PERFORMANCE REPORT

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FEDERAL AID PROJECT F-30-R-35

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2009 Survey Report

McClellan Reservoir

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TABLE OF CONTENTS

SURVEY AND MANAGEMENT SUMMARY

Fish Populations in McClellan Reservoir were surveyed in 2009 using electrofishing and trap nets and in 2010 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:** McClellan Reservoir is a 405-acre reservoir located 64 miles east of Amarillo, Texas, on McClellan Creek in the Red River Basin. It is owned and operated by the United States Forest Service as part of the Black Kettle National Grassland and is used for recreational purposes. No water level data is recorded for the reservoir, but it has a history of extreme water level fluctuations. Extensive excavation was done within the basin in 2001 and 2002 to allow for better water retention. The reservoir was approximately 200 acres in 2009. Rains in spring 2010 filled the basin to capacity. Boat access consisted of two public boat ramps. The shoreline is 100% accessible to bank anglers. There are no handicap-specific facilities. Primary habitat was mud bank and cobble.

- **Management history:** Important sport fish included white crappie and catfish. The US Forest Service did extensive excavation within the basin in 2001 and 2002 with the goal of improved water retention. The reservoir is managed with statewide regulations and stocked with channel catfish and largemouth bass when water conditions permited. Saugeye were stocked in the reservoir to help manage an overabundant crappie population.

- **Fish Community:**

  - Prey species: No gizzard shad were collected in 2009 but catch rate of bluegill was high. None of the bluegill were larger than 4 inches.
  - Catfishes: Five blue catfish and 17 channel catfish were collected in 2010 and most were ≤12 inches.
  - Black basses: Only three largemouth bass were collected in 2009 and all were < 8 inches. These fish may be surviving offspring from stock tanks within the watershed.
  - Crappie: Trap net catch rates for white crappie were extremely high but all fish collected were less than 5 inches.
  - Saugeye: No saugeye were collected in any gear in 2009 or 2010. Saugeye were stocked in 2008; but likely did not survive the extreme low water levels.

- **Management strategies:** Based on current information, and due to extreme water level fluctuations, the reservoir should continue to be managed with existing regulations. The focus will be on providing a catfish fishery in the next few years, if water levels allow for continued survival. Blue and channel catfish, largemouth bass and bluegill will be requested and stocked as available and as water levels permit. Saugeye were stocked in 2010 to address the overpopulation of white crappie. Black bullhead are overabundant in the reservoir. An attempt will be made to collect and stock blue catfish and flathead catfish to help manage this problem.

INTRODUCTION

This document is a summary of conditions at McClellan Reservoir in 2009-2010. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery.

Reservoir Description

McClellan Reservoir is a 405-acre impoundment constructed in 1938 on McClellan Creek. It is located in Gray County approximately 64 miles east of Amarillo and is owned and operated by the US Forest Service, Black Kettle National Grassland. Primary water use is recreation. No water level data is recorded for the reservoir, but it has a history of extreme water level fluctuations. The reservoir had extreme low water levels in 1990, went completely dry in 1995, and then filled to overflowing in 1996. The reservoir again had extreme low water levels in 2000. Extensive excavation was done within the basin in 2001 and 2002 to allow for better water retention. The basin renovation coincided with the beginning of a new drought of record for the area that has persisted through 2009. The reservoir filled to ½ capacity in 2004 then dried completely again in 2005. The reservoir gained water in 2006 but had extreme low water levels through 2008 then refilled in 2009 to approximately 200 acres. Rains in spring 2010 filled the basin to capacity. Habitat in 2005 consisted of mud shoreline and small areas of cobble. Native aquatic plants present were *Potamogeton* species. Boat access consisted of two public boat ramps. The shoreline is 100% accessible to bank anglers. There are no handicap-specific facilities. Other descriptive characteristics for McClellan Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Munger and Henegar 2006) included:

1. The current drought of record has caused the reservoir to experience extreme low water levels or dry three times in the past 10 years.
   Strategy: Stock channel catfish, largemouth bass, and bluegill at standard rates when water levels permit.
   Action: The reservoir was stocked following a water level rise in 2003 and again in 2008, 2009 and 2010.
2. The reservoir has a history of overpopulation of white crappie and black bullhead.
   Strategies:
   1) Monitor the fishery and stock saugeye if the white crappie population becomes overabundant. Stocking rate will be determined based on abundance of white crappie.
   2) Monitor the fishery and conduct management stocking of flathead catfish if the black bullhead population becomes overabundant. Stocking rate will be determined based on abundance of black bullhead.
   Action: Loss of water in 2008 worked to control the crappie and bullhead populations. Saugeye were stocked in 2008 but did not survive the low water level. Saugeye were stocked again in 2010.

Harvest regulation history: Sport fishes in McClellan Reservoir are currently and have historically been managed with statewide regulations (Table 2).

Stocking history: The earliest recorded stocking for McClellan Reservoir is 1965. Experimental stockings of palmetto bass were attempted between 1979 and 1992. Smallmouth bass were stocked in 1984 and paradise bass (hybrid yellow bass X striped bass) were stocked in 1977. Saugeye were stocked since 1999 to control the white crappie and gizzard shad populations. Stocking has been conducted to re-establish sport fish communities following drought periods. The recent stocking history is in Table 3.

Vegetation/habitat management history: McClellan Reservoir had limited diversity of vegetation and habitat. At the time of the last habitat survey, there was only 0.5 acres of *Potamogeton* and available habitat was 87% nondescript (Munger 1999). No additional habitat surveys have been conducted since basin renovation due to drought conditions.

METHODS

Fishes were collected by electrofishing (1.0 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 (n/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (n/nn). All survey sites were randomly selected. All surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2008).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], and condition indices [relative weights (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.

RESULTS AND DISCUSSION

Habitat: A habitat survey was last conducted in 1998 (Munger 1999). At that time, littoral zone habitat consisted primarily of silt, rocks, submerged terrestrial vegetation, and Eurasian watermilfoil.

Prey species: No gizzard shad were collected by electrofishing in 2009. Electrofishing catch rate of bluegill in 2009 was 257.0/h with no fish larger than 4 inches collected (Figure 2). Repeated drying events have severely impacted prey species populations.

Blue catfish: The gill net catch rate for blue catfish in 2010 was 1.0/nn (Figure 3). The blue catfish that were collected are likely survivors of the stocking in 2008 which would indicate very poor growth.

Channel catfish: The gill net catch rate of channel catfish was 3.4/nn in 2010 (Figure 4). The relative weight of most fish collected was over 95.

Largemouth bass: The electrofishing catch rate of largemouth bass was 3.0/h in 2009 (Figure 5). The only fish collected were less than stock length so relative weight was not calculated. These fish may be surviving offspring from stock tanks upstream within the watershed.

White crappie: The trap net catch rate of white crappie was 184.6/nn in 2009 (Figure 6). No stock-size (5 inch) crappie were collected so condition indices could not be calculated.

Saugeye: No saugeye were collected in gill nets in 2010.

Fisheries management plan for McClellan Reservoir, Texas

Prepared – July 2010.

ISSUE 1: The current drought of record has caused the reservoir to experience extreme low water levels or dry three times in the past 10 years.

MANAGEMENT STRATEGY

1. Stock blue catfish, channel catfish, largemouth bass, and bluegill at standard rates when water levels permit.

ISSUE 2: The reservoir has a history of overpopulation of white crappie and black bullhead.

MANAGEMENT STRATEGIES

1. Monitor the fishery and stock saugeye when the white crappie population becomes overabundant. Stocking rate will be determined based on abundance of white crappie. Saugeye predation on white crappie should be high as no gizzard shad are available as alternate prey.
2. Monitor the fishery and conduct management stocking of flathead catfish if the black bullhead population becomes overabundant. Stocking rate will be determined based on abundance of black bullhead and the ability to collect fish for transfer from other water bodies.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes additional trap net sampling in fall 2011, additional gill netting in spring 2012 if water levels permit, and a full survey in 2013/2014 (Table 4). Additional trap net sampling in 2011 is necessary to assess white crappie abundance. The gill net survey in 2012 is necessary to monitor the catfish fishery and stocking success of saugeye.

