

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2010 Survey Report

Lake Cypress Springs

Prepared by:

Timothy J. Bister, District Management Supervisor

Inland Fisheries Division
District 3-A, Marshall, Texas



Carter Smith
Executive Director

Gary Saul
Director, Inland Fisheries

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Cypress Springs were surveyed in 2010 using electrofishing and trap netting and in 2011 using gill netting. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Lake Cypress Springs is a 3,461-acre impoundment located on Big Cypress Creek in the Cypress River Basin. The lake is located in Franklin County. Habitat features consist of standing timber, bulkhead, boat docks, rocky shoreline, riprap, and limited aquatic vegetation.
- **Management history:** Important sport fish include channel catfish, largemouth bass, and crappie. All sport fish at Lake Cypress Springs have historically been managed with statewide harvest regulations. Florida largemouth bass were stocked in this reservoir in 1980 and 1992 to improve the quality of the largemouth bass fishery. These initial stockings were successful in establishing the Florida largemouth bass genetics in the population. Hydrilla, first discovered in the reservoir in the 1970s, has been absent since 2007. Triploid grass carp were stocked in 1997 and 2006 to control hydrilla. Additionally, a native aquatic plant restoration project was initiated by Franklin County Water District in 2003 to increase plant diversity and provide additional habitat. Environmental conditions and grass carp herbivory have resulted in unstable submersed aquatic plant coverage in the reservoir.
- **Fish community**
 - **Prey species:** Threadfin shad were present in the reservoir. Electrofishing catch rate of gizzard shad was higher than previous surveys with half available as prey to most sport fish. Bluegill and redear sunfish were also available as prey.
 - **Catfishes:** The channel catfish population had many fish above legal length and provided excellent angling opportunities. One large blue catfish was collected during the 2011 gill netting survey.
 - **White bass:** White bass were present, but suitable spawning habitat limits their numbers in the reservoir.
 - **Black bass:** The spotted bass population has increased in the reservoir over the last several years. The abundance of largemouth bass has declined and is likely related to the lack of vegetation. Largemouth bass growth was slower than previous years.
 - **Crappie:** Both white and black crappie were present in the reservoir. Very few crappie have been collected during trap netting surveys. However, previous angler survey data indicated an excellent crappie fishery.
- **Management strategies:** Conduct electrofishing surveys every other year beginning in 2012, and general monitoring with gill nets in 2015. An angler creel survey is scheduled from June 2014 through May 2015 to monitor angling effort and catch rates. Aquatic vegetation surveys will be conducted annually to monitor hydrilla coverage. Technical guidance will be given to the controlling authority regarding an integrated approach to invasive aquatic vegetation management when applicable. Vegetation surveys will also help monitor the return of submersed aquatic vegetation for the opportunity to stock Florida largemouth bass to enhance the quality and trophy potential of the fishery. All sport fish will continue to be managed under statewide harvest regulations.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Cypress Springs from June 2010 through May 2011. 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 fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2010-2011 data for comparison.

Reservoir description

Lake Cypress Springs is a 3,461-acre impoundment constructed in 1970 on Big Cypress Creek in the Cypress River Basin. It is located in Franklin County approximately 10 miles south of Mt. Vernon. The controlling authority is Franklin County Water District (FCWD). Primary water uses are municipal and industrial water supply and public recreation. It has a watershed of approximately 75 square miles and a shoreline length of 43 miles. Average annual water fluctuation is 2-2.5 feet; however, from May 2005 to May 2007, water level remained below conservation pool (378 feet msl) and was as low as 373 feet msl in December 2006 (Figure 1). Aquatic vegetation has been sparse in recent years. Other descriptive characteristics for Lake Cypress Springs are in Table 1.

Management history

Previous management strategies and actions: Management strategies and actions from the previous survey report (Brice and Bister 2007) included:

1. Conduct annual surveys to monitor hydrilla coverage; provide technical guidance to FCWD regarding an integrated approach to hydrilla management; provide a hydrilla management plan to FCWD annually.
Action: Hydrilla surveys have been conducted every year since 2005 except 2009. District biologists have maintained contact with FCWD regarding hydrilla management. Because no substantial amounts of hydrilla have been found in the reservoir since 2006, the hydrilla management plan has not been updated annually.
2. Stock Florida largemouth bass in 2008 and 2009; conduct supplemental electrofishing in 2008; assess genetics of largemouth bass population in 2012.
Action: Because little submersed vegetation was present in the reservoir since 2007, Florida largemouth bass stocking was not conducted due to poor available habitat. The supplemental electrofishing was conducted in 2008 as scheduled. Genetic analysis of the largemouth bass population will still be scheduled for fall 2012.
3. Keep anglers and other public aware of harvest regulations, fishing methods, and other fisheries-related topics.
Action: Fisheries-related information has been posted on the FCWD website. Most recently, district staff were filmed by ArkLaTex Sportsman Television during the 2011 gill netting survey.

Harvest regulation history: Sport fishes in Lake Cypress Springs have been managed with statewide regulations (Table 2).

Stocking history: Blue catfish and walleye have been stocked but populations were not established. Channel catfish have been stocked numerous times from the late 1960s to the early 1990s. These stockings were done in an effort to supplement the limited recruitment of channel catfish. From 1984 to 1993, fingerling channel catfish were stocked into FCWD rearing ponds and grown to advanced-size (8-9 inches) before being stocked in the lake. Additionally, catfish, redear sunfish, and black crappie were

stocked prior to the reservoir filling. Florida largemouth bass were stocked in 1980 and 1992. Triploid grass carp were stocked at a rate of 5 fish per vegetated acre (2,200 fish) in 1997 in an effort to control hydrilla. A maintenance stocking of 1,000 triploid grass carp was conducted in 2006. A complete stocking history is in Table 3.

Vegetation/habitat history: Hydrilla, introduced in the 1970s, was the dominant aquatic plant through the 1990s. Coverage typically approached 10% of the reservoir, and reached a peak in 1996 at 13.5% (434 acres). Franklin County Water District was granted a permit to stock triploid grass carp in 1997 (2,200 fish). Hydrilla fly larvae were also introduced in 1997 as an additional control measure. Hydrilla declined to <1% coverage after these biological control measures were implemented. This was likely the result of a combination of the biological control efforts and cold winter temperatures prior to the decline. In 2003, a native aquatic plant restoration project was initiated by FCWD to increase plant diversity and increase available habitat. Hydrilla coverage began to increase as the number of grass carp remaining in the reservoir declined due to natural mortality (2005; 11.9%, 2006; 14.7%). The FCWD was permitted to stock an additional 1,000 triploid grass carp (2.5 fish/hydrilla acre) in January 2006. By 2007, all submersed vegetation had declined to only trace amounts. Once again, this was likely the result of grass carp herbivory combined with environmental conditions. The water level in the reservoir had dropped to approximately 5-feet below conservation pool level near the end of 2006. Rapid refilling of the reservoir in the early 2007 likely scoured the seed bed and high turbidity levels limited sunlight penetration in the water for plant growth.

Water transfer: Lake Cypress Springs is controlled by the Franklin County Water District (FCWD), who is a wholesale water supplier to four entities. These include the cities of Mount Vernon and Winnsboro as well as the Cypress Springs Special Utility District (rural water supply). All three of these have water intake structures on Lake Cypress Springs. FCWD also provides water to the City of Mount Pleasant. Water for Mount Pleasant is released from Lake Cypress Springs downstream into Lake Bob Sandlin, at which point it is removed by the City of Mount Pleasant.

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 netting, as the number of fish per net night (fish/nn). All survey sites were randomly selected and electrofishing, trap netting, gill netting, angler access, and habitat surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Largemouth bass, white crappie, and black crappie ages were determined using otoliths. Source for water level data was the United States Geological Survey (USGS) website.

