

PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

Lost Creek Reservoir

Prepared by:

Tom Lang, District Management Supervisor
and
Robert Mauk, Assistant District Management Supervisor

Inland Fisheries Division
Wichita Falls District
Wichita Falls, Texas



Carter Smith
Executive Director

Craig Bonds
Director, Inland Fisheries

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SURVEY AND MANAGEMENT SUMMARY

Largemouth Bass and prey populations in Lost Creek Reservoir were surveyed in 2014 using daytime electrofishing. Other species historically found in the reservoir were not surveyed since past creel surveys determined that the majority of anglers are targeting the Largemouth Bass population. Anglers were surveyed from June-November 2014 and March-May 2015 with a creel survey. Historical data are presented with the 2014-2015 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Lost Creek Reservoir is a 385-acre impoundment located on Lost Creek, a tributary of the West Fork of the Trinity River approximately 58 miles south of Wichita Falls. It has a primarily rocky shoreline with flooded timber. Lost Creek water quality was good with very little turbidity.
- **Management History:** Historically important sport fish include Channel Catfish, White Bass, Largemouth Bass, and White Crappie. The Largemouth Bass minimum length limit was reduced from 16 inches to the statewide 14-inch regulation on September 1, 2003. Stocking of advanced size Channel Catfish last occurred in 2008. Threadfin Shad were stocked at the reservoir in 2008 and 2009 in an effort to boost the amount of available prey.
- **Fish Community**
 - **Prey species:** The Gizzard Shad catch rate was below average for the reservoir, but Gizzard Shad abundance has historically been poor. The Gizzard Shad sampled were too big for predators to consume. Threadfin Shad were sampled in low abundance indicating that the introductory stockings have contributed to the prey base. The catch per unit effort (CPUE) for Bluegill was the lowest ever. Green Sunfish, Warmouth, Redear Sunfish, and Longear Sunfish supplemented the prey base. In addition to these species, Logperch and Inland Silversides were present with Inland Silversides being abundant but Logperch being scarce.
 - **Catfishes:** Channel Catfish have historically been present in low abundance. During the creel survey, several quality sized Channel Catfish were harvested.

Flathead Catfish were present in the reservoir and observed during the 2014 electrofishing survey.
 - **White Bass:** White Bass were present in the reservoir and sought by anglers. This species was illegally introduced by the public. The reproducing population puts an increased demand on the somewhat limited prey base.
 - **Largemouth Bass:** Largemouth Bass had the lowest electrofishing catch rate recorded. This was caused by the low reservoir elevation at time of the survey. The littoral zone was almost exclusively standing trees which made boat maneuvering next to impossible and resulted in sampling deeper water than is ideal. Few legal length bass were sampled and body condition, as measured by relative weight was considered poor.
 - **White Crappie:** White Crappie have historically been present in low abundance, though none were documented during the present survey year.
- **Management Strategies:** Conduct an objective-based electrofishing survey in 2018 to gather in-depth information on the Largemouth Bass population, the most-targeted species in the reservoir based on creel survey results.

INTRODUCTION

This document is a summary of fisheries data collected from Lost Creek Reservoir 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 species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data is presented with the 2014-2015 data for comparison.

Reservoir Description

Lost Creek Reservoir is a 385-acre impoundment constructed in 1990 on Lost Creek, a tributary of the West Fork of the Trinity River. It is located in Jack County approximately 58 miles south of Wichita Falls and is controlled by the City of Jacksboro. Primary uses include municipal water supply and recreation. Mean depth was 30 feet, shoreline development index was 2.3, and conductivity was 336 $\mu\text{S}/\text{cm}$. Habitat consisted of aquatic vegetation, rocks, and dead trees. The water level was within 13 feet of conservation pool during the electrofishing survey (Fig. 1). However, significant rain fell in May of 2015 and filled the reservoir beyond capacity. Boat access consisted of one two-lane public boat ramp. Bank fishing was available at the public access points including the boat ramp as well as a fishing pier managed by Fort Richardson State Park. Other descriptive characteristics for Lost Creek Reservoir are in Table 1.

Angler Access

Boat access consisted of one two-lane public boat ramp (Table 2). Bank fishing was available at the public access points including the boat ramp as well as a fishing pier managed by Fort Richardson State Park. The pier however; was out of the water during the creel survey.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Howell and Mauk 2010) included:

1. Request advanced-size Channel Catfish at the rate of 10/acre every other year if supplemental fish are available from the state hatchery program. Also try to sample the population with tandem hoop nets since gill nets surveys have captured few Channel Catfish in the past.

Action: No Channel Catfish were stocked since the last management survey report. Lost Creek was surveyed with tandem hoop nets in 2012 but no Channel Catfish were sampled with this gear. Little directed effort in historic creel surveys and poor survey catch rates led us to decide against advanced-size Channel Catfish stockings. The reservoir also has a high density of Largemouth Bass and it is thought that stocking smaller fingerling Channel Catfish would be counter-productive as well.

2. Educating the public about Invasive species which threaten aquatic habitats and organisms in Texas is a priority as well as documenting their presence.

Action: Presentations about invasives have been given several times since the last management report. In 2013, a small stand of the invasive aquatic plant hydrilla was found near the reservoir gate tower. Hydrilla was chemically treated and the treatment appears to have been successful.

Harvest regulation history: Sport fish species in Lost Creek are currently managed under statewide regulations. Largemouth Bass minimum length-limit was reduced from 16 inches to 14 inches on September 1, 2003 (Table 3).

Stocking history: Advanced fingerling Channel Catfish were last stocked in 2008. Threadfin Shad were last stocked in 2009 to increase prey numbers. The stocking history is shown in Table 4.

Vegetation/habitat management history: During the 2013 summer, a small stand of hydrilla was discovered near the gate tower by the dam. It was treated twice with chemicals and has not been documented since. This is the only case of an invasive exotic aquatic plant being documented in Lost Creek. Native water willow *Justicia americana* and pondweed *Potamogeton sp.* have been present in the past.

Water transfer: Lost Creek Reservoir is primarily used for municipal water supply and recreation. There is one permanent pumping station on the reservoir which transfers water to the City of Jacksboro. No interbasin transfers are known to exist.

METHODS

Fishes were collected by electrofishing (one and a half hours at 18 five-minute stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. All survey sites were randomly selected and all surveys were conducted according to TPWD Inland Fisheries Fishery Assessment Procedures except that electrofishing occurred during daylight hours because of safety concerns (TPWD, Inland Fisheries Division, unpublished manual revised 2014). Surveys were conducted to achieve survey and sampling objectives in accordance with objective-based sampling plan (Appendix D).

Age and growth analysis of the Largemouth Bass population was attempted at category 3 level according to TPWD Inland Fisheries Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014).

A nine-month roving creel survey was conducted from June-November 2014 and March-May 2015. Angler interviews were conducted on five weekend days and four 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).

A structural habitat survey was conducted in 2014. Vegetation surveys were conducted in 2002, 2006, 2010, and 2014 to monitor vegetation types and coverage. Habitat was assessed with the digital shapefile method (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 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 ($RSE = 100 \times SE$ of the estimate/estimate) was calculated for all CPUE and creel statistics.

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

RESULTS AND DISCUSSION

Habitat: A physical habitat survey was conducted August 2014 and indicated that the littoral zone habitat consisted primarily of rocky and natural shoreline and flooded timber (Table 5). There were no observed manmade changes to the physical habitat during the four-year period since the last habitat survey.

However, there was an observed decrease in emergent and submersed aquatic plants compared to the previous survey due to extreme low reservoir elevations caused by drought (Table 6).

