

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-33

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

Hamilton City Lake

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INTRODUCTION

This document is a summary of fisheries data collected from Hamilton City Lake in 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 species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Fish populations in Hamilton City Lake were surveyed in summer 2007 using a boat electrofisher. This report summarizes the results of that survey and contains a management plan for the reservoir based on those findings.

Reservoir Description: Hamilton City Lake is a 35-acre impoundment located within the Leon River drainage in Hamilton County, just east of Hamilton. The reservoir was constructed in 1923, and is currently operated by the City of Hamilton for municipal and recreational use. Maximum water depth is approximately 5 meters, and the shoreline is mostly undeveloped. Additional historical data are presented in Table 1.

Management history: Important sport fish include largemouth bass, channel catfish, and sunfishes. The management plan from the 1994 survey report included stocking advanced fingerling channel catfish at 32 fish/acre annually, promoting Hamilton City Lake's angling opportunities, enforcing fishing regulations, and improving bank and boat access (Sellers 1994).

Harvest regulation history: Sportfishes in Hamilton City Lake are currently managed with statewide regulations, except there is no minimum length limit for channel and blue catfish, their daily bag limit is five in any combination, and fishing is by pole and line only (Table 2).

Stocking history: Channel catfish is the only species TPWD has stocked into Hamilton City Lake. The first stocking of unknown-sized fish occurred in 1967 ($n = 875$); followed by stockings of advanced fingerlings in 1993, 1994, and 1996 at roughly 33 fish per acre each. Despite management plans to continue stocking channel catfish at that rate (Sellers 1994), the last recorded stocking occurred in 1996 and it is unknown why these stockings were terminated. The complete stocking history is in Table 3.

METHODS

Fishes were collected by electrofishing (30 minutes at 3 10-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Electrofishing sites were randomly selected and conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2002). Ages for largemouth bass were determined from otoliths and followed procedures for the category II age and growth sample.

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). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error ($RSE = 100 \times SE$ of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Ages were determined using otoliths from 13 fish from 11.5 to 12.5 inches in total length.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of overhanging trees, submerged timber, water willow *Justicia Americana*, and naiads *Najas spp.* No habitat surveys have ever been conducted.

Prey species: The forage base is dominated by sunfishes (i.e., bluegill (224 fish/hour), redear (48 fish/hour), warmouth (22 fish/hour) and green (8 fish/hour) in order of decreasing abundance (Figures 1 through 4). Electrofishing catch of bluegill was higher than other sunfish species, but few were over 6-inches in length. Threadfin and gizzard shad have never been collected in Hamilton City Lake.

Catfishes: Only flathead catfish and yellow bullhead were collected from electrofishing. The flatheads ranged from 9 to 26 inches in length (Figure 5), while the bullheads ranged from 7 to 10 inches. No channel catfish were observed.

Largemouth bass: Largemouth bass were abundant (144 fish/hour) with sufficient recruitment. Legal sized fish (14 inches and greater) were noticeably absent from the sample with the exception of two individuals over 19 inches in length (Figure 6). Condition and growth of largemouth bass in Hamilton City Lake was poor. Most relative weights were about 80. Average length at age three was 11.94 inches (range 11.4 to 12.5 inches) (N = 4).

White crappie: Only one white crappie was collected.

Fisheries management plan for Hamilton City Lake, Texas

Prepared – July 2008.

ISSUE 1: No channel catfish were observed during the summer 2007 electrofishing survey despite good stockings of advanced fingerlings in the mid to late 1990s. Channel catfish were probably harvested before natural recruitment could make a difference in the population.

MANAGEMENT STRATEGIES

1. Stock advanced fingerling Channel catfish at 33/acre every two years.
2. Stock 2" fingerlings or brood fish if they become available to increase the numbers of catfish in the lake and perhaps improve the chances of natural recruitment.

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.

Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sellers, K. K.. 1994. Statewide freshwater fisheries monitoring and management program survey report for Hamilton City Lake, 1993. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Table 1. Characteristics of Hamilton City Lake, Texas.

Characteristic	Description
Year Constructed	1923
Controlling authority	City of Hamilton
County	Hamilton
Reservoir type	Tributary
Shoreline Development Index (SDI)	3.6
Conductivity	320 umhos/cm

Table 2. Harvest regulations for Hamilton City Lake.

