

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-30

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2004 Survey Report

**Mountain Creek Reservoir**

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## Executive Summary

Mountain Creek Reservoir was surveyed in 2004 using electrofishing and trap netting, and in 2005 using gill netting. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Mountain Creek Reservoir, a 2,710-acre reservoir located on Mountain Creek (a tributary of the Trinity River), was constructed in 1937 by Dallas Power and Light. It was primarily built as a cooling reservoir for a power plant. It is located in Dallas County four miles southeast of Grand Prairie, Texas. At conservation elevation (457-ft mean-sea-level), the reservoir contains 22,840 acre feet of water. It has an average depth of 8.5 ft and a maximum depth of approximately 26 ft. The reservoir is located in the Blackland Prairies vegetational area. The watershed is primarily industrial and residential. The northwest side of the reservoir is owned by the City of Dallas which purchased the property from the U.S. Navy. Angler and boat access is inadequate. There is no handicap specific facility on the reservoir. At the time of sampling the fishery habitat was primarily rip-rap and native emergent vegetation. In April 1996, the Texas Department of State Health Services (TDSHS) declared Mountain Creek Reservoir a prohibited area for the possession of all fish species due to their contamination with PCB's.
- **Prey species:** The electrofishing catch rate of 150.0/hour for gizzard shad was lower than in previous years and lower than the district average of 270.0/hour. The index of vulnerability (IOV) (i.e., percentage of individual gizzard shad less than 8 inches total length thought to be vulnerable to largemouth bass predation) for 2004 was 93 which indicates a high percentage of gizzard is available for predators (DiCenzo et al. 1996).

The 2004 threadfin shad electrofishing catch rate was 10.0/hour which was much lower than the district average of 204.0/hour.

Bluegill and longear sunfish are the two principal sunfishes and their catch rates for 2004 were 77.0/hour and 111.0/hour, respectively. The 2004 bluegill and longear sunfish catch rates are much higher than previous years catches but lower than the district averages of 160.0/hour and 87.0/hour, respectively.

- **Channel Catfish:** The gill netting catch rate for channel catfish in 2005 was 2.2/net night which was lower than the two previous years catch rate, and lower than the district average of 5.6/net night. This is the third sample in a row in which catch rates have declined. The population consists of legal sized fish as indicated with RSD-12 equal to 100.
- **White bass:** The white bass gill netting catch rate for 2005 was 3.6/net night which was higher than in 2001, but lower than in 1998. The 2004 catch rate is lower than the district average of 8.0/net night. Size distribution of white bass caught was poor as indicated by an RSD-10 value of 6.
- **Black bass:** The largemouth bass electrofishing catch rate for 2004 (122.0/hour) was similar to catch rates in 2000 and 1997, and the district average of 126.0/hour. Largemouth bass reached legal size by age 3. No age 2 largemouth were collected in the age and growth sample. In 2000 the electrophoresis indicated that the percentage of the Florida bass alleles in the bass sample was 27.3%. No electrophoresis was conducted in 2004.
- **White crappie:** Mountain Creek Reservoir continues to have an outstanding white crappie population. The frame netting catch rate for white crappie in 2004 was 52.0/net night which was much higher than the district average of 16.0/net night. The population consisted of many fish greater than 10 inches. In 2004, the catch rate for fish  $\geq$  10 inches was 12.0/net.
- **Management Strategies**

Due to the TDSHS ban on possession of fish from Mountain Creek for PCB contamination, existing regulations should be changed to catch-and-release only to reflect the fish possession ban regulation. Management strategies that complement the catch-and-release regulation need to be developed. In the spring 2001, Angler complaints were received concerning the inability to submit lake records. After consulting with TDSHS, no modification of the ban could be developed. With the addition of a former TPWD employee to TDSHS, efforts are being made to modify current fish possession ban to allow fish harvest for lake records only. With access to the reservoir limited by the poor condition of the only public boat ramp, the controlling authority, Exelon Energy, has been contacted for improvements.

## Introduction

This document is a summary of the fisheries data collected from Mountain Creek Reservoir in 2004 - 2005. 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. Management strategies are included to address existing problems or opportunities. Historical data are presented for comparison.