RESULTS AND DISCUSSION

Habitat: Approximately 67% of the reservoir shoreline consisted of bulkhead and 31% was natural shoreline (Table 4). No submersed aquatic vegetation was found during the 2010 survey. This was likely a result of environmental conditions along with the presence of triploid grass carp. Native emergent and

native floating-leaved vegetation was sparse (Table 4). No hydrilla has been found in the reservoir since 2007. Alligatorweed was present (9.9 acres, Table 4).

Prey species: Gizzard shad, threadfin shad, and several sunfish species were present, indicating good prey fish diversity. The electrofishing catch rate of gizzard shad in 2010 was 276.0/h which was higher compared to previous surveys (2006 = 103.0/h, 2008 = 179.0/h) (Figure 2). Index of vulnerability (IOV) for gizzard shad (Figure 3) was moderate, which indicated 49% of gizzard shad were available to most predator fish. The electrofishing catch rate of bluegill in 2010 (435.0/h) was lower than 2008 (666.0/h) but higher than 2006 (351.0/h) (Figure 3). The redear sunfish electrofishing catch rate was only 100.0/h in 2010 compared to 217.0/h in 2008 and 155.0/h in 2006 (Figure 4). However, redear sunfish were observed up to 9 inches and provide quality-size sunfish for anglers.

Channel catfish: The gill net catch rate of channel catfish in 2011 was 24.8/nn, which was higher than the catch rate in 2007 (18.8/nn) and 2003 (19.8/nn) (Figure 5). Even though age-and-growth analysis of channel catfish was not conducted during this survey period, Ryan and Brice (2003) stated growth was fast with fish attaining legal size (≥ 12 inches) by age 2. Body condition was good with mean W_r for most inch groups ≥ 90 (Figure 5).

White bass: White bass abundance has historically been low in this reservoir. The lack of suitable spawning habitat likely limits successful reproduction and recruitment. The catch rate of white bass during 2011 gill netting was 3.0/nn, which was similar to previous surveys (Figure 6).

Black bass: The electrofishing catch rate of spotted bass has increased over the last several years from 57.0/h in 2006, to 70.0/h in 2008, and 194.0/h in 2010 (Figure 7). This is most likely a response to the lack of submersed aquatic vegetation in the reservoir. However, the majority of spotted bass collected were less than 10 inches. Mean relative weights declined as the length of spotted bass increased (Figure 7). This may be an indication of poor prey availability to these fish as they grow to larger sizes. Historical data indicate spotted bass growth was slow, with fish reaching 12 inches during their fifth growing season (Ryan and Brice 1999).

The electrofishing catch rate of largemouth bass in 2010 was 44.0/h, which was much lower than the 2008 survey (187.0/h) (Figure 8). Also, a small proportion of largemouth bass were collected over the 14-inch minimum length limit. Several years of limited submersed aquatic vegetation likely has resulted in poor recruitment in the reservoir. Poor sampling conditions due to the lack of vegetated areas in the reservoir resulted in an inadequate sample for age-and-growth analysis to evaluate the average age of largemouth bass at 14 inches. However, the sample that was collected indicated growth of largemouth bass may be slowing in the reservoir. The average age at 14 inches (13.9 to 14.8 inches) in 2008 was 2.3 years ($N = 6$; range = 1 – 4 years), which was faster growth compared to the average age at 14 inches (13.2 to 14.7 inches) in 2010 of 3 years ($N = 6$; range = 2 – 3 years). Length at age data for largemouth bass sampled during the survey period is presented in Figure 9.

Crappie: Both black and white crappie were present in the reservoir. The trap net catch rate of white crappie in 2010 was 1.2/nn (Figure 10). No white crappie were collected in 2006. However, the catch rate in 2010 was much lower than 2002 (4.0/nn) (Figure 10). The trap net catch rate of black crappie in 2010 was 1.2/nn, which was similar to 2006 (0.8/nn), but much lower than 2002 (3.2/nn) (Figure 11). Body condition was good for both species with mean W_r for most inch groups >100 (Figure 10, Figure 11). The average age at 10 inches (10.1 to 10.3 inches) for white crappie in 2010 was 1.0 year ($N = 4$; all fish collected were age 1). The average age at 10 inches (9.1 to 10.3 inches) for black crappie in 2010 was 1.5 years ($N = 2$; range = 1 – 2 years). Even though age and growth sample sizes were low in 2010, results were similar to those reported by Ryan and Brice (2003), in which white crappie reached 10 inches in total length (legal size) by the end of their second growing season (age 1+) and black crappie attained legal size during their third growing season (age 2+).

Fisheries management plan for Lake Cypress Springs, Texas

Prepared – July 2011.

ISSUE 1: The abundance of hydrilla in Lake Cypress Springs has varied considerably in recent years. Hydrilla coverage was estimated at 415 acres in 2005 (11.9%) and 510 acres (14.7%) in 2006. These are the highest estimates of hydrilla on the lake since 1996 (13.5%; 434 acres). In 1997, triploid grass carp were stocked at 5 fish/vegetated acre in an effort to control hydrilla. The hydrilla fly was also introduced in 1997 as an additional control measure. Following these control measures, abundance of hydrilla dropped to <1%. However, hydrilla coverage began to increase once again and in January 2006 the Franklin County Water District (FCWD) was permitted to stock an additional 1,000 triploid grass carp (2.5 fish/hydrilla acre). Due to a combination of environmental conditions and grass carp herbivory, no hydrilla has been found in the reservoir since 2007. However, the situation should be monitored to identify when hydrilla begins to return in the reservoir.

MANAGEMENT STRATEGIES

1. Conduct annual aquatic vegetation surveys to monitor trends and estimate coverage of hydrilla.
2. Work with FCWD and encourage an integrated approach to controlling hydrilla upon its return.

ISSUE 2: Lake Cypress Springs has had a quality largemouth bass population in past years. This has occurred when there has been hydrilla coverage. The previous fisheries management plan for the reservoir recommended Florida largemouth bass (FLMB) stocking in 2008 and 2009. The stockings were not conducted because quality habitat had declined to a point that very little submersed vegetation existed in the reservoir. FCWD has been planting native aquatic plants to enhance habitat in the reservoir. When desirable largemouth bass habitat returns, FLMB should be stocked to enhance the quality of the fishery.

MANAGEMENT STRATEGIES

1. Monitor submersed aquatic vegetation community in the reservoir during annual hydrilla surveys.
2. Conduct a supplemental electrofishing survey in 2012 and a standard electrofishing survey in 2014 to monitor largemouth bass relative abundance, size structure, condition, and growth.
3. Collect age-0 largemouth bass in 2012 to assess population genetics.

ISSUE 3: Anglers and other stakeholders need to be informed about fisheries management activities, fishing opportunities, and other issues at Lake Cypress Springs.

MANAGEMENT STRATEGIES

1. Continue to provide news releases to the print and broadcast media and to FCWD.
2. Continue to provide fisheries presentations to the public regarding issues/opportunities at Lake Cypress Springs.

ISSUE 4: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels 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 and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling 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 and literature so that they can educate their customers.
3. Educate the public about invasive species through the use of appropriate media.
4. Discuss invasive species when presenting to constituent and user groups.
5. Document existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes annual hydrilla surveys, a supplemental electrofishing survey in 2012, required angler access, electrofishing, and gill netting surveys in 2014/2015, and a roving angler creel survey from June 2014 through May 2015 (Table 11). Annual hydrilla surveys are necessary to monitor management efforts and to provide coverage estimates to the controlling authority. Supplemental electrofishing in 2012 will be conducted to monitor the largemouth bass and prey fish populations. Genetic analysis of age-0 LMB in fall 2012 will be used to monitor the Florida largemouth bass genetics in the population.

