

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-35

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2009 Survey Report

**Victor Braunig Reservoir**

Prepared by:

John Dennis and Randy Myers  
Inland Fisheries Division  
District 1-D, San Antonio, Texas



Carter Smith  
Executive Director

Gary Saul  
Director, Inland Fisheries

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Victor Braunig Reservoir were surveyed annually from 2006 to 2009 using electrofishing and in 2007, 2008, and 2010 using gill nets. This report summarizes the survey results and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Victor Braunig Reservoir is a 1,298-acre power plant cooling impoundment located on the southeast side of San Antonio, Texas. Water level is maintained at or near conservation pool by pumping from the San Antonio River. About half of the shoreline is considered rocky and the remainder natural. Aquatic plants, primarily bulrush, cattails, marine naiad, and sago pondweed, typically occupy about 5% of the reservoir.
- **Management History:** Important sport fishes currently include red drum, palmetto bass, catfishes, and largemouth bass. Fingerling stockings have been conducted in most years since the mid-1970s to support palmetto bass and red drum fisheries. Angler harvest of palmetto bass, red drum, and catfishes has been managed under statewide length and daily bag limits, except that red drum do not have a maximum length limit. Largemouth bass have been intensively managed since the reservoir opened through stocking and special harvest regulations. Florida largemouth bass (FLMB) were first stocked in 1976 and were last stocked in 1987. Largemouth bass harvest regulations were changed from the statewide 10-inch minimum length limit (MLL), 10 fish daily bag limit (DBL) to a 21-inch MLL, 2-fish DBL in 1985. The harvest regulations were again changed in 1993 to an 18-inch MLL, 5-fish DBL. In 2004 and 2006-2008, City Public Service Energy (CPSE, the controlling authority) purchased and stocked sub-adult (6-9 inch) northern largemouth bass.
- **Fish Community**
  - **Prey species:** Gizzard shad, threadfin shad, and bluegill were the primary prey species in the reservoir. Relative abundance of gizzard shad remained high, but bluegill abundance declined in recent years. Prey species were sufficient in size and number to support existing predators.
  - **Catfishes:** Channel catfish dominated the catfish community and provided a popular fishery. Relative abundance and size structure of channel catfish remained were excellent.
  - **Palmetto bass:** Relative abundance of palmetto bass has declined since 2007 despite annual stockings. Palmetto bass were popular with anglers.
  - **Largemouth bass:** Relative abundance was low and similar in all years except in 2005 and 2007. The population size structure remained less than desired with very few fish exceeding the 18-inch MLL. Stockings of sub-adult northern largemouth bass were successful in reducing FLMB introgression, but did not increase relative abundance.
  - **Red drum:** Few red drum were collected in surveys and thus population trends remain unknown. However, this species continued to provide a very popular fishery.
- **Management strategies:** Continue to stock red drum and palmetto bass annually, and evaluate effectiveness of sub-adult northern largemouth bass stockings. Consider changing largemouth bass harvest regulations to standard statewide restrictions.

## INTRODUCTION

This document is a summary of fisheries data collected from Victor Braunig Reservoir from 2006 to 2010. 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 are presented with current data for comparison.

### Reservoir Description

Victor Braunig is a 1,298-acre reservoir constructed in 1964 for power plant cooling and recreation. It is located in Bexar County on the southeast side of San Antonio and owned by City Public Service Energy (CPSE). Recreation access is controlled by Thousand Trails Management Services, Inc., and paid entry is required. Water level is maintained at or near conservation pool by pumping from the San Antonio River. About half of the shoreline is considered rocky and the remainder natural. Aquatic plants, primarily bulrush, cattails, marine naiad, and sago pondweed, typically occupy about 5% of the reservoir. Improvements were made to the boat launches in 2008, funded in part by a TPWD grant. Considerable shoreline access, including a fishing pier, exists for bank angling. Other descriptive characteristics for Victor Braunig Reservoir are in Table 1.

### Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Myers and Dennis 2006) included:

1. Stock palmetto bass at the rate of 15 fish/acre annually to maintain the fishery.  
**Action:** Palmetto bass were stocked in 2007, 2008, and 2009 at the recommended rate.
2. Stock red drum at the rate of 200 fish/acre annually to maintain the fishery.  
**Action:** Red drum were stocked in 2007 and 2008 at 193.8 and 208.3 fish/acre respectively. In 2009, TPWD hatcheries were unable to produce sufficient red drum fingerlings to stock the reservoir.
3. Evaluate stocking of sub-adult northern largemouth bass.  
**Action:** Sub-adult largemouth bass were stocked in 2006, 2007 and 2008, and fall electrofishing and genetic analysis were conducted annually from 2006-2009. The creel survey planned for 2007-2008 was cancelled to allow creel and economic surveys to be conducted on Lake Amistad. Creel survey sampling is currently being conducted and will be completed December 2010.

**Harvest regulation history:** All sport fishes, except largemouth bass and red drum, are currently managed with statewide regulations (Table 2). From 1985 to 1994, largemouth bass were managed with a 21-inch MLL and 2-fish daily bag limit (DBL). The regulations were changed to an 18-inch MLL, 5-fish DBL in 1995. Red drum do not have a maximum size limit.

**Stocking history:** Palmetto bass and red drum were stocked in most years since 1976. Largemouth bass were stocked in most years from 1967 to 1984 to supplement low natural reproduction. In addition, experimental stockings of Kemp's largemouth bass, Nile perch, orangemouth corvina, tarpon, and black X white hybrid crappie were conducted to evaluate alternative angling opportunities. In 2004, 2006, 2007, and 2008 sub-adult northern largemouth bass (6-10 inches total length, TL) were purchased and stocked by CPSE as part of a special research project to improve the largemouth bass fishery. The complete stocking history is in Table 3.

**Vegetation/habitat management history:** Shoreline structural habitat has remained rocky or natural since reservoir impoundment. Predominant aquatic vegetation species have been bulrush and cattails. In some years, marine naiad and sago pondweed occupies shallow areas. Aquatic vegetation typically occupies less than 5% of the reservoir and herbicide treatments have not ever been conducted.

