

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-221-M-1

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2010 Survey Report

**Casa Blanca Reservoir**

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July 31, 2011

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Casa Blanca Reservoir were surveyed in 2004, 2006, and 2010 using electrofishing and in 2005, 2007, and 2011 using gill nets. This report summarizes survey results and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Casa Blanca is a 1,055 acre reservoir located near Laredo, Texas, in the Rio Grande River watershed. In 1990, the county park located on the lower end of the reservoir was acquired by Texas Parks and Wildlife and opened in March of 1991 as Lake Casa Blanca International State park. Major uses include recreation and irrigation for a golf course. The reservoir has a history of substantial water level fluctuation. Angler and boat access is adequate. A little less than half of the shoreline is rocky or gravelly, and aquatic plants and flooded terrestrial vegetation typically occupy about 25% of the reservoir. Considerable shoreline access, including a fishing pier, exists for bank angling.
- **Management History:** Important sport fishes include largemouth bass, catfishes, 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 (implemented in 1994). Palmetto bass have been stocked regularly with stockings occurring in five years since 2004. Florida largemouth bass fingerlings were last stocked in 2004 and ShareLunker fingerlings were stocked in 2006, 2008, and 2010.
- **Fish Community**
  - **Prey species:** Gizzard and threadfin shad, bluegill and other sunfishes constitute the reservoir's forage base. Prey species relative abundance and size structure provides an adequate forage base for existing predators.
  - **Catfishes:** Blue and channel catfishes occur in the reservoir. During the study period relative abundance of blue catfish declined, but channel catfish numbers increased. Population size structure declined for blue catfish and remained poor for channel catfish.
  - **Palmetto bass:** Relative abundance of palmetto bass increased over the study period, but population size structure declined.
  - **Largemouth bass:** Since 2004, relative abundance has remained similar and the population has continued to be primarily composed of <14 inch fish. Six largemouth bass from the reservoir have been submitted to the ShareLunker program since 2004.
- **Management strategies:** Continue to stock palmetto bass annually and evaluate the 18-inch minimum length limit on largemouth bass.

## INTRODUCTION

This document summarizes fisheries data collected for Casa Blanca Reservoir from 2004 to 2011 and provides information to 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 are presented with current data for comparison.

### *Reservoir Description*

Casa Blanca is a 1,055 acre reservoir located near Laredo, Texas, in the Rio Grande River watershed. In 1990, the county park located on the lower end of the reservoir was acquired by Texas Parks and Wildlife and opened in March of 1991 as Lake Casa Blanca International State park. Major uses include recreation and irrigation for a golf course. The reservoir, fed by a 117 sq mile drainage area of Chacon and San Ygnacio Creeks, has a history of substantial water level fluctuation; however water level records have not been recorded for this reservoir. Angler and boat access is adequate. A little less than half of the shoreline is rocky or gravelly and the remaining is considered natural (i.e. non-descript). Aquatic plants, primarily bulrush and cattails, typically occupy about 15% of the reservoir and flooded terrestrial vegetation occupies about 10%. Considerable shoreline access, including a fishing pier, exists for bank angling. Other descriptive characteristics for Casa Blanca Reservoir are in Table 1.

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Myers and Dennis 2007) included:

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

**Action:** Additional electrofishing was not conducted due to oversight.

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.

**Action:** Palmetto bass were stocked in 2008 at 11.6/acre and in 2009 at 16.5/acre. Additional gill net sampling was not conducted due to oversight.

**Harvest regulation history:** All sport fishes, except largemouth bass, are currently managed with statewide regulations (Table 2). In 1994, an 18-inch MLL and 3-fish daily bag limit (DBL) were enacted for largemouth bass. The DBL was changed to 5 fish in 1995.

**Stocking history:** Palmetto bass were first stocked in 1977 and have been stocked regularly since 1984. Florida Largemouth bass were stocked periodically from 1978 to 2004. ShareLunker largemouth bass fingerlings were stocked in 2006, 2008, and 2010. The complete stocking history is in Table 3.

**Vegetation/habitat management history:** There has been no significant vegetation or habitat management on this reservoir.

**Water Transfer:** Casa Blanca Reservoir is primarily used for recreation, golf course irrigation, and to a lesser extent, flood control. Currently no water is transferred to other reservoirs.

