

# Joe Pool Reservoir

## 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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## Survey and Management Summary

Fish populations in Joe Pool Reservoir were surveyed in 2015 and 2017 using electrofishing, in 2017 using trap nets and in 2018 using gill nets. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

**Reservoir Description:** Joe Pool Reservoir, a 7,470-acre reservoir located on Mountain Creek (a tributary of the Trinity River), was constructed in 1986 by the U.S. Army Corps of Engineers for flood control, water supply, recreation, and fish and wildlife enhancement. It was opened to public fishing in August 1989. Joe Pool Reservoir is in Tarrant, Ellis, and Dallas Counties four miles south of Grand Prairie, Texas. Historically habitat was composed mainly of shoreline emergent vegetation, submersed vegetation in the form of Hydrilla (*Hydrilla verticillata*), American Pondweed (*Potamogeton nodosus*), and flooded timber. However, at the time of sampling, fish habitat was greatly reduced due to recent flooding and was limited to mainly flooded timber.

**Management History:** Important sport fish include White Bass, Largemouth Bass, White Crappie, and Channel and Blue Catfish. Largemouth Bass have been intensively managed through harvest regulations and opened with an 18-inch minimum length limit. This regulation was changed to a 14-to 21-inch slot length limit in fall 1992.

### Fish Community

- **Prey species:** Gizzard and Threadfin Shad were present in the reservoir. Catch rates of these species remain well below averages of other district reservoirs. This could be the result of the low productivity of the water. However, reservoir productivity is increasing which could benefit Gizzard and Threadfin Shad populations.
- **Catfishes:** Blue Catfish catch rates continued to increase with several large fish ( $\geq 30$  inches) captured in gill nets. Catch rate of Channel Catfish also increased compared to previous years. Flathead catfish are present but none were captured during the most recent survey.
- **White bass:** White Bass catch rates were below rates observed in previous surveys.
- **Largemouth Bass:** The Largemouth Bass catch rates decreased from previous surveys. This was likely due to decrease in vegetation habitat. Average body condition continued to be below optimal levels as in previous surveys.
- **White Crappie:** White Crappie catch rates almost doubled from the previous survey. The catch rate of White Crappie  $\geq 10$  inches also increased.

**Management Strategies:** An additional electrofishing survey will be conducted in 2018 and general monitoring with trapnetting, gillnetting, and electrofishing in 2021-2022. Annual aquatic vegetation surveys will be conducted to monitor hydrilla coverage.

## Introduction

This document is a summary of fisheries data collected from Joe Pool Reservoir in 2015-2018. 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 2015-2018 data for comparison.

## Reservoir Description

Joe Pool Reservoir is a 7,470-acre impoundment constructed in 1986 on Mountain Creek (a tributary of the Trinity River) by the United States Army Corps of Engineers (USACE) for flood control, water supply, recreation, and fish and wildlife enhancement. Joe Pool Reservoir is in Tarrant, Ellis, and Dallas Counties, four miles south of Grand Prairie, Texas. The watershed was primarily agricultural but is being developed for residential purposes. Land use on the northeast side of the reservoir is maintained by Cedar Hill State Park. Joe Pool Reservoir historically has had low productivity measured by chlorophyll a production and low total phosphorus levels. This has undoubtedly had an impact on the limited forage available for sport fish populations. However, with urban development around the reservoir, it has become more productive and now ranks 88 out of 136 reservoirs in productivity (Texas Commission on Environmental Quality 2018). Because Joe Pool is not a major water supply source, water levels are fairly stable with the exception of flooding events (Figure 1). At the time of sampling the fishery habitat was composed mainly of non-descript bank and flooded timber. Other descriptive characteristics for Joe Pool Reservoir are in Table 1.

## Angler Access

Joe Pool Reservoir has seven public boat ramps and no private boat ramps. Additional boat ramp characteristics are in Table 2. Shoreline access for bank anglers is good within the numerous parks that are around the reservoir.

## Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Brock and Hungerford 2013) included:

1. Conduct annual vegetation surveys to monitor Hydrilla coverage.
 

**Action:** Annual summer vegetation surveys were conducted from 2013-2017 to monitor Hydrilla abundance.
2. Stock Florida Largemouth Bass.
 

**Action:** Florida Largemouth Bass were stocked in 2015.
3. Plant floating leaf vegetation.
 

**Action:** No plantings occurred due to flooding conditions and hard substrate that was encountered during previous plantings.
4. Cooperate with and contact the controlling authority, contact and educate marina owners and the boating and fishing public about invasive species.
 

**Action:** Any additional information regarding Zebra Mussels in Texas was shared with controlling authority and marina operators.

**Harvest regulation history:** Sport fish populations in Joe Pool Reservoir are managed with statewide regulations except for Largemouth Bass (Table 2). From 1989 to 1991, Largemouth Bass were managed with an 18-inch minimum length limit. A 14- to 21-inch slot length limit was implemented in 1992 to improve growth rates, fish condition, and the population size structure. Current regulations are found in Table 3.

**Stocking history:** Joe Pool Reservoir was stocked in 2015 with Florida Largemouth Bass. The complete stocking history is in Table 3.

**Vegetation/habitat management history:** Joe Pool Reservoir is currently lacking any significant amounts of aquatic vegetation. This is due in part to high water levels observed the last several years. Historically, vegetation was composed of sporadic stands of American Pondweed and shoreline emergent stands of American Water-willow (*Justicia americana*), and Common Reed (*Phragmites australis*). Hydrilla was first observed in Joe Pool Reservoir in 1994. At that time, it comprised less than 0.10 acres. No Hydrilla was observed in vegetation surveys conducted in 1995, 1996, 1997, 1999 or 2000. Small stands (less than 1 acre in size) of Hydrilla were observed in 1998 and again in 2001 near the Lynn Creek Park boat ramps. In 2002, Hydrilla was evident at numerous locations around the reservoir with a total coverage estimated to be 13 acres. One year later, Hydrilla expanded to an estimated 116 acres. In 2004, 2005, and 2006, Hydrilla coverage fluctuated between 120 and 106 acres. Large dense stands of Hydrilla were primarily along the shores of Cedar Hill State Park and Lynn Creek Park. The boat ramps and swimming beaches were treated at both parks in summer 2004 with aquatic herbicide. In summer 2005, the City of Grand Prairie conducted herbicide treatments to their swimming areas and boat ramps and also conducted a first-time herbicide treatment at Britton Park. Hydrilla abundance decreased in 2007 to 7.5 acres. From 2008-2010 less than an acre was reported. Hydrilla reappeared in 2011 and covered an estimated 31.7 acres. In 2012 and 2013, Hydrilla covered an estimated 63.1 and 115.0 acres, respectively. Some mechanical harvest of hydrilla was conducted around the state park marina. In 2014, a trace amount was found, but Hydrilla was not observed in surveys conducted from 2015-2017.

**Zebra mussels:** The exotic species Zebra Mussels has been found in several DFW area reservoirs. Joe Pool Reservoir has tested positive for Zebra Mussel DNA as determined by PCR analysis conducted by the United States Geologic Survey (USGS). However, no adults or larva have been found in the reservoir.

