PERFORMANCE REPORT

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STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2006 Survey Report

Lone Star Lake

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July 31, 2007

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lone Star Lake were surveyed in 2006 using electrofishing and trap nets and in 2007 using gill nets. Anglers were surveyed from March 2006 to May 2006 with a roving creel. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Lone Star Lake is a 1,516-acre impoundment located on Ellison Creek in the Cypress River Basin in Morris County. Structural habitat is sparse, but is comprised of inundated timber, brush, riprap, creek channels, and boat docks. Native aquatic plant abundance has recently increased and hydrilla was discovered in the reservoir in 2006. A fish consumption advisory was issued due to PCB contamination in 2005.
- **Management history:** Important sport fish include channel catfish, white bass, palmetto bass, and largemouth bass. All sport fish have historically been managed with statewide harvest regulations. Florida largemouth bass have been stocked in this reservoir to improve the quality of the largemouth bass fishery. Palmetto bass stocking was discontinued in 2006. Hydrilla was discovered in the reservoir in 2006 and the controlling authority has taken action to manage the infestation.
- Fish community
 - Prey species: One threadfin shad was collected during the 2006 fall electrofishing survey. Electrofishing catch rates of gizzard shad were relatively low with 43% available as prey to most sport fish. Bluegill, redbreast sunfish, and redear sunfish were also available as prey and are abundant.
 - Catfishes: There were many channel catfish collected above legal length (12 inches) during the 2007 gill net survey, but recruitment was low. Five percent of all angling effort at Lone Star Lake was directed towards catfish, but no catfish harvest was observed during the spring 2006 angler creel survey.
 - Temperate basses: White bass and palmetto bass were present in the reservoir. Relative abundance of white bass has increased in recent years. Palmetto bass stocking was discontinued following a fish consumption advisory issued by the Texas Department of State Health Services. No anglers targeted white bass or palmetto bass during the spring 2006 angler creel survey.
 - Largemouth bass: The largemouth bass population was good with high relative abundance, good size structure, and adequate recruitment. Relative weights were good for all inch groups indicating adequate prey availability. Largemouth bass had adequate growth rates, reaching legal-size in three growing seasons. Over 80% of the directed effort at Lone Star Lake was from anglers targeting largemouth bass during spring 2006.
 - **Crappie:** Both white and black crappie were observed during fall trap net surveys, but only one fish of each species was collected. Ten percent of the directed angler effort at Lone Star Lake was for crappie during spring 2006.
- **Management Strategies:** Conduct electrofishing surveys every other year beginning in 2008, and general monitoring with trap nets and gill nets 2010-2011. Hydrilla surveys will be conducted annually beginning in 2007. Technical guidance will be given to controlling authority regarding hydrilla management. All sport fish will continue to be managed under statewide harvest regulations.

INTRODUCTION

This document is a summary of fisheries data collected from Lone Star Lake in 2006-2007. 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 2006-2007 data for comparison.

Reservoir Description

Lone Star Lake is a 1,516-acre impoundment constructed in 1943 on Ellison Creek in the Cypress River Basin. It is located in Morris County in the City of Lone Star. The controlling authority is Lone Star Steel Company. Primary water uses are industrial water supply and public recreation. It has a watershed of approximately 37 square miles, a shoreline length of 14 miles, and a shoreline development index of 2.6. Structural habitat is sparse, but is comprised of inundated timber, brush, riprap, creek channels, and boat docks. Native aquatic plant abundance has recently increased and hydrilla was discovered in the reservoir in 2006. Boat access consisted of two public boat ramps and one private boat ramp. Bank fishing access is limited. Other descriptive characteristics for Lone Star Lake are in Table 1. The Texas Department of State Health Services issued a fish consumption advisory due to PCB contamination in 2005.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ryan and Brice 2003) included:

- Develop a habitat enhancement program to increase aquatic vegetation densities in the lake. Action: The abundance of aquatic vegetation had increased to the point that a habitat enhancement program was no longer a tactical management strategy for the lake. The abundance of aquatic vegetation in Lone Star Lake had increased from 59 acres (4%) in 2002 to 355 acres (25%) in 2006. Hydrilla was discovered in the reservoir in 2006 (36 acres) and chemical treatment was contracted by the controlling authority to manage the infestation.
- 2. Keep anglers and other public aware of harvest regulations, fishing methods, and other fisheries-related topics.

