PERFORMANCE REPORT

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FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

Champion Creek Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Champion Creek Reservoir were surveyed in 2014 using electrofishing and trap netting, and in 2015 using gill netting. Historical data are presented with the 2014-2015 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Champion Creek Reservoir is a 1,560-acre impoundment at conservation pool (2,083 feet above mean sea level) located 7 miles south of Colorado City in Mitchell County, Texas, in the Colorado River drainage basin. The reservoir is primarily used for recreation. The reservoir was approximately 48 feet below conservation level at the time of sampling, and was at about 5 % capacity with a surface area of 219 acres. Habitat features consisted of rocks, natural shoreline, and flooded saltcedar. Access to the reservoir was sometimes restricted by a locked entrance gate. Gate keys could be procured for public use by contacting the Colorado City municipal office. There were no useable boat ramps, but boats could be launched off the shoreline.

- **Management History:** Important sport fish historically included Largemouth Bass, White Crappie, catfishes, and White Bass. The management of this reservoir has been impacted by chronic low-water levels and recently, toxic golden alga blooms.

- **Fish Community**: Golden alga caused a massive fish kill in winter 2014-2015, reducing all fish populations to small numbers. No fish were collected in the spring 2015 gill net survey (5 net-nights).

- **Management Strategies:** Sportfish should continue to be managed with statewide regulations. Monitor water quality on a quarterly basis. When water level and water quality improves, re-establish fish populations with hatchery and management stockings. An electrofishing survey, along with access and vegetation surveys, will be conducted in 2018-2019.

INTRODUCTION

This document is a summary of fisheries data collected from Champion Creek Reservoir in 2014-2015. 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. Historical data are presented with the 2014-2015 data for comparison.

Reservoir Description

Champion Creek Reservoir is a 1,560-acre impoundment constructed in 1959. Located in Mitchell County, approximately 7 miles south of Colorado City, the reservoir is operated and controlled by Colorado City and is primarily used for recreation. This reservoir has been severely impacted by drought. The reservoir was approximately 48 feet below conservation level at the time of sampling, and was at about 5 % capacity with a surface area of 219 acres. Habitat features consisted of rocks, natural shoreline, and flooded saltcedar. Other descriptive characteristics for Champion Creek Reservoir are in Table 1.

Angler Access

Champion Creek Reservoir has three improved boat ramps; however, only one is unusable as of August 2015. Boat launching is possible on the south shoreline near the low-water boat ramp when all ramps are above water, but four-wheel drive is recommended. Because of severe water fluctuations and extreme elevation drop, extending the current boat ramps is not feasible. Fishing from the shoreline is possible near the dam and boat launch areas. In the past, Colorado City controlled access to the lake with a locked gate, allowing any interested parties to borrow a key from their city offices. In recent years the gate has not been locked.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Farooqi and Scott 2011) included:

1. Conduct low-frequency electrofishing to better gauge the Blue Catfish population.
   Actions: Low frequency electrofishing was attempted but unsuccessful in 2013. Jug line sampling was conducted in 2013.
2. Educate public and make efforts to prevent spread of invasive species.
   Action: Educational materials were disseminated throughout the management district.

Harvest regulation history: Sportfishes in Champion Creek Reservoir are currently and have historically been managed with statewide regulations (Table 2). One exception was a 16-inch minimum length limit (MLL) imposed on Largemouth Bass in 1995 to protect a strong year class produced following a 10-foot water rise in 1994. Declining water level following the regulation change negated benefits of the previous water rise and the size limit was rescinded in favor of the statewide 14-inch MLL in 1999.

Stocking history: Species stocked have included Channel Catfish, Florida Largemouth Bass, Bluegill, and Blue Catfish. One stocking of Blue Catfish has occurred since the last report (Farooqi and Scott 2011). The complete stocking history is in Table 3.

Vegetation/habitat management history: Champion Creek Reservoir has not supported aquatic vegetation due to severe water level fluctuations. The reservoir has no vegetation management history.

Water Transfer: Champion Creek Reservoir is primarily used for recreation. It was formerly used for auxiliary water supply for the TXU generation plant on Colorado City Reservoir and municipal water supply for Colorado City. The TXU generation plant on Colorado City Reservoir ceased operation circa 2003, ending the need for auxiliary water from Champion Creek Reservoir.

METHODS

Fish were collected by electrofishing (1 hour at 12, 5-min stations), and trap netting (10 net nights at 10 stations), and gill netting (5 net nights at 5 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by by Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics, and SE was calculated for structural indices and IOV. Source for water level data was the United States Geological Survey (USGS 2015).