## METHODS

Standard electrofishing surveys (1 hour at 12 5-min randomly selected stations) were conducted in 2004, 2006, and 2010 and standard gill net surveys (5 net nights at 5 randomly-selected stations) were conducted in 2005, 2007, and 2011 according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009). 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, as the number of fish per net night (fish/nn). Refer to Appendix A for a reservoir map and location of 2010-2011 standard sampling stations. Aerial photography for Appendix A came from the Texas Natural Resources Information System website (<http://www.tnris.state.tx.us/>).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], and condition indices [relative weights ( $W_r$ )] 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 =  $100 \times \text{SE of the estimate/estimate}$ ) 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 2009).

Shoreline structural habitat and vegetation surveys were conducted in accordance with Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009).

## RESULTS AND DISCUSSION

**Habitat:** In 2010, native emergent vegetation (bulrush and cattail) occupied 14.8% of the reservoir (Table 4). Rock and gravel comprised 11.9% and 32.2% of the shoreline, respectively (Table 5).

**Prey species:** Electrofishing CPUE of gizzard shad was 103.0/h in 2010, nearly triple the CPUE in 2006 (38.0/h) and less than one-third the CPUE of 2004 (328.0/h; Figure 1). Gizzard shad IOV was 65 in 2010 indicating most of the shad were available to predators as forage. This was an increase from 2006 (26) and similar to 2004 (69). Bluegill CPUE was 111.0/h in 2010 which was similar to 103.0/h in 2006 and 150.0/h in 2004 (Figure 2). Most bluegill were  $\leq 5$  inches total length indicating they were suitably-sized forage for most adult predators. Threadfin shad, tilapia, and other sunfishes also contribute to the forage base (Appendix B).

**Blue catfish:** Blue catfish CPUE decreased dramatically in 2011 to 2.4/nn from 10.8/nn in 2007 and 10.6/nn in 2005 (Figure 3). While PSD in 2011 (42) was nearly double that in 2005 and 2007 (23 and 21, respectively), no fish  $> 26$  inches were collected in 2011. Mean relative weights by inch group ranged from 90 to 110 in 2011.

**Channel catfish:** Channel catfish CPUE has increased steadily from 2.0/nn in 2005 to 11.0/nn in 2011 (Figure 4). All channel catfish collected in the last three samples have been  $\leq 12$  inches total length.

**Palmetto bass:** The CPUE of palmetto bass increased over the last three samples; it was 0.6/nn in 2005, 5.0/nn in 2007, and 6.4/nn in 2011 (Figure 5). PSD-P has declined from 76 in 2007 to 16 in 2011. No legal sized palmetto bass (18-inches) were collected in 2011. Mean relative weights in 2011 were near 80.

**Largemouth bass:** Over the past three samples, electrofishing catch rates of largemouth bass have varied from 131.0/h in 2004 down to 58.0/h in 2006 and back up to 73.0/h in 2010 (Figure 6). PSD-P has increased from 5 in 2004 to 9 in 2006 to 18 in 2010. Mean relative weights by inch groups varied from the low 70s to over 100 in 2010. While the percentage of FLMB alleles in the population has remained in the 80s in 2006 and 2010, the percentage of FLMB genotypes has declined from 50 to 13 (Table 6).

## Fisheries Management Plan for Casa Blanca Reservoir, Texas

Prepared – July 2011

**ISSUE 1:** According to anecdotal information, palmetto bass is a popular sport fish in Casa Blanca Reservoir. Because natural reproduction of these species does not occur in the reservoir, stocking is necessary to support this fishery. The forage base appears to have rebounded, so reduced stocking rates are no longer required.

### MANAGEMENT STRATEGY

1. Stock palmetto bass fingerlings annually at a rate of 15 fish/acre.

**ISSUE 2:** The reservoir has an 18-in MLL regulation and supports a trophy largemouth bass fishery. Since 2004, 6 fish >13lbs have been documented 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 the spring of 2013 to monitor the population.

**ISSUE 3:** Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant Salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

### MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc... so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

### SAMPLING SCHEDULE JUSTIFICATION:

Standard gill net sampling (2015) is necessary to monitor population trends in catfishes and palmetto bass. Spring electrofishing will be conducted in 2013 and fall electrofishing will be conducted in 2014 to monitor trends in the largemouth 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, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.
- 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.
- Guy, C. S., R. M. Neuman, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7): 348.
- Myers, R. A. and J. A. Dennis. 2007. Statewide freshwater fisheries monitoring and management program survey report for Casa Blanca Reservoir, 2006. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

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	930 $\mu$ mhos/cm

Table 2. Harvest regulations for Casa Blanca Reservoir.