## METHODS

Standard electrofishing surveys (1 hour at 12 5-min randomly selected stations) and supplemental electrofishing surveys were conducted annually during the study period. Supplemental sampling included 12 5-min randomly selected stations during night-time and variable numbers of biologist selected stations during the day. Only largemouth bass were collected during supplemental sampling. Standard gill net surveys (5 net nights at 5 randomly-selected stations) were conducted in 2007, 2008, and 2010 according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009). Trap netting was not conducted because few, if any crappie, were present in the reservoir. 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 2009-2010 standard sampling stations. Aerial photography for Appendix A came from the Texas Natural Resources Information System website.

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. Ages of largemouth bass were determined using otoliths from a minimum of 200 fish collected by electrofishing each year from 2005-2009.

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 2009, native submersed and emergent aquatic plants were the primary vegetation species in the reservoir (Table 4). Native emergent vegetation, primarily cattails, bulrush, and arrowhead occupied 3.0 acres of the reservoir. Native submersed vegetation, primarily marine naiad and sago pondweed, occupied 4.0 acres of the reservoir. Rocky shoreline occurred along 6.1 miles of shoreline representing 44% of the total shoreline distance (Table 5).

**Prey species:** Electrofishing CPUE of gizzard shad increased steadily from 96.0 fish/hr in 2007 to 108.0 fish/hr in 2008 to 145.0 fish/hr in 2009 (Figure 1). Gizzard shad IOV was poor in 2007 (35) but increased to 84 in 2009, indicating that the majority of gizzard shad were available to existing predators. Electrofishing CPUE of bluegill has steadily decreased from 137.0 fish/hr in 2007 to 90.0 fish/hr in 2008 to 41.0 fish/hr in 2009 (Figure 2). Most bluegill were  $\leq 4$  inches TL which is suitably sized forage for most adult predator sport fishes. Threadfin shad abundance was high in 2009 (296.0 fish/hr, Appendix B) and this species was an important component of the forage fish community.

**Channel catfish:** Gill net CPUE of channel catfish in 2010 (18.2 fish/nn) was similar to 2008 (21.0 fish/nn) and 2007 (19.4 fish/nn). Population size structure improved in 2010 compared to 2008; modal peak of length frequency distribution increased to 19 inches in 2010 from 16 inches

in 2008 (Figure 3). Proportional size distribution increased to 89 in 2010 from 50 in 2008 and 68 in 2007. In 2010, mean relative weight exceeded 100 for channel catfish exceeding the MLL.

**Palmetto bass:** Gill net CPUE of palmetto bass decreased steadily from 24.4 fish/nn in 2007 to 7.8 fish/nn in 2008 to 3.2 fish/nn in 2010. Size structure also declined in 2010 with the majority of palmetto bass being below the 18-inch MLL (Figure 4). Palmetto bass PSD ranged from 92-94 across all three years, but PSD-P decreased to 25 in 2010 from 82 in 2008, indicating a smaller proportion of the population were preferred size (15 inches TL). For fish larger than 13 inches, mean relative weights exceeded 100 when abundance was greatest (2007), but were lower in 2008 when abundance was less.

**Largemouth bass:** Electrofishing CPUE of largemouth bass has been highly variable since 2004, ranging from a high of 141.0 fish/hr in 2005 to a low of 6.0 fish/hr in 2006 (Figures 5-6). Size structure was also variable with PSD and PSD-P values ranging from 17 (2004) to 70 (2008) and 9 (2005) to 30 (2008) among years, respectively. Mean relative weights exceeded 100 for all size classes during the study period, suggesting that forage is not limiting growth. Largemouth bass exhibited rapid growth in the reservoir averaging 11.5 -14.0 inches TL at age-1 (Table 6). Although largemouth bass grew rapidly during their first few years and generally lived up to about 7 years, growth slowed substantially after age-3 resulting in few fish attaining the 18-inch MLL. Florida largemouth bass influence decreased and northern largemouth bass influence increased substantially since 2006 following the stocking of northern largemouth bass in 2004 and 2006-2008 (Table 7). Data suggest that the special size regulation has been ineffective for increasing abundance of fish  $\geq 18$  inches TL. Currently available data indicate that the sub-adult northern bass stockings was successful in restructuring the genetic composition of the population, but did not increase abundance.

**Red drum:** Gillnet CPUE of red drum decreased from 12.8 fish/nn in 2008 to 1.2 fish/nn in 2010 but was greater than the catch rate in 2007 (0.2 fish/nn, Figure 6). Spring gill net sampling yielded an insufficient sample size to effectively monitor changes in relative abundance of this species.

## Fisheries Management Plan for Victor Braunig Reservoir, Texas

Prepared – July 2010.

**ISSUE 1:** Palmetto bass and red drum have become popular sport fishes in Victor Braunig Reservoir. Of the total angling effort expended in the reservoir in 2004-2005, 40% and 30% was specifically directed at these combined species by bank and boat anglers, respectively (Myers and Dennis 2006). Because natural reproduction of these species does not occur in the reservoir, stocking is necessary to support these fisheries. Recent survey data indicated decreased abundance of palmetto bass and increased popularity of red drum among anglers.

**MANAGEMENT STRATEGIES**

1. Stock palmetto bass fingerlings annually at a rate of 30 fish/acre, twice the rate previously used to increase population abundance.
2. Stock red drum fingerlings annually at a rate of 200 fish/acre or sub-adult red drum annually at a rate of 4 fish/acre.

**ISSUE 2:** A poor largemouth bass fishery has existed in the reservoir since the early 1990s and sub-adult northern largemouth bass stocking has thus far proved ineffective for increasing population abundance or angler interest in the fishery. In 2004-2005, angling effort by boat anglers directed at largemouth bass accounted for only 7% of the total angling effort on the reservoir and angler catch rate of largemouth bass was only 0.12 fish/hr (Myers and Dennis, 2006).

**MANAGEMENT STRATEGY**

1. Complete evaluation of stocking sub-adult northern largemouth bass on the bass fishery, including conducting the final 12 month creel, electrofishing, genetic, and age and growth surveys.
2. Evaluate changing the largemouth bass minimum length limit from 18 inches to the statewide 14-inch MLL contingent on final results of sub-adult northern largemouth bass stocking evaluation special project.

