

PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2013 Fisheries Management Survey Report

**Lake Bryan**

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Bryan were surveyed in 2013 using electrofishing and trap netting and in 2014 using gill netting. Historical data are presented with the 2013-2014 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 Bryan is a 732-acre reservoir in Brazos County, Texas, built by Bryan Texas Utilities (BTU) to provide water for power-plant cooling. The lake has a small watershed with a water-well owned by BTU to help maintain water level. The lake is located within a public park, and access for both boat and bank angling is excellent. The primary fish habitat is limestone riprap and scattered native emergent vegetation.
- **Management History:** Primary sport fishes in Lake Bryan include Largemouth Bass, Blue Catfish, Channel Catfish, White Crappie, and Black Crappie. A variety of sunfish species are also present. Sport fish species are managed under statewide length and bag limits with the exception that the Largemouth Bass population has been under an 18-inch minimum length limit since September 1996. The number of Largemouth Bass and sunfishes captured in electrofishing has increased since the 2009 survey. Catfishes and crappies have remained relatively stable with the exception that Blue Catfish are now present.
- **Fish Community**
  - **Prey species:** Bluegill, Longear Sunfish, Threadfin Shad, and tilapia comprised most of the available prey. However, catch rates were low. Bluegill were the most abundant of the sunfish species and all were < 7 inches in length.
  - **Catfishes:** Channel Catfish and Blue Catfish were both available to anglers although densities were low. Blue Catfish were noted for the first time in the 2010 gill net sample following stocking in 2009.
  - **Largemouth Bass:** Although relative abundance of Largemouth Bass was not high in electrofishing, it was consistent with historical data and indicated fish up to 18 inches were available to anglers. Body condition of Largemouth Bass was fair.
  - **Crappies:** Both White Crappie and Black Crappie were present in Lake Bryan. Although catch rates in trap nets were low, anecdotal information indicates a crappie fishery exists at Lake Bryan.
- **Management Strategies:** Low primary productivity limits the Lake Bryan fishery. Although fertilization is a feasible management strategy, BTU has shown little interest in cooperative fisheries management. Staff will consider a reduction in length limit for Largemouth Bass from the current 18-inch minimum length limit to the statewide 14-inch minimum length limit. Staff will also conduct water salinity sampling to determine Lake Bryan's suitability for Red Drum stocking.

## INTRODUCTION

This document is a summary of fisheries data collected from Lake Bryan in 2013-2014. 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 2013-2014 data for comparison.

### *Reservoir Description*

Lake Bryan is a 732-acre reservoir in Brazos County, Texas, built by Bryan Texas Utilities (BTU) to provide water for power-plant cooling. The lake has a small watershed with a water-well owned by BTU to help maintain water level. The lake is located within a public park, and access for both boat and bank angling is excellent. The primary fish habitat is limestone riprap and scattered native emergent vegetation. Although there are no water-level data available for Lake Bryan, the reservoir generally remains within four feet of conservation pool. Other descriptive characteristics for Lake Bryan are listed in Table 1.

### *Angler Access*

Lake Bryan has one public boat ramp and no private boat ramps. The reservoir is contained completely within the Lake Bryan Park and has excellent shoreline access. The boat ramp provided good boat access even during the recent drought. Additional boat ramp characteristics are in Table 2.

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Henson and Webb 2010) included:

1. Continue attempts to increase BTU's interest in the fishery management efforts at Lake Bryan. Implement voluntary trophy bass reporting program.  
**Action:** TPWD staff has attempted to make contact with BTU staff. However, operation of the Lake Bryan Park has been turned over to a contractor who's major interest lies in operation of the Lake Bryan Ice House, a bar, grill, and live music venue owned by BTU. Attempts to work with BTU on fisheries management at Lake Bryan will continue.
2. Attempt to promote the crappie fishery to consumptive anglers through news releases.  
**Action:** TPWD staff has worked closely with Bryan/College Station Eagle reporter Ben Tedrick to promote all Lake Bryan fisheries.

**Harvest regulation history:** Harvest has been regulated with statewide regulations except that Largemouth Bass harvest has been managed with an 18-inch minimum length limit since 1996 to increase the relative abundance of larger fish available to anglers. Current regulations are found in Table 3.

**Stocking history:** Stockings at Lake Bryan have included Florida Largemouth Bass in 1993, Threadfin Shad in 1992, hybrid crappie in 1997, and Blue Catfish in 2009. A complete summary of the stocking history of Lake Bryan is presented in Table 4.

**Vegetation/habitat management history:** Habitat is limited in Lake Bryan. Limestone riprap is the most common habitat available to juvenile fish. Historically, native emergent plants including cattails, bulrush, and spike rush provided limited littoral habitat. Bulrush and spike rush were introduced into the reservoir

by TPWD in the late 1990s as part of a fish kill mitigation project funded by the City of Bryan. In 2009 and 2013 no aquatic vegetation was observed at Lake Bryan; however, Lake Bryan was 4 feet low at the time of vegetation survey.

**Water transfer:** Lake Bryan is used as a cooling water supply for the gas-fired Dansby Electric Production Facility. The reservoir is located on top of a hill and has a very small watershed. Water level is maintained by a water well. No interbasin transfers exist.

## METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations), gill netting (5 net nights at 5 stations), and trap netting (5 net nights at 5 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and for gill and trap nets as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011).

