

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

Lake Cypress Springs

Prepared by:

Lynn D. Wright, Assistant District Management Supervisor
and
Timothy J. Bister, District Management Supervisor

Inland Fisheries Division
Marshal District
Marshall, Texas



Carter Smith
Executive Director

Craig Bonds
Director, Inland Fisheries

July 31, 2015

TABLE OF CONTENTS

Survey and Management Summary 1

Introduction..... 2

Reservoir Description..... 2

Angler Access 2

Management History 2

Methods..... 3

Results and Discussion..... 4

Fisheries Management Plan 6

Literature Cited..... 8

Figures and Tables 9-26

 Water Level (Figure 1) 9

 Reservoir Characteristics (Table 1) 9

 Boat Ramp Characteristics (Table 2)..... 10

 Harvest Regulations (Table 3) 11

 Stocking History (Table 4)..... 11

 Structural Habitat (Table 5)..... 13

 Aquatic Habitat and Vegetation Surveys (Table 6)..... 13

 Percent Directed Angler Effort per Species (Table 7)..... 14

 Total Fishing Effort and Fishing Expenditures (Table 8)..... 14

 Gizzard Shad (Figure 2)..... 15

 Bluegill (Figures 3) 16

 Channel Catfish (Figure 4-5, Table 9)..... 17

 White Bass (Figure 6) 19

 Black Bass (Figures 7-11, Tables 10-11)..... 20

 Crappie (Figures 12-13, Table 12) 25

 Proposed Sampling Schedule (Table 13) 27

Appendix A

 Catch Rates for all Species from all Gear Types 28

Appendix B

 Map of 2014-2015 Sampling Locations 29

Appendix C

 Reporting of Creel ZIP Code Data 30

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Cypress Springs were surveyed in 2014 using electrofishing and in 2015 using gill netting. Anglers were surveyed from June 2014 through May 2015 with a creel survey. 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 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. The electrofishing catch rate of Gizzard Shad was lower than previous surveys with 27% 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. Over 16,000 Channel Catfish were harvested during the 2014/2015 survey period.
 - **White Bass:** White Bass were present, but lack of suitable spawning habitat limits their numbers in the reservoir.
 - **Black Bass:** The Spotted Bass population has remained consistent in the reservoir over the last several years. The abundance of Largemouth Bass is limited by the lack of submerged vegetation. Anglers spent over 19,000 hours fishing for Black Bass during the 2014/2015 creel period.
 - **Crappie:** Both White and Black Crappie were present in the reservoir. Only 7.9% of all fishing effort was directed toward crappies, which was lower than previous surveys.
- **Management Strategies:** Conduct additional electrofishing surveys in 2016 and required sampling with electrofishing, hoop nets, and tandem trap nets in 2018/2019. Aquatic vegetation surveys will be conducted annually to monitor for the presence of hydrilla and alligatorweed. 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 in 2014-2015. 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 2014-2015 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 (Figure 1). Aquatic vegetation has been sparse in recent years. The shoreline is highly developed and approximately 800+ dock/boat houses are present on the reservoir. Other descriptive characteristics for Lake Cypress Springs are in Table 1.

Angler Access

Lake Cypress Springs has 5 public boat ramps maintained by the FCWD and all are in excellent condition. Numerous bank fishing opportunities are available at most FCWD parks and a fishing pier is located at Mary King Park. Addition characteristics are in table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Bister 2011) included:

1. Conduct annual surveys to monitor hydrilla.
Action: Hydrilla surveys have been conducted every year since 2005 (except 2009 and 2011). District biologists have maintained contact with FCWD regarding hydrilla management. Because no substantial amounts of hydrilla have been found in the reservoir since 2006, an annual update of the hydrilla management plan has not been necessary.
2. Monitor Largemouth Bass population through electrofishing and genetic sampling.
Action: Electrofishing surveys were conducted in 2012 and 2014. Genetic analysis of the Largemouth Bass population was conducted in 2012.
3. Keep anglers and public aware of harvest regulations, fishing methods, and other fisheries-related topics.
Action: Fisheries-related information has been posted on the FCWD website. Other fisheries related information has been disseminated through the district Facebook page and by direct interactions with anglers in person or on the phone.

Harvest regulation history: Sport fishes in Lake Cypress Springs have been managed with statewide regulations (Table 3).

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 limited recruitment. 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, 1992, and 2015. 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 re-stocking of 1,000 Triploid Grass Carp was conducted in 2006. A complete stocking history is in Table 4.

Vegetation/habitat management history: Hydrilla, present in the reservoir since 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). FCWD 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 (2005; 11.9%, 2006; 14.7%) as the number of Grass Carp remaining in the reservoir declined due to natural mortality. 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. This was likely the result of Grass Carp herbivory combined with environmental conditions. Since this time, limited amounts of native submerged vegetation have been observed and no hydrilla has been observed since 2006. In addition to native aquatic plant restoration, FCWD has also conducted mechanical removal of *Lyngbia* algae and American lotus. TPWD has released alligatorweed flea beetles in the past.

Water transfer: Lake Cypress Springs is controlled by the 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) 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 netting as the number of fish per net night (fish/nn). All survey sites were randomly selected and electrofishing, gill netting, angler access, and habitat surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014).

A roving creel survey was conducted from June 2014 through May 2015. Angler interviews were conducted on 5 weekend days and 4 weekdays per quarter to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified 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). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = $100 \times \text{SE of the estimate/estimate}$) was calculated for all CPUE and creel statistics. Ages were determined using otoliths for Largemouth Bass in 2012 and 2014.

Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014). Micro-satellite DNA analysis was used to determine genetic composition of individual fish.

Source for water level data was the United States Geological Survey (USGS 2015).

RESULTS AND DISCUSSION

Habitat: Native floating-leaved vegetation, primarily American Lotus, was present in the upper portion of the reservoir. Native emergent plants were limited to the fringe areas in coves and consisted of Maidencain, Water-willow, Cattail, and Pickerelweed. The only submersed aquatic vegetation found during the 2014 survey was a few patches of Illinois Pondweed. The presence of triploid Grass Carp has limited the abundance of submersed vegetation. No hydrilla has been found in the reservoir since 2007. Alligatorweed increased to 40 acres in 2014, significantly more than previous surveys (Table 6). However, most of the alligatorweed was located in the upper most portion of the reservoir and did not cause any access issues. Structural habitat is limited to the numerous boat houses and docks present on the reservoir.

Creel: Directed fishing effort by anglers was highest for black bass (46.2%), followed by anglers fishing for catfish (33.1%) and crappie (7.9%) (Table 7). Tournament anglers made up 4.6% of all angling effort. Total angler expenditures were \$211,476 and total effort was 38,357 hours. While total effort was similar to the 2006/2007 survey, total expenditures were down nearly 20% (Table 8). Most (62%) anglers surveyed traveled less than 50 miles to fish Lake Cypress Springs, while 7% traveled over 100 miles. ZIP code data indicated two distinct angler groups. The first group was local, traveled less than 20 miles, and comprised 38% of all anglers while a secondary group originated from the Dallas/Rockwall/Plano area and comprised approximately 30% of all anglers (Appendix C).

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 2014 was 111.0/h, which was less than half than previous surveys (2012 = 221.0/h, 2010 = 276.0/h) (Figure 2). Index of vulnerability (IOV) for Gizzard Shad was also lower than previous surveys and indicated only 27% were available to most predator fish. The electrofishing catch rate of Bluegill in 2014 (358.0/h) was slightly lower than 2012 (490.0/h) and 2010 (435.0/h) (Figure 3). Redear Sunfish and Longear Sunfish were also present. Only 3% of anglers targeted sunfish during the 2014/2015 creel survey (Table 7).

Channel Catfish: The gill net catch rate of Channel Catfish in 2011 was 23.8/nn, which was similar to the catch rate in 2011 (24.8/nn) and slightly higher than 2007 (18.8/nn) (Figure 4). Body condition was excellent with mean W_t for most inch groups ≥ 100 . Size structure has remained very consistent over the past three surveys with PSDs of 57 in 2007, 61 in 2011, and 67 in 2015. During the 2014/2015 creel survey, 33% of anglers targeted catfish and directed effort was 12,692 hours, both significant increases from the 2006/2007 survey (Table 9). An estimated 16,170 Channel Catfish were harvested during the creel period and only 4% of legal sized fish were released (Figure 5).

White Bass: Catch rates of White Bass during the last three survey years were low (range = 1.2 to 3.0/nn). (Figure 6). The lack of suitable spawning habitat likely limits successful reproduction and recruitment. No directed effort for White Bass was observed during the 2014/2015 creel survey.