**SAMPLING SCHEDULE JUSTIFICATION:**

Biennial gill net sampling (2012 and 2014) is necessary to monitor population trends of red drum, catfish, and palmetto bass, the three most popular sport fish in the reservoir (Table 8). Following the final electrofishing survey of the sub-adult northern largemouth bass stocking evaluation in 2010, electrofishing will be conducted once every four years beginning fall 2013. A 6-month creel survey will be conducted in 2009-2010 to evaluate the effect of red drum, palmetto bass, and sub-adult northern largemouth bass stockings on the fishery. Subsequent creel surveys will be conducted for six months from March through August every four years beginning in 2013.

## 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.
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- 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.
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Table 1. Characteristics of Victor Braunig Reservoir, Texas.

Characteristic	Description
Year Constructed	1964
Controlling authority	City Public Service Energy
County	Bexar
Reservoir type	Tributary
Shoreline Development Index	2.24
Conductivity	1,695 umhos/cm

Table 2. Harvest regulations for Victor Braunig 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
Drum, red	3	20" minimum
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10" minimum

Table 3. Stocking history of Victor Braunig 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
Channel catfish	1969	35,000	NR
	1974	103,280	NR
	2005	61,923	FGL
	Total	200,203	
Blue catfish	1986	134,975	FGL
	1987	136,720	FGL
	Total	271,695	
Palmetto bass	1977	9,900	NR
	1981	16,425	NR
	1983	13,500	NR
	1984	61,140	FGL
	1985	101,885	FGL
	1986	67,000	FGL
	1987	135,310	FGL
	1988	180,000	FRY
	1989	179,200	FRY
	1991	139,894	FGL
	1992	277,085	FGL
	1994	135,000	FGL
	1995	25,150	FGL
	1996	22,500	FGL
	1997	20,648	FGL
	1998	20,461	FGL
	1999	20,650	FGL
	2000	20,100	FGL
	2002	10,108	FGL
	2003	19,370	FGL
	2004	19,650	FGL
	2005	19,517	FGL
	2006	21,572	FGL
	2007	19,538	FGL
	2008	19,638	FGL
	2009	20,692	FGL
	Total	1,595,933	
Largemouth bass	1967	28,000	NR
	1968	60,000	NR
	1969	40,000	NR
	1970	67,000	NR
	1972	56,200	NR
	1974	69,630	NR
	2004	6,999	AFGL
	2006	11,997	AFGL
	2007	12,000	AFGL
	2008	11,000	AFGL
	Total	362,826	
Kemps largemouth bass	1985	273,368	FGL
	1986	97,655	FGL
	1987	112,584	FGL
	Total	483,607	

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

Species	Year	Number	Size
Florida largemouth bass	1976	27,000	FGL
	1977	67,300	FGL
	1978	49,968	FGL
	1981	68,000	FGL
	1982	68,500	FGL
	1983	67,900	FGL
	1984	268,580	FRY
	Total	617,248	
White crappie	1974	10,000	NR
Black crappie	1972	5,600	NR
Black X white hybrid crappie	1987	545,095	FGL
	1994	135,000	FRY
	1995	128,933	FRY
	Total	809,028	
Nile perch	1978	88	NR
	1979	14	NR
	1984	26	NR
	Total	128	
Red drum	1976	2,065	NR
	1980	3,051	NR
	1981	135,000	NR
	1982	135,000	NR
	1983	126,000	NR
	1984	162,000	FGL
	1985	447,000	FGL
	1986	293,223	FGL
	1987	180,000	FGL
	1988	19,700	FGL
	1989	2,800	FRY
	1990	1,910	FGL
	1990	213,100	FRY
	1991	294,714	FRY
	1992	270,305	FGL
	1992	4	ADL
	1993	182,540	FRY
	1994	160,229	FGL
	1995	146,108	FRY
	1996	159,026	FGL
	1997	136,046	FGL
	1999	198,621	FGL
	2000	183,619	FGL
	2001	190,806	FGL

Table 3 continued. Stocking history of Victor Braunig 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
Red drum	2002	169,429	FGL
	2003	246,505	FGL
	2004	153,705	FGL
	2004	5,491	AFGL/ADL
	2006	7,568	AFGL/ADL
	2006	252,568	FGL
	2006	51,835	FRY
	2007	251,543	FGL
	2008	270,330	FGL
	Total	5,035,814	
Black X red drum	1983	5,995	NR
	1984	47,035	NR
	1984	3,316	ADL
	Total	56,346	
Spotted seatrout	1984	72,000	FGL
Tarpon	1984	17	NR
	1985	17	NR
	Total	34	
Orangemouth corvina	1985	3,150	NR

Table 4. Results of a vegetation survey conducted at Victor Braunig Reservoir, Texas, in July, 2009. Surface area coverage (acres) was estimated for each vegetation type for the 1,298 acres using 100 randomly selected sample points.

Vegetation type	Coverage	Percent	Lower 95% CL	Upper 95% CL
Native submerged vegetation <sup>1</sup>	54.0	4.0	1.1	9.9
Open water	1,255.5	93.0	86.1	97.1
Native emergent vegetation <sup>2</sup>	40.5	3.0	0.6	8.5

<sup>1</sup> marine naiad, sago pondweed

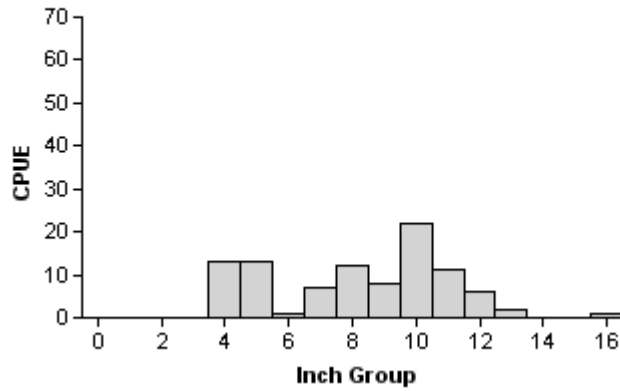
<sup>2</sup> bulrush, cattail, arrowhead

Table 5. Results of a structural habitat survey conducted at Victor Braunig Reservoir, Texas, in July, 2009. Linear distance (miles) was estimated for each habitat type for the 13.9 miles of shoreline using 50 randomly selected sample points.