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). 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 CPUE.

## RESULTS AND DISCUSSION

**Habitat:** The primary fish habitat is limestone riprap and scattered native emergent vegetation; however, during the 2013 habitat survey the reservoir level was approximately 4 feet below conservation pool and no structural habitat or aquatic vegetation was available as fish habitat (Tables 5 and 6).

**Prey species:** Dominant prey species at Lake Bryan included Bluegill (57.0/h), Longear Sunfish (42.0/h), tilapia (26.0/h), and Threadfin Shad (20.0/h) (Figures 1 and 2; Appendix A). Electrofishing catch rates of all dominant prey species increased substantially from the 2009 sample (Henson and Webb 2010).

**Catfishes:** Blue Catfish were stocked in 2009 (100,011 fingerlings, Table 4). Catch rates from the 2010 and 2014 gill net surveys were 0.2/nn and 0.8/nn, respectively (Figure 3), and all in the 2014 sample were between 11 and 13 inches.

The gill net catch rate of Channel Catfish was 0.2/nn in 2014. This catch rate was lower than it was in 2010 (3.0/nn), but identical to that of 2006 (0.2/nn) (Figure 4).

**Largemouth Bass:** The total electrofishing catch rate of Largemouth Bass was 35/h in 2013 with a stock-size ( $\geq 8$  inches) catch rate of 20/h. Catch rates were higher than the 2009 sample when only one largemouth bass captured, but similar to the 2008 survey ( $CPUE_{total} = 36/hr$ ;  $CPUE_{stock} = 30/hr$ ). Largemouth Bass in Lake Bryan are generally in fair condition (Figure 5).

**Crappies:** The trap net catch rate of White Crappie was 0.6/nn in 2013, lower than it was in 2009 (1.2/nn) and 2005 (1.2/nn). No White Crappie collected were harvestable size (Figure 6). No Black Crappie were caught in trap nets in 2013. The trap net catch rate of Black Crappie was 0.2/nn in 2009 and 0.4/nn in 2005 (Figure 7).

## **Fisheries management plan for Lake Bryan, Texas**

Prepared – July 2014.

**ISSUE 1:** Lake Bryan suffers from low productivity due to its small watershed. In addition, water from a deep well used to maintain the reservoir level tends to be saline and alkaline. These conditions, combined with the current lack of interest on the part of the controlling authority to improve productivity, limit management options.

### MANAGEMENT STRATEGY

1. Continue to try to gain cooperation from BTU regarding fisheries management at Lake Bryan. If BTU becomes interested, explore a fertilization program to increase primary productivity.

**ISSUE 2:** Because of the unusual water chemistry of Lake Bryan, stocking Red Drum may be an option to increase angler interest in the reservoir.

### MANAGEMENT STRATEGY

1. Sample Lake Bryan water in summer of 2014 to determine if overall water chemistry is conducive to Red Drum stocking. If parameters are appropriate, recommend Red Drum stocking at 5/acre.

**ISSUE 3:** Lake Bryan is under an 18-inch minimum length limit for Largemouth Bass; however, few harvestable fish have been collected in recent electrofishing samples.

### MANAGEMENT STRATEGY

1. Gather opinion information from area bass anglers regarding a potential change to the statewide 14-inch minimum length limit.

**ISSUE 4:** 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. 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:**

The proposed sampling schedule includes angler access and aquatic vegetation sampling, electrofishing and trap-netting in 2017, and gill-netting 2018 (Table 7).

## LITERATURE CITED

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pp 447-482 in B. R. Murphy and D. W. Willis, editors. *Fisheries techniques, 2<sup>nd</sup> edition*. American Fisheries Society, Bethesda, Maryland.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimert. 1996. Relations between reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. *North American Journal of Fisheries Management* 16:888-895.
- Guy, C. S., R. M. Neuman, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. *Fisheries* 32(7): 348.
- Henson, J., and M. Webb. 2010. Statewide freshwater fisheries monitoring and management program survey report for Lake Bryan, 2009. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Table 1. Characteristics of Lake Bryan, Texas.

Characteristic	Description
Year constructed	1973
Controlling authority	Bryan Texas Utilities
County	Brazos
Reservoir type	Power-plant
Shoreline Development Index (SDI)	1.80
Conductivity	1,200 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Lake Bryan, Texas, September 2013. Reservoir elevation at time of survey was 354 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Lake Bryan Park	30.70399 -96.46957	Y	20	353	Good

Table 3. Harvest regulations for Lake Bryan, 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, Largemouth	5	18-inch minimum
Crappies: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum



Table 4. Stocking history of Lake Bryan, Texas. FGL = fingerling; ADL = adults.

Year	Number	Size
	<u>Threadfin Shad</u>	
1992	2,000	ADL
	<u>Blue Catfish</u>	
2009	100,011	FGL
	<u>Channel Catfish</u>	
1974	120,000	FGL
	<u>Florida Largemouth Bass</u>	
1993	83,401	FGL
	<u>Hybrid Crappie</u>	
1997	80,490	FGL
	<u>Walleye</u>	
1974	200,000	FGL
1977	<u>90,000</u>	FGL
Total	290,000	
	<u>Red Drum</u>	
1983	39,800	FGL

Table 5. Survey of structural habitat types, Lake Bryan, Texas, 2013. Shoreline habitat type units are in miles.

