

PERFORMANCE REPORT

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FEDERAL AID PROJECT F-30-R-33

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

Lake Timpson

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Timpson were surveyed in 2007 using fall electrofishing and trap nets and in 2008 using gill nets and spring electrofishing. A vegetation and access survey was conducted in 2007. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Lake Timpson is located in Shelby County. The Shelby County Freshwater Supply District is the controlling authority. Primary uses are water supply and recreation. This reservoir has a surface area of 223 acres, a shoreline length of 8 miles, and an average depth of 8 feet. Water level fluctuations average 1-3 feet annually. Boat and bank access is adequate, with one boat ramp present.
- **Management history:** Important sport fish included largemouth bass, crappie, and catfish. Prior to 1994, largemouth bass were managed under statewide regulations. In 1994 largemouth bass regulations were changed to a 14- to 21-inch slot length limit. Electrofishing data indicated the slot length limit had the desired effect of producing increased numbers of largemouth bass within the protective slot-length limit. Growth rates of largemouth bass were good with fish growing into the protective slot-length limit between age 2 and age 3. Hydrilla was first documented in Lake Timpson in 2003, and has the potential to become highly problematic given the average depth of the lake. Triploid grass carp were stocked in 2004 at a rate of 5 fish/vegetated acre (448 fish total) in an attempt to reduce hydrilla coverage to 10-15%. Since these stockings, hydrilla coverage has steadily declined with virtually no hydrilla coverage observed during the summer of 2007.
- **Fish community**
 - **Prey species:** Threadfin shad were present in the reservoir. Electrofishing catch rates of bluegill and redear sunfish were high. Good numbers of 6- to 8-inch redear sunfish were also present. Other prey species included redbreast sunfish, warmouth, and spotted sunfish.
 - **Catfishes:** Blue catfish and channel catfish were present in the reservoir. Blue catfish were stocked in 1998, but no fish less than 30 inches were caught during 2008 gill netting, indicating no natural reproduction. Channel catfish catch was also low indicating poor reproduction.
 - **Largemouth bass:** Largemouth bass were relatively abundant. Population size structure from recent surveys indicated the protective slot-length limit had the desired effect, with an abundance of largemouth bass within the protective slot-length limit available for angler catch. Largemouth bass exhibited good growth rates and were in average condition.
 - **Crappies:** The abundance of crappies during the 2007 trap netting survey was high, with good numbers of legal-length (≥ 10 inches) fish observed. Both white and black crappies were present with black crappie being the dominant species.
- **Management strategies:** Continue to manage largemouth bass with a 14- to 21-inch slot length limit. Continue to monitor trends of hydrilla coverage through annual aquatic vegetation surveys. Conduct electrofishing (spring and fall), trap netting, and gill netting surveys in 2011 and 2012, respectively. Conduct access and structural habitat surveys in 2011.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Timpson 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.

Reservoir Description

Lake Timpson is a 223-acre impoundment constructed in 1956 (Table 1). It is located in Shelby County approximately 5 miles northeast of Garrison and is operated and controlled by the Shelby County Freshwater Supply District. Primary water uses included municipal water supply and recreation. Secchi disc readings are typically 2-4 feet. Habitat at time of sampling consisted of rocks, concrete, and aquatic vegetation. Native aquatic plants present were water primrose and giant cutgrass. Hydrilla was first discovered in 2003. The majority of the land surrounding the reservoir is used for agriculture, timber production, and residential development.

Management History

Previous management strategies and actions:

1. Stocked triploid grass carp at a rate of 5 fish/vegetated acre. Conduct annual aquatic vegetation surveys.

Action: Aquatic vegetation surveys have been conducted annually from 2003 through present and no hydrilla coverage was observed in 2007.

Harvest regulation history: Sport fishes in Lake Timpson are currently managed with statewide regulations with the exception of largemouth bass (Table 2). Prior to 1994, largemouth bass were managed with statewide regulations. A 14- to 21-inch slot length limit was implemented in 1994 to improve largemouth bass population size structure, growth, and size of bass caught by anglers.

Stocking history: Triploid grass carp were stocked in 2004. Blue and channel catfish have been stocked into the reservoir. Florida largemouth bass fingerlings were stocked in 1980 and again in 1996. Threadfin shad were introduced in 1979 and were still present in the reservoir (Table 3).