Harvest regulations for Mountain Creek Reservoir 2004 - 2005.

| Species           | Bag Limit | Minimum-Maximum Length |
|-------------------|-----------|------------------------|
| Bass, largemouth  | 5         | 14-No limit            |
| Bass, white       | 25        | 10-No limit            |
| Catfish, flathead | 5         | 18-No limit            |
| Catfish, channel  | 25        | 12-No limit            |
| Crappie, white    | 25        | 10-No limit            |

## Methods

- Fishes were collected by electrofishing (1.0 hours at 12 stations/year), 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 of actual electrofishing, and for gill netting and trap netting as the number of fish caught in one net set overnight. Stations were randomly selected. Habitat data, vegetation coverage, and largemouth bass electrophoresis samples were collected according to the Texas Parks and Wildlife Department (TPWD) Inland Fisheries Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2003).
- Sampling statistics (CPUE for various length categories) and structural indices (Proportional Stock Density [PSD] and Relative Stock Density [RSD]) were calculated for target

fishes according to Anderson and Neumann (1996). Standard weight equations used to calculate relative weight were from Anderson and Neumann (1996).

- Ages were determined for selected largemouth bass using otoliths.
- A littoral zone/physical habitat survey was conducted in accordance with TPWD Inland Fisheries Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2003).

#### 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, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.
- 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.

Physical and historical data for Mountain Creek Reservoir, Texas,  
2004-2005.

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Inland Fisheries water body code: 0782                      IF District: 2D

Reservoir size (Acres): 2,493

Controlling authority: City of Dallas

Counties: Dallas (location of dam)

Latitude: 32° 48'    Longitude: 96° 44'

Nearest major metropolitan area and distance: Dallas PMSA - 0  
miles

Reservoir description:    River system: Trinity

Mean depth (ft): 9.5    Maximum depth (ft): 22.0

Shoreline development index: N/A

Secchi disc range (ft): 1-2                                      Conductivity (umhos/cm): 240

Constructed: 1910

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#### Survey History

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| Method               | Year |      |      |      |      |      |
|----------------------|------|------|------|------|------|------|
| Gill netting         | 1987 | 1990 | 1994 | 1997 | 2001 | 2005 |
| Electrofishing       | 1987 | 1990 | 1994 | 1997 | 2000 | 2004 |
| Trap netting         | 1987 | 1990 | 1994 | 1997 | 2000 | 2004 |
| Vegetation surveying | 1994 | 1997 | 2000 | 2004 |      |      |
| Habitat surveying    | 1994 | 1997 | 2000 | 2004 |      |      |

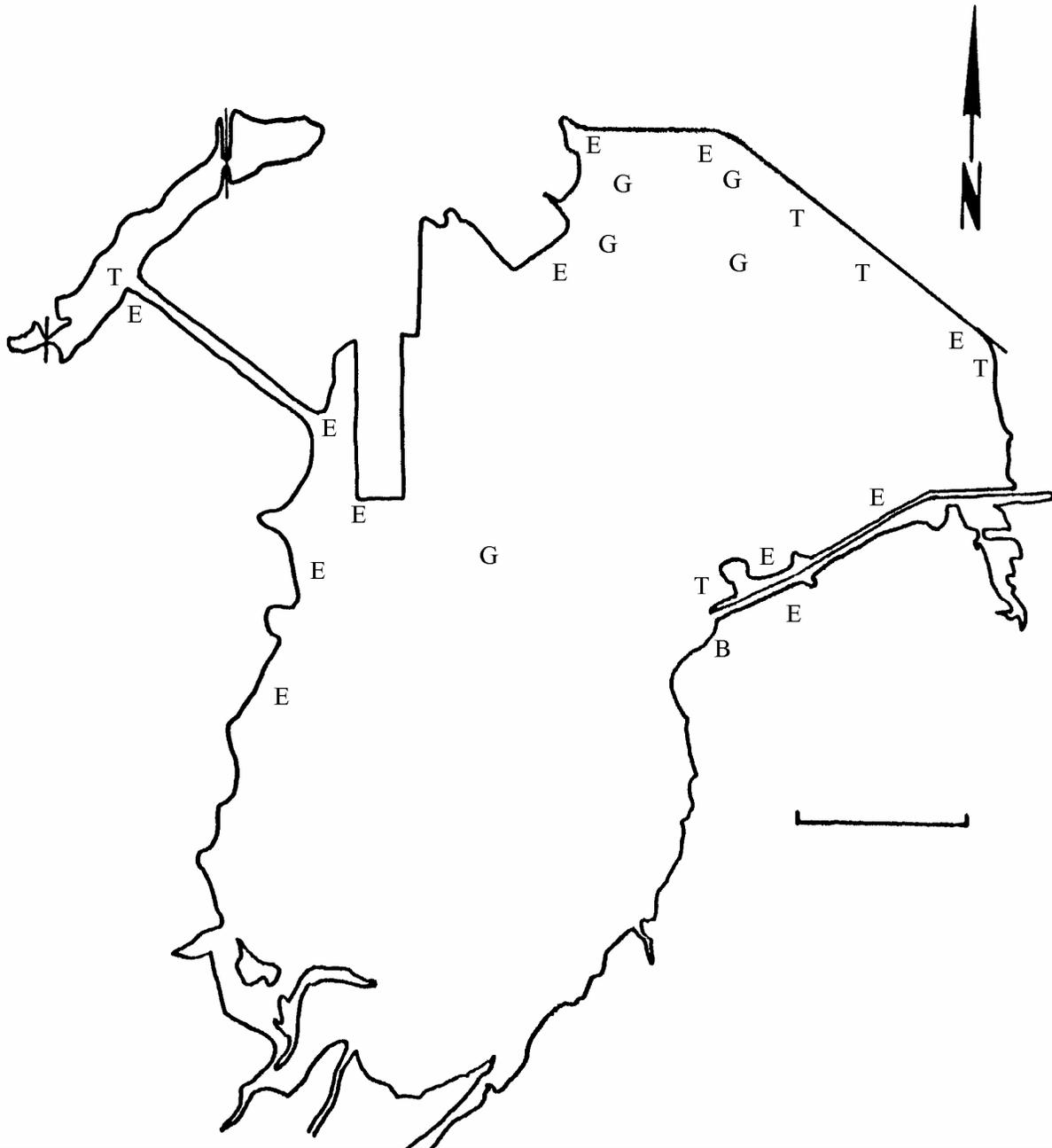
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Survey of littoral zone and physical habitat types, Mountain Creek Reservoir, Texas, summer 2004. A linear shoreline distance (miles) was recorded for each habitat type found.

