

Lost Creek Reservoir

2018 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-3

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in Lost Creek Reservoir were surveyed in 2018 using electrofishing. This report summarizes the results of the survey 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 Reservoir has an average depth of 30 feet and water clarity as measured by Secchi disc is often over seven feet or greater in depth

Management History: Historically important sport fish are Largemouth Bass with less important species including Channel Catfish, White Bass, and White Crappie being present. 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 in the reservoir in 2008 and 2009 to boost the amount of available prey.

Fish Community

- **Prey species:** Gizzard Shad continued to be present in the reservoir in low relative abundance with the majority of the population being too large for predators to consume. Bluegill relative abundance is slightly down but good numbers of small Bluegill will provide a good prey source. Threadfin Shad have been introduced on three different occasions but have never become established. Threadfin Shad were present in Jacksboro Reservoir which overflows into Lost Creek so there is a source for them to enter the reservoir. Inland Silversides were quite abundant and contribute to the prey base.
- **Channel Catfish:** During previous survey efforts Channel Catfish relative abundance has been consistently low. Few anglers target them, and few are caught. This species doesn't seem to survive well in this very clear reservoir with a high density of Largemouth Bass. Sampling was not conducted for this species.
- **White Bass:** During previous survey efforts White Bass relative abundance has been consistently low. Few anglers target them, and few are caught. This species doesn't seem to survive well in this very clear reservoir with a high density of Largemouth Bass. Sampling was not conducted for this species.
- **Largemouth Bass:** Although the catch rate was below the historical average, it was a large improvement from the 2015 survey. Body condition was good for legal length bass.
- **White Crappie:** During previous survey efforts White Crappie relative abundance has been consistently low. Few anglers target them, and few are caught. This species doesn't seem to survive well in this very clear reservoir with a high density of Largemouth Bass. Sampling was not conducted for this species.

Management Strategies: Conduct electrofishing survey in 2022 to monitor Largemouth Bass population. Monitor hydrilla in reservoir to assure it does not develop into a problem. Investigate repairing the State Park fishing pier and reopening it for anglers.

Introduction

This document is a summary of fisheries data collected from Lost Creek Reservoir in 2018-2019. 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 were collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2018 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 338 $\mu\text{S}/\text{cm}$. Water clarity is usually quite high as measured by Secchi disc often exceeding seven feet in depth. Habitat consisted of aquatic vegetation, rocks, and dead trees. The water level was 0.8 feet above conservation pool during the electrofishing survey (Figure 1). Jacksboro Reservoir's spillway empties into Lost Creek reservoir when it over flows. Other descriptive characteristics for Lost Creek Reservoir are in Table 1.

Angler Access

Boat access consisted of one two-lane public boat ramp. Shoreline fishing access was available at the public access points including the boat ramp. A paved bike path is located near the shoreline and many areas of the reservoir can be accessed from the trail. There is a fishing pier managed by Fort Richardson State Park but it is in disrepair and has been closed to the public. Additional boat ramp characteristics are in Table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Lang and Mauk 2015) included:

1. Historically, Largemouth Bass have been targeted by nearly two-thirds of the anglers but the population numbers were down in 2014 because of drought. The Largemouth Bass population has historically had high relative abundance with few legal-length fish, slow growth and poor body condition. Surveying the reservoir with an additional electrofishing survey once the reservoir refilled and performing genetic analysis of the bass population was recommended.

Action: Monitored Largemouth Bass population in 2016 with an electrofishing survey which resulted in much higher relative abundance than the survey in 2014. Genetic analysis was not completed because the Lost Creek Reservoir Largemouth Bass population is self-sustaining and has not been stocked since 1994. According to new procedures, there was not sufficient justification for examining population genetics.

2. The potential spread of zebra mussels and other invasive species exists. Informing the public and reservoir authorities of what to do to prevent the spread and what to do if they suddenly appear in the reservoir are prudent actions.

Action: Signage was posted at the boat ramps to make boaters aware of invasive species. Invasive species are a talking point while communicating with the public and discussed/published in various media outlets. Hydrilla has been monitored annually since being found in 2013.

Harvest regulation history: Sport fish species in Lost Creek Reservoir 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 complete stocking history is presented 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 in 2013 and had not been documented again until 2016 when a small patch <0.1 acres was identified near the Jacksboro Reservoir overflow in Lost Creek Reservoir. In 2017 it had expanded to 0.8 acres and a small stand was located near the boat ramp. In 2018 0.5 acres was estimated to exist in the Jacksboro Reservoir overflow area in Lost Creek Reservoir and boat ramp areas. Native water willow *Justicia Americana*, pondweed *Potamogeton* spp., bulrush *Scirpus* spp., American lotus *Nelumbo lutea*, and cattail *Typha* spp. were also present during the 2018 vegetation survey.