Action: District staff made contacts with anglers during a 3-month angler creel survey. News releases were written and disseminated to area newspapers.

 Enhance the quality of the Lone Star Lake fishery through supplemental stocking of palmetto bass.

Action: Palmetto bass stocking was discontinued in Lone Star Lake due to a fish consumption advisory from the Texas Department of State Health Services that recommended no consumption of any fish species in this reservoir because of high levels of PCBs found in fish tissues.

Work with area officials to improve access facilities to meet ADA standards.
 Action: The City of Lone Star recently installed an ADA-compliant fishing pier at their city park.

Harvest regulation history: Sport fishes in Lone Star Lake are currently managed with statewide regulations (Table 2).

Stocking history: Lone Star Lake was stocked with Florida largemouth bass in 1990 (fry) and 1995 (fingerlings). Palmetto bass were stocked in the reservoir in 1983, 1997, 1999, 2002, 2004, and 2005. The complete stocking history is presented in Table 3.

Vegetation/habitat history: In 2006, aquatic vegetation covered approximately 355 acres (25%), with coontail (287 acres) the dominant plant species (Table 4). The coverage estimated in 2006 is a substantial increase compared to recent years. Ryan and Brice (2003) reported aquatic vegetation coverage was <4% of the total reservoir surface area. The discovery of hydrilla in 2006 (36 acres) has been a cause of concern for lake residents and the controlling authority. District staff discussed various options to control hydrilla with the controlling authority, which resulted in chemical treatment of 12 acres in 2006. Lone Star Steel contracted to have up to 50 acres of hydrilla treated during June 2007.

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). A roving angler creel survey was conducted from March 2006 to May 2006. An aquatic vegetation survey was conducted in August 2006. 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 and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected and electrofishing, gill netting, trap netting, vegetation, and creel surveys were conducted according to the 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). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 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 and IOV. Average age-at-length was determined using otoliths for largemouth bass from 13 fish 13.1 to 14.8 inches. Ages of palmetto bass were determined using otoliths to document age classes remaining in the reservoir. Source for water level data was Lone Star Steel Company.

RESULTS AND DISCUSSION

Habitat: Structural habitat was sparse. It consisted primarily of overhanging brush and boat houses (Ryan and Brice 2003). In 2002, aquatic vegetation covered 4% of the reservoir surface area (Ryan and Brice 2003). During the 2006 survey, approximately 25% (354 acres) of the lake surface area was covered with aquatic vegetation with coontail as the dominant species (Figure 2, Table 4). The presence of hydrilla (36 acres) was documented in 2006.

Creel: Directed fishing effort by anglers was highest for black bass (82%), followed by anglers fishing for crappie (10%), catfish (5%), and 3% of anglers who stated they were fishing for anything (Table 5). Total fishing effort for all species at Lone Star Lake was 6,688 h from March 2006 through May 2006, and anglers spent an estimated \$30,844 in direct expenditures (Table 6).