RESULTS AND DISCUSSION

Habitat: A habitat survey was last conducted in 2007 (Bonds and Scott 2007). The reservoir supported no aquatic vegetation species. Much of the reservoir's shoreline has been colonized by non-native saltcedar. Other habitat features included rocks and natural shoreline.

***Note: Golden alga caused a massive fish kill in winter 2014-2015, reducing all fish populations to small numbers. No fish were collected in the spring 2015 gill net survey (5 net-nights). Latest survey results are presented below to document the state of the fisheries before golden alga impacted the reservoir.**

Prey species: In the latest electrofishing survey, catch rates of Gizzard Shad and Bluegill were 410.0/h and 4.0/h, respectively. Most Gizzard Shad were available as prey with IOV of 92% (Fig 2). Bluegill abundance slowly declined from 2010 to 2014 (Fig 3).

Blue Catfish: Blue Catfish were introduced via hatchery stockings in 2008, and additional stockings were made in 2009 and 2013. The gill net catch rate in 2011 was 3.8/nn with fish up to 13 inches in length. The 2013 gill net survey showed larger Blue Catfish were present, ranging from 13 to 17 inches in length (Figure 4). Catch rate was the same in both 2011 and 2013. No Blue Catfish were captured in 2015.

Channel Catfish: Gill net catch rate of Channel Catfish was 9.2/nn in 2013, higher than in 2011 (Fig 5). No Channel Catfish were captured in 2015.

White Bass: The gill net catch rate of White Bass was 2.4/nn in 2011 and 1.2/nn in 2013 (Figure 6). Some large individuals (over 14 inches in length) were present in both samples. No White Bass were captured in 2015.

Largemouth Bass: The electrofishing catch rate of Largemouth Bass declined over time from 72/h to 38/h (Figure 7). By 2014, stock CPUE was only 1/h and that fish was the only legal-sized fish captured.

White Crappie: The trap net catch rate of White Crappie was 14.2/nn in 2010, much lower than in 2006 (51.8/nn) (Figure 8). The 2014 trap netting survey produced zero crappie in 10 net-nights. Centrarchids in Champion Creek Reservoir appear to have been negatively impacted before the 2014-2015 golden alga bloom was detected.

Fisheries management plan for Champion Creek Reservoir, Texas

Prepared – July 2015.

ISSUE 1: Golden alga blooms affected the reservoir for the first time in 2014. Fish populations were severely impacted so that a viable fishery no longer exists.

MANAGEMENT STRATEGY

1. Begin a quarterly water quality sampling regime to monitor water chemistry as well as golden alga cell counts and toxicity levels.
2. When water level and water quality improves, re-establish fish populations through hatchery and management stockings.

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 electrofishing in 2018 (Table 5). Additional sampling will be conducted if water levels and golden alga status change. This schedule will be sufficient to monitor any potential recovery of fish populations.

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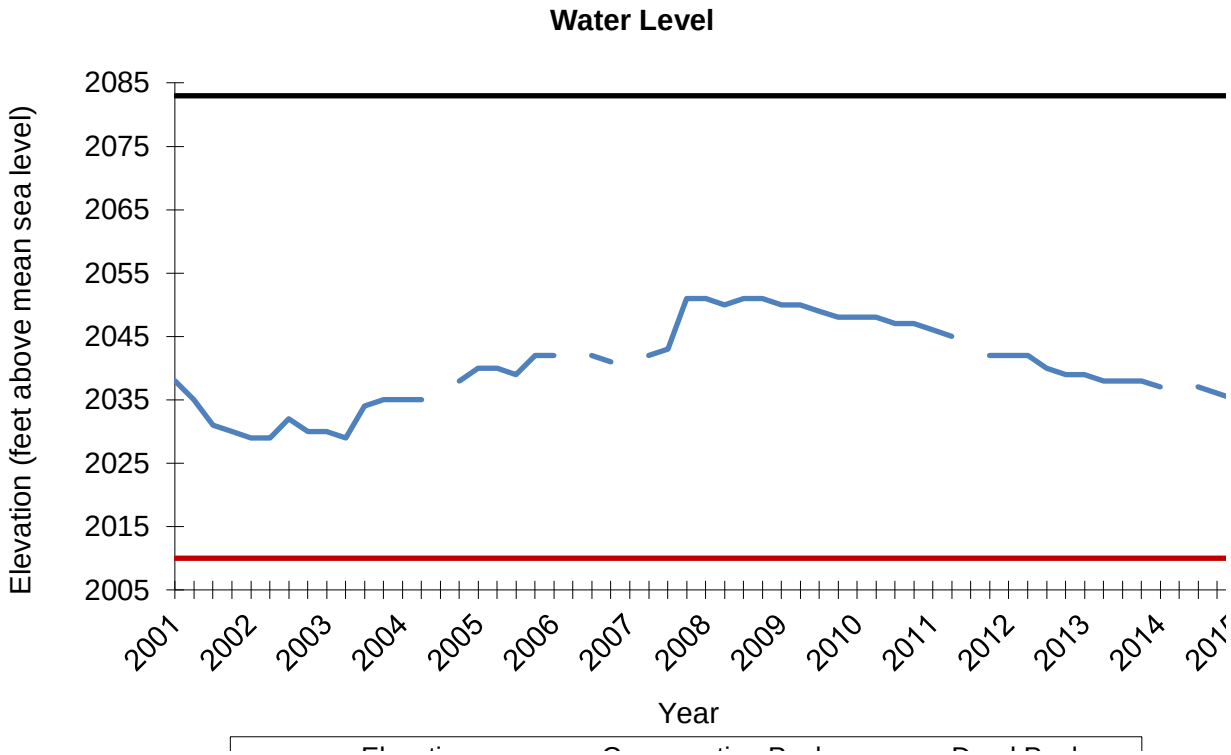


