PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-2

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2011 Survey Report

Lake Naconiche

Prepared by:

Dan Ashe, Assistant District Management Supervisor
and
Todd Driscoll, District Management Supervisor

Inland Fisheries Division
District 3-D, Brookeland, Texas

Carter P. Smith
Executive Director

Gary Saul
Director, Inland Fisheries

July 31, 2012

TABLE OF CONTENTS

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Naconiche were surveyed in 2010-2012 using electrofishing and in 2011 using trap netting. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Lake Naconiche is an impoundment of Naconiche and Telesco creeks, tributaries of the Attoyac Bayou in the Neches River Basin. The lake was constructed by the County of Nacogdoches for recreation and flood control. This reservoir has a surface area of 692 acres at conservation pool (348 feet msl), a shoreline length of 13.1 miles, and an average depth of 13 feet. Access is available with a two lane boat ramp and two ADA-approved fishing piers. Bank access is adequate. Lake Naconiche was impounded in 2009 and will open for fishing in September 2012.

- **Management history:** Fish stockings began in 2009 and included threadfin shad, channel catfish, bluegill, Florida largemouth bass, and white and black crappie. Largemouth bass harvest will be regulated with an 18-inch minimum length limit. All other sport fish will be regulated with statewide regulations. Hydrilla was documented in 2009 and current coverage is 15% of the reservoir surface area.

- **Fish community**
  - **Prey species:** Electrofishing surveys indicated an adequate forage base for sport fishes. Forage species consisted of threadfin shad, gizzard shad, warmouth, bluegill, longear sunfish, redear sunfish, and redspotted sunfish. Bluegill were stocked in 2009 and 2011. Threadfin shad were stocked in 2010 and 2011.

  - **Catfishes:** Channel catfish were stocked in 2009 and 2011. A gill net survey (the method for assessing catfish abundance) has not been conducted.

  - **Largemouth bass:** Largemouth bass were abundant and numerous age classes of fish were present. Increasing catch rates from electrofishing surveys indicated adequate spawning and fish survival. Size structure has also improved, as the most recent survey reflected an abundance of fish > 12 inches in length, including some fish > 18 inches.

  - **Crappies:** White crappie and black crappie were stocked in the reservoir in 2010. A trap net survey conducted in 2011 sampled black crappie only. Black and white crappie have been observed during electrofishing surveys.

- **Management strategies:** Open the lake for public fishing on September 1, 2012. Manage largemouth bass harvest with an 18-inch minimum length limit. Continue to monitor trends of hydrilla coverage through annual aquatic vegetation surveys (2012-2014). Conduct annual electrofishing surveys (both fall and spring) through 2013/2014. Beginning in 2014/2015, conduct biennial spring surveys and a fall survey every four years. Monitor initial angler catch and harvest with a fall 2012 (September - November) and spring 2013 (March – May) creel survey. Beginning in 2016, conduct a spring quarter creel survey every four years. Conduct the initial gill net survey in 2014, and beginning in 2016, conduct surveys every four years.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Naconiche in 2010-2012. 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.

Reservoir Description

Lake Naconiche is a 692-acre reservoir impounded in 2009 on Naconiche and Telesco creeks (Table 1). It is located in Nacogdoches County approximately 14 miles northeast of Nacogdoches and is operated and controlled by the County of Nacogdoches for recreation and flood control. The lake will open for public fishing on September 1, 2012. Secchi disc readings average 5 feet. Aquatic habitat consisted of standing timber, hydrilla, and trace amounts of emergent plants. The majority of the land surrounding the reservoir is used for agriculture, timber production, and residential development.

