

PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

**Brady Creek Reservoir**

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Brady Creek Reservoir were surveyed in 2014 using electrofishing and in 2015 using gill netting. Historical data are presented with the 2014-2015 data for comparison. This report summarizes survey results and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Brady Creek Reservoir is a 2,021-acre impoundment on Brady Creek located in the Colorado River basin. It was constructed in 1963 to provide water for municipal, recreational, and flood control purposes. From 2000 to 2015, water level ranged from 2 to 16 below conservation pool elevation. Boat and angler access is adequate, however launching larger boats becomes restricted at water levels  $\leq 1,733$  feet above mean sea level (10 feet below conservation pool). Primary habitat was submersed aquatic vegetation and limited areas of standing timber. In winter 2012, the reservoir was impacted by its first toxic golden alga bloom that severely impacted fish populations.
- **Management History:** Important sport fishes have included Largemouth Bass, White Bass, White Crappie, and Blue and Channel Catfishes. Florida Largemouth Bass were introduced in 1982 and were stocked again in 2007 to improve trophy potential of the bass fishery. Smallmouth Bass were stocked in 1984 and 1986, but neither a self-sustaining population nor a fishery developed. Bluegill, Channel Catfish, and Largemouth Bass were stocked in 2013 in an attempt to help these populations recover from the golden alga fish kill. Angler harvest of sportfishes has been managed under statewide length and daily bag limits. The City of Brady used grants from TPWD to repair boat ramps and make improvements to the city park adjacent to the reservoir in 2010-2011. Management of the reservoir was transferred from the San Antonio district office to the San Angelo district office in 2011.
- **Fish Community**
  - **Prey species:** Abundance of shad and sunfish decreased dramatically due to fish kills associated with toxic golden alga blooms.
  - **Game species:** Abundance of Largemouth Bass, White Bass, White Crappie, and catfish decreased dramatically due to fish kills associated with toxic golden alga blooms.
- **Management Strategies:** Monitor water quality and status of golden alga quarterly. When water quality improves and golden alga has subsided, re-establish game and prey fish populations through hatchery and management stockings. Inform the public about the negative impacts of aquatic invasive species. Conduct electrofishing survey in 2018 and additional sampling if water conditions improve before then. Access and vegetation surveys will be conducted in 2018/2019.

## INTRODUCTION

This document is a summary of fisheries data collected from Brady Creek Reservoir in 2014-2015. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2014-2015 data for comparison.

### *Reservoir Description*

Brady Creek Reservoir is a 2,021-acre impoundment on Brady Creek located in the Colorado River basin about 5 miles west of Brady, Texas. It was constructed in 1963 to provide water for municipal, recreational, and flood control purposes. Severe water level fluctuations of 15+ feet are common (Figure 1). In 2014, habitat consisted primarily of submerged aquatic vegetation and limited areas of standing timber. Sparse hydrilla stands have been detected in past vegetation surveys, but not recently. Golden alga impacted the reservoir for the first time in 2012, and subsequent fish kills have reduced abundance of fish populations. Other descriptive characteristics for Brady Creek Reservoir are contained in Table 1.

### *Angler Access*

Brady Creek Reservoir has four public boat ramps and one private ramp (Table 2). When water level drops below 1,733 feet above MSL, launching larger boats is restricted to two of the four public boat ramps as the other two public boat ramps do not extend into the water at that elevation. At 1,730 feet above MSL only one lane of one public boat ramp is usable. Below 1,726 feet above MSL, no public boat ramps extend into the water. The City of Brady received a grant from TPWD and made repairs to boat ramps including extending one lane of the main boat ramp to approximately 1,726 feet above MSL. Shoreline access is available at the county park along the northern and eastern sides of the reservoir. There is also a large public enclosed "crappie house" accessible from the park.