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

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lost Creek Reservoir (TPWD unpublished). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Statistics – 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 ($RSE = 100 \times SE$ of the estimate/estimate) was calculated for all CPUE and creel statistics.

Habitat – A structural habitat survey was conducted in 2014. Vegetation surveys were conducted in 2002, 2006, 2010, 2014 and 2018 to monitor aquatic vegetation. Hydrilla has been monitored annually since first being identified in 2013. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Water level – Source for water level data was the United States Geological Survey (USGS 2019).

Results and Discussion

Habitat: Structural survey was completed in 2014 and since there have been no observed changes, it was not repeated during this reporting period (Table 6). The shoreline was rocky and there is an abundance of standing timber in the reservoir. An aquatic vegetation survey was conducted in August 2018 (Table 7). Reservoir elevation at time of survey was 1,008.4 ft. above mean sea level. Emergent aquatic vegetation ringed the shoreline, with some floating-leaved aquatic vegetation also present.

Prey species: Electrofishing catch rates of Gizzard Shad was 17.0/h (Figure 2). Index of Vulnerability (IOV) for Gizzard Shad was 12%, indicating most Gizzard Shad in the reservoir are too large for Largemouth Bass to consume (Figure 2). While relative abundance was low, it was still one of the highest catch rates sampled at the reservoir. Historical average is 9.6/h. Threadfin Shad were introduced in 2008 and 2009 but were not documented in the 2018 survey. Total CPUE of Bluegill (Figure 3) in 2018 (71.0/h) was below the historical average of 121.9/h. The majority were between two to four inches in length. The Redear Sunfish population in 2018 (12.0/h) was nearly identical to 2016 (11.0/h; Figure 4). Seven and eight-inch fish were collected which can provide an opportunity for anglers wanting to catch larger sunfish. While not sampled during this survey but present, Inland Silversides were plentiful and available as forage as indicated by the 2014 electrofishing survey when they were collected at a rate of 575.0/h in smaller mesh dip nets.

Channel Catfish: Channel Catfish are not considered a popular species among anglers at the reservoir, so no effort was made to sample the population. Past sampling has resulted in a historical gill net catch rate average of 0.9/n and past creel surveys determined little angling effort targeted this species.

White Bass: White Bass are not considered a popular species among anglers at the reservoir, so no effort was made to sample the population. Past sampling has resulted in a historical average of 1.5/n and past creel surveys determined little targeted angling effort for this species.

Largemouth Bass: The electrofishing catch rate of Largemouth Bass was 84.0/h in 2018, slightly down from 2016 (106.0/h) but well above the 2014 survey (25.3/h; Figure 5) and slightly below the historical average (90.5/h). Size structure greatly improved with PSD being 69 in the 2018 survey, up from 42 in 2016 and 35 in 2014. Body condition as measured by W_r ranged from 81 to 90 for stock-length bass in 2018 compared to 2016 when it ranged from 80-102 and 2014 when it ranged from 76 to 85. Largemouth

Bass at Lost Creek Reservoir have rarely exhibited good body condition and have historically been slow growing taking about four years to attain legal length (14 inches). Largemouth Bass were the most important sport fish in the reservoir being targeted by about two out of every three anglers as indicated by past creel surveys.

White Crappie: White Crappie are not considered a major species at the reservoir, so no effort was made to sample the population. Past sampling has resulted in a historical average of 1.9/fn and past creel surveys determined little angling effort for this species. The latest creel survey (completed in 2015), found no angling pressure for this species. This was probably a result of the close proximity of Jacksboro Reservoir, which has been a good crappie reservoir, attracting anglers targeting this species to that location instead.

Fisheries Management Plan for Lost Creek Reservoir, Texas

Prepared – July 2019

ISSUE 1: Hydrilla seems to have become established but in low density. While not detrimental to the reservoir, it could be transported to other waterbodies where it could become a nuisance.

MANAGEMENT STRATEGIES

1. Maintain signage at reservoir and make it a talking point when discussing this reservoir.
2. Continue annual monitoring of hydrilla in the reservoir. Currently there are a few strands by the boat ramp, but it has not fully established there. If it becomes established by the boat ramp, it will be chemically treated to lessen the chance of being spread to other waterbodies.

ISSUE 2: The fishing pier at the state park was in disrepair and was closed to the public. Angler shoreline access at this reservoir is limited so it would be beneficial to repair the pier and reopen it to the public.

MANAGEMENT STRATEGY

1. Discuss repair status of fishing pier with Ft. Richardson State Park regarding what needs to be done to reopen the fishing pier. Offer any help we can to achieve an open, safe fishing pier for the angling public.