Species	Bag Limit	Length Limit
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12" minimum
Catfish, flathead	5	18" minimum
Bass, largemouth	5	18" minimum
Bass, palmetto	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
	2008	12,266	FGL
	2009	17,375	FGL
	Total	462,663	
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 =<1 inch, FGL = 1-3 inches, AFGL = 8 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
	2008	2,782	FGL
	2010	2,091	FGL
	Total	9,390	
Red drum	1963	490	FGL

Table 4. Results of a vegetation survey conducted at Casa Blanca Reservoir, Texas, in August, 2010. Surface area coverage (acres) was estimated for each vegetation type for the 1,055 acres using 88 randomly selected sample points.

Vegetation type	Coverage	Percent	Lower 95% CL	Upper 95% CL
Flooded terrestrial vegetation	107.6	10.2	3.9	16.6
Open water	802.9	76.1	67.2	85.0
Native emergent vegetation <sup>1</sup>	156.1	14.8	7.4	22.2

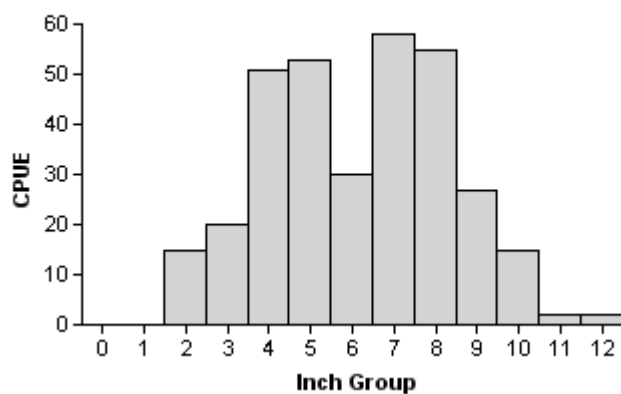
<sup>1</sup> bulrush and cattail

Table 5. Results of a structural habitat survey conducted at Casa Blanca Reservoir, Texas, in August, 2010. Linear distance (miles) was estimated for each habitat type for the 25.6 miles of shoreline using 83 randomly selected sample points.

Habitat type	Linear distance	Percent	Lower 95% CL	Upper 95% CL
Natural shoreline	14.3	55.9	43.9	67.9
Rock	3.0	11.9	3.9	19.9
Gravel	8.2	32.2	20.2	44.2

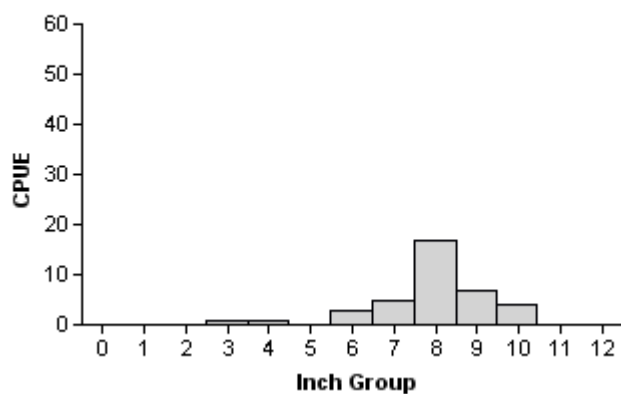
## Gizzard Shad

2004



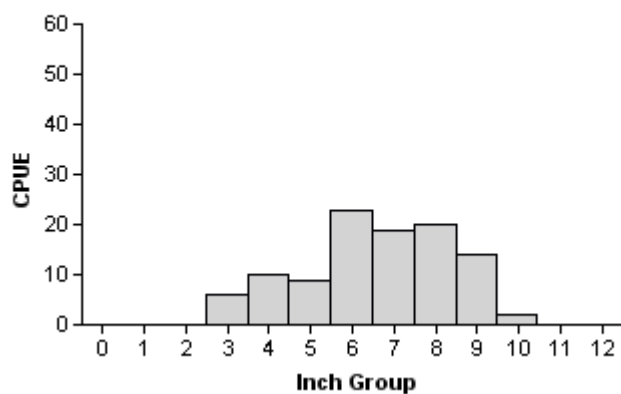
Effort = 1.0  
Total CPUE = 328.0 (24; 328)  
IOV = 69 (7)

2006



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

2010

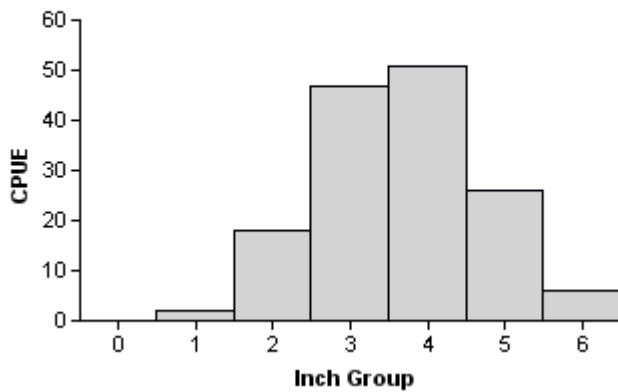


Effort = 1.0  
Total CPUE = 103.0 (12; 103)  
IOV = 65 (6)

Figure 1. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Casa Blanca Reservoir, Texas, 2004, 2006, and 2010. For IOV values, SE is provided in parentheses.