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Dennis and Myers 2011) included:

1. Encourage City of Brady officials to further lengthen the boat ramp to facilitate boat launching when water level is below 1,727 feet above MSL.  
**Action:** Contacts were made with city officials and boat ramp improvements were encouraged.
2. Transfer management of the reservoir to San Angelo District office.  
**Action:** San Angelo management staff began sampling and management activities in summer 2011.
3. Encourage awareness of invasive species to stop the spread into new waters.  
**Action:** Promotional materials and press releases were distributed throughout the district.

**Harvest regulation history:** All sport fishes have been and are currently managed with statewide regulations (Table 3).

**Stocking history:** Florida Largemouth Bass, Blue and Channel Catfishes, Smallmouth Bass, and Threadfin Shad have been stocked into the reservoir. Blue Catfish were last stocked in 1981. Smallmouth Bass stockings were conducted in the mid-1980s; however, a fishery did not result. Most recently, Florida Largemouth Bass, Channel Catfish, and Bluegill were stocked in spring 2013 to help these populations recover from the toxic golden alga bloom of 2012. The complete stocking history is in Table 4.

**Vegetation/habitat management history:** There has been no significant vegetation or habitat management on this reservoir.

**Water transfer:** Brady Creek Reservoir is primarily used for municipal water supply, recreation, and to a lesser extent, flood control. No interbasin transfers are known to exist.

## METHODS

Daytime electrofishing surveys (1 hour at 12, 5-min randomly selected stations) were conducted in 2012 and 2014. A gill netting survey (7 net nights at 7 randomly-selected stations) was conducted in spring 2015. The planned trap netting survey was not conducted due to knowledge of golden alga fish kills that had reduced all fish populations.

A vegetation survey was conducted using the shapefile method in September 2014. A circumnavigation was made around the reservoir, and observed vegetation was recorded on a map that was later digitized. Percent (%) occurrence was calculated for each vegetation and habitat type. All surveys were conducted according to the Fishery Assessment Procedures (Inland Fisheries Division, unpublished manual revised 2014).

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 nets as the number of fish per net night (fish/nn). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics. Source for water level data was the United States Geological Survey (USGS 2015).

## RESULTS AND DISCUSSION

**Habitat:** In 2014, native submersed and emergent aquatic plants were the primary vegetation species in the reservoir (Table 5). Native emergent vegetation (cattail and bulrush) occupied approximately 1 % of the reservoir, similar to 2011. Native submersed vegetation (chara, sago and Illinois pondweed, marine naiad) occupied approximately 6 % of the reservoir, which was less coverage than in 2011. The last structural habitat survey was conducted in 2010 (Dennis and Myers 2011).

**\*Note:** For historical (prior to 2012 fish kills) catch and size structure results, refer to Dennis and Myers 2011.

**Prey species:** Electrofishing catch rates of Gizzard Shad in 2012 and 2014 were 35.0/h and 8.0/h, respectively. Bluegill catch rate was 11.0/h in 2012 and 4.0/h in 2014. Warmouth and Green Sunfish were present in very low numbers as well.

**Blue Catfish:** No Blue Catfish were captured in the 2015 gill netting survey.

**Channel Catfish:** Gill net CPUE of Channel Catfish in 2015 was 0.6/nn and 0.8 in 2011.

**White Bass:** Three White Bass were observed during the 2014 electrofishing survey, but none were collected in the spring 2015 gill netting survey.

**Largemouth Bass:** In the 2012 daytime electrofishing survey, 22 Largemouth Bass were collected ranging from 4 to 22 inches in one hour of sampling. In the 2014 daytime electrofishing survey, 12 bass were collected between 5 and 10 inches in one hour of sampling.

**White Crappie:** One White Crappie was observed during the 2014 daytime electrofishing survey, and none were observed during the 2015 gill netting survey. Trap netting was not conducted.

