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FEDERAL AID PROJECT F-221-M-3

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2012 Fisheries Management Survey Report

**Colorado City Reservoir**

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Colorado City Reservoir were surveyed in 2010 using electrofishing, and in 2011 using gill netting. The water level was too low to allow boat access during the report year 2012-2013. 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 located on Morgan Creek, a tributary of the Colorado River, west of Colorado City in Mitchell County, Texas. Habitat consisted primarily of flooded terrestrial vegetation, native emergent vegetation, boulders and boat docks. The Morgan Creek Power Plant, that once used Colorado City as a cooling reservoir, closed down in 2008. After that the reservoir water level was not maintained at a near-constant level as it had been in the past. Colorado City Reservoir has been severely impacted by toxic golden alga (*Prymnesium parvum*) blooms every year since 2001 with fish kills occurring regularly. Shoreline access was good, including at the Lake Colorado City State Park, but boat access was not possible in 2012-2013 due to water level below the end of the boat ramps.
- **Management History:** Historically, important sport fish included Largemouth Bass, White Bass, Channel Catfish, Blue Catfish, and Red Drum. Colorado City Reservoir has been impacted by toxic golden alga blooms, and a concerted effort was made to restock the reservoir when water quality was suitable. Florida Largemouth Bass (603,683) and Bluegill (863,965) were stocked during 2004-2008 and Channel Catfish (1,054,326) during 2003-2008. Re-occurrence of golden alga-related toxic conditions rendered these stocking efforts unsuccessful at re-building populations. As a result, all fish stocking in this reservoir has been suspended pending sustained improvements in water quality.
- **Fish Community:** Only a few Common Carp were captured in the electrofishing survey, and no fish were captured in the gill netting survey.
- **Management Strategies:** Based on current data, Colorado City Reservoir should continue to be managed with existing regulations. Future stockings are contingent on sustained improvements in water quality as determined by monitoring cell density and toxicity levels of golden alga. A mandatory standard survey is scheduled for 2016-2017 with gill nets and electrofishing to determine the status of fish populations.

## INTRODUCTION

This document is a summary of fisheries data collected from Colorado City Reservoir in 2010-2011. We could not access the lake in the report year 2012-2013 due to low water level. The purpose of the document is to provide fisheries information and make management recommendations to improve the sport fishery.

### *Reservoir Description*

Colorado City Reservoir is a 1,618-acre impoundment that was constructed in 1949 and is located on Morgan Creek, a tributary of the Colorado River, west of Colorado City in Mitchell County, Texas. The reservoir is operated and controlled by the City of Colorado City. It is a former power-plant reservoir with habitat consisting primarily of flooded terrestrial vegetation, native emergent vegetation, boulders and boat docks. There is currently no substantial coverage of submerged aquatic vegetation in the reservoir. The Morgan Creek Power Plant closed around in 2008, so the water level is no longer maintained at a near-constant level (Figure 1). Colorado City Reservoir has been severely impacted by toxic golden alga (*Prymnesium parvum*) blooms every year since 2001 (Figure 2), and fish kills have been routinely documented. In 2008, Colorado City Reservoir was classified as hypereutrophic based on Carlson's Trophic State Index for Chlorophyll-*a* (TSI Chl-*a*) with a mean TSI chl-*a* of 66.08 (Texas Commission on Environmental Quality 2011). Other descriptive characteristics for Colorado City Reservoir are shown in Table 1.

### *Angler Access*

Boat access consisted of one public boat ramp at Colorado City State Park, and a privately-owned boat ramp at Cooper's Cove resort. Shoreline access was adequate at Lake Colorado City State Park. During the report year, neither of the boat ramps was usable due to low water level.

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Farooqi and Scott 2009) included:

1. Continue monitoring cell densities and toxicity levels of golden alga on a regular basis and restock with prey and sport fish species when water samples indicate low toxicity.  
**Action:** Golden alga monitoring was conducted monthly (except for summer) through 2011, and quarterly since 2012.

**Harvest regulation history:** Sport fish in Colorado City Reservoir are currently managed with statewide regulations (Table 2).

**Stocking history:** Red Drum were originally stocked in 1981. In an effort to maintain the population, stocking took place nearly every year from 1991 to 2003. Stocking was terminated in 2004 when it was determined that the power station that produced the warm water winter refuge necessary for the survival of red drum would no longer be fully operational and was scheduled for closure. The reservoir has been impacted by fish kills since 2001 due to golden algae blooms. When water quality conditions permitted, sport fish and forage fish were stocked to rebuild the populations. Florida Largemouth Bass were first stocked in 1986. Additional stocking occurred during the period 2004-2008. Bluegill were stocked as forage during the period 2004-2008. Channel Catfish were stocked from 2003 to 2008. Hybrid crappie were stocked between 1994 and 1997. The complete stocking history is shown in Table 3.

**Water transfer:** Colorado City was used as a power plant cooling reservoir until 2008, when the plant closed. Now the reservoir is primarily used for municipal water supply and recreation. Water transfers have been conducted in the past by the Colorado River Municipal Water District, moving water from

Champion Creek, E. V. Spence, and Moss Creek Reservoirs into Colorado City Reservoir.

## METHODS

Fish were collected by electrofishing (1.0 hour at 12, 5-min stations), and gill netting (five net-nights at five stations). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011).

Monthly water samples have been collected from the reservoir at the state park boat ramp, starting in May 2002. In fall 2012 we began sampling on a quarterly basis. Samples are processed by the TPWD fish health laboratory in San Marcos to determine golden alga cell counts and to perform bioassay toxicity assessments. Water quality parameters collected at time of sampling consisted of temperature, dissolved oxygen, conductivity, salinity, pH, and Secchi depth.

Source for water level data was the United States Geological Survey website.

## RESULTS AND DISCUSSION

**Habitat:** A habitat survey was last conducted in 2000 (Dennis and Farquhar 2001).

**Prey species:** No shad or sunfish were collected in the 2010 electrofishing survey.

**Catfishes:** No catfish were collected in the 2011 gill netting survey.

**White bass:** No White Bass were collected in the 2011 gill netting survey.

**Largemouth bass:** No Largemouth Bass were collected in the 2010 electrofishing survey.

**White crappie:** No sampling was conducted for crappie due to low water level during the report year.

### Fisheries management plan for Colorado City Reservoir, Texas

Prepared – July 2013.

**ISSUE 1:** Toxic golden alga blooms have severely limited the fishery at Colorado City Reservoir. Multiple restocking efforts since 2003 have not resulted in the development of adequate fish populations of Largemouth Bass, Bluegill and Channel Catfish. As a result, all fish stocking has been suspended.

#### MANAGEMENT STRATEGY

1. Continue monitoring golden alga cell density and toxicity levels to determine water quality. If significant improvements in water quality (e.g., no toxic conditions for a minimum of two years) are documented, then stock with Bluegill, Largemouth Bass, Channel Catfish and White Crappie (via management stocking) to help develop these populations and re-establish the fishery.

**ISSUE 2:** Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example,

zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

#### MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc... so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

#### SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes mandatory monitoring in 2016/2017 (Table 4). Any additional fish population surveys are not needed until water quality improvements provide suitable conditions for the recovery of the fish populations.

#### LITERATURE CITED

- Dennis, J. A, and B. W. Farquhar. 2001. Statewide freshwater fisheries monitoring and management program survey report for Colorado City Reservoir, 2000. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Farooqi, M. and M. Scott. 2009. Statewide freshwater fisheries monitoring and management program survey report for Colorado City Reservoir, 2008. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Texas Commission on Environmental Quality. 2011. Trophic classification of Texas reservoirs; 2011 Texas water quality inventory and 303(d) list (November 18, 2011). 18 pp.



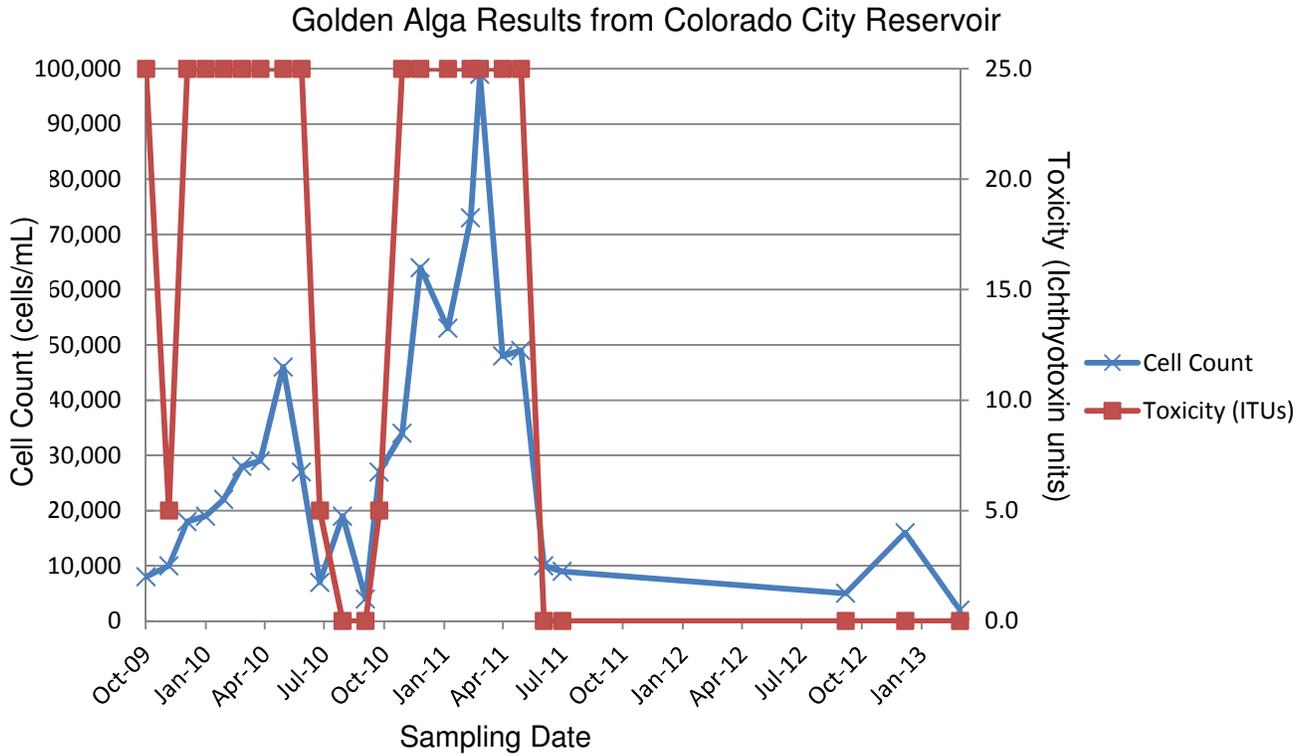


Figure 2. Golden alga monitoring results for Colorado City Reservoir, October 2009-March 2013. Toxicity rankings based on laboratory bioassays conducted with fathead minnows. Toxicity rankings are: 0=non-toxic, 1.0=slight, 5.0=moderate, and 25.0=high. Cell count units are cells/mL of water.

Table 1. Characteristics of Colorado City Reservoir, Texas.

Characteristic	Description
Year constructed	1949
Controlling authority	City of Colorado City
County	Mitchell
Reservoir type	Tributary
Shoreline Development Index	4.09
Conductivity	4,950 $\mu$ mhos/cm

Table 2. Boat ramp characteristics for Colorado City Reservoir, Texas, July 2013.

Boat ramp	Latitude	Longitude (dd)	Public	Parking capacity (N)	Condition
Lake Colorado City State Park	32°20'22.5"	-100°55'43.3"	Y	15	Out of water
Cooper's Cove	32°21'23.70"	-100°56'1.18"	N	10	Out of water

Table 3. Harvest regulations for Colorado City Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Largemouth	5	14-inch minimum
Crappie: White and Black, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Colorado City Reservoir, Texas. Size categories are: FRY =  $\leq 1$  inch; FGL = 1-3 inches; ADL = adults, and UNK = unknown. Continued on next page.

Species	Year	Number	Size
Threadfin Shad	1980	2,000	UNK
Bluegill	2003	162,739	FGL
	2004	83,251	FGL
	2005	168,338	FGL
	2006	140,191	FGL
	2007	135,618	FGL
	2008	173,828	FGL
	Total	863,965	
Channel Catfish	1972	7,000	UNK
	2003	79,983	FGL
	2003	151	ADL
	2004	149,628	FGL
	2005	359,478	FRY
	2005	165,719	FGL
	2006	142,404	FGL
	2008	156,963	FGL
Total	1,061,326		
Largemouth Bass	1966	40,000	UNK
	1968	25,000	UNK
	1970	15,000	UNK
	1972	50,000	UNK
	1997	161,800	FGL
	Total	291,800	
Florida Largemouth Bass	1986	160,351	FGL
	2000	41,113	FGL
	2004	143,915	FGL
	2005	162,134	FGL
	2007	135,384	FGL
	2008	162,250	FGL
	Total	805,147	
Palmetto Bass	1978	10,000	UNK
Red Drum	1981	167,400	FGL
	1982	134,000	FGL
	1986	174,850	FGL
	1987	160,000	FGL
	1991	183,800	FGL
	1992	72,803	FGL
	1993	162,780	FRY
	1994	160,859	FGL
	1995	166,000	FGL
	1996	165,228	FGL
	1997	168,178	FGL
	1999	195,948	FGL
	2000	204,400	FGL
2001	204,016	FGL	

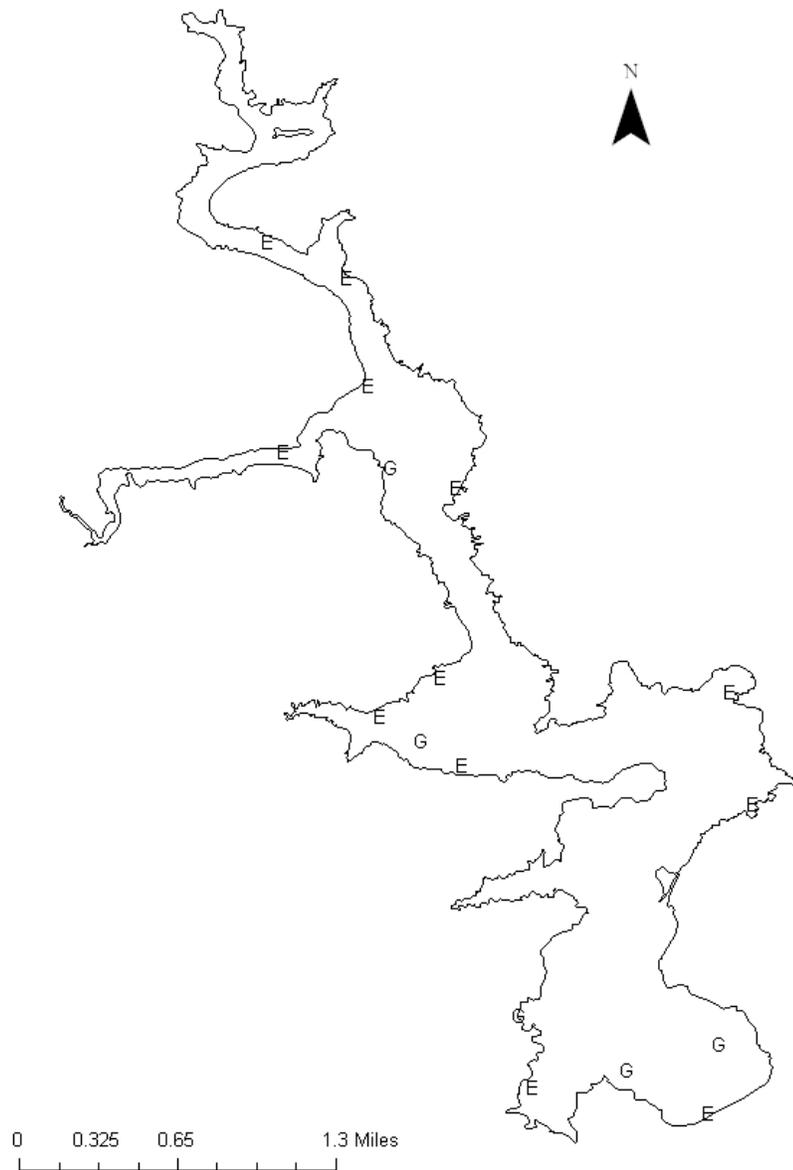
Table 4. Stocking history continued.

Species	Year	Number	Size
Red Drum	2003	177,093	FGL
	Total	2,497,355	
Hybrid crappie	1994	162,548	FRY
	1995	161,830	FRY
	1996	162,423	FRY
	1997	143,697	FGL
	Total	630,498	
Walleye	1978	50,000	UNK

Table 5. Proposed sampling schedule for Colorado City Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey year	Electrofishing	Trap net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2013-2014								
2014-2015								
2015-2016								
2016-2017	S		S		S	S		S

## APPENDIX A



Location of sampling sites, Colorado City Reservoir, Texas, 2010 and 2011. Gill net (spring 2011) and electrofishing (fall 2010) stations are indicated by G and E, respectively. Low water level prevented regular monitoring surveys in 2012-2013. The reservoir was about 13 feet below conservation pool at the time of sampling. This map was drawn from the lake outline at full pool.

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