PERFORMANCE REPORT

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FEDERAL AID PROJECT F-221-M-6

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2015 Fisheries Management Survey Report

Lake Monticello

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Monticello were surveyed in 2015 using electrofishing and in 2016 using baited tandem hoop netting. Historical data are presented with the 2015-2016 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 Monticello is a 2,001-acre impoundment constructed in 1972 on Smith and Blundell Creeks in the Big Cypress River Basin. Primary uses are for power plant cooling and recreation. Structural habitat is mainly inundated timber. Native aquatic plant abundance has increased in recent years. Water hyacinth and hydrilla are present in the reservoir.

- **Management History:** Important sport fish include Channel Catfish and Largemouth Bass. Channel Catfish are managed with the statewide 12-inch minimum length limit. Largemouth Bass are managed with a 14- to 24-inch slot length limit and 5-fish daily bag, of which only one fish can be greater than 24 inches. The Largemouth Bass population is managed for its trophy potential due to the high percentage of pure Florida Largemouth Bass genetics and fast growth.

- **Fish Community**
  - **Prey species:** Threadfin Shad and Gizzard Shad were present in the reservoir. Most (79%) Gizzard Shad were small enough to be available as prey to most sport fish. Electrofishing catch of Bluegill was very high, and many fish were < 4 inches providing excellent prey for Largemouth Bass.

  - **Channel Catfish:** There were many Channel Catfish collected above legal length (12 inches) during the 2016 tandem hoop netting survey. Fish collected ranged from 8 to 23 inches.

  - **Largemouth Bass:** Largemouth Bass were abundant in the fall electrofishing survey. Also, there were many small fish, which indicated excellent reproduction and recruitment of fish that were spawned in 2015. Largemouth Bass had fast growth (average age at 14 inches long was 1 year). Fish also had excellent body condition, indicating good prey availability.

  - **Black Crappie:** Black Crappie have been present in Lake Monticello, but they usually exist in low density. Also, few anglers have been documented fishing for crappie in the past. Therefore, no sampling was conducted for crappie during this report period.

Management Strategies: Survey Largemouth Bass and prey populations with electrofishing during fall 2019 and the Channel Catfish population with baited tandem hoop netting during spring 2020. Conduct an additional electrofishing survey in fall 2017 to monitor Largemouth Bass and prey populations. Water hyacinth and hydrilla surveys will be conducted annually beginning in 2016. Technical guidance will be given to controlling authority regarding water hyacinth management. Largemouth Bass will continue to be managed with a 14- to 24-inch slot length limit.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Monticello in 2015-2016. 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 2015-2016 data for comparison.

Reservoir Description

Lake Monticello is a 2,001-acre impoundment constructed in 1972 on Smith and Blundell Creeks in the Big Cypress River Basin. The reservoir is located in Titus County near the City of Mount Pleasant. The controlling authority is Luminant Energy. Primary water uses are power plant cooling and public recreation. It has a watershed of approximately 40 square miles, a shoreline length of 23.2 miles, and a Shoreline Development Index of 2.6. Water levels are relatively stable and can be maintained by supplemental water supply from Lake Bob Sandlin (Figure 1). Structural habitat consisted of inundated timber, overhanging brush, and creek channels. Water hyacinth and hydrilla were present in the reservoir. Other descriptive characteristics for Lake Monticello are listed in Table 1.

Angler Access

Lake Monticello has one public boat ramp and no private boat ramps. Additional boat ramp characteristics are listed in Table 2. Shoreline access is limited to the public boat ramp area.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Bister and Wright 2012) included:

1. Monitor water hyacinth annually and provide guidance to controlling authority.
   Action: Annual surveys have been conducted and controlling authority has conducted periodic herbicide treatments.
2. Monitor Largemouth Bass population.
   Action: Fall electrofishing was conducted in 2013 and 2015. Genetic analysis of population was conducted in 2015. The planned age-and-growth analysis to determine mean length of age1-3 fish was not conducted due to poor sample size of larger fish.

Harvest regulation history: Sport fishes in Lake Monticello are currently managed with statewide regulations except for Largemouth Bass (Table 3). Largemouth Bass are managed with a 14- to 24-inch slot length limit and 5-fish daily bag of which only one fish can be over 24 inches. This regulation was implemented in September 1998. The length limit had previously been a 14- to 21-inch slot length limit.

Stocking history: Lake Monticello was stocked initially with Florida Largemouth Bass, Blue Catfish, Channel Catfish, Flathead Catfish, Walleye, and Green x Redear Sunfish hybrids. Florida Largemouth Bass and Channel Catfish stockings have been successful. Previous attempts to establish crappie in this reservoir have not been successful. The complete stocking history is presented in Table 4.

Vegetation/habitat management history: Aquatic vegetation coverage has historically been low with American lotus as the dominant species. However, there has been an increase in native submersed vegetation (e.g., coontail and *Chara*). Hydrilla has been present but has not been problematic. Water hyacinth has generally been contained above the railroad bridge in the Smith Creek area of the reservoir. However, recent heavy rains have flushed many plants into the main reservoir. Annual surveys have been conducted to monitor the abundance of invasive species. Private herbicide applicators have been

hired in previous years by the controlling authority to treat the water hyacinth infestation. Luminant also plans to install floating booms above the railroad bridge in Smith Creek as well as above the Highway 127 bridge that crosses the main reservoir to help prevent further introductions of water hyacinth to the rest of the reservoir.