Figure 1. Quarterly water level elevations in feet above mean sea level recorded for Champion Creek Reservoir, Texas (2001-2015).

Table 1. Characteristics of Champion Creek Reservoir, Texas.

Characteristic	Description
Year constructed	1959
Controlling authority	Colorado City
County	Mitchell
Reservoir type	Main stream
Shoreline Development Index	5.37
Conductivity	3,600 µmhos/cm

Table 2. Boat ramp characteristics for Champion Creek Reservoir, Texas, August, 2015. Reservoir elevation at time of survey was 2044 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Dam Ramp	32.277806°N 100.854642°W	Y	2	2043	Poor
Marina Ramp	32.281972°N 100.847411°W	Y	15	2070	Out of water. Extension is not feasible
Low-water Ramp	32.28175°N 100.84735°W	Y	5	2040	Good

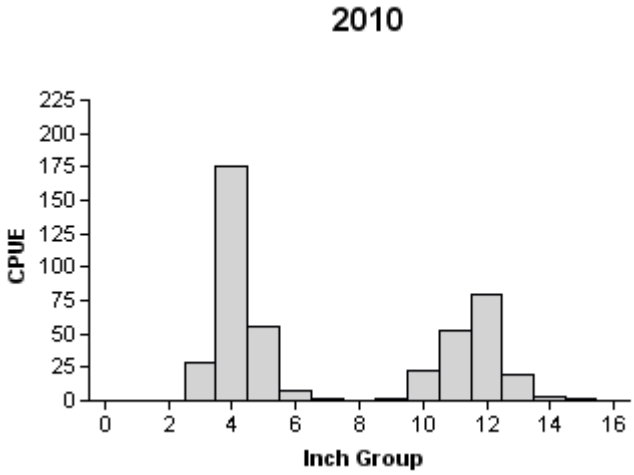
Table 3. Harvest regulations for Champion Creek Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, 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 crappie, their hybrids and subspecies	25 (in any combination)	10 – inch minimum

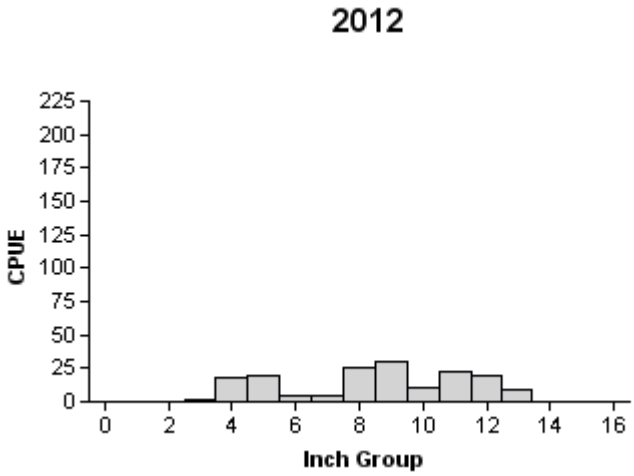
Table 4. Stocking history of Champion Creek Reservoir, Texas. FGL = fingerling; UNK = Unknown.