Habitat type	Estimate	% of total
Natural	7.6 miles	76.0
Rocky	2.4 miles	24.0

## Gizzard Shad

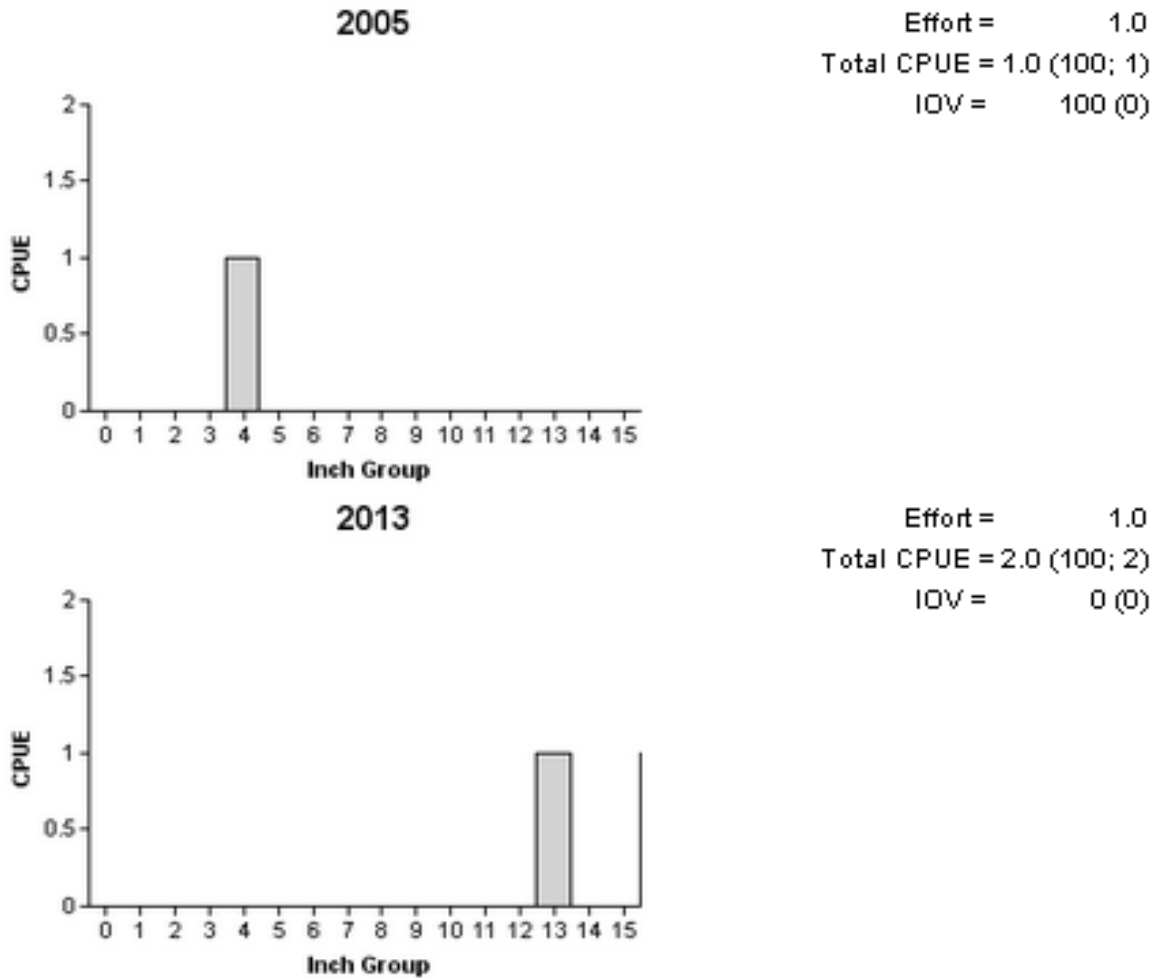


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Bryan, Texas, 2005 and 2013.