Creel: The most recent creel survey was from June-November, 2014 and March-May, 2015. Little harvest was observed for any species except Channel Catfish. Past surveys had never documented much Channel Catfish harvest. Effort for catfish spp. increased as compared to previous creels. Largemouth Bass was still the most sought-after species but the percentage of directed effort was down to about 46%, a drop of approximately 20 percentage points compared to previous creel surveys (Table 7). Anglers fishing for “anything” was the next most common response. Drought conditions may have impacted directed effort, and may not be representative of normal directed effort at the reservoir. This is probably just a temporary result and not a trend to targeting different species. Total direct expenditures were estimated at \$35,190 during the nine-month creel period (Table 8), similar to the 2001-02 creel results. Angling effort was estimated at 11,319 hours, also similar to the 2001-02 creel survey results. All anglers reported travelling less than 50 miles to fish the reservoir.

Prey species: Electrofishing catch rates of Gizzard Shad and Bluegill were 2.0/h and 4.7/h, respectively. The catch rates for these two species represent the lowest recorded for the reservoir. While Gizzard Shad abundance is historically low (Fig. 2), Bluegill is usually much more abundant (Fig. 3). Other prey species CPUEs are Threadfin Shad (10.0/h), Green Sunfish (16.7/h), Warmouth (0.7/h), Longear Sunfish (12.7/h) and Redear Sunfish (6.0/h). Historically, the sunfish species have done well in the reservoir and have shown the ability to grow to lengths that interest anglers. The CPUE of these species are probably depressed somewhat because of the low reservoir elevations and the amount of standing timber along the littoral zone which made electrofishing extremely tough. In the past, many Inland Silversides and Logperch were observed during electrofishing and were probably important prey species in the reservoir, but they have never been quantified. This survey attempted to examine their importance as a prey item and found the CPUE for Inland Silversides was 575.0/h (RSE=55) and Logperch was 1.7/h (RSE=68). This suggests that Inland Silversides could be an important prey species. Food habit analysis of predators may be warranted to confirm utilization of this available prey species. Logperch have been observed in the past at a much higher abundance, their numbers might have been affected by the extreme low reservoir elevation. The Logperch and Inland Silversides sampling objectives were RSE's of ≤ 25 but this was not accomplished. The quality of sampling was affected in several ways by the drought. The number of standing trees and submerged rocks caused a safety concern and warranted daytime electrofishing. Many Inland Silversides were sampled but they were not randomly located which resulted in a high RSE. Finally, 24 electrofishing stations were planned, but could not be completed because the entire circuit of the reservoir was covered by 18 stations.

Blue Catfish: No attempt was made to sample this species in our objective-based sampling plan because it is not established in the reservoir. A Blue Catfish was sampled during the 2007 gill net survey which was the first time the species has been documented at Lost Creek. No blue catfish were observed during the 2011 survey. Since there are a few Blue Catfish in Jacksboro Reservoir and it empties into Lost Creek, it is probable that there might be a few in the reservoir. No Blue Catfish were observed during the creel survey.

Channel Catfish: In 2012, tandem hoop nets were set in an attempt to learn more about the Channel Catfish population since few fish were sampled using gill nets. No Channel Catfish were caught with the baited tandem hoop nets. No attempt was made to survey this population in 2014 since it has existed in low abundance and angler pressure has been minimal. Channel Catfish have historically been sampled in low abundance and previous creel surveys found little fishing pressure for the species. Channel Catfish were last stocked as advanced fingerlings in 2008. The reservoir was stocked with advanced fingerling because of the existing high density Largemouth Bass population, believed to prey on smaller fingerling stocked catfish. With little directed effort for the species in previous creels, stocking of this species was halted. The most recent creel survey documented high Channel Catfish harvest estimate for the first time (Fig. 4). One angler caught all the fish in one trip (Table 9).

Flathead Catfish: Flathead Catfish have historically been present in the reservoir and were observed in small numbers during the objective-based electrofishing survey. No fish were observed during the creel survey.

White Bass: No effort was made to survey the population since previous creels have documented little targeted effort. White Bass have historically remained at relatively low abundance. Directed effort for this species has continued to increase but it is a catch-and-release fishery mostly with little harvest (Table 10; Fig. 5). With limited prey availability besides Inland Silversides, predator populations could benefit from some harvest of this species.

Largemouth Bass: The electrofishing CPUE of Largemouth Bass of 25.3/h in 2014, was the lowest ever recorded and well below the historical average of 99.8/h (Fig. 6). The low catch rate is a function of a tree lined littoral zone that forced us to sample in deeper water for much of the survey. Body condition, as measured by relative weight (*Wr*) was poor with all inch-groups of bass being below 90 and some below 80. Age-and-growth analysis of the Largemouth Bass population was attempted at the category 3 level, but could not be completed because of the scarcity of sampled bass. Instead, age and growth was conducted at the category 1 level. The population is characterized by slow growth. Sample sizes are small, especially for older fish making it impossible to distinguish when mean age at legal length occurs. The youngest aged legal length bass was five years at time of sampling. Historical analyses included substantial age-and-growth data and typically legal-length was attained at age four (Table 13). Sampling objectives were: collecting 200 bass for age and growth and obtaining an RSE of ≤ 15 . Neither sampling objective was achieved but an RSE of 20 was reached. Due to safety concerns caused by low reservoir elevation, the decision was made to complete the survey during the daytime as opposed to the standard night survey. This might have affected catch rates, but with the number of trees and steep drop-offs, it is doubtful a night survey would have rendered better results. Anecdotal reports from anglers encountered during the creel survey reflected a perception of reduced bass abundance. This possible decline in Largemouth Bass abundance could also be attributed to low recruitment caused by lack of littoral habitat. We attempted to complete 24 stations but after 18 stations we had completed a circuit of the reservoir and decided to end the survey. The creel survey results documented a decrease in directed effort for this species for the nine-month creel period, but effort per acre was about the same (Table 11). Catch rate was consistent with previous surveys. No harvest was observed during the recent survey (Fig. 7). With the reservoir filling to storage capacity, it is expected that Largemouth Bass effort will be greater in the future than it was during the creel survey.

White Crappie: White Crappie have been present in low abundance historically, but the species was not observed during electrofishing or the creel survey period. The current creel survey did not capture directed effort or catch of White Crappie (Table 14; Fig. 8). The reservoir historically supported a population but not in an abundance to interest most anglers.

Fisheries management plan for Lost Creek Reservoir, Texas

Prepared - July 2015

Issue 1: Largemouth Bass CPUE declined greatly compared to past surveys. This was related to the drought conditions at the reservoir and by sampling conditions that made sampling problematic. In past creel surveys, it is the most sought after species but historically the population has exhibited slow growth.

MANAGEMENT STRATEGIES

1. Since reservoir elevation greatly improved, during the fall of 2016 complete an additional electrofishing survey on the reservoir to monitor the population abundance.
2. Collect population genetics since it will have been a decade since they had been analyzed.

Issue 2: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant Salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Educate the public about invasive species through the use of media and the internet.
3. Make a speaking point about invasive species when presenting to constituent and user groups.
4. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

Standard electrofishing sampling will be conducted in fall of 2018 to continue monitoring species population trends. An additional electrofishing survey will occur in fall of 2016 since the lake returned to full pool in May 2015 (Table 15).