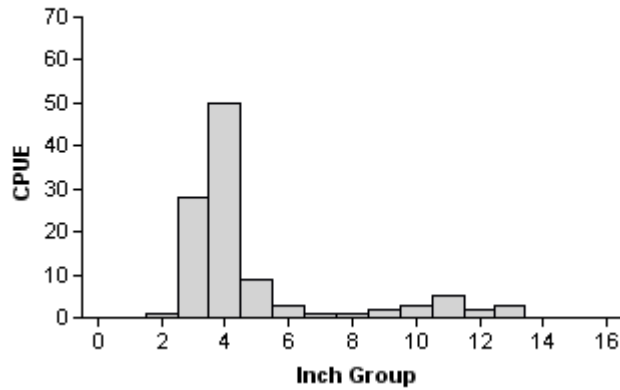
Habitat type	Linear distance	Percent	Lower 95% CL	Upper 95% CL
Natural shoreline	6.7	48.0	33.7	62.6
Rocky shoreline	6.1	44.0	29.9	58.8
Bulkhead	0.6	4.0	0.5	13.7
Gravel	0.6	4.0	0.5	13.7

**Gizzard Shad****2007**

Effort = 1.0  
 Total CPUE = 96.0 (28; 96)  
 IOV = 35.4 (12)

**2008**

Effort = 1.0  
 Total CPUE = 108.0 (43; 108)  
 IOV = 85.2 (7)

**2009**

Effort = 1.0  
 Total CPUE = 145.0 (33; 145)  
 IOV = 83.5 (9)

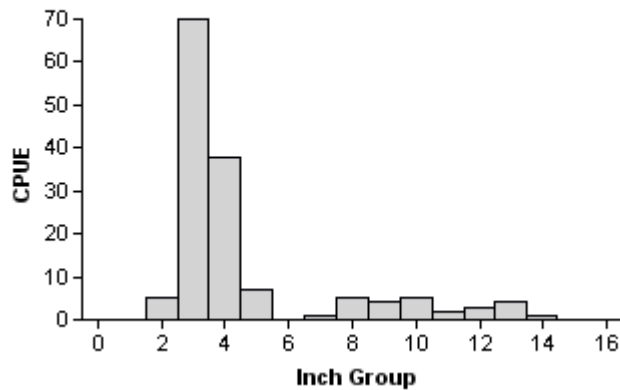
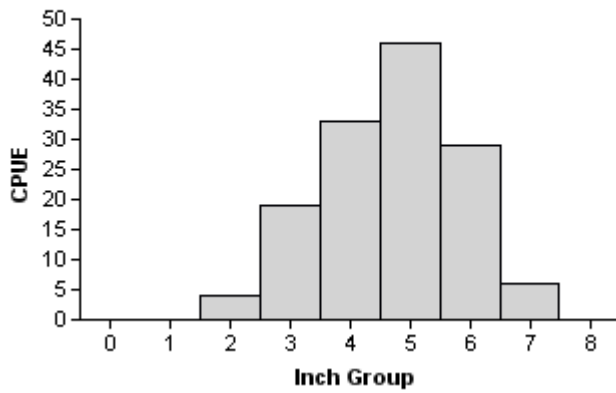
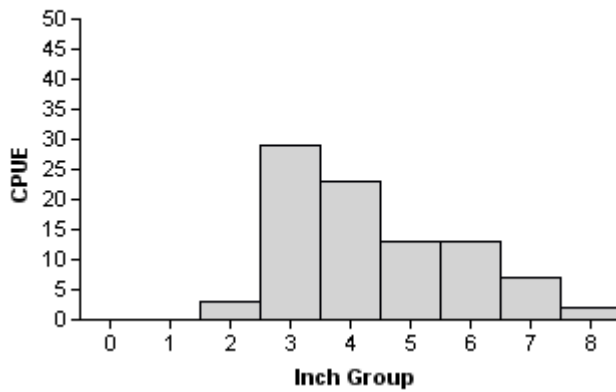


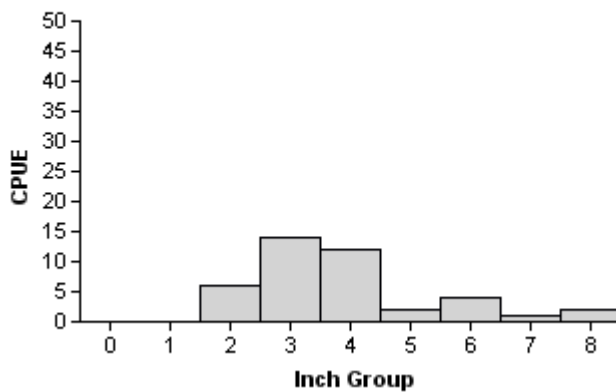
Figure 1. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Victor Braunig Reservoir, Texas, 2007, 2008, and 2009. For IOV values, SE is provided in parentheses.

**Bluegill****2007**

Effort = 1.0  
 Total CPUE = 137.0 (31; 137)  
 Stock CPUE = 133.0 (31; 133)

**2008**

Effort = 1.0  
 Total CPUE = 90.0 (34, 90)  
 Stock CPUE = 87.0 (33; 87)

**2009**

Effort = 1.0  
 Total CPUE = 41.0 (35; 41)  
 Stock CPUE = 34.0; (36; 35)

Figure 2. Number of bluegill caught per hour (CPUE) and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Victor Braunig Reservoir, Texas, 2007, 2008, and 2009.