Water transfer: Lake Monticello receives water from Lake Bob Sandlin to maintain sufficient water level in the reservoir for power plant operation. Overflow returns to Lake Bob Sandlin via the spillway at Monticello. There are no inter-basin water transfers to or from Lake Monticello.

METHODS

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Monticello (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 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. Ages for Largemouth Bass were determined using otoliths from 13 randomly-selected fish (range 13.1 to 14.6 inches) in 2013 and from 14 randomly-selected fish (range 13.1 to 14.9 inches) in 2015.

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).

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 2015.

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 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

Habitat – A structural habitat survey was conducted in 2011. No development had occurred at the reservoir, and there was no perceived change in structural habitat. Vegetation surveys were conducted in 2012 – 2015 to monitor hydrilla and water hyacinth. Native aquatic vegetation groups were surveyed and summarized in 2015. 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 2016).

RESULTS AND DISCUSSION

Habitat: Bister and Wright (2012) reported littoral zone structural habitat consisted primarily of natural shoreline and standing timber (Table 6). Submersed native vegetation has increased to 110 acres in 2015. The previous native aquatic vegetation survey in 2011 did not document any submersed native vegetation (Bister and Wright 2012). Hydrilla coverage increased from 18 acres in 2014 to 32 acres in 2015, which was similar to coverage in 2012 and 2013 (Table 7). Water hyacinth coverage in the 2015 survey was similar to that of 2014, but high rain events in the latter part of 2015 and early 2016 flushed many plants from the Smith Creek area to the entire reservoir.

Prey species: Gizzard Shad and Threadfin Shad were present in the 2015 electrofishing survey. Index of vulnerability (IOV) for Gizzard Shad was high, indicating 72% of Gizzard Shad were available to existing predators (Figure 2). The electrofishing catch rate of Bluegill was very high in 2015 (1,634/h), and the size structure was dominated by smaller fish (< 4 inches; Figure 3).

Channel Catfish: The use of baited tandem hoop nets to survey the Channel Catfish population in Lake Monticello met sampling objectives. We collected 362 stock-sized fish in 10 hoop net series (RSE= 18; Figure 4). Fish ranged in length from 8 to 23 inches, which was similar to previously reported length ranges caught using gill nets (Bister and Wright 2012).

Largemouth Bass: Sampling objectives were met for the 2015 electrofishing survey. The electrofishing CPUE of stock-length Largemouth Bass was 125/h (RSE = 21; Figure 5). This catch rate was similar to that of 2013 but higher than that of 2011. Recruitment was very high in 2015 as seen by the number of fish collected less than 8 inches. Body condition of Largemouth Bass was high, with relative weight greater than 100 for most size classes, indicating excellent prey availability (Figure 5). Largemouth Bass growth was fast in Lake Monticello. The average age of 14 inch fish was 1.2 years old in both 2013 (N = 13; range = 1 – 3 years) and 2015 (N = 14; range = 1 – 3 years). Florida Largemouth Bass influence has remained high. Florida Largemouth Bass alleles were 87% with 37% pure Florida Largemouth Bass in the 2015 sample (Table 8).

Black Crappie: Black Crappie were present in Lake Monticello, but population abundance has been low. Trap net surveys were discontinued after 2003, and CPUE of Black Crappie was never higher than 1.6 fish/nn from 1992 to 2003. There was no directed effort for crappie during winter creel surveys in 2009-2010 and 2011-2012. Sampling this population was determined to be unnecessary in FY 2016.

Fisheries management plan for Lake Monticello, Texas

Prepared – July 2016.

ISSUE 1: The presence of water hyacinth in Lake Monticello poses a threat to water quality, power plant operation, and recreational access. The main infestation is located in Smith Creek; however, rain events in late 2015 and early 2016 flushed a large quantity of plants into the main reservoir. Many water hyacinth plants escaped Lake Monticello through gates at the dam and were introduced into Lake Bob Sandlin. Herbicide treatment and containment efforts should be conducted to minimize threats to Lake Monticello as well as reduce the introduction of any more plants to Lake Bob Sandlin. Hydrilla is also present and should be monitored.

MANAGEMENT STRATEGIES

1. Continue to provide technical guidance to the controlling authority regarding water hyacinth management.
2. Conduct annual surveys to monitor trends and estimate coverage of water hyacinth and hydrilla.

ISSUE 2: The Lake Monticello Largemouth Bass population is managed with a highly restrictive 14- to 24-inch slot length limit for the trophy potential of the fishery. Largemouth Bass and prey populations should be monitored more frequently than minimum required sampling.

MANAGEMENT STRATEGIES

1. Conduct electrofishing surveys in fall 2017 and 2019 to monitor relative abundance and size structure of Largemouth Bass and prey species populations.
2. Conduct genetic analysis of the Largemouth Bass population during the fall 2019 electrofishing survey.
3. Monitor growth of Largemouth Bass (average age at 14 inches) in 2017 and 2019.
4. Conduct winter-quarter creel survey in 2019-2020 to monitor the Largemouth Bass fishery.

