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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2015 Fisheries Management Survey Report

**Baylor Creek Reservoir**

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Baylor Creek Reservoir were not surveyed since 2011 due to extreme drought conditions. This report summarizes the history of the reservoir and contains a management plan.

- **Reservoir Description:** Baylor Creek Reservoir is a 600-acre impoundment constructed in 1950 on Baylor Creek, a tributary of the Red River, located 9 miles west of Childress, Texas. There are no official water level records. Water level in the reservoir has declined since 2000 due to drought conditions and the reservoir has been inaccessible by boat since 2008. Since preparation of this report began, rainfall in the watershed has increased water levels approximately 25 feet. Habitat features consisted primarily of silt shoreline. The reservoir has been severely impacted by golden alga (*Prymnesium parvum*) blooms and related fish kills since 2003.
- **Management History:** Important sport fish have included Largemouth Bass, White Crappie, and catfish. The sport fish populations have only been managed with statewide harvest regulations, but the reservoir had previously been known as a trophy Largemouth Bass fishery prior to 2003. Crappie and catfish were popular secondary species.
- **Fish Community**
  - No fisheries surveys were conducted in 2015-2016.

**Management Strategies:** Reduce scheduled sampling to the required level. Since water levels increased during June 2016, an additional electrofishing survey and trap net survey will be conducted in fall 2016 and gill netting in spring 2017. Conduct periodic surveys for *Prymnesium parvum*.

## INTRODUCTION

This document is a description and history of Baylor Creek Reservoir. The purpose of the document is to provide information and make management recommendations to protect and improve the sport fishery. No fisheries data was collected in 2015 and 2016 due to extreme drought conditions.

### *Reservoir Description*

Baylor Creek Reservoir is a 600-acre impoundment constructed in 1950 on Baylor Creek, a tributary of the Red River, located 9 miles west of Childress, Texas. In 2015-2016 the reservoir covered approximately 30 surface acres. The reservoir is owned by the City of Childress and maintained for recreation. There are no official water level gauges or records. Water level in the reservoir declined from 2000-2011 due to drought conditions and has remained low since 2011. The reservoir became inaccessible by boat since 2008. Baylor Creek Reservoir has experienced fish kills caused by golden alga (*Prymnesium parvum*) blooms beginning in spring 2003. Conductivity has increased from an average of 1,150  $\mu\text{mhos/cm}$  in the 1980's to over 10,000  $\mu\text{mhos/cm}$  since 2007. No specific source of chlorides has been identified but it is suspected that there may be brine springs in the watershed on private property. Since preparation on this report initially began, rainfall in the watershed has increased water levels approximately 25 feet and increased acreage to an estimated 300 acres and 1,200  $\mu\text{mhos/cm}$ . Habitat in 2015 was primarily silt shoreline. There were two boat ramps with no handicap specific facilities. By spring 2008, neither boat ramp was usable. Other descriptive characteristics for Baylor Creek Reservoir are in Table 1.

### *Angler Access*

Baylor Creek Reservoir has two public boat ramps and no private boat ramps. The ramps, North and South, were unavailable to anglers in 2015 and the spring of 2016 because the end of the boat ramp was above the waterline. Extension of the ramps is not feasible. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the lower half of the reservoir.

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Munger and Clayton 2012) included:

1. Baylor Creek Reservoir has been repeatedly impacted by *Prymnesium parvum*. Repeated blooms have decimated the fish populations.  
**Action:** Stocking was suspended until *Prymnesium parvum* issues abate. Conducted periodic *P. parvum* surveys.
2. Baylor Creek Reservoir has been impacted by a long-term drought and has very low water levels. Conductivity was over 10,000  $\mu\text{mhos/cm}$  which would prevent effective electrofishing.  
**Action:** Sampling had been suspended until water levels and chlorides return to levels that allow access and sampling.
3. Habitat evaluation and enhancement is typically conducted when the habitat area is flooded which makes accurate surveys difficult and enhancement efforts more expensive and difficult. Current extreme low water conditions provide the opportunity to evaluate existing habitat with the potential for lower cost enhancement activities  
**Action:** The basin was evaluated via satellite images and no practical habitat enhancement projects were identified. Low water levels have allowed extensive growth of woody terrestrial vegetation that will provide quality habitat when water levels rise.
4. Threat of invasive species in Texas can adversely affect the state ecologically,

environmentally, and economically.

**Action:** Current low water conditions and high chlorides have reduced the risk of infestation, but inflows could return the reservoir to high risk. Risk has been communicated to the marina management.

**Harvest regulation history:** Sport fishes in Baylor Creek Reservoir are currently managed with statewide regulations (Table 3).

**Stocking history:** Baylor Creek Reservoir was stocked in 2005 with Channel Catfish, Bluegill and Florida Largemouth Bass following *Prymnesium parvum* fish kills. The complete stocking history is in Table 4.