Black Bass: The electrofishing catch rate of Spotted Bass has remained relatively consistent over the last several years from 194.0/h in 2010, to 156.0/h in 2012, and 182.0/h in 2014 (Figure 7). Size structure has also remained somewhat consistent with PSDs of 20, 34 and 31 from 2010, 2012, and 2014,

respectively. Mean relative weights declined as the length of Spotted Bass increased. This may be an indication of poor prey availability to these fish as they grow to larger sizes. During the 2014/2015 creel survey, an estimated 1,144 Spotted Bass were harvested (Figure 9) with 88% of all fish being released. Harvested Spotted Bass ranged in size from 9-17 inches, with 13-15 inch fish most commonly observed in the survey.

The electrofishing catch rate of Largemouth Bass in 2014 was 62.0/h, which was lower than the 2012 survey (123.0/h) but similar to the 2010 catch (44.0/h) (Figure 8). A combination of poor recruitment and poor sampling conditions due to the lack of submersed vegetation has likely led to lower abundance estimates. In 2014, growth of Largemouth Bass was satisfactory; mean age at 14 inches (13.5 to 14.7 inches) was 2.3 years (N = 4; range = 2 - 3 years) and was similar to 2012 when Largemouth Bass mean age at 14 inches (13.0 to 14.8) was 2.0 years (N = 9; range = 1 - 5 years). Length at age data for Largemouth Bass sampled during the 2012 fall survey indicated that most fish reach legal size between 2 and 3 years of age (Figure 11), however, few fish over age 2 were collected. Genetic analysis in 2012 indicated 34% FLMB alleles in the population, similar to previous years (Table 11). During the 2014/2015 creel survey, directed effort for Black Bass was 19,501 hours and 50.8% of anglers targeted Black Bass, including tournament anglers, making them the most sought after species (Table 9). An estimated 2,909 Largemouth Bass were harvested (Figure 10) during the creel period with 46% of legal sized fish being released. An estimated 1,008 Largemouth Bass were harvested by tournament anglers, which were later released. Catch rate for all anglers was 1.11 fish/h. Total effort, total harvest, and catch rate were all slightly down from the 2006/2007 creel survey.

Crappie: Both Black and White Crappie were present in the reservoir, although Black Crappie were more abundant. Trap netting was discontinued after 2010 due to poor catch rates. 7.9% of anglers targeted crappie during the 2014/2015 creel survey, which was a large decrease from the 23.4% that targeted crappie during the 2006/2007 survey (Table 7). Total harvest was 2,807, which was much lower than the 16,870 that were harvested in 2006/2007 (Table 12). Harvested crappie ranged in size from 10-15 inches and 0% of legal sized crappie were released (Figure 11).

Fisheries management plan for Lake Cypress Springs, Texas

Prepared – July 2015.

ISSUE 1: Lake Cypress Springs has the potential to support a quality Largemouth Bass population and quality populations have occurred in the past when submerged aquatic vegetation was present. Grass Carp have limited the abundance of submerged vegetation, however enough floating-leaved and emergent vegetation was present to warrant stocking in 2015. The Largemouth Bass population needs to be monitored for improvement when submerged vegetation begins to return.

MANAGEMENT STRATEGIES

1. Conduct a supplemental electrofishing survey in 2016 and a standard electrofishing survey in 2018 to monitor Largemouth Bass relative abundance, size structure, condition, and growth.
2. Assess Largemouth Bass population genetics in 2018.
3. Recommend stocking FLMB at 1000 fish/km in 2016.

ISSUE 2: Hydrilla has not been observed in Lake Cypress Springs since 2006, but has caused access issues in the past. 2,200 Triploid Grass Carp were stocked in 1997 and an additional 1,000 were stocked in 2006, which has eliminated the hydrilla and nearly all native submerged vegetation from the reservoir. However, the effectiveness of Grass Carp may decline as the population ages, allowing for the return of hydrilla. Additional vegetation surveys are needed to monitor for the presence of hydrilla and continued cooperation with the FCWD regarding treatment when it returns.

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 3: Fish habitat is limited in Lake Cypress Springs. When the reservoir was constructed, the lake basin was clear-cut, leaving very little submerged standing timber. Additionally, Grass Carp have eliminated nearly all submerged vegetation in the lake, further reducing habitat. Lake Cypress Springs would be an excellent lake to add artificial structure and pursue vegetation restoration projects. Adding structure would provide much needed habitat and increase catch rates for anglers fishing the structures. Also, adding stands of water-willow throughout the reservoir would provide quality littoral habitat for fish.

MANAGEMENT STRATEGIES

1. Coordinate with the FCWD to place artificial structures in Lake Cypress Springs to improve structural habitat and increase angler success.
2. Plant water-willow in new areas by relocating plants from patches already present in the reservoir.

ISSUE 4: Anglers and other stakeholders need to be informed about fisheries management activities, fishing opportunities, and other issues at Lake Cypress Springs.

MANAGEMENT STRATEGIES

3. Continue to provide news releases to local media, the district Facebook page, and to FCWD.
4. Continue to provide fisheries presentations to the public regarding issues/opportunities at Lake Cypress Springs.

ISSUE 5: 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 media and the internet.
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 2016, required angler access, electrofishing, and hoop netting surveys in 2018/2019 (Table 13). With the switch to object based sampling; Channel Catfish will no longer be sampled with gill nets and will be sampled with hoop nets. Although the object based sampling plan for Cypress Springs has not yet been completed, the switch from gill nets to hoops nets is anticipated. Annual hydrilla surveys are necessary to monitor management efforts and to provide coverage estimates to the controlling authority. Supplemental electrofishing in 2016 will be conducted to monitor the Largemouth Bass and prey fish populations. Genetic analysis of age-0 LMB in fall 2018 will be used to monitor the Florida Largemouth Bass genetics in the 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.
- Bister, T. J. 2011. Statewide freshwater fisheries monitoring and management program survey report for Lake Cypress Springs, 2010. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Brice, M. W., and T. J. Bister. 2007. Statewide freshwater fisheries monitoring and management program survey report for Lake Cypress Springs, 2006. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 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. Neumann, 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.
- Ryan, M. J., and M. W. Brice. 2003. Statewide freshwater fisheries monitoring and management program survey report for Lake Cypress Springs, 2002. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- United States Geological Society (USGS). 2015. National water information system: Web interface. Available: <http://waterdata.usgs.gov/tx/nwis> (May 2015).

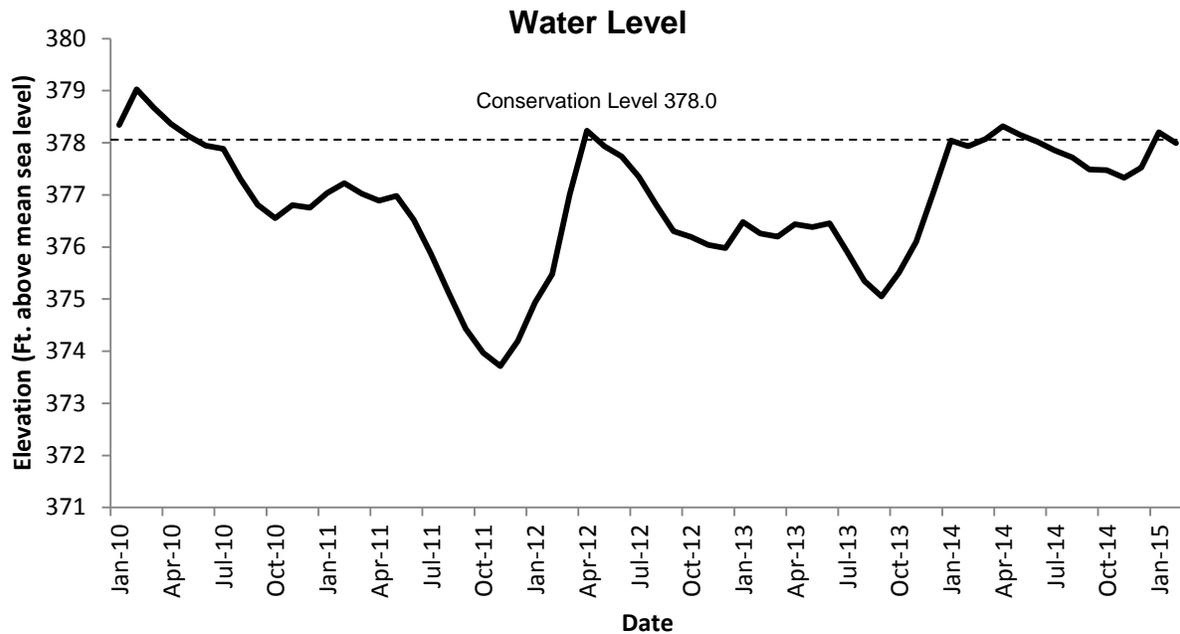


Figure 1. Average monthly water level elevations in feet above mean sea level (MSL) recorded for Lake Cypress Springs, Texas January 2010 to April 2015. Horizontal dashed-line denotes conservation pool level (378.0 msl).