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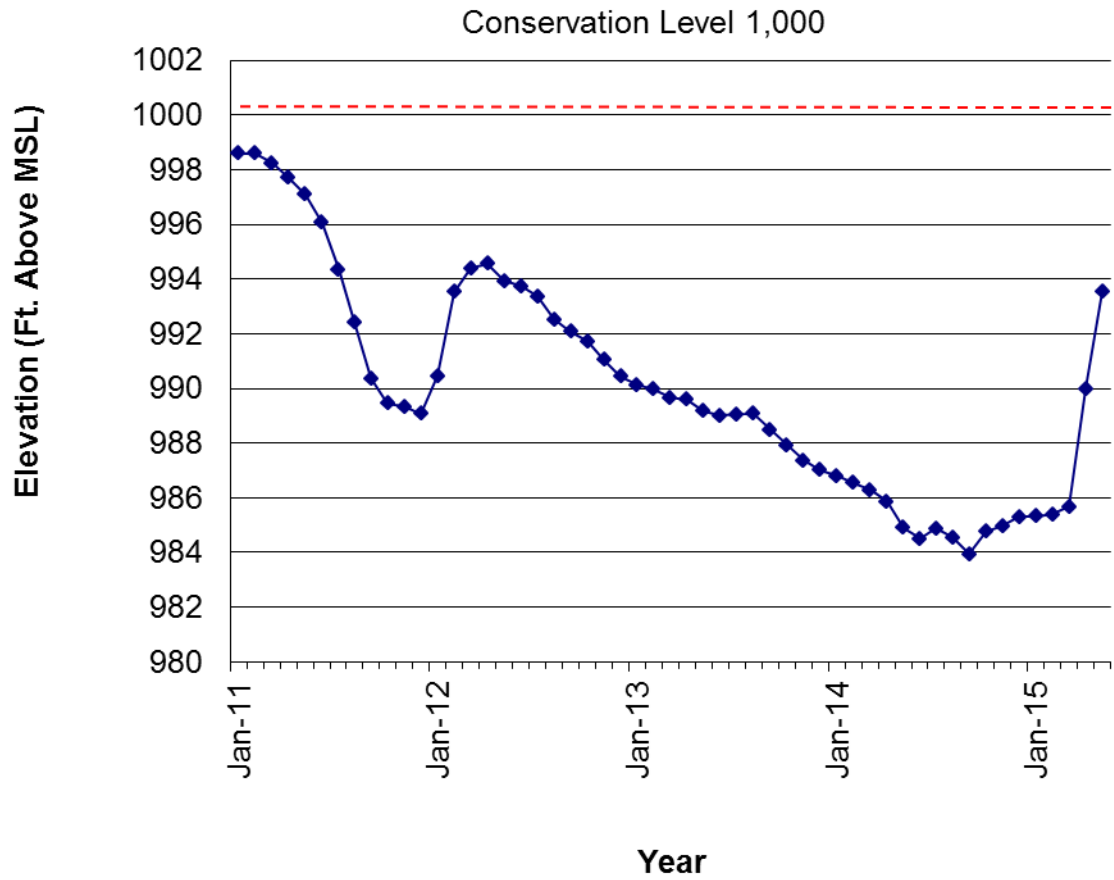


Figure 1. Average monthly water level elevations in feet above mean sea level (msl) recorded for Lost Creek Reservoir, Texas.

Table 1. Characteristics of Lost Creek Reservoir, Texas.

Characteristic	Description
Year constructed	1990
Controlling authority	City of Jacksboro
County	Jack
Reservoir type	Tributary
Shoreline development index (SDI)	2.3
Conductivity	336 μ S/cm
Secchi disc reading	220 cm

Table 2. Boat ramp characteristics for Lost Creek Reservoir, Texas, August, 2014. Reservoir elevation at time of survey was 997.6 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Lost Creek	33.23343 -98.13352	Y	30	992	Good

Table 3. Harvest regulations for Lost Creek Reservoir, Texas.

Species	Bag Limit	Length Limit (inches)
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Largemouth	5	14-inch minimum*
Crappie, White	25	10-inch minimum

*Largemouth Bass regulation was changed from 16-inch minimum to the statewide 14-inch minimum length limit in September 1, 2003.

Table 4. Stocking history of Lost Creek, Texas. FRY = Fry; FGL = fingerling; AFGL = adult fingerling; ADL = Adult.

Species	Year	Number	Life Stage	Mean TL (in)
Bluegill	1991	121,939	FGL	1.2
Channel Catfish	1991	24,450	FGL	3.3
	1993	6,120	AFGL	6.0
	1993	50,601	FGL	2.6
	2006	4,000	AFGL	9.4
	2008	3,703	AFGL	9.1
	Total	88,874		
Coppernose Bluegill	1991	28,902	FGL	1.5
Florida Largemouth Bass	1990	50,141	FRY	1.0
	1994	50,000	FGL	1.2
	Total	100,141		
Smallmouth Bass	1991	25,088	FGL	1.3
Threadfin Shad	1996	359	ADL	4.4
	2008	100	ADL	3.5
	2009	300	AFGL	2.0
	Total	759		
White Crappie	1990	25,364	FRY	0.9

Table 5. Survey of structural habitat types, Lost Creek Reservoir, Texas, 2014. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Natural	2.4 miles	43.8
Rocky	3.1 miles	56.2
Standing timber	146.5 acres	53.6

Table 6. Survey of aquatic vegetation, Lost Creek Reservoir, Texas, 2002-2014. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2002	2006	2010	2014
Native submersed	0.9 (3.1)	6.8 (1.8)	0.7 (0.2)	0.0
Native floating-leaved	0.0	0.7 (<0.1)	0.0	0.0
Native emergent	0.0	5.0 (1.3)	2.0 (0.5)	0.0

Table 7. Percent directed angler effort by species for Lost Creek Reservoir, Texas, 2001-2012, 2008, and 2014-2015. Survey periods were from June 1 through Nov 30 and March 1-May 31 for the 2001-2002 and 2014-2015 surveys. March 1-May 31 was the survey period in 2008.

Species	2001/2002	March-May 2008	2014/2015
Channel Catfish	4.3	2.8	4.0
Catfish spp.	2.1		14.1
White Bass	0.5	2.4	2.3
Sunfishes	1.2		
Largemouth Bass	66.6	68.6	45.9
White Crappie	5.3	6.8	
Anything	20.1	19.4	33.7

Table 8. Total fishing effort (h) for all species and total directed expenditures at Lost Creek Reservoir, Texas, 2001-2002, 2008, and 2014-2015. Survey periods were from June 1-November 30 and March 1-May 31 for the 2001-2002 and 2014-2015 surveys. March 1- May 31 was the survey period in 2008. Relative standard error is in parentheses.

Creel statistic	2001/2002	March-May 2008	2014/2015
Total fishing effort	12,007 (21)	7,940 (21)	11,319.1 (22)
Total directed expenditures	\$37,044 (49)	\$33,677 (51)	\$35,190 (47)

