

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-29

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2004 Survey Report

**Colorado City Reservoir**

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## EXECUTIVE SUMMARY

Colorado City Reservoir was surveyed in 2002 and 2004 using electrofishing and trap nets, and in 2005 using gill nets. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Colorado City Reservoir is a 1,618-acre reservoir on Morgan Creek west of Colorado City in Mitchell County, Texas. It is a power-plant reservoir with habitat consisting primarily of flooded terrestrial vegetation, native emergent vegetation, boulders, and boat docks. The water level has remained within 15 feet of conservation pool for the last 17 years due to pumping water from Champion Creek and Moss Creek reservoirs to maintain water levels at a sufficient elevation for power generation. The reservoir has been severely impacted by toxic golden alga blooms since 2001 (see Appendix C). Boat and shoreline access are good.
- **Prey species:** No bluegills were collected in either the 2002 or 2004 electrofishing surveys. Gizzard shad catch rates (number/hour) declined after the 2001 golden alga bloom from 380/h in 2000 to 100/h in 2002 and 151/h in 2004. These results indicate that recruitment of gizzard shad continues despite the repeated toxic algal blooms.
- **Blue catfish:** No blue catfish have been collected in gill net surveys since 2000.
- **Channel catfish:** No channel catfish have been collected in gill net surveys since 2000.
- **White bass:** No white bass have been collected in gill net surveys since 2000.
- **Largemouth bass:** Six individual largemouth bass, ranging from 5 to 7 inches in length, were collected during an electrofishing survey in 2002. No largemouth bass were collected in the 2004 electrofishing survey.
- **White crappie:** No white crappie have been collected in trap net surveys since 2000.
- **Management Strategies:** Continue monitoring golden alga on a regular basis, and restock the reservoir with prey and sport fish species when water samples indicate low toxicity. The following stockings have been requested for Colorado City in 2005: channel catfish fingerlings (100/acre), bluegill fingerlings (100/acre), and Florida largemouth bass fingerlings (100/acre). The power plant on Colorado City Reservoir is no longer being operated on a continual basis; therefore, the reservoir will no longer support a red drum fishery. We recommend that red drum stockings be discontinued, and that harvest regulations pertaining to red drum be changed to no minimum length limit and no daily bag limit.

## INTRODUCTION

This document is a summary of fisheries data collected from Colorado City Reservoir from fall 2004 to spring 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 with the 2004-2005 data for comparison.

### STATUS OF MANAGEMENT ACTIONS FROM 2001 (Dennis and Farquhar, 2001) SURVEY REPORT

1. Continue stocking red drum to support the fishery of this non-reproducing population.  
Action: Colorado City Reservoir experienced a major fish kill due to golden alga in 2001, and has had toxic alga blooms every year since. Also, the power plant located on the reservoir will soon discontinue power generation; therefore, hot water discharge that sustains red drum during winter months will not be available. Because of these reasons, stocking of red drum into the reservoir has been discontinued.
2. Contact the power plant manager about reducing the size of the restricted zone around the intake structure.  
Action: The power plant manager was contacted; however, he indicated the restricted zone could not be altered because of liability concerns.

#### Harvest regulations for Colorado City Reservoir.

| Species                                   | Bag Limit | Minimum-Maximum Length (inches) |
|---|-----------|---------------------------------|
| Bass, Largemouth                          | 5         | 14 - No Limit                   |
| Bass, Striped, its hybrids and subspecies | 5         | 18 - No Limit                   |
| Bass, White                               | 25        | 10 - No Limit                   |
| Catfish, Flathead                         | 5         | 18 - No Limit                   |
| Catfish, Blue & Channel                   | 25        | 12 - No Limit                   |
| Crappie, Black & White                    | 25        | 10 - No Limit                   |
| Drum, Red                                 | 3         | 20 - No Limit                   |

## METHODS

- We sampled Colorado City reservoir with electrofishing (12 5-minute stations) and trap netting (1 net-night at 5 stations) in fall 2004, and gill netting (1 net-night at 5 stations) in spring 2005. Fish population surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2004). All sampling sites were randomly selected. No habitat survey was conducted in 2004-2005 because there had been no man-made changes to the reservoir since the previous survey. The most recent habitat survey results can be found in

- Dennis and Farquhar (2001).
- Sampling statistics: Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour of actual sampling time (number/h). Proportional stock density (PSD) was used to assess population size structure (Anderson and Neumann 1996), and the index of vulnerability (IOV; DiCenzo et al. 1996) was used to determine what percentage of the gizzard shad population was less than 8 inches TL, the lengths at which they are most vulnerable to predation.
  - Age and growth analysis was not conducted on fish from Colorado City Reservoir in 2004-2005 because of inadequate sample sizes.
  - Monthly water samples have been collected from the reservoir at the state park boat ramp, starting in May 2002 and continuing through the present. Water quality parameters collected at time of sampling consist of water temperature, dissolved oxygen, conductivity, salinity, pH, and Secchi depth. The water samples are shipped overnight via UPS to the TPWD fish health laboratory in San Marcos for analysis. The results of the analyses, including cell counts and bioassay toxicity assessments, are then forwarded to the District 1-C office.