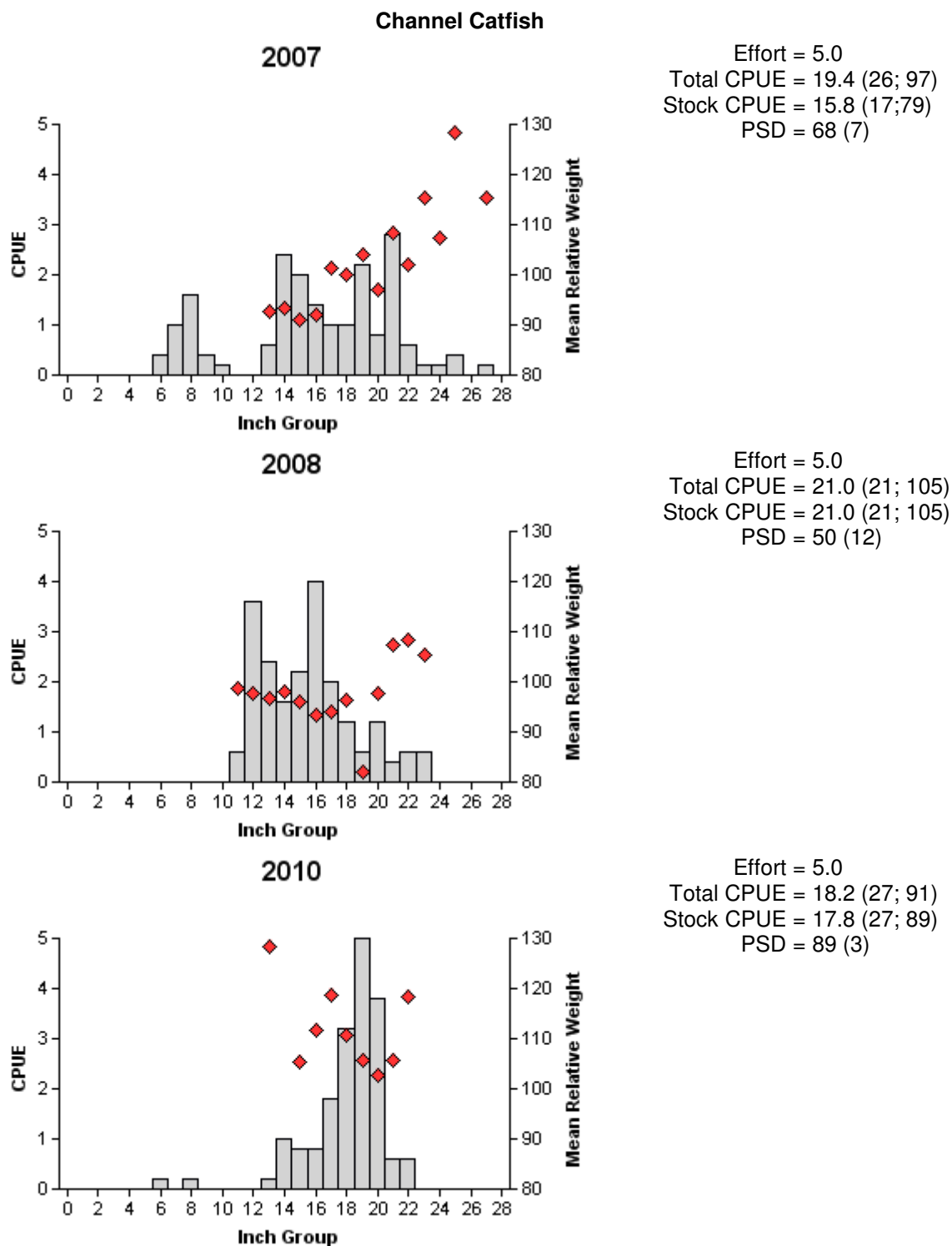


Figure 3. Number of channel catfish caught per net night (CPUE, bars) mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Victor Braunig Reservoir, Texas, 2007, 2008, and 2010. For PSD values, SE is provided in parentheses.



