PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-33

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

Bryson Reservoir

Prepared by:

Wes Dutter and Steven Hise
Inland Fisheries Division
District 2-E, Wichita Falls, Texas

Carter Smith
Executive Director

Phil Durocher
Director, Inland Fisheries

July 31, 2008

TABLE OF CONTENTS

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Bryson Reservoir were surveyed in 2007 using trap nets and electrofishing and in 2008 using gill nets. This report summarizes the results of the surveys and contains a reservoir management plan based on those findings.

- **Reservoir Description:** Bryson Reservoir is a 170-acre impoundment constructed in 1980. It is located in Jack County approximately 57 miles southeast of Wichita Falls and is controlled by the City of Bryson. The primary use is for municipal water supply. Maximum depth is 49 feet. Habitat consisted of flooded terrestrial vegetation, rocks, and dead trees. The water level had been extremely low leading up to the high inflow of 2007 that filled the lake to just under full. Boat access consists of a single, one-lane public boat ramp when water levels allow. Although a four-wheel drive is not always needed, it is recommended for launching larger boats. Bank fishing is available, but is limited by heavy brush around the lake to a few public access points including the boat ramp. Water clarity was 5.5 feet as measured by secchi disk.

- **Management history:** Historically important sport fish include largemouth bass and channel catfish. Channel catfish were last stocked in 1998.

- **Fish Community**
  - **Prey species:** Prey species included bluegill, redear sunfish, and inland silversides. Although some bluegill were larger, most remained in the size range most vulnerable to predation. Redear sunfish were observed up to 9 inches in length.

  - **Catfishes:** Channel and flathead catfish are present in the reservoir. They were both sampled during the 2008 gill net survey.

  - **Largemouth bass:** Largemouth bass are abundant with good body condition, but catch rate was down from the previous survey.

- **Management Strategies:** Stock nine to 12 inch advanced fingerling channel catfish to increase the abundance of channel catfish present in the reservoir. Also, visit with the controlling authority about improving the boat ramp.

INTRODUCTION

This document is a summary of fisheries data collected from Bryson Reservoir in 2007-2008. 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 information is presented with the 2007-2008 data for comparison.

Reservoir Description

Bryson Reservoir is a 170-acre impoundment constructed in 1980. It is located in Jack County approximately 57 miles southeast of Wichita Falls and is controlled by the City of Bryson. Primary uses include municipal water supply and recreation. Maximum depth is 49 feet. Habitat consisted of flooded terrestrial vegetation, rocks, and dead trees. The water level had been extremely low before 2007, but high inflow that year filled the lake to just under full. Boat access consists of a single, one-lane public boat ramp when water levels allow. Although a four wheel drive is not required, it is recommended for launching larger boats. Bank fishing is available, but is limited by heavy brush around the lake to a few public access points including the boat ramp. Other characteristics are found in Table 1.

Harvest regulation history: Sport fish species in Bryson are currently managed under statewide regulations (Table 2).

Stocking history: The last stocking this lake received was advanced fingerling channel catfish in 1998 at a rate of 25 per acre. See stocking history (Table 3).

METHODS

Fishes were collected by electrofishing (one complete circuit around the reservoir), gill netting (4 net nights at 4 stations to match historical sampling and because possible sampling sites were limited due to size of reservoir and standing timber), and trap netting (5 net nights at 5 stations). Catch per unit effort 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 caught per net night (fish/nn). All survey sites were randomly selected and the surveys, except for the daytime electrofishing circuit, were conducted according to standardized Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and condition indices [relative weight (Wr)] were calculated for target fishes according to Anderson and Neumann (1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices.

RESULTS AND DISCUSSION

Habitat: Lake Bryson consists of primarily a rocky shoreline with standing timber. For years preceding 2007, the watershed was under a severe drought that lowered the reservoir to only 10% of volume (City of Bryson personal communication). In the spring of 2007, the watershed received much-needed precipitation that brought the water level up to almost full. The new elevation inundated terrestrial vegetation that became established during the low water period.

