

Lake Waxahachie  
2017 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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July 31, 2018



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## Survey and Management Summary

Fish populations in Lake Waxahachie were surveyed in 2016 using low-frequency electrofishing, in 2017 using electrofishing, hoop netting and trap netting, and in 2018 using gill netting. Historical data are presented with the 2016-2018 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:** Lake Waxahachie is a 656 acre impoundment located on Prong Creek in the Trinity River Basin approximately 4 miles south of Waxahachie, Texas. Water level has fluctuated up to 6 feet below spillway elevation since 2008. Lake Waxahachie has high productivity. Habitat features consisted of standing timber, rocks, boat docks and native emergent and floating aquatic plants.

**Management History:** Important sport fish include White Bass, Largemouth Bass, White and Black Crappie, and catfish. Blue Catfish were stocked in 2003, 2005 and 2007. The management plan from the 2014 survey report primarily focused on monitoring the sport and prey-fish populations through a combination of low-frequency electrofishing in 2016, trap netting, hoop netting and electrofishing in 2017 and gill netting in 2018.

### Fish Community

- **Prey species:** Threadfin Shad were present in the reservoir. Electrofishing catch of Gizzard Shad was poor and very few (9%) were available as prey to most sport fish. Electrofishing catch of Bluegill was high and most were less than 6-inches long.
- **Catfishes:** Blue, Channel and Flathead Catfish are present within the reservoir; Blue and Channel Catfish were abundant and have the potential to provide angling opportunities.
- **White bass:** White Bass were present in the reservoir. Recruitment is inconsistent, likely due to variable water levels and associated inflow.  
**Largemouth Bass:** Largemouth Bass were abundant and displayed moderate body condition. Largemouth Bass growth to legal length was moderate (average age at 14 inches long was 2.8 years)
- **Crappie:** Black and White Crappie are present in the reservoir and historically have provided a popular fishery.

**Management Strategies:** Draft a proposal for an artificial habitat improvement project through the Conservation License Plate (CLP) grant system. Contact the city of Waxahachie and local angling groups about interest in partnering in any habitat improvement efforts

## Introduction

This document is a summary of fisheries data collected from Lake Waxahachie in 2016-2018. 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 2016-2018 data for comparison.

## Reservoir Description

Lake Waxahachie is a 656-acre impoundment constructed in 1958 on Prong Creek, a tributary of the Trinity River. It is located in Ellis county 4 miles south of Waxahachie, Texas and is operated and controlled by the city of Waxahachie. Primary water uses included municipal water supply and recreation. Lake Waxahachie was eutrophic with a mean TSI cl-a of 54.2 (Texas Commission on Environment Quality 2011). Habitat at time of sampling consisted of rocks, standing timber, and native submersed and emergent vegetation. Water level has fluctuated from conservation pool to 6 feet low since 2008 (Figure 1). Other descriptive characteristics for Lake Waxahachie are in Table 1.

## Angler Access

Lake Waxahachie has three public boat ramps and no private boat ramps. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the public boat ramp areas and Waxahachie City Park located around Public Ramp 1.

## Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Norman and Ott 2014) included:

1. Monitor the Blue Catfish population dynamics with low-frequency electrofishing in 2016 and gill netting in 2018. Conduct age analysis on Blue Catfish in 2016; identify year classes present within the reservoir to determine if natural reproduction is occurring.
 

**Action:** Low-frequency electrofishing was conducted in 2016 and otoliths were collected from 32 Blue Catfish and subsequently aged. Gill netting was conducted in 2018.
2. Consider planting bare-root water willow along protected cove shorelines at Lake Waxahachie in 1-3 feet of water to augment the current lack of littoral habitat.
 

**Action:** Water level returned to full pool in 2015 and water willow naturally expanded along several areas of the shoreline. No planting was necessary.
3. Contact local bass club to assess interests in artificial habitat partnership and projects.
 

**Action:** No local bass clubs were reached.
4. Consult with the city of Waxahachie about pursuing a boater access grant to extend existing boat ramps. Discuss the possibility of constructing a fishing pier within Waxahachie City Park to improve and increase fishing access for bank anglers.
 

**Action:** Water level returned to full pool in 2015 and negated any boat ramp or pier construction possibilities.

**Harvest regulation history:** Largemouth Bass regulations reverted from a 14- to 18-inch slot-size limit to a 14-inch minimum-length limit on September 1, 2003. Current regulations are found in Table 3.

**Stocking history:** Lake Waxahachie was stocked with Threadfin Shad in 1987, Florida Largemouth Bass 1988, 1997 and 1998, and Blue Catfish in 2003, 2005 and 2007. The complete stocking history is in Table 4.

**Vegetation/habitat management history:** Pilot introductions of several native aquatic plant species (wild celery, Illinois pondweed, water stargrass, pickerel weed and bull tongue) were conducted in 2007 however, fluctuating water levels prevented the introduced plants from establishing within the reservoir.

**Water transfer:** 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 Lake Waxahachie (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 2015).

**Electrofishing** – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1.0 hours 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. Ages for Largemouth Bass were determined using otoliths from 13 randomly-selected fish (range 13.0 to 14.8 inches).

**Trap netting** – Crappie were collected using trap nets (10 net nights at 10 stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn). Ages for crappie were determined using otoliths from 13 randomly-selected fish (range 9.0 to 10.9 inches).

**Gill netting** – Blue Catfish, Channel Catfish and White Bass were collected by gill netting (10 net nights at 10 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

**Low-frequency electrofishing** – Blue Catfish were collected by low-frequency electrofishing at 20 stations. The minimum duration of electrofishing at each station was 3 minutes. CPUE for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Ages for Blue Catfish were determined using otoliths from 32 randomly-selected fish (range 9.1 to 28.0 inches).

**Tandem hoop nets** – Channel Catfish were collected using 10 tandem hoop-net series at 10 stations. Nets were baited with soap and deployed for 2-night soak durations. CPUE for tandem hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series).

**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 vegetation survey was conducted in 2017. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

**Water level** – Source for water level data was the United States Geological Survey (USGS 2018).

## Results and Discussion

**Habitat:** Aquatic vegetation in Lake Waxahachie continued to be limited (~2% of total reservoir surface area); likely attributable to fluctuating water levels and substrate composition. Water willow was the only aquatic species with considerable surface coverage (~ 12 acres; Table 6). Approximately 2 acres of smartweed surrounded the shoreline of the upper end of the reservoir. Other species present (< 1 acre) included American lotus, bulrush, pondweed and buttonbush.

**Prey species:** Electrofishing catch rates of Bluegill and Gizzard Shad were 258.0/h and 45.0/h, respectively. Index of Vulnerability (IOV) for Gizzard Shad was poor and lower than previous surveys, indicating that just 9% of Gizzard Shad were available to existing predators (Figure 2). Total CPUE of Gizzard Shad was lower than the previous two surveys in 2009 and 2013 (72.0 and 109.0, respectively). Sunfish continued to be the primary forage option in the reservoir (Appendix A). Total CPUE of Bluegill was high over the last three surveys (range: 241.0 – 399.0), and size structure continued to be dominated by small individuals (Figure 3).