Management History

Previous management strategies and actions: Although there is no previous management report available for this reservoir, past management strategies and actions include:

1. Stock forage and sport fish species to establish a viable fishery.
   Action: A total of 406,612 fish were stocked from 2009 to 2012 and included threadfin shad, channel catfish, bluegill, Florida largemouth bass (FLMB), white crappie, and black crappie.
2. Establish harvest regulations that will be conducive to both the angling public and the protection of a new and developing fishery.
   Action: In 2012, statewide harvest regulations were adopted for all species with the exception of largemouth bass. Largemouth bass will be managed with an 18-inch minimum length limit to protect the developing population from over harvest.
3. Foster a productive working relationship with the County of Nacogdoches.
   Action: TPWD and the County of Nacogdoches have fostered an excellent working relationship over the past five years. TPWD has notified the County of Nacogdoches of all management activities.
4. Conduct fishery surveys to assess fish abundance and stocking success.
   Action: Electrofishing surveys have been conducted from 2010 through 2012 to monitor largemouth bass and forage fish abundance. A trap net survey was conducted in 2011 to assess crappie abundance.

Harvest regulation history: Sport fishes in Lake Naconiche will be managed with statewide regulations with the exception of largemouth bass (Table 2). Largemouth bass will be managed with an 18-inch minimum length limit.

Stocking history: Sharelunker largemouth bass (2009 and 2011) and FLMB (2011 and 2012) were stocked to establish trophy fish potential (Table 3). Threadfin shad were successfully introduced in 2010. Bluegill and channel catfish were stocked in 2009 and 2011 and white and black crappie were stocked in 2010.

Vegetation/habitat history: Lake Naconiche was completely impounded in 2009. The controlling authority cleared all of the timber in the lower basin, but left a considerable amount in the two creek arms for fish habitat. A structural habitat survey has not been conducted. Hydrilla was observed as the lake was beginning to fill in 2008 and current coverage is estimated to be 15% of the lake surface area.

Water transfer: The purpose of Lake Naconiche is to provide recreation and flood control. There are no plans for water transfer.

METHODS

Fishes were collected by day time electrofishing during November 2010 (0.9 hours at 11, 5-min stations), April 2011 (0.5 hours at 6, 5-min stations), and October 2011 and March 2012 (both for 1 hour at 12, 5-min stations). Fishes were collected by trap netting in December 2011 (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 trap nets as the number of fish caught per net night (fish/nn). All surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011), but due to the amount of timber in the creek arms and inundated terrestrial growth in the lower basin, all survey sites were biologist selected.

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

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consists primarily of standing timber, trace amounts of native emergent aquatic vegetation, and hydrilla (15% total coverage).

Prey species: Electrofishing surveys indicated an adequate forage base for sport fishes. Forage species consisted of threadfin shad, gizzard shad, warmouth, bluegill, longear sunfish, redear sunfish, and redspotted sunfish (Appendix A). Bluegill was the most abundant sunfish species with 277.0/h collected during the 2011 fall electrofishing survey (Figure 1). Threadfin shad were also abundant, as 422.0/h were collected in 2011 (Appendix A)

Largemouth bass: Fall electrofishing catch rates increased and size structure improved from 2010 (51.3/h; PSD=21) to 2011 (107.0/h; PSD=64) (Figure 2). Most relative weights were > 90 which indicated ample forage. Spring electrofishing catch rates also indicated that abundance and size structure had improved between 2011 (112.0/h; PSD=59) and 2012 (204.0/h; PSD=88), and several fish >18 inches were collected (Figure 3).

Although the reservoir was stocked with > 90,000 Sharelunker largemouth bass in 2009 (Table 3), a random sample of numerous age classes in 2011 indicated that FLMB influence was relatively low (0.0% pure FLMB and 31% FLMB alleles; Table 4). An additional sample was collected in 2012 (age-1 fish only) and FLMB influence was higher (23.0% pure FLMB and 53% FLMB alleles). It appears that the 2011 FLMB stockings resulted in much higher survival rates when compared to the 2009 stockings.

Crappies: Five black crappie were collected during the 2011 trap net survey (1/nn) (Appendix A).

Fisheries management plan for Lake Naconiche, Texas

Prepared – July 2012

ISSUE 1: The largemouth bass population is still developing and must be protected from angler over harvest.

MANAGEMENT STRATEGIES

1. Manage largemouth bass harvest with an 18-inch minimum length limit
2. Assess the developing largemouth bass population and evaluate the minimum length limit by fall electrofishing (2012, 2013, and 2015) and spring electrofishing (2013, 2014, and 2016). Assess largemouth bass growth in 2015.
3. Conduct angler creel surveys (Fall 2012, Spring 2013 and 2016) to assess catch, harvest, and angler opinion regarding future harvest regulations.
4. Continue to stock FLMB annually at a rate of 100 fish/acre to increase trophy fish potential.