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

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. 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.

Objective-Based Sampling Plan and Schedule (2019–2023)

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, and Gizzard Shad.

Low-density fisheries

Gizzard and Threadfin Shad: Gizzard Shad are present in Lost Creek Reservoir, but population abundance is low. From 1998-2018, CPUE of Gizzard Shad ranged from 2.0 to 27.0 fish/h, with a historical average of 9.6/h. Threadfin Shad have been stocked in 1996, 2008, and 2009 but have never become established.

Channel Catfish: Channel Catfish are present in Lost Creek Reservoir, but population relative abundance is extremely low because water clarity is high and predation by Largemouth Bass on juvenile catfish is likely high. Gill net surveys from 1998-2011 resulted in CPUE of Channel Catfish from 0.3 to 1.4 fish/nn. In 2012, three tandem baited hoop nets were each set for two nights, and no Channel Catfish were sampled. Creel surveys in 2002, 2008, and 2014 indicated low directed effort (0.6 to 1.7/acre) and catch (0 to 0.3/h) of Channel Catfish occurred. Sampling this population is unnecessary in the next four years.

White Bass: White Bass are present in Lost Creek Reservoir, but population relative abundance is low. Gill net surveys from 1996-2011 resulted in CPUE of White Bass from 0.4 to 2.0 fish/nn. Creel surveys in 2002, 2008, and 2014 indicated low directed effort (0.2 to 0.9h/acre) for White Bass. Sampling this population is unnecessary in the next four years.

White Crappie: White Crappie are present in Lost Creek Reservoir, but population relative abundance is low. Trap net surveys from 1996-2011 resulted in CPUEs of White Crappie ranging from 0.5 to 3.4 fish/nn. Creel surveys in 2002, 2008, and 2014 indicated low directed effort (0.0 to 1.7h/acre) and catch (0.0/h to 0.1/h) of White Crappie occurred. Sampling this population is unnecessary in the next four years.

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 some previous creel surveys have demonstrated more than 65% of the anglers targeting Largemouth Bass. Largemouth Bass have been managed with the statewide 14-inch minimum length limit regulation since Sept. 1, 2003 when it was reduced from a 16-inch minimum length limit. Trend data on CPUE, size structure, and body condition have been collected about every two years since 1996 with fall electrofishing. The population in the past was characterized as abundant with few legal length bass, poor body condition, and slow growth. Creel surveys indicated anglers are aware of the problems but like the idea of catching lots of bass. In 2014, the OBS called for a minimum of 24 randomly selected 5-min electrofishing sites to be completed with extra sampling occurring to collect 200 stock-size fish for age and growth. It was anticipated that a CPUE-S with a RSE <15 (the anticipated effort to meet CPUE sampling objectives is 15-20 stations with 95% confidence) would also be attained. In 2014, 18 sites were the most that could be completed around this small reservoir (385 acres). None of the 2014 OBS goals or objectives were reached, even with extra sampling for 200 Largemouth Bass. Considering the 2014 OBS results, 12 randomly selected sites were sampled in 2016 and 2018 with the objective of general monitoring purposes with a goal of a CPUE-S RSE of ≤ 25 and collecting at minimum 50 stock length Largemouth Bass for size structure and body condition. All goals were met except the 2016 RSE-S was 26, just missing the goal of 25 or less. In 2018, RSE-S was 14. The Largemouth bass population in Lost Creek Reservoir has always been abundant with body condition being characterized as poor with slow growth and few legal length bass available. This population does not need biennial monitoring as in the past. An electrofishing survey is unnecessary until 2022. This will be conducted with the goal of

general monitoring purposes and the specific objectives of a CPUE-S RSE of ≤ 25 and collecting at minimum 50 stock length Largemouth Bass for size structure and body condition.

Bluegill: Bluegill are a primary forage species at Lost Creek Reservoir. Like Largemouth Bass, trend data on CPUE and size structure of Bluegill have been collected nearly biennially 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 RSE ≤ 25 for CPUE of Bluegill.