Prey species: Electrofishing catch rates of bluegill were 102.9/h; down from the previous catch rate in 1993 of 140.0/h (Figure 1). Redear sunfish were sampled at 25.7/h, which is higher than the results of the 1993 electrofishing survey of 5.0/h (Figure 2). Inland silversides were observed during our surveys, but were not collected or enumerated. Green sunfish and warmouth were also documented in this lake in low abundance. No shad have ever been recorded during sampling, but threadfin shad were introduced in 1996.

Channel catfish: Channel catfish sampled in the 2008 gill net survey dropped from a total of 4 caught in 1998 to 1 (Figure 3). Body condition was very good for the lone individual sampled, but more samples would be needed to make an assessment of the entire population.

Flathead catfish: Flathead catfish have historically been present in the reservoir and one flathead catfish was observed in the 2008 gill net survey compared to three in the 1998 gill net survey (Figure 4).

Largemouth bass: In 2007, largemouth bass catch rates were down from the previous 1993 survey from 205.0/h to 62.3/h, but relative weights did increase (Figure 5). In 1993, the CPUE for bass over 14 inches was 19.0 compared to 12.0 for the 2007 survey. The electrofishing survey in 1993 was conducted at night, coinciding with the time largemouth bass are most susceptible to that gear type, while the 2007 survey was conducted during the day. This could explain some of the differences between years. Another factor that could also have contributed to this difference is the amount of dense terrestrial vegetation that has grown up around the lake when the water level was low making it difficult to maneuver the electrofishing boat.

Fisheries management plan for Bryson Reservoir, Texas

Prepared – July 2008

ISSUE 1: The boat ramp area is very difficult to use, and for the most part a four wheel drive vehicle is required to launch a boat. The area has a very steep grade and is covered with loose rocks.

MANAGEMENT STRATEGY

1. Visit with controlling authority officials to discuss options to improve the current boat ramp on the lake.

ISSUE 2: Many anglers are unfamiliar with this lake as a fishing destination and need directions to get to Bryson Reservoir.

MANAGEMENT STRATEGY

1. Complete the area angler's guide and a link to the lake on TPWD website to make more angler's aware of this lake with directions on how to get there.

ISSUE 3: Due to a long period of low water in the reservoir, our surveys showed a drop in catch rate of channel catfish. Within the last year the lake received a significant amount of precipitation to bring the lake level to near full.

MANAGEMENT STRATEGY

1. Stock 12-inch advanced fingerling channel catfish at a rate of 10/acre in fall of 2008. Advanced fingerling catfish is requested due to the clear water and high abundance of large largemouth bass.

ISSUE 4: Due to very dense vegetation and some steep sided banks, there are very few access areas for anglers to get to the lake.

MANAGEMENT STRATEGY

1. Visit with controlling authority officials to discuss possibility of constructing fishing piers or docks or removing some dense vegetation to allow for better utilization by anglers.

SAMPLING SCHEDULE JUSTIFICATION:

Conduct an electrofishing survey in the fall of 2008 to monitor bass recruitment and obtain some baseline age and growth data. Conduct a gill net survey in 2011 to monitor the channel catfish stocking.

LITERATURE CITED

Anderson, R. O. and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Table 1. Characteristics of Bryson Reservoir, Texas.

Characteristic	Description
Year constructed	1980
Controlling authority	City of Bryson
County	Jack
Reservoir type	Tributary
Shoreline development index (SDI)	2.53
Conductivity	370 *µ*mhos/cm
Secchi disc reading	170 cm

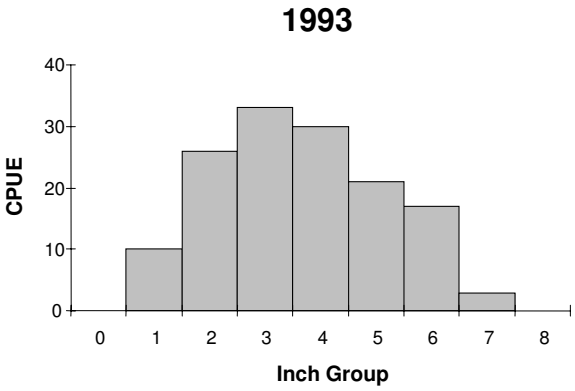
Table 2. Harvest regulations for Bryson Reservoir.