ISSUE 2: Hydrilla is present in Lake Naconiche and has the potential to become problematic (i.e. impede use of the swimming area, boat ramp, and fishing piers).

MANAGEMENT STRATEGY

1. Monitor aquatic vegetation annually (2012-2015). If hydrilla coverage prompts public or controlling authority complaints, meet with constituents to develop an integrated aquatic vegetation management plan.

ISSUE 3: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, giant salvinia can multiply rapidly fouling swimming beaches, restricting angler access, and uptake nutrients that benefit native vegetation. The financial costs of controlling and/or eradicating 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 area businesses about invasive species, and provide them with posters and literature so they can educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Discuss invasive species when presenting to constituent and user groups.

ISSUE 4: TPWD prides itself on being responsive to the desires of the public and controlling authorities that provide access and opportunity, and it is important to maintain trust and professional relationships.

MANAGEMENT STRATEGIES

1. Continue to inform the County of Nacogdoches of all TPWD management results and recommendations. Address concerns and encourage officials to take part in sampling activities.
2. Continue to interact with the public and inform them of all management recommendations. Always consider angler opinions before considering any regulation changes.

SAMPLING SCHEDULE JUSTIFICATION:
The proposed sampling schedule includes additional aquatic vegetation surveys (2012-2014), fall electrofishing surveys (2012 and 2013), spring electrofishing surveys (2013, 2014, and 2016), a fall and spring quarter creel survey in 2012/2013, a spring creel survey in 2016, and gill net survey in 2014 (Table 5). Additional aquatic vegetation surveys are required to monitor hydrilla coverage. Additional electrofishing and creel surveys are conducted to monitor the developing largemouth bass population and evaluate the 18-inch minimum length limit regulation. The additional gill net survey is needed to evaluate channel catfish stocking success. Standard monitoring with fall electrofishing, trap nets, and gill nets will be conducted in 2015-2016.

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.

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.

Table 1. Characteristics of Lake Naconiche, Texas.

Characteristic	Description
Year constructed	2009
Controlling authority	County of Nacogdoches
County	Nacogdoches
Reservoir type	Secondary stream
Shoreline Development Index (SDI)	3.55
Mean depth	13 feet
Size	692 acres
Secchi disc	> 5 feet
Conductivity	100 umhos/cm

Table 2. Harvest regulations for Lake Naconiche, Texas.

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

[a]Bag limit for spotted and largemouth bass is 5 in the aggregate.

Table 3. Stocking history of Lake Naconiche, Texas. Life stages are fingerlings (FGL), advanced fingerlings (AFGL), and adults (ADL). 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)
Black crappie	2010	266	ADL	6.9
	Total	266		
Bluegill	2009	79,480	AFGL	2.8
	2011	67,369	AFGL	2.9
	Total	146,849		
Channel catfish	2009	70,444	FGL	3.2
	2011	72,393	FGL	3.3
	Total	142,837		
Florida largemouth bass	2011	15	ADL	14.2
	2011	6,729	AFGL	6.2
	2011	73,135	FGL	1.6
	2012	60	ADL	13.8
	2012	75,214	FGL	1.6
	Total	155,153		
ShareLunker largemouth bass	2009	173	ADL	10.3
	2009	27,927	AFGL	5.4
	2009	67,462	FGL	1.9
	2011	2,020	AFGL	6.5
	2012	173	ADL	11.5
	Total	97,755		
Threadfin shad	2010	2,500	AFGL	2.4
	2011	4,000	FGL	1.6
	Total	6,500		
White crappie	2010	89	ADL	6.9
	Total	89		