Prey species: Gizzard shad, threadfin shad, and several sunfish species were present indicating good forage fish diversity. Electrofishing catch rates of gizzard shad and bluegill were 63.0/h and 663.0/h, respectively. Index of vulnerability (IOV) for gizzard shad was moderate, indicating 43% of gizzard shad were available to predators, which was lower than IOV estimates in previous years (Figure 3). Electrofishing catch rate of gizzard shad in 2006 was much lower than 2002 (292.0/h) and 1998 (194.7/h) (Figure 3). This decrease was likely a function of the increased coverage of submersed aquatic vegetation. Conversely, higher sunfish numbers were observed during the 2006 survey. Electrofishing catch rates of bluegill were higher in 2006 than in 2002 (493.0/h) and 1998 (129.3/h) surveys, with

abundant small individuals available as prey (Figure 5). The combined catch rate for sunfish species (warmouth, redbreast sunfish, orangespotted sunfish, bluegill, longear sunfish, redear sunfish, spotted sunfish, and bantam sunfish) has increased from 823/h in 2002 (Ryan and Brice 2003) to 975/h in 2006.

Channel catfish: Channel catfish have been the only catfish species collected during recent fish population surveys at Lone Star Lake. The gill net catch rate of channel catfish in 2007 was 11.0/nn, which was higher than in 2005 (6.0/nn) but similar to 2003 (10.8/nn) (Figure 7). Even though age-and-growth analyses were not conducted during the 2007 gill net survey, historic growth of channel catfish was good with fish attaining legal-size (\geq 12 inches) during their third growing season (Ryan and Brice 2003). Body condition was excellent with mean Wr for most inch groups >100 (Figure 7). The 2006 spring quarter creel survey indicated that directed effort for catfish was only 0.26 hours/acre (Table 7). No harvest of channel catfish was observed during the 3-month survey period.

Temperate bass: The gill net catch rate of white bass in 2007 was 14.4/nn, which was higher than catch rates in 2005 (5.0/nn) and 2003 (6.6/nn) (Figure 8). White bass growth was not assessed in 2007, but historically growth has been excellent with fish attaining legal-size (10 inches) by age 1 (Ryan and Brice 2003). The gill net catch rate of palmetto bass in 2007 (3.0/nn) was much lower than 2005 (12.8/nn) (Figure 9). Palmetto bass stocking was discontinued after 2005 following a fish consumption advisory issued by the Texas Department of State Health services. Fish from the 2004 and 2005 stockings were observed during 2007 gill netting and are expected to persist in the reservoir for several years (Figure 10). No anglers surveyed during spring 2006 were targeting white bass or palmetto bass. However, 56 palmetto bass <18 inches were estimated to have been caught and released by anglers seeking other species.

Black bass: The electrofishing catch rate of spotted bass in 2006 was 2.0/h, which was much lower than 2002 (21.0/h) (Figure 11). The recent increase in submersed aquatic vegetation was more suitable for largemouth bass. No spotted bass were reported caught or harvested by anglers during the spring 2006 creel survey.

The electrofishing catch rate of largemouth bass in 2006 was 265.0/h. This rate was twice that in 2002 (129.0/h) and also greater than catch rates in 1998 (108.7/h) (Figure 12). Most of this increase in relative abundance was attributed to the increase in stock-size fish (\geq 8 inches). An increase in abundance of aquatic vegetation in recent years likely contributed to this increase in recruitment. The Florida largemouth bass allele frequency was 40.1%, which was similar to the 42% reported in 2002 (Table 9). No pure Florida largemouth bass were collected in a sample of age-0 largemouth bass in 2006 (Table 9). Growth of largemouth bass was good. Average age at 14 inches (13.1 to 14.8 inches) was 2.1 years (N = 13; range = 1 - 4 years). Condition of largemouth bass was good with mean Wr for most inch groups >90.

Anglers targeting black bass fished 3.93 hours/acre during the spring 2006 creel survey, and harvested an estimated 0.72 fish/acre (Table 8). Harvest of largemouth bass ranged from 6 to 22 inches (Figure 13). Anglers released 66% of the legal-size black bass that they caught (Table 8).

Crappie: Only two crappie were collected during fall 2006 trap net surveys. Trap net catch rates for white and black crappie were 0.2/nn and 0.2/nn, respectively (Figures 14 and 15). These catch rates were similar to those in 2002. Anglers targeting crappie during spring 2006 fished 0.46 hours/acre (Table 10) and harvested an estimated 1,045 fish that ranged from 11 to 13 inches (Figure 16).