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. Boat ramp characteristics for Lake Cypress Springs, Texas, 2015. Reservoir elevation at time of survey was 378 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Guthrie Park	33.06487 -95.14173	Y	15	368	Excellent, no access issues
Dogwood Park	33.05185 -95.14268	Y	20	368	Excellent, no access issues
Mary King Park	33.05496 -95.17019	Y	15	370	Excellent, no access issues
Overlook Park	33.06348 -95.16818	Y	30	369	Excellent, no access issues
Walleye Park	33.06205 -95.15261	Y	10	368	Excellent, no access issues

Table 3. Harvest regulations for Lake Cypress Springs, Texas.

Species	Bag Limit	Length Limit
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 4. Stocking history of Lake Cypress Springs, Texas. FGL = fingerling; AFGL = advanced fingerling; ADL = adults and UNK = unknown.

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 4. 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	9,900	FGL
	1980	111,000	FRY
	1992	172,394	FGL
	2015	70,570	FGL
	Total	363,864	
Walleye	1970	600,000	FRY
	1971	4,000,000	FRY
	1972	53,460	FRY
	Total	4,653,460	
Tripliod Grass Carp	1997	2,200	ADL
	2006	1,000	ADL
	Total	3,000	

Table 5. Survey of structural habitat types, Lake Cypress Springs, Texas, 2010 (Bister 2011). Shoreline habitat type units are in miles.

Habitat type	Estimate	% of total
Bulkhead	5.1 miles	10.9
Bulkhead with boat docks	26.3 miles	56.0
Natural	14.4 miles	30.6
Rocky	1.2 miles	0.3

Table 6. Survey of aquatic vegetation, Lake Cypress Springs, Texas, 2012 – 2014. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2012	2013	2014
Native submersed			Trace
Native floating-leaved			104.0 (2.1)
Native emergent			15.0 (1.5)
Non-native			
Alligatorweed (Tier III)*	Trace	0.0	40.0 (1.4)

*Tier III is Watch Status

Table 7. Percent directed angler effort by species for Lake Cypress Springs, Texas, 2014/2015. Survey periods were from 1 June through 31 May.

Species	2006/2007	2014/2015
Catfish	12.1	33.1
Sunfishes	1.8	3.0
Black Bass	55.0	50.8
Crappie	23.4	7.9
Anything	7.7	4.6

Table 8. Total fishing effort (h) for all species and total directed expenditures at Lake Cypress Springs, Texas, 2014/2015. Survey periods were from 1 June through 31 May. Relative standard error is in parentheses.

Creel statistic	2006/2007	2014/2015
Total fishing effort	37,047 (18)	38,357 (11)
Total directed expenditures	\$263,895 (26)	\$211,476 (28)

Gizzard Shad

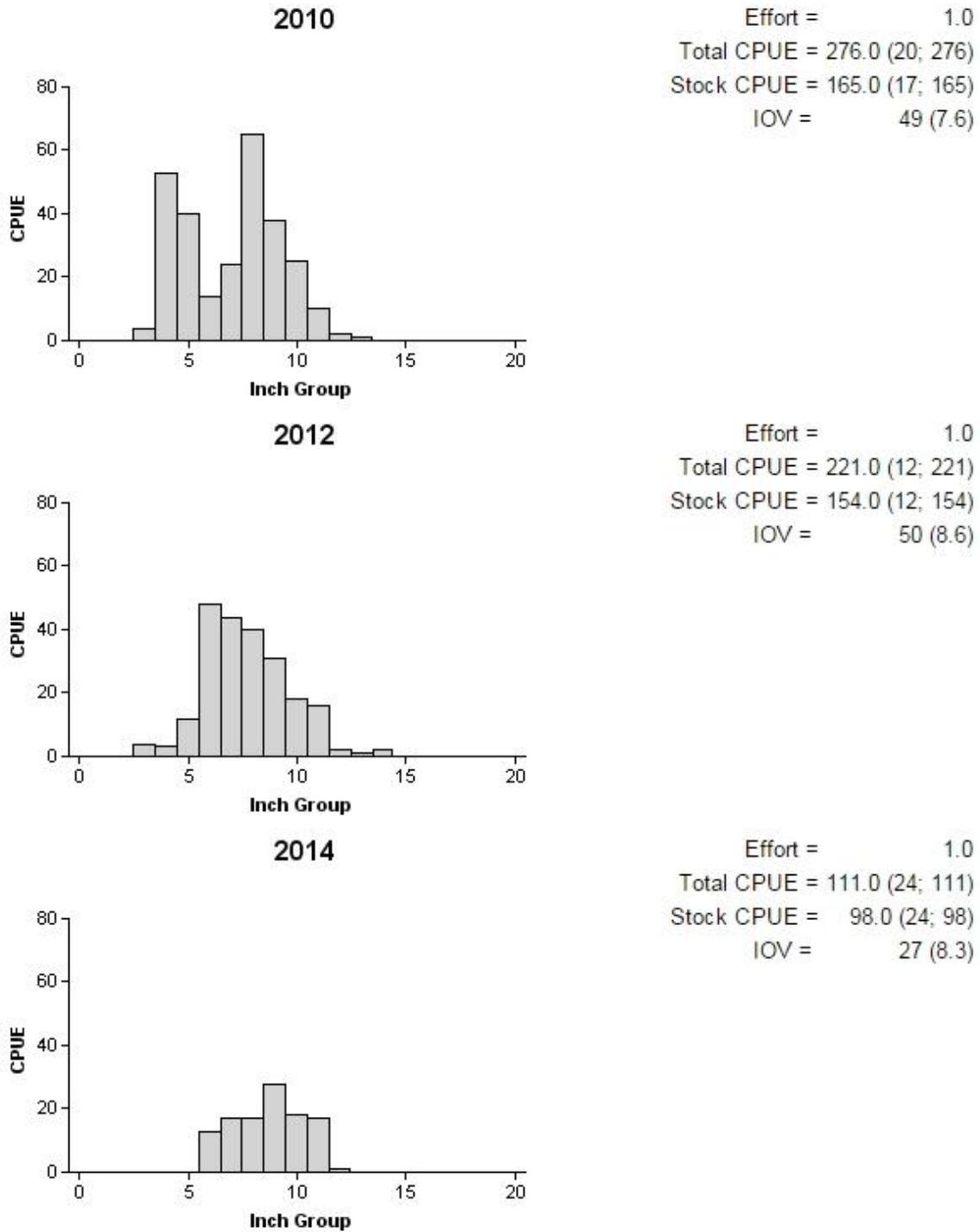


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV and size structure are in parentheses) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2010, 2012, and 2014.