Species	Bag Limit	Length Limit (inches)
Catfish: Channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 minimum
Flathead catfish	5	18 minimum
Largemouth bass	5	14 minimum

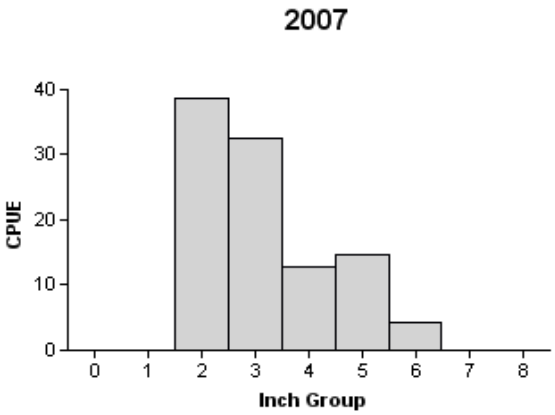
Table 3. Stocking history of Bryson, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Channel catfish	1996	17,050	FGL	2.0
	1998	4,246	AFGL	7.4
	Total	21,296		
Coppernose bluegill	1981	100,000	UNK	UNK
	Total	100,000		
Florida largemouth bass	1981	19,900	FRY	1.0
	Total	19,900		
Green sunfish x redear sunfish	1980	20,000		UNK
	Total	20,000		
Mississippi silvery minnow	1984	100		2.0
	Total	100		
Threadfin shad	1984	300	AFGL	2.0
	Total	300		

Bluegill



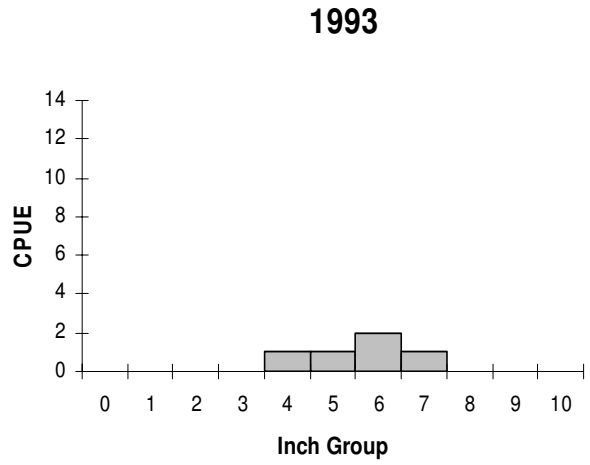
Effort = 1.0
Total CPUE =140.0 (12; 143)
PSD = 19 (7)



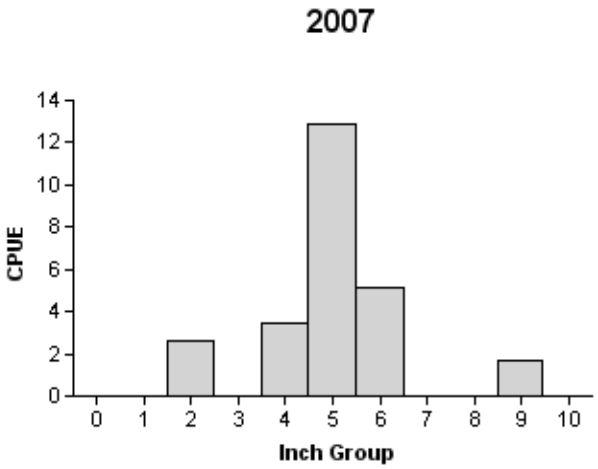
Effort = 1.2
Total CPUE =102.9 (28; 120)
PSD = 7 (2)

Figure 1. 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, Bryson Reservoir, Texas, 1993 and 2007.