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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.

Guy, C. S., R. M. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional Size Distribution (PSD): A Further Refinement of Population Size Structure Index Terminology. Fisheries 32:348.

Munger, C. 1999. Statewide freshwater fisheries monitoring and management program survey report for McClellan Reservoir, 1998. Texas Parks and Wildlife Department, Federal Aid In Sport Fish Restoration, Grant F-30-R, Performance Report, Austin.

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Table 1. Characteristics of McClellan Reservoir, Texas.

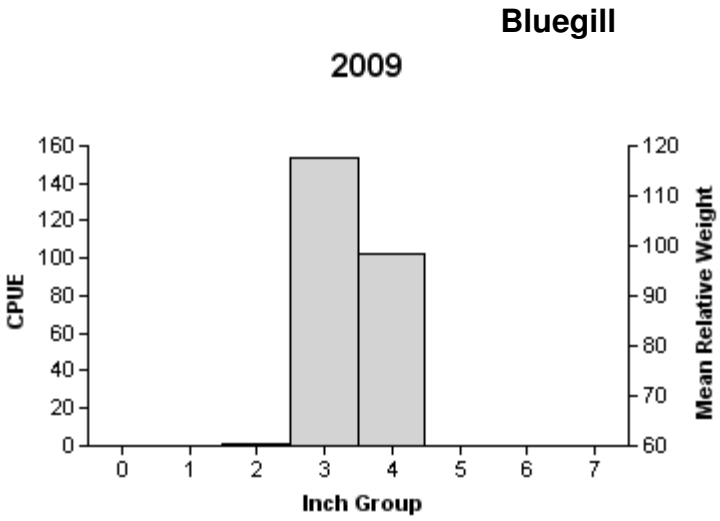
Characteristic	Description
Year constructed	1938
Controlling authority	US Forest Service
County	Gray
Reservoir type	Tributary
Shoreline Development Index	1.06
Conductivity	230 µmhos/cm

Table 2. Harvest regulations for McClellan Reservoir, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Bass, largemouth	5	14 - No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit
Saugeye	3	18 - No Limit

Table 3. Stocking history of McClellan Reservoir, Texas. Size categories: FRY = <1 inch, FGL = 1-3 inches, ADL = adults. Since the reservoir went completely dry in 2005, stocking data is not presented prior to that year.

Species	Year	Number	Size
Blue catfish	2008	3,416	FGL
Channel catfish	2005	8,000	FGL
	2007	5,662	FGL
	2009	1,999	FGL
	2010	183	ADL
	Total	15,844	
Largemouth bass	2010	31,265	FGL
Florida largemouth bass	2008	32,793	FGL
Saugeye	2008	30,042	FGL
	2010	489,450	FRY
	2010	12,063	FGL
	Total	531,555	



Effort =	1.0
Total CPUE =	257.0 (21; 257)
Stock CPUE =	256.0 (21; 256)
PSD =	0 (0)
PSD-P =	0 (0)

Figure 1. Number of bluegill caught per hour (CPUE) and population indices (RSE and N are in parentheses) for the fall electrofishing survey, McClellan Reservoir, Texas, 2009. RSE is used for CPUE values and SE is used for PSD values.