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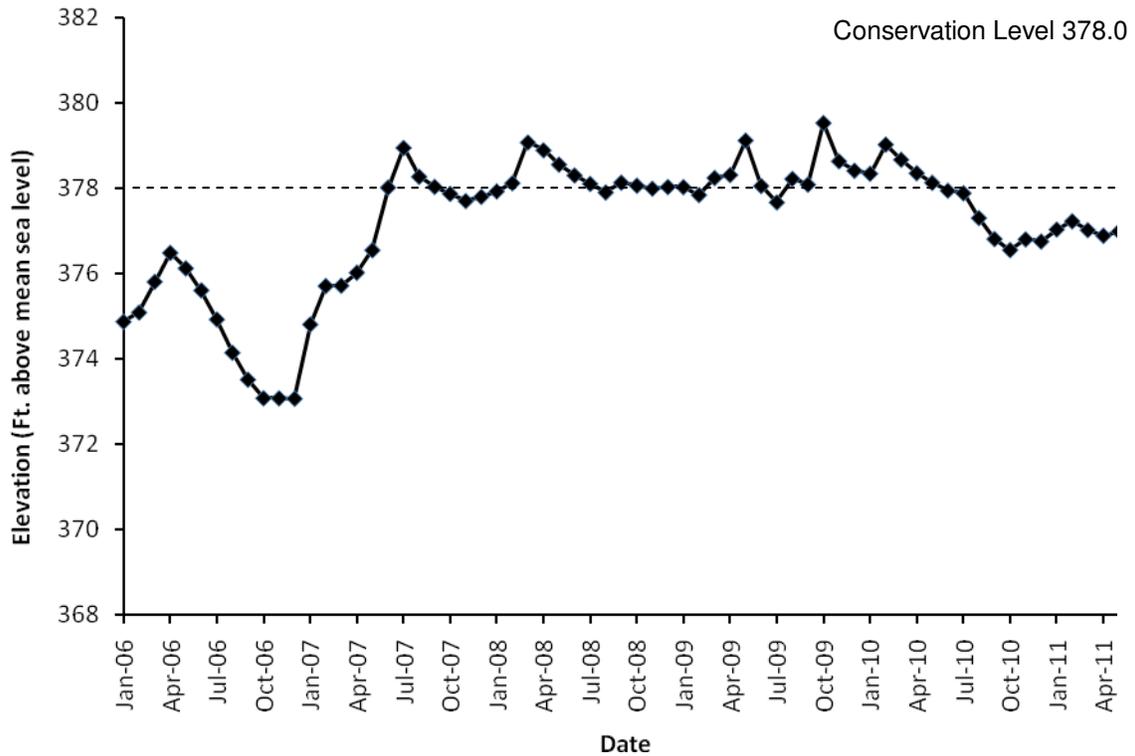


Figure 1. Average monthly water level elevations in feet above mean sea level (MSL) recorded for Lake Cypress Springs, Texas January 2006 to May 2011. Horizontal dashed-line denotes conservation pool level (378.0 msl).

Table 1. Characteristics of Lake Cypress Springs, Texas.

Characteristic	Description
Year constructed	1970
Controlling authority	Franklin County Water District
County	Franklin
Reservoir type	Mainstream
Shoreline development index (SDI)	5.2
Conductivity	168 umhos/cm

Table 2. Harvest regulations for Lake Cypress Springs, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass, white	25	10 - No Limit
Bass, largemouth	5 ^a	14 - No Limit
Bass, spotted	5 ^a	No Limit - No Limit
Crappie, white and black, their hybrids and subspecies	25 (in any combination)	10 - No Limit

^a Daily bag for largemouth bass and spotted bass = 5 in any combination.

Table 3. Stocking history of Lake Cypress Springs, Texas. Size categories are fry (FRY; <1 inch), fingerlings (FGL; 1-3 inches), advanced fingerlings (AFGL; 8 inches), adults (ADL), and unknown (UNK).

Species	Year	Number	Size
Blue catfish	1982	1,996	AFGL
	1983	4,997	AFGL
	1987	6,154	AFGL
	Total	13,147	
Channel catfish	1966	5,500	AFGL
	1970	112,644	FGL
	1971	18,514	FGL
	1980	66,827	FGL
	1981	10,000	FGL
	1983	35,000	FGL
	1984	6,000	AFGL
	1985	5,569	AFGL
	1986	6,000	AFGL
	1989	6,390	AFGL
	1991	5,000	AFGL
	1992	5,095	AFGL
	1993	4,991	AFGL
	Total	287,530	

Table 3. Stocking history continued.

Species	Year	Number	Size
Redear sunfish	1967	2,750	UNK
	Total	2,750	
Bluegill x green sunfish	1997	500	FGL
	Total	500	
Largemouth bass	1971	690,000	FRY
	Total	690,000	
Black crappie	1966	2,750	FGL
	Total	2,750	
Florida largemouth bass	1980	120,000	FGL
	1992	172,394	FGL
	Total	293,294	
Walleye	1970	600,000	FRY
	1971	4,000,000	FRY
	1972	53,460	FRY
	Total	4,653,460	
Triploid grass carp	1997	2,200	ADL
	2006	1,000	ADL
		3,000	

Table 4. Survey of littoral zone and physical habitat types, Lake Cypress Springs, Texas, 2010. 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 type of aquatic vegetation found.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Bulkhead	5.1	10.9		
Bulkhead & boat docks	26.3	56.0		
Natural shoreline	14.4	30.6		
Rocky shoreline	1.2	0.3		
Native submerged vegetation			0	0
Native emergent vegetation			24.3	0.7
Native floating-leaved			80.4	2.3
Non-native				
Alligatorweed			9.9	0.3
Hydrilla			0	0