Gizzard Shad

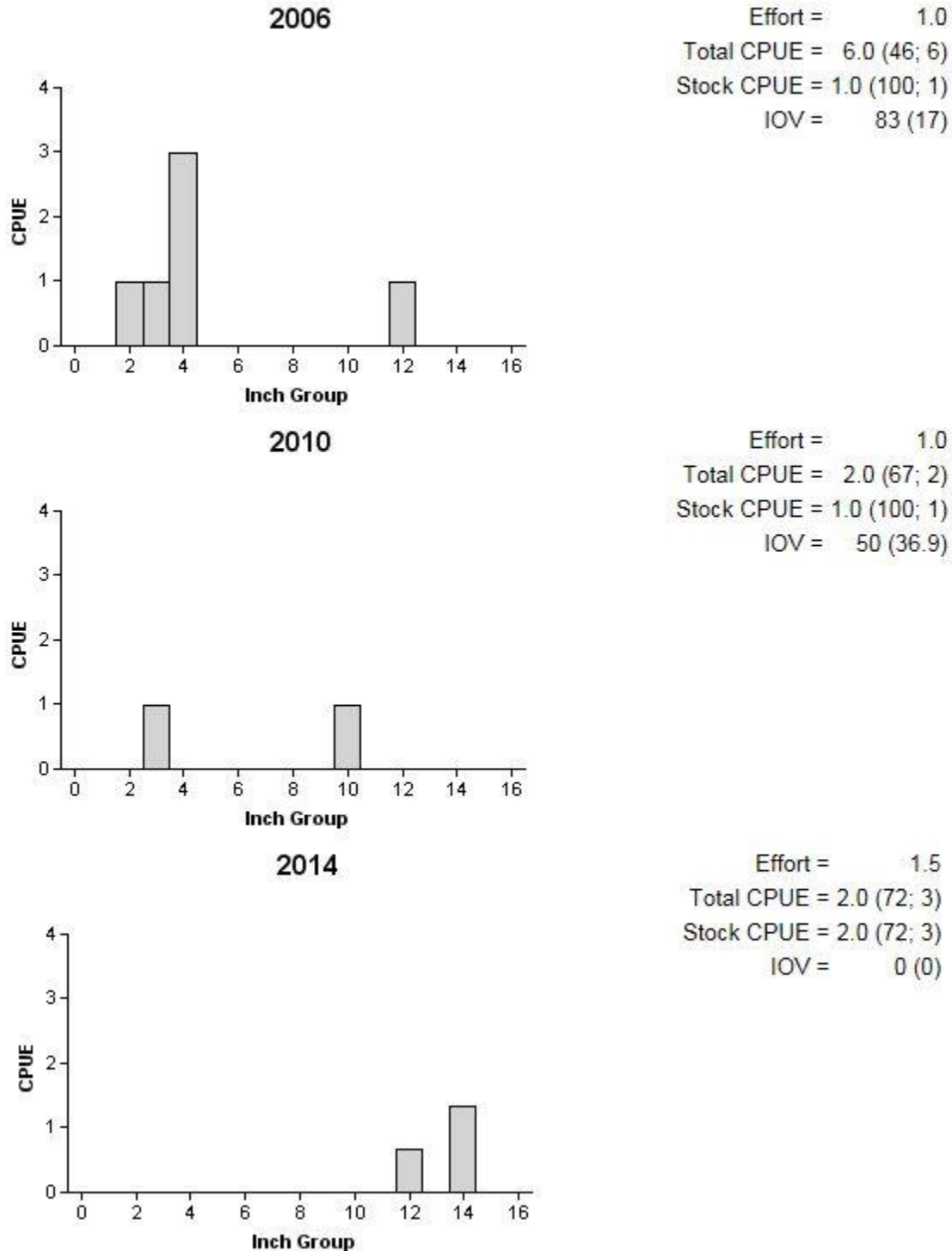
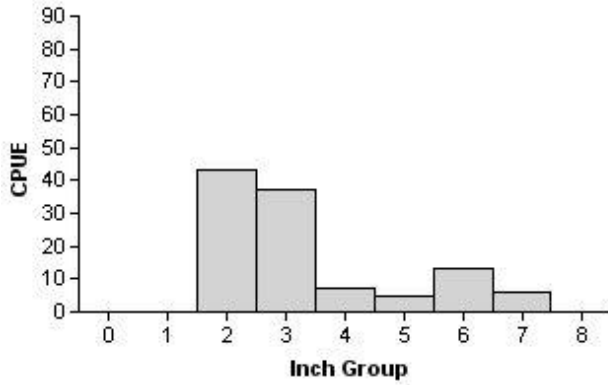


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lost Creek Reservoir, Texas, 2006, 2010, and 2014. Daytime electrofishing occurred during 2014 survey period.

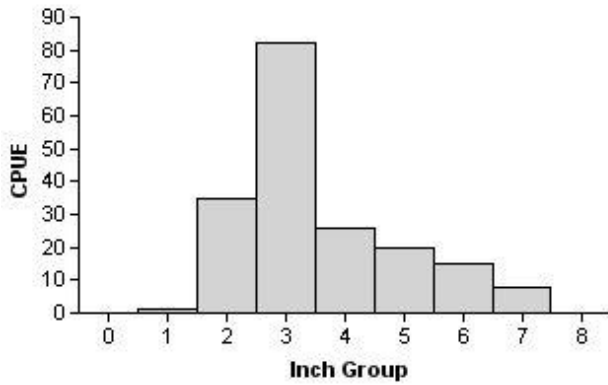
Bluegill

2006



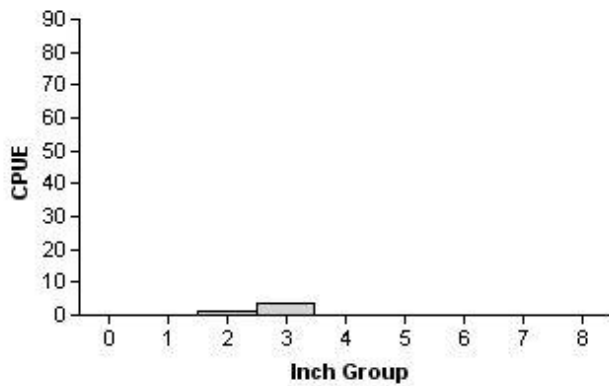
Effort = 1.0
 Total CPUE = 111.0 (25; 111)
 Stock CPUE = 68.0 (23; 68)
 PSD = 28 (7.6)
 PSD-P = 0 (0)

2010



Effort = 1.0
 Total CPUE = 187.0 (16; 187)
 Stock CPUE = 151.0 (17; 151)
 PSD = 15 (5.4)
 PSD-P = 0 (0)

2014



Effort = 1.5
 Total CPUE = 4.7 (72; 7)
 Stock CPUE = 3.3 (63; 5)
 PSD = 0 (107.6)
 PSD-P = 0 (0)

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, Lost Creek Reservoir, Texas, 2006, 2010, and 2014. Daytime electrofishing occurred during 2014 survey period.

Channel Catfish

Table 9. Creel survey statistics for Channel Catfish at Lost Creek Reservoir from June-November 2002 and March-May 2003, March-May 2008, and June-November 2014 and March-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. Acreage during the 2014-2015 creel survey was 273.3.

Creel survey statistic	Year		
	2002/2003	2008	2014/2015
Directed effort (h)	519.1 (202.8)	224.3 (127.6)	451.0 (66.4)
Directed effort/acre	1.3 (202.8)	0.6 (127.6)	1.7 (66.4)
Total catch per hour	0.0 (-)	0.3(-)	0.1 (-)
Total harvest	0.0 (-)	135.8 (100.0)	1,552.6 (99.2)
Harvest/acre	0.0 (-)	0.4 (100.0)	5.7 (99.2)
Percent legal released	0.0	0.0	0.0