**Water Transfer:** Baylor Creek Reservoir is currently used only for recreation and no interbasin water transfers are planned for the reservoir.

## METHODS

No fisheries surveys were conducted in 2015 or 2016 due to extreme low water levels. Scheduled objective-based survey components for 2015-2016 are presented in Table 5.

**Habitat** - A structural habitat survey was conducted in 2015. Habitat was assessed with the digital shapefile method using digital aerial photography (TPWD, Inland Fisheries Division, unpublished manual revised 2015) and is presented in Table 6.

**Water level** – There are no water level gauges on the reservoir. Elevation for the habitat survey was estimated using satellite information.

*Prymnesium parvum* surveys – water samples were collected and average cell densities were recorded from 2-4 stations as number of cells/mL. Data are presented in Table 7.

## RESULTS AND DISCUSSION

**Habitat:** The previous habitat survey was conducted in 2011 (Munger and Clayton 2012). The 2015 structural habitat survey determined that the primary structural habitat is natural (silt) shoreline and is presented in Table 6. Low water levels have allowed extensive growth of woody terrestrial vegetation that will provide an estimated 200 acres or more of quality habitat when water levels rise.

**Fish community:** No fisheries results are presented because the reservoir could not be surveyed in 2015 or 2016 due to extreme low water levels.

## Fisheries management plan for Baylor Creek Reservoir, Texas

Prepared – July 2016.

**ISSUE 1:** Baylor Creek Reservoir has been repeatedly impacted by *Prymnesium parvum*. Repeated blooms have decimated its fish populations. This is a continuation of the previous management plan.

### MANAGEMENT STRATEGY

1. Conduct periodic monitoring for *P. parvum* during February and March and delay stocking until conditions improve to where *Prymnesium parvum* blooms are less likely.
2. The recent water level increase may allow for stocking in 2017 depending on *P. parvum* survey results in winter 2017.

**ISSUE 2:** Baylor Creek Reservoir has been impacted by a long-term drought and has very low water levels. Conductivity was over 10,000  $\mu\text{mhos/cm}$  and precluded the ability to conduct electrofishing surveys and the low water levels had eliminated boat access. This is a continuation of the previous management plan.

### MANAGEMENT STRATEGY

1. Reduce fisheries sampling activities to every four years until water levels recover to allow access and conductivity declines enough to allow effective electrofishing. As of June 2016, water levels have increased approximately 25 feet and conductivity declined to around 1,200  $\mu\text{mhos/cm}$  which will allow for an additional electrofishing survey in fall 2016.

**ISSUE 3:** Boating access at the two public access sites was impeded by low water level since 2008. The boat ramps cannot be extended because the lake bottom levels out at the end of the ramp with no access to deeper water.

### MANAGEMENT STRATEGIES

1. Recent water level increases have improved boating access. Ramp and parking areas will be evaluated for potential improvements.

**ISSUE 4:** 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. 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. Current low water conditions and high chlorides have reduced the risk of infestation, but inflows could return the reservoir to high risk.

### 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.

## Objective-Based Sampling Plan and Schedule

### Baylor Creek Reservoir 2016-2020

**Reservoir Status/Disclaimer:** Baylor Creek Reservoir has been impacted by drought conditions since 2000 and periodic golden alga blooms since 2003. The total area of Baylor Creek Reservoir was approximately 50 acres based on water levels on 4/30/16. The entire basin was water levels too shallow to launch a boat or set any type of nets. Since 1 June 2016, rainfall in the watershed has increased water levels approximately 25 feet allowing for boat access at this time. Acreage in June 2016 was estimated at approximately 300 acres following the water rise. Evidence from sampling surveys conducted prior to 2008 (the last time water levels were high enough to launch a boat) indicated that all game fish species had been extirpated from the reservoir.

#### Sport fish, forage fish, and other important fishes

There are no known sport fish currently in Baylor Creek Reservoir.

#### Negligible fisheries

Historically the reservoir had quality populations of **White Crappie**, **Channel Catfish**, **Flathead Catfish**, and **Largemouth Bass**. None of these species have been sampled since 2008.

#### Survey objectives, fisheries metrics, and sampling objectives

**Channel Catfish and Flathead Catfish:** If water levels remain high enough where boats can be launched, exploratory gill net sampling will be used to determine if either species survived the extended drought and golden alga kills. Sampling effort for spring 2017 and 2020 will be 5 random gill net stations. Catch-per-unit-effort will be the measure of their presence, with no specific CPUE RSE required.

**Largemouth Bass:** If water levels remain high enough where boats can be launched and if conductivities are below 3,500 mhos/cm, exploratory electrofishing will be used to determine if this species survived the extended drought and golden alga kills. Sampling effort for fall 2016 and 2019 will be 10 random 5-minute electrofishing stations. Catch-per-unit-effort will be the measure of their presence, with no specific CPUE RSE required.

