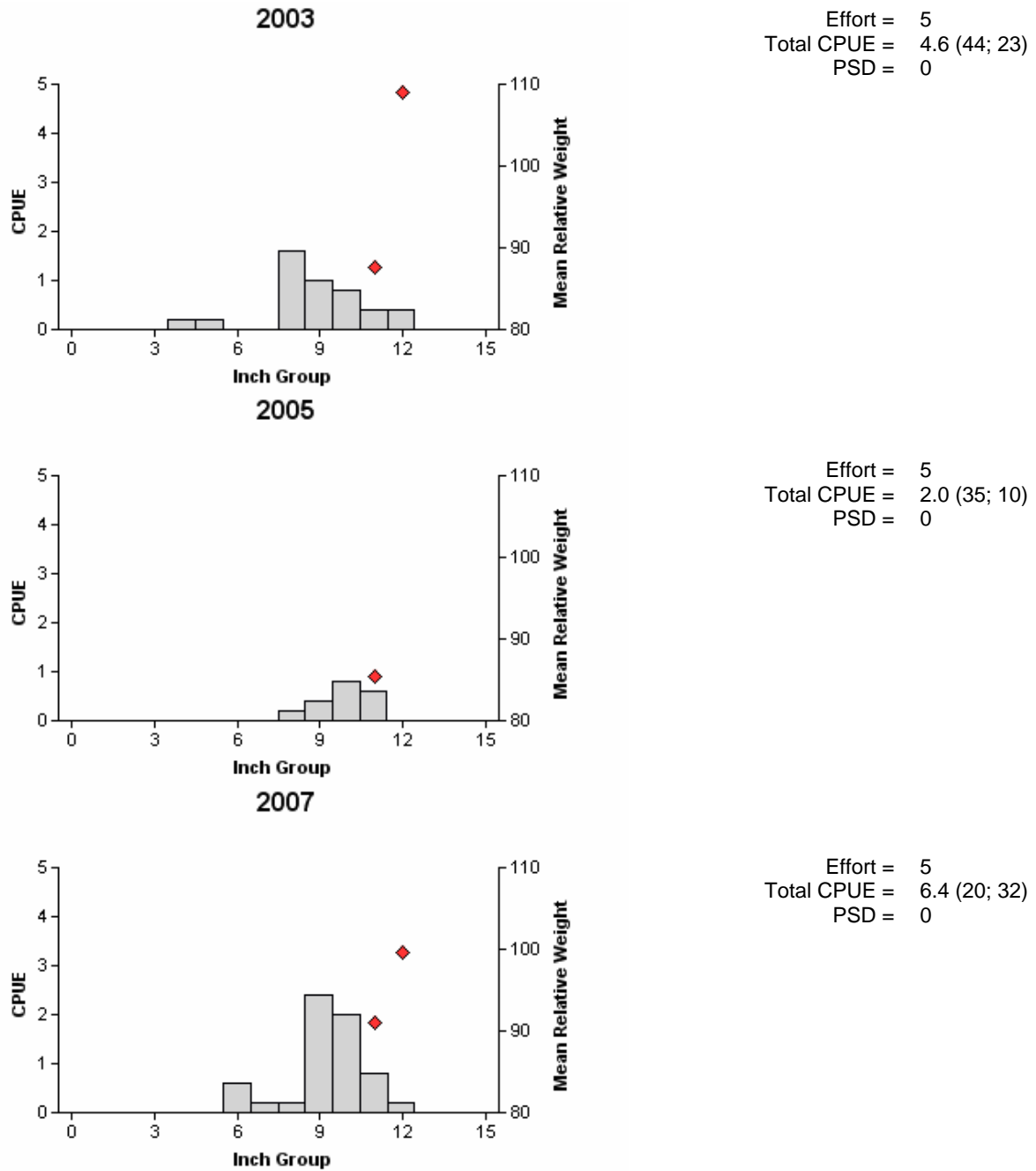


Figure 4. Number of channel catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2003, 2005, and 2007.