## Bluegill

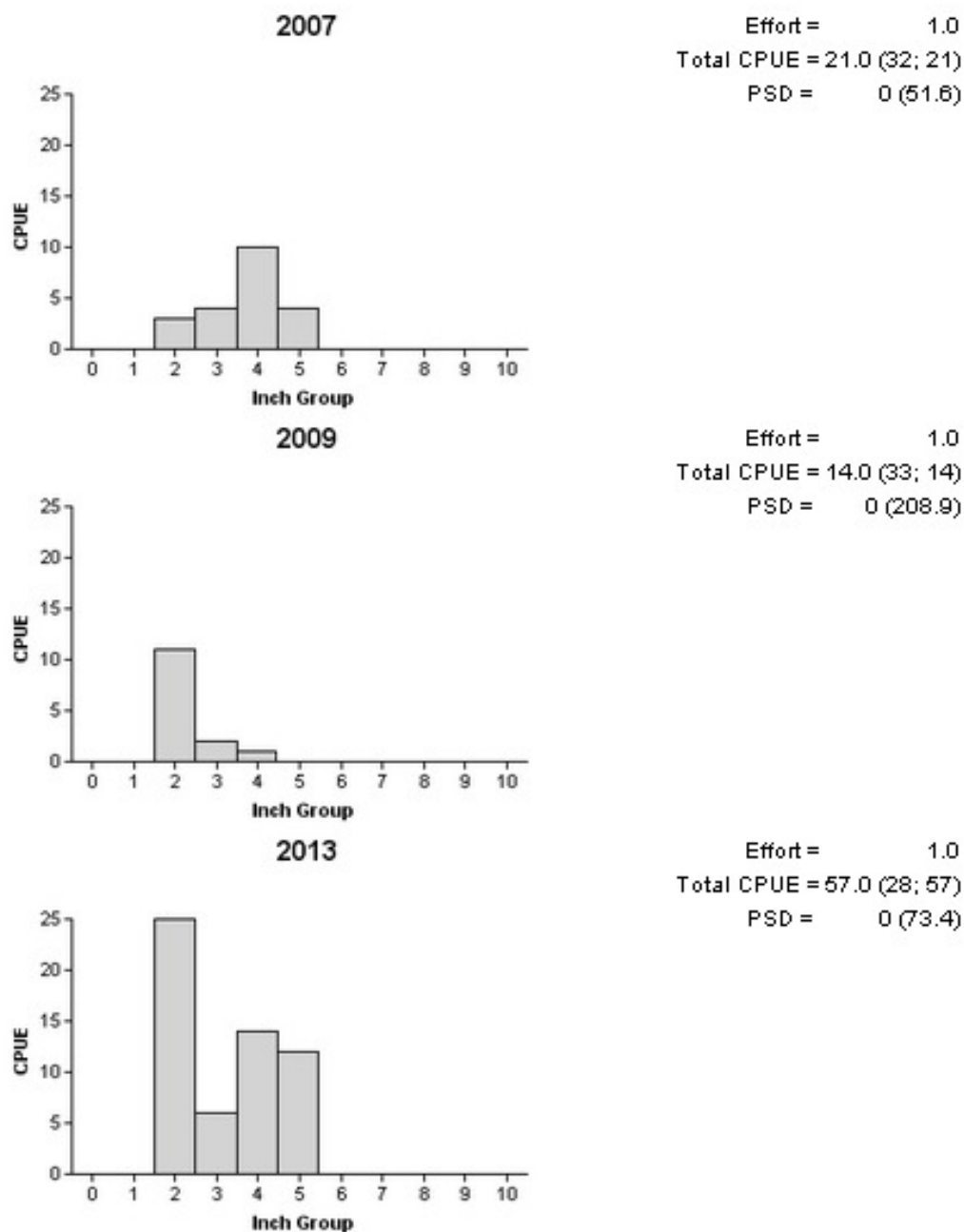


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Bryan, Texas, 2007, 2009, and 2013.