**Catfish:** The 2018 gill net catch rate of Blue Catfish was 3.9/nn and consisted primarily of fish  $\leq$  17 inches (PSD = 8; Figure 4). Size structure was comparable to the 2014 survey (PSD = 6), but lower than 2010 (PSD = 22). Size structure in the 2018 survey was also comparable to the 2016 low-frequency electrofishing survey (PSD = 8; Figure 5). Thirty-two Blue Catfish from the 2016 survey were aged to identify possible natural recruitment within the reservoir; all 32 specimens were aged back to years fish were stocked (Figure 6). Twenty-eight aged fish were from the 2007 year class and 4 were from 2005 suggesting very little to no natural recruitment of Blue Catfish occurs within the reservoir.

The 2018 gill net catch rate of Channel Catfish was 3.5/nn and consisted primarily of fish  $\leq$  13 inches (PSD = 11; Figure 7). Size structure was better than the 2014 survey (PSD = 0), but lower than 2010 (PSD = 45). The 2017 hoop net survey also consisted primarily of smaller fish (PSD = 0; Figure 8).

**White Bass:** White Bass were present in the reservoir; gill net catch rates continued to be variable, ranging from 0.3/nn – 4.8/nn over the last three surveys (Figure 9). Survey precision is historically poor, limiting comparisons between surveys. The White Bass population likely fluctuates with reservoir water level related to prolonged periods of drought.

**Largemouth Bass:** The 2017 electrofishing catch rate (146.0/h) was higher than the two previous surveys in 2013 (134.0/h) and 2009 (106.0/h) (Figure 10). Size structure (PSD = 36) was also higher than the 2013 and 2009 surveys (PSD = 19 and 16, respectively). Relative weights were moderate for most size classes of fish ( $W_r$  range = 80 - 95). Growth was moderate; average age at 14 inches (13.0 to 14.9 inches) was 2.8 years ( $N = 13$ ; range = 2 – 3 years).

**Crappie:** Both White and Black Crappie were present within the reservoir. The 2017 trap net catch rate for all Crappie combined was 5.5/nn, similar to the 2009 and 2013 surveys (5.2/nn and 8.8/nn, respectively; Figure 11). Size structure continued to be good (PSD = 95) and body condition was good for both species ( $W_r$  range 85 – 100). White Crappie growth was faster than Black Crappie; average age at 10 inches (9.0 – 10.9) was 1.2 years ( $N = 13$ ; range = 1 – 2 years) for White Crappie and 2.7 years ( $N = 13$ ; range = 2 – 5 years) for Black Crappie.

# Fisheries Management Plan for Lake Waxahachie, Texas

Prepared – July 2018

**ISSUE 1:** Aquatic habitat in Lake Waxahachie is limited and the introduction of habitat enhancements may improve foraging efficiency for sport fishes and improve fishing success for anglers. The lake's history of fluctuating water elevation makes establishment of native aquatic plants problematic.

## MANAGEMENT STRATEGY

1. Develop proposal to purchase artificial habitat structures (Georgia Cube, Mossback, etc.) through Conservation License Plate (CLP) grant. Determine feasibility (time, resources, etc.) of habitat improvement project on Lake Waxahachie and submit proposal if opportunities are available.
2. Gauge partnership interest from City of Waxahachie and local angler groups. .

**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 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 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. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc.... so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

## Objective-Based Sampling Plan and Schedule (2018–2022)

### Sport fish, forage fish, and other important fishes

Sport fishes in Lake Waxahachie include Black and White Crappie, Blue and Channel Catfish, White Bass, and Largemouth Bass. Important forage species are Gizzard and Threadfin Shad and, sunfishes.

### Low-density fisheries

**White Bass:** White bass are low-density and no directed effort for this species was documented in the most recent (spring 2007) creel survey. In accordance with the catfish sampling objectives, up to 10

randomly-selected gill netting sites will be sampled in the winter of 2022 to determine presence or absence. No additional effort will be expended.

#### Survey objectives, fisheries metrics, and sampling objectives

**Crappie:** Crappie provide a popular fishery in Lake Waxahachie and were the most targeted species during the spring 2007 creel survey, accounting for 38% of the directed angler effort. Due to the popularity of this fishery, crappie relative abundance, size structure, and body condition (CPUE, PSD and  $W_r$ ) will continue to be monitored every four years to determine large-scale changes that may spur further investigation. A minimum of 10 randomly selected trap netting sites will be sampled in the fall of 2021; random sampling will continue up to 20 net nights, until 50 stocked-sized fish are collected and relative abundance estimates contain a precision of  $\leq 25$ .

**Catfish:** It is unclear if the Blue Catfish population is still expanding, stable or decreasing. Historical data suggests over 25 net nights may be necessary to estimate relative abundance, size structure and body condition with an acceptable precision, however the limited importance of this fishery does not warrant intensive sampling (10+ net nights). Therefore, in the winter of 2022, five randomly selected sites will be sampled with gill nets, with up to five more sites if necessary, to estimate relative abundance with an  $RSE \leq 25$  and size structure of at least 50 stock-size fish, for both catfish species. No additional effort will be conducted if survey objectives are not met after 10 total net nights. However, lower precision ( $RSE < 35$ ) of CPUE estimates will be acceptable, if necessary, to make historical comparisons and determine further sampling needs (e.g. age and growth analysis).

**Largemouth Bass:** Largemouth Bass were the second most targeted species in the most recent (spring 2007) creel survey, accounting for 17% of the directed angling effort. Due to the relative importance of this fishery, Largemouth Bass trend data on relative abundance, size structure, body condition, and growth (CPUE, PSD,  $W_r$ , average age at 14") will continue to be monitored in fall 2021 with night-time electrofishing. Historical data suggests that sampling objectives ( $RSE \leq 25$ ,  $N \geq 50$ ) can be met with 12 randomly-selected 5-minute sampling sites. Otoliths will be removed from 13 specimens collected (13.0-14.9 inches), if available, for age and growth analysis.

**Prey Species:** Gizzard Shad, sunfish and to a lesser extent, Threadfin Shad, are all important prey species in Lake Waxahachie. Traditionally, trend data (CPUE and IOV for Gizzard Shad, CPUE and PSD for sunfishes) was monitored every four years with fall night-time electrofishing. Following Largemouth Bass sample objectives, 12 randomly selected night-time electrofishing sites will be sampled in the fall of 2021 to monitor the prey base. No additional effort will be expended, regardless of survey precision or sample size; relative weight of Largemouth Bass will provide supplemental information on the prey base availability within Lake Waxahachie.