Vegetation/habitat history: Lake Timpson aquatic vegetation coverage has declined significantly since 2004. The controlling authority stocked triploid grass carp in 2004 to reduce hydrilla that had become problematic. The reservoir exhibited nearly 40% hydrilla coverage prior to the triploid grass carp stockings. An aquatic vegetation survey conducted in 2007 indicated no hydrilla coverage (Table 4). Native aquatic vegetation was limited to less than 2 acres (water primrose and giant cutgrass).

METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations during October and March [largemouth bass only]), trap netting (4 nets nights at 4 stations), and gill netting (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 and gill nets as the number of fish caught per net night (fish/nn). All survey sites were randomly selected and the electrofishing, trap netting, and gill netting 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 (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Relative standard error ($RSE = 100 \times SE$ of the estimate/estimate) was calculated for all CPUE statistics. Average age of 14-inch (13.0 – 15.0 inches) largemouth bass was determined from otoliths.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of rocky shoreline, concrete, and native emergent vegetation (Table 4). Hydrilla was non-existent, although tubers likely are still present in the substrate. The elimination of hydrilla can be attributed to the effectiveness of the grass carp stocking in 2004 and low water levels in 2005 and 2006.

Prey species: Electrofishing catch rates of threadfin shad were 176.0 fish/h in 2007. Bluegill and redear sunfish catch rates were high (892.0 and 448.0 fish/h, respectively) (Figures 1 and 2). Bluegill catch was composed primarily of small individuals (PSD = 4) but the abundance of quality-size (≥ 7 inches) redear sunfish was high (PSD = 40).

Catfishes: The gill net catch rate of channel catfish was low (1.2 fish/nn) in 2008, reflecting poor recruitment (Figure 4). Additionally, no blue catfish less than 30 inches were caught in the 2008 gill nets, indicating no natural recruitment of these fish. Hydrilla had become problematic by 2004 with coverage exceeding 40% of the reservoir. Excessive hydrilla coverage may suppress catfish growth and abundance. Also, trophic dynamics of the reservoir likely changed with increased aquatic vegetation growth, possibly leading to reductions in preferred food items (namely benthic invertebrates) for channel catfish. Similar relationships between hydrilla coverage and channel catfish catch rates have been observed at Nacogdoches Reservoir (Driscoll and Parks 2001) and Martin Creek Reservoir (Ashe and Driscoll 2006). Given the decline in hydrilla coverage in recent years, channel catfish recruitment may increase.

Largemouth bass: The fall electrofishing catch rate of largemouth bass was 184.0 fish/h and was dominated by fish ≤ 10 inches indicating successful recruitment (Figure 5). Fish abundance within the slot length limit was also desirable ($RSD-14 = 35$). The spring electrofishing catch rate in 2008 (221.0 fish/h) was considerably higher than catch rates observed in 2001 (110.0 fish/h) and 1999 (148.0 fish/h) (Figure 6). Largemouth bass abundance was higher both below and within the slot-length limit in 2008 compared to previous spring electrofishing surveys.

Growth of largemouth bass was good; average age at 14 inches (13.5 to 14.5 inches) was 2.14 years ($N = 7$; range = 2 to 3 years). Given the good growth rate, recruitment into the 14- to 21-inch slot size range should remain stable in future years.

Florida largemouth bass were last stocked in to the reservoir in 1996 (Table 3). Florida largemouth bass

genetic influence was still present within the population (total alleles = 47.9%); N=30). No pure Florida or Northern strain fish were sampled.

Crappies: White and black crappie were present in the reservoir with black crappie being the dominant species. The trap net catch rate of white crappie was low (0.5 fish/nn) (Figure 7). The black crappie catch rate was high (44.8 fish/nn) (Figure 8) but included only quality-size (≥ 7 inches) fish (PSD=100). Although abundance of legal-size fish was also high (RSD-10=70), lack of smaller fish (< 8 inches) likely indicates a weak or missing 2007 year class.

Fisheries management plan for Lake Timpson, Texas

Prepared – July 2008

ISSUE 1: Hydrilla in Lake Timpson was first documented by TPWD in 2003. Since then, hydrilla has proven to be problematic with coverage reaching 40% of the surface area by 2004. Triploid grass carp were stocked at a rate of 5 fish/vegetated acre in 2004. No hydrilla was observed in 2007. The management goal agreed upon by county officials and the angling public in 2003 was to maintain hydrilla coverage at 10-15% of the surface area.