Species	Year		Number	Size
Threadfin Shad	1982		2,000	UNK
	1984		8,500	UNK
Blue Catfish	2008		59,353	FGL
	2009		56,000	FGL
	2013		30,766	FGL
		Total	146,119	
Channel Catfish	1967		10,000	UNK
	1968		35,000	UNK
	1969		26,400	UNK
	1970		20,600	UNK
	1971		28,355	UNK
	1973		5,000	UNK
	1974		15,000	UNK
	1980		48,780	UNK
	1981		71,239	UNK
	1987		164,799	FGL
	2005		35,702	FGL
		Total	460,875	
Bluegill	2007		105,882	FGL
Largemouth Bass	1970		39,000	UNK
	1971		5,194	UNK
		Total	44,194	
Florida Largemouth Bass	1981		75,000	FGL
	1987		24,049	FGL
	1996		158,779	FGL
	1999		77,030	FGL
	2005		35,770	FGL
	2008		60,180	FGL
		Total	430,808	
Green sunfish X redear sunfish	1980		17,326	UNK
Coppernose Bluegill X green sunfish	1981		133,701	UNK
Other sunfishes	1980		2,700	UNK

Gizzard Shad



Effort = 1.0
Total CPUE = 447.0 (15; 447)
IOV = 60 (8)



Effort = 1.0
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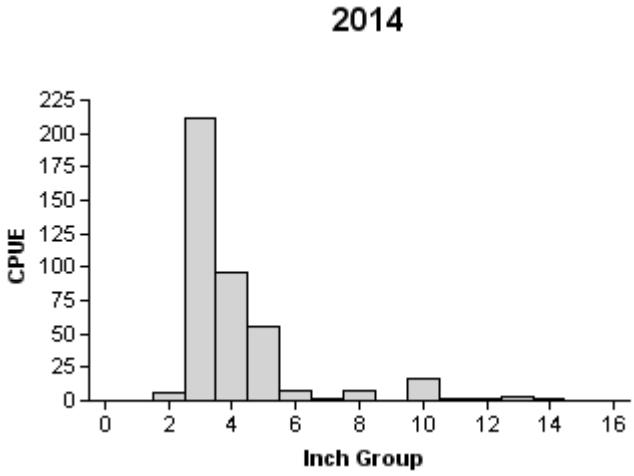
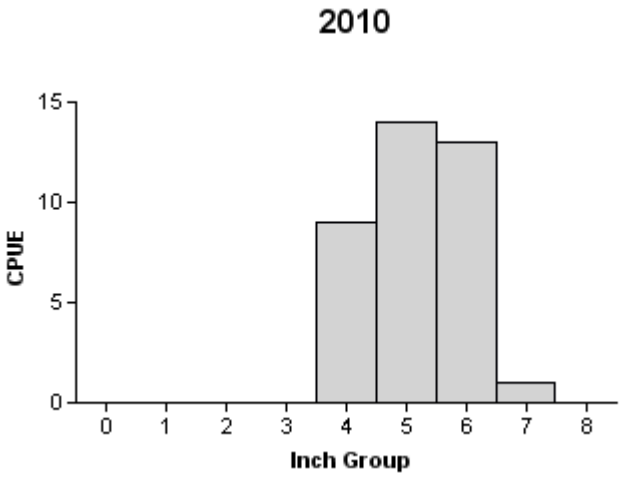
IOV = 29 (6)



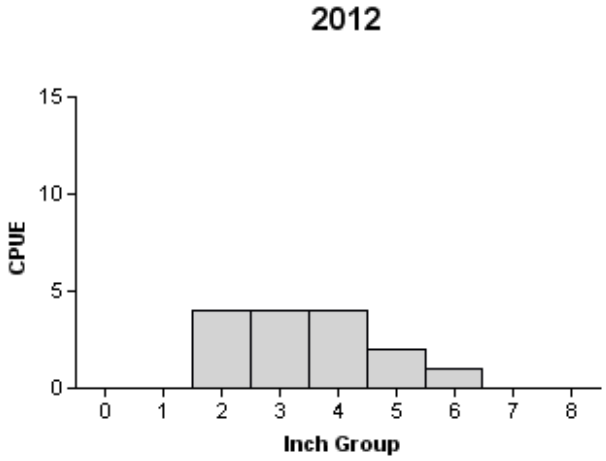
Effort = 1.0
Total CPUE = 410.0 (25; 410)
IOV = 92 (4)

Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Champion Creek Reservoir, Texas, 2010, 2012, and 2014.