Redear Sunfish



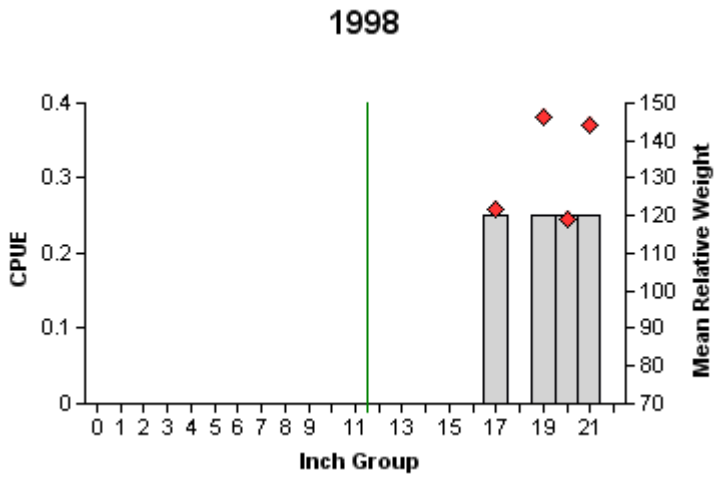
Effort = 1.0
Total CPUE = 5.0 (76, 5)
PSD = 17 (11.6)



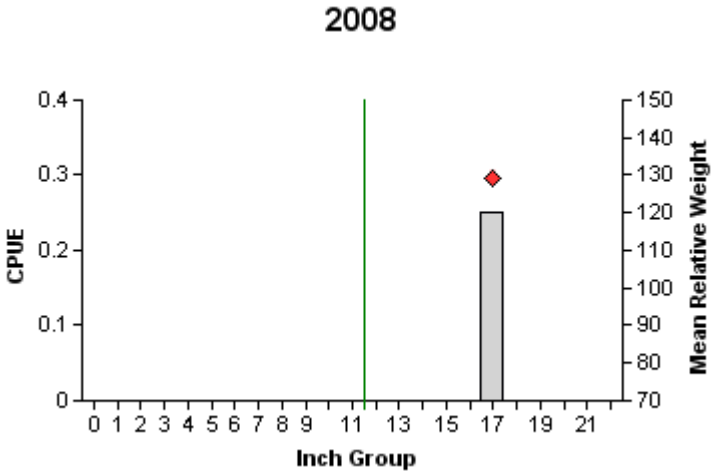
Effort = 1.2
Total CPUE = 25.7 (6; 30)
PSD = 7 (3)

Figure 2. Number of redear sunfish 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, Bryson Reservoir, Texas, 1993 and 2007.

Channel Catfish



Effort = 4.0
Total CPUE = 1.0 (58; 4)
Stock CPUE = 1.0 (58; 4)
PSD = 100 (0)
RSD-P = 0 (0)

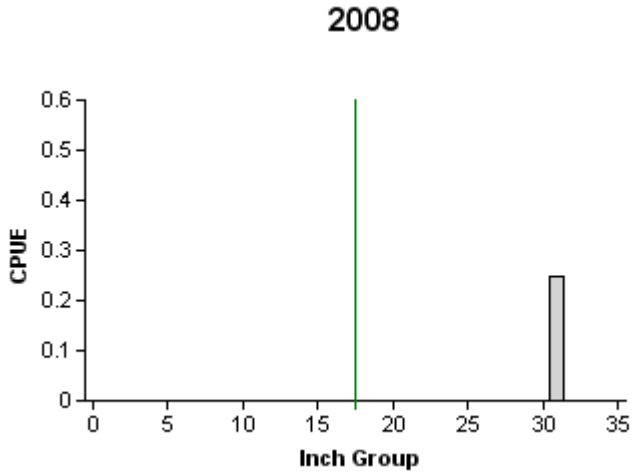


Effort = 4.0
Total CPUE = 0.3 (100; 1)
Stock CPUE = 0.3 (100; 1)
PSD = 100 (0.0)
RSD-P = 0 (0)

Figure 3. 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 netting surveys, Bryson Reservoir, Texas, 1998 and 2008. Line indicates minimum size limit at time of sampling.