Fisheries management plan for Lone Star Lake, Texas

Prepared – July 2007

ISSUE 1: The abundance of aquatic vegetation in Lone Star Lake has increased from 59 acres (4%) in 2002 to 355 acres (25%) in 2006. Hydrilla was introduced in the reservoir between surveys and was estimated at 36 acres in 2006. In the areas where hydrilla was present, it has caused access problems at boat ramps and along lakefront property. District staff provided technical guidance to the controlling authority, which resulted in herbicide treatment of 12 acres of hydrilla in 2006 and up to 50 acres in 2007. Continued management of hydrilla will be necessary to minimize expansion throughout the reservoir.

MANAGEMENT STRATEGY

- 1. Continue to provide technical guidance to the controlling authority regarding hydrilla management.
- 2. Conduct annual hydrilla surveys to monitor trends and estimate coverage of hydrilla.
- **ISSUE 2:** Florida largemouth bass (FLMB) influence has remained above 20% in the Lone Star Lake largemouth bass population since 1995; however, very few pure FLMB have been collected in young-of-year samples (Table 9). Recent increases in aquatic vegetation at Lone Star Lake create conditions favorable for good survival and recruitment of stocked FLMB. Stocking at this time could increase abundance of pure FLMB and increase the trophy fishing potential of this reservoir.

MANAGEMENT STRATEGY

- 1. Stock FLMB at 100 fish/acre in 2008 and 2009.
- Assess the genetic composition of the largemouth bass population in fall 2012. Young-of-year largemouth bass will be collected (N=60), and if the percentage of pure FLMB is <20 supplemental stocking (100/acre) will be requested for 2013 and 2014.
- 3. Conduct electrofishing surveys in fall 2008 and 2010 to monitor relative abundance and size structure of largemouth bass and prey species populations.
- **ISSUE 3:** Anglers and stakeholders need to be informed about fisheries management activities, fishing opportunities, and other issues at Lone Star Lake.

MANAGEMENT STRATEGIES

- 1. Continue to provide news releases to the print and broadcast media.
- 2. Continue to provide fisheries presentations to public regarding issues/opportunities at Lone Star Lake.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes annual hydrilla surveys, a supplemental electrofishing survey in 2008, and required electrofishing, trap net, and gill net surveys in 2010/2011 (Table 11). Annual hydrilla surveys are necessary to monitor management efforts and to provide coverage estimates to the controlling authority. Supplemental electrofishing in 2008 will be conducted to monitor the largemouth bass and prey fish populations. Genetic analysis of age-0 LMB in fall 2010 will be used to evaluate effectiveness of the 2008/2009 FLMB stockings.

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- DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

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Monthly Water Levels



Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lone Star Lake, Texas. Horizontal line denotes conservation pool level (268 msl).

Table 1. Characteristics of	Lone Star Lake, Texas.
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Characteristic	Description
Year constructed	1943
Controlling authority	Lone Star Steel Company
County	Morris
Reservoir type	Mainstream
Shoreline development index (SDI)	2.6
Conductivity	218 umhos/cm

Table 2.	Harvest regulations	for	Lone Star	Lake,	Texas.

Table 2. Harvest regulations for Lone Star Lake, Texas.			
Species	Bag Limit	Minimum-Maximum Length (inches)	
Catfish, channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit	
Catfish, flathead	5	18 - No Limit	
Bass, white	25	10 - No Limit	
Bass, palmetto	5	18 - No Limit	
Bass, largemouth	5 ^a	14 – No Limit	
Bass, spotted	5 ^ª	No Limit - No Limit	
Crappie, white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit	

^a Daily bag for largemouth bass and spotted bass = 5 in any combination.