MANAGEMENT STRATEGY

1. Continue to monitor aquatic vegetation annually (2008-2012). If hydrilla coverage expands beyond an acceptable coverage (40% or levels prompting public complaint) within the next 4 years, meet with county officials and angling public to develop an integrated aquatic vegetation management plan.

ISSUE 2: Giant salvinia has been found within several water bodies within the management district. There is potential that giant salvinia may be introduced to Lake Timpson.

MANAGEMENT STRATEGY

1. During aquatic vegetation surveys continue to remain vigilant to identify any presence of giant salvinia with plans to initiate an eradication or control response if any plants are found. Maintain signs educating the public of giant salvinia identification and reminding the public to conduct boat trailer inspections before launching.

ISSUE 3: The 14- to 21-inch slot length limit implemented in 1994 has been successful. Recruitment of largemouth bass into the slot limit has been relatively high. Growth rates of fish below the slot were good.

MANAGEMENT STRATEGY

1. Continue to monitor largemouth bass size structure and growth to assess the success of the implemented slot limit by fall electrofishing (2011) and spring electrofishing (2012).

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes additional aquatic vegetation surveys (2008-2010), additional spring electrofishing (2012), and standard monitoring with fall electrofishing, gill nets and trap nets (2008-2012) (Table 5). Additional aquatic vegetation surveys are required to monitor hydrilla coverage.

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.
- Ashe, D., and T. Driscoll. 2006. Statewide freshwater fisheries monitoring and management program survey report for Martin Creek Reservoir, 2005. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-31, Austin.
- Driscoll, T., and J. Parks. 2001. Statewide freshwater fisheries monitoring and management program survey report for Nacogdoches Reservoir, 2000. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-26, Austin.

Table 1. Characteristics of Lake Timpson, Texas.

Characteristic	Description
Year constructed	1956
Controlling authority	Shelby County Freshwater Supply District
County	Shelby
Reservoir type	Mainstream
Shoreline Development Index (SDI)	3.8
Mean depth	8 feet
Size	223 acres
Secchi disc	2-4 feet
Conductivity	120 umhos/cm

Table 2. Harvest regulations for Lake Timpson, 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: largemouth ^a	5	14 – 21
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

^aNo more than one largemouth bass \geq 21 inches may be retained.

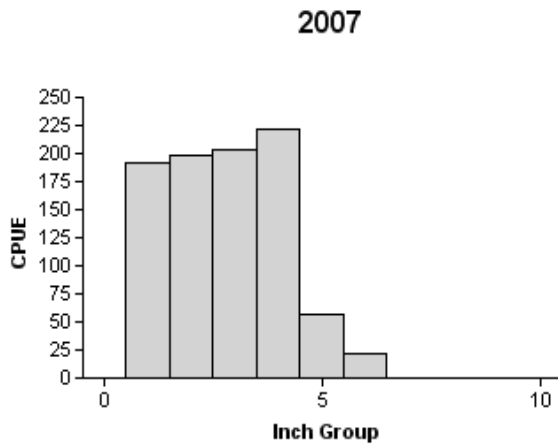
Table 3. Stocking history of Lake Timpson, Texas. Life stages are fingerlings (FGL), advanced fingerlings (AFGL), and unknown (UKN). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean 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)
Blue catfish	1998	3,027	AFGL	7.2
	Total	3,027		
Channel catfish	1966	12,000	AFGL	7.9
	1992	2,000	AFGL	5.5
	1995	5,934	AFGL	7.2
	Total	19,934		
Flathead catfish	1992	16		22.0
	Total	16		
Florida largemouth bass	1980	10,000	FGL	2.0
	1996	5,981	FGL	1.3
	Total	15,981		
Triploid grass carp	2004	448	AFGL	UKN
	Total	448		
Threadfin shad	1979	1,200	AFGL	2.9
	Total	1,200		

Table 4. Survey of littoral zone and physical habitat types, Lake Timpson, Texas, 2007. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Overhanging brush	0.3	3.8		
Concrete	1.0	12.5		
Rocky shoreline	2.4	30.0		
Indescript	0.2	2.5		
Non vegetated shoreline	2.5	31.1		
Water primrose	0.3	3.8	1	< 1.0
Giant cutgrass	1.3	16.3	1	< 1.0