## Fisheries Management Plan for Brady Creek Reservoir, Texas

Prepared – July 2015

**ISSUE 1:** Toxic golden alga blooms have severely impacted all game fish populations in the reservoir.

### MANAGEMENT STRATEGIES

1. Monitor water quality, golden alga cell counts, and toxicity at least twice a year during November-March.
2. When water level and golden alga status improves, re-establish populations of game and prey species through hatchery and management stockings.

**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 (*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 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.

### **SAMPLING SCHEDULE JUSTIFICATION:**

Fall electrofishing will be conducted in 2018 to evaluate recovery status of fish populations. Additional sampling may be conducted after water levels rise and fish stockings occur.

## LITERATURE CITED

Dennis J. A. and R. A. Myers. 2011. Statewide freshwater fisheries monitoring and management program survey report for Brady Creek Reservoir, 2010. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

United States Geological Survey (USGS). 2015. National water information system: Web interface. Available: <http://waterdata.usgs.gov/tx/nwis> (July 2015).

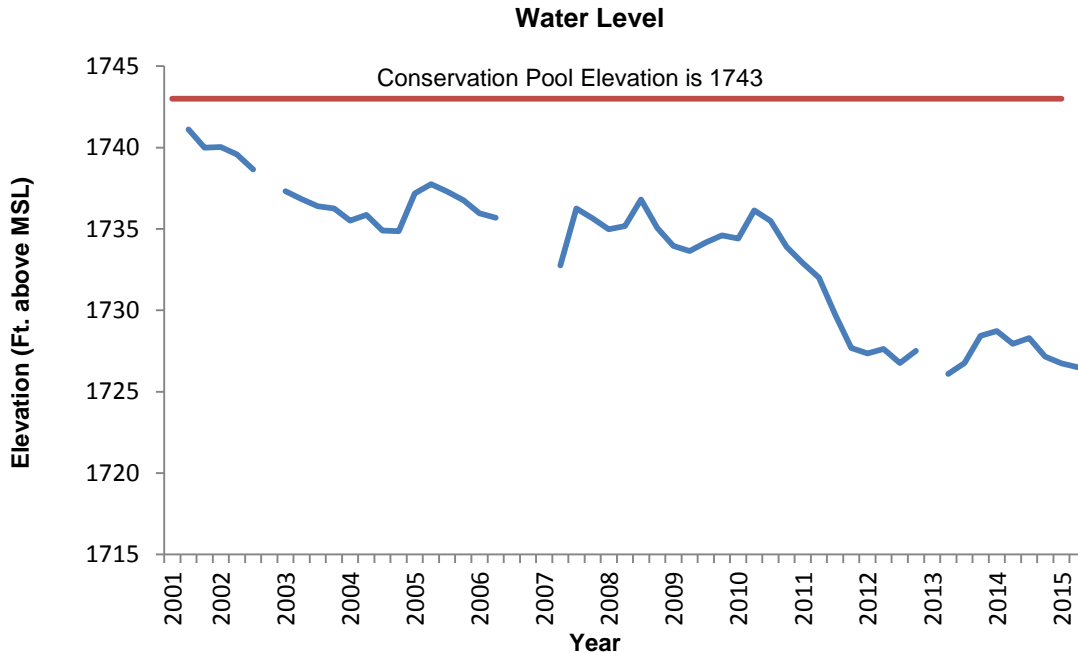


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Brady Creek Reservoir, Texas. Some data points were missing due to gauge malfunction.

Table 1. Characteristics of Brady Creek Reservoir, Texas.

Characteristic	Description
Year constructed	1963
Controlling authority	City of Brady, Texas
County	McCulloch
Reservoir type	Tributary
Shoreline Development Index	4.0
Conductivity	3,890 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Brady Creek Reservoir, Texas, August 2014. Reservoir elevation at time of survey was 1729 feet above mean sea level.