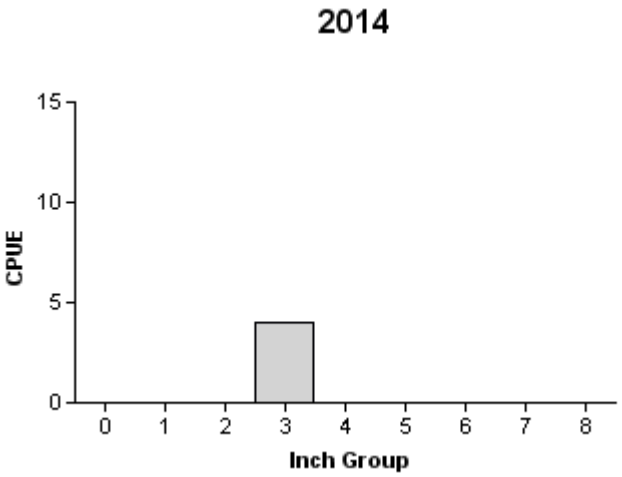
Bluegill



Effort = 1.0
Total CPUE = 37.0 (29; 37)
PSD = 38 (10)



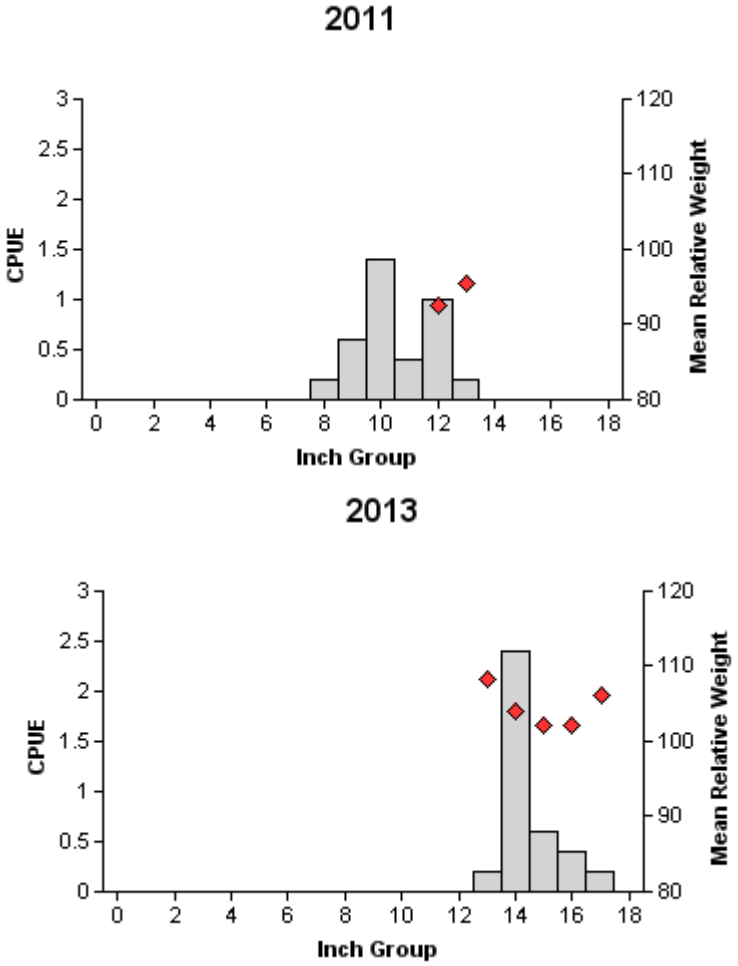
Effort = 1.0
Total CPUE = 15.0 (47; 15)
PSD = 9 (8)



Effort = 1.0
Total CPUE = 4.0 (77; 4)
PSD = 0 (0)

Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Champion Creek Reservoir, Texas, 2010, 2012, and 2014.