| Habitat                          |                   | Miles | Acres |
|----------------------------------|-------------------|-------|-------|
| Water's Edge                     | Nondescript       | 1.7   |       |
|                                  | Dead Trees        | 0.5   |       |
|                                  | Native emergent   | 5.4   |       |
|                                  | Gravel            | 1.0   |       |
|                                  | Eroded bank       | 0.4   |       |
|                                  | Rip rap           | 2.6   |       |
|                                  | Overhanging brush | 0.3   |       |
|                                  | Bulkhead          | 1.3   |       |
| Vegetation                       | Native floating   | 0.4   |       |
|                                  | Native submerged  | 0.3   |       |
| Near shore                       | Boat docks, piers | 0.5   |       |
|                                  | Dead trees        | 0.5   |       |
| Open water                       | Dead trees        |       |       |
| Total reservoir shoreline length |                   | 13.2  |       |

Stocking history of Mountain Creek Reservoir, Texas. Size of fish is indicated as FG - fingerling.

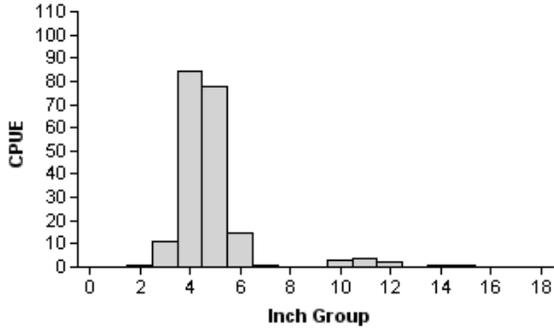
| Species                 | Year          | Number         | Size |
|-------------------------|---------------|----------------|------|
| Palmetto bass           | 1978          | <u>10,656</u>  | FG   |
|                         | Species total | 10,656         |      |
| Florida largemouth bass | 1980          | 136,630        | FG   |
|                         | 1990          | 135,276        | FG   |
|                         | 1994          | <u>136,389</u> | FG   |
|                         | Species total | 408,295        |      |
| Red Drum                | 1981          | <u>235,500</u> | FG   |
|                         | Species total | 235,500        |      |



Location of sampling sites, Mountain Creek Reservoir, Texas, 2004-2005. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. The boat ramp is indicated by B.

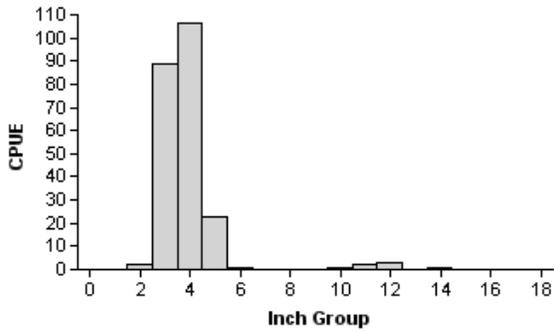
### Gizzard Shad

1997



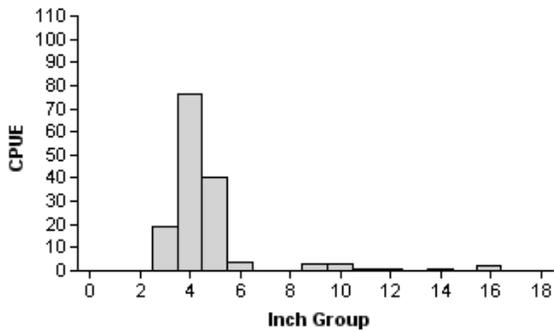
IOV = 95  
Total CPUE = 201.00  
N = 201  
Effort = 1.00  
CPUE Stock = 12.00