Boat Ramp Name	Latitude Longitude (dd)	Public	Parking Capacity (N)	Elevation at end of boat ramp (ft)	Condition
Brady Lake Park South	31.13658 99.3845	Y	15	1726	Fair
Brady Lake Park North	31.14183 99.39067	Y	10	1735	Out of water-extension not feasible
North Shore Ramp	31.13067 99.38293	Y	30	1733	Out of water-extension not feasible
FM 2028 Ramp	31.119433 99.39693	Y	30	1730	Out of water-extension not feasible



Table 3. Harvest regulations for Brady Creek Reservoir.

Species	Bag Limit	Length Limit
Catfish: 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	14-inch minimum
Crappie: White and Black, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Brady Creek Reservoir, Texas. FGL = fingerling, ADL = adults, and NR = size not recorded.

Species	Year	Number	Size
Threadfin Shad	1984	500	ADL
Bluegill	2013	2,316	ADL
Blue Catfish	1978	12,257	NR
	1979	43,998	NR
	1980	14,406	NR
	1981	40,000	NR
	Total	110,661	
Channel Catfish	1980	35,000	NR
	1987	200,500	FGL
	1999	400	ADL
	2013	82,291	FGL
	Total	318,191	
Smallmouth bass	1984	40,000	FGL
	1986	36,240	FGL
	Total	76,240	
Florida Largemouth Bass	1982	103,765	FGL
	1983	101,132	FGL
	2007	103,097	FGL
	2013	84,273	FGL
	Total	392,267	

Table 5. Survey of aquatic vegetation, Brady Creek Reservoir, Texas, 2011 and 2014. Surface area coverage (acres) was estimated for each vegetation type for the actual elevation during the survey. Water level in 2011 was 8 feet below conservation pool (1322 acres), and in 2014 was 15 feet below conservation pool (820 acres). Surface area is listed with percent of total reservoir area in parentheses. In 2011 the survey was conducted using random-point method, and in 2014 the survey was conducted with a lake circumnavigation by boat.

Vegetation type	2011	2014
Native submerged vegetation <sup>1</sup>	251 (19)	103 (6)
Native emergent vegetation <sup>2</sup>	13 (1)	13 (1)

<sup>1</sup> chara, sago pondweed, marine naiad, Illinois pondweed,  
<sup>2</sup> cattail, bulrush

Table 6. Proposed sampling schedule for Brady Creek Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, electrofishing and trap netting surveys are conducted in the fall and vegetation and access surveys are conducted in the summer. Standard survey denoted by S. Additional surveys may be conducted after water level and quality improve.