Gizzard shad

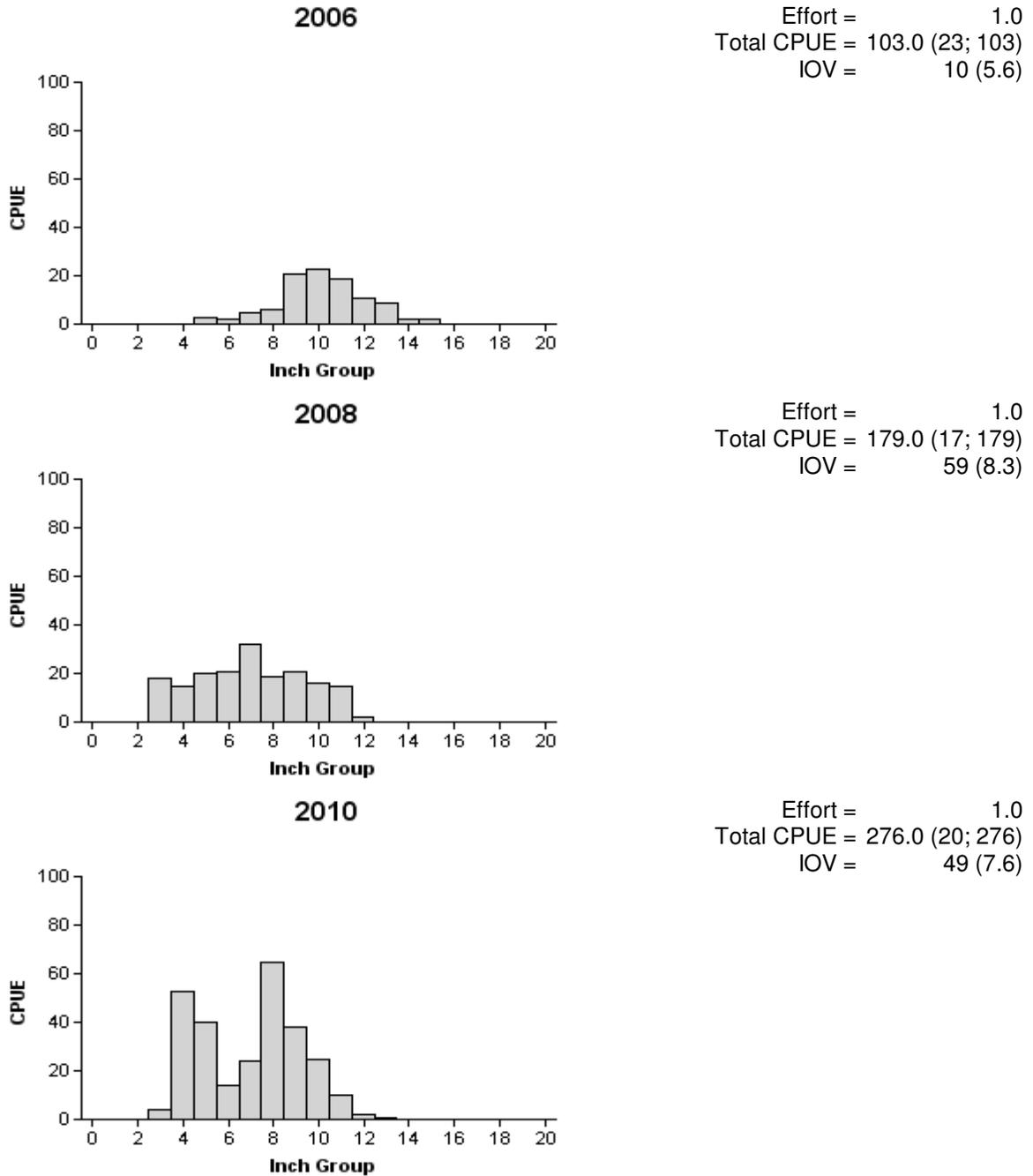
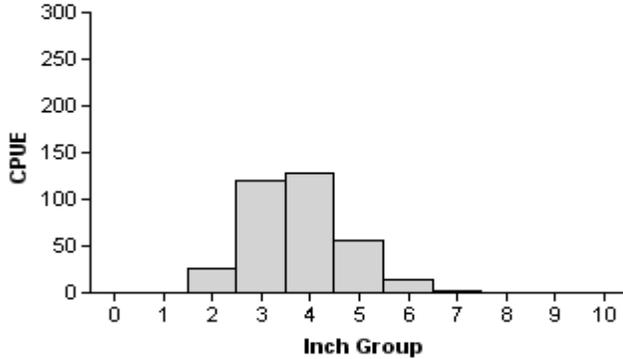


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV and size structure are in parentheses) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2006, 2008, and 2010.

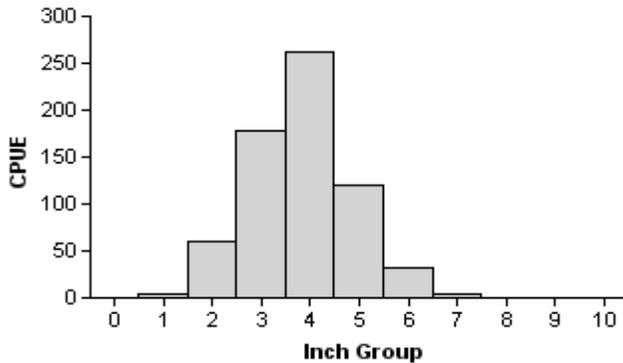
Bluegill

2006



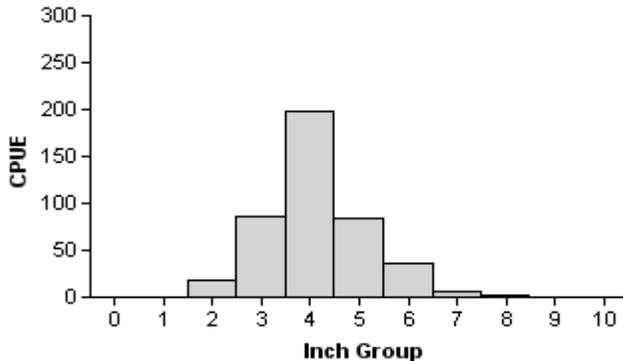
Effort = 1.0
 Total CPUE = 351.0 (20; 351)
 Stock CPUE = 324.0 (19; 324)
 PSD = 6 (1.6)
 PSD-P = 0 (0.3)

2008



Effort = 1.0
 Total CPUE = 666.0 (17; 666)
 Stock CPUE = 600.0 (17; 600)
 PSD = 6 (1.5)
 PSD-P = 0 (0.2)

2010



Effort = 1.0
 Total CPUE = 435.0 (14; 435)
 Stock CPUE = 415.0 (15; 415)
 PSD = 11 (1.9)
 PSD-P = 0 (0.4)

Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2006, 2008, and 2010.