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Tables and Figures

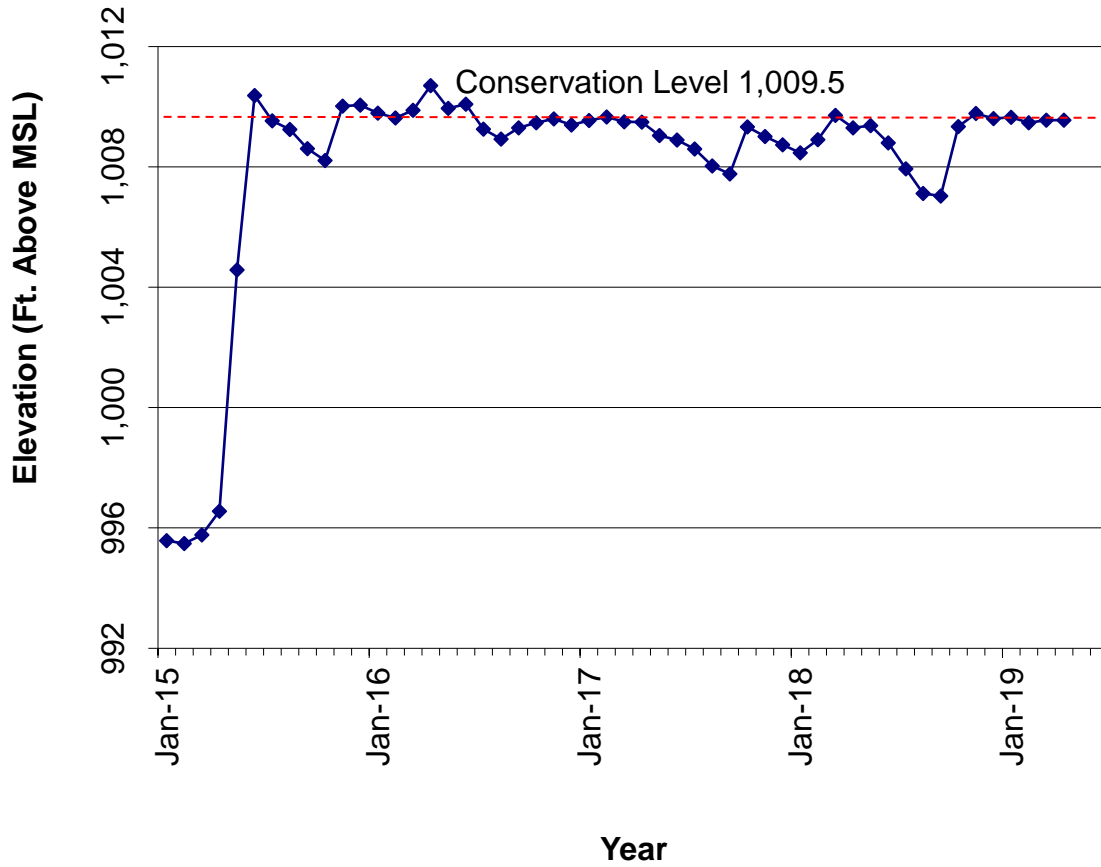


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lost Creek Reservoir, Texas

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	2.3
Conductivity	338 μ S/cm

Table 2. Boat ramp characteristics for Lost Creek Reservoir, Texas, June, 2018. Reservoir elevation at time of survey was 1,008 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	993	Good

Table 3. Harvest regulations for Lost Creek Reservoir.

Species	Bag limit	Length limit
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 and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history for Lost Creek Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), and adults (ADL). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Bluegill	1991	121,939	FGL	1.2
	Total	121,939		
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
	Total	28,902		
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
	Total	25,088		
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
	Total	25,364		

Table 4. Objective-based sampling plan components for Lost Creek Reservoir, Texas 2018.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Bluegill	Abundance	CPUE	Practical effort
Gizzard Shad	Abundance	CPUE	Practical effort

Table 5. Survey of structural habitat types, Lost Creek Reservoir, Texas, 2014 (Lang and Mauk 2015). 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, 2006, 2010, 2014, and 2018. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2002	2006	2010	2014	2018
Native submersed	0.9 (3.1)	6.8 (1.8)	0.7 (0.2)	0.0	6.8 (1.8)
Native floating-leaved	0.0	0.7 (<0.1)	0.0	0.0	8.9 (2.3)
Native emergent	0.0	5.0 (1.3)	2.0 (0.5)	0.0	8.1 (2.1)
Non-native					
Hydrilla (Tier III)*	0.0	0.0	0.0	0.0	0.5 (0.1)