**Water transfer:** Joe Pool Reservoir is primarily used as water supply for the City of Midlothian and an irrigation supply for the City of Grand Prairie. No interbasin transfers exist. In the future, the Cities of Duncanville and Cedar Hill will also be using water from the reservoir.

## Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Joe Pool 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 2015).

**Electrofishing** – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1.5 hours at 18, 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.

**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).

**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).

**Genetics** – Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015). Micro-satellite DNA analysis was used to determine genetic composition of individual fish from 2005 through 2012 and by electrophoresis for previous years.

**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 ( $W_t$ )] were calculated for target fishes according to Anderson and Neumann (1996). Palmetto Bass PSD was calculated according to Dumont and Neely (2011). 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 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

**Habitat** – A structural habitat survey was conducted in 2012. Vegetation surveys were conducted in 2014–2017 to monitor the presence of hydrilla.

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

## Results and Discussion

**Habitat:** Vegetation surveys to locate and measure Hydrilla abundance were conducted from 2013-2017. None was observed in the most recent surveys of 2015-2017 (Table 5).

**Prey species:** Electrofishing catch rate of Gizzard Shad observed in 2017 (70.7/h) was much lower than the rate observed in 2015 (179.3/h) (Figure 2.). The catch rate of Gizzard Shad observed in 2015 and 2017 were above and below respectively than the reservoir average of 101.5 (Appendix C). Index of vulnerability for Gizzard Shad was good in 2015 (92) but poor in 2017 (48; Figure 2). The electrofishing catch rate of Threadfin Shad was 196.7/h in 2015 and decreased to 54.0/h in 2017. The rate observed in 2015 and 2017 was above and below respectively of the reservoir average of 93.8/h (Appendix C). Electrofishing catch rate of Bluegill was 78.7/h in 2015 and 14.0/h in 2017 (Figure 3). These rates were well below the reservoir average of 136.5/h (Appendix C). The number of quality-sized Bluegill ( $\geq 6$  inches) decreased drastically from 16.0/h in 2015 to 2.0/h in 2017. Longear Sunfish catch rates were near the reservoir average of 33.8/h in 2015 (34.0/h) and well below average in 2017 (1.7/h). Objective-based sampling objectives were met for Gizzard Shad but were not for Bluegill. Because habitat suitable for Bluegill was limited, it was deemed inefficient to continue electrofishing to capture additional fish.

**Catfishes:** Blue Catfish were first captured by gill netting in 2006 (Appendix C). The catch rates have been low but have gradually increased in subsequent surveys. The gill netting catch rate of Blue Catfish in 2018 was 3.6/nn and was the highest rate observed to date (Figure 4, Appendix C). Condition values

of fish captured were near or above 90 for most size classes (Figure 4). Size structure of the Blue Catfish population remained consistent with the previous survey (Figure 4). The gill net catch rate of Channel Catfish was 5.1/nn in 2018 which was higher than the two previous rates observed in 2014 (4.3/nn) and 2010 (1.4/nn; Figure 5). It was also above the reservoir average of 2.8/nn (Appendix C). Most Channel Catfish collected were less than 15 inches. Condition of the fish were above or near 80 for most size classes.

**White Bass:** White Bass were first collected by gill netting in Joe Pool in 1994 (Appendix C). The gill netting catch rates of White Bass have historically been low (Appendix C). The catch rate in 2018 was 0.6/nn which was the lowest on record and drastically lower than the catch rate observed in 2014 (13.4/nn; Figure 7). Yellow Bass were collected for the first time in in 2014 (Appendix C), but were not collected in the 2018 survey (Appendix A).

**Largemouth Bass:** Total electrofishing catch rate of Largemouth Bass observed in 2017 (46.0/h) was much lower than rate observed in 2015 (117.3/h) and below the reservoir average (Figure 7; Appendix C). The catch rate of Largemouth Bass  $\geq$  14 inches decreased from 12.7/h in 2015 to 5.3/h in 2017. Size structure of the population remained stable from 2015-2017 with PSD values of 40 and 49, respectively. The decrease in catch rates could be attributed to poor habitats found at sampling sites because of recent flooding which eliminated much of the shoreline emergent habitat. Objective-based sampling objectives were considered met for Largemouth bass although the sample was 7 stock size fish short of the 50 fish needed for size structure estimation and RSE for total catch was slightly above the 25 threshold listed in objectives.

**White Crappie:** Trap net catch rate of White Crappie was 19.4/nn in 2017, which almost doubled the previous survey (Figure 18). Population size structure had improved as PSD value increased from 53 in the previous survey to 82 in the most recent survey.

# Fisheries Management Plan for Joe Pool Reservoir, Texas

Prepared – July 2018

**ISSUE 1:** Hydrilla has been documented in Joe Pool Reservoir. High coverage of Hydrilla can cause negative impacts to boating access.

## MANAGEMENT STRATEGY

1. Conduct annual vegetation surveys to monitor Hydrilla.

**ISSUE 2:** Most recent electrofishing data showed drastically lower number of Largemouth Bass and Bluegill. Data needs to be collected to determine if the lower numbers are an outlier or if more investigation is needed to determine the cause.

## MANAGEMENT STRATEGIES

1. Conduct an additional fall electrofishing survey in 2018 to collect data on Largemouth Bass and sunfish populations. A standard fall electrofishing survey will be conducted in fall of 2021.

**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. 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 using 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

Important sport fishes in Joe Pool Reservoir include Largemouth Bass, Channel and Blue Catfish, White Bass, and White Crappie. Known important forage species include Bluegill, Longear Sunfish, Theadfin and Gizzard Shad.

Low-density fisheries

**Flathead Catfish:** Flathead Catfish are present in Joe Pool Reservoir, however, they are rarely captured in gill nets. Data on CPUE and size structure will be recorded from all Flathead Catfish collected by gill nets targeting Catfish and White Bass.

Survey objectives, fisheries metrics, and sampling objectives

**Catfishes:** Catfishes are the second most sought after sport fish in Joe Pool Reservoir (12 % of total angling effort; creel conducted 2013-2014). It is currently not known what percentage of catfish anglers prefer Blue and which prefer Channel Catfish. However, based on observations of angler effort trends on other district reservoirs, more of the effort is probably directed toward Blue Catfish. The popularity of catfish fishing at this reservoir warrants sampling time and effort. A gill net survey consisting of 10 gill nets will be conducted in spring of 2022 to determine CPUE and size structure of both species. Based on past catch rates, this should be adequate to obtain an RSE of CPUE-S  $\leq 25$  and size structure (PSD; 50 fish minimum at 15 stations with 80% confidence). If RSE objectives are not met no additional gillnetting will be conducted.

**White Bass:** Previous creel survey data indicated only 1.9% of anglers targeted White Bass in Joe Pool Reservoir. Data on White Bass will be collected when the gill net survey for catfishes is conducted in the spring of 2022. This should give an idea of the population status when compared to past surveys. No sampling objectives will be set for White Bass because of the low popularity of the species and variability in year class strength of the population.