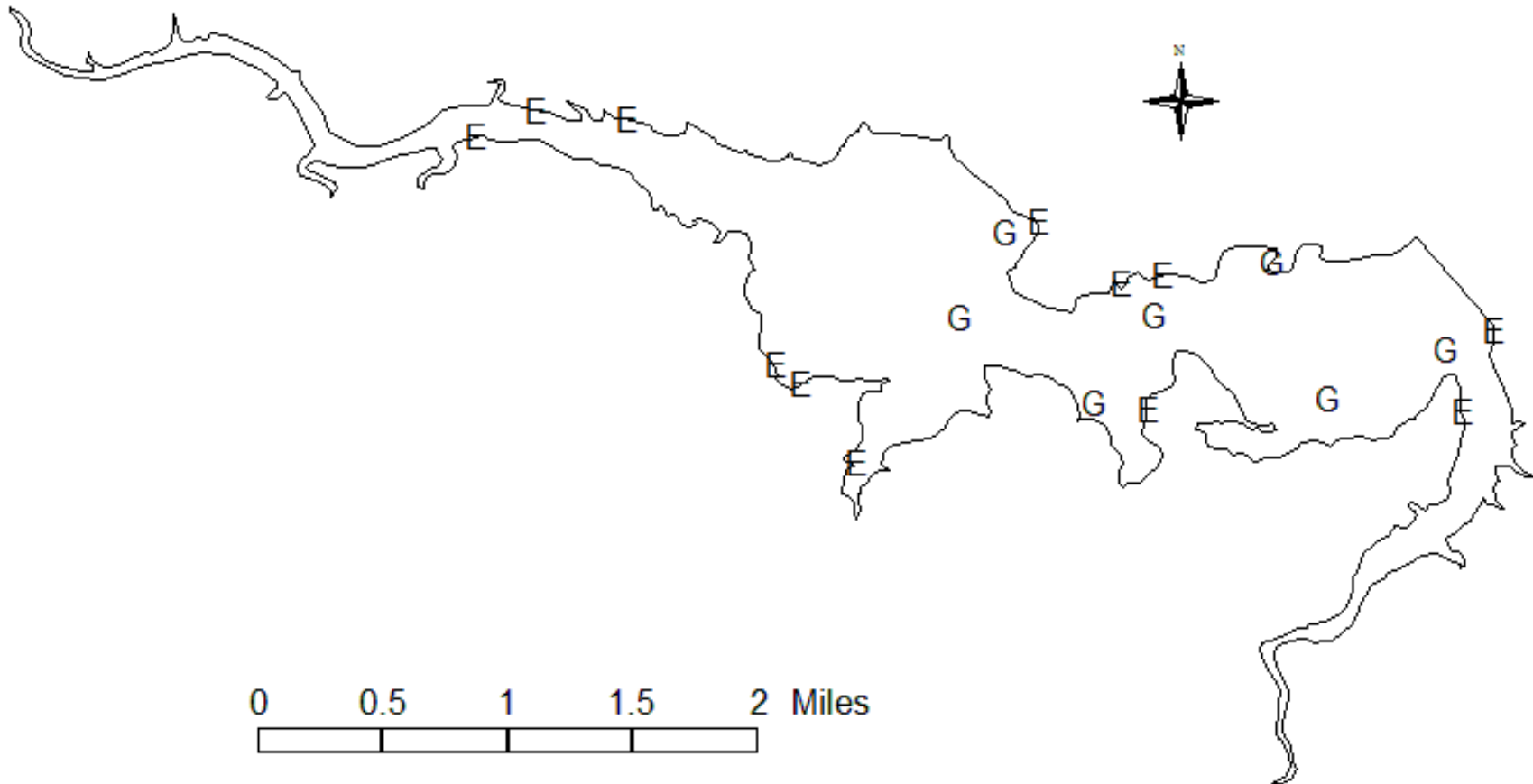
Survey year	Electrofishing	Trap net	Gill net	Vegetation	Access	Report
2015-2016						
2016-2017						
2017-2018						
2018-2019	S			S	S	S