Redear sunfish

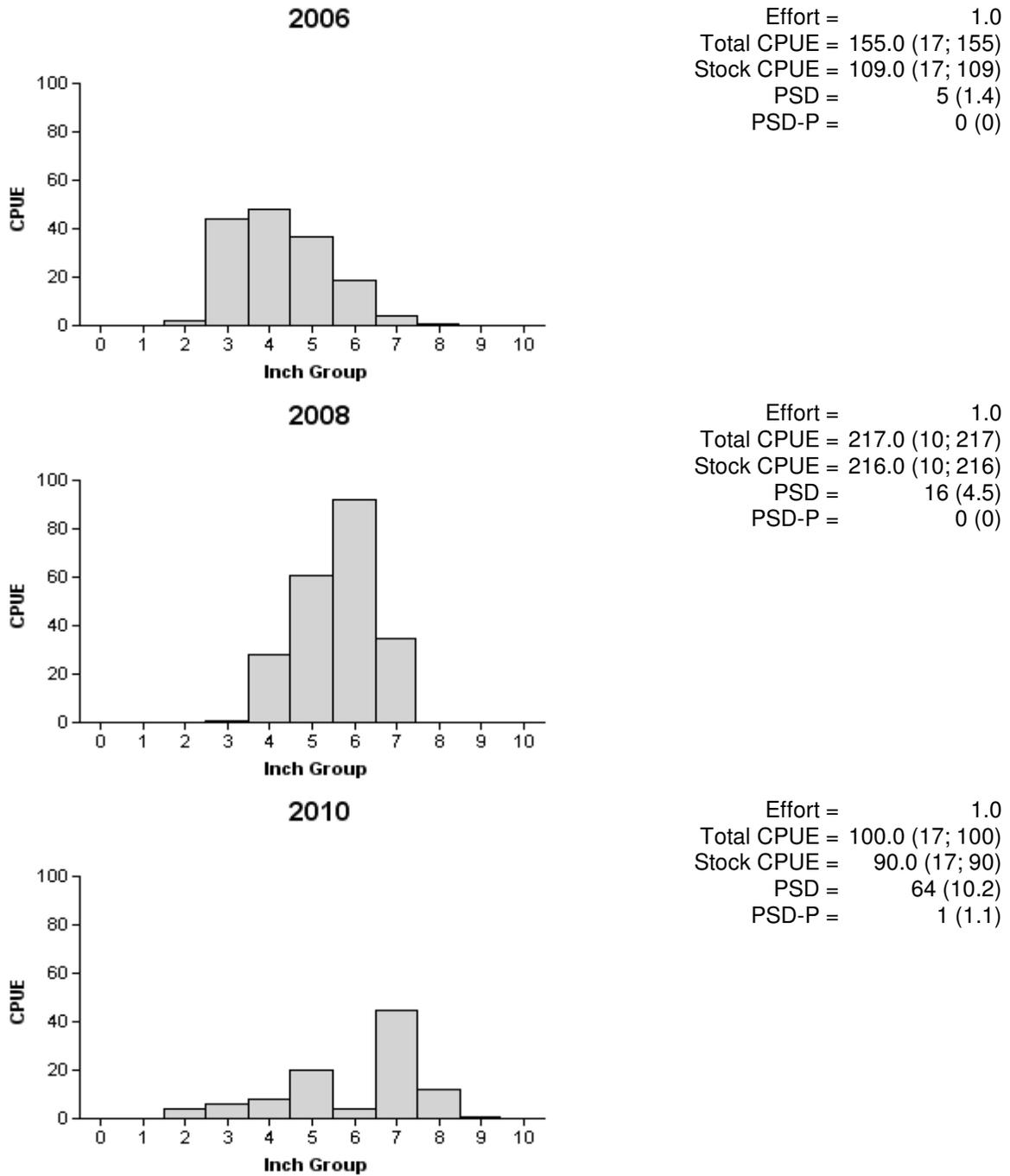


Figure 4. Number of redear sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2006, 2008, and 2010.

Channel catfish

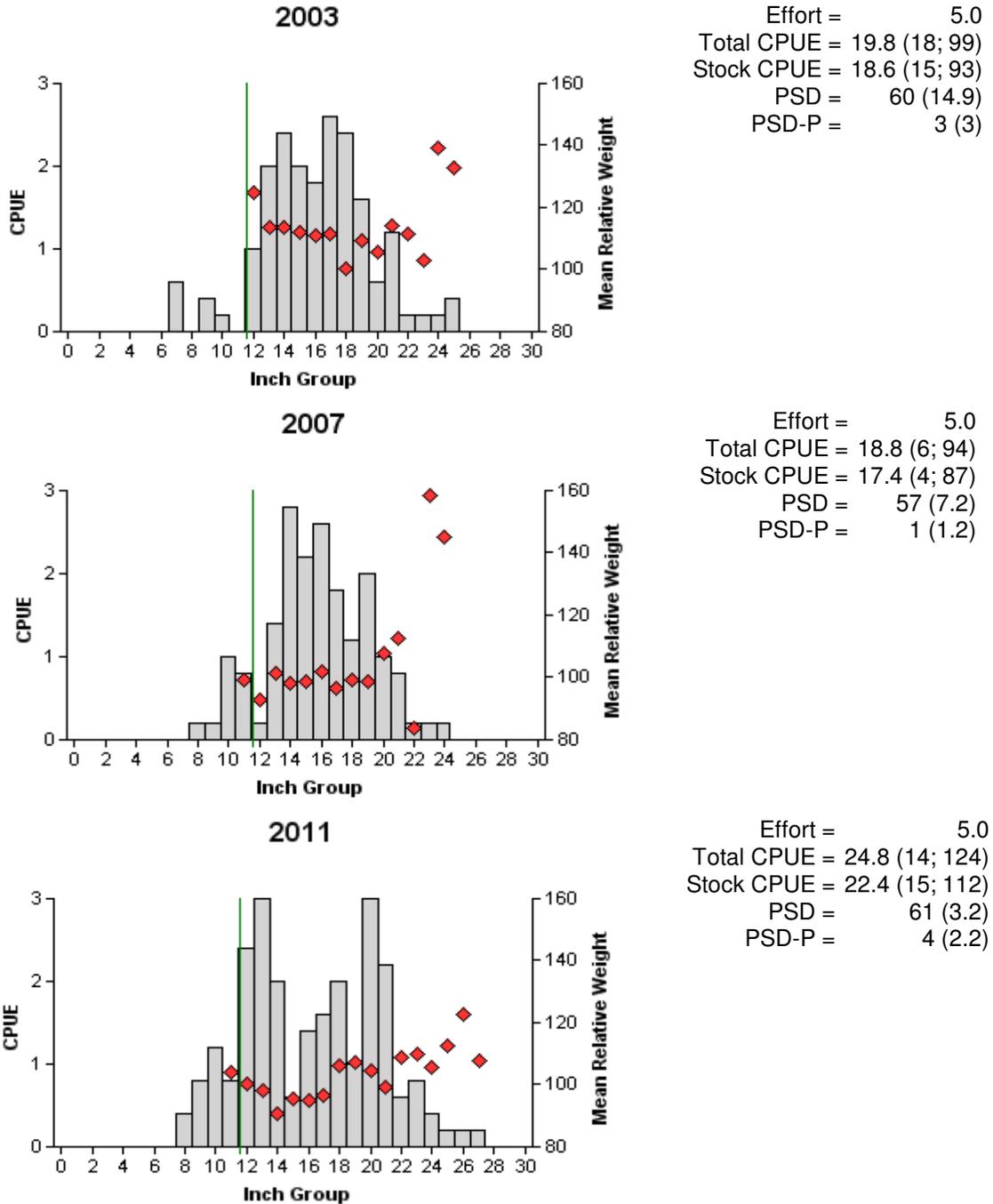


Figure 5. Number of channel catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Cypress Springs, Texas, 2003, 2007, and 2011. Vertical lines indicate minimum length limit.