## Blue Catfish

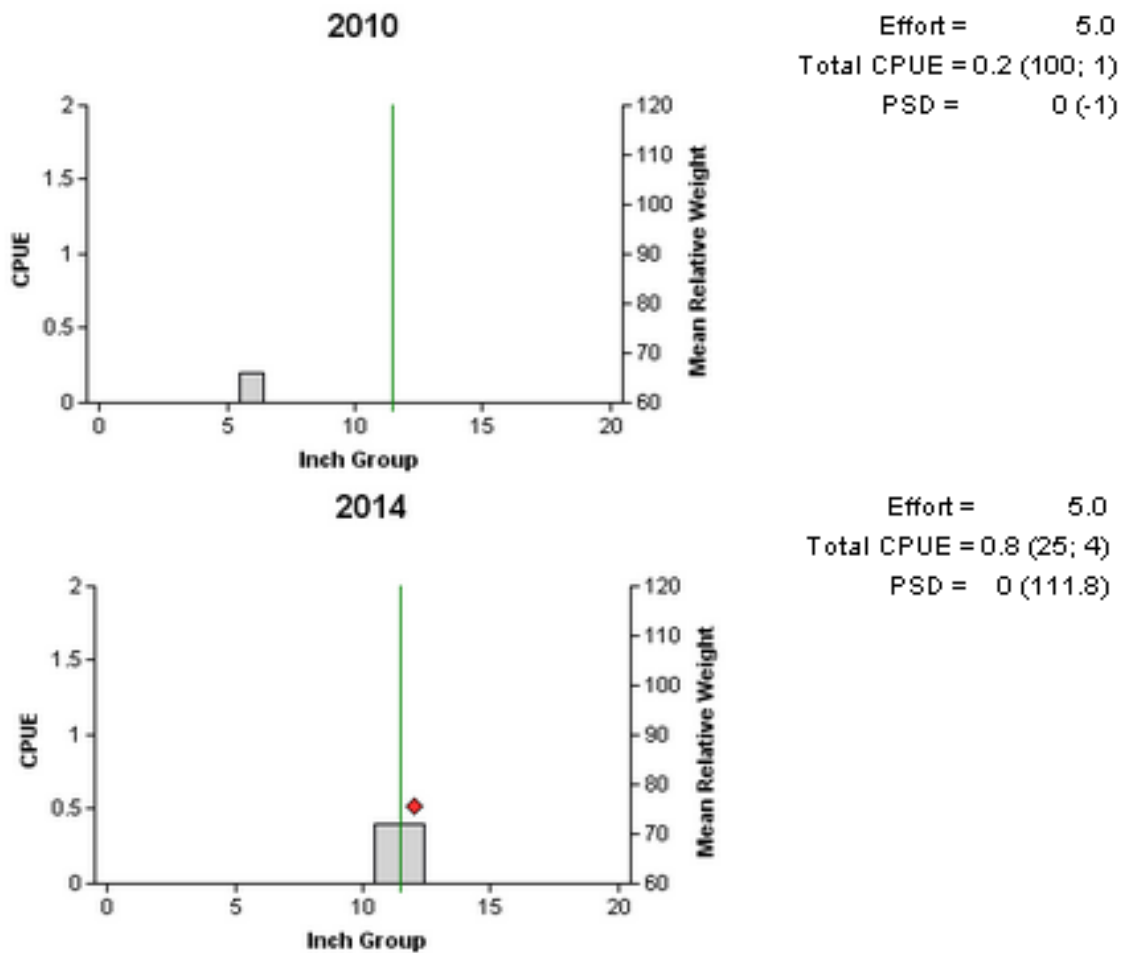


Figure 3. Number of Blue Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Bryan, Texas, 2010 and 2014.

## Channel Catfish

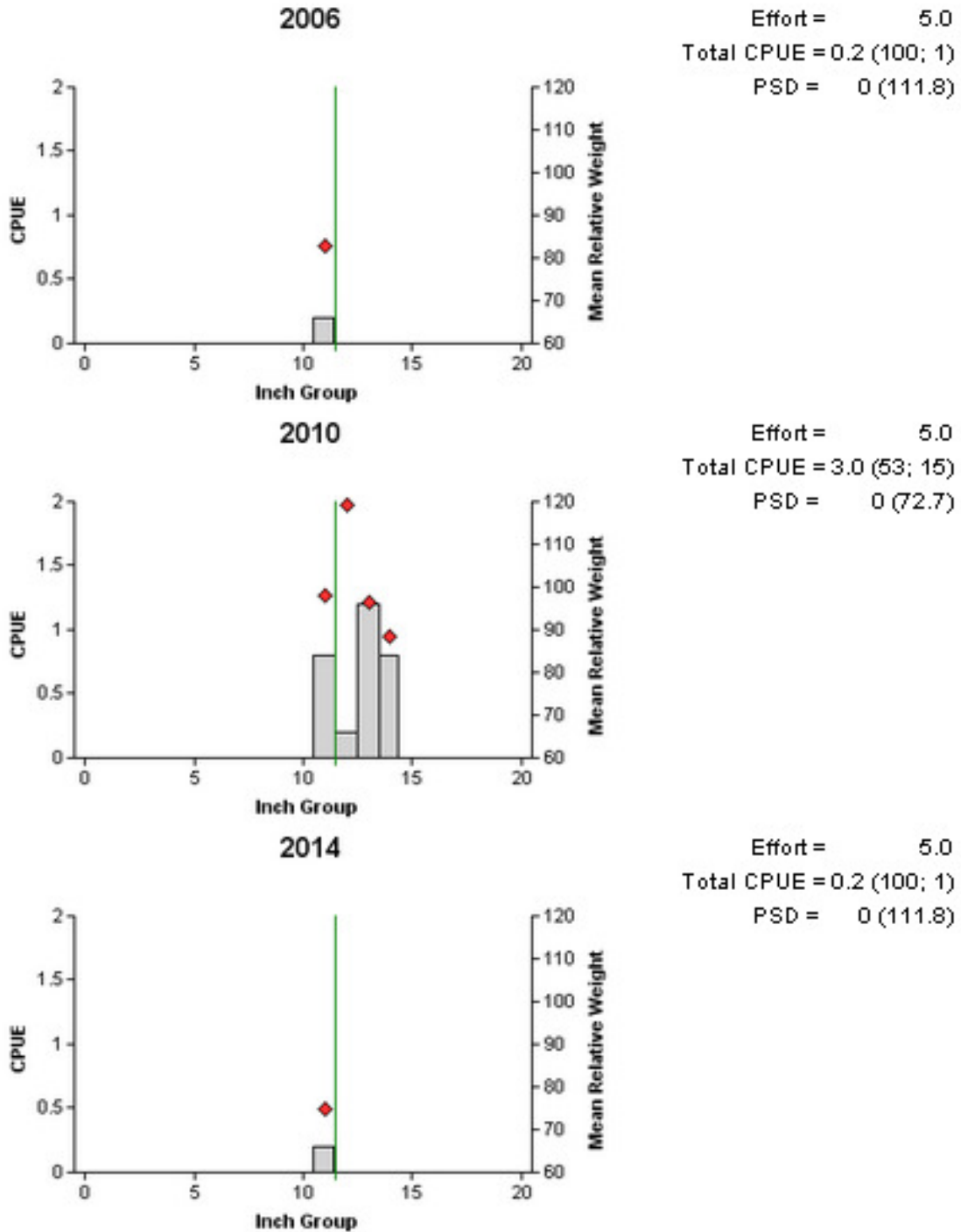


Figure 4. Number of Channel Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Bryan, Texas, 2006, 2010, and 2014.