## Literature Cited

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## Tables and Figures

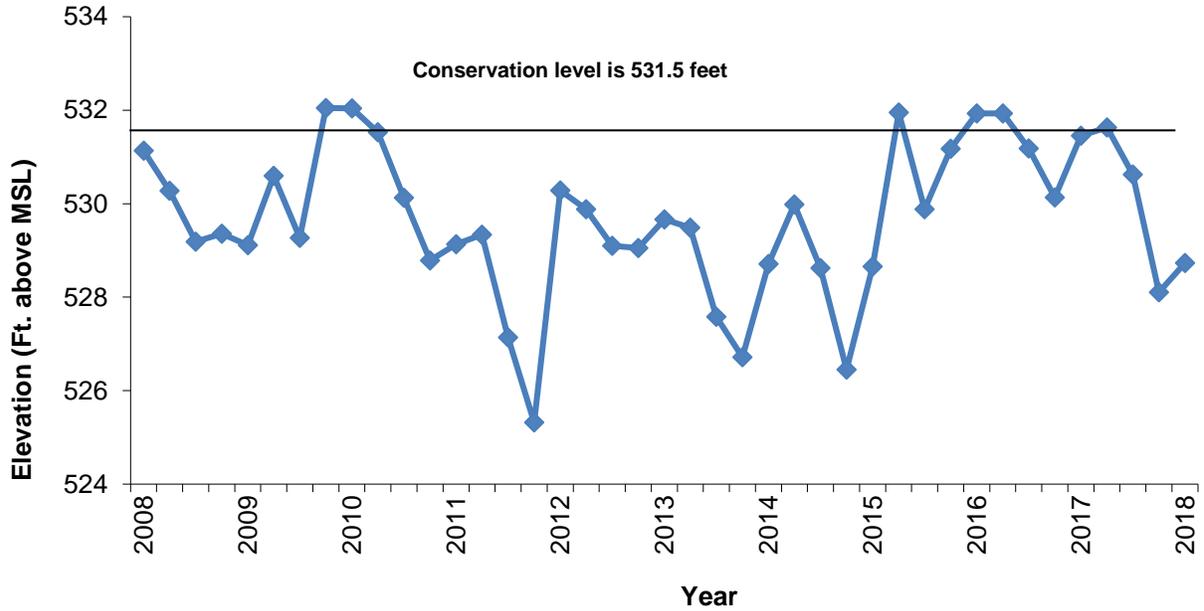


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Waxahachie, Texas.

Table 1. Characteristics of Lake Waxahachie, Texas.

Characteristic	Description
Year constructed	1958
Controlling authority	City of Waxahachie
County	Ellis
Reservoir type	Tributary
Shoreline Development Index	2.8
Conductivity	240 $\mu$ S/cm

Table 2. Boat ramp characteristics for Lake Waxahachie, Texas July, 2017. Reservoir elevation at time of survey was 531 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft.)	Condition
Public Ramp 1	32.345181 -96.833542	Y	20	529.8	Excellent, no access issues
Public Ramp 2	32.344442 -96.816928	Y	10	524.4	Excellent, no access issues
Public Ramp 3	32.344294 -96.813308	Y	25	525.4	Excellent, no access issues

Table 3. Harvest regulations for Lake Waxahachie, Texas.

Species	Bag Limit	Length limit
Catfishes: Channel and Blue, 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 <sup>a</sup>	14-inch minimum
Crappie: White and Black, their hybrids and subspecies	25 (in any combination)	10-inch minimum

<sup>a</sup> Daily bag for Largemouth Bass and Spotted Bass = 5 fish in any combination.

Table 4. Stocking history of Lake Waxahachie, Texas. FGL = fingerling; AFGL = advanced fingerling; ADL = adults.

Species	Year	Number	Size
Threadfin Shad	1987	<u>1,000</u>	ADL
	Total	1,000	
Blue Catfish	2003	57,658	FGL
	2005	49,594	FGL
	2007	<u>55,200</u>	FGL
	Total	162,452	
Florida Largemouth Bass	1988	69,459	FGL
	1997	70,051	FGL
	1998	<u>69,011</u>	FGL
	Total	208,521	

Table 5. Objective-based sampling plan components for Lake Waxahachie, Texas 2016–2018.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Relative Abundance	CPUE–Stock	RSE-Stock $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$ stock
	Age-and-growth	Age at 14 inches	$N = 13, 13.0 - 14.9$ inches
	Condition	Wr	10 fish/inch group (max)
Bluegill <sup>a</sup>	Relative Abundance	CPUE–Total	RSE $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$
Gizzard Shad <sup>a</sup>	Relative Abundance	CPUE–Total	RSE $\leq 25$
	Prey availability	IOV	$N \geq 50$
<i>Low-frequency electrofishing</i>			
Blue Catfish	Relative Abundance	CPUE–stock	RSE-Stock $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$ stock
	Year Class	Age	5 fish/10 mm
<i>Trap netting</i>			
Crappie	Size structure	PSD, length frequency	$N = 50$
	Relative Abundance	CPUE–Stock	RSE-Stock $\leq 25$
	Condition	Wr	10 fish/inch group (max)
	Age-and-growth	Age at 10 inches	$N = 13, 9.0 - 10.9$ inches
<i>Gill netting</i>			
Blue Catfish	Relative Abundance	CPUE–stock	RSE-Stock $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$ stock
Channel Catfish	Relative Abundance	CPUE–stock	RSE-Stock $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$ stock
White Bass	Presence-absence		
<i>Tandem hoop netting</i>			
Channel Catfish	Abundance	CPUE–stock	RSE-Stock $\leq 25$
	Size structure		$N \geq 50$ stock

<sup>a</sup> No additional effort will be expended to achieve an RSE  $\leq 25$  for CPUE of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

Table 6. Survey of aquatic vegetation, Lake Waxahachie, Texas, 2013–2017. Surface area (acres) is listed with percent of total reservoir surface area in parentheses; tr = trace.

Vegetation	2013	2017
Native submersed		
Chara	0.1 (<1)	
Pondweed		tr
Native floating-leaved		
Lotus	0.8 (<1)	0.5 (<1)
Native emergent		
Bulrush		0.1 (<1)
Smart Weed		2 (<1)
Water willow	5.7 (<1)	12 (1.8)
Inundated terrestrial		
Buttonbush		tr