**Largemouth Bass:** According to the most recent creel survey conducted on Joe Pool Reservoir (2013-2014), 47.3 % of anglers target Largemouth Bass and they are the most popular sport fish in the reservoir. The popularity of Largemouth Bass fishing at this reservoir warrants sampling time and effort. Trend data on CPUE, size structure, and body condition have been collected annually for many years with fall nighttime electrofishing. To continue the monitoring of Largemouth bass, fall nighttime electrofishing will be conducted. A minimum of 18 randomly selected 5-min electrofishing sites will be sampled in fall of 2018 and 2021. The sample scheduled for fall 2018 is in response to the low catch rate observed for Largemouth Bass during sampling in 2017. Based on past catch rates, this should be adequate to obtain an RSE of CPUE-S  $\leq 25$  and size structure estimates (the anticipated effort to meet both sampling objectives is 18 stations with 80% confidence) (PSD; 50 fish minimum at 18 stations with 80% confidence). If the RSE objective is not met, additional electrofishing sampling will only continue if 50 stocked sized or larger fish are not captured in the 18 sample sites.

**Bluegill, Longear Sunfish, Theadfin and Gizzard Shad:** Bluegill, Longear Sunfish, and Theadfin and Gizzard Shad are the primary forage in Joe Pool Reservoir. Like Largemouth Bass, trend data on CPUE and size structure have been collected with fall nighttime electrofishing. The electrofishing for Largemouth Bass will allow for monitoring of large-scale changes in Bluegill, Longear Sunfish, and Theadfin and Gizzard Shad relative abundance and size structure. Sampling effort for Largemouth Bass should result in sufficient numbers of Bluegill, Longear Sunfish, and Theadfin and Gizzard Shad for size structure estimation (PSD and IOV; 50 fish minimum at 18 stations with 80% confidence).

**White Crappie:** Previous creel survey data indicate White Crappie angling comprised 11% of total angling effort. A trap-netting survey consisting of 10 single-cod shoreline nets will be conducted in fall of 2021. This should provide sufficient information for monitoring of large-scale changes of population.

## Literature Cited

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## Tables and Figures

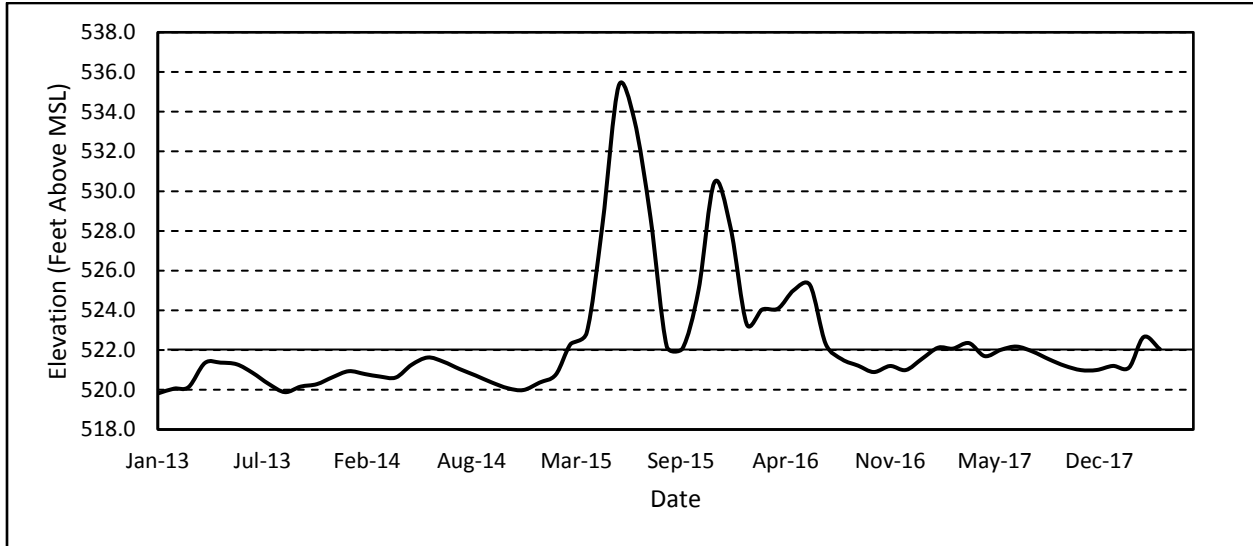


Figure 1. Water level elevations in feet above mean sea level (MSL) recorded for Joe Pool Reservoir, Texas, January 2013- April 2018. Conservation pool (522 MSL) is noted with solid black line.

Table 1. Characteristics of Joe Pool Reservoir, Texas.

Characteristic	Description
Year constructed	1986
Year opened	1989
Controlling authority	United States Army Corps of Engineers
County	Dallas
Reservoir type	Tributary Trinity River
Conductivity	428 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Joe Pool Reservoir, Texas, August 2017. Reservoir elevation at time of survey was 522 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
	32.6142				
State Park South Ramps	-96.9950	Y	80	516.5	Good
	32.6271				
State Park Main Ramps	-96.9823	Y	90	510.5	Good
	32.6323				
Lynn Creek Park North	-97.0228	Y	50	513.0	Good
	32.6313				
Lynn Creek Park South	-97.0250	Y	50	515.0	Good No courtesy dock
	32.6310				
Lynn Creek Marina	-97.0395	Y	100	510.0	Good
	32.5479				
Britton Park	-97.0535	Y	90	513.5	Good
	32.6189				
Loyd Park	-97.0625	Y	50	510.0	Good No courtesy dock

Table 3. Harvest regulations for Joe Pool Reservoir, Texas.

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 (only 1 > 21 inches)	14- to 21-inch slot
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Joe Pool Reservoir, Texas. FRY= fry, FGL = fingerling; AFGL = advanced fingerling; ADL = adults. UNK=unknown.

Year	Number	Size
Theadfin Shad		
1981	1,000	AFGL
Coppernose Bluegill		
1981	19,995	UNK
1985	125,000	AFGL
1986	5,290	AFGL
Species Total	150,285	
Channel Catfish		
1986	750,000	FRY
Florida Largemouth Bass		
1981	2,970	FRY
1984	2,700	FRY
1986	665,810	FRY
1987	203,315	FRY
2001	182,049	FGL
2005	317,036	FGL
2006	325,681	FGL
2015	74,756	FGL
Species Total	1,744,317	

Table 5. Objective-based sampling plan components for Joe Pool Reservoir, Texas 2017–2018.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock $\leq$ 25
	Size structure	PSD, length frequency	N $\geq$ 50 stock
	Condition	$W_r$	N $\geq$ 50 stock
Bluegill <sup>a</sup>	Abundance	CPUE–Total	None
	Size structure	PSD, length frequency	N $\geq$ 50 stock
Gizzard Shad <sup>a</sup>	Abundance	CPUE–Total	None
	Size structure	PSD, length frequency	None
	Prey availability	IOV	None
<i>Trap netting</i>			
Crappie	Size structure	PSD, length frequency	None
<i>Gill netting</i>			
Blue Catfish	Size structure	PSD, length frequency	None
Channel Catfish	Size structure	PSD, length frequency	None