## Largemouth Bass

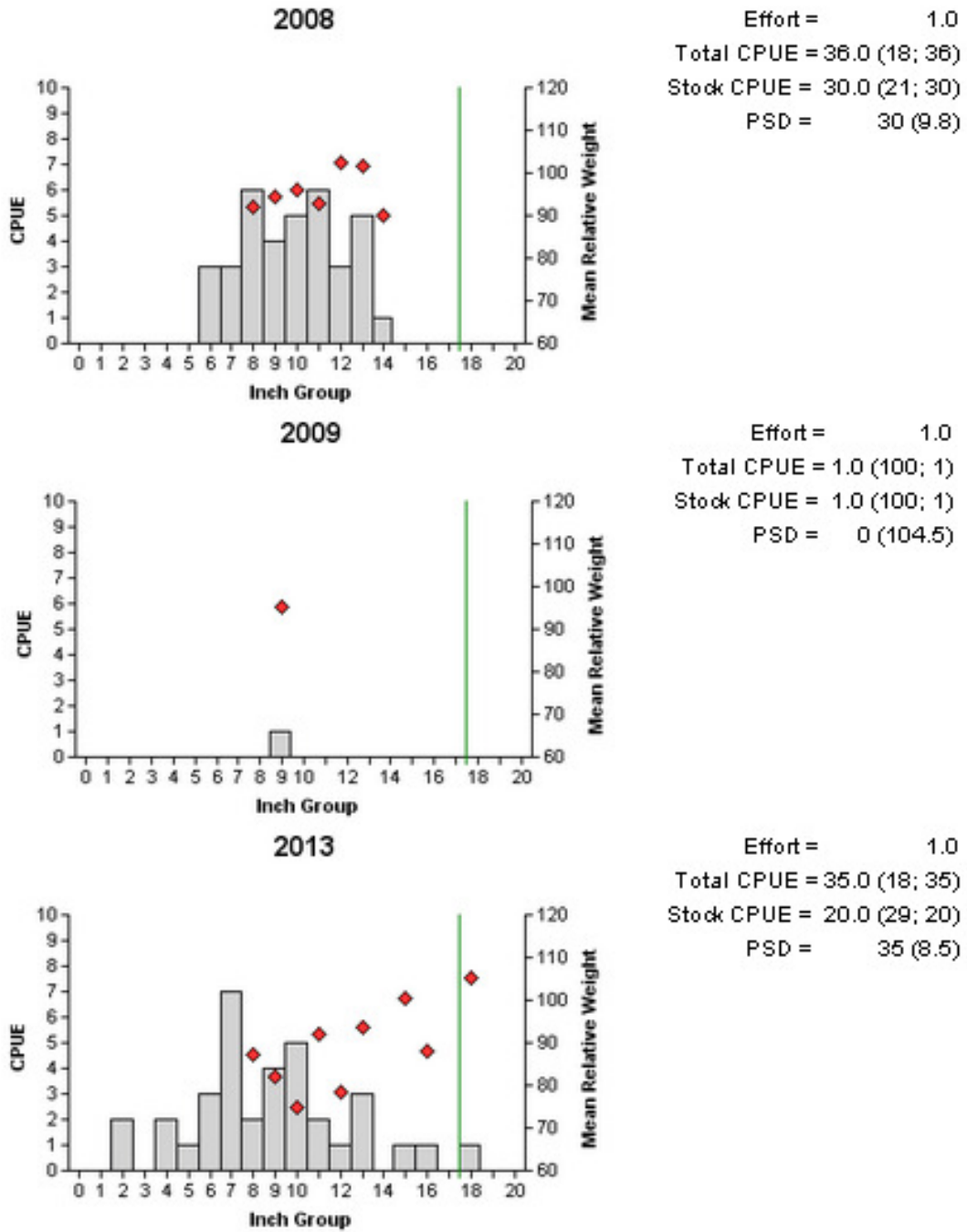


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Bryan, Texas, 2008, 2009, and 2013.