**Appendix A**

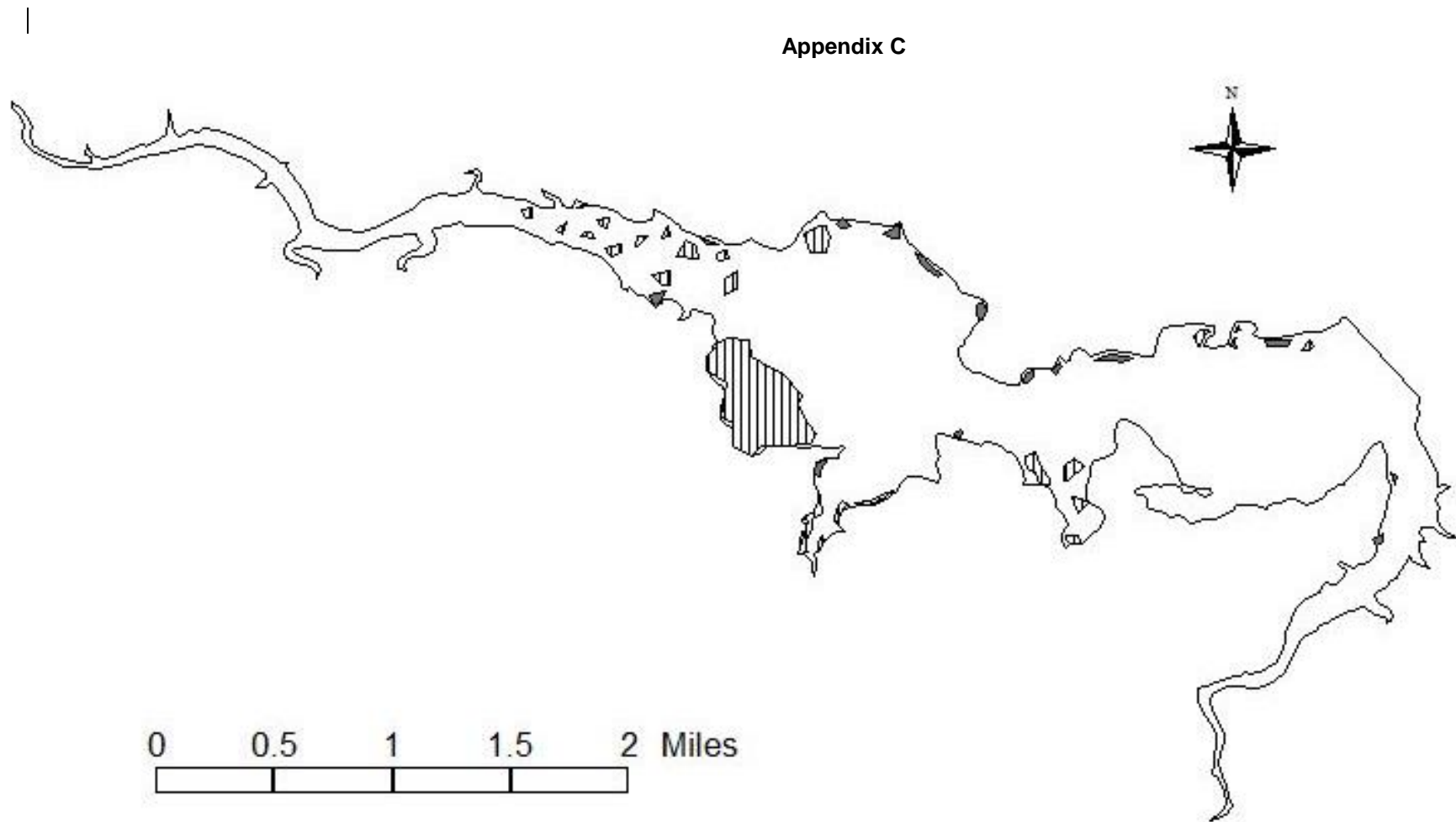
Number (N) and catch rate (CPUE) of all species collected from all gear types from Brady Creek Reservoir, Texas, 2014-2015. Effort was 7 net-nights for spring gill netting, and 1 hour for fall electrofishing.

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Longnose Gar	16	2.3	14	14.0
Gizzard Shad			8	8.0
Common Carp	26	3.7	6	6.0
River Carpsucker	5	0.7		
Smallmouth Buffalo			4	4.0
Channel Catfish	4	0.6	1	1.0
White Bass			3	3.0
Green Sunfish			3	3.0
Warmouth			4	4.0
Bluegill			4	4.0
Largemouth Bass			12	12.0
White Crappie			1	1.0
Freshwater Drum			3	3.0

## Appendix B



Location of sampling sites, Brady Creek Reservoir, Texas, 2014-2015. Gill net and electrofishing stations are indicated by Gs and Es, respectively. Water level was approximately 15 feet below conservation pool at time of sampling (actual elevation represented by map above).



Location and types of vegetation observed during 2014 vegetation survey, Brady Creek Reservoir, Texas, 2014. Solid gray indicates native emergent plants. Black and white stripes indicates native submerged plants. Water level was approximately 15 feet below conservation pool at time of sampling (actual elevation represented by map above).