<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, Joe Pool Reservoir, Texas, 2009–2012. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2014	2015	2016	2017
Non-native				
Hydrilla (Tier III)*	1 < (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)

\*Tier III is Watch Status

## Gizzard Shad

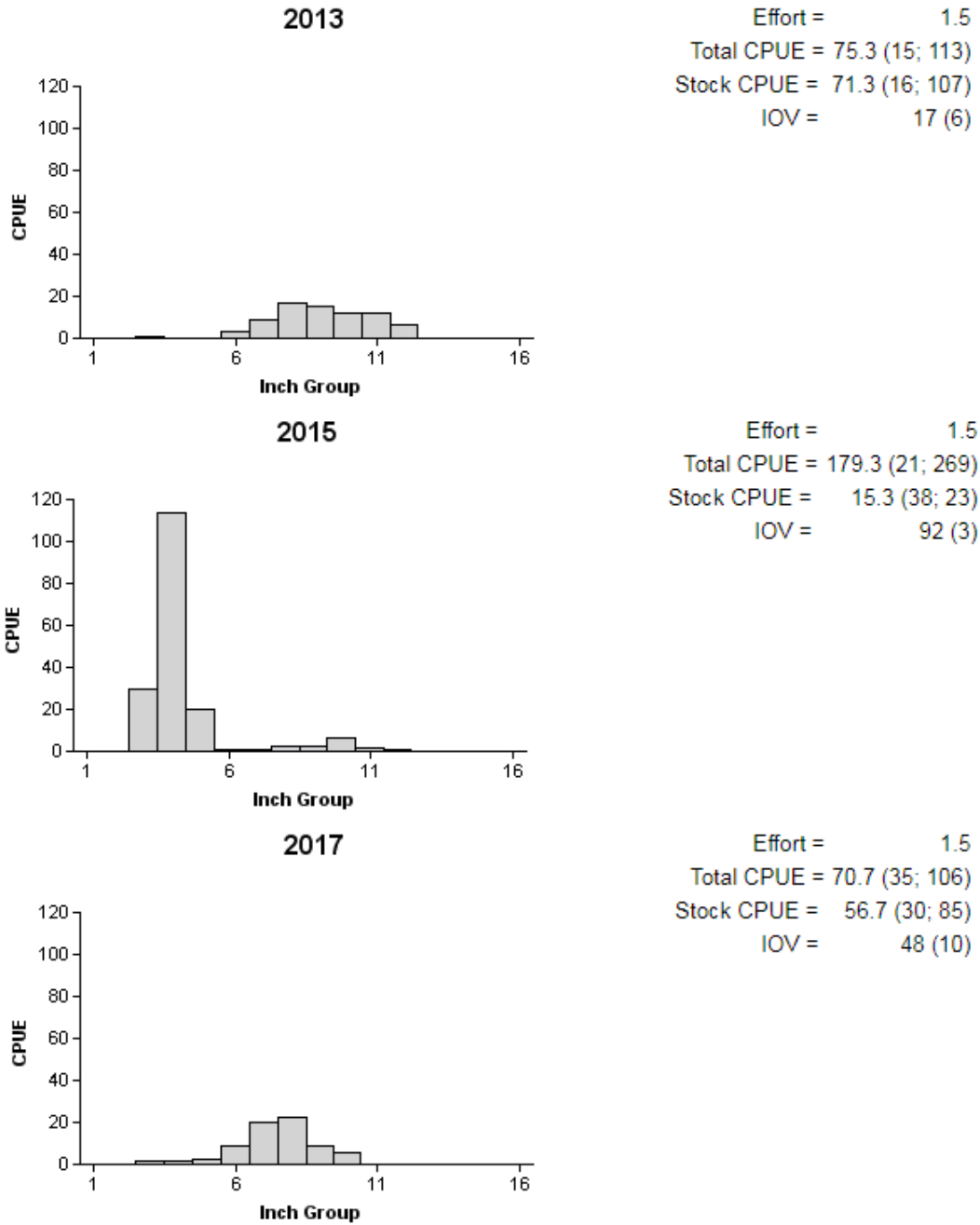
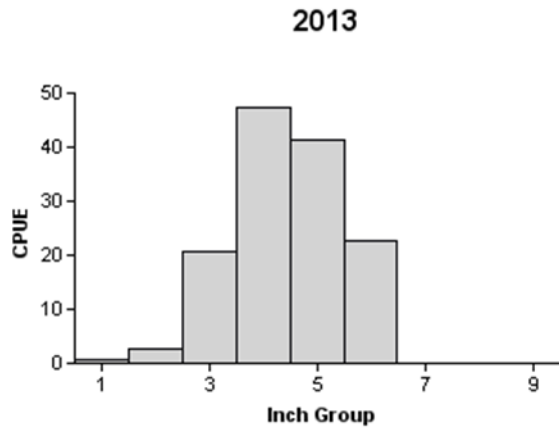


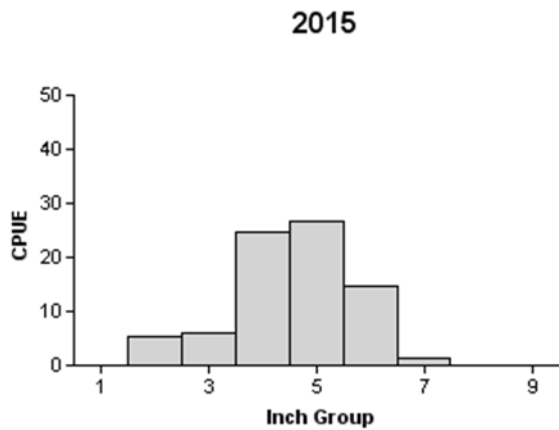
Figure 2. Number of Gizzard Shad caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Joe Pool Reservoir, Texas, 2013, 2015, and 2017.



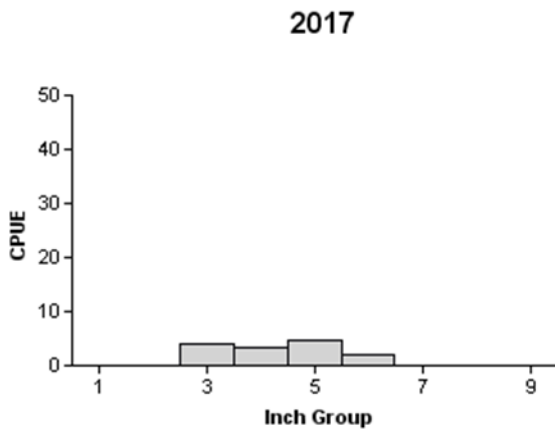
## Bluegill



Effort = 1.5  
 Total CPUE = 135.3 (27; 203)  
 Stock CPUE = 132.0 (28; 198)  
 CPUE-6 = 22.7 (32; 34)  
 PSD = 17 (3)



Effort = 1.5  
 Total CPUE = 78.7 (22; 118)  
 Stock CPUE = 73.3 (23; 110)  
 CPUE-6 = 16.0 (26; 24)  
 PSD = 22 (4)



Effort = 1.5  
 Total CPUE = 14.0 (47; 21)  
 Stock CPUE = 14.0 (47; 21)  
 CPUE-6 = 2.0 (73; 3)  
 PSD = 14 (6)

Figure 3. Number of Bluegill caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Joe Pool Reservoir, Texas, 2013, 2015, and 2017.