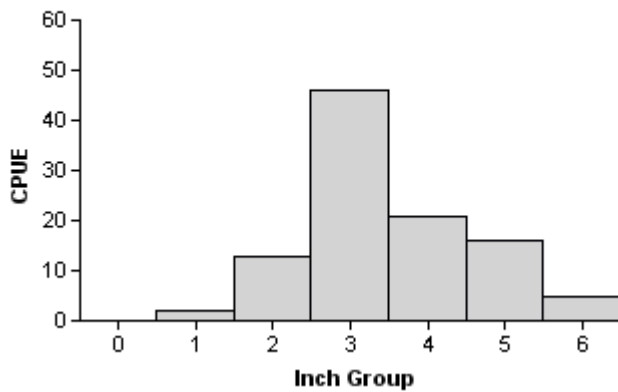
# Bluegill

**2004**



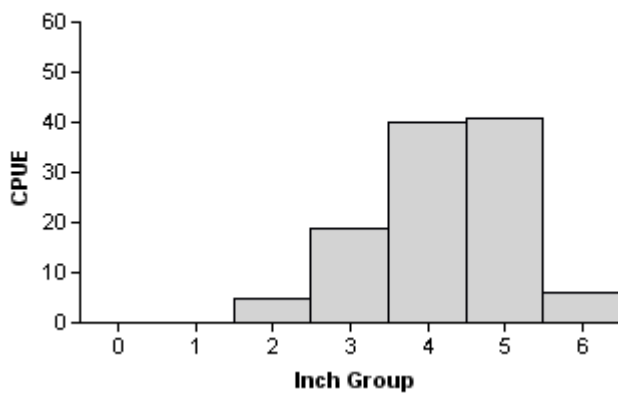
Effort = 1.0  
 Total CPUE = 150.0 (18; 150)  
 Stock CPUE = 130.0 (48; 130)

**2006**



Effort = 1.0  
 Total CPUE = 103.0 (33; 103)  
 Stock CPUE = 88.0 (32; 88)

**2010**

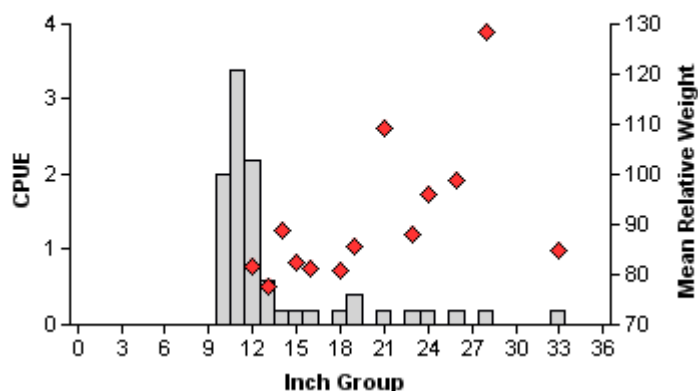


Effort = 1.0  
 Total CPUE = 111.0 (40; 111)  
 Stock CPUE = 106.0 (41; 106)

Figure 2. Number of bluegill caught per hour (CPUE) and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Casa Blanca Reservoir, Texas, 2004, 2006, and 2010.