2000



IOV = 97  
Total CPUE = 228.00  
N = 228  
Effort = 1.00  
CPUE Stock = 7.00

2004

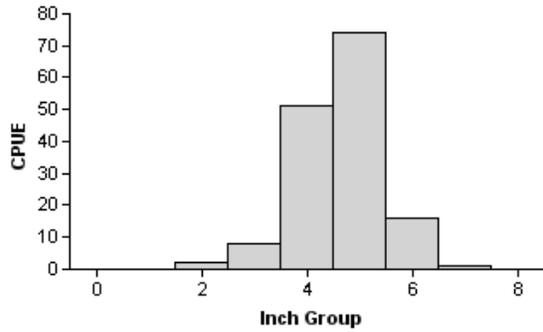


IOV = 93  
Total CPUE = 150.00  
N = 150  
Effort = 1.00  
CPUE Stock = 11.00

Comparison of the number of gizzard shad caught per hour (CPUE, bars) and population indices for fall electrofishing surveys, Mountain Creek Reservoir, Texas

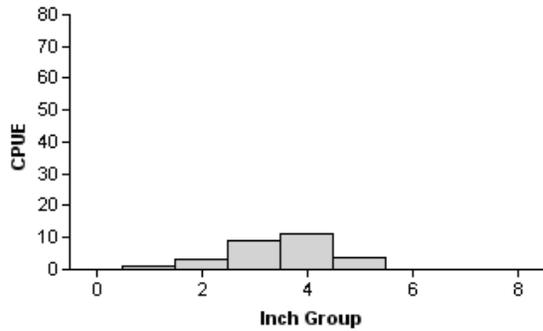
**Bluegill**

1997



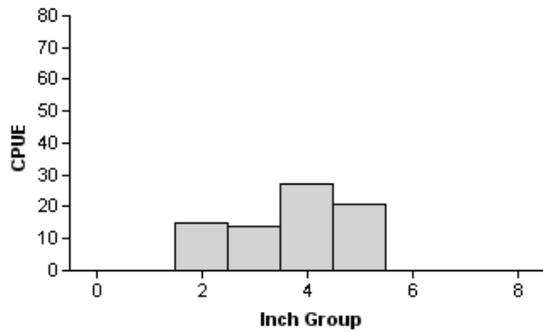
PSD = 11                      Effort = 1.00  
 Total CPUE = 152.00        CPUE Stock = 150.00  
 N = 152

2000



PSD = 0                      Effort = 1.00  
 Total CPUE = 28.00        CPUE Stock = 24.00  
 N = 28

2004

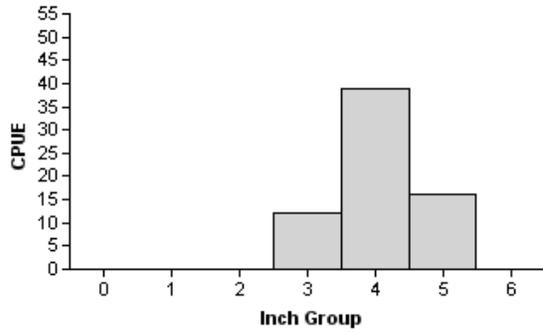


PSD = 0                      Effort = 1.00  
 Total CPUE = 77.00        CPUE Stock = 62.00  
 N = 77

Comparison of the number of bluegill caught per hour (CPUE, bars) and population indices for fall electrofishing surveys, Mountain Creek Reservoir, Texas

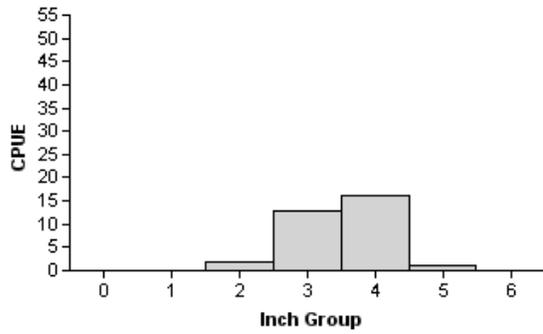
**Longear Sunfish**

1997



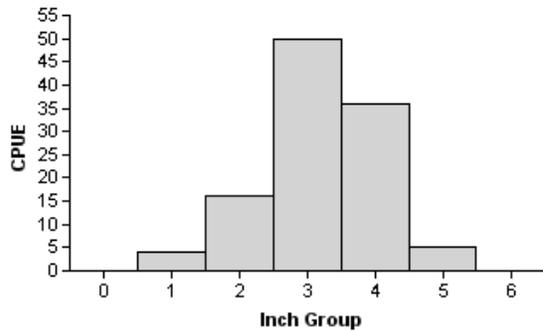
Total CPUE = 67.00      Effort = 1.00  
N = 67