### Blue Catfish

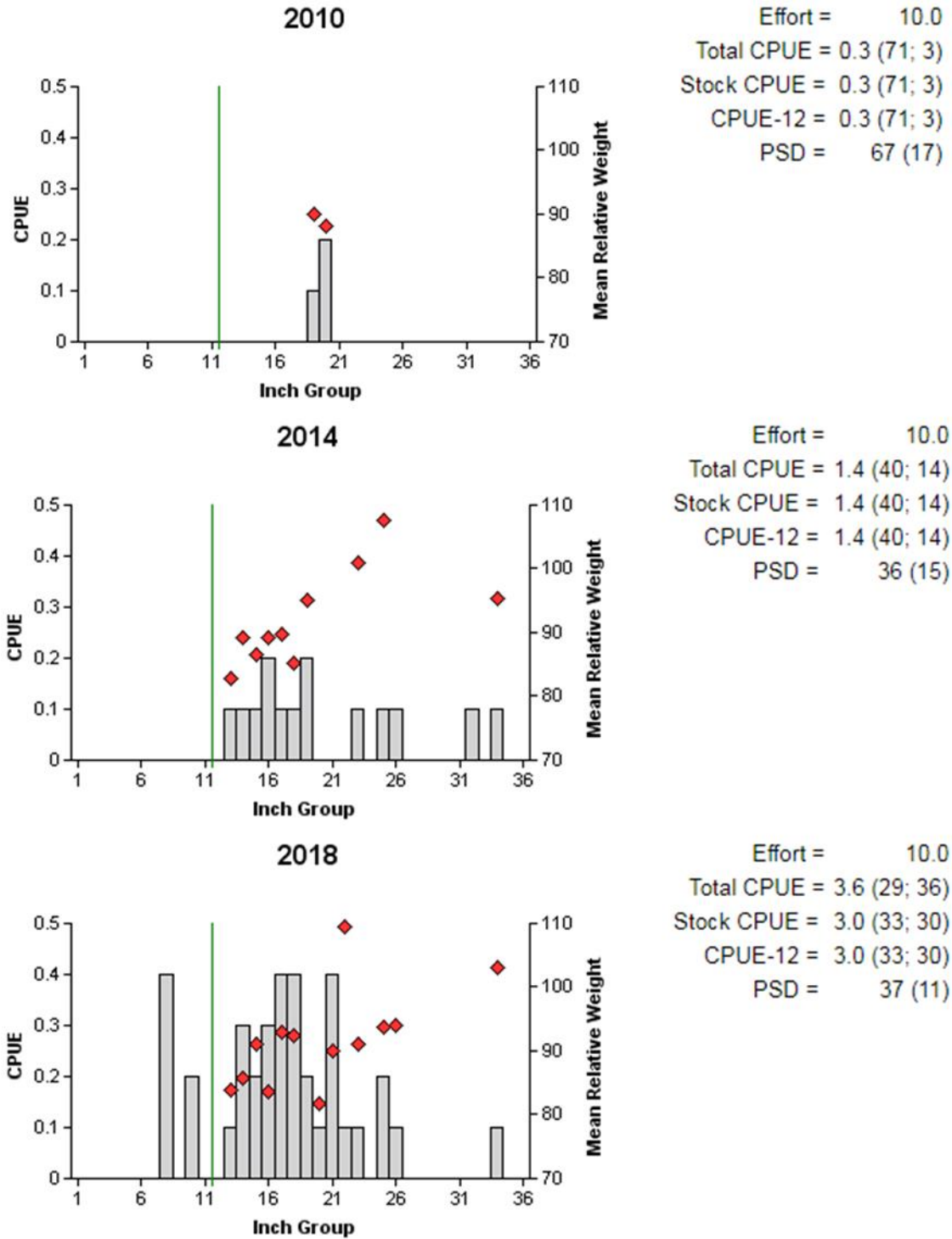


Figure 4. Number of Blue Catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Joe Pool Reservoir, Texas, 2010, 2014, 2018. Vertical line represents length limit at time of sampling.