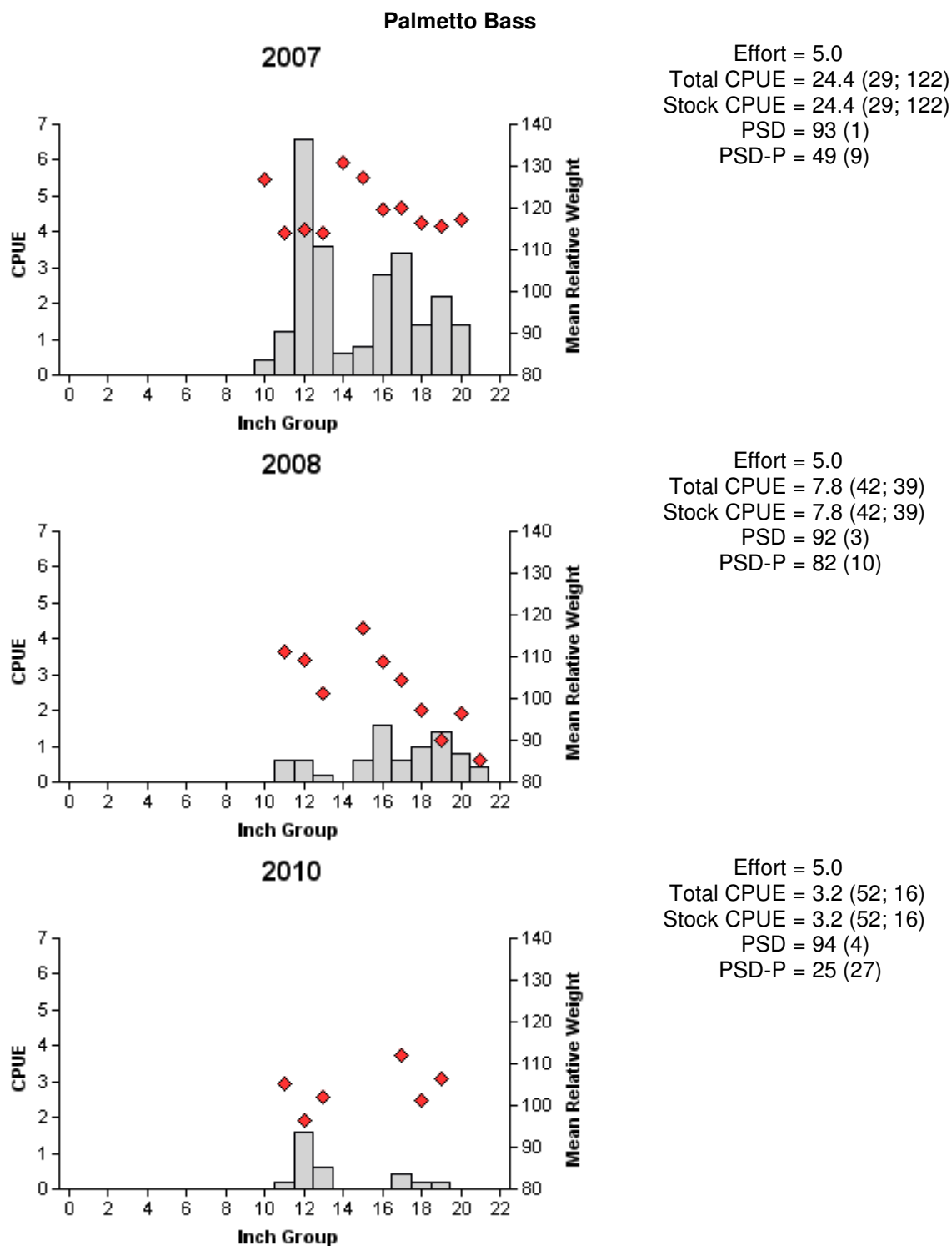


Figure 4. Number of palmetto bass caught per net night (CPUE, bars) mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Victor Braunig Reservoir, Texas, 2007, 2008, and 2010. For PSD values, SE is provided in parentheses.

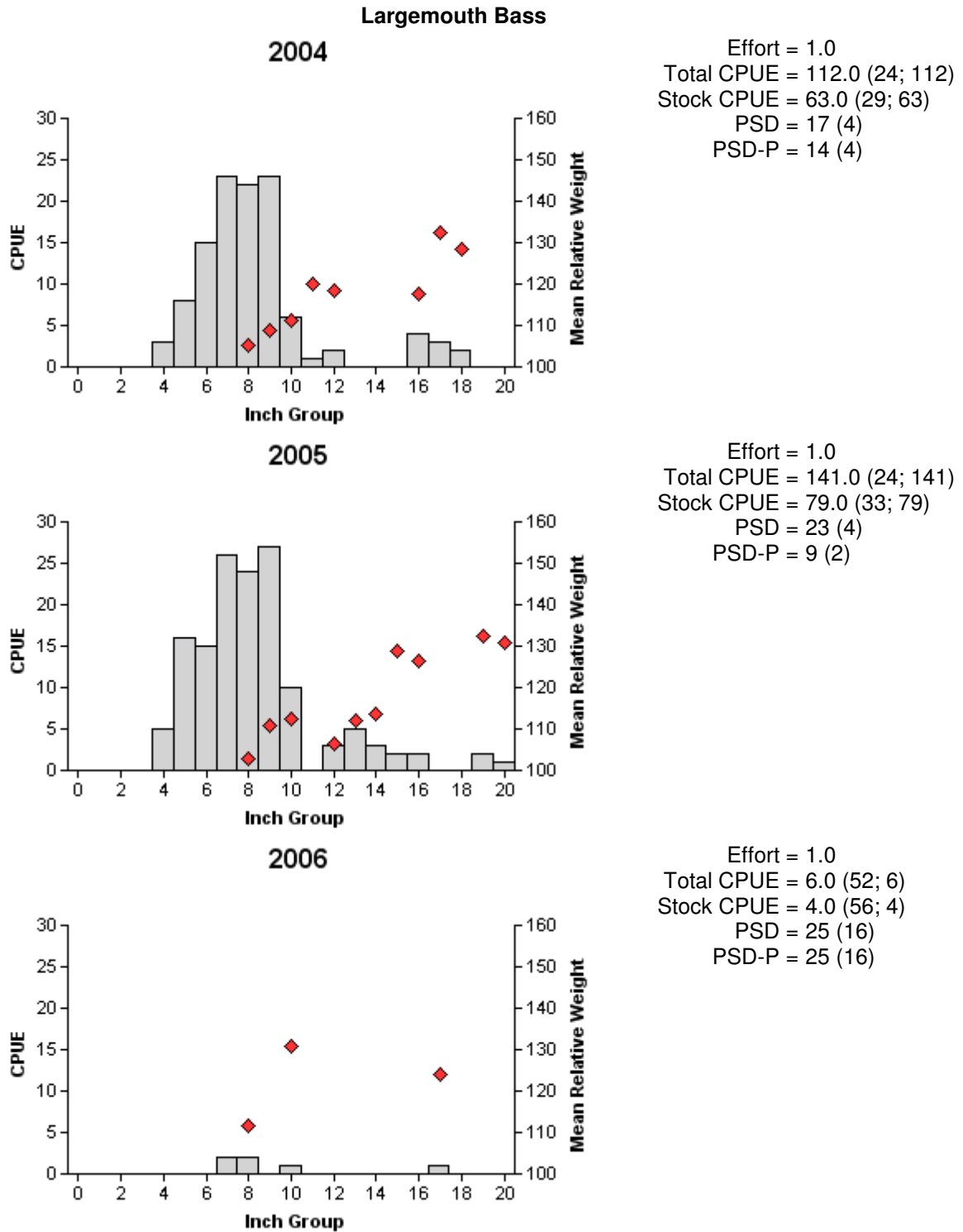


Figure 5. Number of largemouth bass caught per hour (CPUE, bars) mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Victor Braunig Reservoir, Texas, 2004 through 2009. RSE is used for CPUE values and SE is used for PSD values.