**White Crappie:** If water levels remain high enough where boats can be launched, exploratory trap net sampling will be used to determine if this species survived the extended drought and golden alga kills. Sampling effort for fall 2016 and 2019 will be 5 biologist-selected trap net stations. Biologist selected stations will be used to increase probability of catch. Catch-per-unit-effort will be the measure of their presence, with no specific CPUE RSE required.

The proposed sampling schedule is presented in Table 8 and the objective-based sampling plan components for Baylor Creek Reservoir, Texas 2016 – 2020 are presented in Table 9.

## LITERATURE CITED

Munger, C. and J. Clayton. 2012. Inland fisheries division monitoring and management program survey report, Baylor Creek Reservoir 2011. Texas Parks and Wildlife Department, Federal Aid in Sport Fish Restoration Act, Federal Aid Grant F-221-M, Performance Report, Austin.

Table 1. Characteristics of Baylor Creek Reservoir, Texas.

Characteristic	Description
Year constructed	1950
Controlling authority	City of Childress
County	Childress
Reservoir type	Main stream
Shoreline Development Index (SDI)	2.39
Conductivity	10,400 $\mu$ mhos/cm (1,200 following water level rise)

Table 2. Boat ramp characteristics for Baylor Creek Reservoir, Texas, June, 2016.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
North	34.47828 -100.37404	Y	10	1,794	Usable. Extension is not feasible
South	34.47220 -100.37190	Y	15	1,797	Usable. Extension is not feasible

Table 3. Harvest regulations for Baylor Creek Reservoir, Texas.

Species	Bag Limit	Length Limit
Catfish: Channel and Blue, their hybrids and subspecies	25 (in any combination)	12-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 Baylor Creek Reservoir, Texas. Size categories are fingerlings (FGL), adults (ADL) and unknown (UNK).

Species	Year	Number	Size	Species	Year	Number	Size
Blue Catfish	1981	15,682	FGL	Flathead Catfish	1975	2,000	UNK
Channel Catfish	1965	6,000	ADL	Largemouth Bass	1967	20,000	FGL
	1966	4,000	ADL		1968	9,400	FGL
	1967	3,500	ADL		1970	20,000	FGL
	1967	500	UNK		1971	24,000	FGL
	1968	5,000	ADL		1972	10,000	FGL
	1969	5,000	ADL		1973	5,000	FGL
	1971	5,000	ADL		2002	11	ADL
	1972	10,000	ADL		Total	88,411	
	1973	10,000	ADL				
	1975	5,000	ADL		Florida Largemouth Bass	1981	32,000
	1976	6,000	ADL	1999		280	FGL
	1977	6,000	ADL	2000		60,069	FGL
	1978	6,000	ADL	2002		61,000	FGL
2005	17,151	FGL	2004	72,668		FGL	
Total	89,151			2005	61,222	FGL	
				Total	287,239		
Bluegill	2005	66,101	FGL				
Coppernose Bluegill x Green Sunfish	1981	60,000	FGL				
	1982	60,000	FGL				
	Total	120,000					

Table 5. Objective-based sampling plan components for Baylor Creek Reservoir, Texas 2015 – 2016.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Exploratory	CPUE	Presence/absence
Bluegill	Exploratory	CPUE	Presence/absence
Gizzard Shad	Exploratory	CPUE	Presence/absence
Trap netting			
White Crappie	Exploratory	CPUE	Presence/absence
Gill netting			
Channel Catfish	Exploratory	CPUE	Presence/absence
Flathead Catfish	Exploratory	CPUE	Presence/absence

Table 6. Survey of structural habitat types, Baylor Creek Reservoir, Texas, 2015. Shoreline habitat type units are in miles and open water is acres.

Habitat type	Estimate	% of total	Acres	% of total
Natural	2.12	100		
Open water			30	100

Table 7. *Prymnesium parvum* average cell counts, ITUs and conductivity for Baylor Creek Reservoir, Texas.

Sampling Date	Average Density (cells/mL)	ITUs*	Conductivity (µmhos/cm)
04/09/2003	4,000		4,546
05/07/2003	500		
03/16/2004	18,000		4,890
03/23/2004	7,667		
03/31/2004	10,250		
04/04/2004	12,500		
04/22/2004	7,250		
05/05/2004	3,000		
01/13/2006	4,250		7,100
02/24/2006	11,000		
03/13/2006	19,330		
11/01/2007	22,000		10,700
03/06/2008	24,000		10,940
03/30/2008	25,330		
01/28/2009	1,500		
04/01/2009	0		
02/14/2012	39,500	5	10,400
02/28/2012	63,500	5	
03/12/2012	48,000	5	
01/21/2015	37,000		
06/23/2016	0		1,200

\*ITUs – Ichthyotoxic Units measure the waters toxicity.