## Gizzard Shad

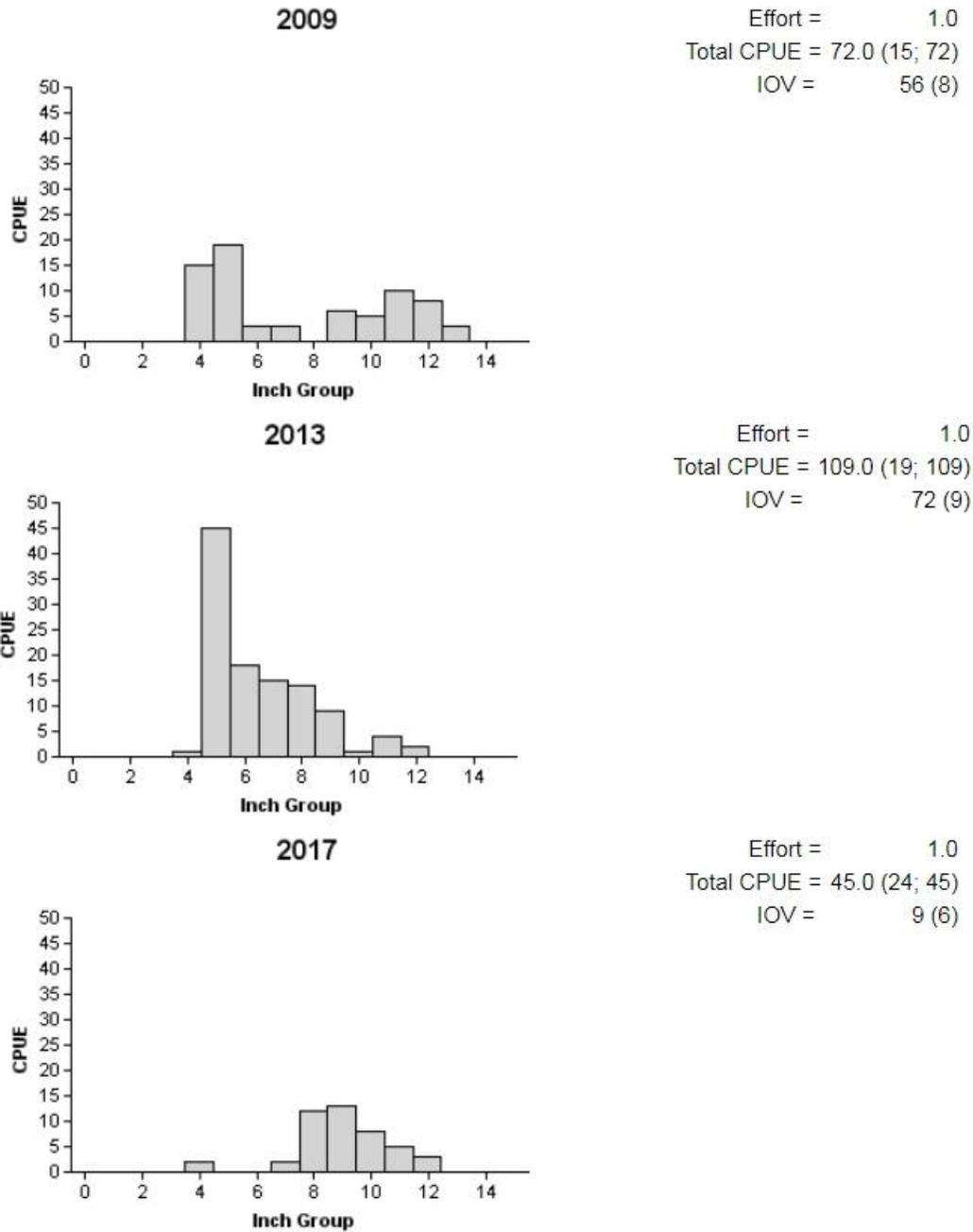


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Waxahachie, Texas, 2009, 2013 and 2017

## Bluegill

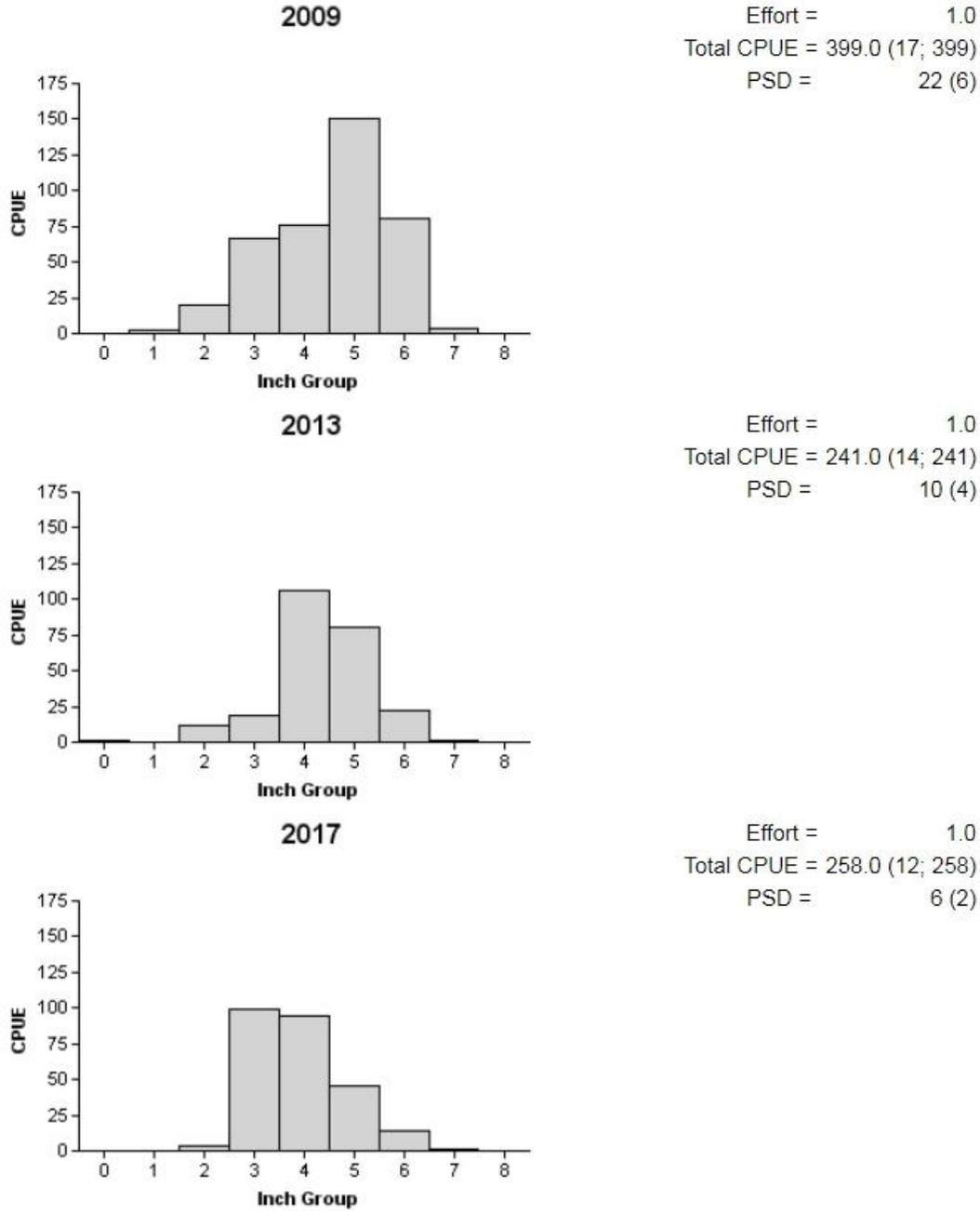


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Waxahachie, Texas, 2009, 2013 and 2017.