Bluegill

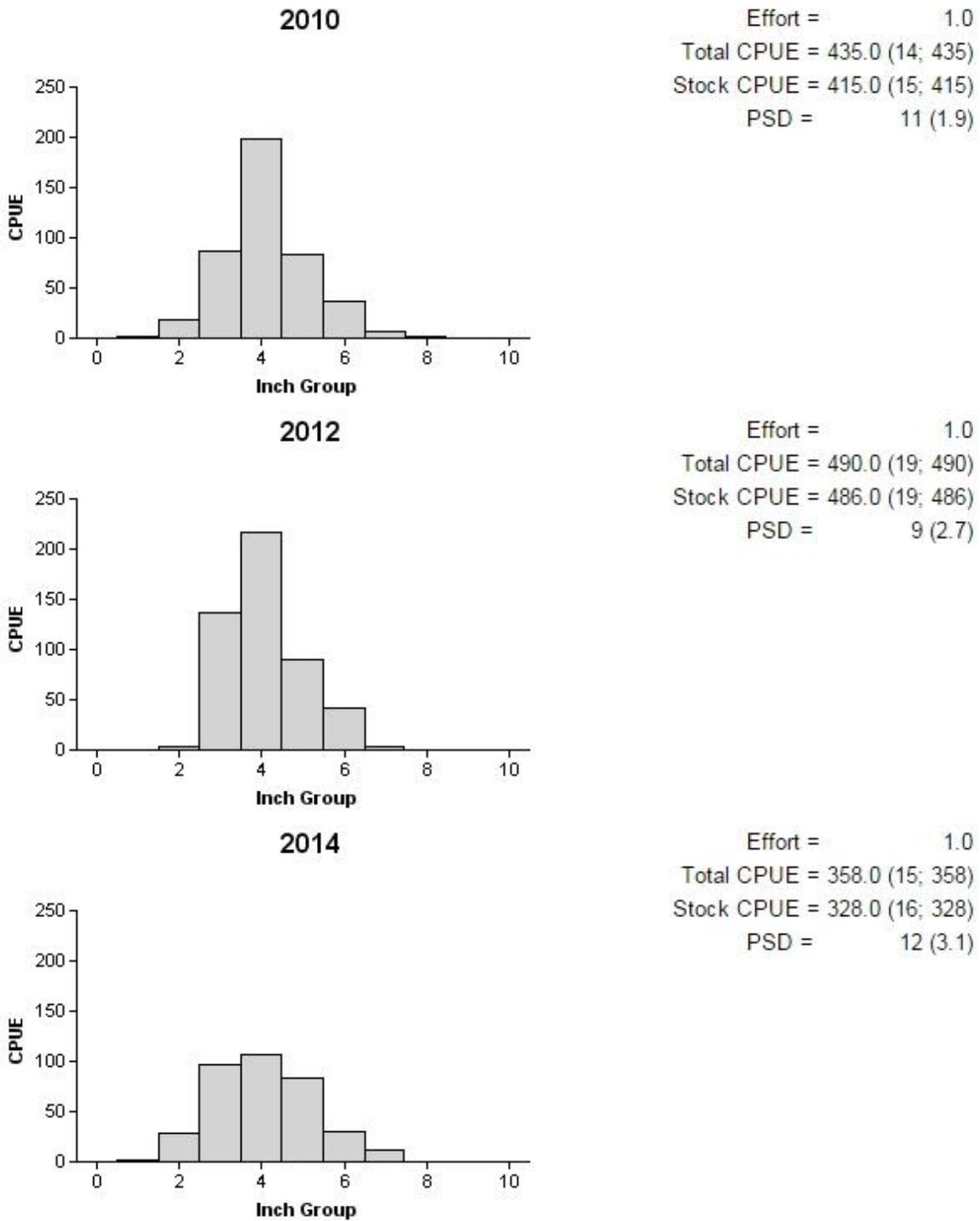


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2010, 2012, and 2014.

Channel Catfish

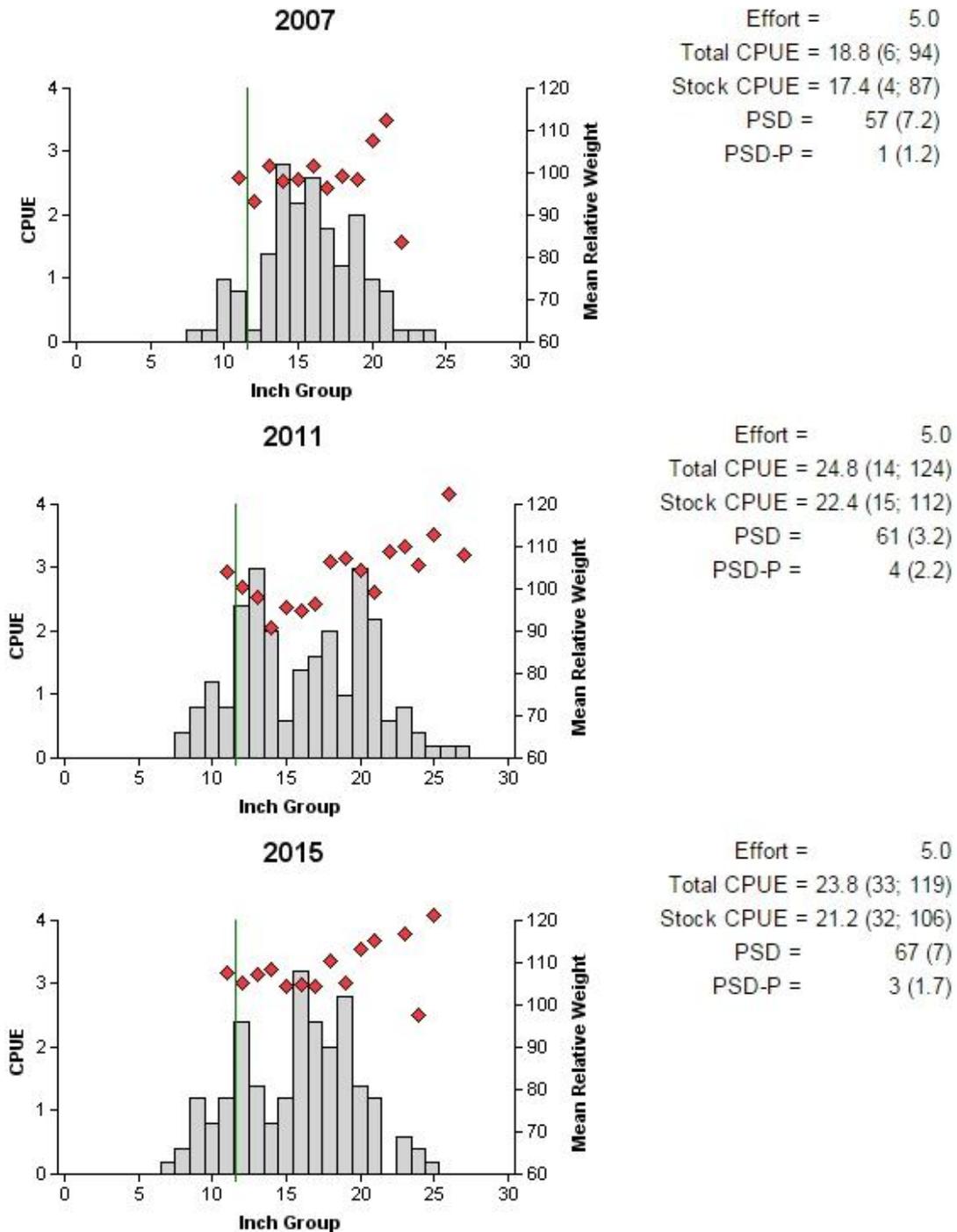


Figure 4. Number of Channel Catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Cypress Springs, Texas, 2007, 2011, and 2015. Vertical lines indicate minimum length limit.

Channel Catfish

Table 9. Creel survey statistics for Channel Catfish at Lake Cypress Springs, Texas, from June 2006 through May 2007 and June 2014 through May 2015. Total catch per hour is for anglers targeting Channel Catfish and total harvest is the estimated number of Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2006/2007	2014/2015
Directed effort (h)	4,491 (33)	12,692 (28)
Directed effort/acre	1.30 (33)	3.67 (28)
Total catch per hour	2.03 (66)	1.13 (67)
Total harvest	11,798 (66)	16,170 (58)
Harvest/acre	3.41 (25)	4.67 (58)
Percent legal released	2.2	4.1

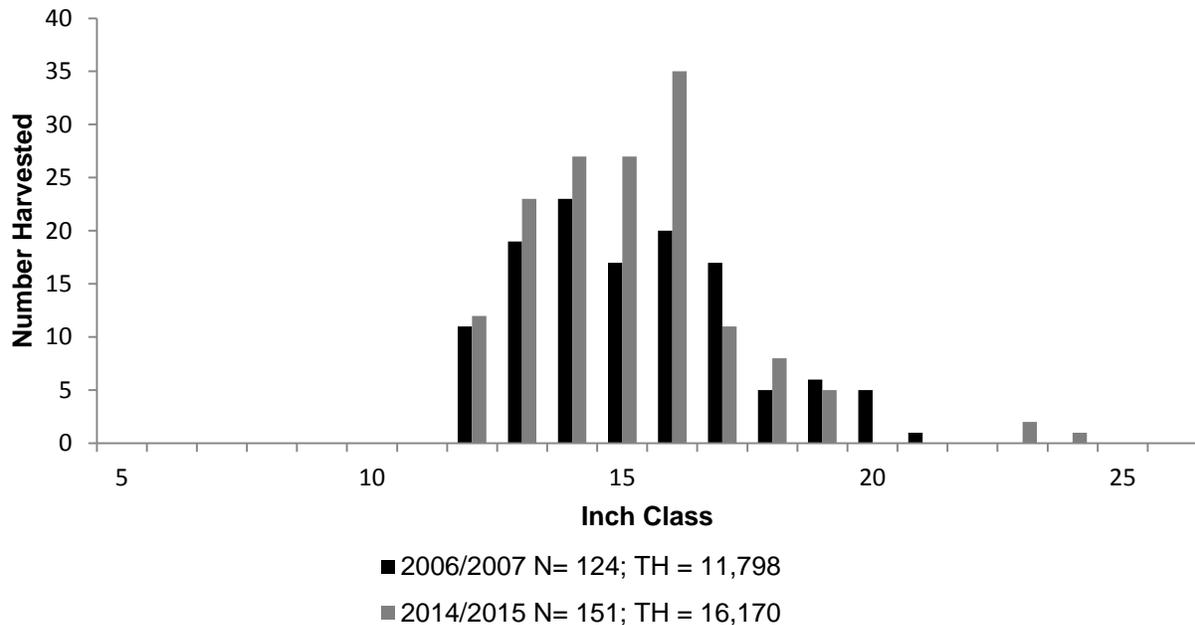


Figure 5. Length frequency of harvested Channel Catfish observed during creel surveys at Lake Cypress Springs, Texas, June 2006 through May 2007 and June 2014 through May 2015, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