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

^a Fishing is by pole and line only.

Table 3. Stocking history of Hamilton City, Texas. Life stages are advanced fingerlings (AFGL) 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	Numbe	Life Stage	Mean TL (in)
Channel catfish	1967	87	UNK	UNK
	1993	1,12	AFGL	7.2
	1994	1,12	AFGL	7.7
	1996	1,18	AFGL	8.1
	Total	4,30		

Bluegill

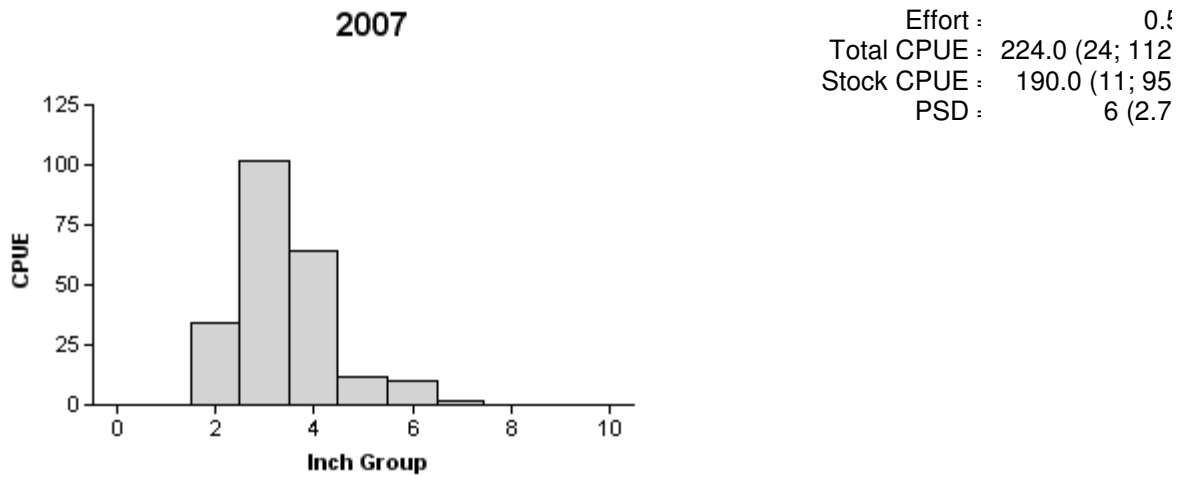


Figure 1. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the summer 2007 electrofishing survey, Hamilton City Lake, Texas.

Redear sunfish

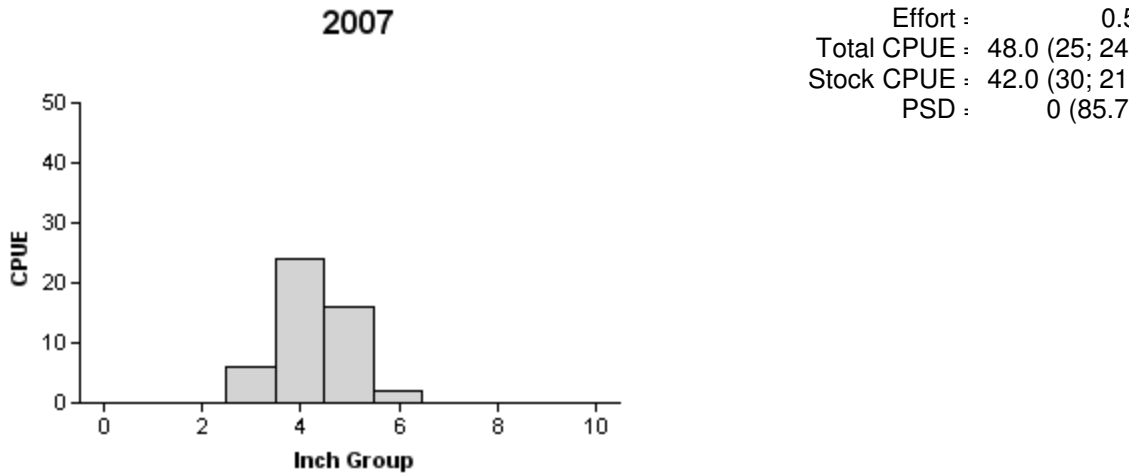


Figure 2. Number of redear sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the summer 2007 electrofishing survey, Hamilton City Lake, Texas.