### Blue Catfish

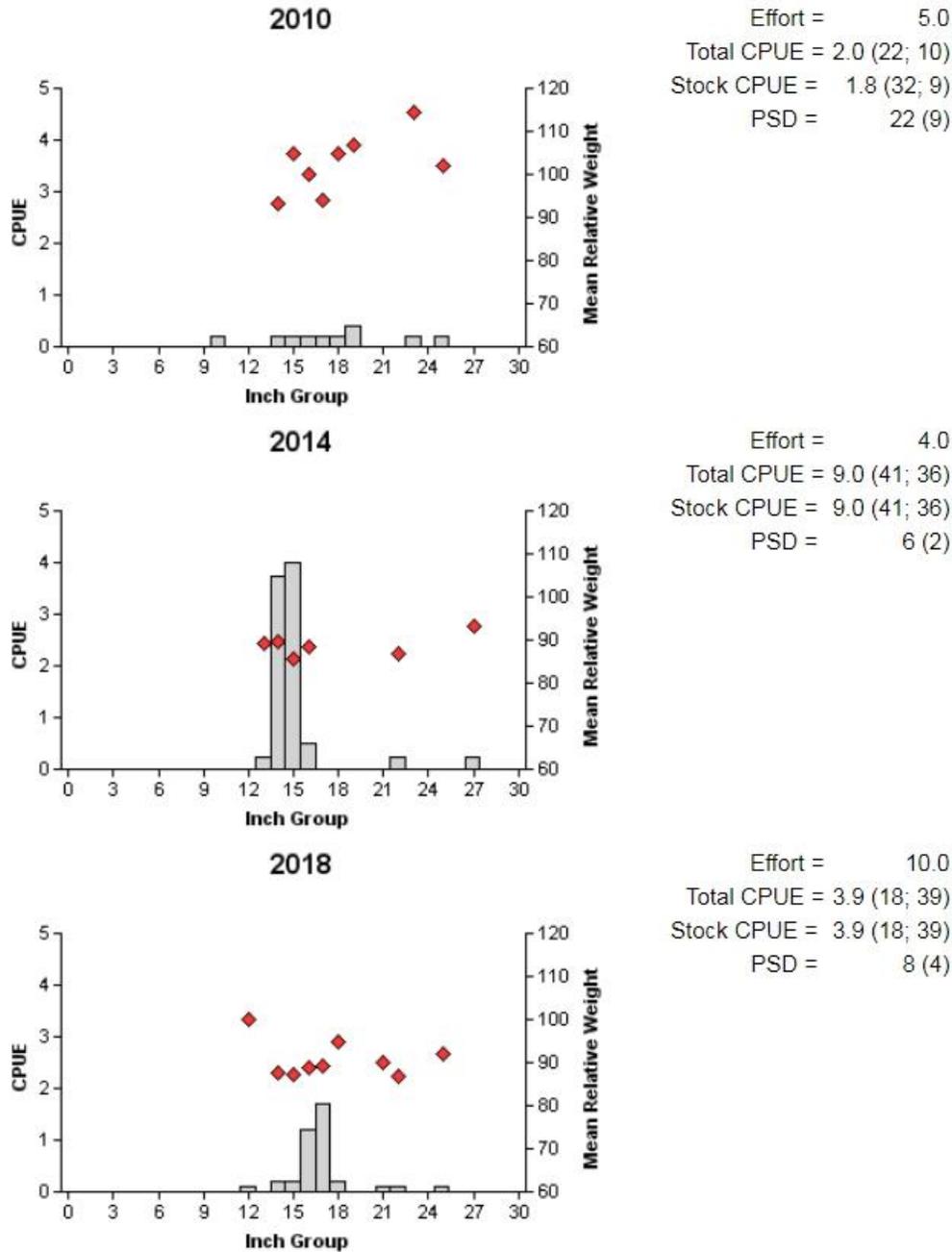


Figure 4. Number of Blue Catfish caught per net night (CPUE), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Waxahachie, Texas, 2010, 2014 and 2018.

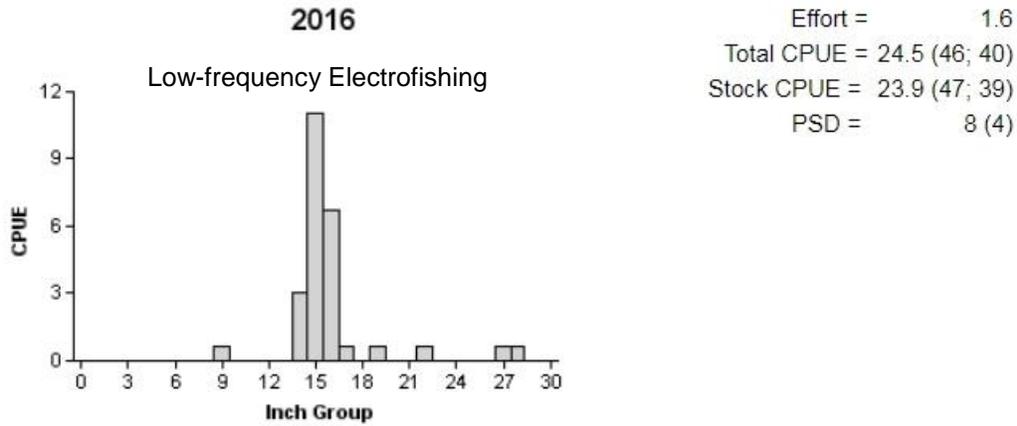


Figure 5 Number of Blue Catfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for low-frequency electrofishing survey, Lake Waxahachie, Texas, 2016.

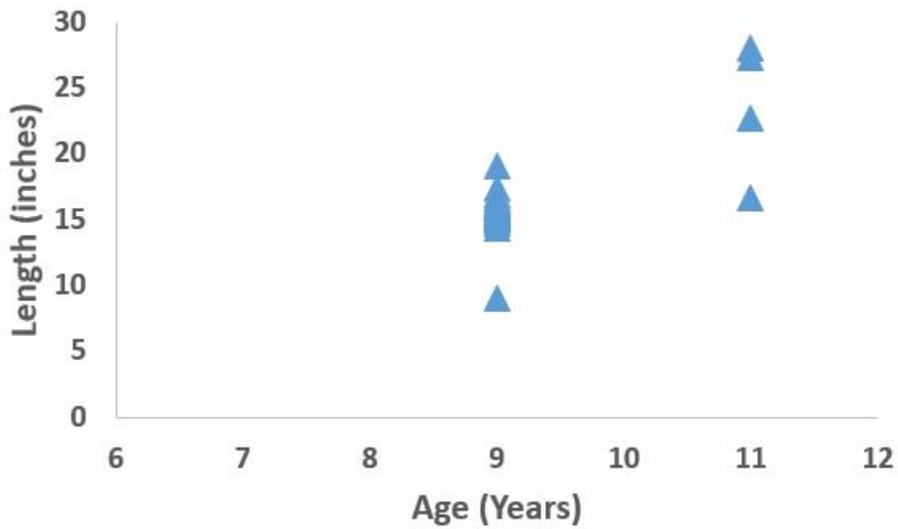


Figure 6. Length at age for Blue Catfish (N = 32) collected with low-frequency electrofishing, Lake Waxahachie Texas, July 2016.