White Bass

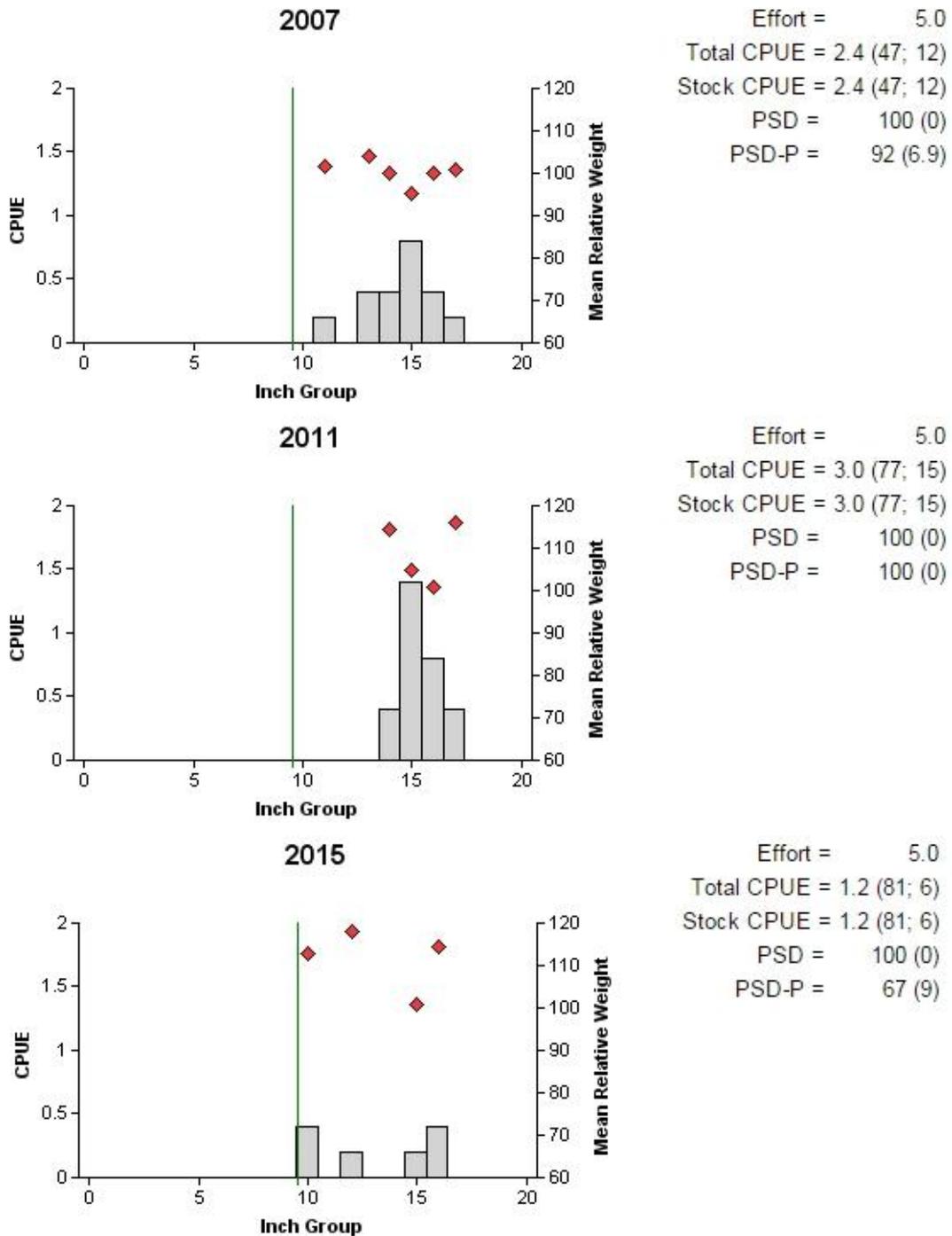


Figure 6. Number of White Bass caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Cypress Springs, Texas, 2007, 2011, and 2015. Vertical lines indicate minimum length limit.

Spotted Bass

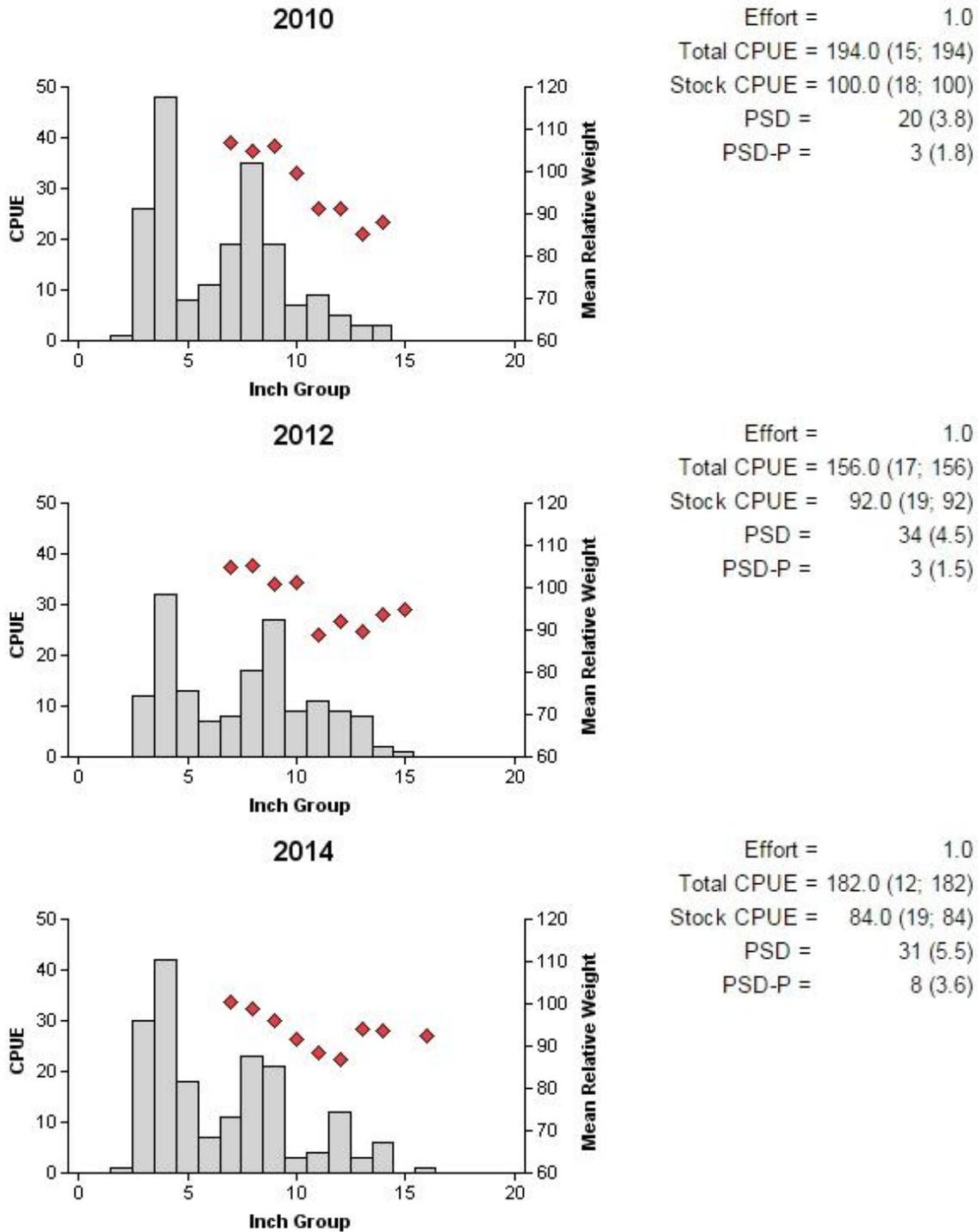


Figure 7. Number of Spotted Bass caught per hour (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2010, 2012, and 2014.