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 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

FY 2017-2020

Sport fish, forage fish, and other important fishes

Sport fishes in Lake Monticello include Channel Catfish, Black Crappie, and Largemouth Bass. Known important forage species include Bluegill, Gizzard Shad, and Threadfin Shad.

Low-density fisheries

Black Crappie: Black Crappie are present in Lake Monticello, but population abundance has been low. Trap net surveys were discontinued after 2003, and CPUE of Black Crappie was never higher than 1.6 fish/nn from 1992 to 2003. There was no directed effort for crappie during winter creel surveys in 2009-2010 and 2011-2012. Sampling this population is unnecessary in FY 2017 – FY 2020.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass are the most popular sport fish in Lake Monticello. Previous winter-quarter creel surveys indicated Largemouth Bass angling comprised 86.4 to 93.6% of total angling effort. Largemouth Bass in Lake Monticello are managed for trophy potential due to high percentage of Florida Largemouth Bass alleles and fast growth rates. The popularity and reputation for quality Largemouth Bass fishing at this reservoir warrant sampling time and effort. Largemouth Bass have been managed with a 14-24 inch slot regulation since 1998. Trend data on CPUE, size structure, and body condition have been collected biennially since 2003 with fall nighttime electrofishing. Continuation of biennial trend data in this reservoir with night electrofishing in the fall will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation. A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in fall 2017 and 2019, but sampling will continue at random sites until 100 stock-sized fish are collected and the RSE of CPUE-S is $\leq$ 25. Twelve random stations will be determined for electrofishing. Exclusive of the original 12 random stations, another 3 random stations will be determined in the event some extra sampling is necessary. A maximum of 15 stations will be sampled. During the mid to late 90's, RSEs were always below 25, primarily due to the presence of hydrilla that provided consistent sampling habitat. Given the increased coverage of submersed vegetation, electrofishing catch rates should be more consistent. During 2015 fall electrofishing, 125 stock-length fish were collected in 12 stations with an RSE of 21. Based on past CPUE estimates, it is likely the minimum 100 stock sized fish will be collected with 12-15 stations. Fin samples will be taken from 30 fish every 4 years beginning in 2019 and submitted for genetic analysis to monitor trends of Florida Largemouth Bass genetic influence in the population. Otoliths from 13 fish between 13.0 and 14.9 inches will be collected in 2017 and 2019 to determine mean age at 14 inches to monitor large-scale changes in growth that may indicate the need for further investigation. Relative weight of largemouth bass $\geq$ 8 inches (total length) will be determined from their length/weight data (maximum of 10 fish weighed and measured per inch class). A winter-quarter angler creel survey will be conducted in 2019-2020 to monitor the Largemouth Bass fishery.

Channel Catfish: Previous winter-quarter creel surveys indicated Channel Catfish angling comprised 5.6 to 13.4% of total angling effort, making them the second most sought after species. Channel Catfish have been surveyed at Lake Monticello using 5 gill nets set at random locations since 1996. Since 2004, this amount of effort has always collected more than 150 stock-length fish; however, CPUE-S RSE ranged from 36 to 42. Baited tandem hoop nets were used to survey the Channel Catfish population in May 2016. More than 350 stock-length fish were collected in 10 net series with an RSE of 18. Continuing to use baited hoop nets will reduce the by-catch and unnecessary mortality of non-target species. The estimated number of sets to achieve an RSE for CPUE-S $\leq$ 25 is 10 sets using the recommended 2-night soak duration. A target of 100 stock sized fish should provide an adequate PSD estimate per the tandem hoop net procedures (PSD within 10% with 80% confidence, 75-140 fish are

recommended). Ten additional random stations will be selected in the event extra sampling is necessary. A maximum of 20 tandem hoop net sets will be sampled. Channel Catfish will be sampled using baited tandem hoop nets in spring 2020. A winter-quarter angler creel survey will be conducted in 2019-2020 to monitor the Channel Catfish fishery.

Bluegill: Bluegill are the primary forage at Lake Monticello, and CPUE-Total typically exceeds 1,000 fish/hr. Like Largemouth Bass, trend data on CPUE and size structure of Bluegill has been collected biennially since 2003. 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 will result in sufficient numbers of Bluegill for size structure estimation (PSD; 50 fish at a minimum of 12 stations with 80% confidence)**.** Data from 2005-2015 has shown RSE $\leq$ 25 for CPUE-Total for Bluegill using the traditional 12 randomly-selected stations. No additional effort will be expended to achieve an RSE25 for CPUE of Bluegill 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. Relative weight of Largemouth Bass $\geq$ 8 inches total length will be determined from their length/weight data (maximum of 10 fish weighed and measured per inch class).

Gizzard Shad and Threadfin Shad: Gizzard Shad and Threadfin Shad are present in the reservoir, but abundance has been very low. CPUE-Total has been < 20 fish/hr in recent years for both species. Sampling effort based on sampling objectives for Largemouth Bass will be sufficient to determine presence or absence of shad species.