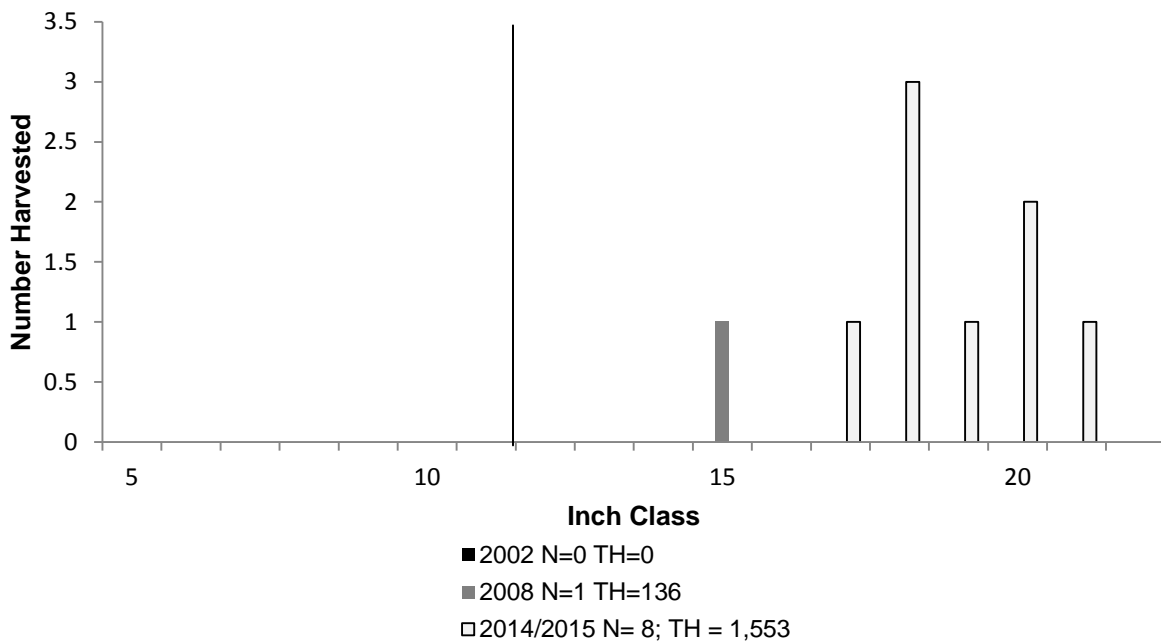


Figure 4. Length frequency of harvested Channel Catfish observed during creel surveys at Lost Creek Reservoir, Texas, June-November 2002 and March-May 2003, March-May 2008, and June-November 2014 and March-May 2015, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period. Line indicates minimum length limit.

White Bass

Table 10. Creel survey statistics for White Bass at Lost Creek Reservoir from June-November 2002 and March-May 2003, March-May 2008, and June-November 2014 and March-May 2015. Total catch per hour is for anglers targeting White Bass and total harvest is the estimated number of White Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses. Acreage during the 2014-2015 creel survey was 273.3.

Creel survey statistic	Year		
	2002/2003	2008	2014/2015
Directed effort (h)	59.7 (303.7)	186.9 (140.5)	255.5 (97.3)
Directed effort/acre	0.2 (303.7)	0.5 (140.5)	0.9 (97.3)
Total catch per hour	0.5 (-)	3.0 (-)	12.8 (-)
Total harvest	312.4 (71.2)	0.0 (-)	33.2 (100.0)
Harvest/acre	0.8 (71.2)	0.0 (-)	0.1 (100.0)
Percent legal released	44.1	100.0	98.9

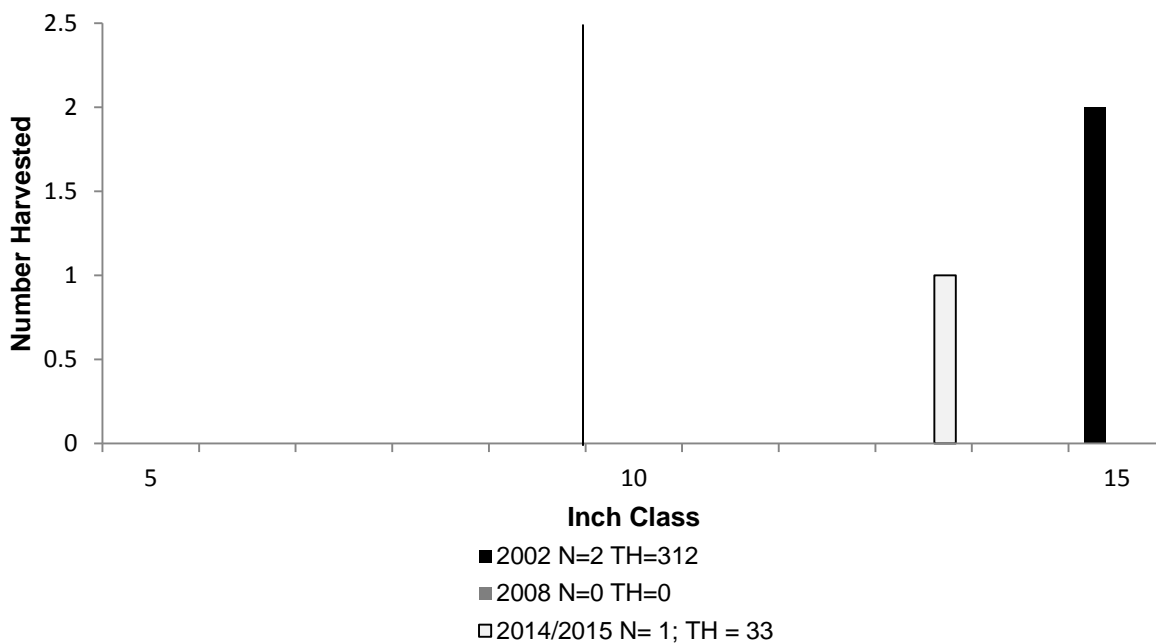


Figure 5. Length frequency of harvested White Bass observed during creel surveys at Lost Creek Reservoir, Texas, June-November 2002 and March-May 2003, March-May 2008, and June-November 2014 and March-May 2015, all anglers combined. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period. Line indicates minimum length limit.