Palmetto Bass

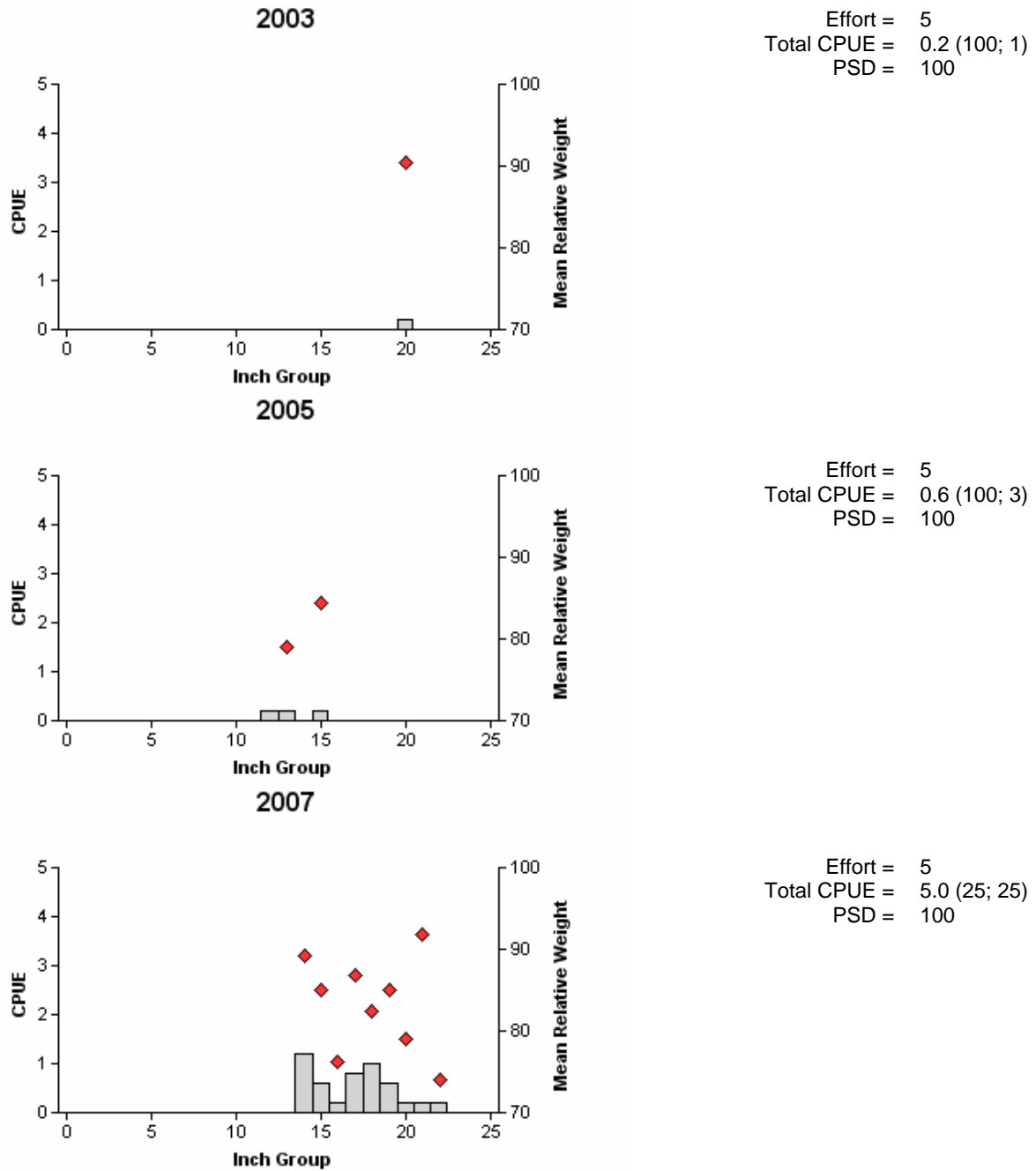
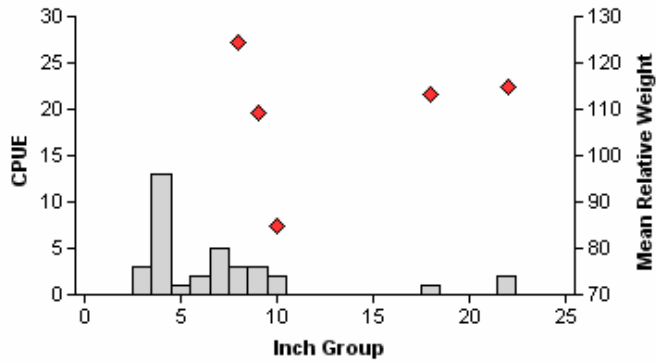