*Tier III is Watch Status

Gizzard Shad

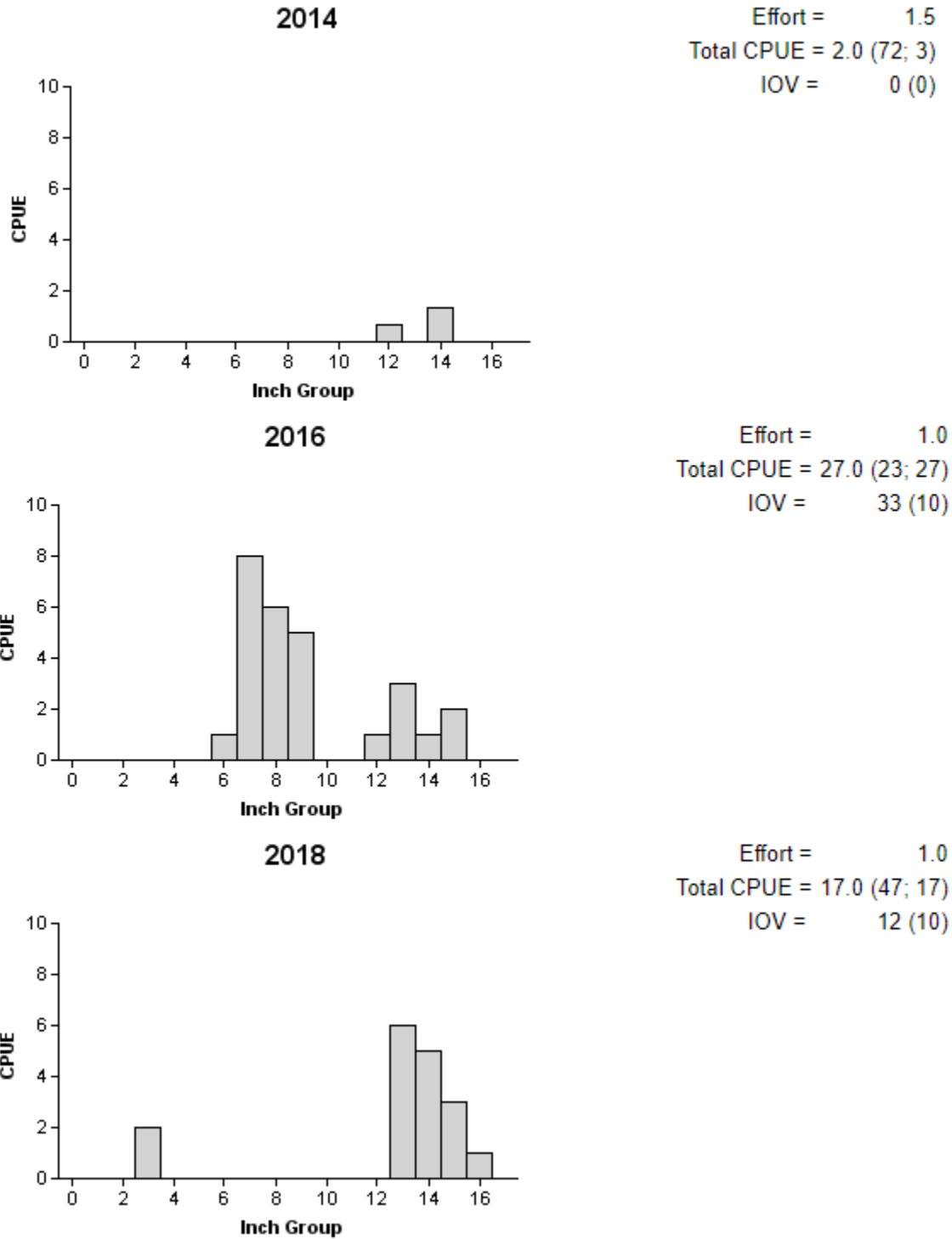


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lost Creek Reservoir, Texas, 2014, 2016, and 2018.