White bass

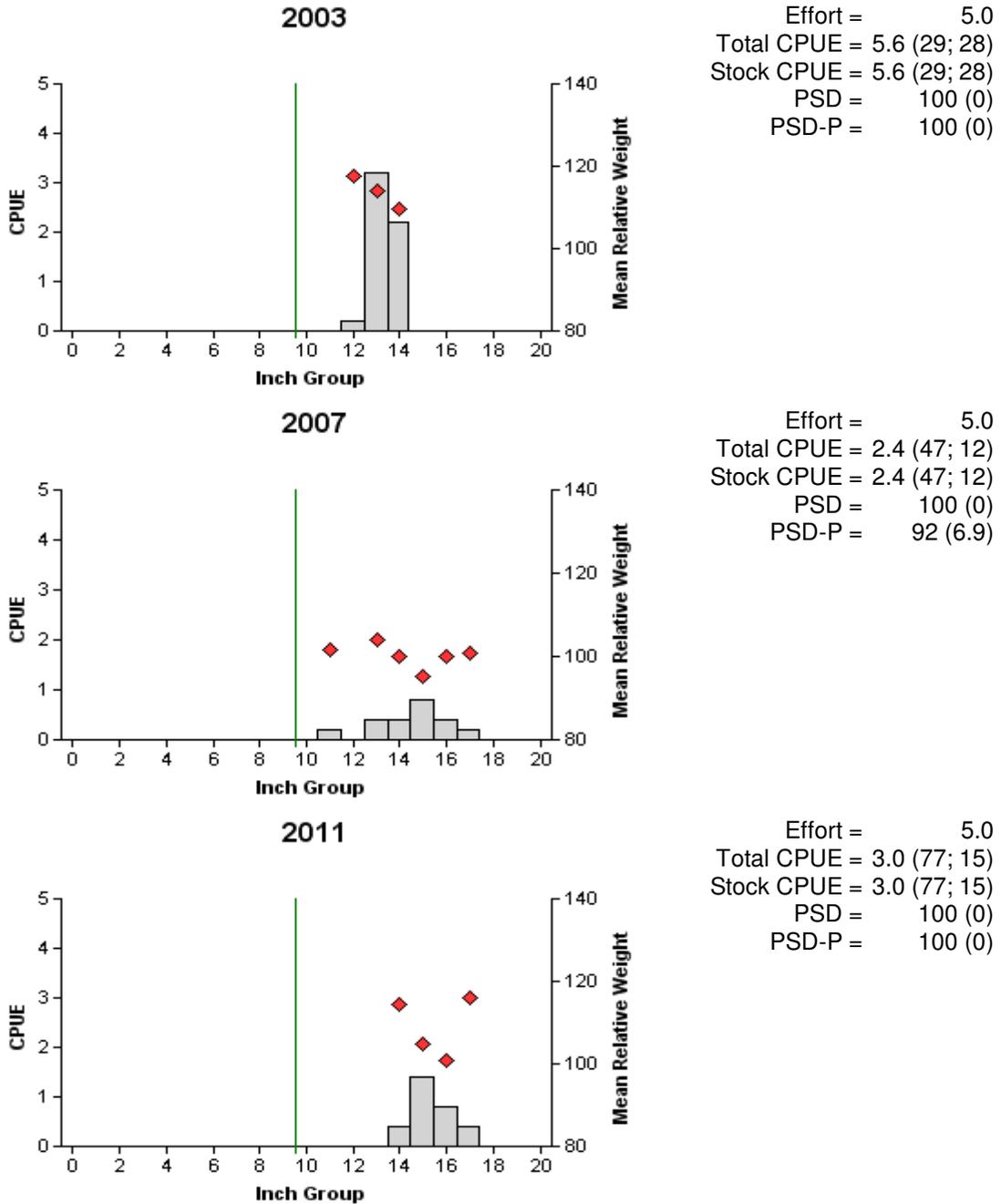


Figure 6. Number of white bass caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Cypress Springs, Texas, 2003, 2007, and 2011. Vertical lines indicate minimum length limit.

Spotted bass

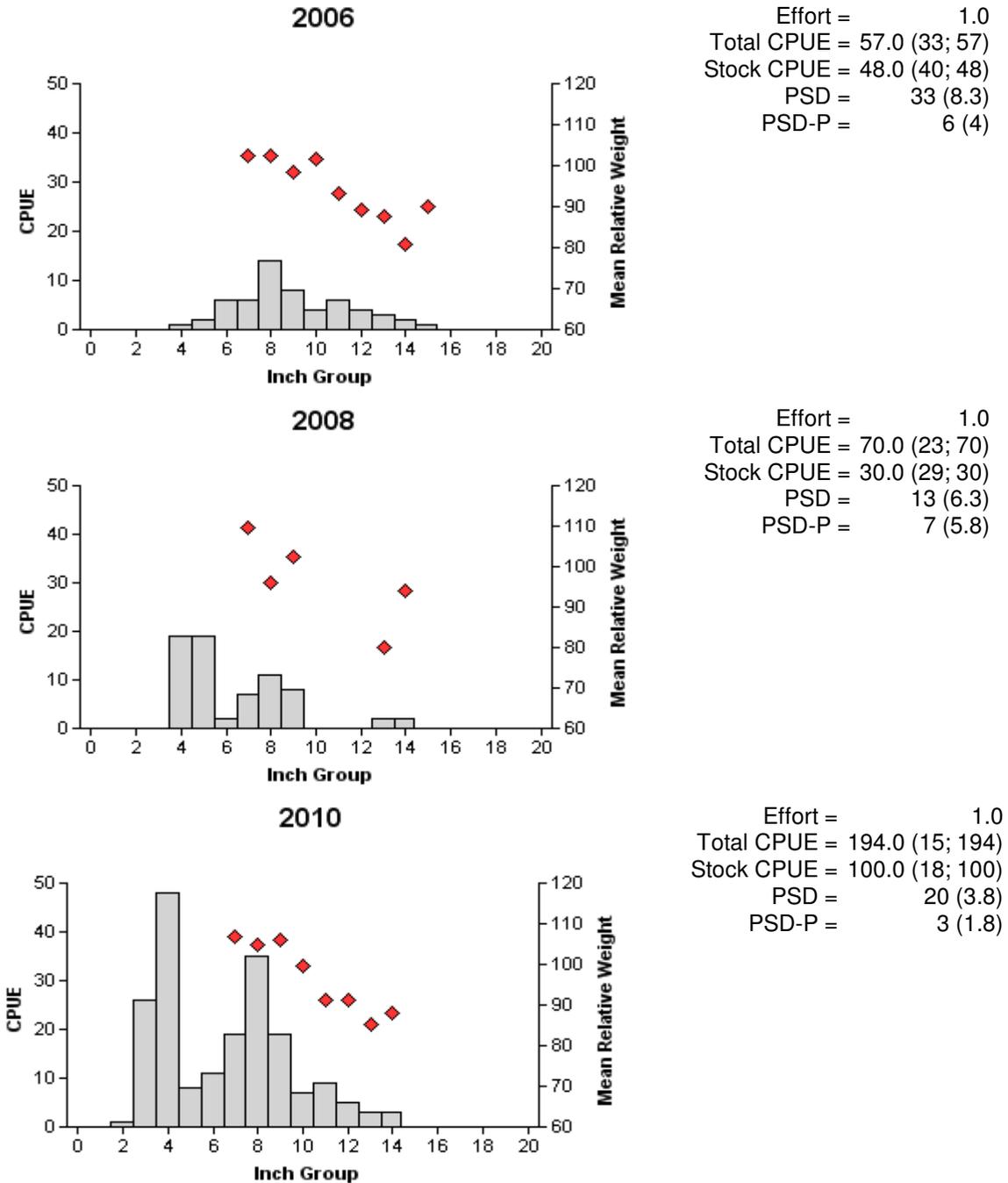


Figure 7. Number of spotted bass caught per hour (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2006, 2008, and 2010.