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Water Level

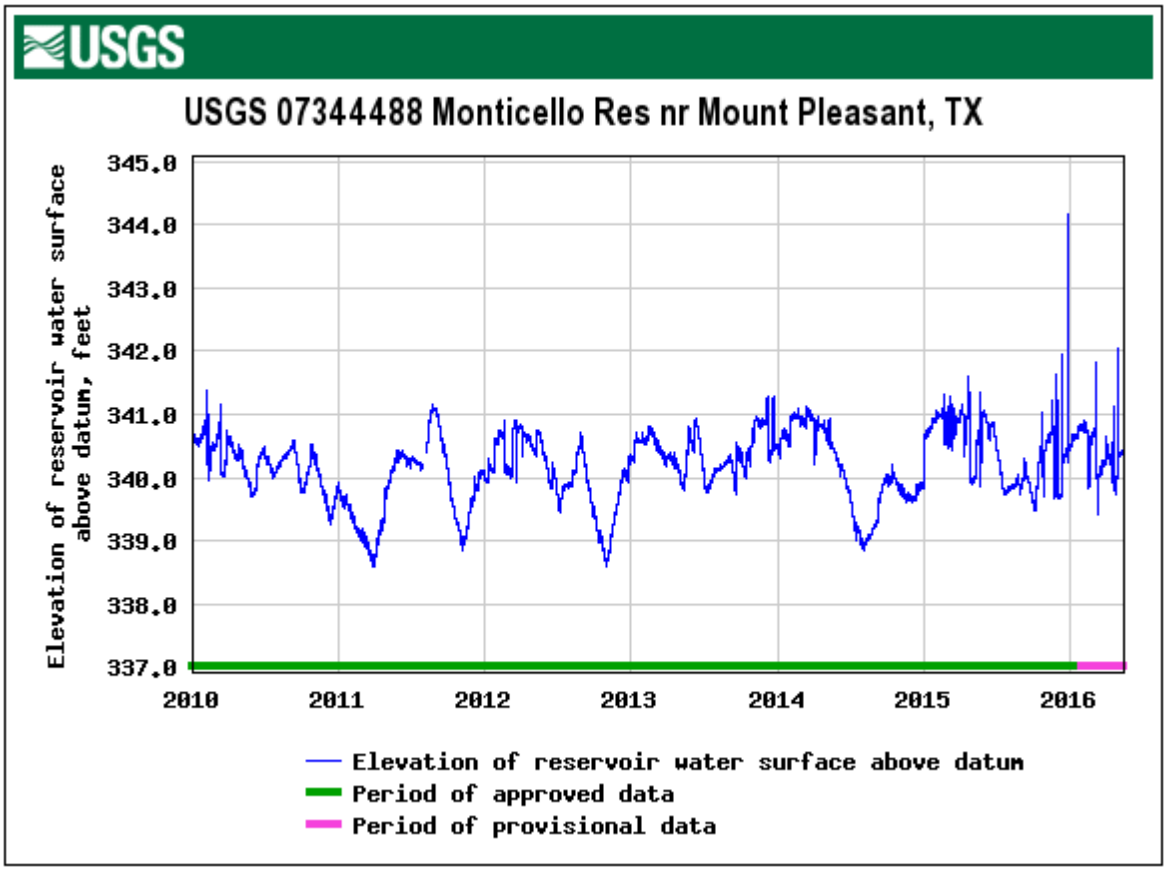


Figure 1. Water level elevations in feet above mean sea level (MSL) recorded for Lake Monticello, Texas. Conservation pool elevation is 340.0 ft. MSL.

Table 1. Characteristics of Lake Monticello, Texas.

Characteristic	Description
Year constructed	1972
Controlling authority	Luminant Energy
County	Titus
Reservoir type	Cooling, tributary
Shoreline development index (SDI)	2.6
Conductivity	458 umhos/cm

Table 2. Boat ramp characteristics for Lake Monticello, Texas, August 2015. Reservoir elevation at time of survey was 340 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Monticello Park	33.085275 -95.058432	Y	30	332	Good, no issues

Table 3. Harvest regulations for Lake Monticello, 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[a] (only 1 > 24 inches)	14- to 24-inch slot
Bass, Spotted	5[a]	None
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

[a] Daily bag for Largemouth Bass and Spotted Bass = 5 fish in any combination.

Table 4. Stocking history of Lake Monticello, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL), and unknown (UNK).

Species	Year	Number	Life Stage
Black Crappie	1988	50,000	FGL
	1989	50,119	FGL
	1990	100,488	FGL
	1991	98,330	FGL
	Total	298,937	
Black Crappie x White Crappie	1995	201,984	FRY
	1996	301,231	FRY
	Total	503,215	
Blue Catfish	1972	10,000	UNK
	1980	3,250	UNK
	Total	13,250	
Channel Catfish	1972	75,500	AFGL
	1973	91,405	AFGL
	Total	166,905	
Flathead Catfish	1973	2,740	UNK
	Total	2,740	
Florida Largemouth Bass	1973	197,140	FRY
	1998	50,321	FRY
	Total	247,461	
Green Sunfish x Redear Sunfish	1972	925	UNK
	Total	925	
Walleye	1973	1,000,000	FRY
	1974	40,000	FRY
	Total	1,040,000	
White Crappie	1986	100,800	FRY
	Total	100,800	

Table 5. Objective-based sampling plan components for Lake Monticello, Texas, 2015 – 2016.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE – stock	RSE-stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 100 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
	Condition	W_r	10 fish/inch group (max)
	Genetics	% FLMB	N = 30, any age
Bluegill [a]	Abundance	CPUE – total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad			Presence/absence
Threadfin Shad			Presence/absence
Tandem hoop netting			
Channel Catfish	Abundance	CPUE– stock	RSE-stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 100 stock

[a] No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill 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 structural habitat types, Lake Monticello, Texas, 2011 (Bister and Wright 2012). Shoreline habitat type units are in miles and standing timber is acres. Shoreline length = 23.2 miles. Reservoir surface area = 2,000 acres.