Largemouth Bass

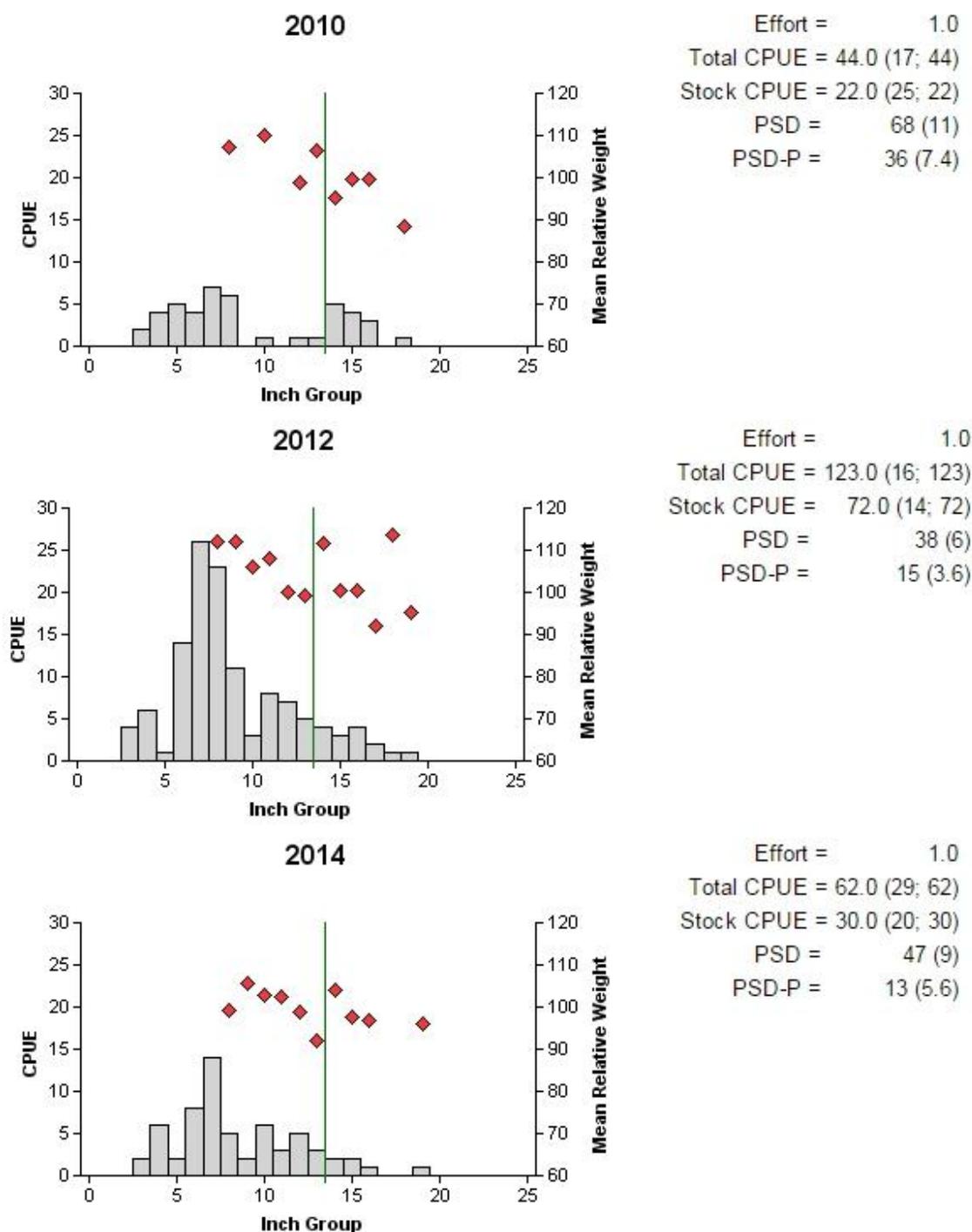


Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Cypress Springs, Texas, 2010, 2012, and 2014. Vertical lines indicate minimum length limit.

Black Bass

Table 10. Creel survey statistics for black bass at Lake Cypress Springs, Texas, from June 2006 through May 2007 and June 2014 through May 2015. Catch rate is for all anglers targeting black bass. Harvest is partitioned by the estimated number of fish harvested by non-tournament anglers and the number of fish retained by tournament anglers for weigh-in and release. The estimated number of fish released by weight category is for anglers targeting Largemouth Bass. Relative standard errors (RSE) are in parentheses.

Statistic	2006/2007	2014/2015
Directed angling effort (h)		
Tournament	5,550 (25)	1,766 (35)
Non-tournament	16,586 (24)	17,735 (17)
All black bass anglers combined	22,136 (24)	19,501 (18)
Angling effort/acre	6.4 (24)	5.6 (16)
Catch rate (number/h)	1.19 (20)	1.11 (41)
Harvest		
Non-tournament harvest	6,551 (65)	4,053 (58)
Harvest/acre	1.9 (65)	1.2 (58)
Largemouth Bass	4,482 (52)	2,909 (60)
Spotted Bass	2,069 (94)	1,144 (53)
Tournament weigh-in and release	2,601 (61)	1,008 (110)
Release by weight		
<4.0 lbs		6,829 (54)
4.0-6.9 lbs		54 (131)
7.0-9.9 lbs		
≥10.0 lbs		
Percent legal released (non-tournament)		
Largemouth Bass	39	46
Spotted Bass	61	88

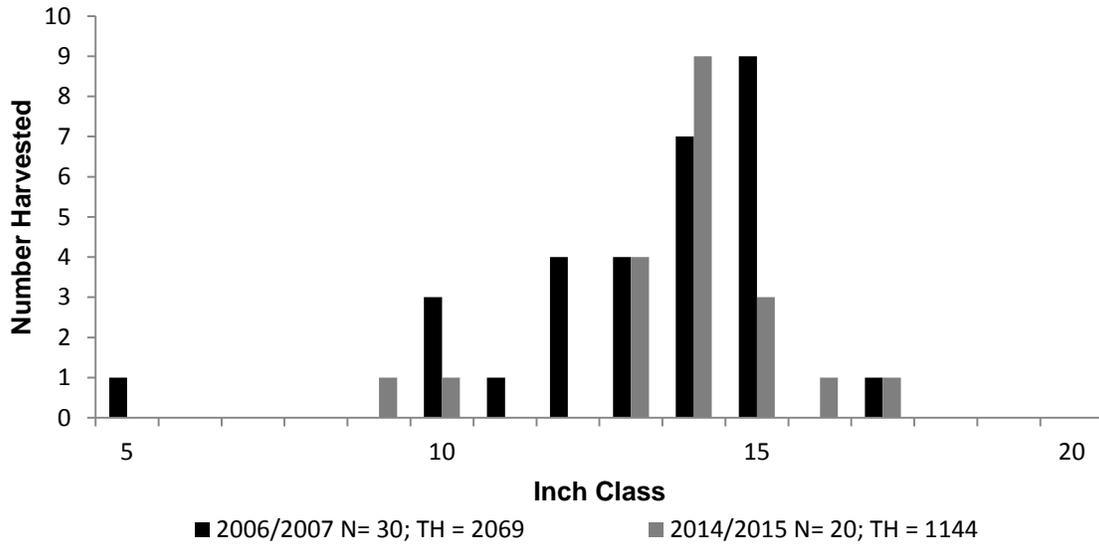


Figure 9. Length frequency of non-tournament harvested Spotted Bass observed during creel surveys at Lake Cypress Springs, Texas, June 2006 through May 2007 and June 2014 through May 2015, all anglers combined. N is the number of harvested Spotted Bass observed during creel surveys, and TH is the estimated non-tournament harvest for the creel period.