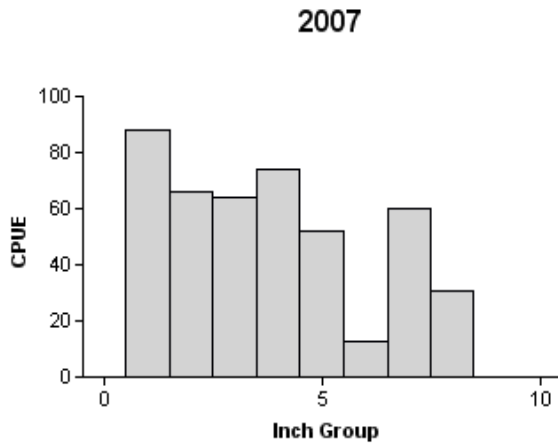
Bluegill



Effort = 1.0
 Total CPUE = 892.0 (10; 892)
 Stock CPUE = 502.0 (8; 502)
 PSD = 4 (1.5)

Figure 1. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the fall electrofishing survey, Lake Timpson, Texas, 2007.

Redear Sunfish



Effort = 1.0
 Total CPUE = 448.0 (19; 448)
 Stock CPUE = 230.0 (26; 230)
 PSD = 40 (7.3)

Figure 2. Number of redear sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the fall electrofishing survey, Lake Timpson, Texas, 2007.

Blue Catfish

2008

Effort = 5.0
 Total CPUE = 0.6 (67; 3)
 Stock CPUE = 0.6 (67; 3)
 RSD-12 = 100 (0)

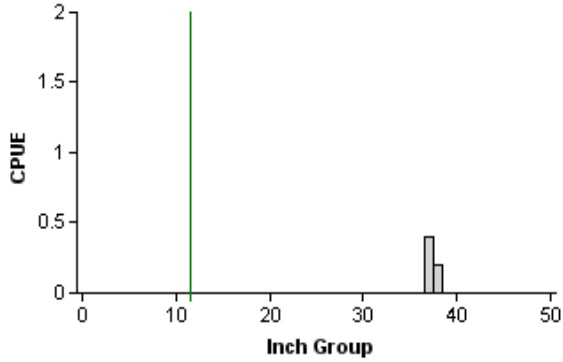


Figure 3. Number of blue catfish caught per net night (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the spring gill net survey, Lake Timpson, Texas, 2008. Vertical line represents the minimum length limit.

Channel Catfish

2008

Effort = 5.0
 Total CPUE = 1.2 (61; 6)
 Stock CPUE = 0.6 (67; 3)
 PSD = 100 (0)
 RSD-12 = 100 (0)

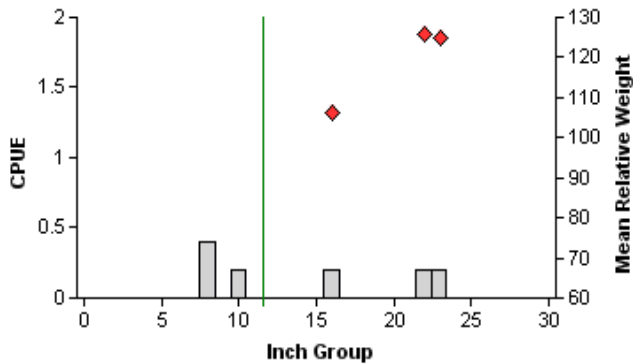


Figure 4. Number of channel catfish caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the spring gill net survey, Lake Timpson, Texas, 2008. Vertical line represents the minimum length limit.