Bluegill

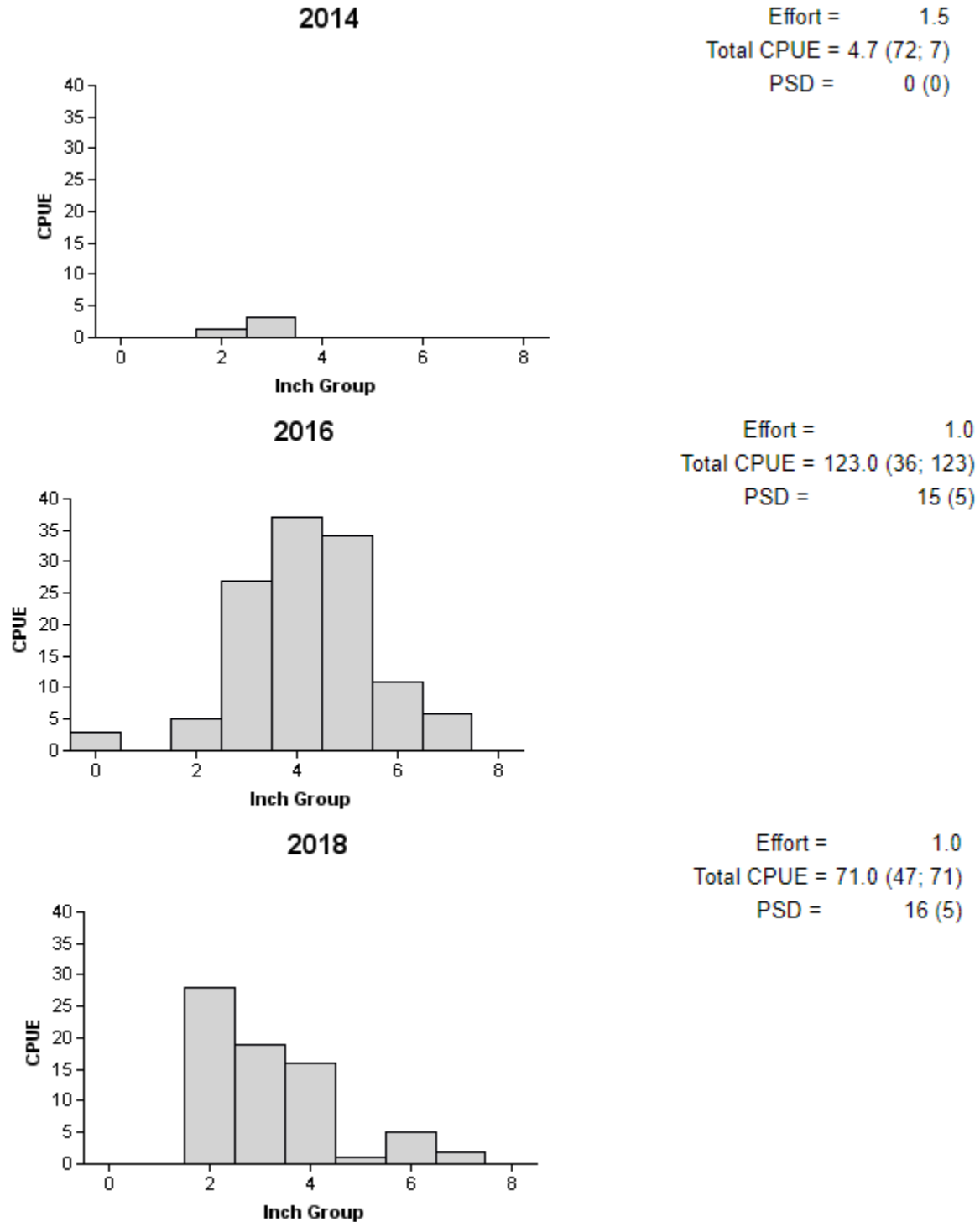


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lost Creek Reservoir, Texas, 2014, 2016, and 2018.