2000



Total CPUE = 32.00      Effort = 1.00  
N = 32

2004

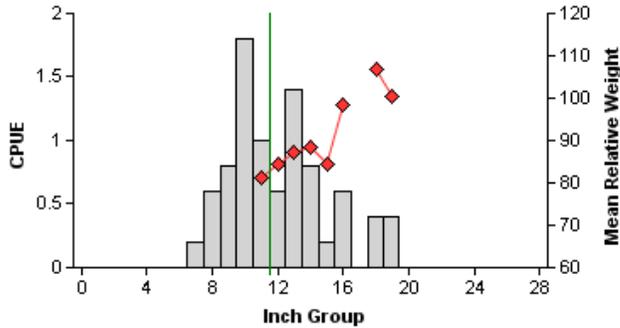


Total CPUE = 111.00      Effort = 1.00  
N = 111

Comparison of the number of longear sunfish caught per hour (CPUE, bars) and population indices for fall electrofishing surveys, Mountain Creek Reservoir, Texas

**Channel Catfish**

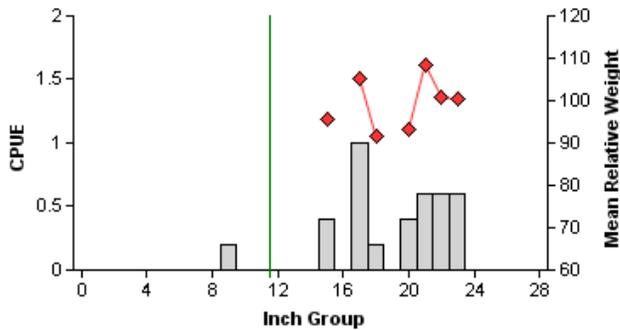
1997



PSD = 26  
 RSD-12 = 81  
 Total CPUE = 8.80  
 N = 44

Effort = 5.00  
 CPUE Stock = 5.40

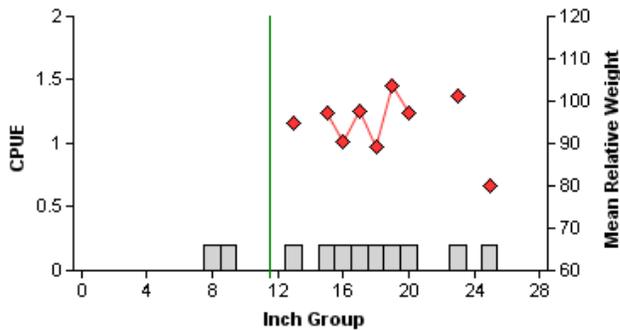
2001



PSD = 89  
 RSD-12 = 100  
 Total CPUE = 4.00  
 N = 20

Effort = 5.00  
 CPUE Stock = 3.80

2005



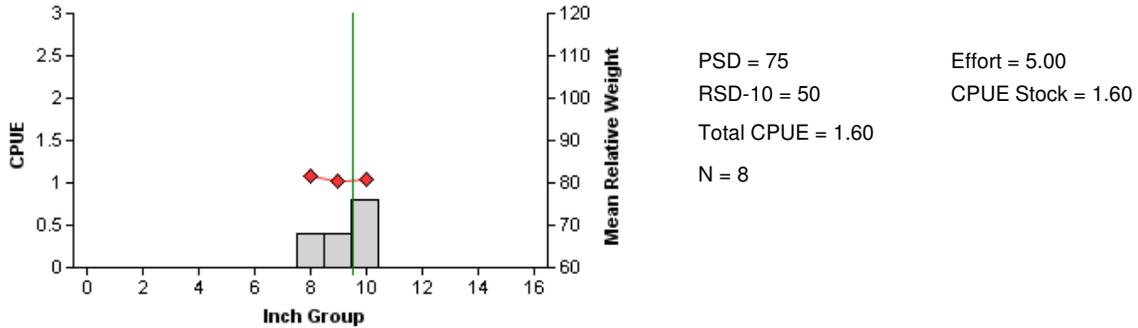
PSD = 78  
 RSD-12 = 100  
 Total CPUE = 2.20  
 N = 11