Habitat type	Estimate	% of total
Bulkhead	0.2 miles	1.0
Concrete	2.6 miles	11.0
Natural	19.7 miles	85.0
Rock	0.7 miles	3.0
Standing timber	380.0 acres	19.0

Table 7. Survey of aquatic vegetation, Lake Monticello, Texas, 2012 – 2015. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2012	2013	2014	2015
Native submersed				110.0 (5.5)
Native floating-leaved				185.0 (9.3)
Native emergent				31.0 (1.6)
Non-native				
Hydrilla (Tier III)*	36.0 (1.8)	36.0 (1.8)	18.0 (1.0)	32.0 (1.6)
Water hyacinth (Tier II)*	19.0 (1.0)	22.0 (1.1)	8.0 (0.4)	8.0 (0.4)

*Tier II is active management status; Tier III is Watch Status

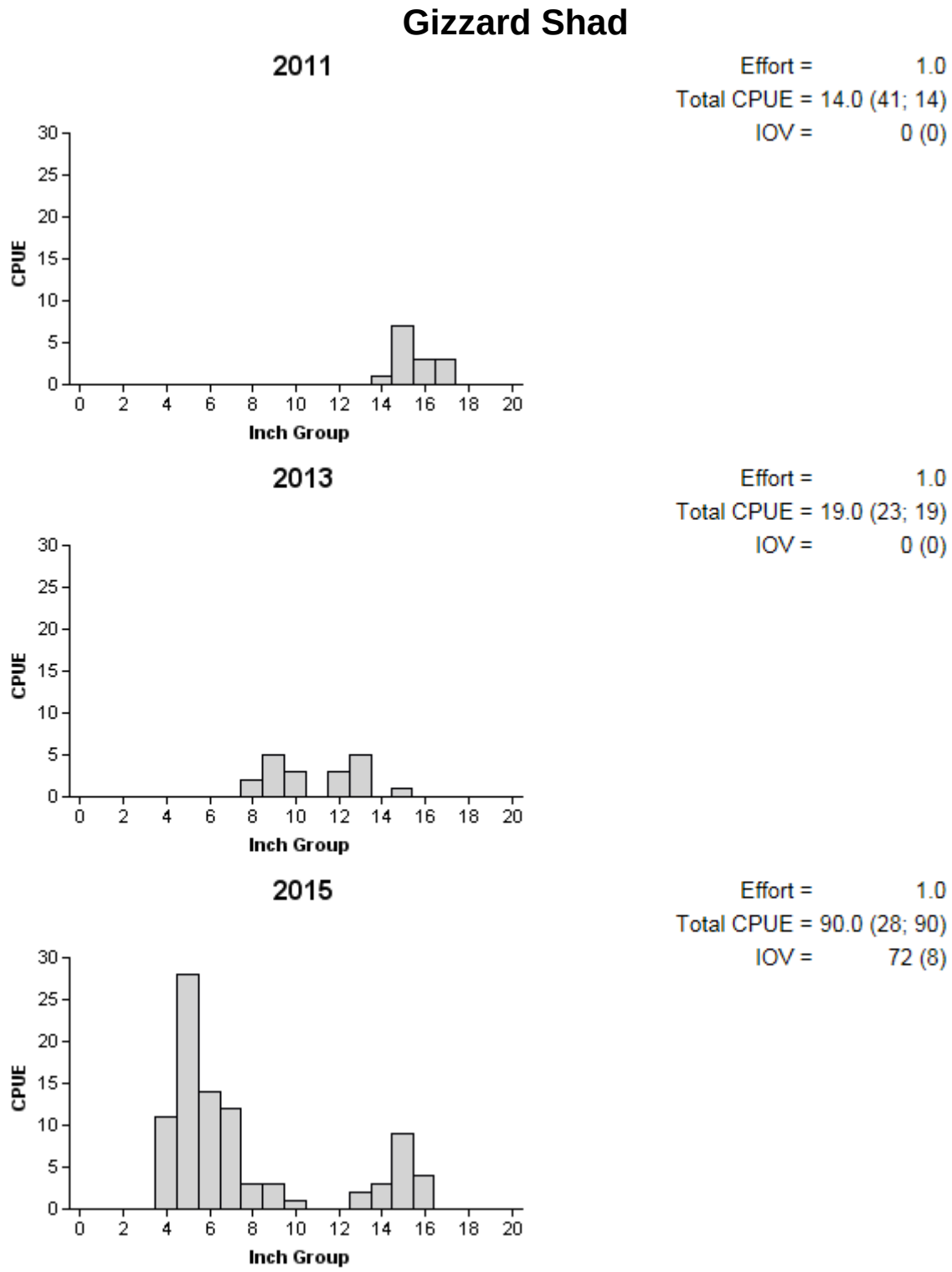


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Monticello, Texas, 2011, 2013, and 2015.