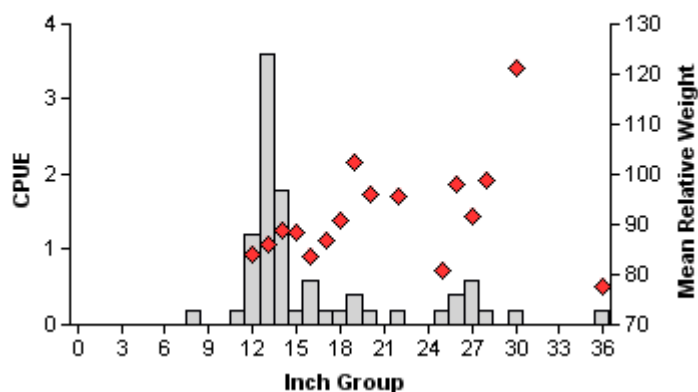
## Blue Catfish

2005



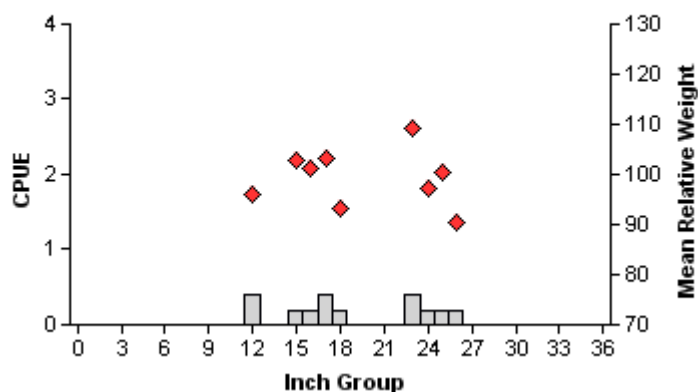
Effort = 5.0  
Total CPUE = 10.6 (16; 53)  
Stock CPUE = 5.2 (17; 26)  
PSD = 23 (6)

2007



Effort = 5.0  
Total CPUE = 10.8 (29; 54)  
Stock CPUE = 10.4 (27; 52)  
PSD = 21 (6)

2011

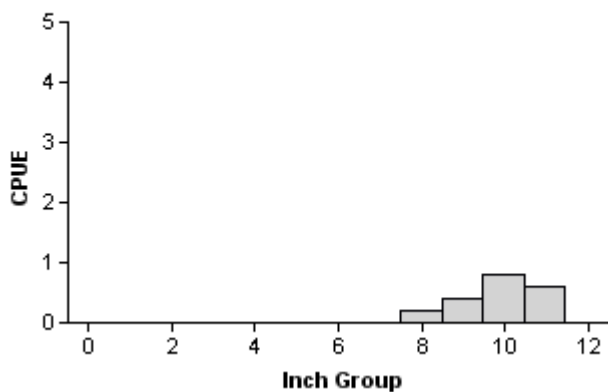


Effort = 5.0  
Total CPUE = 2.4 (39; 12)  
Stock CPUE = 2.4 (39; 12)  
PSD = 42 (9)

Figure 3. Number of blue catfish caught per net night (CPUE, bars) mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2005, 2007, and 2011. For PSD values, SE is provided in parentheses.

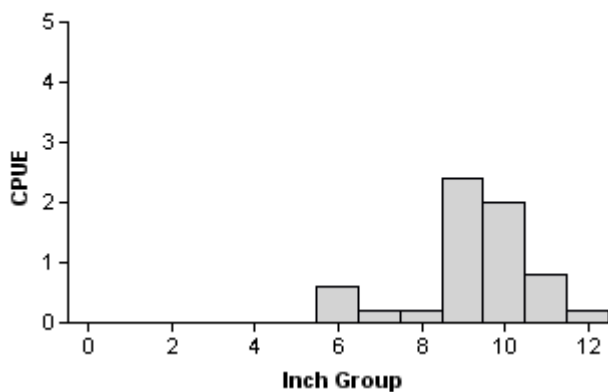
## Channel Catfish

2005



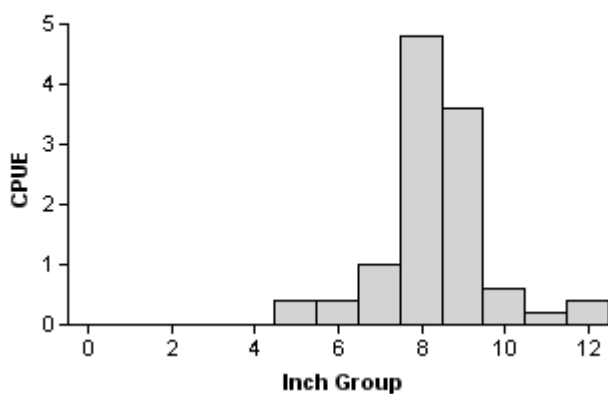
Effort = 5.0  
Total CPUE = 2.0 (35; 10)  
Stock CPUE = 0.6 (41; 3)  
PSD = 0 (0)

2007



Effort = 5.0  
Total CPUE = 6.4 (20; 32)  
Stock CPUE = 1.0 (63; 5)  
PSD = 0 (0)