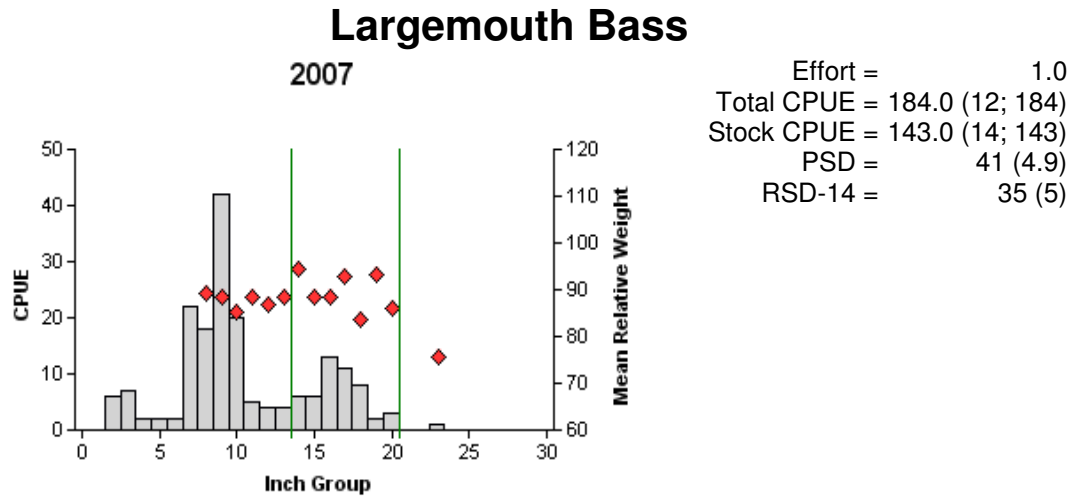


Figure 5. Number of largemouth bass caught per hour (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the fall electrofishing survey, Lake Timpson, Texas, 2007. Vertical lines represent the slot length limit.

Largemouth Bass

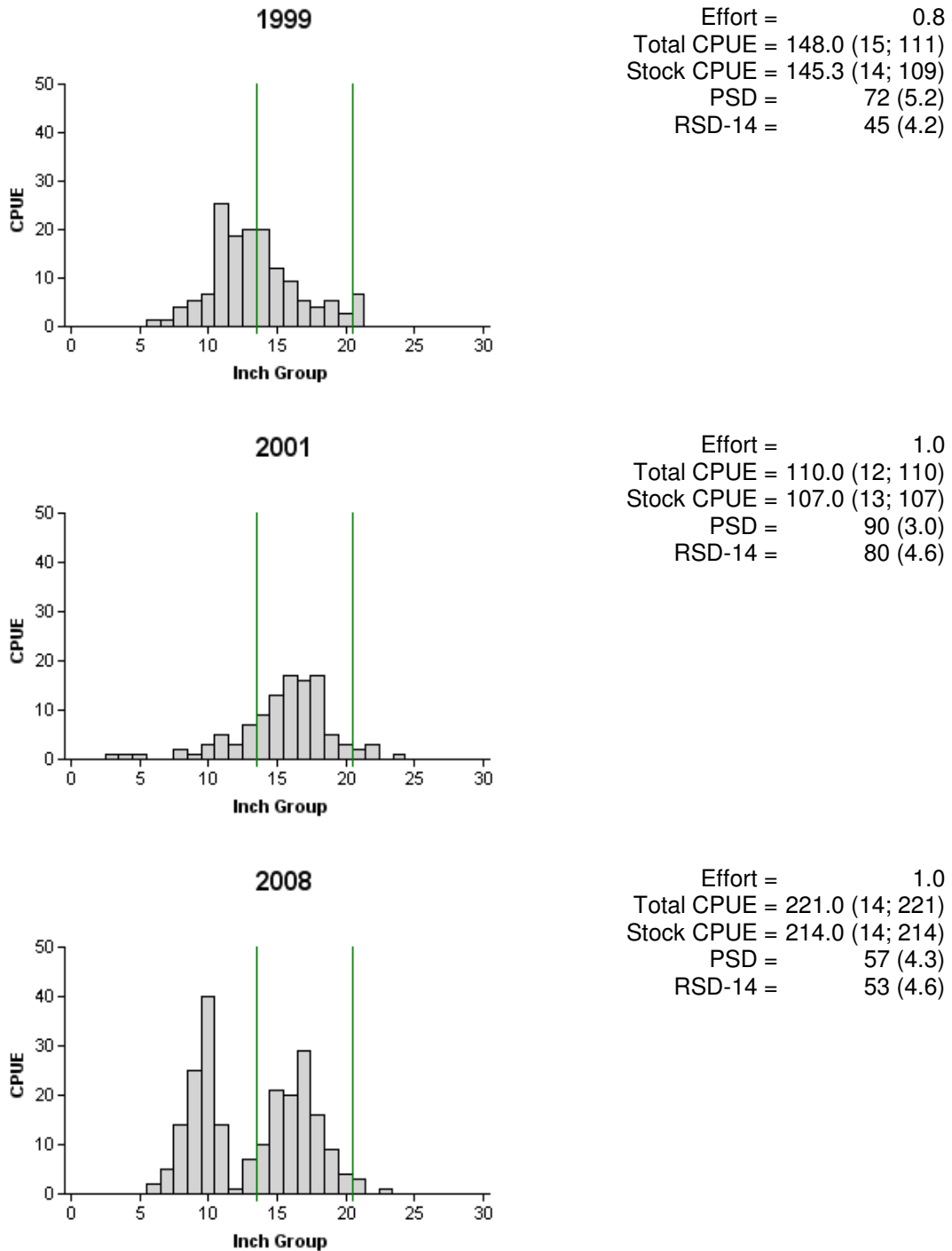


Figure 6. Number of largemouth bass caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Lake Timpson, Texas, 1999, 2001, 2008. Vertical lines represent the slot length limit.