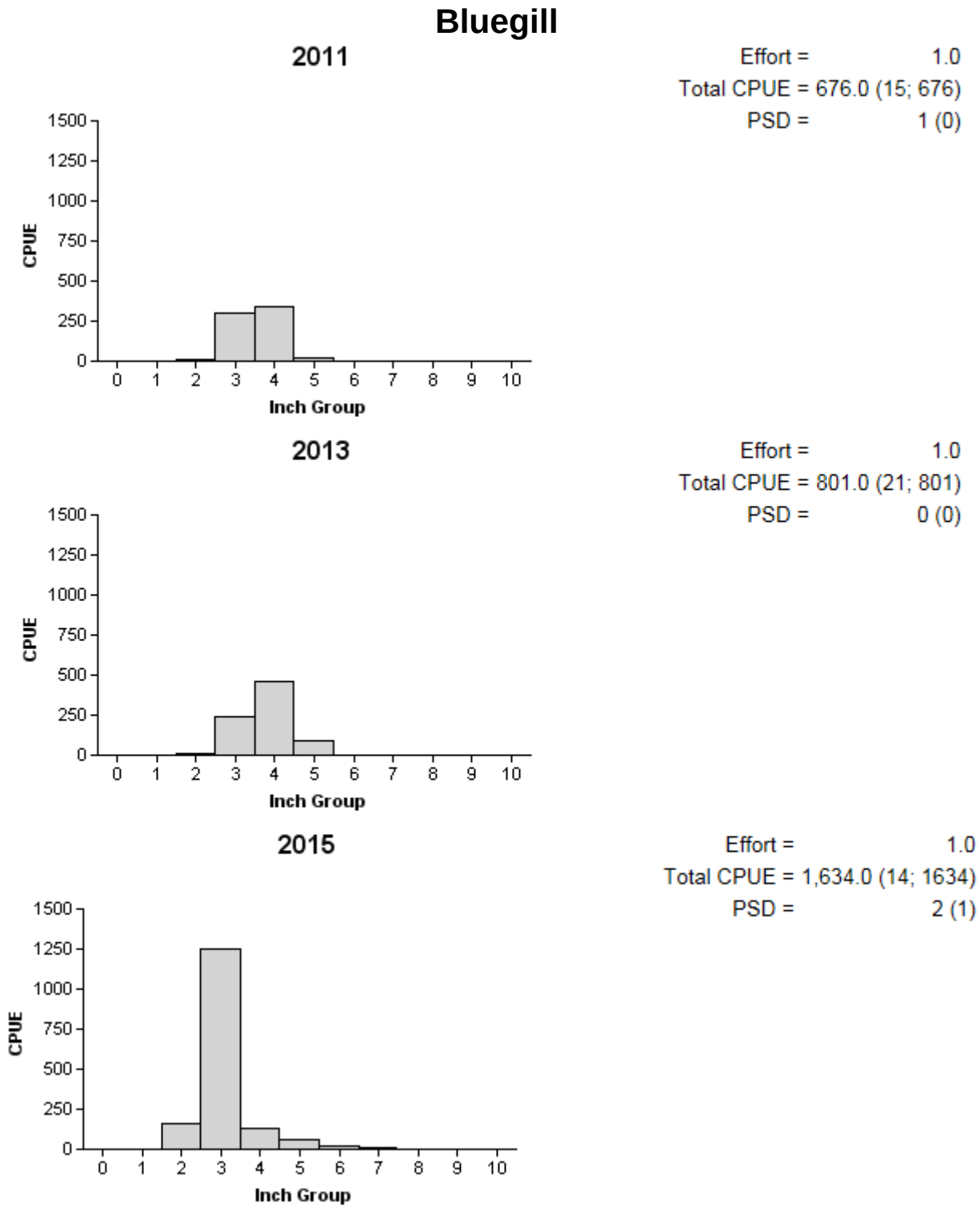


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Monticello, Texas, 2011, 2013, and 2015.