Bluegill

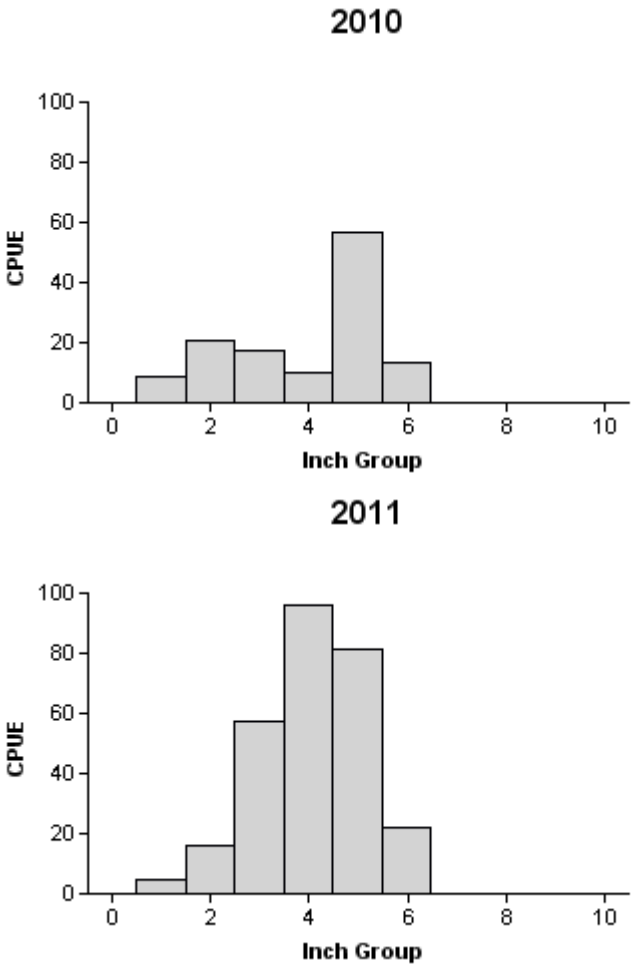


Figure 1. Number of bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Naconiche, Texas, 2010 and 2011.

Largemouth Bass

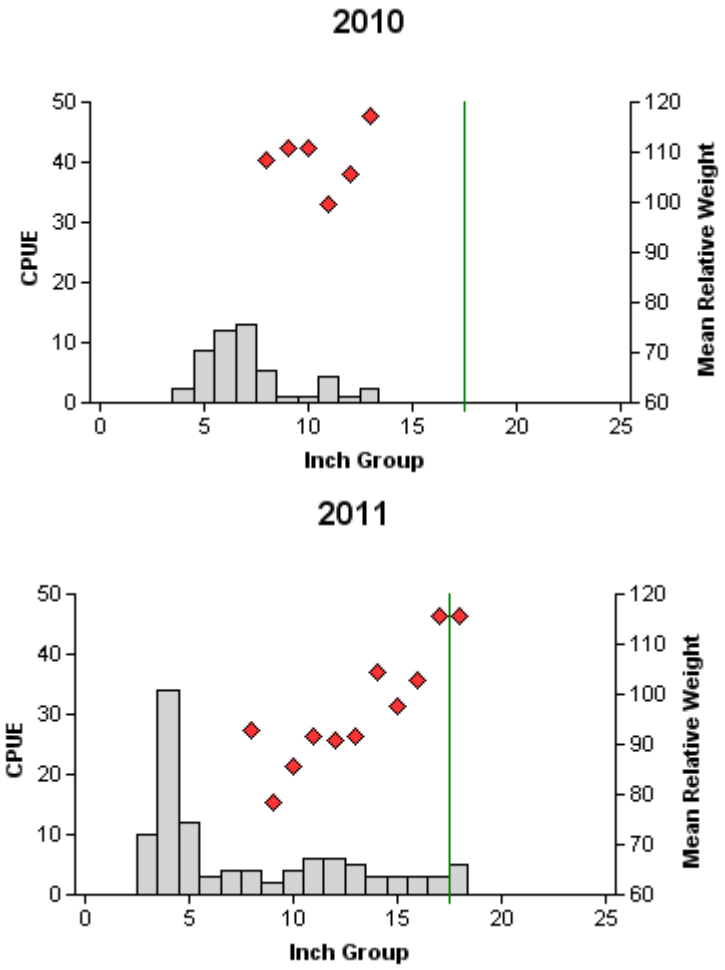
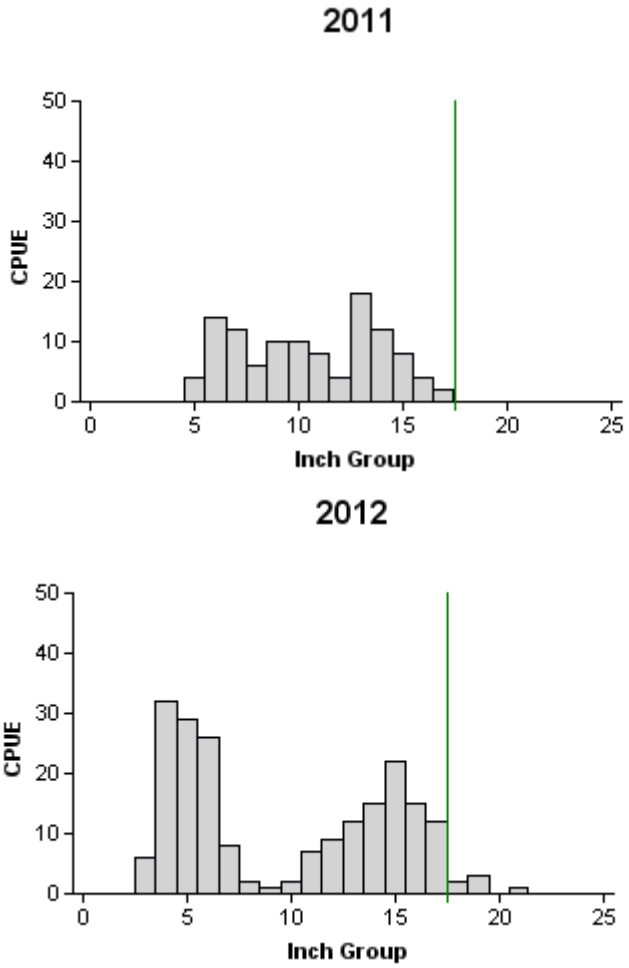