### Channel Catfish

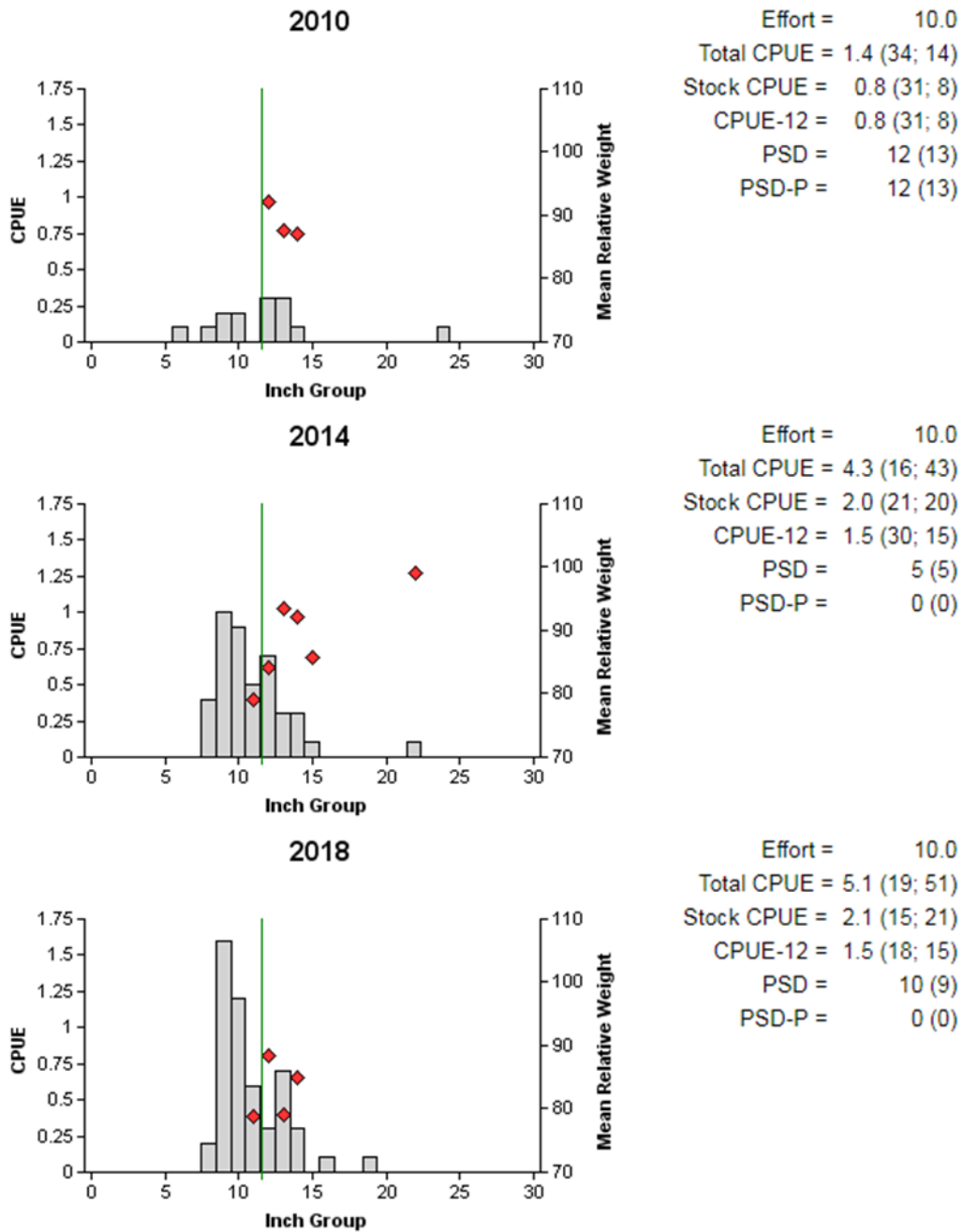


Figure 5. Number of Channel Catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Joe Pool Reservoir, Texas, 2010, 2014, and 2018. Vertical line represents length limit at time of sampling.

## White Bass

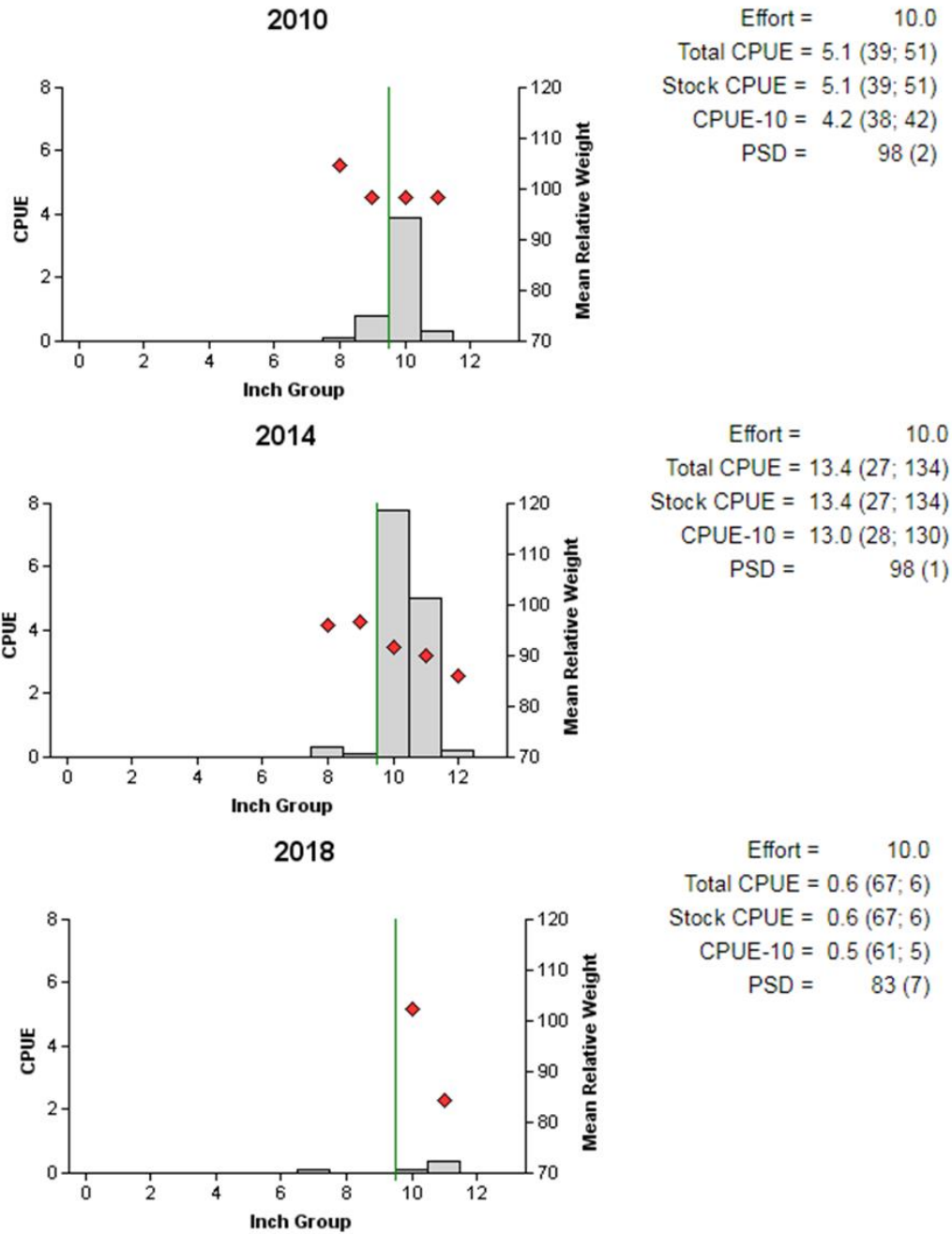


Figure 6. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Joe Pool Reservoir, Texas, 2010, 2014, and 2018. Vertical line represents length limit at time of sampling