### Channel Catfish

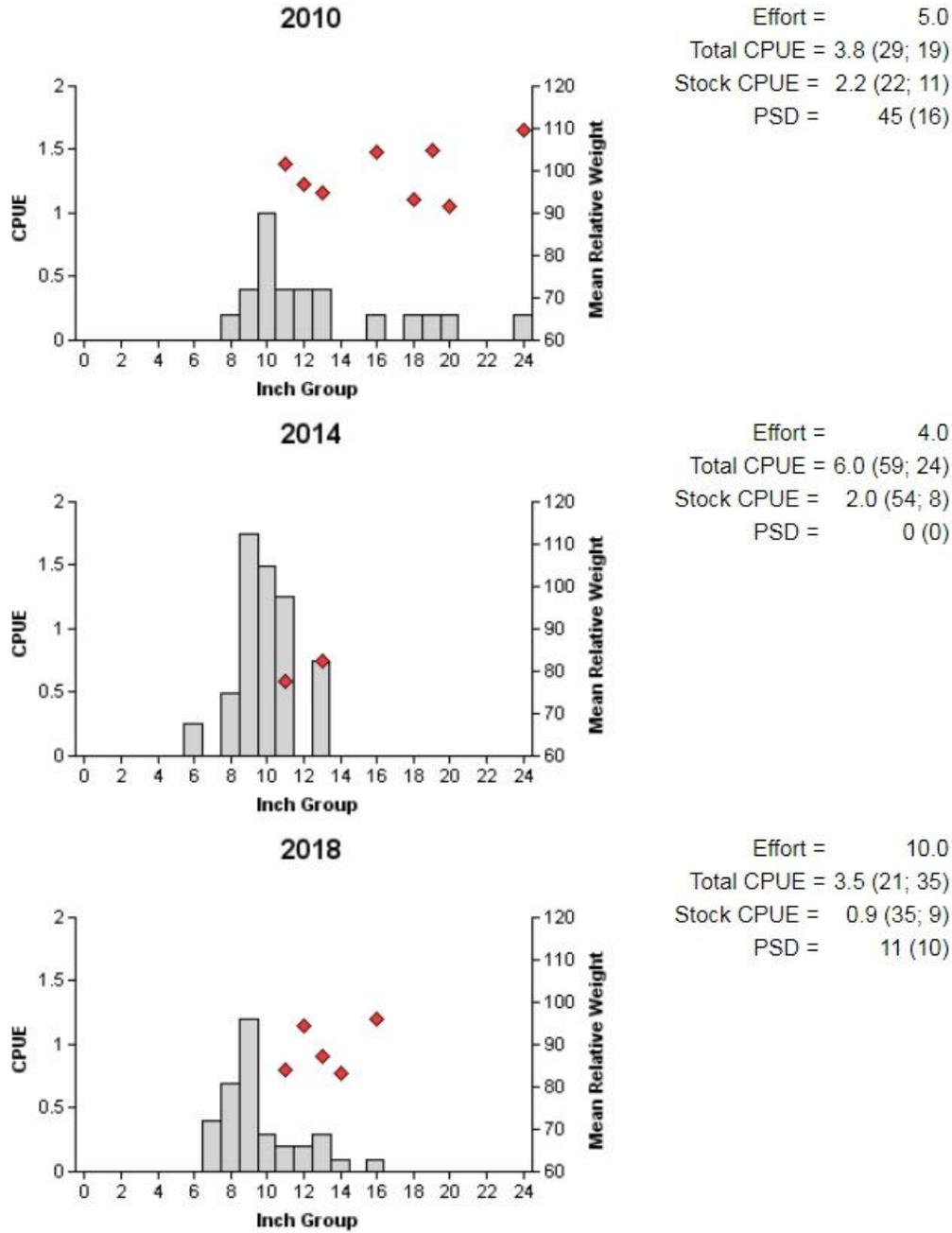


Figure 7. Number of Channel Catfish caught per net night (CPUE), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Waxahachie, Texas, 2010, 2014 and 2018.

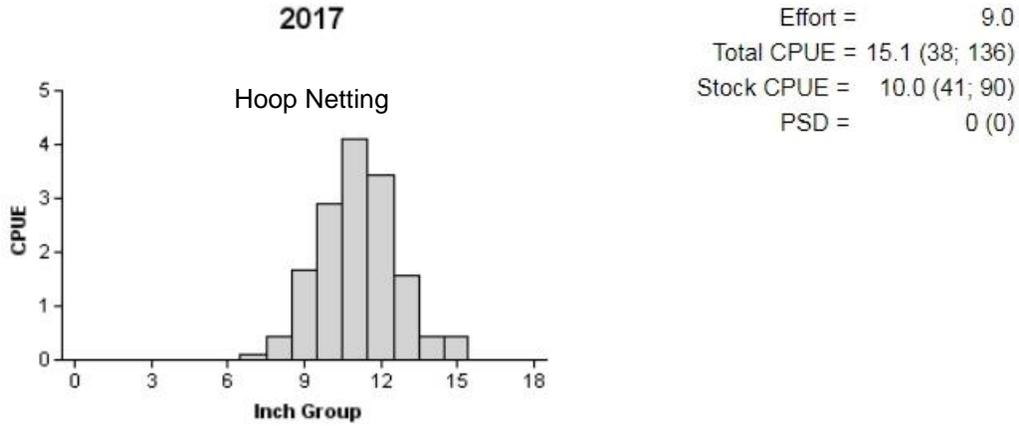


Figure 8. Number of Channel Catfish caught per hoop net series (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for hoop net survey, Lake Waxahachie, Texas, 2017.