Largemouth Bass

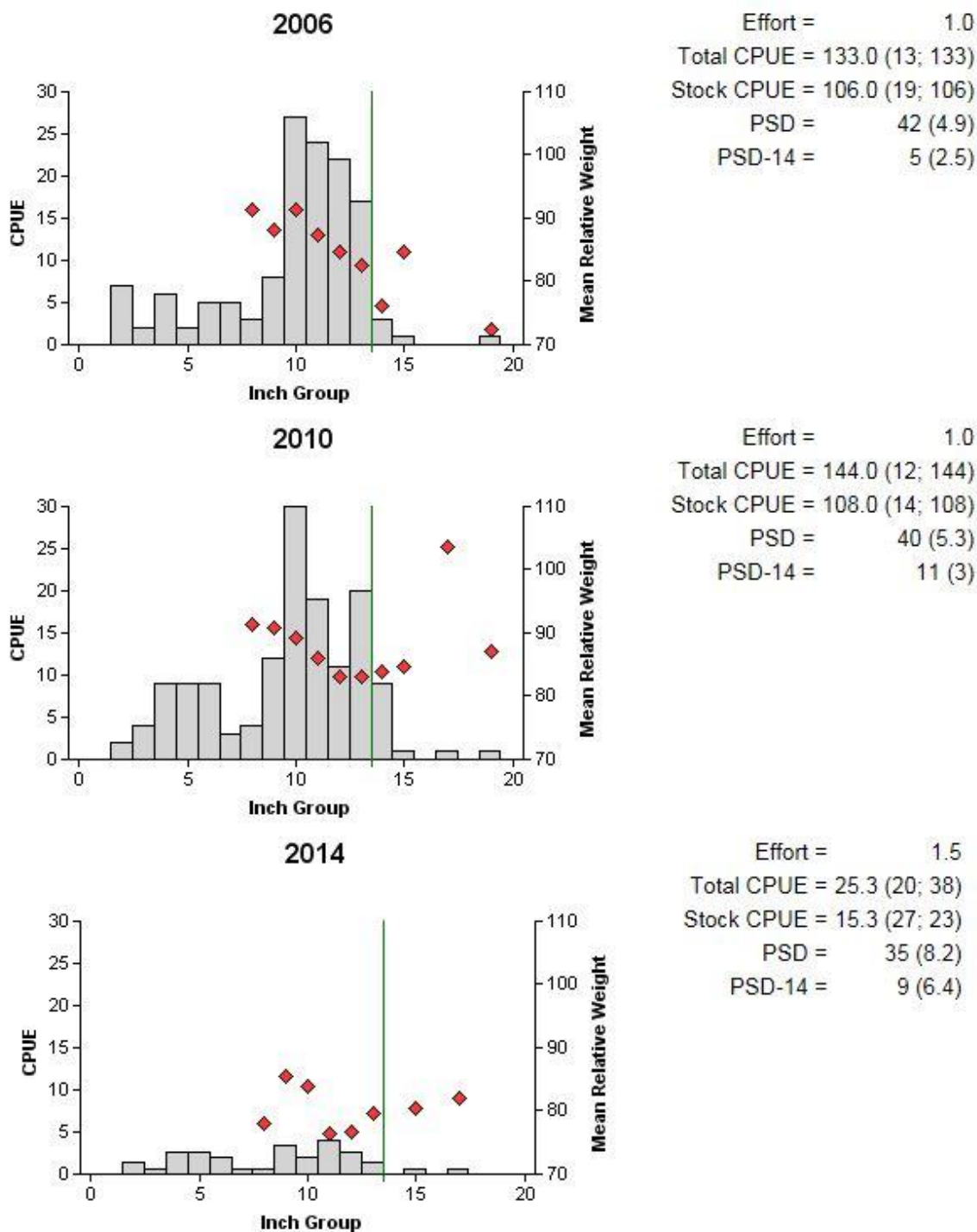


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lost Creek Reservoir, Texas, 2006, 2010 and 2014. Line indicates minimum length

limit at time of sampling. Daytime electrofishing occurred during 2014 survey period.

Largemouth Bass

Table 11. Creel survey statistics for Largemouth Bass at Lost Creek Reservoir from June-November 2002 and March-May 2003, March-May 2008, and June-November 2014 and March-May 2015. Total catch per hour is for anglers targeting Largemouth Bass and total harvest is the estimated number of Largemouth Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses. Acreage during the 2014-2015 creel survey was 273.3.

Creel survey statistic	Year		
	2002/2003	2008	2014/2015
Directed effort (h)	7,992.3 (34.7)	5,448.6 (28.4)	5,172.5 (22.8)
Directed effort/acre	20.8 (34.7)	14.2 (28.4)	18.9 (22.8)
Total catch per hour	1.3 (39.7)	1.8 (16.9)	1.2 (48.9)
Total harvest	683.6 (103.0)	164.7 (57.2)	0.0 (-)
Harvest/acre	1.8 (103.0)	0.4 (57.2)	0.0 (-)
Percent legal released	37.5	92.4	100.0

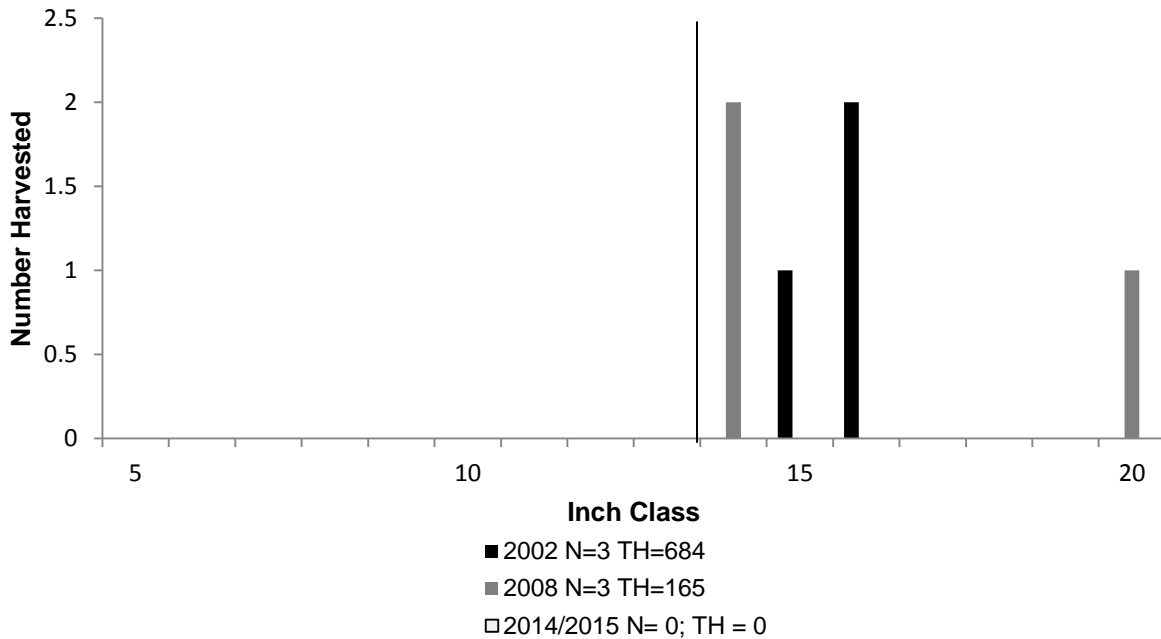


Figure 7. Length frequency of harvested Largemouth Bass observed during creel surveys at Lost Creek Reservoir, Texas, June-November 2002 and March-May 2003, March-May 2008, and June-November 2014 and March-May 2015, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period. Line indicates minimum length limit.

Largemouth Bass

Table 12. Results of genetic analysis of Largemouth Bass collected by fall electrofishing at Lost Creek Reservoir, Texas, 1993, 1998, 2001, 2002, and 2006. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

Year	Sample size	Genotype			% FLMB alleles	% pure FLMB
		FLMB	FX	NLMB		
1993	30	0	1	29	1.7	0.0
1998	9	0	4	5	21.0	0.0
2001	17	0	15	2	36.8	0.0
2002	27	2	19	6	38.6	7.4
2006	30	0	28	2	38.0	0.0

Table 13. Average length at capture for Largemouth Bass (sexes combined) collected by fall electrofishing surveys at Lost Creek Reservoir, Texas, 1995, 1998, 2000, 2001, 2002, 2006 and 2014 compared to ecological region averages. Lengths are followed by the sample size in parentheses (N).

Sampling date	Length (inches) at capture for age						
	1	2	3	4	5	6	7
10/24/1995	9.7(15)	11.9(9)	12.8(5)	14.8(1)			
10/14/1998	10.3(15)	12.9(6)	13.8(7)	15.4(1)			
10/04/2000	9.4(14)	11.6(9)	13.4(5)	14.3(4)	15.9(2)	14.8(1)	
10/08/2001	10.6(11)	12.5(5)	14.2(2)				
10/01/2002	10.6(11)	12.5(5)	14.2(2)				
09/26/2006	10.0(47)	12.4(16)	13.7(16)	15.6(2)		18.1(1)	19.6(1)
10/22/2014	9.9(8)	11.9(10)	13.4(1)	13.4(1)	15.2(1)	17.5(1)	
Averages ^a	10.1	12.9	15.1	16.9	18.3	19.4	20.3

^aEcological region 5 averages from Prentice (1987); lengths derived for October 15.

White Crappie

Table 14. Creel survey statistics for White Crappie at Lost Creek Reservoir from June-November 2002 and March-May 2003, March-May 2008, and June-November 2014 and March-May 2015. Total catch per hour is for anglers targeting White Crappie and total harvest is the estimated number of White Crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses. Acreage during the 2014/2015 creel survey was 273.3.