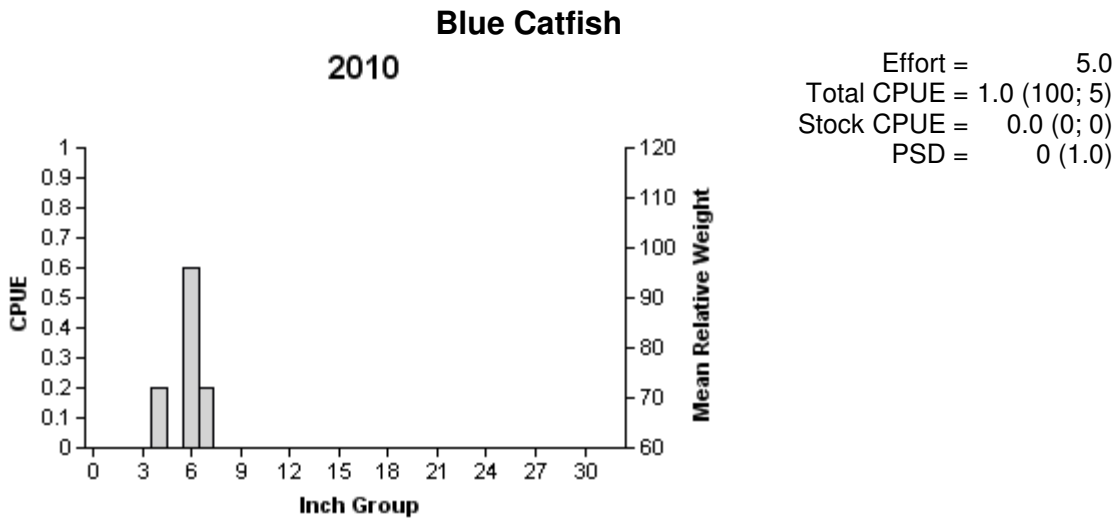


Figure 2. Number of blue catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for the spring gill net survey, McClellan Reservoir, Texas, 2010. RSE is used for CPUE values and SE is used for PSD values.

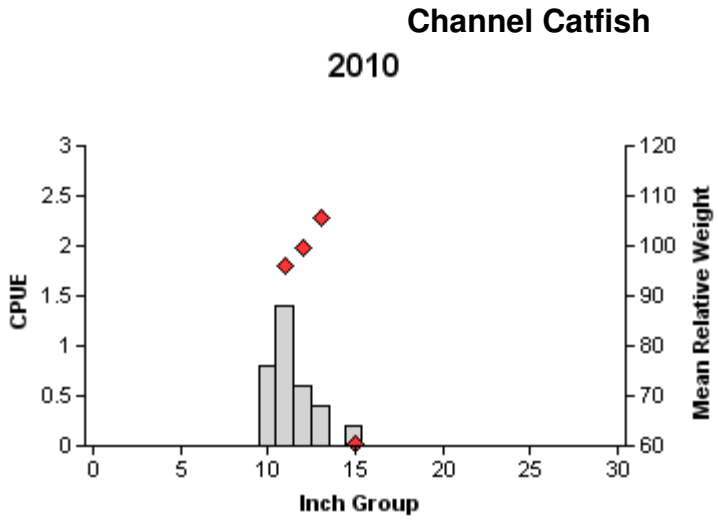


Figure 3. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net survey, McClellan Reservoir, Texas, 2010. RSE is used for CPUE values and SE is used for PSD values.

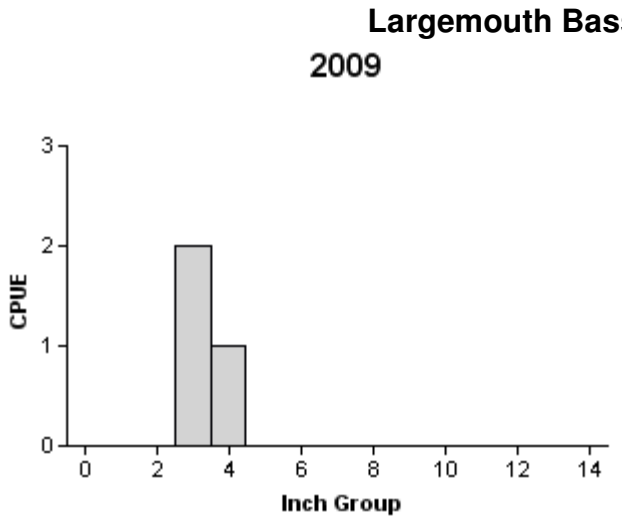


Figure 4. Number of largemouth bass caught per hour (CPUE, bars), and population indices (RSE and N are in parentheses) for the fall electrofishing survey, McClellan Reservoir, Texas, 2009. RSE is used for CPUE values and SE is used for PSD values.