## Largemouth Bass

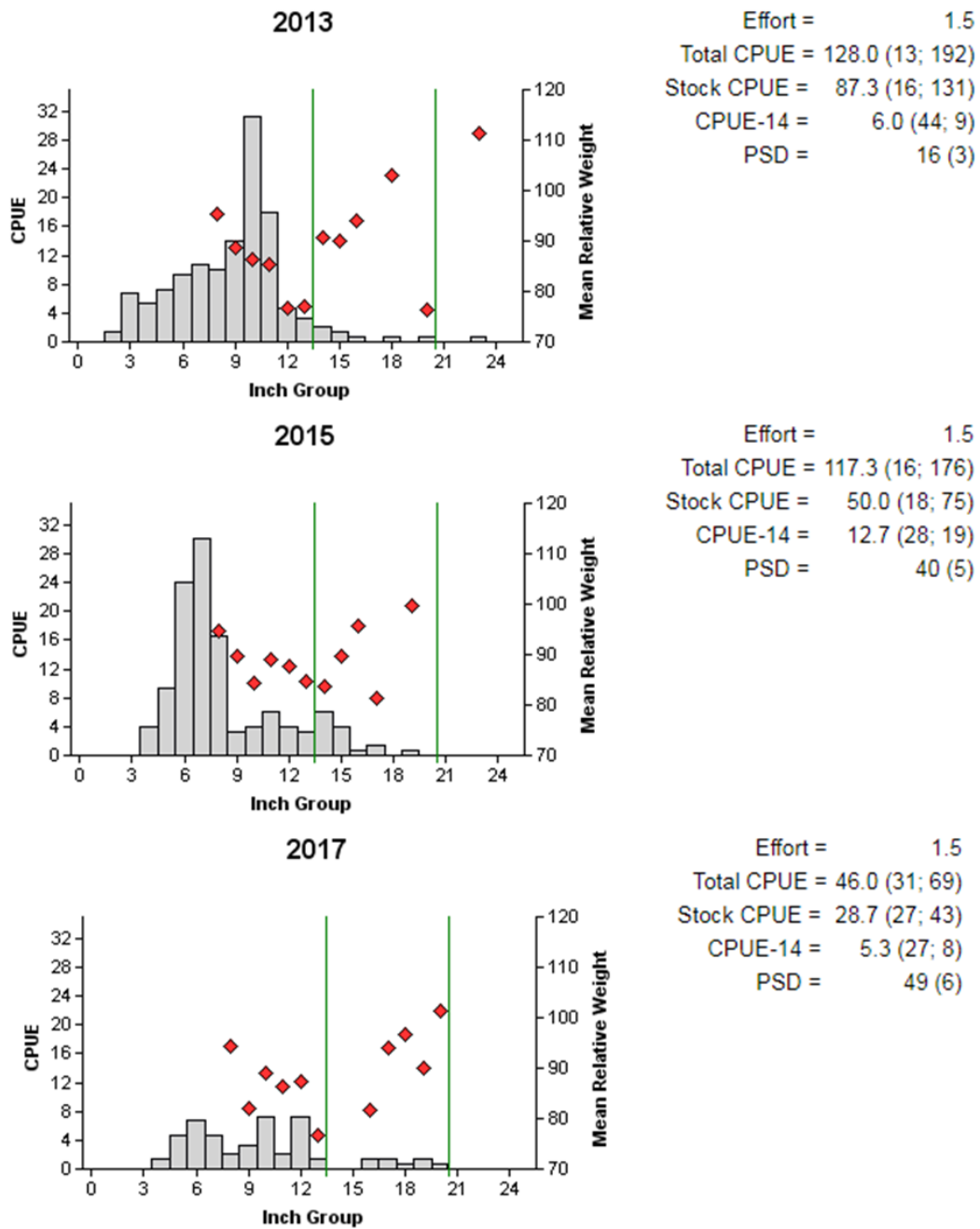


Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Joe Pool Reservoir, Texas, 2013, 2015, and 2017. Vertical line represents length limit at time of sampling.

Table 7. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Joe Pool Reservoir, Texas, 2004, 2008, and 2012. 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	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
2004	30	0	16	14	25	0
2009	30	0	28	2	52	0
2013	30	1	29	0	57	3.3

## White Crappie

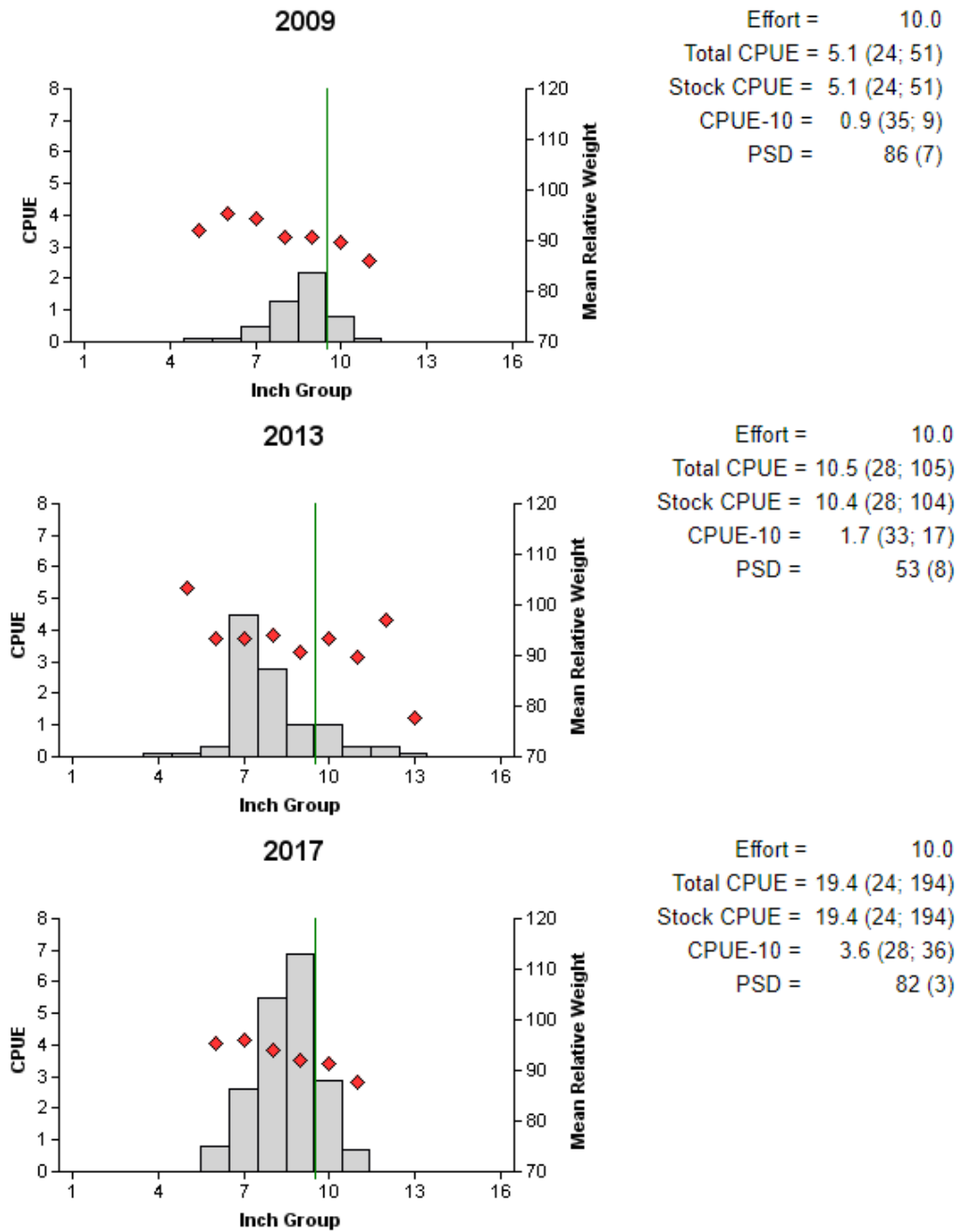


Figure 8. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Joe Pool Reservoir, Texas, 2009, 2013, and 2017. Vertical line indicates minimum length limit.