# White Crappie

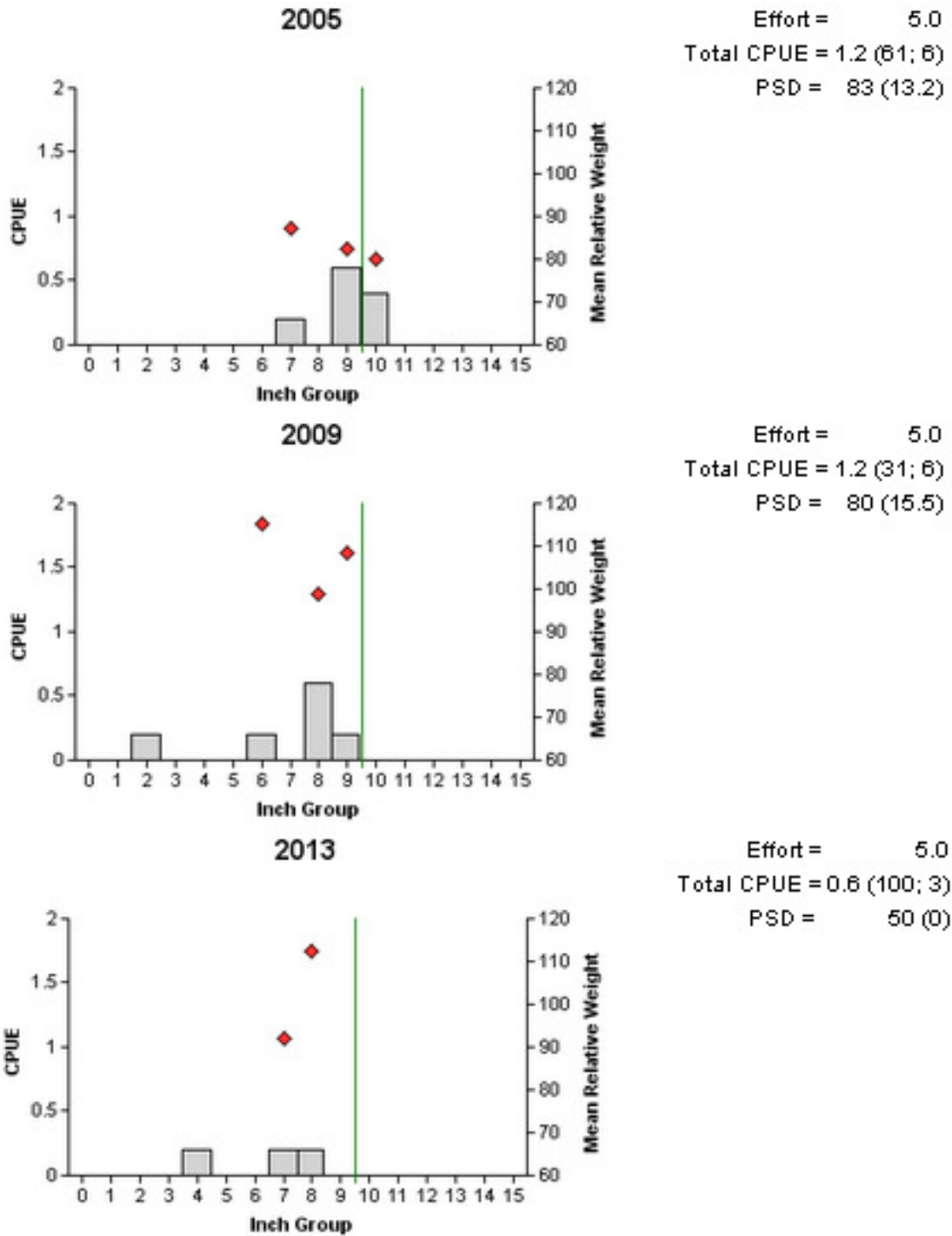


Figure 6. Number of White Crappie caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Bryan, Texas, 2005, 2009, and 2013.

## Black Crappie

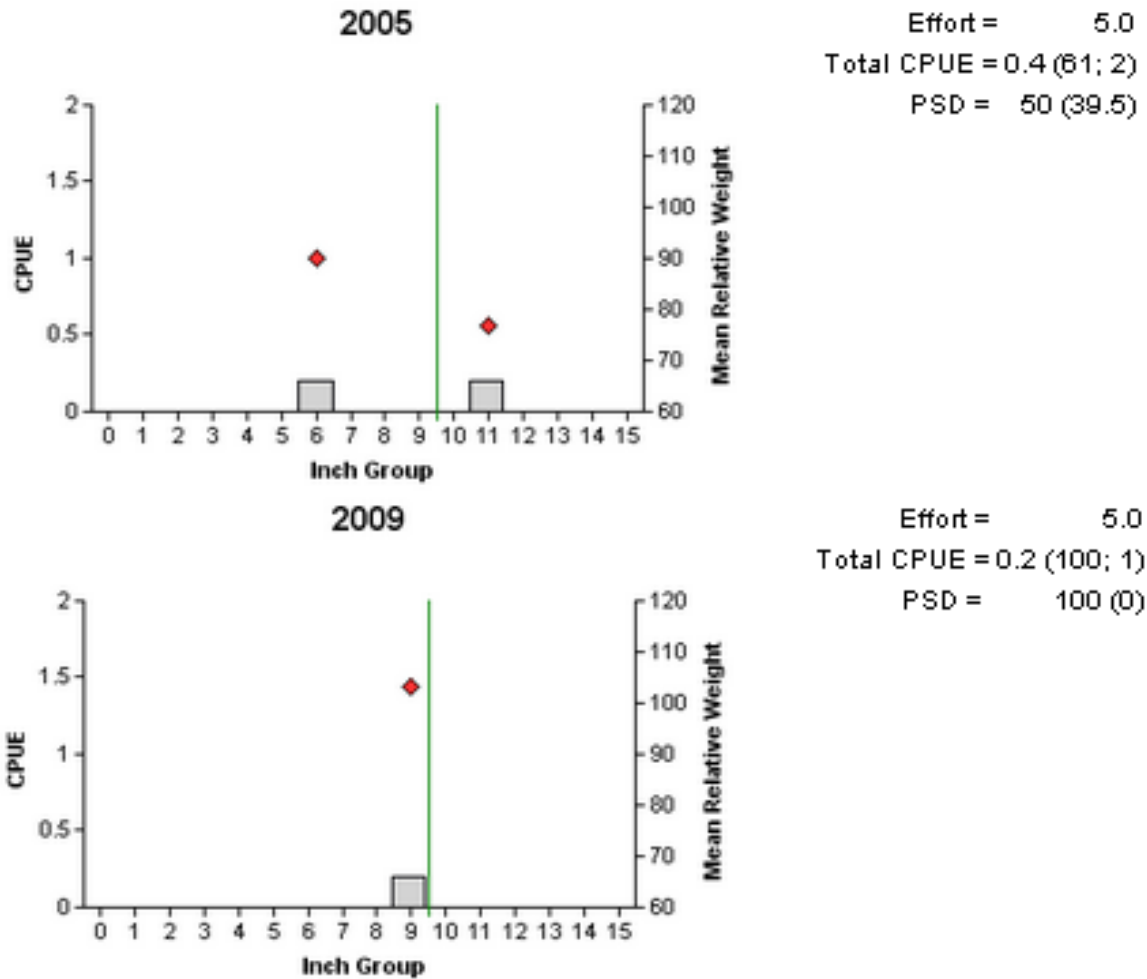


Figure 7. Number of Black Crappie caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Bryan, Texas, 2005 and 2009.