Warmouth

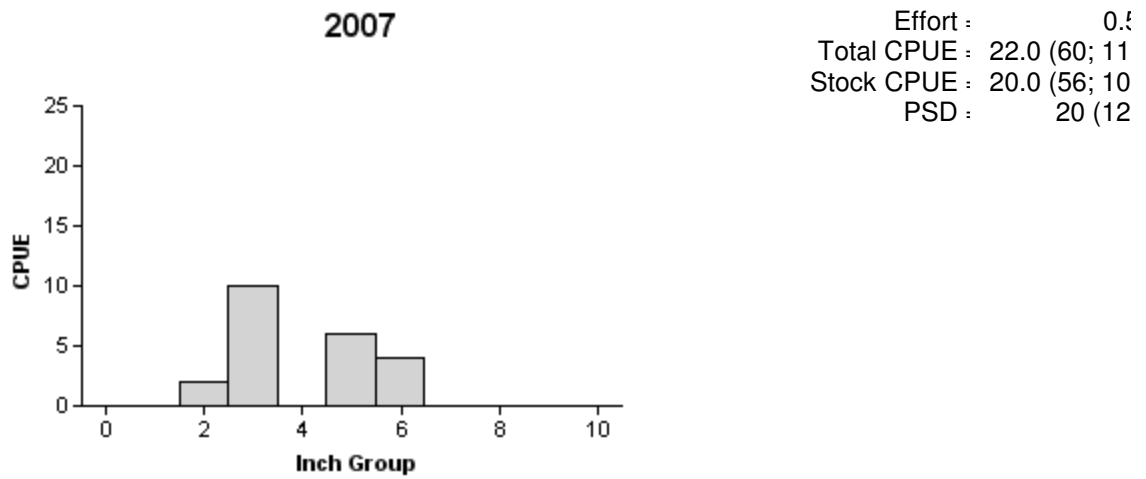


Figure 3. Number of warmouth caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the summer 2007 electrofishing survey, Hamilton City Lake, Texas.

Green sunfish

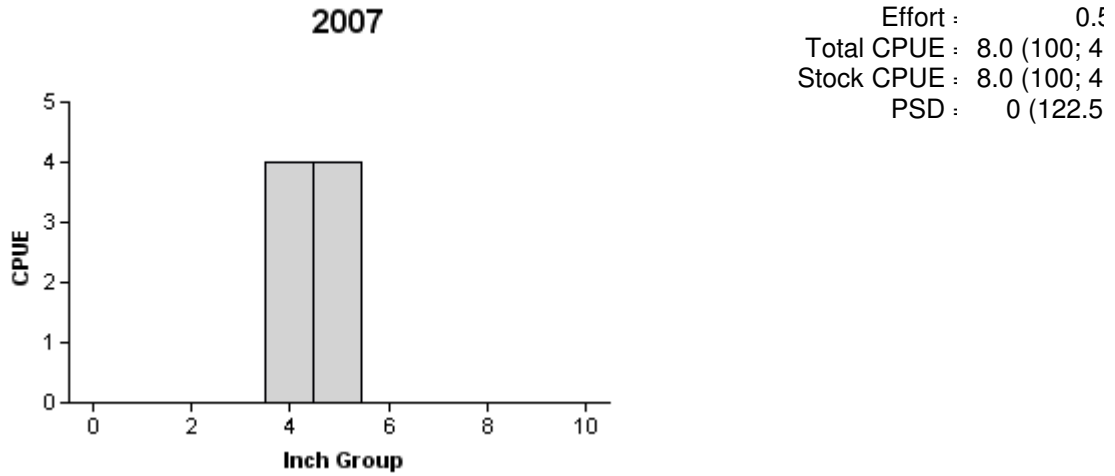


Figure 4. Number of green sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the summer 2007 electrofishing survey, Hamilton City Lake, Texas.