Blue Catfish

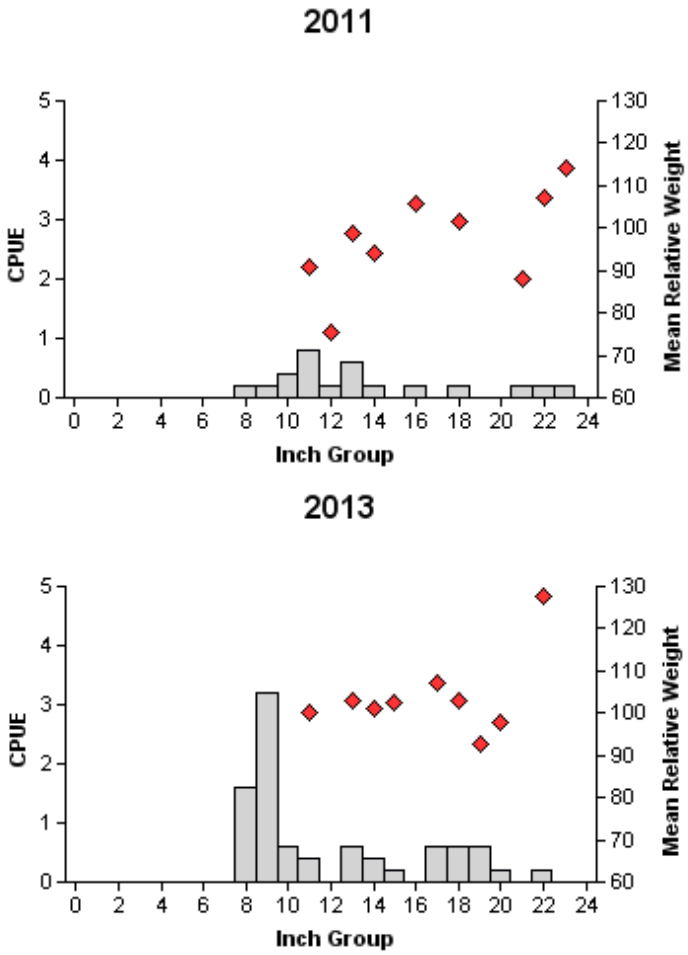


Effort =	5.0
Total CPUE =	3.8 (68; 19)
Stock CPUE =	1.2 (61; 6)

Effort =	5.0
Total CPUE =	3.8 (23; 19)
Stock CPUE =	3.8 (23; 19)

Figure 4. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for spring gill net surveys, Champion Creek Reservoir, Texas, 2011 and 2013. No Blue Catfish were captured in 5 net-nights in 2015. Blue Catfish were introduced in the reservoir via stockings in 2008 and 2009.

Channel Catfish



Effort = 5.0
Total CPUE = 3.6 (31; 18)
Stock CPUE = 2.8 (31; 14)
PSD = 36 (19)

Effort = 5.0
Total CPUE = 9.2 (29; 46)
Stock CPUE = 3.8 (21; 19)
PSD = 58 (11)

Figure 5. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Champion Creek Reservoir, Texas, 2011 and 2013. No fish were collected in 5 gill net-nights in 2015.