Channel Catfish

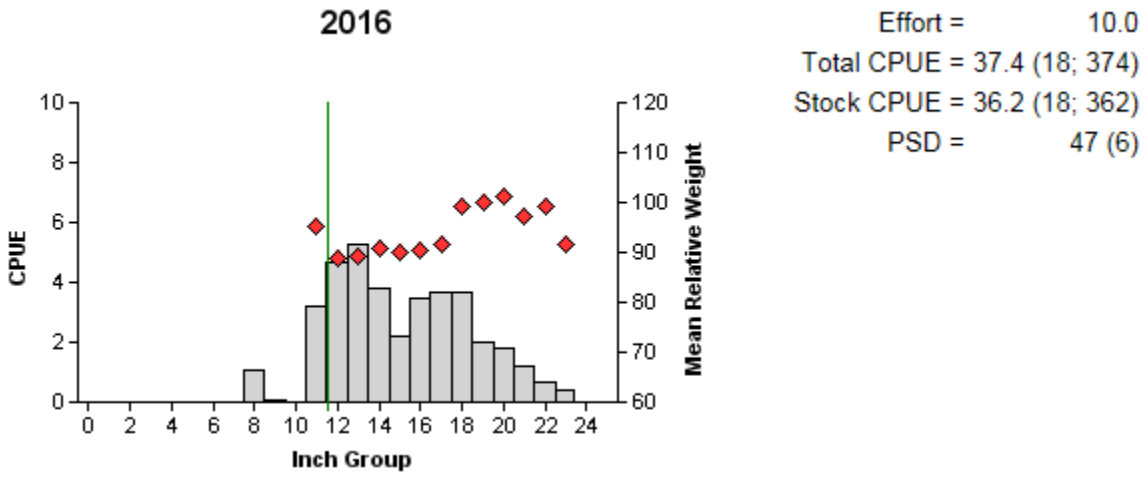


Figure 4. Number of Channel Catfish caught per tandem hoop net series (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring tandem hoop netting surveys, Lake Monticello, Texas, 2016. Vertical line indicates minimum length limit.

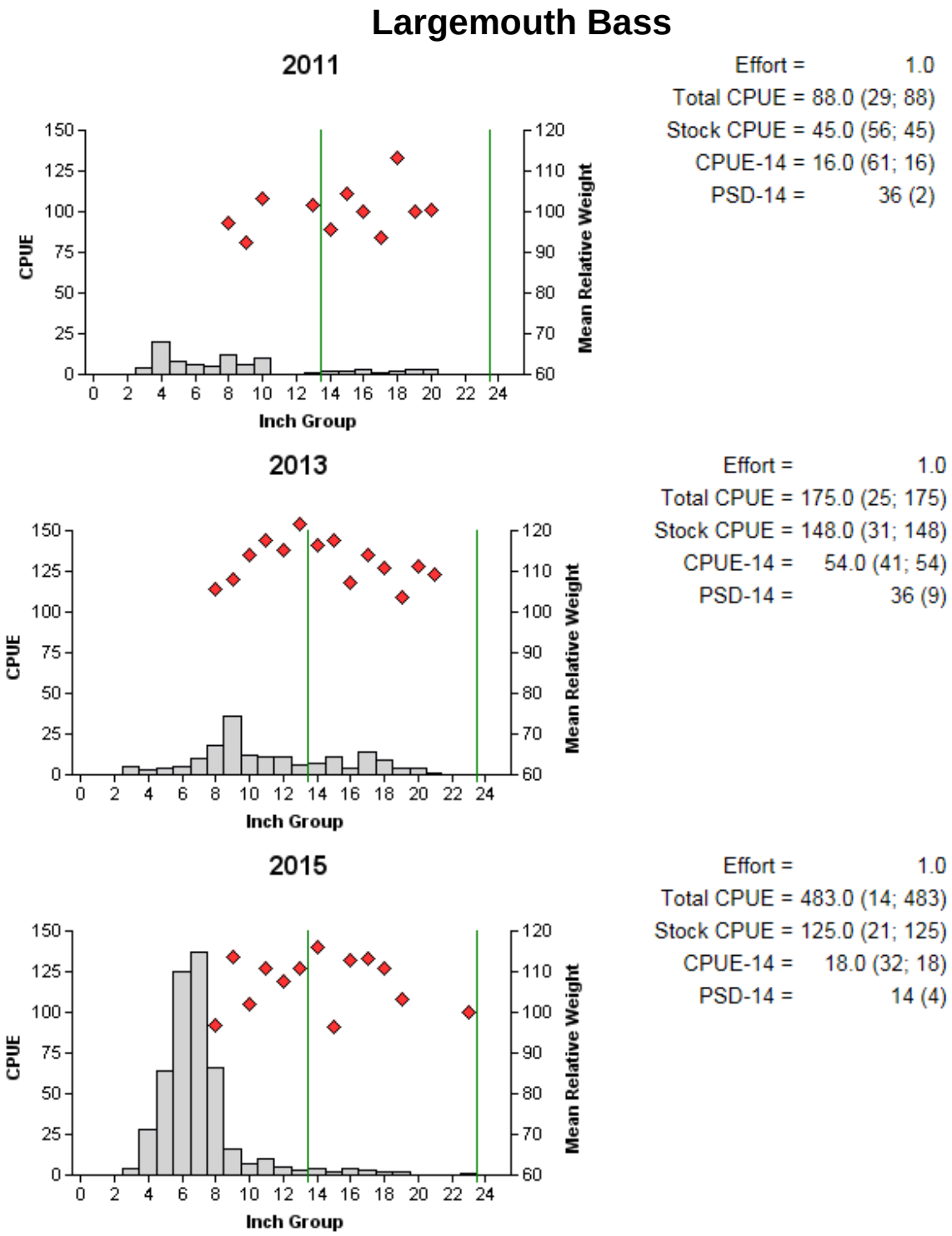


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Monticello, Texas, 2011, 2013, and 2015. Vertical lines indicate slot length limit.