Table 6. Proposed sampling schedule for Lake Bryan, 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			
				Structural	Vegetation	Access	Report
2017-2018	S	A	S	S	S	S	S

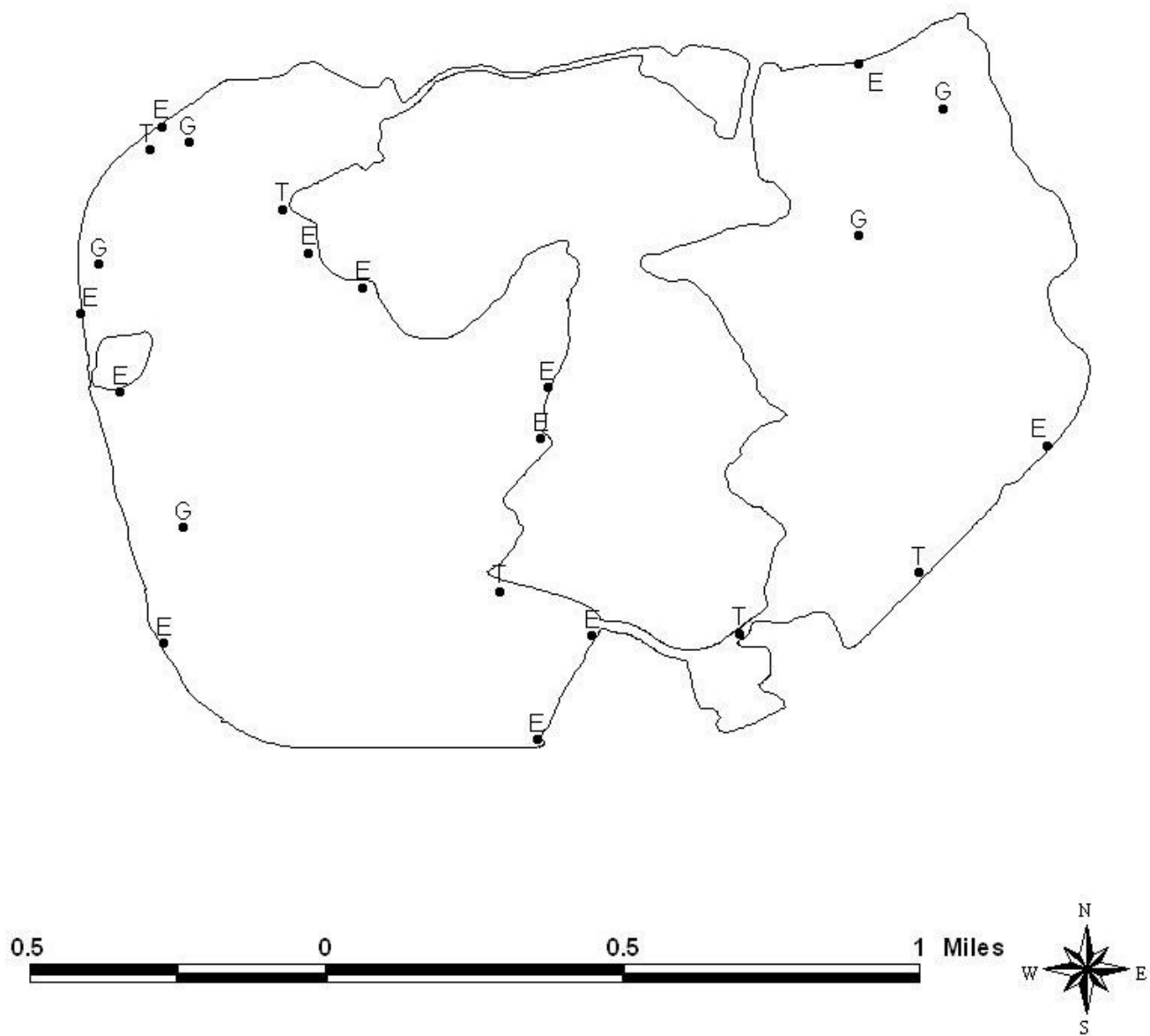


**APPENDIX A**

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Bryan Texas, 2013-2014. Sampling effort was 5 net nights for gill netting, 5 net nights for trap netting, and 1 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					2	2.00
Threadfin Shad					20	20.0
Bullhead Minnow					4	4.0
Inland Silverside					10	10.0
Blue Catfish	4	0.8				
Channel Catfish	1	0.2				
Green Sunfish					4	4.0
Bluegill					57	57.0
Longear Sunfish					42	42.0
Largemouth Bass					35	35.0
White Crappie			3	0.6		
Tilapia					26	26.0

## APPENDIX B



Location of sampling sites, Lake Bryan, Texas, 2013-2014. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was approximately 2 feet low at time of electrofishing and trap netting and near full pool at time of gill netting.