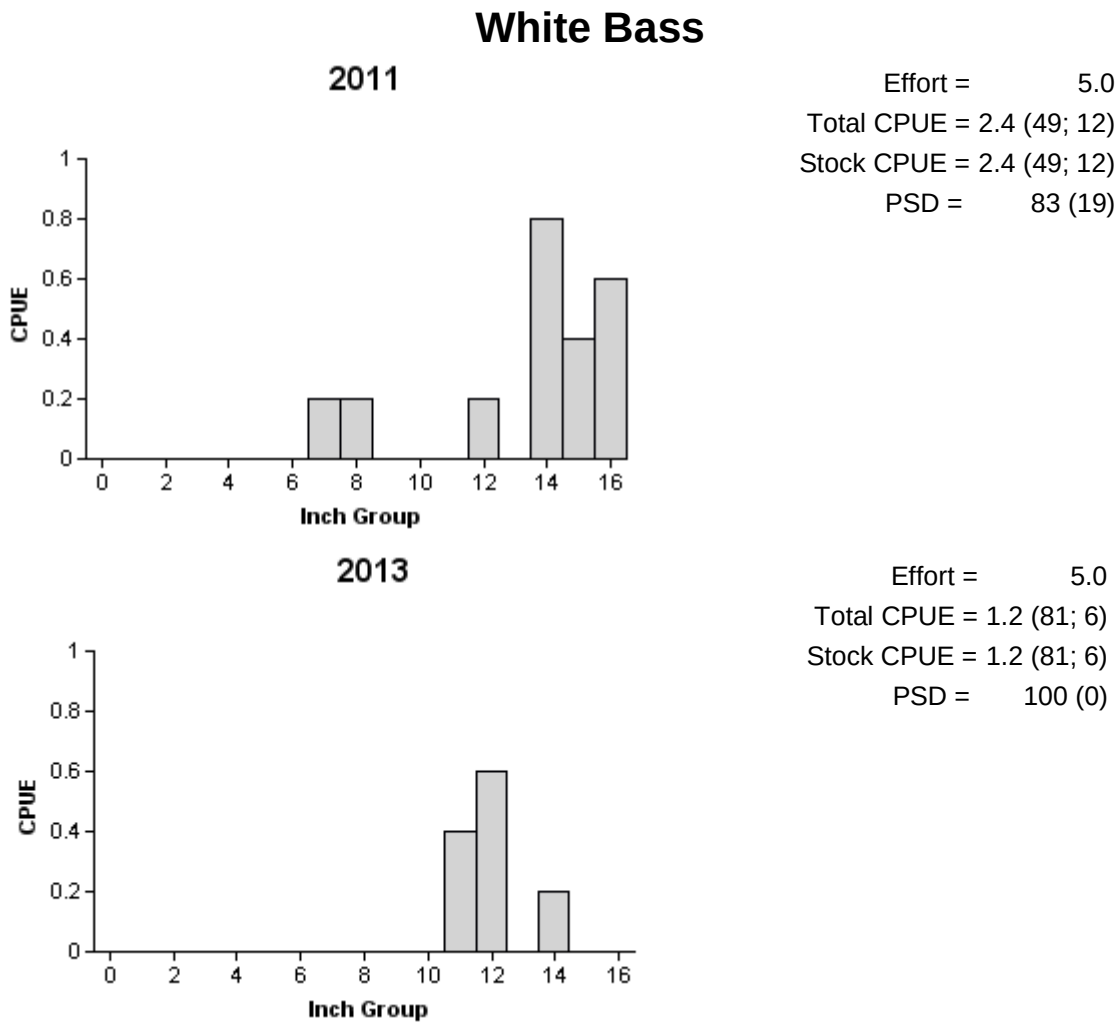
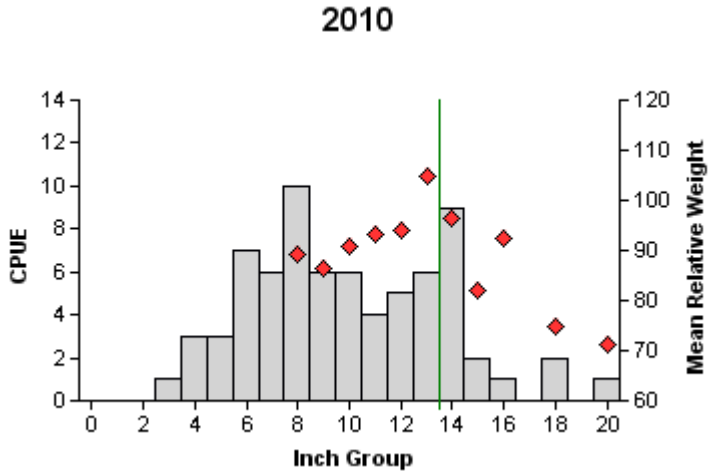
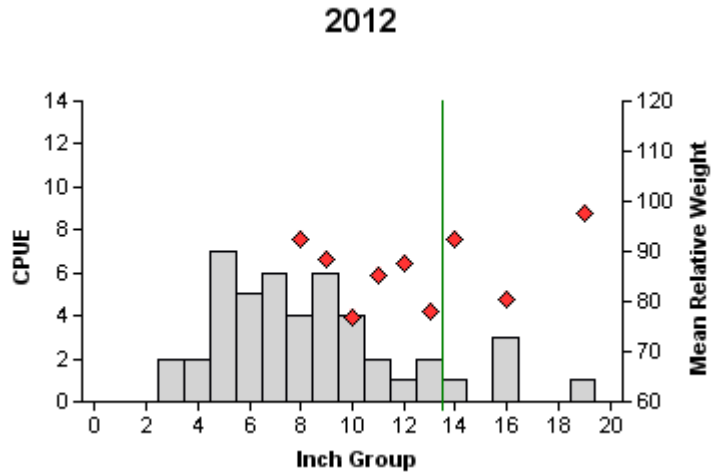


Figure 6. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Champion Creek Reservoir, Texas, 2011 and 2013. No fish were collected in 5 gill net-nights in 2015.

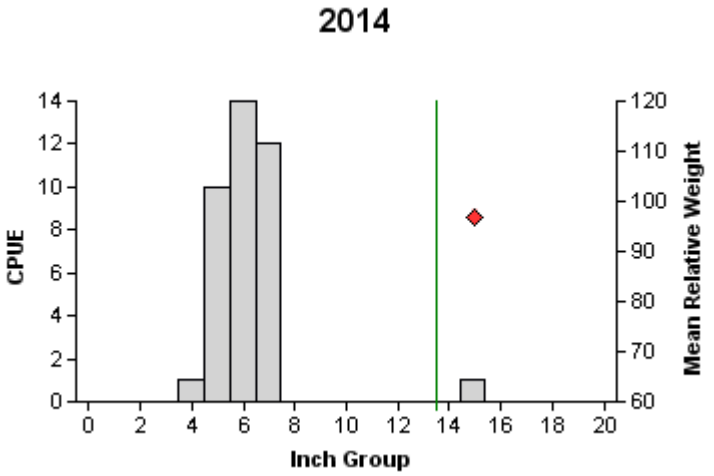
Largemouth Bass



Effort =	1.0
Total CPUE =	72 (16; 72)
Stock CPUE =	52 (18; 52)
PSD =	50 (8)



Effort =	1.0
Total CPUE =	46 (20; 46)
Stock CPUE =	24 (27; 24)
PSD =	33 (7)



Effort =	1.0
Total CPUE =	38 (27; 38)
Stock CPUE =	1 (100; 1)
PSD =	100 (0)

Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Champion Creek Reservoir, Texas, 2010, 2012, and 2014. Vertical line represents the minimum length limit for harvestable-size fish.