Figure 5. Number of palmetto bass caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2003, 2005, and 2007.

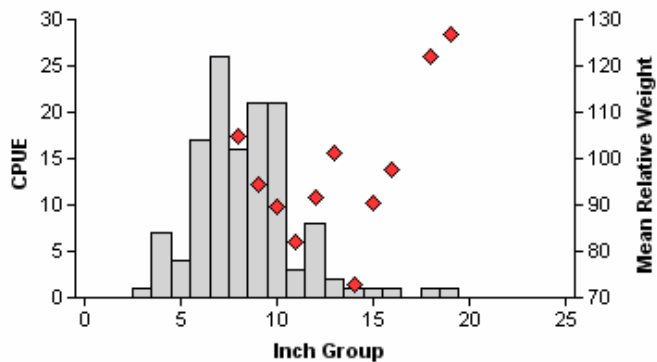
Largemouth Bass

2002



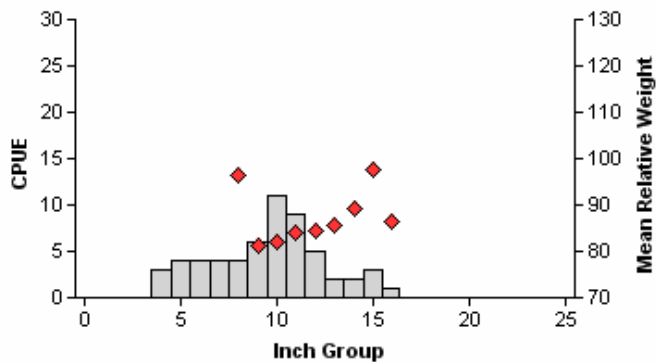
Effort = 1.0
 Total CPUE = 35.0 (31; 35)
 Stock CPUE = 11.0 (34; 11)
 PSD = 27 (15)

2004



Effort = 1.0
 Total CPUE = 131.0 (30; 131)
 Stock CPUE = 76.0 (28; 76)
 PSD = 20 (6)

2006



Effort = 1.0
 Total CPUE = 58.0 (31; 58)
 Stock CPUE = 43.0 (30; 43)
 PSD = 30 (8)

Figure 6. 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, Casa Blanca Reservoir, Texas, 2002, 2004, and 2006.