2011

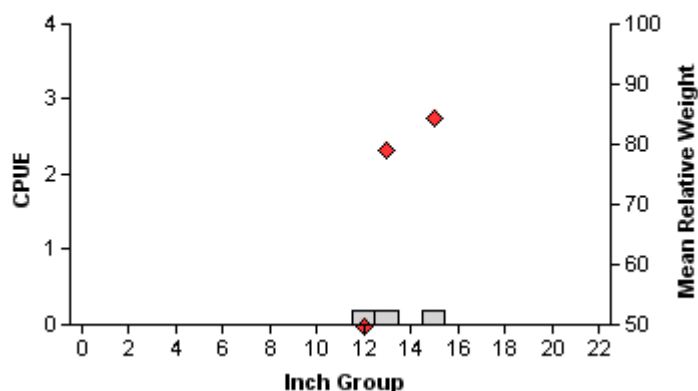


Effort = 5.0  
Total CPUE = 11.4 (39; 57)  
Stock CPUE = 0.6 (41; 3)  
PSD = 0 (0)

Figure 4. Number of channel catfish caught per net night (CPUE, bars) and population indices (RSE and N are in parentheses) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2005, 2007, and 2011. For PSD values, SE is provided in parentheses.

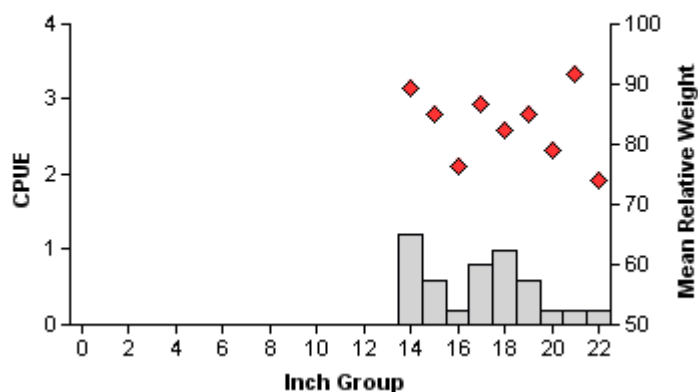
## Palmetto Bass

2005



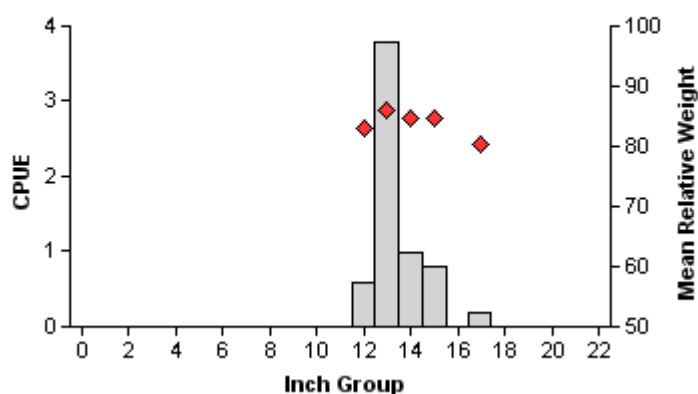
Effort = 5.0  
 Total CPUE = 0.6 (100; 3)  
 Stock CPUE = 0.6 (100; 3)  
 PSD = 100 (0)  
 PSD-P = 33 (0.4)

2007



Effort = 5.0  
 Total CPUE = 5.0 (25; 25)  
 Stock CPUE = 5.0 (25; 25)  
 PSD = 100 (0)  
 PSD-P = 76 (8.1)

2011



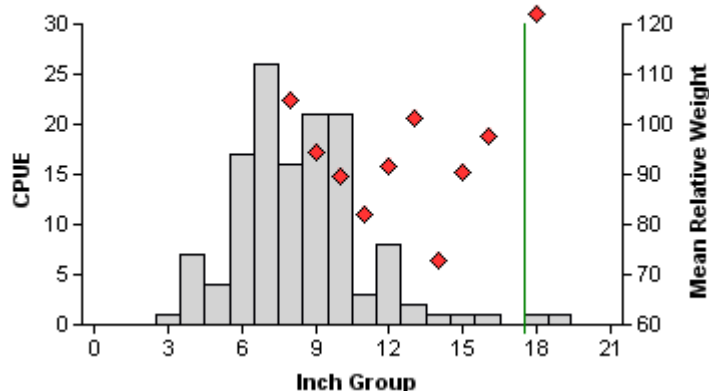
Effort = 5.0  
 Total CPUE = 6.4 (53; 32)  
 Stock CPUE = 6.4 (53; 32)  
 PSD = 100 (0)  
 PSD-P = 16 (9.4)

Figure 5. Number of palmetto bass caught per net night (CPUE, bars) mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Casa Blanca Reservoir, Texas, 2005, 2007, and 2011. For PSD values, SE is provided in parentheses.