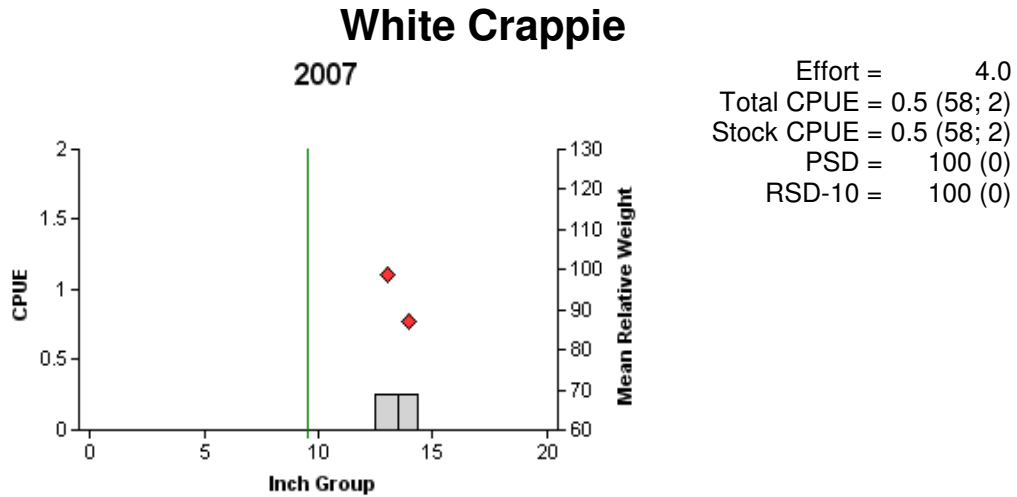


Figure 7. Number of white crappie caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the fall trap net survey, Lake Timpson, Texas, 2007. Vertical line represents the minimum length limit.

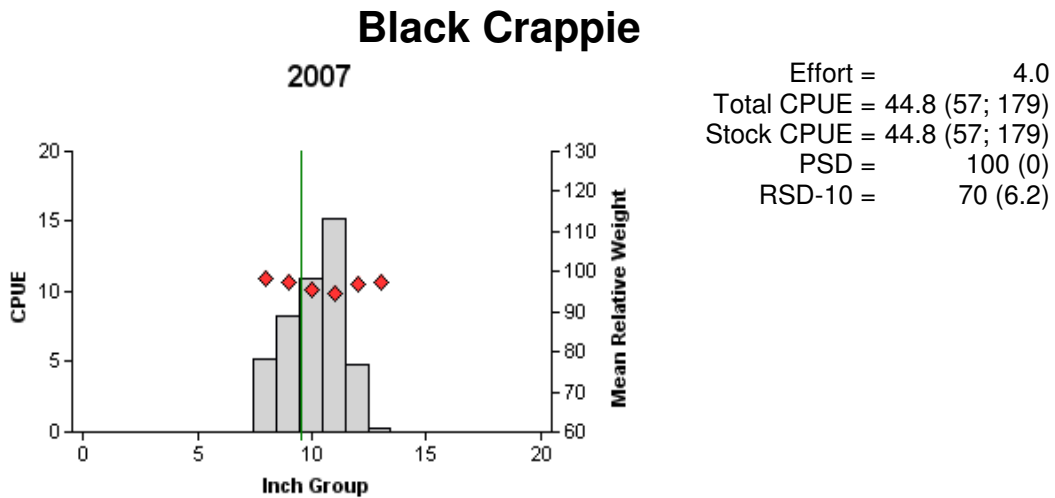


Figure 8. Number of black crappie caught per net night (CPUE, bars), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the fall trap net survey, Lake Timpson, Texas, 2007. Vertical line represents the minimum length limit.