### Proposed Sampling Schedule

Table 8. Proposed sampling schedule for Joe Pool 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			
	2018-2019	2019-2020	2020-2021	2021-2022
Angler Access				S
Vegetation	A	A	A	S
Electrofishing – Fall	A			S
Trap netting				S
Gill netting				S
Report				S

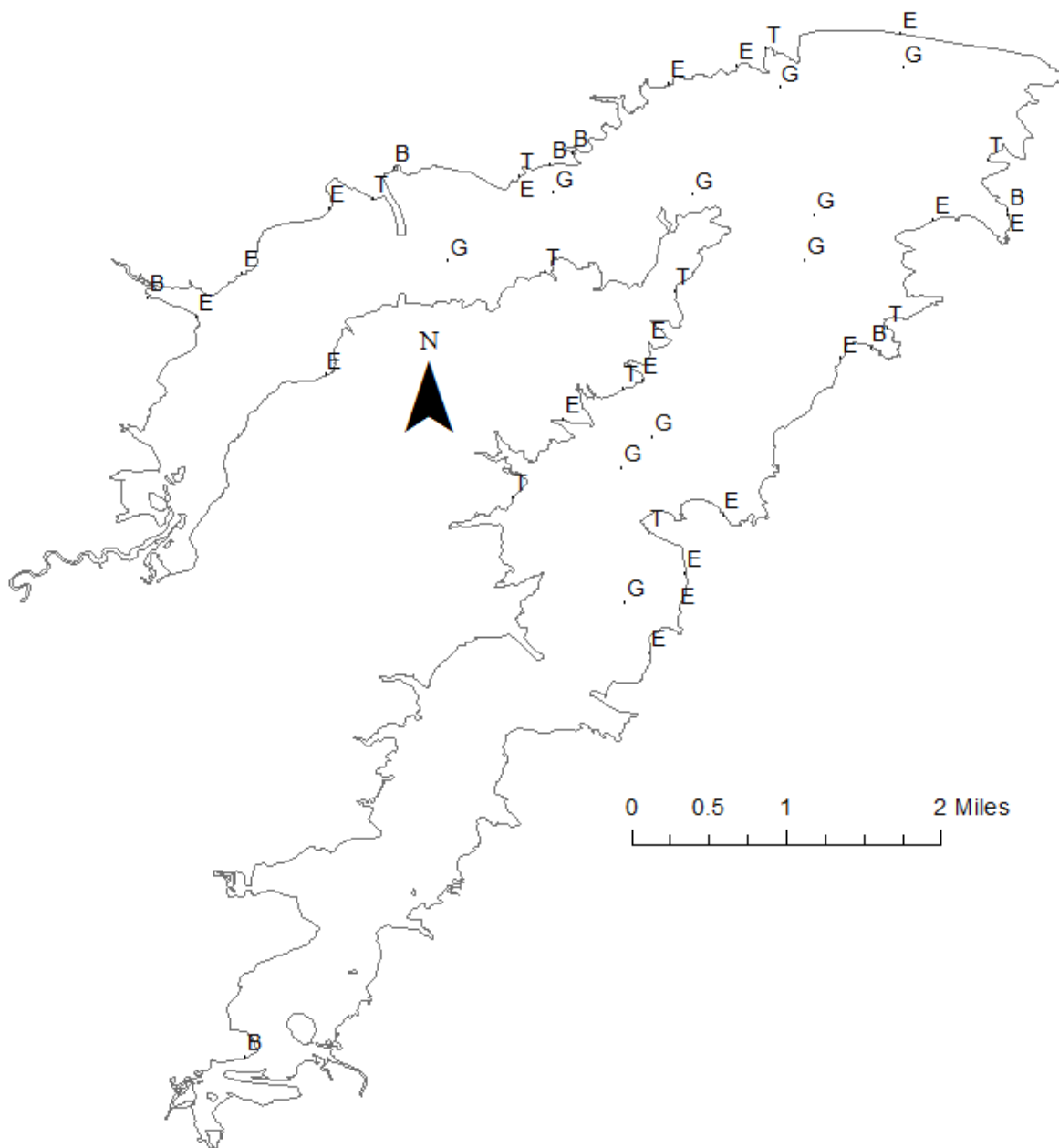


## APPENDIX A – Catch rates for all species from all gear types

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Joe Pool Reservoir, Texas, 2017-2018. Sampling effort was 10 net nights for gill netting, 10 net nights for trap netting, and 1.5 hours for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					106	70.7 (36)
Theadfin Shad					81	54 (45)
Common Carp	33	3.3 (24)				
Smallmouth Buffalo	12	1.2 (74)				
Blue Catfish	36	3.6 (29)				
Channel Catfish	51	5.1 (19)				
White Bass	6	0.6 (67)				
Bluegill					14	21 (47)
Longear sunfish					2	1.3 (100)
Largemouth Bass					69	46 (31)
White Crappie	33	3.3 (38)	194	19.4 (24)		
Freshwater Drum	17	7.1 (52)				

## APPENDIX B – Map of sampling locations



Location of sampling sites, Joe Pool Reservoir, Texas, 2017-2018. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was near full pool at time of all surveys.

**APPENDIX C – Historical catch rates of targeted species by gear type for Joe Pool Reservoir, Texas.**

Gear	Species	Year													
		1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000	2001	2002
Gill Netting (fish/net night)	Blue Catfish														
	Channel Catfish		3.0		1.0				2.1			3.1			2.5
	White Bass		0.0		0.0				2.1			0.8			0.9
	Yellow Bass		0.0		0.0				0.0			0.0			0.0
Electrofishing (fish/hour)	Gizzard Shad		110.0		187.0		153.0	71.0	120.0	112.0		110.7	132.7	90	152
	Theadfin Shad		36.0		12.0		13.0	0.0	22.0	26.0		11.3	84	45.3	149.3
	Bluegill		115.0		208.0		151.0		64.0	106.0		73.0	34.7	106.0	65.3
	Longear sunfish		50.0		101.0				36.0	44.0		45.0	26.0	61.0	28.7
	Largemouth Bass	92.0	120.7	144.0	151.3	144.4	143.5	106.5	113.3	119.0	133.3	91.3	104.0	90.0	78.0
Trap Netting (fish/net night)	White Crappie		15.0		7.0	7.3	4.9		1.5			2.3		18.5	17.9

## APPENDIX C – Continued

Gear	Species	Year													
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2017
Gill Netting (fish/net night)	Blue Catfish				0.4				0.3				1.4		
	Channel Catfish				3.0				1.4				4.3		
	White Bass				10.0				5.1				13.4		
	Yellow Bass				0.0				0.0				0.7		
Electrofishing (fish/hour)	Gizzard Shad	76.0	58.7	106	77.3	93.3	122.7	54.7	144.7	49.3	82.0	75.3		179.3	70.7
	Theadfin Shad	56.0	21.3	77.3	274.7	126	276.0	201.3	312	70.7	44.7	47.3		196.7	54.0
	Bluegill	94.0	346.7	228	235.3	385.3	78.0	98.0	103.3	106.0	178.0	135.3		78.7	14.0
	Longear Sunfish	32.7	33.3	14.0	4.7	54.0	6.0	34.7	38.7	46.0	8.67	9.3		34.0	1.3
	Largemouth Bass	55.3	82.7	141.3	88.0	121.3	101.8	81.3	78.7	128.0	108.7	128.0		117.3	46.0
Trap Netting (fish/net night)	White Crappie			5.2				5.1				10.5			19.4

## APPENDIX C – Continued

Gear	Species	Year	
		2018	Average
Gill Netting (fish/net night)	Blue Catfish	3.6	1.4
	Channel Catfish	5.1	2.8
	White Bass	0.6	3.7
	Yellow Bass	0.0	0.1
Electrofishing (fish/hour)	Gizzard Shad		105.6
	Theadfin Shad		93.8
	Bluegill		136.5
	Longear Sunfish		33.8
	Largemouth Bass		107.8
Trap Netting (fish/net night)	White Crappie		9.6



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