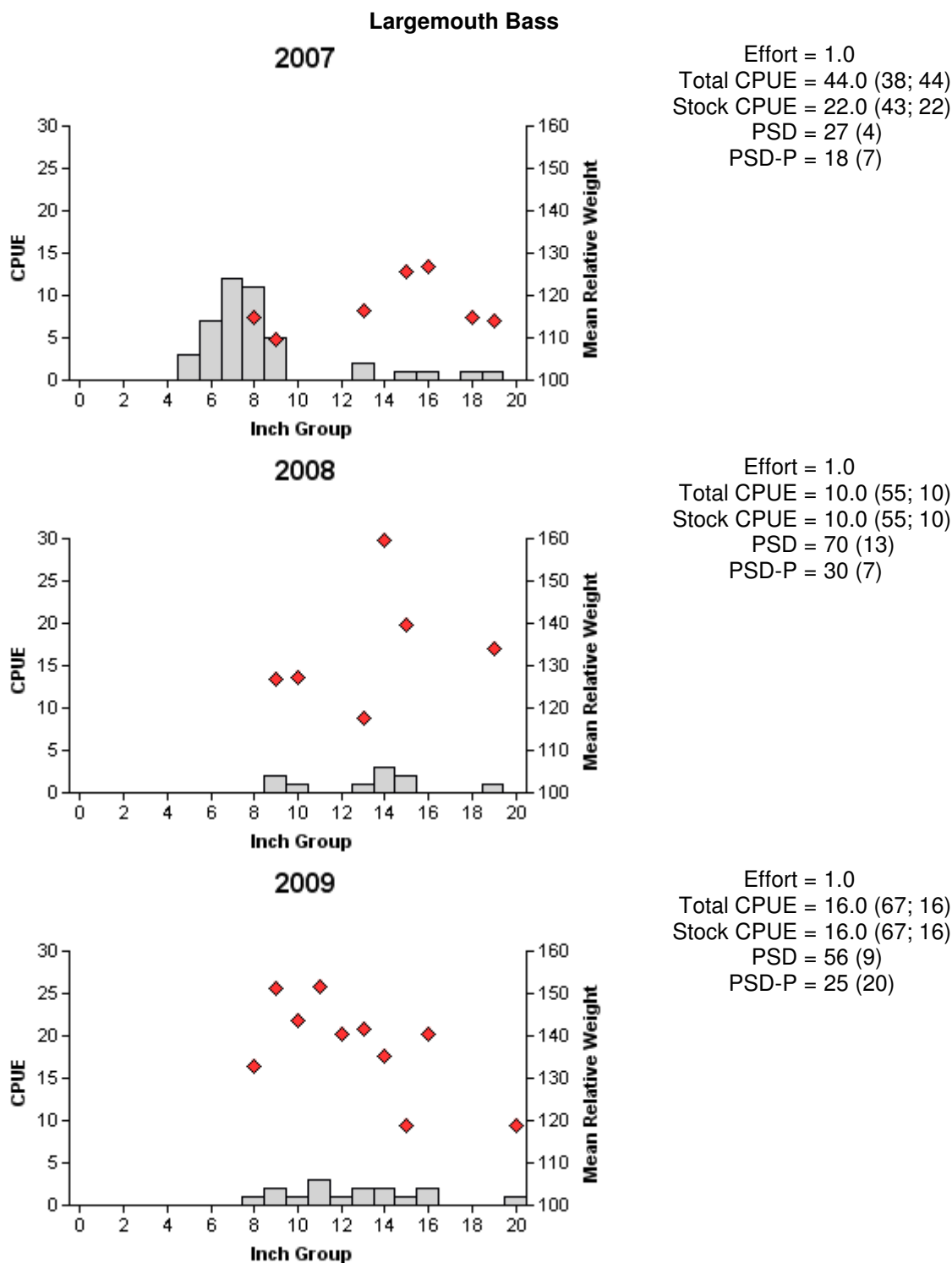


Figure 5 continued. Number of largemouth bass caught per hour (CPUE, bars) mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Victor Braunig Reservoir, Texas, 2004 through 2009. RSE is used for CPUE values and SE is used for PSD values.

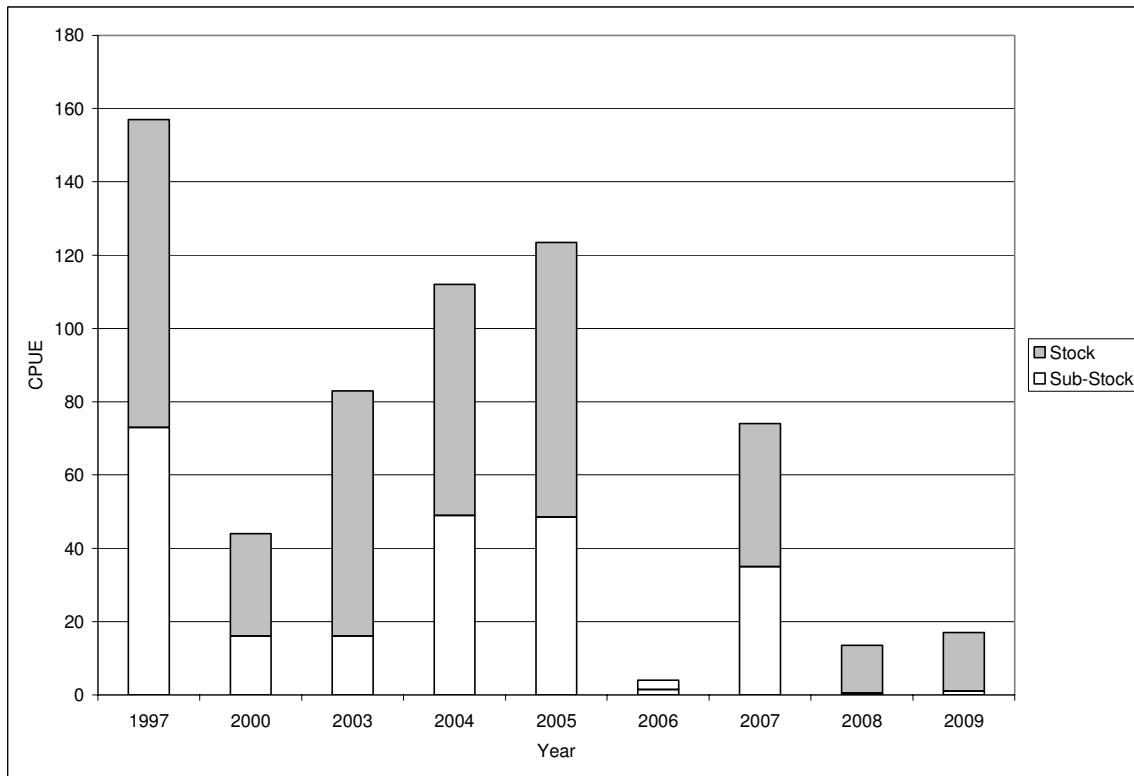
**Largemouth Bass**

Figure 6. Number of largemouth bass caught per hour (CPUE) by size categories from random electrofishing stations at Victor Braunig Reservoir 1997, 2000, and 2003-2009. Bass only electrofishing is included in the 2005-2009 data.