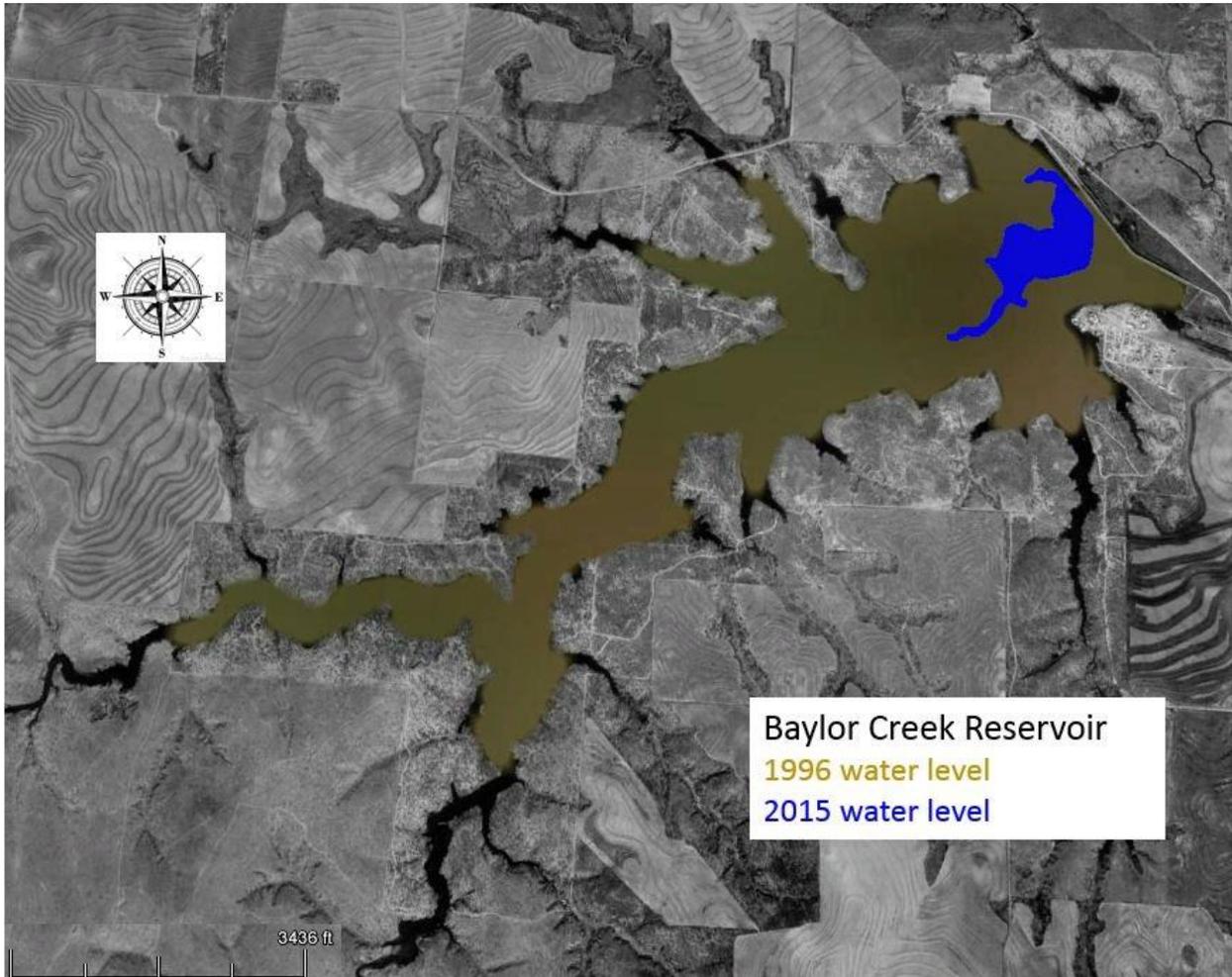
Table 8. Proposed sampling schedule for Baylor Creek Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey year	Electrofishing Fall	Trap net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2016-2017	A	A	A					
2017-2018								
2018-2019								
2019-2020	S	S	S		S	S		S

Table 9. Objective-based sampling plan components for Baylor Creek Reservoir, Texas 2016 – 2020.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Exploratory	CPUE	Presence/absence
<i>Trap netting</i>			
White Crappie	Exploratory	CPUE	Presence/absence
<i>Gill netting</i>			
Channel Catfish	Exploratory	CPUE	Presence/absence
Flathead Catfish	Exploratory	CPUE	Presence/absence

Appendix A



Satellite-determined water levels for Baylor Creek Reservoir, Childress County, Texas for 1996 and 2015.