White Crappie

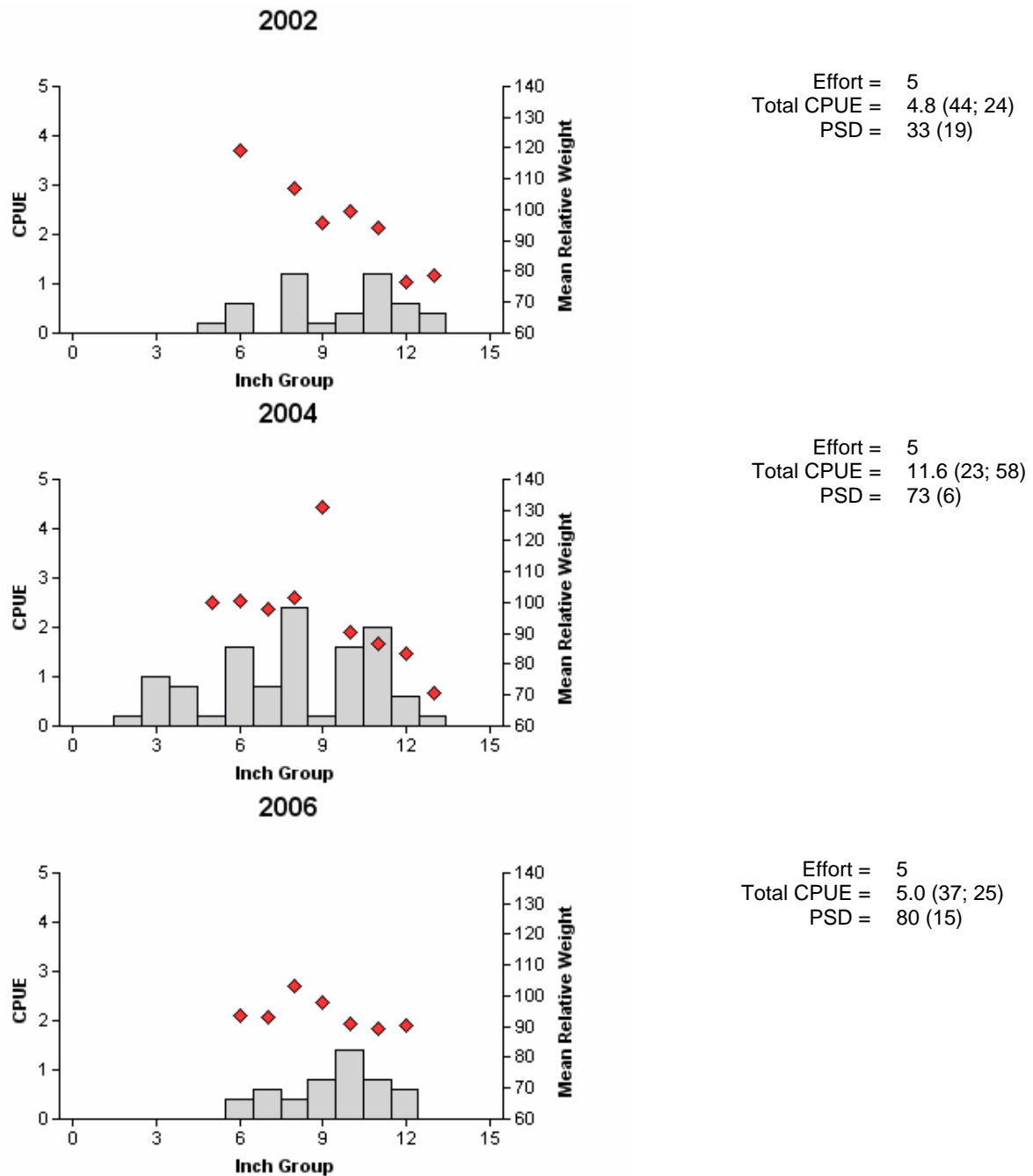
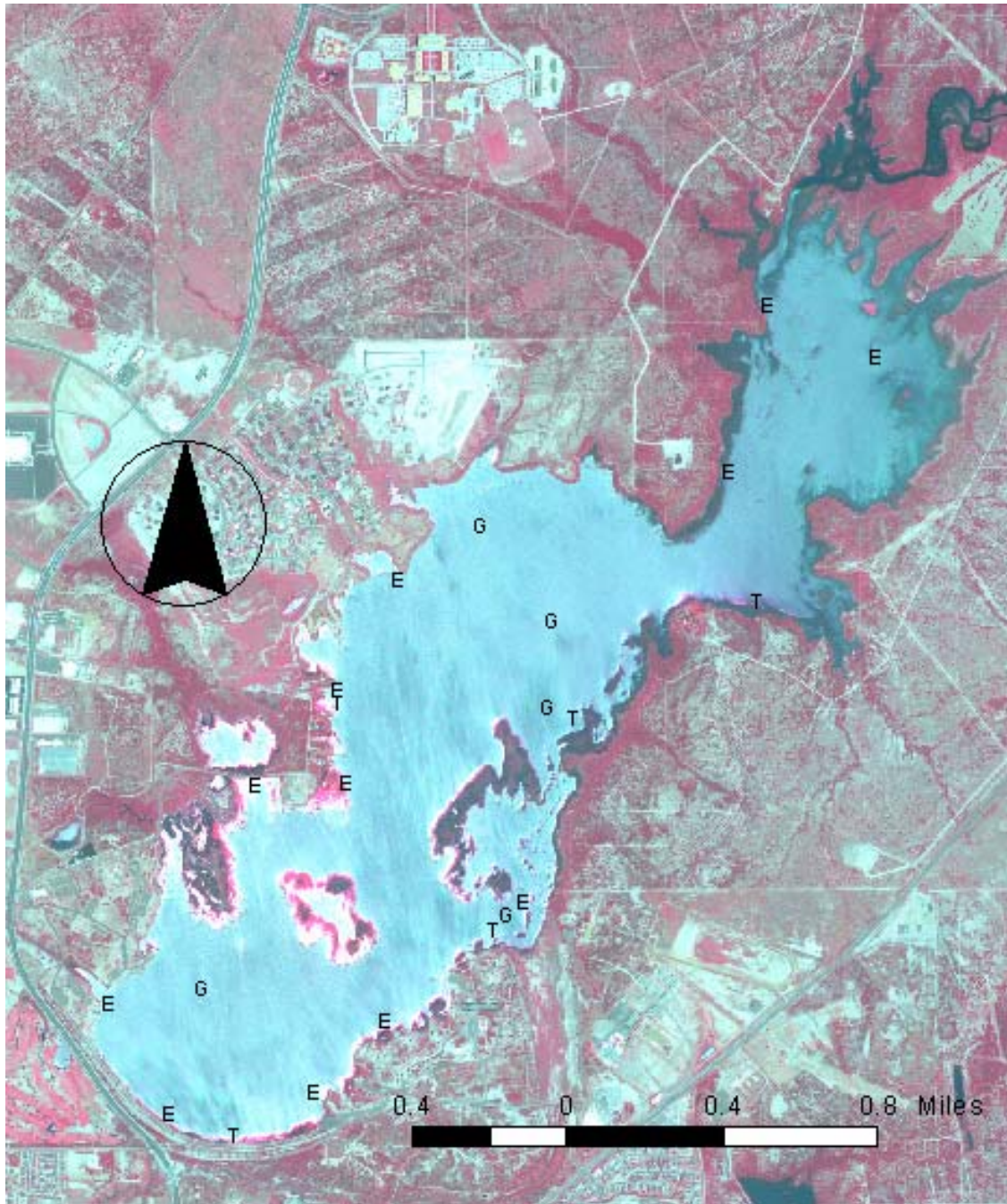