Creel survey statistic	Year		
	2002/2003	2008	2014/2015
Directed effort (h)	634.6 (169.9)	540.1 (66.9)	0.0 (-)
Directed effort/acre	1.7 (169.9)	1.4 (66.9)	0.0 (-)
Total catch per hour	0.0 (-)	0.1 (100.0)	0.0 (-)
Total harvest	0.0 (-)	164.7 (73.1)	0.0 (-)
Harvest/acre	0.0 (-)	0.4 (73.1)	0.0 (-)
Percent legal released	0.0	29.6	-

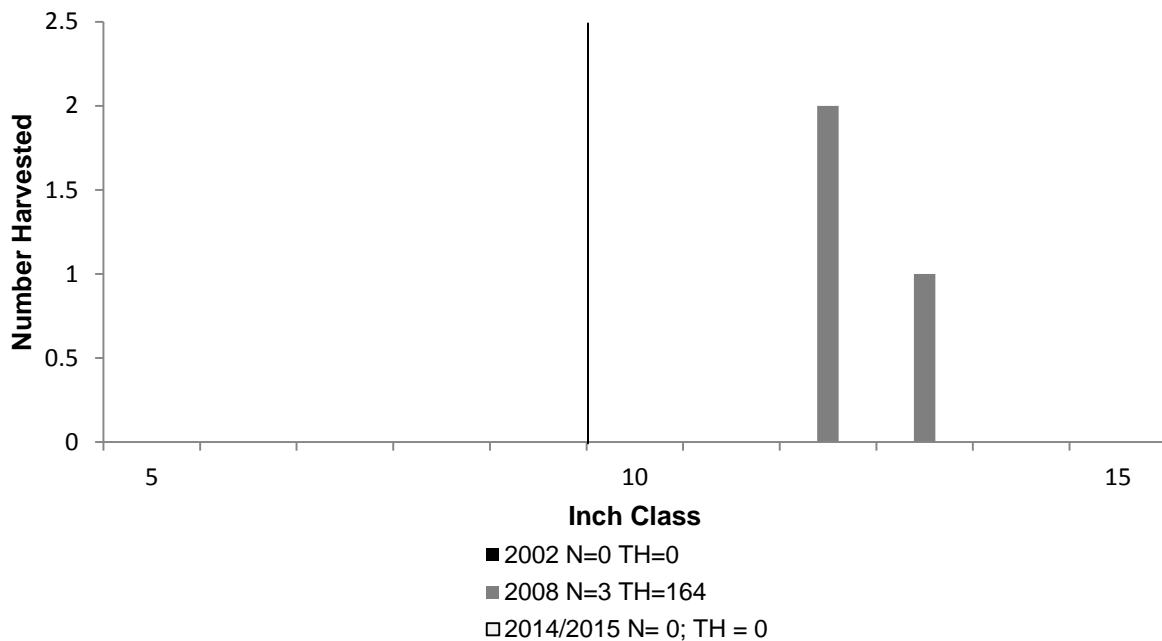


Figure 8. Length frequency of harvested White Crappie observed during creel surveys at Lost Creek Reservoir, Texas, June-November 2002 and March-May 2003, March-May 2008, and June-Nov 2014 and March-May 2015, all anglers combined. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period. Line indicates minimum length limit.

Table 15. Proposed sampling schedule for Lost Creek Reservoir, Texas. Survey period is June through May. 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.

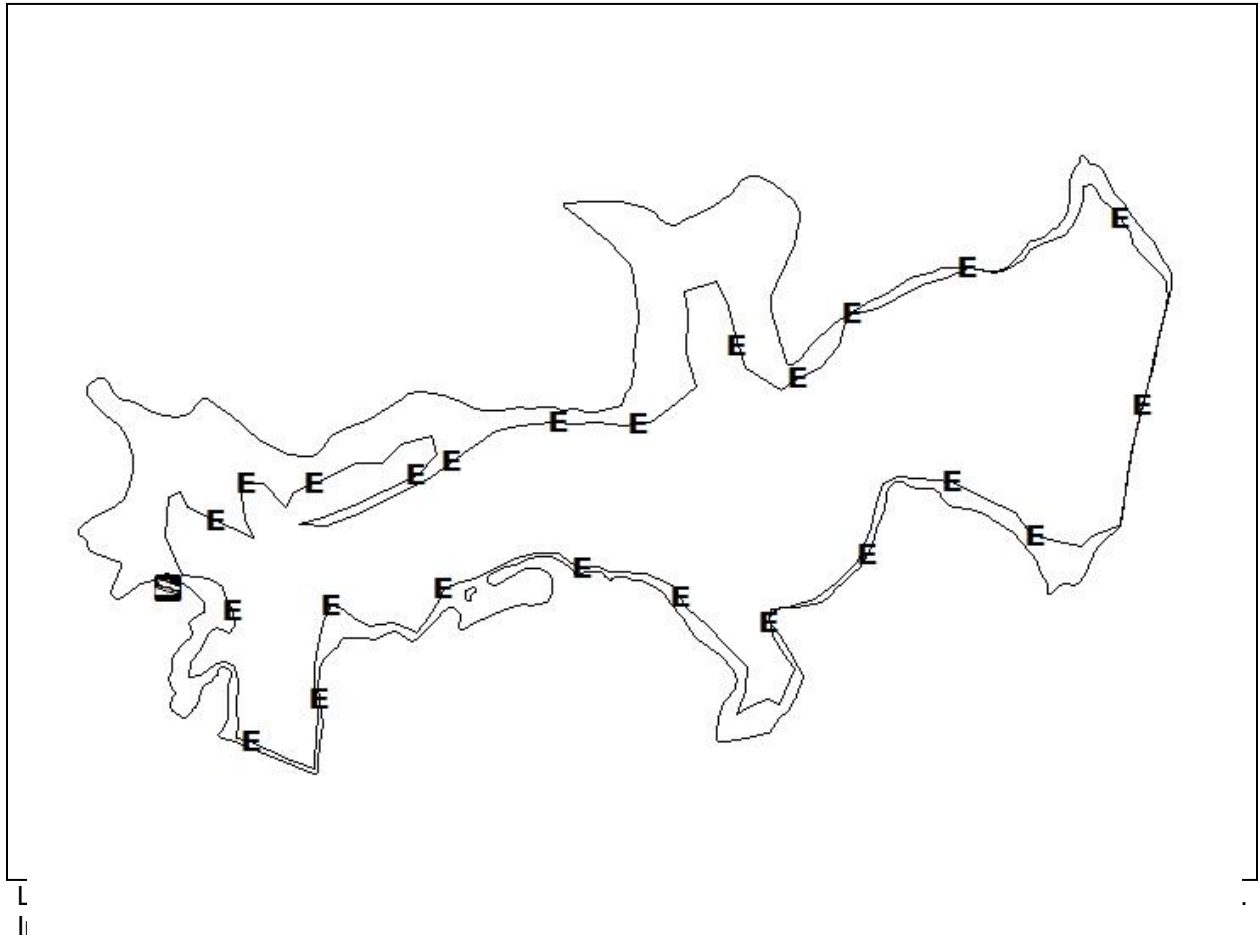
Survey year	Electrofishing Fall(Spring)	Trap net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2015-2016								
2016-2017	A							
2017-2018								
2018-2019	S				S	S		S