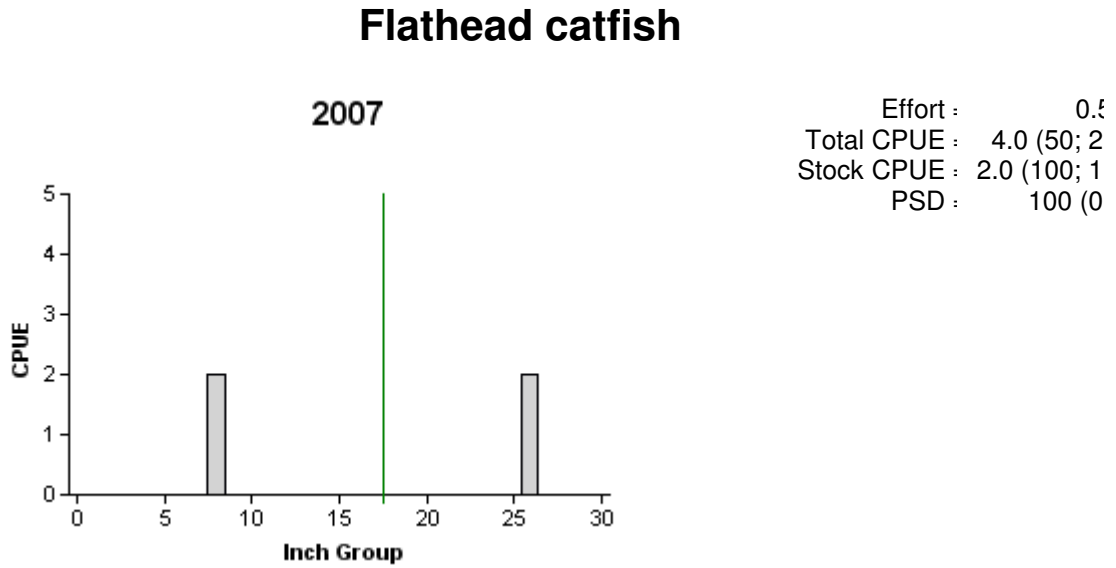


Figure 5. Number of flathead catfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the summer 2007 electrofishing survey, Hamilton City Lake, Texas.

Largemouth bass

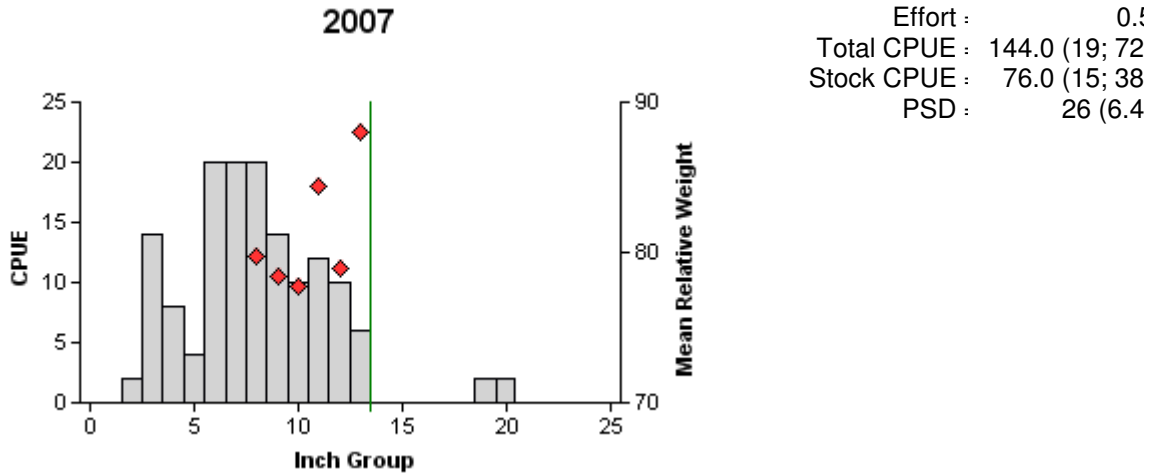


Figure 6. Number of largemouth bass caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for the summer 2007 electrofishing survey, Hamilton City Lake, Texas.

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from the summer electrofishing survey of Hamilton City Lake, Texas, 2007.

Species	Electrofishing	
	N	CPUE
Yellow bullhead	4	8.0
Flathead catfish	2	4.0
Green sunfish	4	8.0
Warmouth	11	22.0
Bluegill	112	224.0
Redear sunfish	24	48.0
Largemouth bass	72	144.0
White crappie	1	2.0