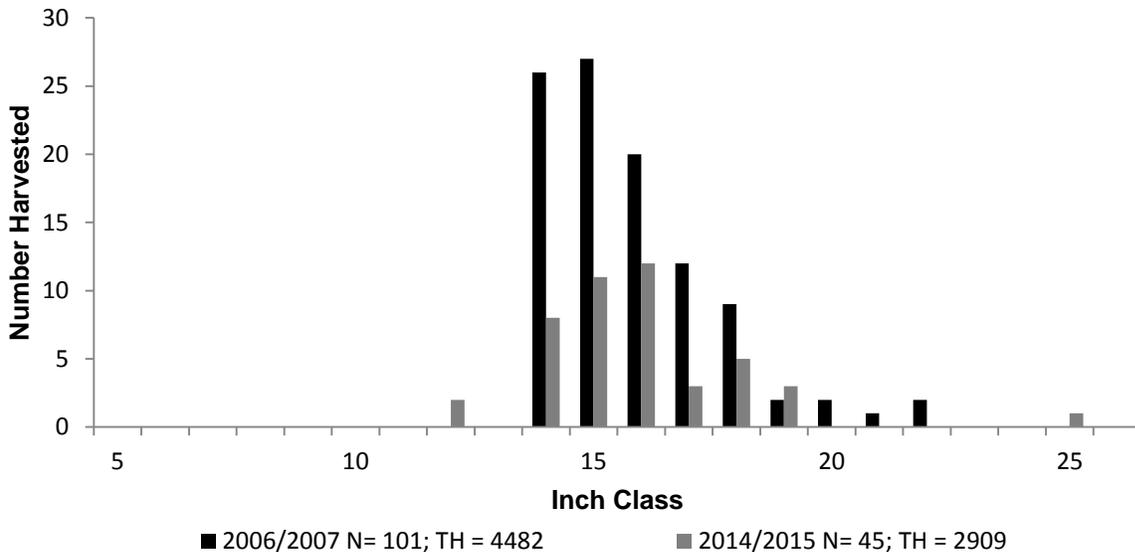


Figure 10. Length frequency of non-tournament harvested Largemouth Bass observed during creel surveys at Lake Cypress Springs, Texas, June 2006 through May 2007 and June 2014 through May 2015, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the estimated non-tournament harvest for the creel period.

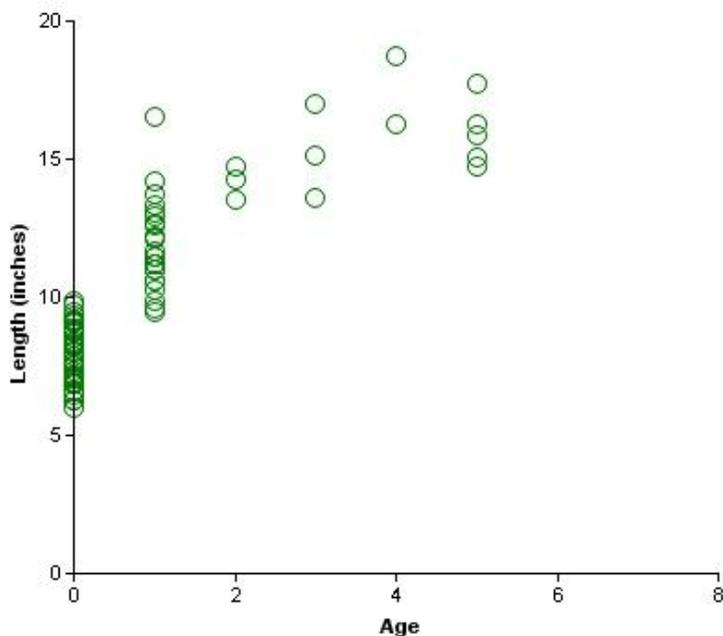


Figure 11. Length at age for Largemouth Bass collected from fall electrofishing at Lake Cypress Springs, Texas, October 2012.

Table 11. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Lake Cypress Springs, Texas, 1998, 2002 and 2012. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined with micro-satellite DNA analysis.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
1998	51	0	35	16	20.6	0.0
2002	39	0	32	7	29.9	0.0
2012	30	0	29	1	34.0	0.0

Crappie

Table 12. Creel survey statistics for crappie at Lake Cypress Springs, Texas, from June 2006 through May 2007 and June 2014 through May 2015. Total catch per hour is for anglers targeting White Crappie and total harvest is the estimated number of Crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year	
	2006/2007	2014/2015
Directed effort (h)	9,441 (19)	3,030 (27)
Directed effort/acre	2.73 (19)	0.88 (27)
Total catch per hour	2.11 (69)	1.30 (50)
Total harvest	16,870 (38)	2,807 (78)
White Crappie	5,949 (44)	665 (136)
Black Crappie	10,921 (34)	2,142 (60)
Harvest/acre	4.87 (38)	0.81 (78)
Percent legal released	0	0

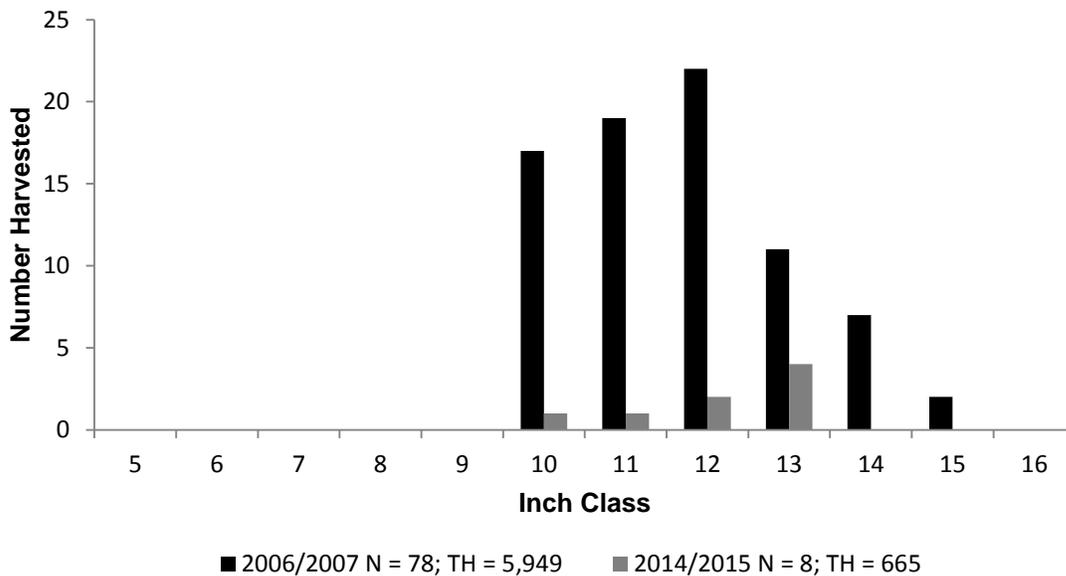


Figure 12. Length frequency of harvested White Crappie observed during creel surveys at Lake Cypress Springs, Texas, June 2014 through May 2015, all anglers combined. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

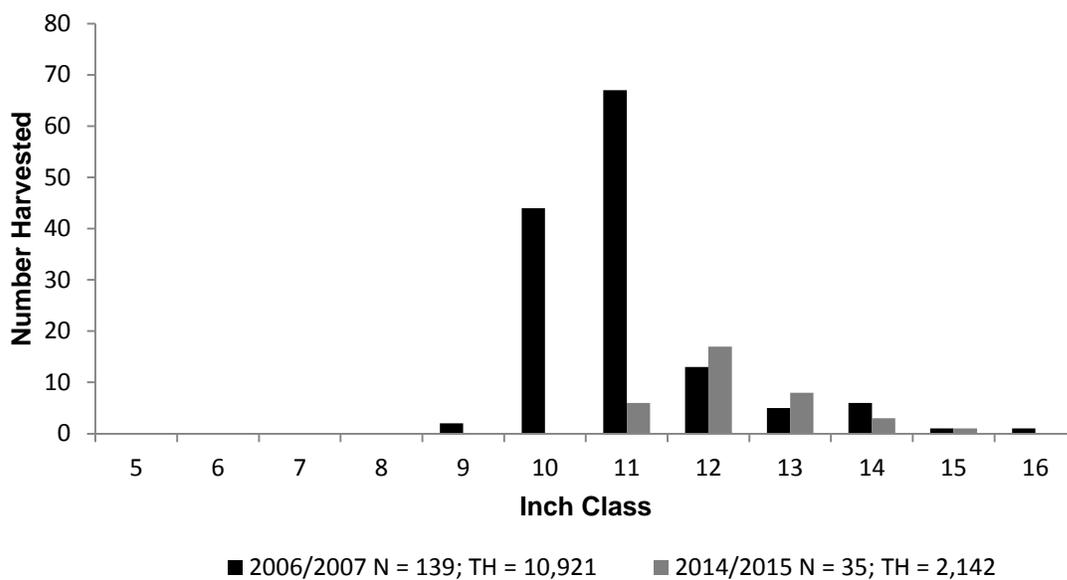


Figure 13. Length frequency of harvested Black Crappie observed during creel surveys at Lake Cypress Springs, Texas, June 2014 through May 2015, all anglers combined. N is the number of harvested Black Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 13. Proposed sampling schedule for Lake Cypress Springs, Texas. Survey period is June through May. Hoop netting surveys are conducted in the spring, while electrofishing and tandem trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey year	Electrofishing Fall	Trap net	Hoop net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2015-2016					A			
2016-2017	A				A			
2017-2018					A			
2018-2019	S	A*	S		S	S		S