Table 3. Stocking history of Lone Star Lake, Texas. Size categories are: FRY=<1 inch, FGL = 1-3 inches, and UNK = unknown.

Species	Year	Number	Size
Florida largemouth bass	1990	153,238	FRY
	1995	75,013	FGL
	Total	228,251	
Palmetto bass	1983	16,500	UNK
	1997	15,253	FGL
	1999	7,636	FGL
	2002	15,264	FGL
	2004	14,300	FGL
	2005	14,328	FGL
	Total	83,281	



Figure 2. Results of aquatic vegetation survey conducted at Lone Star Lake, Texas August 2006. Water level at time of survey was 1 foot below conservation level.

Table 4. Survey of aquatic vegetation, Lone Star Lake, Texas, 2006. Surface area (acres) and percent of reservoir surface area was determined for dominant aquatic vegetation species.

Habitat type	Species	Acres	Percent of reservoir surface area
Native submerged vegetation	Coontail	287	20.5
	Chara	14	1.0
	Illinois pondweed	1	<0.01
Native emergent vegetation	Cutgrass	7	0.5
	American lotus	6	0.4
	Giant bulrush	3	0.2
	White water lily	1	<0.01
Non-native	Hydrilla	36	2.6

Table 5. Percent directed angler effort by species for Lone Star Lake, Texas, March – May 2006.

Species	Year
	March – May 2006
Anything	3
Catfish	5
Crappie	10
Black bass	82

Table 6. Total fishing effort (h) for all species and total directed expenditures at Lone Star Lake, Texas, March–May 2006.

Croal Statiatia	Year
Creel Statistic -	March – May 2006
Total fishing effort	6,688
Total directed expenditures	\$30,844







Effort =	1.5
Total CPUE =	194.7 (22; 292)
Stock CPUE =	34.0 (19; 51)
PSD =	41 (10.1)
IOV =	87.33 (4.2)





Inch Group

12 14 16

6 <u>8</u>

ò

2 4

Effort =	1.0
Total CPUE =	292.0 (21; 292)
Stock CPUE =	179.0 (22; 179)
PSD =	23 (4.7)
IOV =	71.58 (7.3)









Figure 4. Number of redbreast sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lone Star Lake, Texas, 1998, 2002, and 2006.





Figure 5. Number of bluegill 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, Lone Star Lake, Texas, 1998, 2002, and 2006.



Figure 6. Number of redear sunfish 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, Lone Star Lake, Texas, 1998, 2002, and 2006.





Figure 7. 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 net surveys, Lone Star Lake, Texas, 2003, 2005, and 2007. Vertical lines indicate minimum length limit.

Channel Catfish

Table 7. Creel survey statistics for channel catfish at Lone Star Lake, Texas from March-May 2006 where total catch per hour is for anglers targeting channel catfish and total harvest is the estimated number of catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Crool Survey Statistic	Year	
	Spring 2006	
Directed effort (h)	358.7 (81)	
Directed effort/acre	0.26 (81)	
Total catch per hour	0 (^a)	
Total harvest	0 (^a)	
Harvest/acre	0 (^a)	
Percent legal released	100	
<u> </u>		

^a Insufficient data to calculate RSE.



Figure 8. Number of white bass 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 net surveys, Lone Star Lake, Texas, 2003, 2005, and 2007. Vertical lines indicate minimum length limit.



Figure 9. Number of palmetto bass 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 net surveys, Lone Star Lake, Texas, 2003, 2005, and 2007. Vertical lines indicate minimum length limit.



Figure 10. Length-at-age for palmetto bass collected from gill nets at Lone Star Lake, Texas, April 2007.



Figure 11. Number of spotted 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, Lone Star Lake, Texas, 1998, 2002, and 2006. Relative weight data was not collected in 2006.



Figure 12. 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, Lone Star Lake, Texas, 1998, 2002, and 2006. Vertical lines indicate minimum length limit.