Flathead Catfish

Effort = 4.0
Total CPUE = 0.8 (33; 3)
Stock CPUE = 0.8 (33; 3)
PSD = 67 (31.4)
RSD-P = 0 (0)

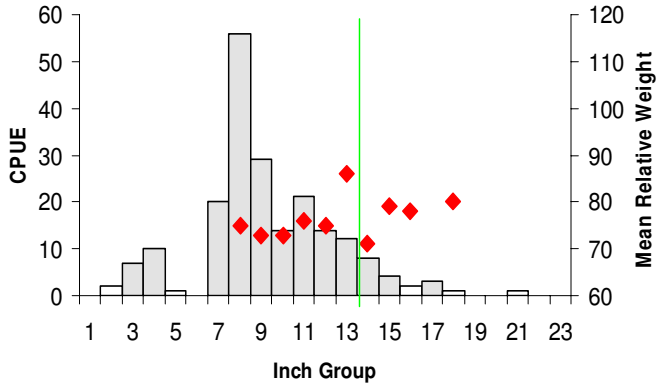


Effort = 4.0
Total CPUE = 0.3 (100; 1)
Stock CPUE = 0.3 (100; 1)
PSD = 100 (0)
RSD-P = 100 (0)

Figure 4. Number of flathead 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 netting surveys, Bryson Reservoir, Texas, 1998 and 2008. Line indicates minimum size limit at time of sampling.

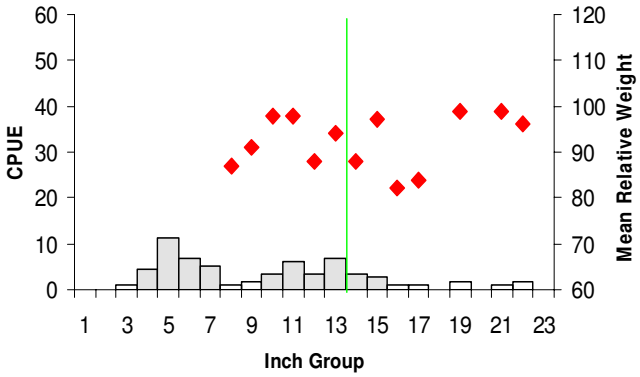
Largemouth Bass

1993



Effort =	1.0
Total CPUE =	205.0 (15; 205)
Stock CPUE =	165.0 (11; 165)
CPUE-14 =	19.0 (18; 19)
PSD =	27 (2.5)
RSD-P =	7 (1.8)

2007



Effort =	1.2
Total CPUE =	62.6 (7; 73)
Stock CPUE =	34.3 (7; 40)
CPUE-14 =	12.0 (26; 14)
PSD =	65 (10.3)
RSD-P =	25 (10.4)

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, Bryson Reservoir, Texas, 1993 and 2007. Line indicates minimum size limit at time of sampling.

Largemouth Bass

Table 4. Results of genetic analysis of largemouth bass collected by fall electrofishing at Bryson Reservoir, Texas. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB.