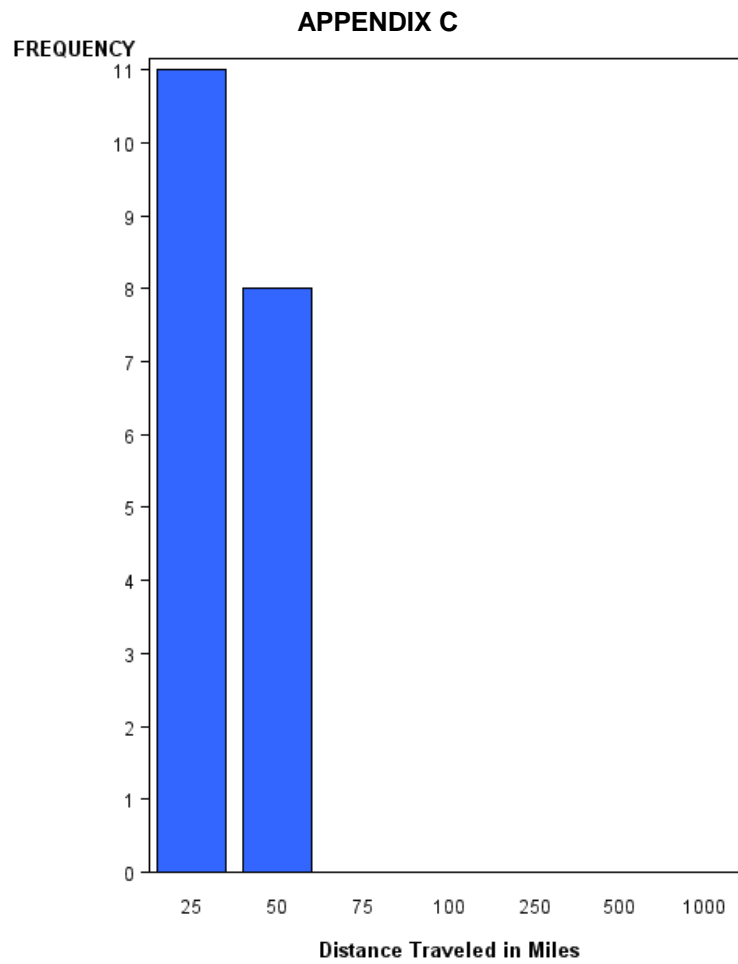
APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from daytime electrofishing from Lost Creek Reservoir, Texas, 2014. Sampling effort was 1.5 hours.

Species	Electrofishing	
	N	CPUE
Inland Silverside	613	525.0
Logperch	2	1.7
Gizzard Shad	3	2.0
Threadfin Shad	15	10.0
Green Sunfish	25	16.7
Warmouth	1	0.7
Bluegill	7	4.7
Longear Sunfish	19	12.7
Redear Sunfish	9	6.0
Largemouth Bass	38	25.3

APPENDIX B





Frequency of anglers that traveled various distances (miles) to Lost Creek Reservoir, Texas, as determined from the June-November 2014 and March-May 2015 creel survey.

APPENDIX D**Objective-Based Sampling Plan for Lost Creek Reservoir****2014 - 2015**Sport fish, forage fish, and other important fishes

Sport fishes in Lost Creek Reservoir include Channel Catfish, White Crappie, White Bass, and Largemouth Bass. Known important forage species include Bluegill, Inland Silverside, Logperch, Threadfin and Gizzard Shad.

Negligible fisheries

Channel Catfish: Channel Catfish are present in Lost Creek Reservoir, but population abundance is extremely low because water clarity is high and predation from Largemouth Bass on juvenile catfish is likely high. Gill net surveys from 1996-2013 showed CPUE of Channel Catfish ranged from 0.3 to 1.4 fish/nn. In 2012, three tandem baited hoop nets were set for two nights and no Channel Catfish were sampled. Spring creel surveys in 2002 and 2008 indicated low directed effort (0.3 and 0.6/acre) and catch (0 and 0.3/hr) of Channel Catfish occurred. Sampling this population is unnecessary in FY 2015.

White Crappie: White Crappie are present in Lost Creek Reservoir, but population abundance is low. Trap net surveys from 1996-2013 showed CPUE of White Crappie ranged from 0.5 to 3.4 fish/nn. Spring creel surveys in 2002 and 2008 indicated low directed effort (0.6 and 1.4/acre) and catch (0 and 0.1/hr) of White Crappie occurred. Sampling this population is unnecessary in FY 2015.

White Bass: White Bass are present in Lost Creek Reservoir, but population abundance is low. Gill net surveys from 1996-2013 showed CPUE of White Bass ranged from 0.4 to 1.9 fish/nn. Spring creel surveys in 2002 and 2008 indicated low directed effort (0.2 and 0.5/acre) and catch (0.5 and 3.0/hr) of White Bass occurred. Sampling this population is unnecessary in FY 2015.

Gizzard and Threadfin Shad: Gizzard Shad are present in Lost Creek Reservoir, but population abundance is low. From 1996-2013, CPUE of Gizzard Shad ranged from 2.0 to 19.0 fish/nn, with a historical average of 6.7/nn. Threadfin Shad have been stocked in 1996, 2008, and 2009 but have never become established.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass are the most popular sport fish in Lost Creek Reservoir. The popularity and reputation for Largemouth Bass fishing at this reservoir warrant sampling time and effort. Results from 2002 and 2008 spring creel surveys showed directed angling effort for Largemouth Bass of 12.3 and 14.2 hours/acre respectively, with over 65% of the anglers targeting Largemouth Bass. Largemouth Bass have been managed with the statewide 14-in MLL regulation since Sept. 1, 2003 when it was changed from a 16-in MLL. Trend data on CPUE, size structure, and body condition have been collected biennially since 1996 with fall nighttime electrofishing. The population in the past was characterized as abundant with few legal length bass, poor body condition, and slow growth. Anecdotally from our creel surveys, anglers are aware of the problems but like the idea of catching lots of bass. Because of these perceived problems, the district recently moved bass from this reservoir to a new waterbody in Wichita Falls. Continuation of every four year trend data in this clear reservoir with night electrofishing in the fall will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation. A minimum of 24 randomly selected 5-min electrofishing

sites will be sampled in 2014, but sampling will continue until 200 stock-size fish are collected for age and growth. Historically, 200 stock-size fish would be collected in two hours of electrofishing. This effort will also allow sufficient numbers of Largemouth Bass to be sampled for body condition and size structure. It should also be enough sampling to result in CPUE with a RSE of CPUE-S is ≤ 15 (the anticipated effort to meet CPUE sampling objectives is 15-20 stations with 95% confidence). If failure to achieve the age and growth objective of 200 stock-size fish sampled has occurred after 24 stations of night sampling, additional electrofishing will occur until 200 bass are collected. This reservoir has been greatly influenced by drought conditions and these sampling estimates are based on more ideal elevation conditions so it may take additional sites to complete objectives.

Bluegill: Bluegill are perceived as one of the primary forage species at Lost Creek Reservoir. Like Largemouth Bass, trend data on CPUE and size structure of Bluegill have been collected every four years since 1996. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in Bluegill relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass should result in sufficient numbers of Bluegill for size structure estimation. No additional effort will be expended to achieve an RSE25 for CPUE of Bluegill. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density. Relative weight of Largemouth Bass ≥ 8 " TL will be determined from their length/weight data (maximum of 10 fish weighed and measured per inch class).

Inland Silverside and Logperch: Inland Silverside and Logperch are perceived as two of the primary forage species at Lost Creek Reservoir. No historic data has ever been collected on these species. Normally, seines would be used but they would most likely not work well at Lost Creek because of the steep sides and lack of littoral habitat. These species are often seen while electrofishing and could be collected with the use of a smaller meshed net. It is proposed to collect some baseline information on these populations by electrofishing these species as a start to collecting trend data on CPUE. Continuation of sampling, will allow for monitoring of large-scale changes in Inland Silverside and Logperch relative abundance. Sampling effort will occur while sampling Largemouth Bass at 24 stations. No additional effort will be expended to achieve an RSE25 for CPUE for these species if RSE 25 is not attained.