Largemouth Bass

Table 8. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Lake Monticello, Texas, 2005, 2007, 2011, and 2015. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined with micro-satellite DNA analysis.

		Number of fish				
Year	Sample size	FLMB	Intergrade	NLMB	% FLMB alleles	% FLMB
2005	75	62	13	0	96.7	83.0
2007	30	20	10	0	91.0	66.7
2011	30	8	22	0	86.0	27.0
2015	30	11	18	1	87.0	37.0

Table 9. Proposed sampling schedule for Lake Monticello, Texas. Survey period is June through May. Hoop netting surveys are conducted in the spring while electrofishing surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

			Habitat				
Survey year	Electrofish	Hoop net	Structural	Vegetation	Access	Creel survey	Report
2016-2017				A			
2017-2018	A			A			
2018-2019				A			
2019-2020	S	A		S	S	A*	S

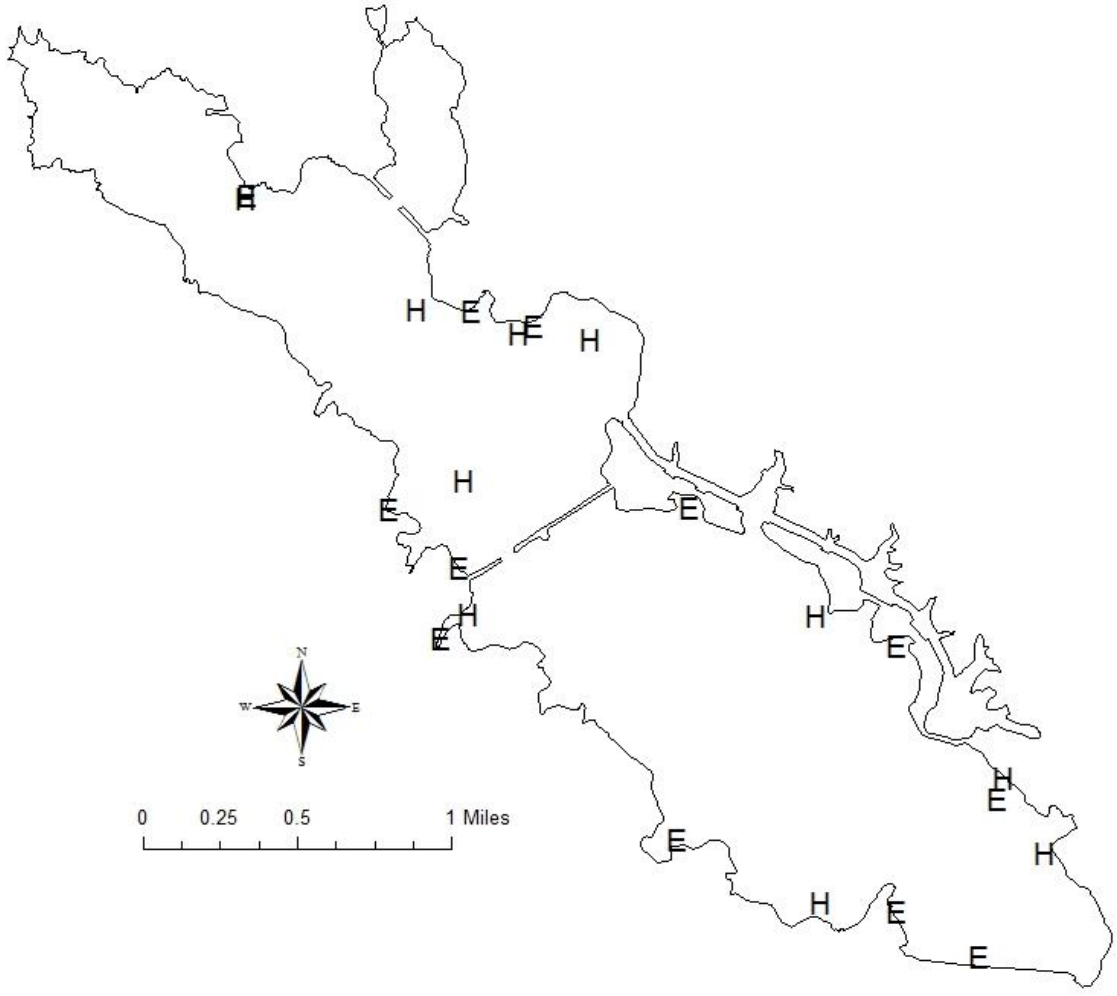
* Winter-quarter creel survey.

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Monticello, Texas, 2015-2016. Sampling effort was 10 tandem hoop net series for hoop netting and 1 hour for electrofishing.

Species	Electrofishing		Hoop Netting	
	N	CPUE	N	CPUE
Gizzard Shad	90	90.0		
Threadfin Shad	126	126.0		
Channel Catfish			374	37.4
Green Sunfish	1	1.0		
Bluegill	1,634	1,634.0		
Longear Sunfish	66	66.0		
Largemouth Bass	483	483.0		

APPENDIX B



Location of sampling sites, Lake Monticello, Texas, 2015-2016. Electrofishing and hoop netting stations are indicated by E and H, respectively. Water level was near full pool at time of sampling.