Largemouth bass

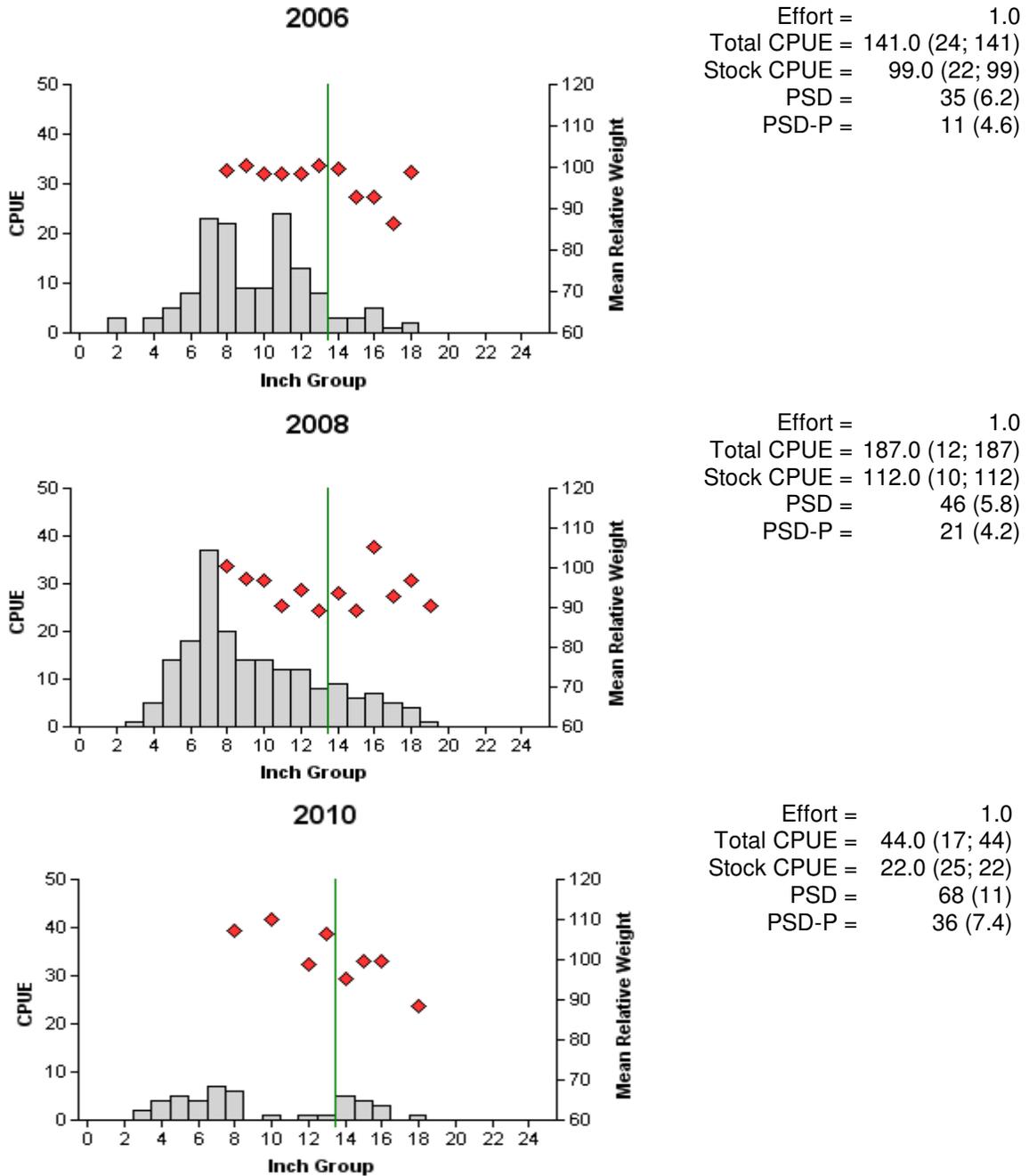


Figure 8. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2006, 2008, and 2010. Vertical lines indicate minimum length limit.

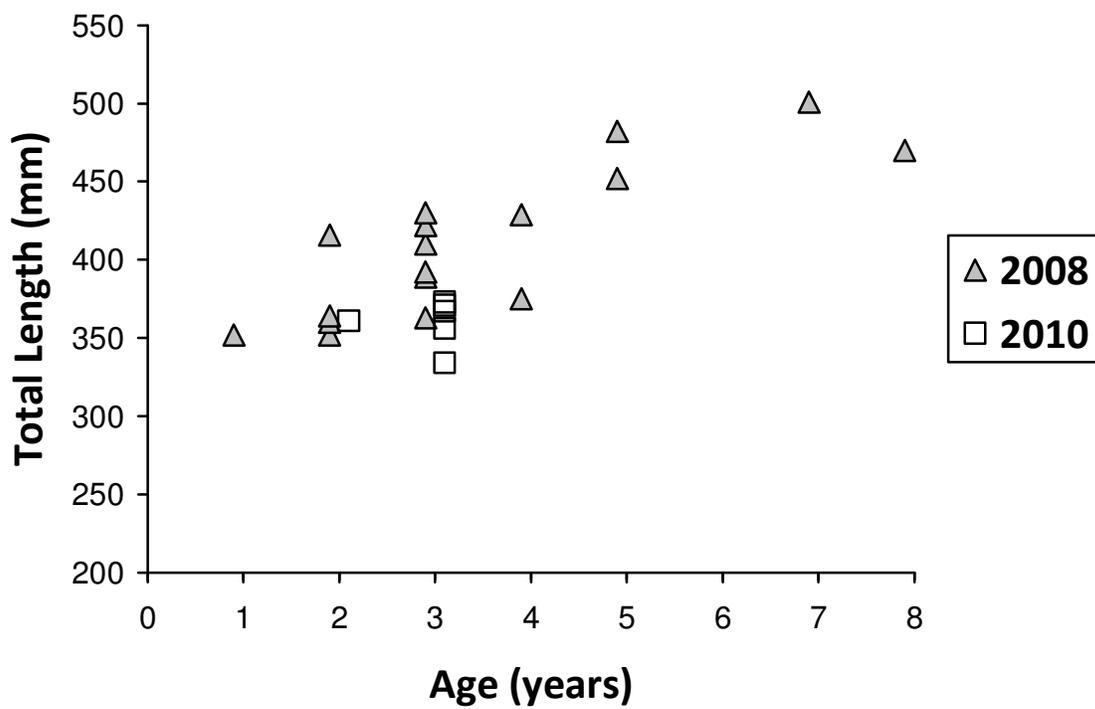


Figure 9. Length at age for largemouth bass collected from electrofishing at Lake Cypress Springs, Texas, October 2008 and October 2010.

White crappie

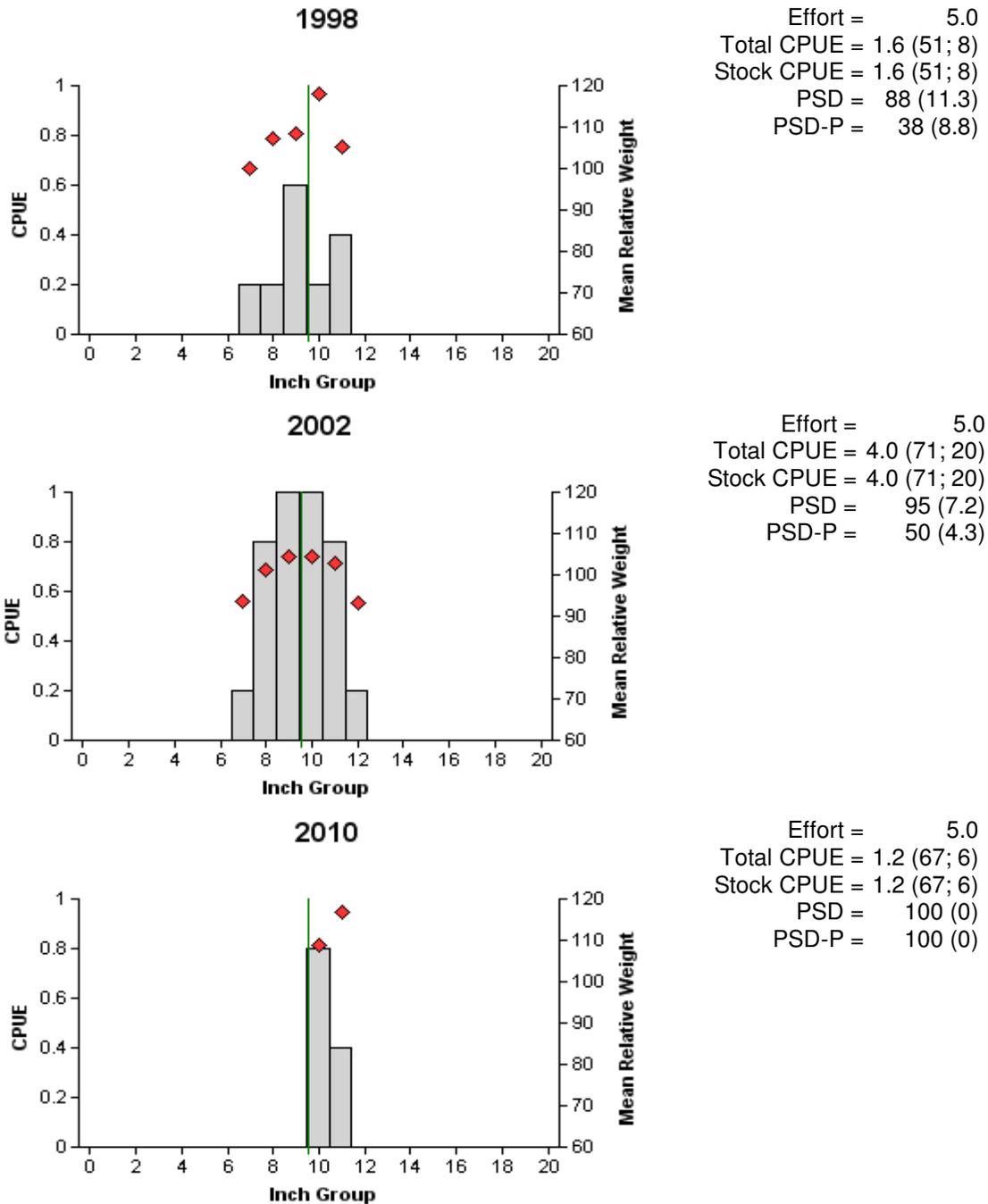


Figure 10. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Cypress Springs, Texas, 1998, 2002, and 2010. No white crappie were collected during 2006 trap netting survey. Vertical lines indicate minimum length limit.