Effort = 5.00  
 CPUE Stock = 1.80

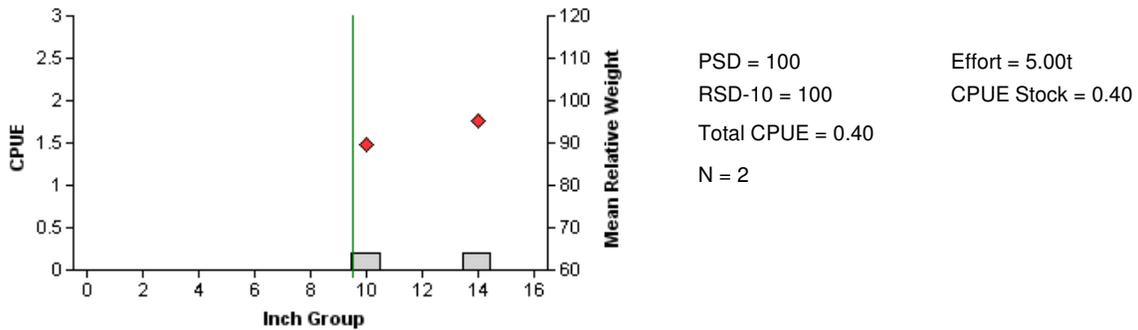
Comparison of the number of channel catfish caught per net night (CPUE, bars), mean relative weight (lines), and population indices for spring gill netting surveys, Mountain Creek Reservoir, Texas. Vertical line represents length limit at time of sampling.

**White Bass**

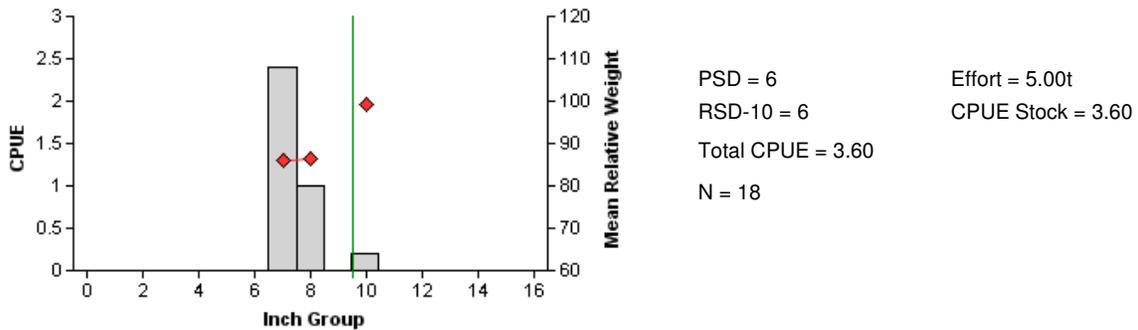
1997



2001



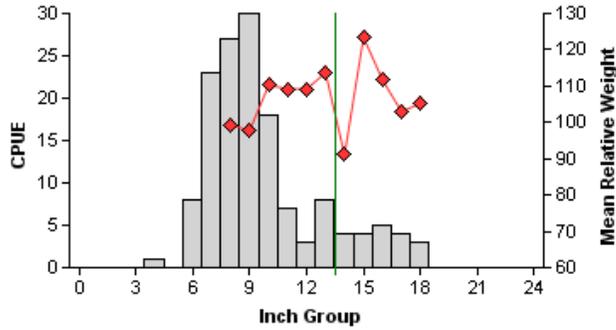
2005



Comparison of the number of white bass caught per net night (CPUE, bars), mean relative weight (lines), and population indices for spring gillnetting surveys, Mountain Creek Reservoir, Texas. Vertical line represents length limit at time of sampling.

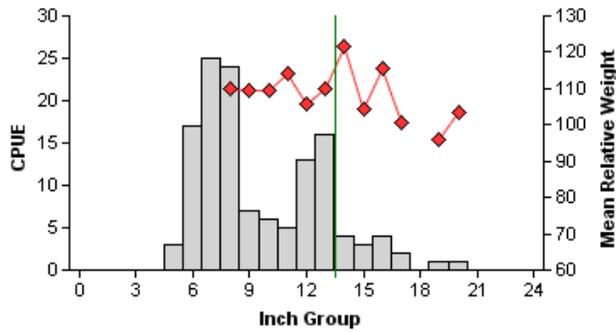
**Largemouth Bass**

1997



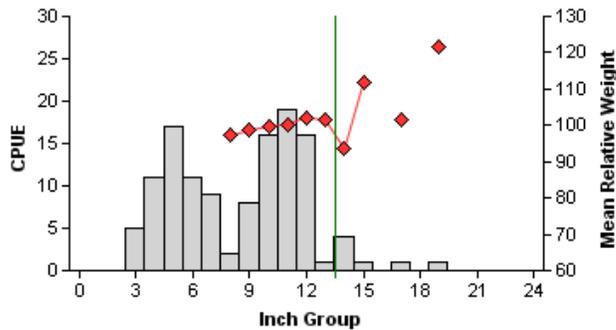
PSD = 27  
 RSD-14 = 18  
 Total CPUE = 145.00  
 N = 145  
 Effort = 1.00  
 CPUE Stock = 113.00