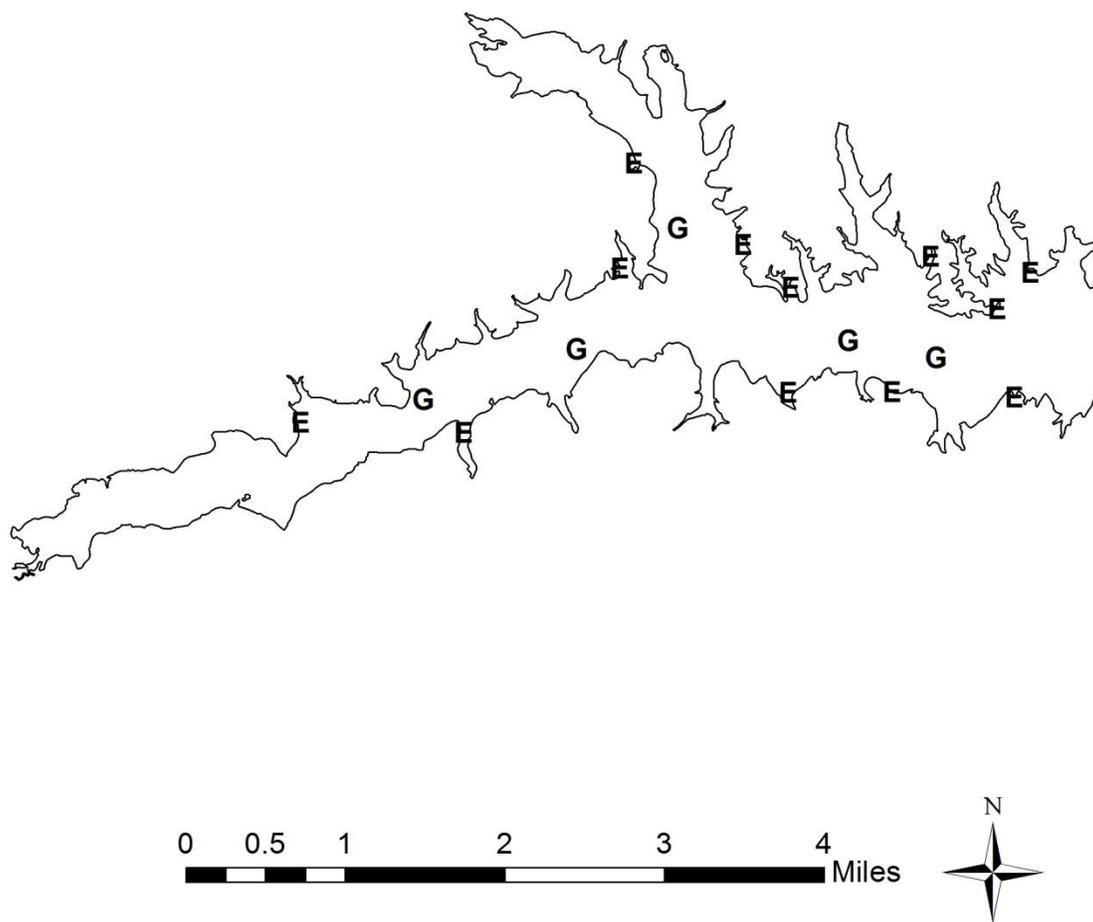
*Tandem trap nets

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Cypress Springs, Texas, 2014-2015.

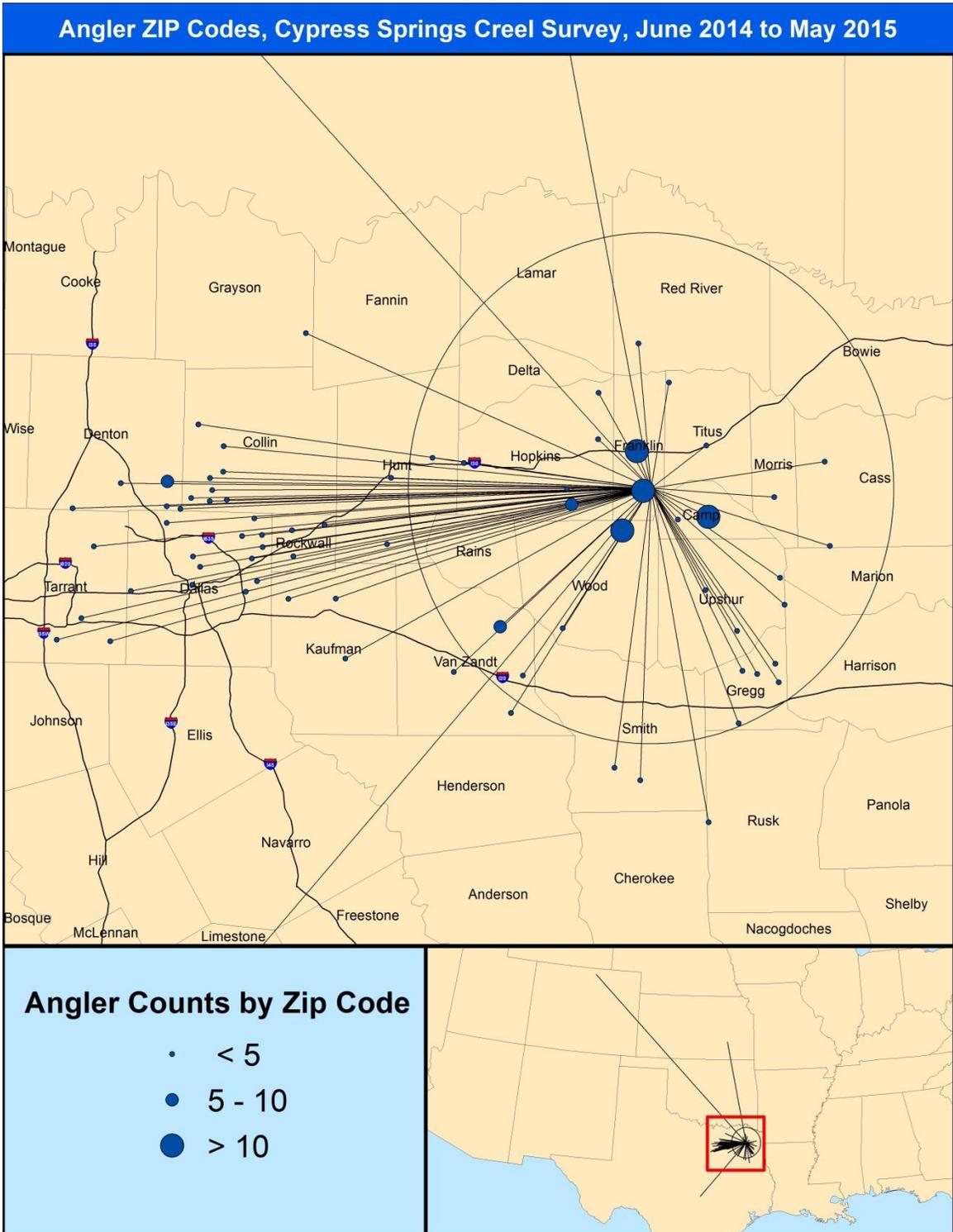
Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			111	111.0
Threadfin Shad			550	550.0
Channel Catfish	119	23.8		
White Bass	6	1.2		
Bluegill			358	358.0
Longear Sunfish			189	189.0
Redear Sunfish			32	32.0
Spotted Bass			182	182.0
Largemouth Bass			62	62.0

APPENDIX B



Location of sampling sites, Lake Cypress Springs, Texas, 2014-2015. Gill netting and electrofishing stations are indicated by G and E, respectively.

APPENDIX C



Location, by ZIP code, and frequency of anglers that were interviewed at Lake Cypress Springs, Texas, during the June 2014 through May 2015 creel survey. Circle indicates 50 mile radius from Lake Cypress Springs.