Redear Sunfish

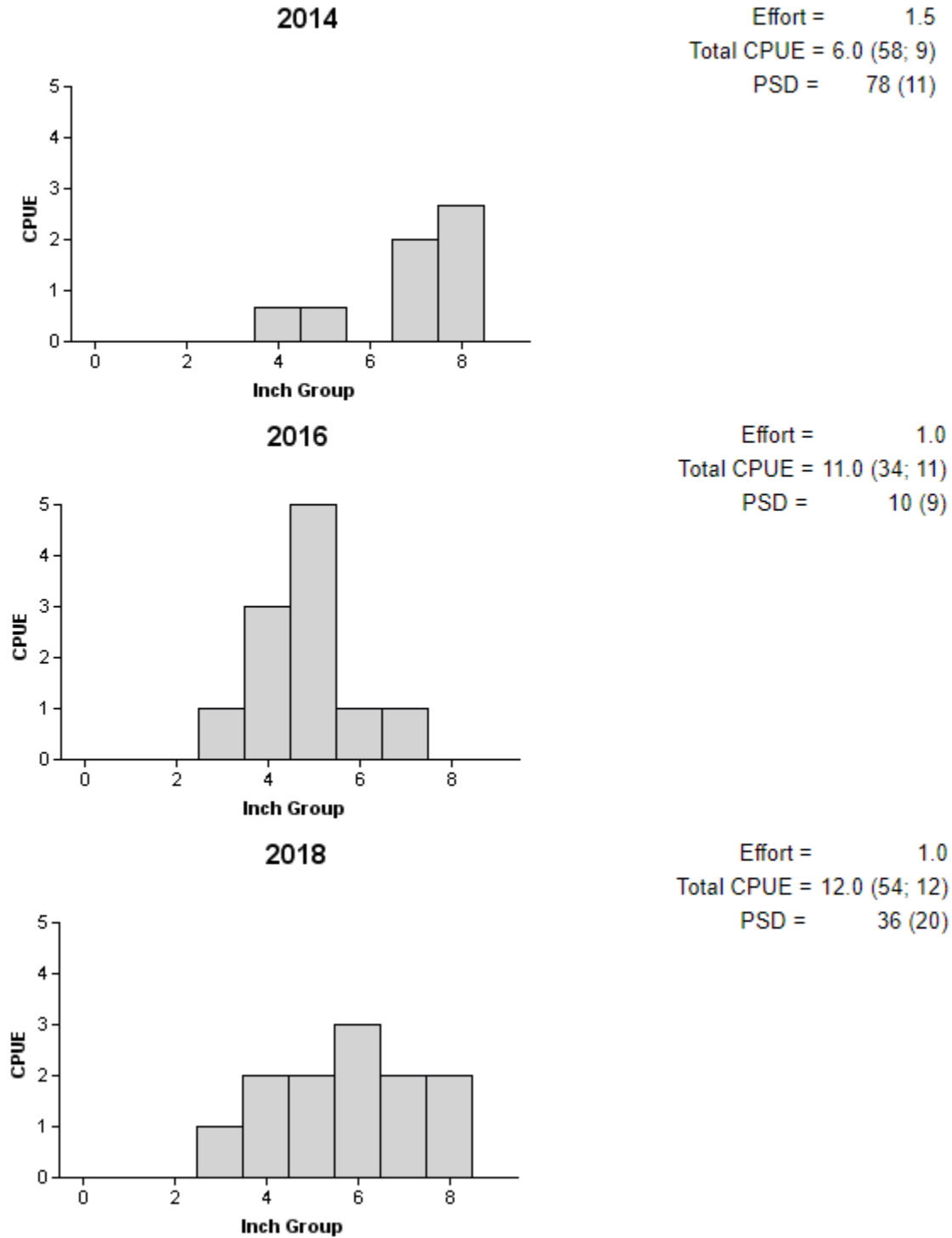


Figure 4. Number of Redear Sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lost Creek Reservoir, Texas, 2014, 2016, and 2018.