2000



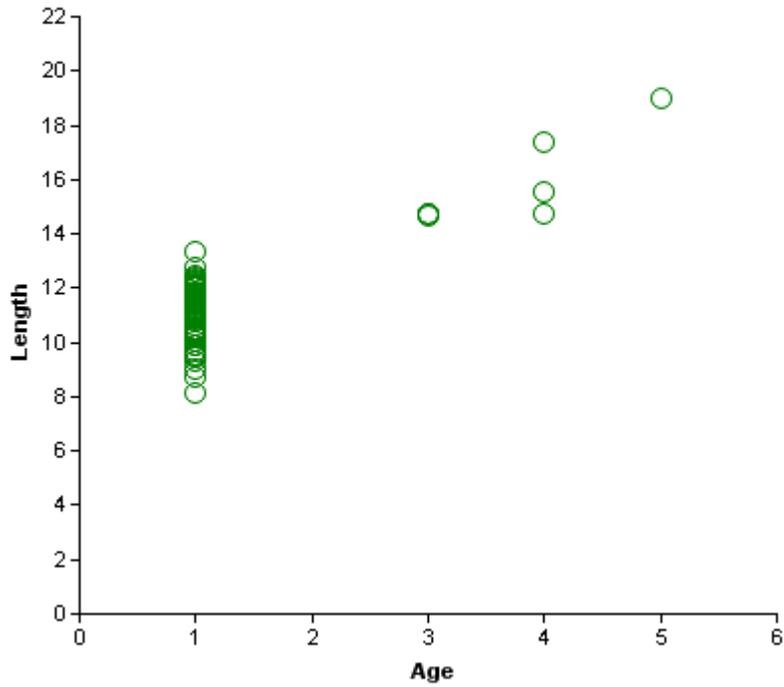
PSD = 51  
 RSD-14 = 17  
 Total CPUE = 131.00  
 N = 131  
 Effort = 1.00  
 CPUE Stock = 86.00

2004



PSD = 35  
 RSD-14 = 10  
 Total CPUE = 122.00  
 N = 122  
 Effort = 1.00  
 CPUE Stock = 69.00

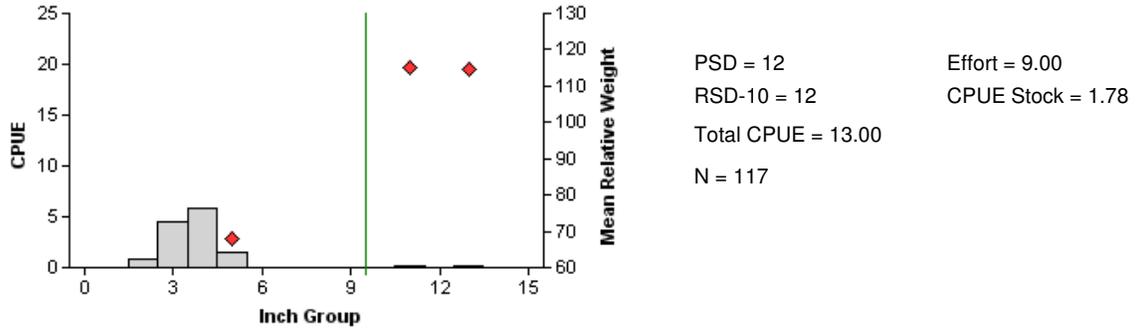
Comparison of the number of largemouth bass caught per hour (CPUE, bars), mean relative weight (lines), and population indices for fall electrofishing surveys, Mountain Creek Reservoir, Texas. Vertical line represents length limit at time of sampling.



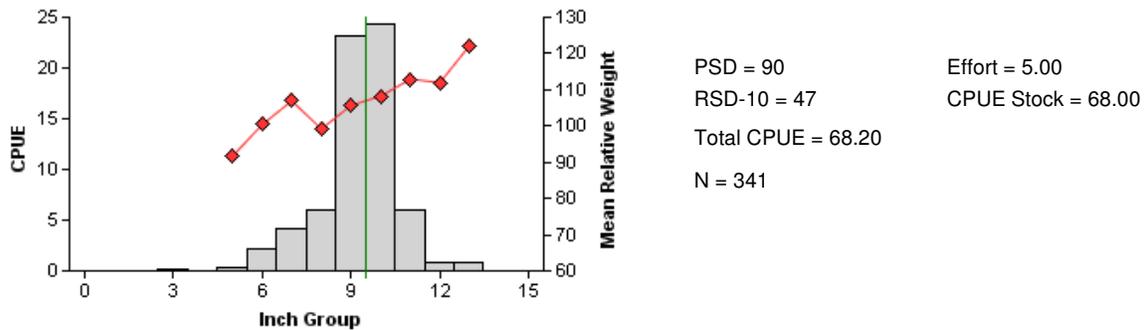
Length (inches) at age of capture for largemouth bass (sexes combined) caught during fall electrofishing sample in 2004 in Mountain Creek Reservoir. Ages were determined using otoliths.