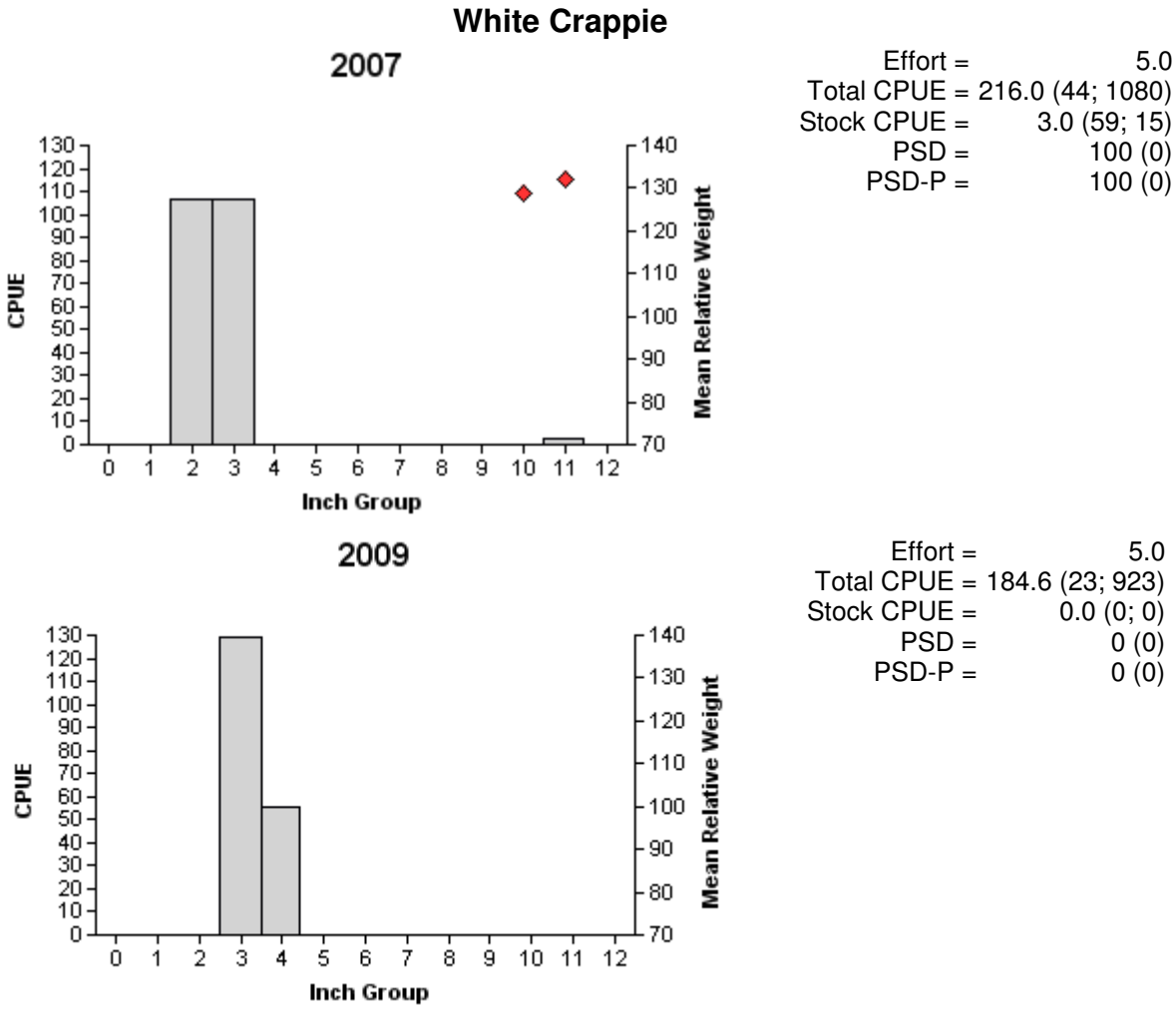


Figure 5. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for fall trap net surveys, McClellan Reservoir, Texas, 2007 and 2009. RSE is used for CPUE values and SE is used for PSD values.