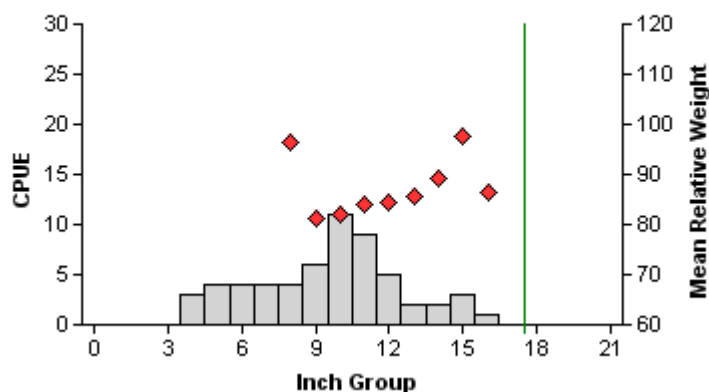
# Largemouth Bass

## 2004



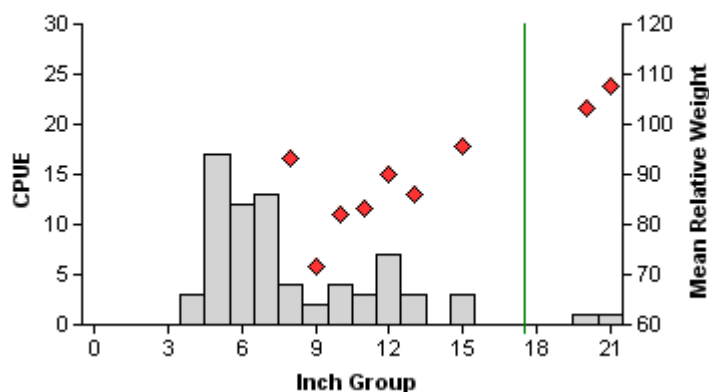
Effort = 1.0  
 Total CPUE = 131.0 (30; 131)  
 Stock CPUE = 76.0 (28; 76)  
 PSD = 20 (6)  
 PSD-P = 5 (4)

## 2006



Effort = 1.0  
 Total CPUE = 58.0 (31; 58)  
 Stock CPUE = 43.0 (30; 43)  
 PSD = 30 (8)  
 PSD-P = 9 (3)

## 2010



Effort = 1.0  
 Total CPUE = 73.0 (22; 73)  
 Stock CPUE = 28.0 (23; 28)  
 PSD = 54 (8)  
 PSD-P = 18 (6)

Figure 6. Number of largemouth bass caught per hour (CPUE, bars) mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Casa Blanca Reservoir, Texas, 2004, 2006, and 2010. RSE is used for CPUE values and SE is used for PSD values. Vertical line denotes 18 inch minimum length limit.