Figure 7. Number of white crappie caught per net night (CPUE, bars), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Casa Blanca Reservoir, Texas, 2002, 2004, and 2006.

Table 5. Proposed sampling schedule for Casa Blanca Reservoir, Texas. Gill netting surveys are conducted in the spring, and electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

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

APPENDIX A



Location of sampling sites, Casa Blanca Reservoir, Texas, 2006-2007. Gill net, trap net, and electrofishing stations are indicated by G, T, and E, respectively. Aerial photography is from 2004.

APPENDIX B

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Casa Blanca Reservoir, Texas, 2006-2007.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					38	38.0
Threadfin shad					34	34.0
Blue catfish	54	10.8				
Channel catfish	32	6.4				
Palmetto bass	25	5.0				
Bluegill					103	103.0
Redear sunfish					2	2.0
Largemouth bass					58	58.0
White crappie			25	5.0		

APPENDIX C

Results of electrophoretic analysis of age-0 largemouth bass collected by electrofishing during fall from Casa Blanca Reservoir, Texas, in selected years from 2000 to 2006. Intergrades are fish with both Florida largemouth bass (FLMB) and northern largemouth bass (NLMB) genes.

Number of fish by genotype						
Year	Sample size	FLMB	Intergrade	NLMB	% FLMB alleles	% FLMB genotype
2000	21	13	8	0	85	62
2002	25	17	8	0	87	67
2006	30*	15	15	0	88	50

* Age-0 through age-2 fish used in the sample.