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

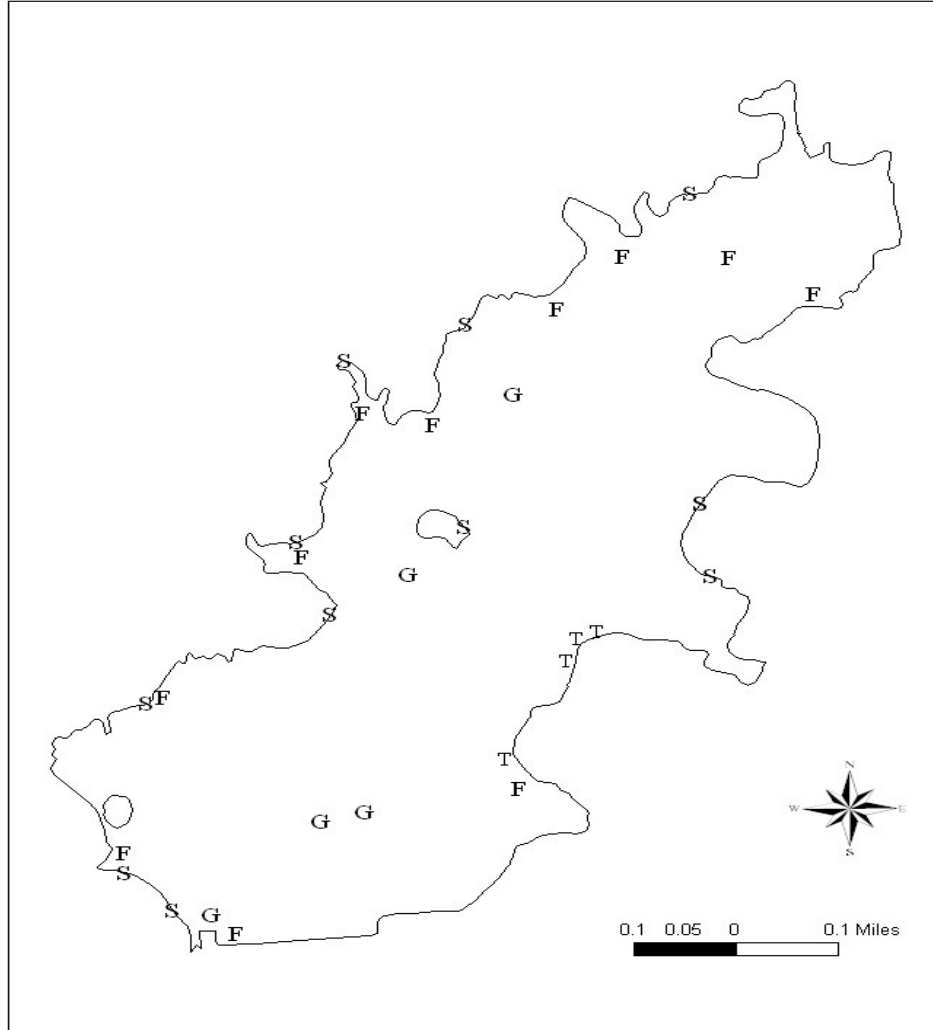
Survey Year	Electrofishing	Gill Net	Trap Net	Vegetation Survey	Access Point Survey
Fall 2008-Spring 2009				A	
Fall 2009-Spring 2010				A	
Fall 2010-Spring 2011				A	
Fall 2011-Spring 2012	S / A	S	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from all gear types from Lake Timpson, Texas, 2007-2008. Electrofishing data represent standard fall surveys.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Threadfin shad					176	176.0
Golden shiner	39	7.8				
Lake chubsucker	1	0.2				
Spotted sucker	21	4.2				
Blue catfish	3	0.6				
Yellow bullhead	3	0.6				
Channel catfish	6	1.2				
Redbreast sunfish					67	67.0
Warmouth					17	17.0
Bluegill					892	892.0
Longear sunfish					1	1.0
Redear sunfish	13	2.6			448	448.0
Spotted sunfish					14	14.0
Largemouth bass	16	3.2			184	184.0
White crappie	2	0.4	2	0.5		
Black crappie	26	5.2	179	44.75		

APPENDIX B



Location of sampling sites, Lake Timpson, Texas, 2007-2008. Gill net and fall electrofishing stations are indicated by G and F, respectively. Trap net and spring electrofishing stations are represented by T and S, respectively.