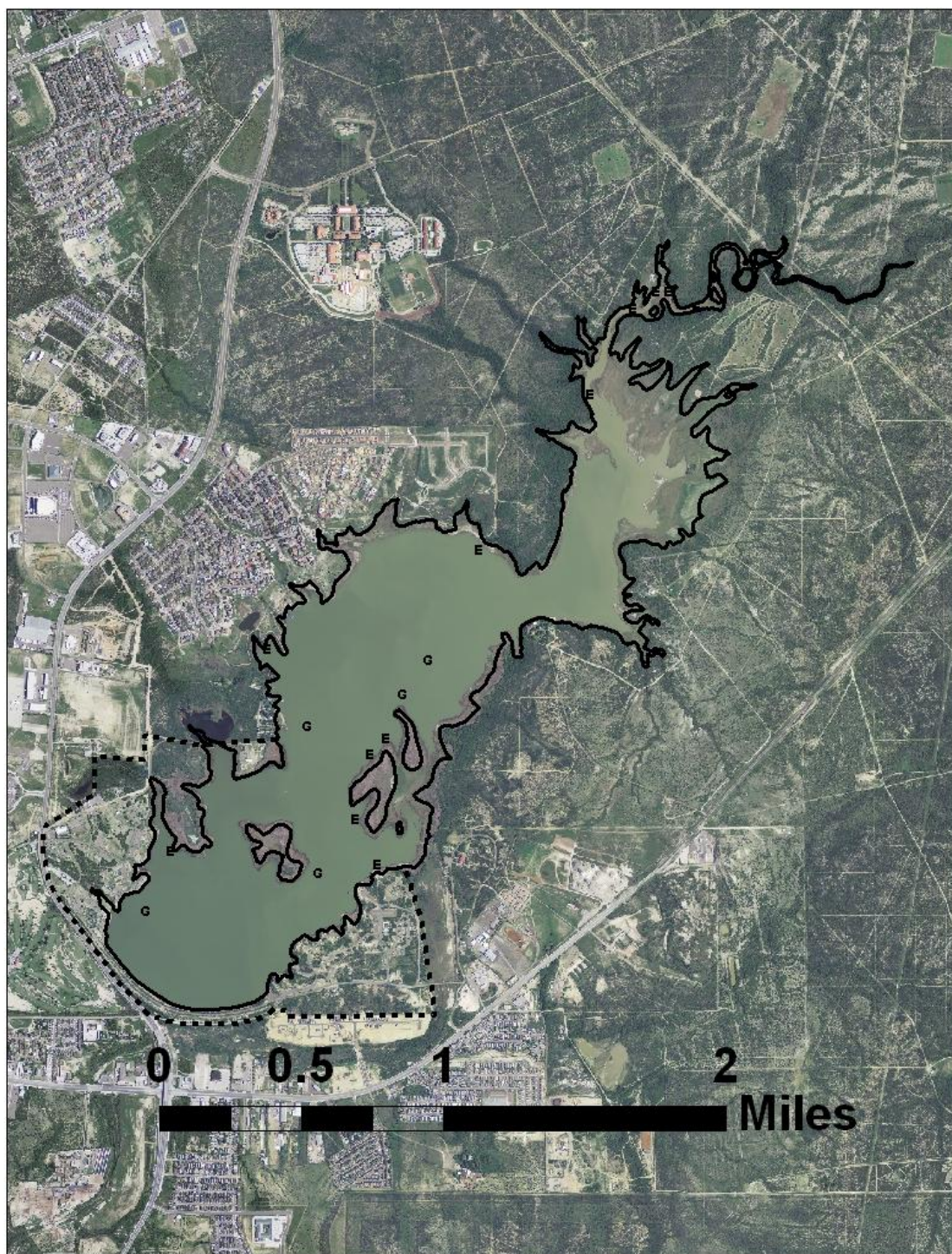
Table 6. Results of genetic analysis of largemouth bass collected by electrofishing during fall from Casa Blanca Reservoir, Texas, in 2000, 2002, 2006 and 2010. Intergrade fish are those with both Florida largemouth bass (FLMB) and northern largemouth bass (NLMB) genes. Genetic analysis procedures changed from electrophoresis to micro satellite DNA in 2005. Thus, the percent FLMB genotype estimates later than 2004 should not be compared with previous estimates.

Year	Sample size	Number of fish by genotype			% FLMB alleles	% FLMB genotype
		FLMB	Intergrade	NLMB		
2000	21	13	8	0	85	62
2002	25	17	8	0	87	67
2006	30	15	15	0	88	50
2010	30	4	26	0	81	13

Table 7. Proposed sampling schedule for Casa Blanca Reservoir, Texas. Gill netting surveys are conducted in the spring, electrofishing and trap netting surveys are conducted in the fall, and vegetation and access surveys are conducted in the summer. Standard survey denoted by S and additional survey denoted by A.

Survey Year	Electrofisher	Trap Net	Gill Net	Creel Survey	Vegetation Survey	Access Survey	Report
Fall 2011-Spring 2012							
Fall 2012-Spring 2013	A (Spring)						
Fall 2013-Spring 2014							
Fall 2014-Spring 2015	S		S		S	S	S

## Appendix A



Location of sampling sites, Casa Blanca Reservoir, Texas, 2010-2011. Gill net and electrofishing stations are indicated by Gs and Es, respectively. The dashed line is the Lake Casa Blanca International State Park boundary. Aerial photography was obtained from the Texas Natural Resources Information Systems website.

**Appendix B**

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Casa Blanca Reservoir, Texas, 2010-2011. Effort was 1.0 hours for electrofishing and 5.0 net-nights for gill netting.

Species	<u>Electrofishing</u>		<u>Gill netting</u>	
	N	CPUE	N	CPUE
Gizzard shad	103	103.0	559	111.8
Threadfin shad	11	11.0		
Common carp			9	1.8
Blue catfish			12	2.4
Channel catfish			57	11.4
Palmetto bass			32	6.4
Green sunfish	2	2.0		
Warmouth	1	1.0		
Bluegill	111	111.0	1	0.2
Redear sunfish	14	14.0		
Largemouth bass	73	73.0	8	1.6
White crappie			31	6.2
Blue tilapia	7	7.0	6	1.2