Figure 2. Number of largemouth bass caught per hour (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Naconiche, Texas, 2010 and 2011. Vertical lines represent the minimum length limit.

Largemouth Bass



2011
Effort = 0.5
Total CPUE = 112.0 (33; 56)
PSD = 59 (10.9)

2012
Effort = 1.0
Total CPUE = 204.0 (12; 204)
PSD = 88 (3.8)

Figure 3. Number of largemouth bass caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Lake Naconiche, Texas, 2011 and 2012. Vertical lines represent the minimum length limit.

Table 4. Results of genetic analysis of largemouth bass collected by spring electrofishing, Lake Naconiche, Texas, 2011 and 2012. 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. Fish collected in 2011 were a random sample including all year classes, whereas the 2012 sample only included age-1 fish.

Year	Sample size	Genotype				% FLMB alleles	% pure FLMB
		FLMB	F1	Fx	NLMB		
2011	30	0	0	30	0	31.0	0.0
2012	30	7	2	20	1	53.0	23.0

Table 5. Proposed sampling schedule for Lake Naconiche, Texas. Gill netting surveys are conducted in the spring, while standard electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey Year	Electrofishing	Trap Net	Gill Net	Creel	Vegetation	Access	Report
June 2012-May 2013	A / A			A	A		
June 2013-May 2014	A / A		A		A		
June 2014-May 2015					A		
June 2015-May 2016	S / A	A	S	A	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of target species collected from all gear types from Lake Naconiche, Texas, 2011-2012.

Species	Trap Netting		Fall Electrofishing		Spring Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					2	2.0
Threadfin shad			422	422.0	2	2.0
Yellow bullhead	83	16.6				
Warmouth			2	2.0	4	4.0
Bluegill	41	8.2	277	277.0	144	144.0
Longear sunfish			17	17.0		
Redear sunfish	2	0.4			9	9.0
Redspotted sunfish			2	2.0	1	1.0
Spotted bass					1	1.0
Largemouth bass			107	107.0	204	204.0
Black crappie	5	1.0				