Largemouth Bass

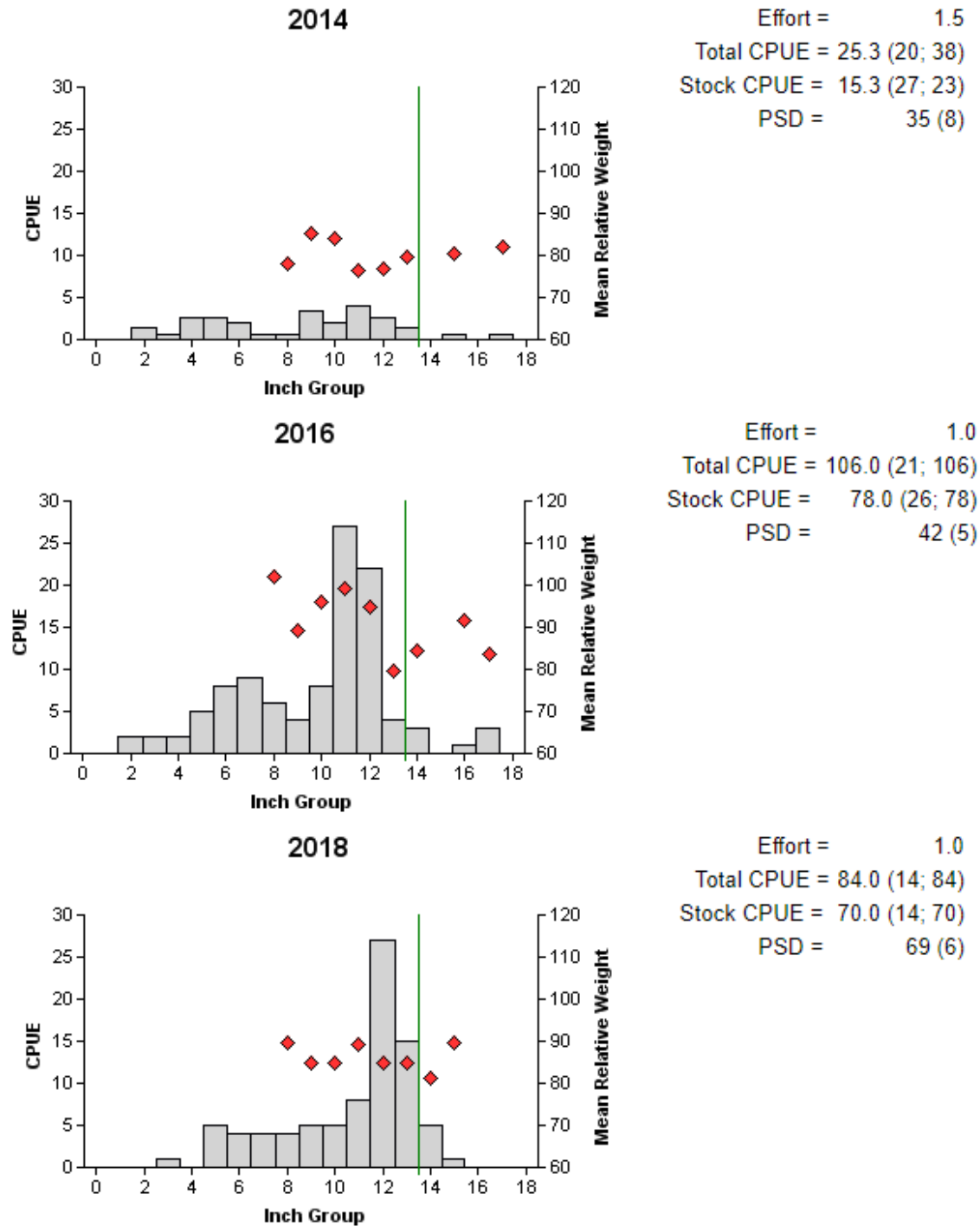


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lost Creek Reservoir, Texas, 2014, 2016, and 2018.

Proposed Sampling Schedule

Table 8. 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.

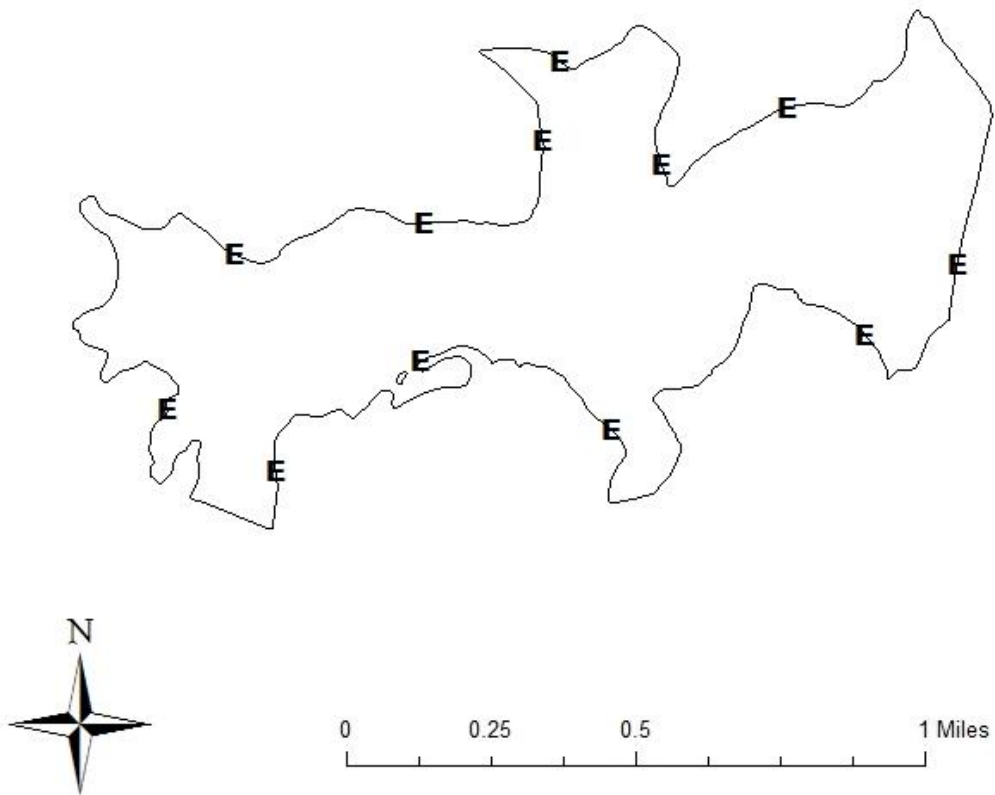
	Survey year			
	2019-2020	2020-2021	2021-2022	2022-2023
Angler Access				S
Vegetation				S
Electrofishing – Fall				S
Report				S

APPENDIX A – Catch rates for all species from all gear types

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Lost Creek Reservoir, Texas, 2018. Sampling effort was 1 hour for electrofishing.

Species	Electrofishing	
	N	CPUE
Gizzard Shad	17	17.0 (47)
Green Sunfish	10	10.0 (79)
Warmouth	2	2.0 (67)
Orangespotted Sunfish	1	1.0 (100)
Bluegill	71	71.0 (47)
Longear Sunfish	13	13.0 (84)
Redear Sunfish	12	12.0 (54)
Largemouth Bass	84	84.0 (14)

APPENDIX B – Map of sampling locations



Location of sampling sites, Lost Creek Reservoir, Texas, 2018. Electrofishing stations are indicated by E. Water level was over full pool at time of sampling.



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