Table 6. Mean length at age at capture for largemouth bass in inches at Victor Braunig Reservoir, Texas, Fall 2000, 2002, 2003, and 2005-2009. Sample sizes are shown in parenthesis.

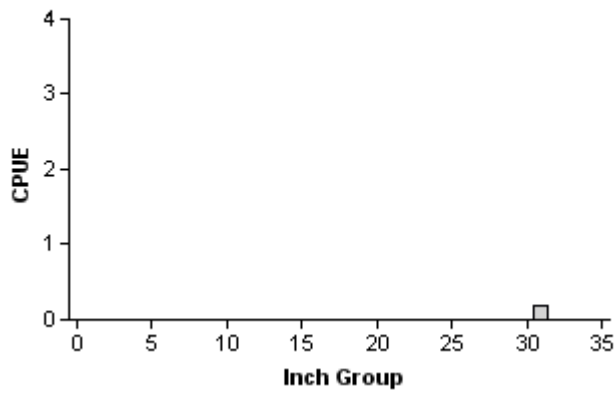
Year	Age											
	0	1	2	3	4	5	6	7	8	9	10	11
2000	8.7 (17)	12.8 (5)		15.9 (2)		18.7 (2)		19.1 (3)				
2002	11.8 (3)	12.9 (9)	15.2 (5)	16.1 (7)	18.2 (10)	19.8 (4)	18.0 (1)	19.0 (4)	20.9 (1)	19.3 (1)		
2003	8.8 (86)	13.3 (6)	14.8 (6)	11.5 (1)		18.7 (91)	18.0 (2)					
2005	8.1 (219)	13.6 (21)	16.1 (1)	18.1 (2)	19.2 (2)	19.8 (1)						
2006	8.4 (53)	13.3 (65)	15.0 (57)	16.6 (6)	19.8 (2)	18.1 (7)	17.5 (3)	17.8 (3)	18.1 (2)	18.7 (1)		
2007	7.8 (186)	11.5 (10)	14.2 (9)	14.5 (7)	16.6 (3)							19.3 (1)
2008	9.7 (60)	14.0 (90)	16.3 (28)	16.6 (13)	16.8 (4)	19.4 (2)	17.7 (1)	18.0 (2)				
2009	9.8 (84)	14.0 (30)	15.7 (56)	17.3 (10)	17.4 (15)	18.3 (3)	18.2 (1)	18.9 (1)				

Table 7. Results of genetic analysis of largemouth bass collected by electrofishing during fall from Victor Braunig Reservoir, Texas, in 2000 and from 2003 to 2009. 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.

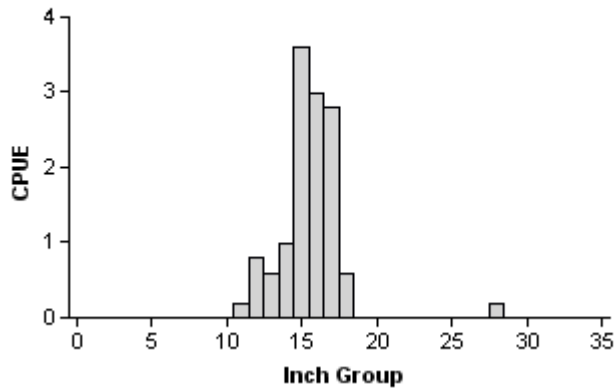
Year	Number of fish by genotype				% FLMB alleles	% FLMB genotype
	Sample size	FLMB	Intergrade	NLMB		
2000	31	28	3	0	94	90
2003	50	43	7	0	97	86
2004	30	25	5	0	97	83
2005	195	173	22	0	98	89
2006	200	115	58	27	79	57
2007	218	127	77	14	83	58
2008	202	50	106	46	55	25
2009	200	70	103	27	72	35

**Red Drum****2007**

Effort = 5.0  
 Total CPUE = 0.2 (100; 1)  
 Stock CPUE = 0.2 (100; 1)

**2008**

Effort = 5.0  
 Total CPUE = 12.8 (45; 64)  
 Stock CPUE = 12.8 (45; 64)

**2010**

Effort = 5.0  
 Total CPUE = 1.2 (31; 6)  
 Stock CPUE = 1.2 (31; 6)

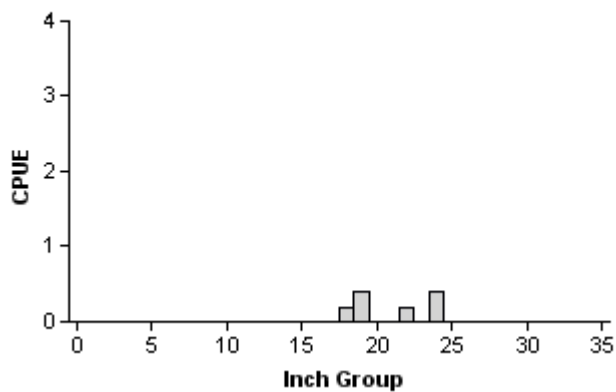


Figure 7. Number of red drum caught per hour (CPUE) and population indices (RSE and N are in parentheses) for spring gill net surveys, Victor Braunig Reservoir, Texas, 2005, 2007, and 2009.

Table 8. Proposed sampling schedule for Victor Braunig 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	Electrofishing	Trap Net	Gill Net	Creel Survey	Report
Fall 2010-Spring 2011	A			A	
Fall 2011-Spring 2012			A		
Fall 2012-Spring 2013				S (6 mo.)	
Fall 2013-Spring 2014	S		S		S



## Appendix A



Location of sampling sites, Victor Braunig Reservoir, Texas, 2009-2010. Gill net, trap net, and electrofishing stations are indicated by Gs, Ts, and Es, respectively. 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 Victor Braunig Reservoir, Texas, 2009-2010. 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
Spotted gar			7	1.4
Longnose gar			17	3.4
Gizzard shad	145	145.0	73	14.6
Threadfin shad	296	296.0		
Common carp			6	1.2
Blue catfish				
Channel catfish			91	18.2
Palmetto bass			16	3.2
Bluegill	41	41.0		
Redear sunfish	1	1.0		
Largemouth bass	18	18.0		
Rio Grande cichlid	3	3		
Red Drum			6	1.2