Black Bass

Table 8. Creel survey statistics for black bass at Lone Star Lake, Texas from March 2006-May 2006, where total catch per hour is for anglers targeting black bass and total harvest is the estimated number of black bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Croal Survey Statistic	Year
Creel Survey Statistic	Spring 2006
Directed effort (h)	5,484.13 (27)
Directed effort/acre	3.93 (27)
Total catch per hour	1.04 (24)
Total harvest	1,005 (49)
Harvest/acre	0.72 (49)
Percent legal released	66.0



Figure 13. Length frequency of harvested largemouth bass observed during creel surveys at Lone Star Lake, Texas, March 2006 - May 2006, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 9. Results of genetic analysis of largemouth bass collected by fall electrofishing, Lone Star Lake,
Texas, 1987, 1991, 1992, 1995, 1998, 2002, and 2006. 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.

			Ge	enotype			
Year	Sample size	FLMB	F1	Fx	NLMB	% FLMB alleles	% pure FLMB
1987	28	0	2	2	24	8.0	0
1991	30	2	0	5	23	13.0	6.7
1992	30	0	3	11	16	18.0	0
1995	30	4	6	10	10	34.0	13.3
1998	13	0	4	6	3	26.9	0
2002	44	1	11	28	4	42.0	2.3
2006	35	0		35 ^a	0	40.1	0

^a Determination of hybrid status not conducted.



Figure 14. Number of white crappie 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 fall trap net surveys, Lone Star Lake, Texas, 1998, 2002, and 2006. Vertical lines indicate minimum length limit.



Figure 15. Number of black crappie caught per net night (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lone Star Lake, Texas, 1998, 2002, and 2006. Vertical lines indicate minimum length limit.

Crappie

Table 10. Creel survey statistics for white and black crappie at Lone Star Lake, Texas from March 2006 - May 2006, where total catch per hour is for anglers targeting crappie and total harvest is the estimated number of crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Crool Survey Statistic	Year		
Creel Survey Statistic	2004/2005		
Directed effort (h)	638 (61)		
Directed effort/acre	0.46 (61)		
Total catch per hour	9.43 (80)		
Total harvest	1,045 (100)		
White crappie	1,045 (100)		
Black crappie	0 (^a)		
Harvest/acre	0.75 (100)		
White crappie	0.75 (100)		
Black crappie	0 (^a)		
Percent legal released	63.3		

^a Insufficient data to calculate RSE.



Figure 16. Length frequency of harvested white crappie observed during creel surveys at Lone Star Lake, Texas, March 2006-May 2006, all anglers combined. N is the number of harvested crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 11. Proposed sampling schedule for Lone Star Lake, Texas. Gill netting surveys are conducted in the spring, vegetation surveys are conducted in the summer, and electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey Year	Vegetation	Electrofisher	Trap Net	Gill Net	Report
Summer 2007 - Spring 2008	А				
Summer 2008 - Spring 2009	А	А			
Summer 2009 - Spring 2010	А				
Summer 2010 - Spring 2011	S	S	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lone Star Lake, Texas, 2006-2007.

Species	Gill N	letting	Trap I	Trap Netting		Electrofishing	
Species	Ν	CPUE	Ν	CPUE	Ν	CPUE	
Gizzard shad					63	63.0	
Threadfin shad					1	1.0	
Warmouth					12	12.0	
Orangespotted sunfish					1	1.0	
Bluegill					663	663.0	
Redbreast sunfish					77	77.0	
Longear sunfish					30	30.0	
Redear sunfish					183	183.0	
Spotted sunfish					8	8.0	
Bantam sunfish					1	1.0	
Channel catfish	55	11.0					
White bass	72	14.4					
Palmetto bass	15	3.0					
Spotted bass					2	2.0	
Largemouth bass					265	265.0	
White crappie			1	0.2			
Black crappie			1	0.2			



Location of sampling sites, Lone Star Lake, Texas, 2006-2007. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively.