

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-34

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2008 Survey Report

Red Bluff Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Red Bluff Reservoir were surveyed in 2007 and 2009 using gill nets. Electrofishing could not be performed due to high conductivity. Trap netting was not conducted because crappie, the target species, do not occur in the saline reservoir. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Red Bluff Reservoir is located on the Pecos River 45 miles north of Pecos on the Loving and Reeves County line; the upper end of the reservoir reaches into New Mexico. It was constructed in 1936 for hydroelectric and irrigation water supply. It has a history of severe water level fluctuations. The reservoir has also suffered from toxic golden alga (*P. parvum*) blooms since the mid-1980s. Since 2001 the algal blooms have suppressed fish populations significantly and prevented the recovery of the fisheries. At the time of sampling, surface acreage was approximately 4,269 acres. The reservoir's conductivity has consistently been in excess of 4,000 $\mu\text{mhos/cm}$, making electrofishing ineffective. Habitat consists mainly of rock or gravel shoreline. Shoreline access is good near the dam, and boats can be launched from the gravel shore in the same area.
- **Management History:** Catfishes and largemouth bass were stocked until the 1980s and Palmetto bass were present in Red Bluff Reservoir up until 2002; however, golden alga blooms have prevented any stocking success since then. Sport fishes have been managed with statewide regulations.
- **Fish Community**
 - **All species:** No fish were collected in gill net surveys in either 2007 or 2009.
- **Management Strategies:** Keep monitoring for golden alga presence and toxicity; restock with prey and game fish species if water samples indicate golden alga problem has cleared. Sample with gill nets during report year only to confirm presence/absence of fish populations.

INTRODUCTION

This document is a summary of fisheries data collected from Red Bluff Reservoir in spring 2009. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. Historical data are not included in this report because ongoing golden alga fish kills have practically eliminated all sport fish populations in the reservoir since 2001.

Reservoir Description

Red Bluff Reservoir is located on the Pecos River 45 miles north of Pecos on the Loving and Reeves County line; the upper end of the reservoir reaches into New Mexico. It was constructed in 1936 for hydroelectric and irrigation water supply. It has a history of severe water level fluctuations (Figure 1). The reservoir has also suffered from toxic golden alga (*P. parvum*) blooms since the mid-1980s. Since 2001 the algal blooms have suppressed fish populations significantly (Figure 2) and prevented the recovery of the fisheries. At the time of sampling, surface acreage was approximately 4,269 acres. Red Bluff Reservoir is hypereutrophic with a mean TSI chl-*a* of 58.7 (Texas Commission on Environmental Quality 2008). The reservoir's conductivity has consistently been in excess of 4,000 $\mu\text{mhos/cm}$, making electrofishing ineffective. Habitat consists mainly of rock or gravel shoreline. Boat and shoreline access are adequate. Other descriptive characteristics for Red Bluff Reservoir are presented in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Scott and Van Zee 2005) included:

1. Continue monitoring golden alga in water samples on a regular basis.
Action: Water samples were analyzed annually from 2005 through 2008 (Figure 2).
2. Restock the reservoir with prey and sport fish species when water samples indicate low toxicity.
Action: Due to ongoing toxic golden alga blooms, no stocking has occurred.

Harvest regulation history: Sport fishes in Red Bluff Reservoir have been managed with statewide regulations.

Stocking history: Species stocked have included red drum (1960s), blue catfish, channel catfish, largemouth bass, black and white crappie, and striped bass (until late 1980s and early 1990s) and Palmetto bass (until 2002). The complete stocking history is in Table 2.

Vegetation/habitat history: Limited fish habitat is available in the form of rocks and gravel shoreline. Large beds of pondweed were present in the late 1990s (Bobby Farquhar, personal communication); however, submerged aquatic vegetation has not been present in several years.

METHODS

Fishes were sampled by gill netting (5 net nights at 5 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 2008), with the exception of sampling effort. Whereas Red Bluff Reservoir's acreage would normally call for 10 net-nights of gill net sampling, we only conducted 5 net nights of gill netting in 2007 and 2009 because no fish were collected in gill nets in the three previous samples (2003: 15 nn, 2004: 10 nn, 2005: 5 nn). The non-standard surveys were conducted primarily to check for presence of any fish after the devastating fish kills. Water samples were collected by the Inland Fisheries District 1-C management crew or Kills and Spills Team biologist and analyzed by the Inland

Fisheries Fish Health Laboratory in San Marcos, Texas.

Access data were collected according to Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005). A littoral zone/physical habitat survey was conducted in 1996 by Dennis and Farquhar (2001). There were no significant man-made changes to the shoreline in 2008-2009, so the survey was not updated. Water level data were provided by U.S. Geological Survey website.

RESULTS AND DISCUSSION

All species: No fish were collected in gill net surveys in either 2007 or 2009.

Fisheries management plan for Red Bluff Reservoir, Texas

Prepared – July 2009.

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

MANAGEMENT STRATEGIES

1. Keep monitoring golden alga through water samples on a regular basis.
2. Restock the reservoir with prey and sport fish species when water samples indicate the golden alga problem has cleared.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes mandatory monitoring in 2012/2013 (Table 3). This schedule is adequate for monitoring the presence or absence of fish populations in the reservoir.

LITERATURE CITED

Dennis, J. A. and B. W. Farquhar. 2001. Statewide freshwater fisheries monitoring and management program survey report for: Red Bluff Reservoir 2000-2001. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

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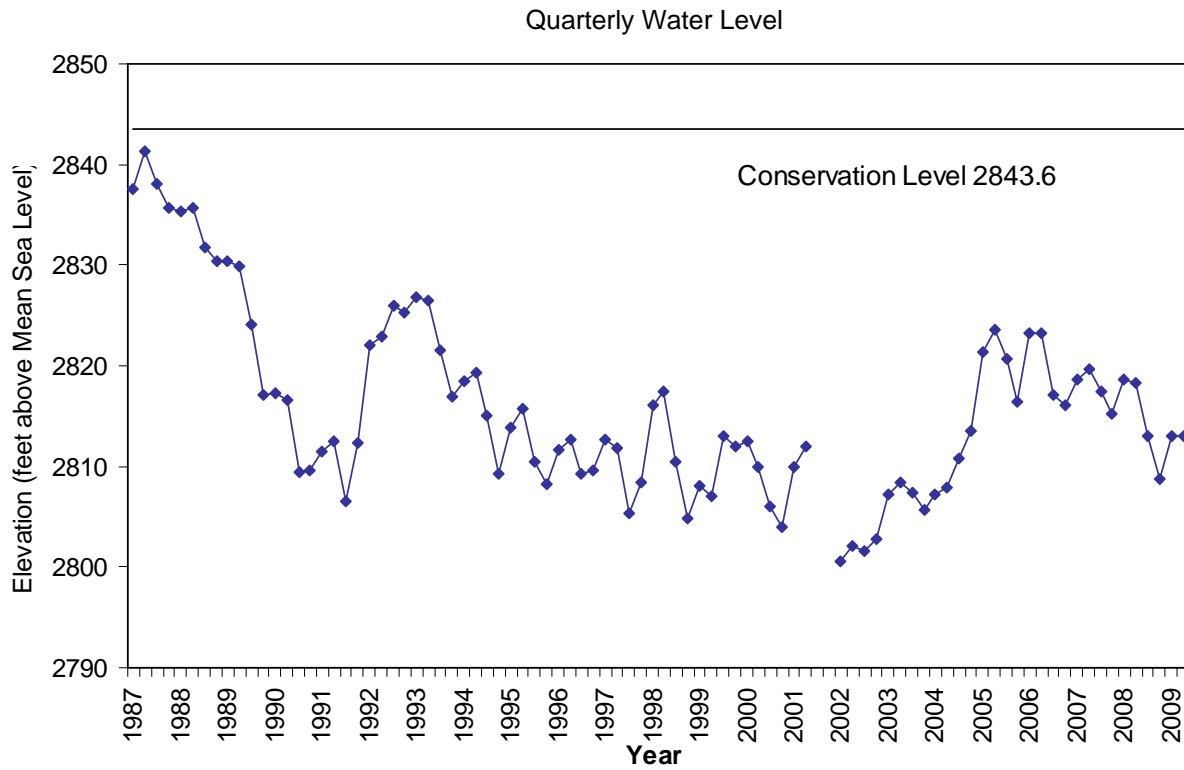


Figure 1. Quarterly water level elevations recorded for Red Bluff Reservoir, Texas.

Table 1. Characteristics of Red Bluff Reservoir, Texas.

Characteristic	Description
Year constructed	1936
Controlling authority	Red Bluff Water Power Control District
Counties	Reeves, Loving
Reservoir type	Mainstream
Shoreline Development Index	5.9
Conductivity	>4,000 μ mhos/cm

Table 2. Stocking history of Red Bluff Reservoir, Texas. Size categories are FRY = <1 inch; FGL = 1-3 inches; ADL = adult; and UNK = unknown.

Year	Number	Size	Year	Number	Size
<u>Blue catfish</u>			<u>Red drum</u>		
1979	263,579	UNK	1960	50	UNK
1980	86,681	UNK	1961	183	UNK
1981	50,000	UNK	1963	171	UNK
1982	49,981	UNK	1964	746	UNK
1988	15	ADL	1965	186	UNK
Total	450,256		1966	36	UNK
			Total	1,372	
<u>Channel catfish</u>			<u>White crappie</u>		
1966	55,680	UNK	1974	3,000	UNK
1969	10,000	UNK	1988	26,402	FGL
1970	39,300	UNK	Total	29,402	
1971	31,500	UNK			
1972	30,000	UNK	<u>Black crappie</u>		
1973	24,750	UNK	1988	30,976	FGL
1974	19,900	UNK	1989	179,688	FRY
1975	20,000	UNK	Total	210,664	
1985	9,684	FGL			
1992	20,000	FGL	<u>Palmetto bass</u>		
1993	300	ADL	1979	50,390	UNK
1993	292,954	FGL	1980	60,806	UNK
Total	554,068		1983	27,800	UNK
			1984	56,057	FGL
<u>Flathead catfish</u>			1985	99,420	FGL
1976	10,600	UNK	1988	325,140	FGL
			1992	1,900,000	FRY
<u>Largemouth bass</u>			1993	1,447,875	FRY
1966	133,280	UNK	1994	1,465,000	FRY
1967	186,300	UNK	1995	130,225	FGL
1969	94,000	UNK	1998	117,114	FGL
1970	97,000	UNK	1999	58,143	FGL
1971	64,000	UNK	2000	59,153	FGL
1974	10,000	UNK	2002	88,145	FGL
1988	75,662	FGL	Total	5,885,268	
Total	660,242				
			<u>Florida largemouth bass.</u>		
			1988	28,400	FGL
			<u>Striped Bass</u>		
			1988	119,812	FGL
			1989	117,367	FGL
			Total	237,179	

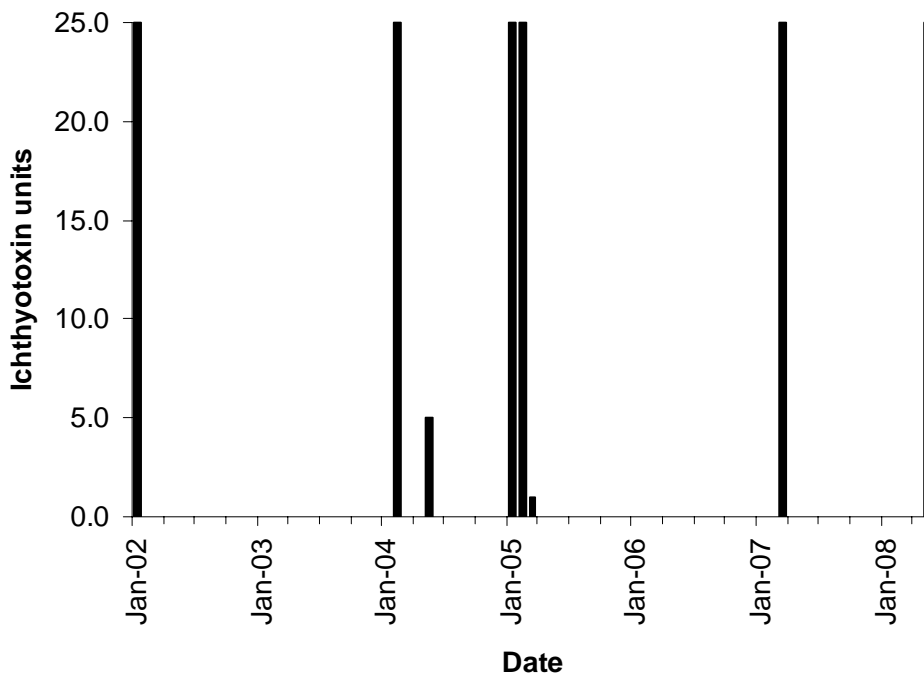
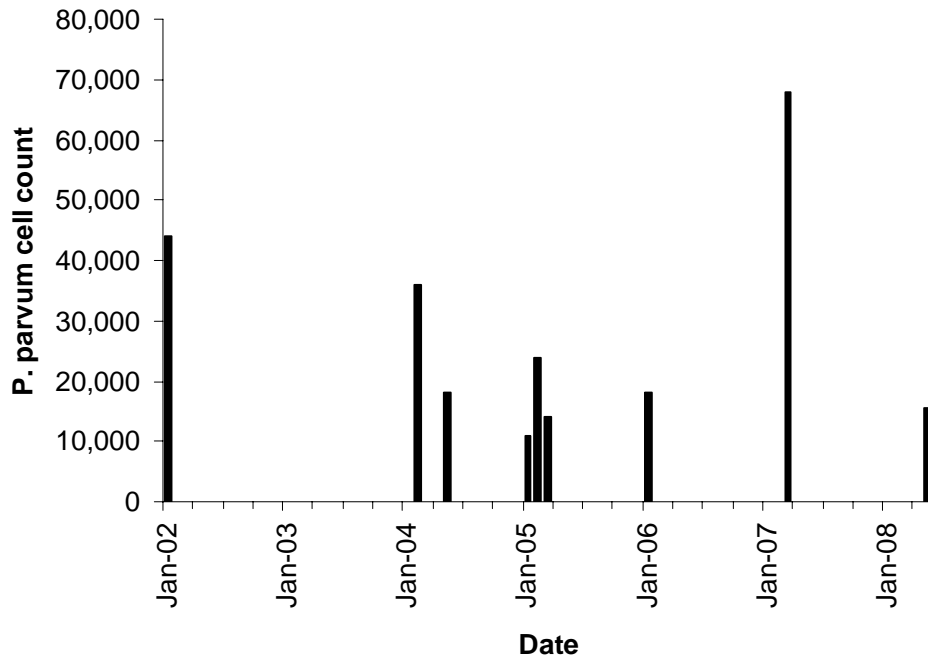


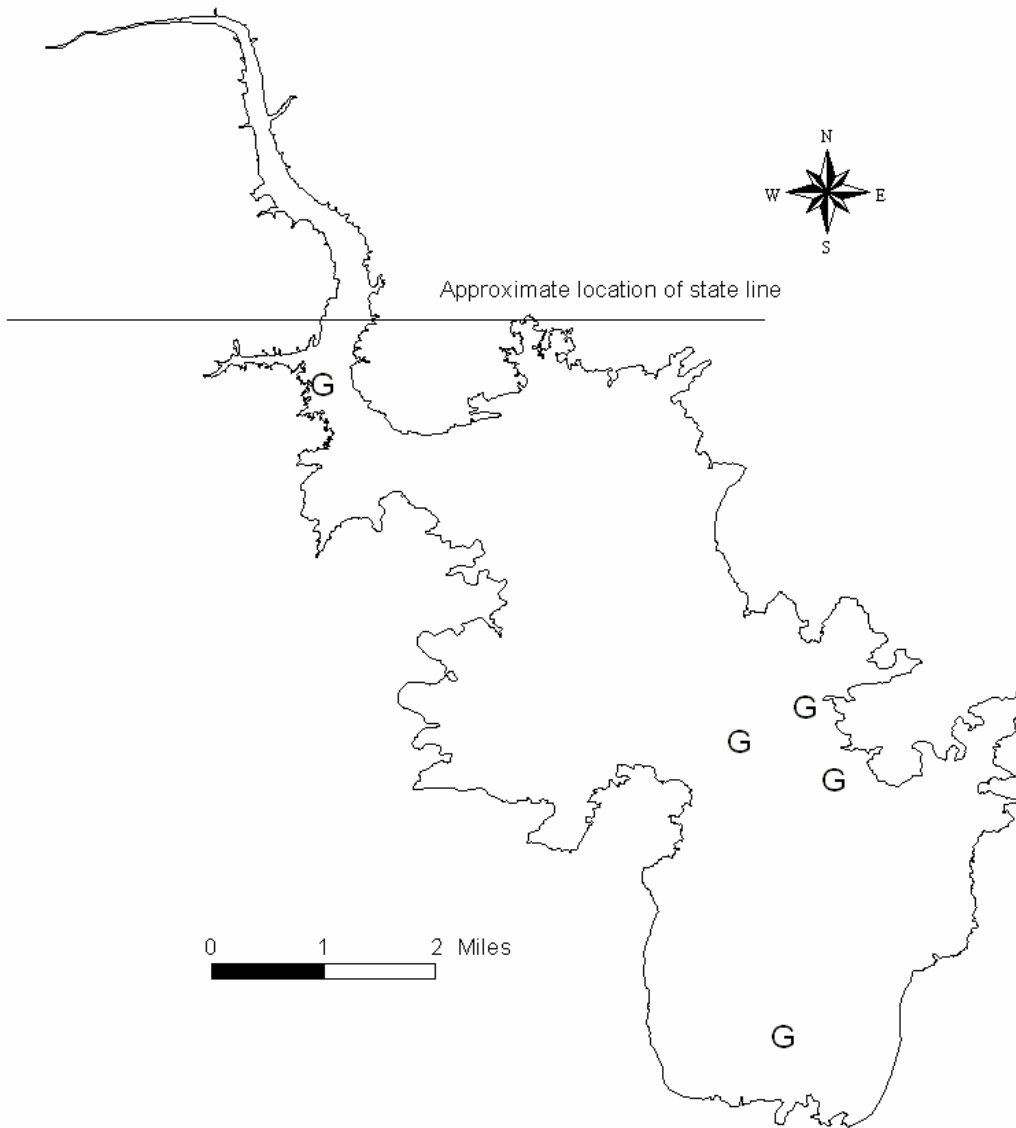
Figure 2. Golden alga (*P. parvum*) cell counts and toxicity data from Red Bluff Reservoir, Texas. Ichthyotoxin units provide an index of toxicity; 0 ITUs=non-toxic, 1 ITU=slight, 5 ITUs=moderate, and 25

ITUs=high.

Table 3. Proposed sampling schedule for Red Bluff Reservoir, Texas. Gill netting surveys are conducted in the spring. Standard survey denoted by S.

Survey Year	Gill Net	Report
Fall 2009-Spring 2010		
Fall 2010-Spring 2011		
Fall 2011-Spring 2012		
Fall 2012-Spring 2013	S	S

APPENDIX



Location of sampling sites, Red Bluff Reservoir, Texas, 2009. Gill net stations are indicated by a G.

Water level was 30 feet below conservation pool at time of sampling.