Table 4. Proposed sampling schedule for McClellan Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. S denotes standard survey and A denotes additional survey.

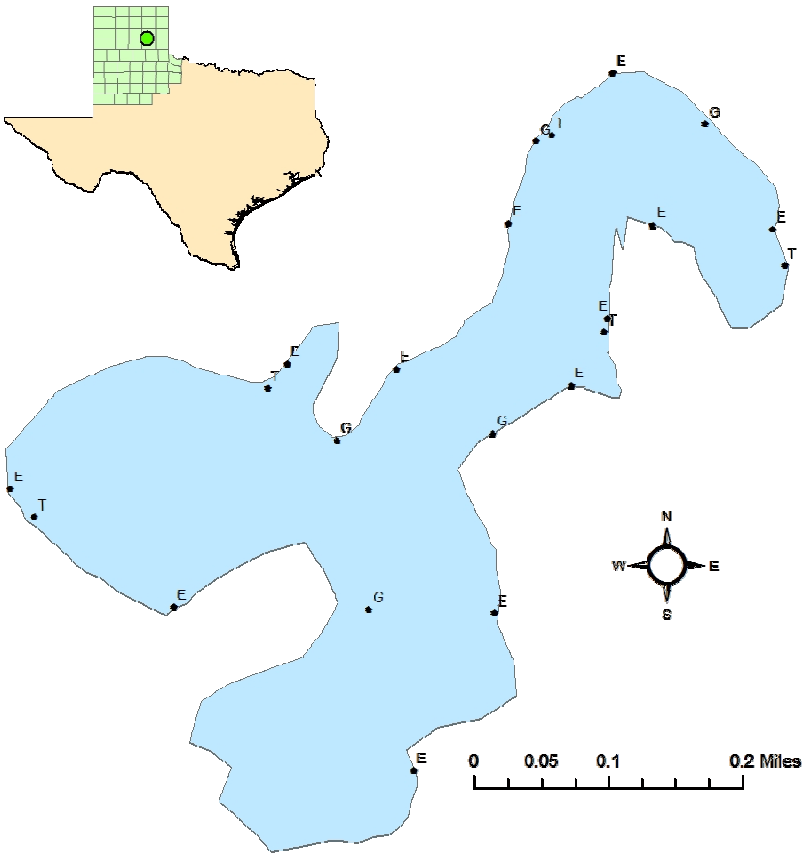
Survey Year	Electrofishing	Trap Netting	Gill Netting	Report
Fall 2010 – Spring 2011				
Fall 2011 – Spring 2012		A	A	
Fall 2012 – Spring 2013				
Fall 2013 – Spring 2014	S	S	S	S

APPENDIX A

Catch rate of all species collected from all gear types from McClellan Reservoir, Texas, 2009-2010. Effort was 1 h for electrofishing, 5 net nights for gill nets, and 5 net nights for trap nets.

	Electrofishing		Gill Netting		Trap Netting	
Species	N	CPUE	N	CPUE	N	CPUE
Blue catfish			5	1.0		
Black bullhead	546	546.0	408	81.6	43	8.6
Channel catfish			17	3.4	9	1.8
Bluegill	257	257.0	7	1.4	2	0.4
Largemouth bass	3	3.0				
White crappie	994	994.0	5	1.0	923	184.6

APPENDIX B



Location of sampling sites, McClellan Reservoir, Texas, 2009-2010. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Surface area indicated is approximately ½ full pool.