Black crappie

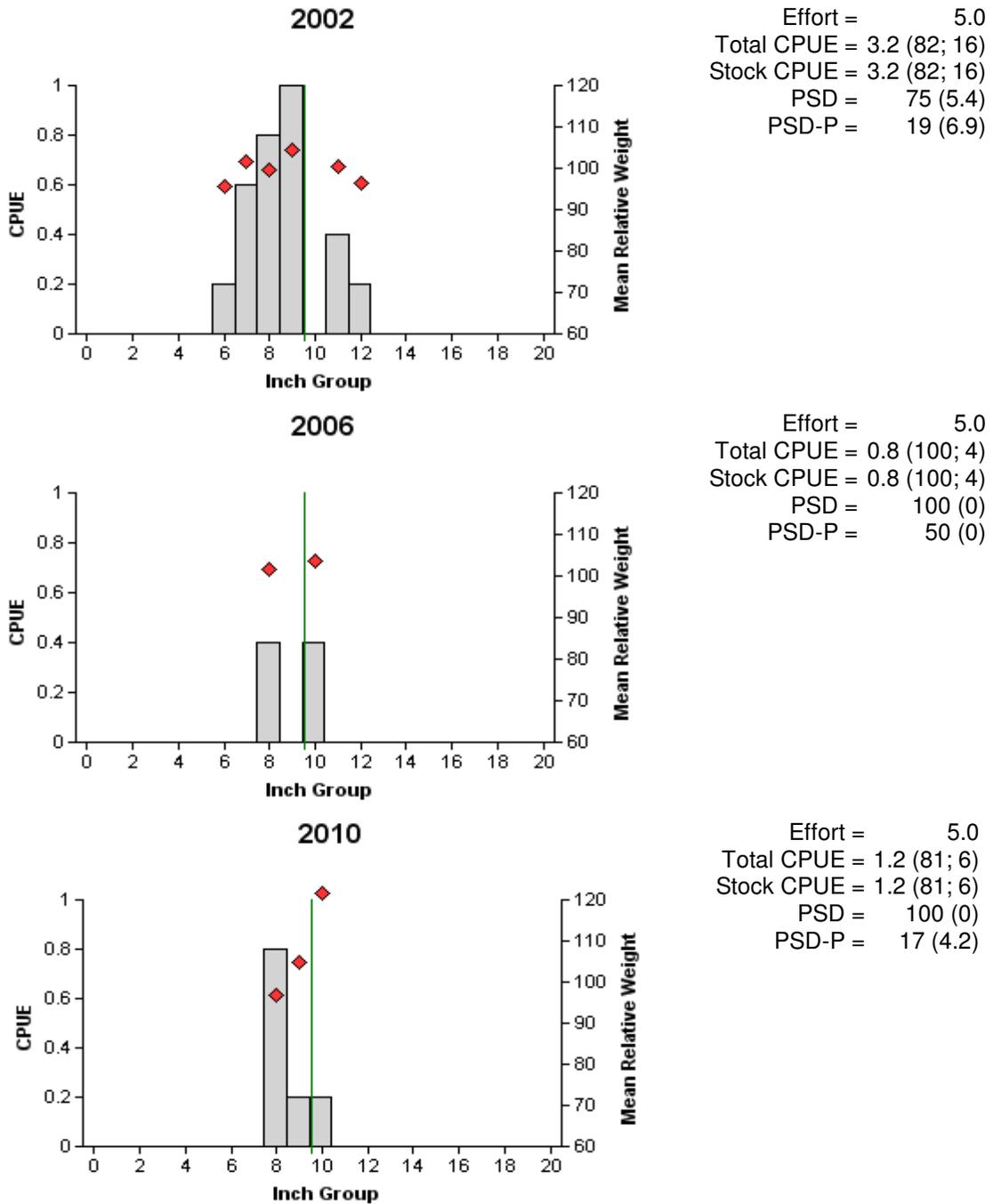


Figure 11. Number of black crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Cypress Springs, Texas, 2002, 2006, and 2010. Vertical lines indicate minimum length limit.

Table 5. Proposed sampling schedule for Lake Cypress Springs, Texas. Gill netting surveys are conducted in the spring, vegetation surveys are conducted in the summer, and electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

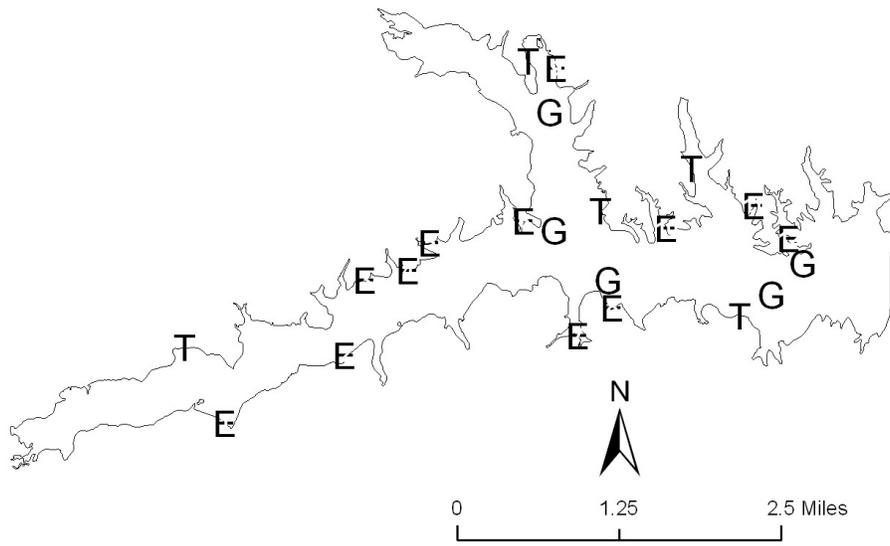
Survey Year	Vegetation	Electrofisher	Access	Gill net	Creel	Report
Summer 2011 - Spring 2012	A					
Summer 2012 - Spring 2013	A	A				
Summer 2013 - Spring 2014	A					
Summer 2014 - Spring 2015	S	S	S	S	A	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Cypress Springs, Texas, 2010-2011.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					276	276.0
Threadfin shad					902	902.0
Blue catfish	1	0.2				
Channel catfish	124	24.8				
White bass	15	3.0				
Warmouth					2	2.0
Orangespotted sunfish					2	2.0
Bluegill					435	435.0
Longear sunfish					95	95.0
Redear sunfish					100	100.0
Spotted bass					194	194.0
Largemouth bass					44	44.0
White crappie			6	1.2		
Black crappie			6	1.2		

APPENDIX B



Location of sampling sites, Lake Cypress Springs, Texas, 2010-2011. Trap netting, gill netting, and electrofishing stations are indicated by T, G, and E, respectively.