## White Bass

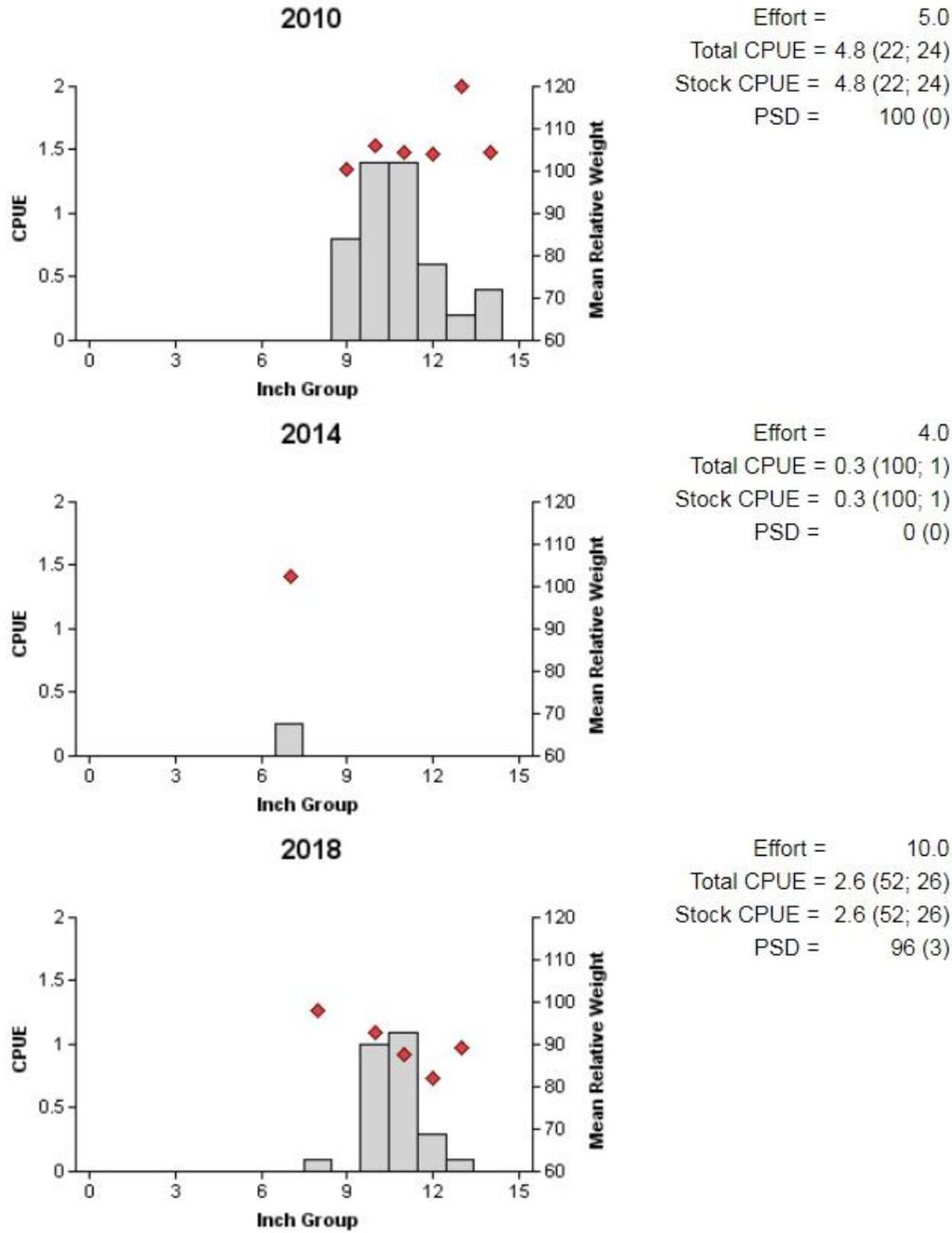


Figure 9. Number of White Bass caught per net night (CPUE), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Waxahachie, Texas, 2010, 2014 and 2018.

## Largemouth Bass

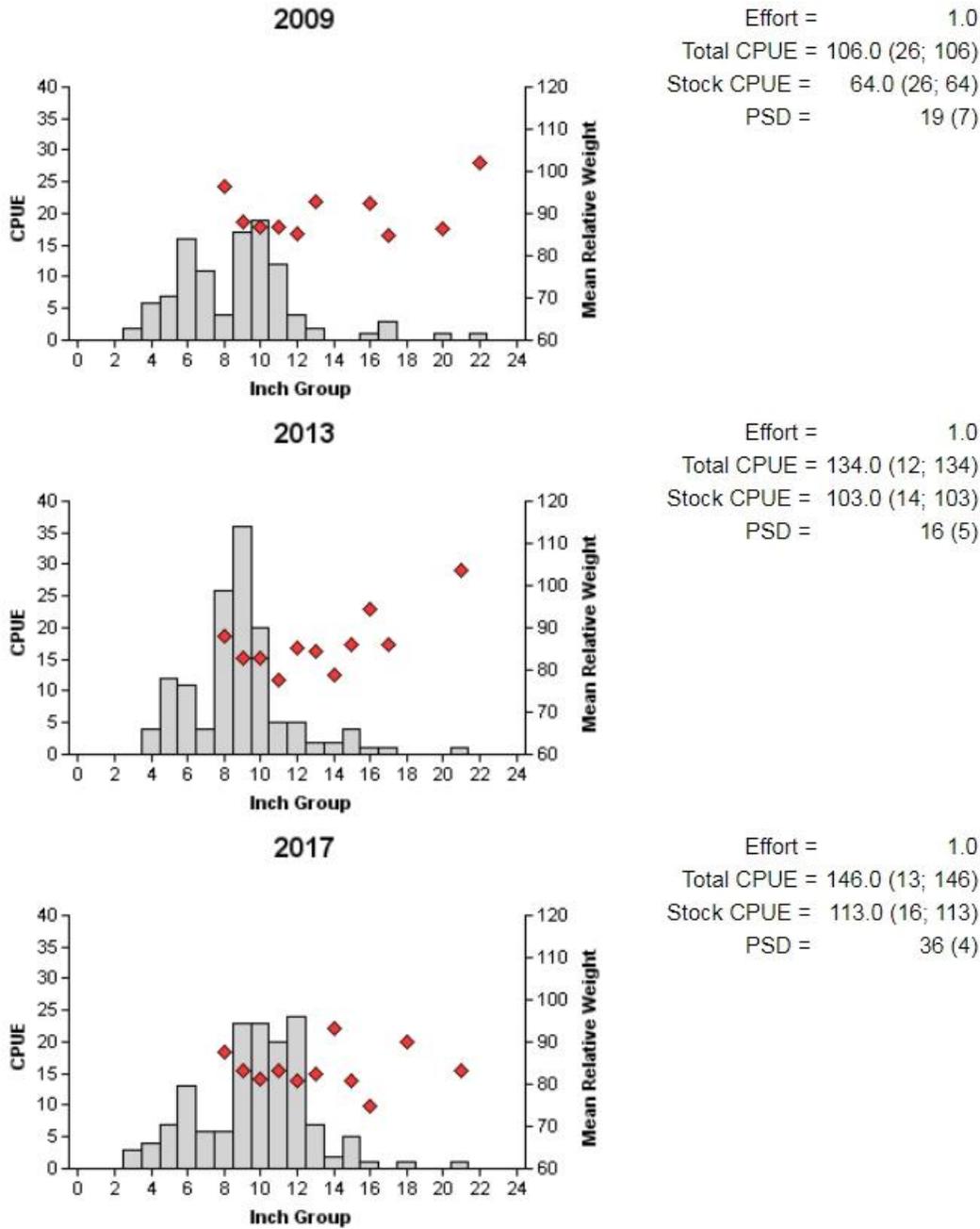


Figure 10. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Waxahachie, Texas, 2009, 2013 and 2017.