### White Crappie

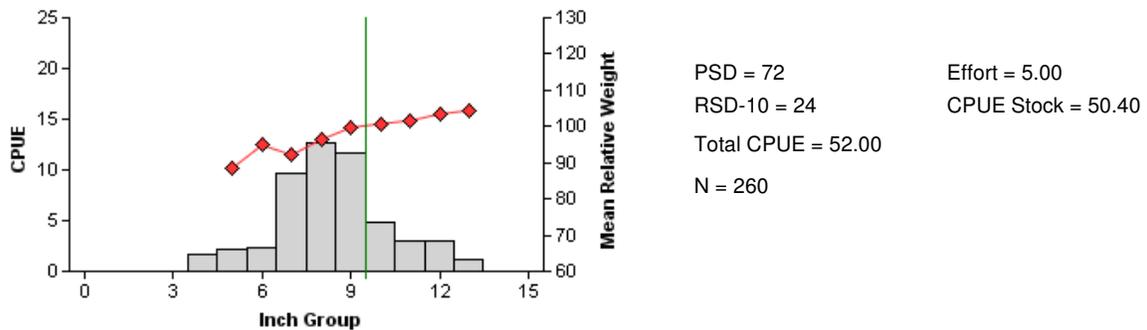
1997



2000



2004



Comparison of the number of white crappie caught per net night (CPUE, bars), mean relative weight (lines), and population indices for fall trap netting surveys, Mountain Creek Reservoir, Texas. Vertical line represents length limit at time of sampling.

**Fisheries Management Plan  
Mountain Creek Reservoir, Texas**

Prepared - July 2005.

**ISSUE 1** Mountain Creek Reservoir has a ban on possession of all fish species implemented by the Texas Department of State Health Services (TDSHS).

Management strategies

1. Propose catch-and-release regulation to mirror TDSHS fish possession ban.
2. Investigate fish management options to take advantage of catch-and-release regulation.

**ISSUE 2** Mountain Creek Reservoir anglers have voiced concern over not being able to harvest fish for lake record purposes.

Management strategies

1. TDSHS has been contacted to possibly modify current fish possession ban to allow one fish bag limit for lake record purposes only. However, legislative action will need to take place to change the TDSHS regulation.
2. Build partnership with TDSHS administrators where TPWD will be consulted prior to implementation of future fish possession bans to allow for fish harvest for lake record purposes only.

**ISSUE 3** Mountain Creek Reservoir has poor boating access. The reservoir has only one boat ramp which is in very poor condition. It is very difficult to launch sampling boats and would be difficult to launch rescue boats into the reservoir safely.

Management strategy

1. The controlling authority, Exelon Power, and the City of Dallas Parks and Recreation will be contacted regarding improving the current boat ramp.

## Appendix A

Number (N) of fish caught per unit effort (CPUE) by gill netting, trap netting, and electrofishing from Mountain Creek Reservoir, Texas, during 2004-2005 sampling season. Sampling effort was 5 net nights for gill netting and trap netting and 1.0 hours for electrofishing.

| Species            | Gill Netting |      | Trap Netting |      | Electrofishing |       |
|--------------------|--------------|------|--------------|------|----------------|-------|
|                    | N            | CPUE | N            | CPUE | N              | CPUE  |
| Gizzard shad       | 141          | 28.2 |              |      | 150            | 150.0 |
| Threadfin shad     |              |      |              |      | 10             | 10.0  |
| Common carp        | 5            | 1.0  |              |      |                |       |
| Smallmouth buffalo | 13           | 2.6  |              |      |                |       |
| Channel catfish    | 11           | 2.2  |              |      |                |       |
| White bass         | 18           | 3.6  |              |      |                |       |
| Bluegill           |              |      |              |      | 77             | 77.0  |
| Longear sunfish    |              |      |              |      | 111            | 111.0 |
| Largemouth bass    |              |      |              |      | 122            | 122.0 |
| White crappie      |              |      | 260          | 52.0 |                |       |

## Appendix B

Mean water level elevation of each month for Mountain Creek Reservoir, 2001-2005. Dashed line represents conservation pool (457 msl).