#### 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, second edition. American Fisheries Society, Bethesda, Maryland.
- Dennis, J. A., and B. W. Farquhar. 2001. Statewide freshwater fisheries monitoring and management program survey report for: Colorado City Reservoir 2000-2001. Texas Parks and Wildlife Department, Austin.
- 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 Colorado City Reservoir, Texas, 2004-2005.

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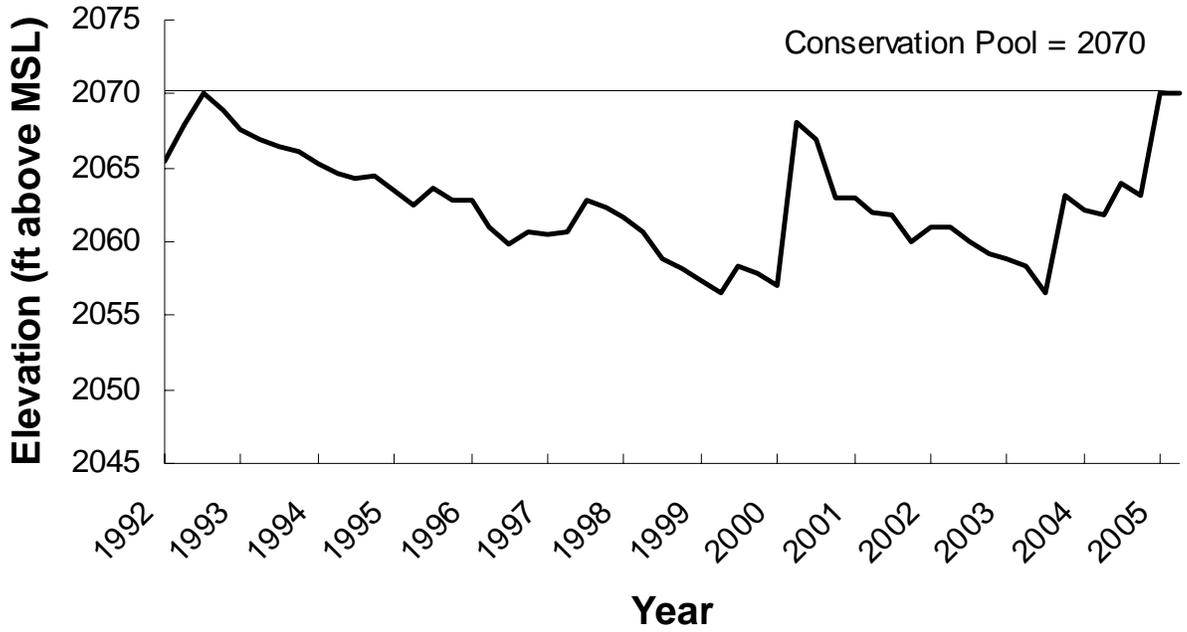
|   |                                      |
|---|--------------------------------------|
| Inland Fisheries water body code: 0182                        | IF District: 1C-San Angelo           |
| Controlling authority: City of Colorado City                  | Acres: 1,618                         |
| Water uses: power-plant cooling, water supply, recreation     |                                      |
| Counties: Mitchell  | Location: West side of Colorado City |
| Latitude: 32° 54'   | Longitude: 100° 20'                  |
| Nearest major metropolitan area & distance: Midland, 80 miles |                                      |
| Reservoir description: Tributary                              | River System: Colorado               |
| Mean depth: 12 ft   | Maximum depth: 51 ft                 |
| Shoreline development index: 4.09                             | Watershed (mi <sup>2</sup> ): 322    |
| Secchi disc range: 2-4 ft                                     | Conductivity: 3500 µmhos/cm          |
| Constructed: 1949   |                                      |
| Access: Boat:   | Adequate - 3 ramps                   |
| Bank:   | Adequate                             |
| Handicap:   | Adequate                             |

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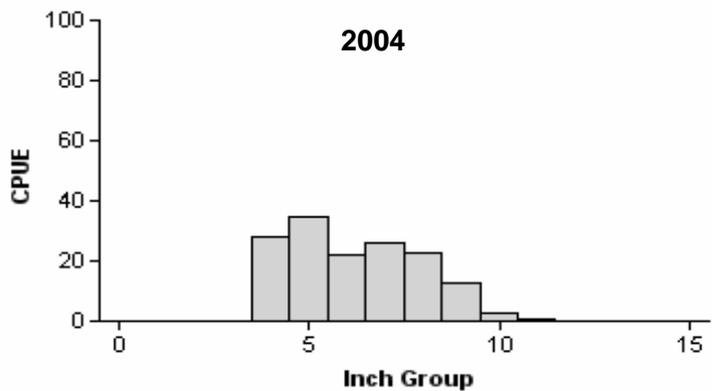
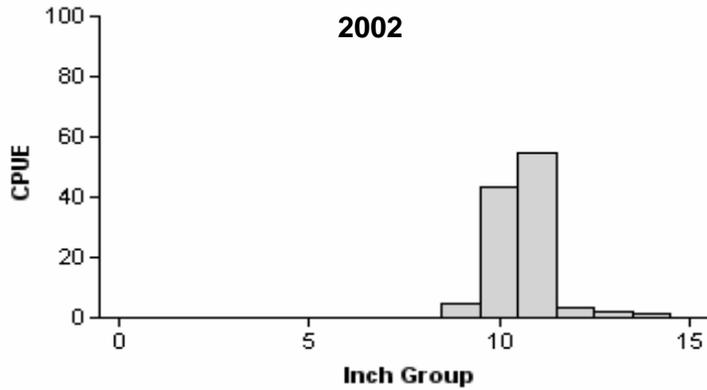
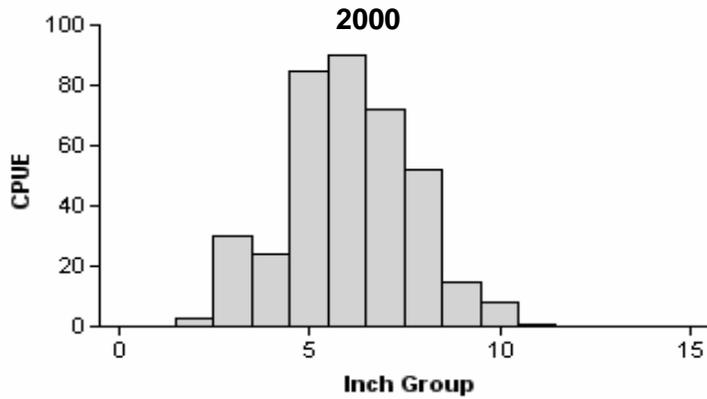


### Quarterly Water Level



Quarterly water level elevations in feet above mean sea level (MSL) recorded for Colorado City Reservoir, Texas.

## Gizzard shad



Comparisons of the number of gizzard shad caught per hour (CPUE) and population indices for fall electrofishing surveys, Colorado City Reservoir, Texas.

**Fisheries Management Plan  
Colorado City Reservoir, Texas**

Prepared - May 2005

**ISSUE 1** Golden alga continues to impact the reservoir with toxic blooms, preventing the recovery of any sport fish populations.

**MANAGEMENT STRATEGIES**

1. Continue monitoring golden alga on a regular basis.
2. Restock the reservoir with prey and sport fish species when water samples indicate low toxicity. The following stockings have been requested for Colorado City in 2005: channel catfish fingerlings (100/acre), bluegill fingerlings (100/acre), and Florida largemouth bass fingerlings (100/acre).

**ISSUE 2** The power plant on Colorado City Reservoir is no longer being operated on a continual basis; therefore, the reservoir will no longer support a red drum fishery.

**MANAGEMENT STRATEGIES**

1. Discontinue stocking of red drum.
2. Change the regulations pertaining to red drum (currently 20" minimum length limit, daily bag limit of 3) to no minimum length limit and no daily bag limit.

## APPENDIX A

Table 1. Number (N) and catch rate (CPUE) of all species collected from all gear types from Colorado City Reservoir, Texas, 2004-2005. Electrofishing and trap netting are conducted in the fall, and gill netting is conducted in the spring.

| <b>Species</b>    | <b>Electrofishing</b> |             | <b>Trap Net</b> |             | <b>Gill Net</b> |             |
|-------------------|-----------------------|-------------|-----------------|-------------|-----------------|-------------|
|                   | <b>N</b>              | <b>CPUE</b> | <b>N</b>        | <b>CPUE</b> | <b>N</b>        | <b>CPUE</b> |
| Gizzard shad      | 1812                  | 151.0       | 2               | 0.4         |                 |             |
| Common carp       | 384                   | 32.0        | 304             | 60.8        | 1               | 0.2         |
| Inland silverside | 396                   | 33.0        |                 |             |                 |             |
| Black bullhead    |                       |             | 84              | 16.8        |                 |             |
| Yellow bullhead   | 12                    | 1.0         |                 |             |                 |             |
| Green sunfish     |                       |             | 1               | 0.2         |                 |             |

**APPENDIX B**

Table 1. Proposed sampling schedule for Colorado City Reservoir. Electrofishing and trap netting are conducted in the fall, and gill netting is conducted in the spring. The letter S indicates standard sampling.

| Sample Year             | Electrofishing | Trap net | Gill net | Report |
|-------------------------|----------------|----------|----------|--------|
| Fall 2005 - Spring 2006 |                |          |          |        |
| Fall 2006 - Spring 2007 | S              |          | S        |        |
| Fall 2007 - Spring 2008 |                |          |          |        |
| Fall 2008 - Spring 2009 | S              | S        | S        | S      |

## APPENDIX C

**Figure 1. Golden alga monitoring results for Colorado City Reservoir, May 2002—April 2005. Toxicity rankings based on laboratory bioassays conducted with fathead minnows. Toxicity rankings are: 0=Not toxic, 1=Slight, 2=Sight-Moderate, 3=Moderate, 4=Moderate-High, 5=High.**