## Crappie

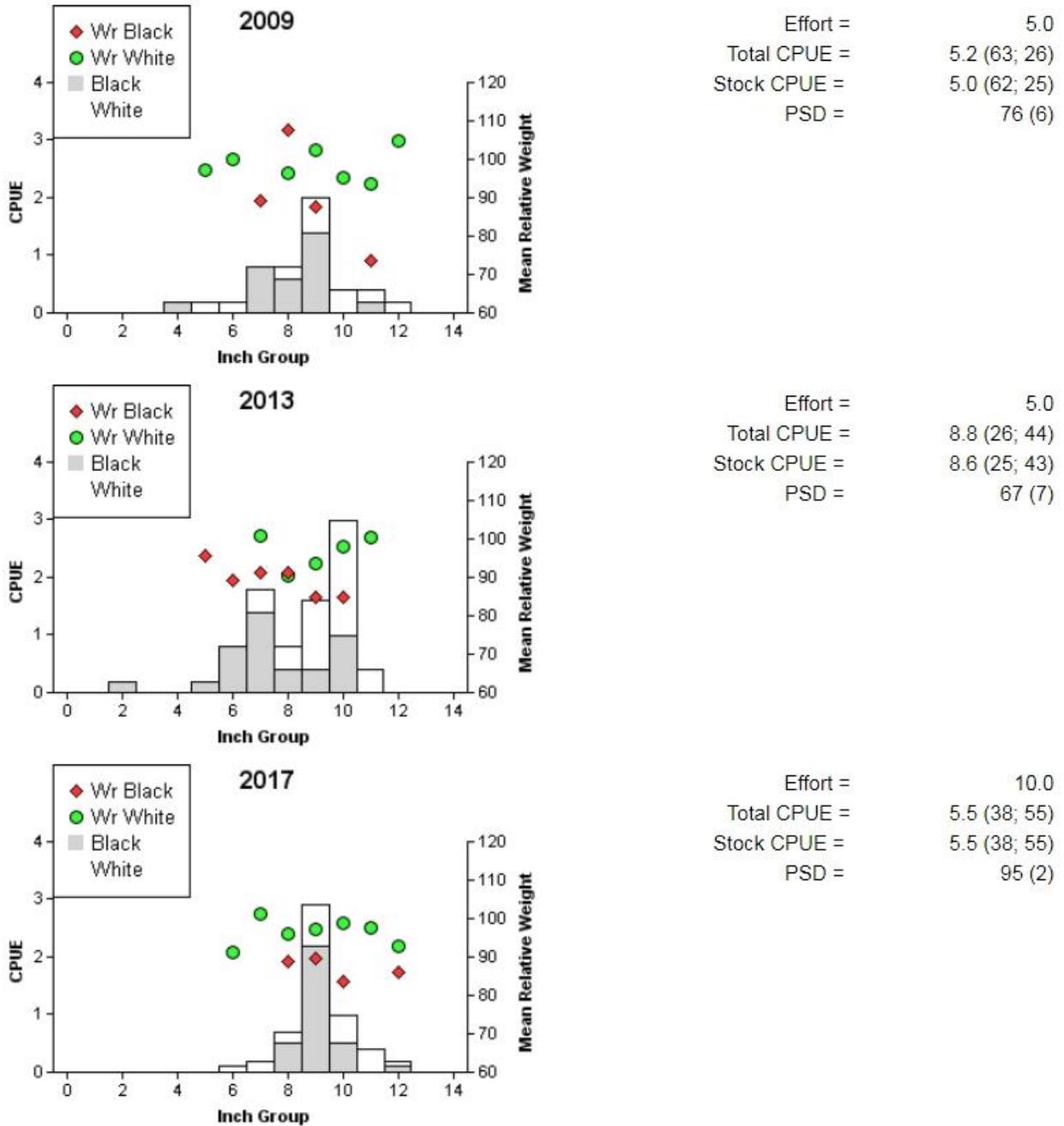


Figure 11. Number of Crappie caught per net night (CPUE, grey bars for Black Crappie, white bars for White Crappie), mean relative weight (diamonds for Black Crappie, Circles for White Crappie), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Lake Waxahachie, Texas, 2009,2013 and 2017.

## Proposed Sampling Schedule

Table 7. Proposed sampling schedule for Lake Waxahachie, 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.

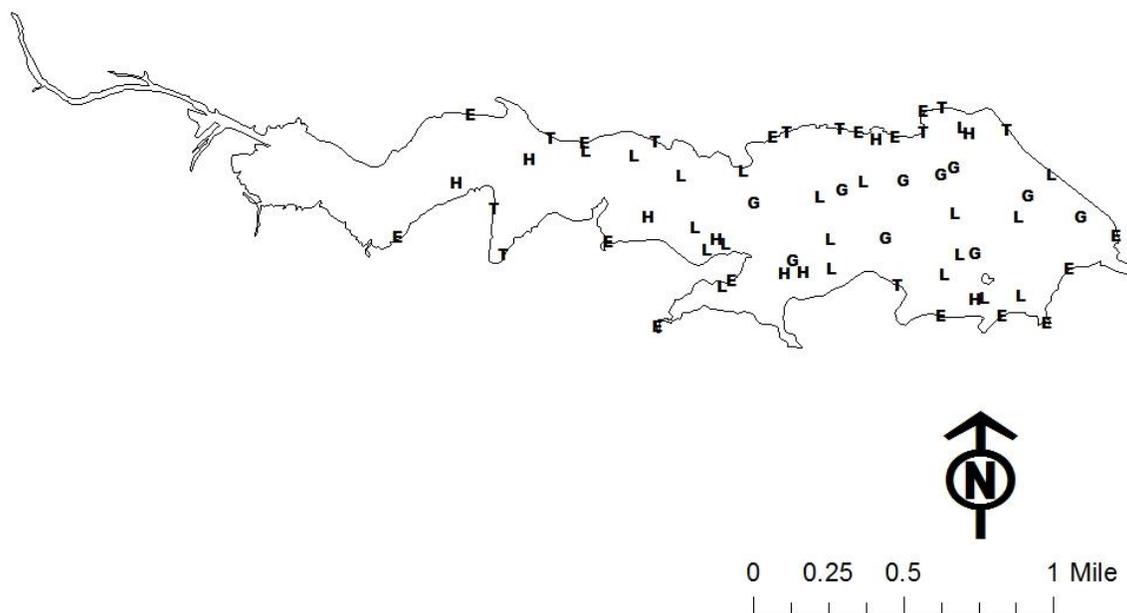
	Survey year			
	2018-2019	2019-2020	2020-2021	2021-2022
Angler Access				S
Vegetation				S
Electrofishing				S
Gill netting				S
Trap netting				S
Report				S

## 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 Lake Waxahachie, Texas, 2017-2018. Sampling effort was 10 net nights for trap netting and gill netting, 10 tandem hoop-net series, 1.5 hours for electrofishing, and 1.6 hours for low-frequency electrofishing.

Species	Gill Netting		Trap Netting		Hoop Netting		Electrofishing		Low-Frequency Electrofishing	
	N	CPUE	N	CPUE	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad							45	45.0(24)		
Threadfin Shad							8	8.0(62)		
Blue Catfish	39	3.9(18)							40	24.5(46)
Channel Catfish	35	3.5(21)			136	15.11(38)				
Flathead Catfish	1	0.1(100)								
White Bass	26	2.6(52)								
Warmouth							18	18.0(39)		
Bluegill							258	258.0(12)		
Longear Sunfish							62	62.0(33)		
Redear Sunfish							55	55.0(21)		
Largemouth Bass							146	146.0(13)		
White Crappie			22	2.2(36)						
Black Crappie			33	3.3(44)						

## APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Waxahachie, Texas, 2016-2018. Gill net, Hoop net, Trap net, Low-frequency Electrofishing and Electrofishing stations are indicated by G, H, T, L and E, respectively. Water level was near full pool at time of sampling.



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