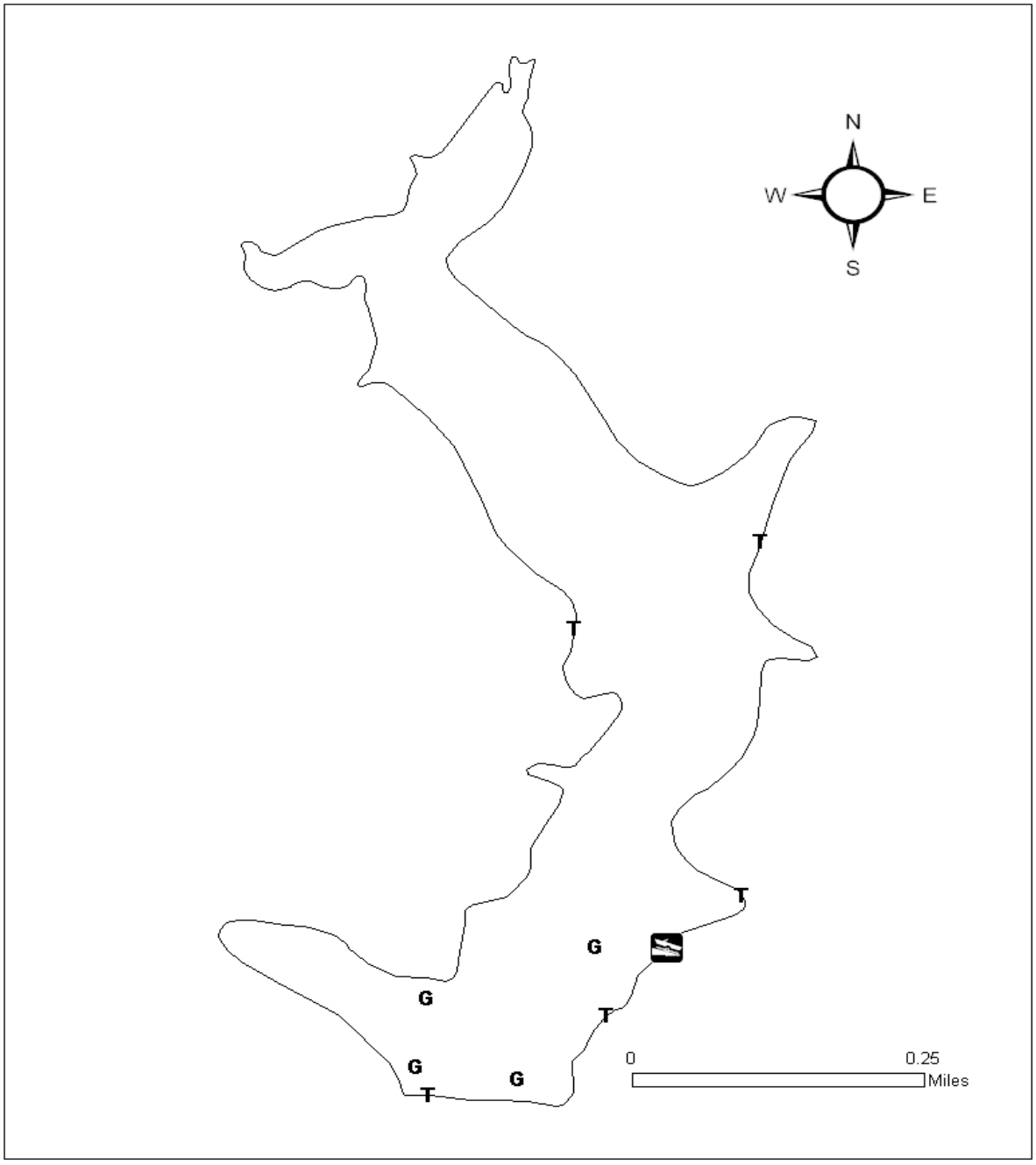
		Genotype				
Year	Sample size	FLMB	F1 or Fx	NLMB	% FLMB alleles	% pure FLMB
1993	19	5	1	1	68.4	26.3
2007	30	2	4	0	66.2	6.7

APPENDIX A

Number (N) and catch rate (CPUE) for species collected from gill nets (2008), trap nets (2007) and electrofishing (2007) from Bryson Reservoir, Texas.

	Gill Nets		Trap Nets		Electrofishing	
Species	N	CPUE	N	CPUE	N	CPUE
Channel catfish	1	0.3				
Flathead catfish	1	0.3				
Green sunfish					6	6.0
Warmouth	1	0.3			1	0.9
Bluegill			94	18.8	120	102.9
Redear sunfish	2	0.5	28	5.6	30	25.7
Largemouth bass	28	7.0			73	62.6

APPENDIX B



Location of sampling sites, Bryson Reservoir, Texas, 2007-2008. Trap net and gill net sites are indicated by T and G. Electrofishing was a complete circuit of the lake.