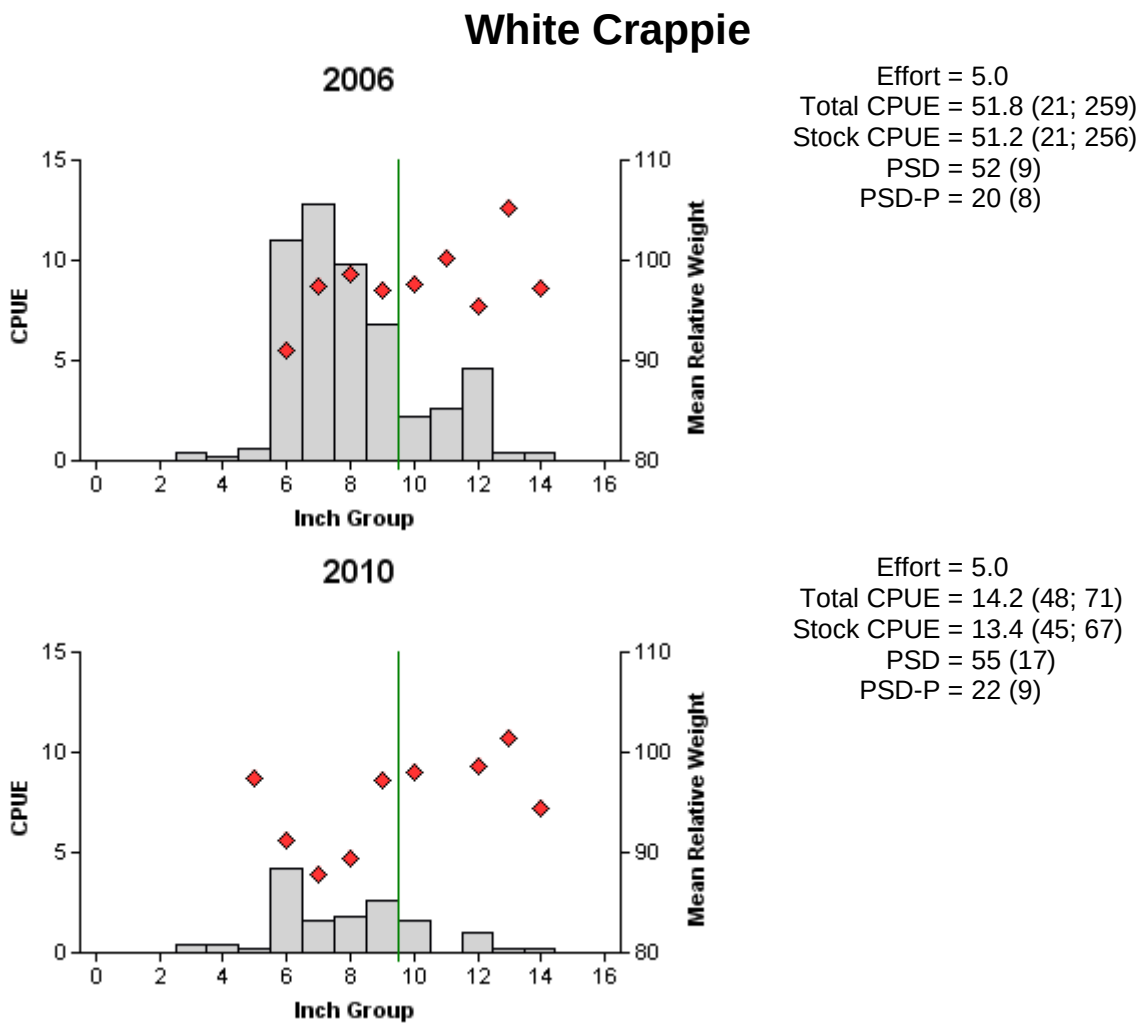


Figure 8. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Champion Creek Reservoir, Texas, 2006 and 2010. No crappie were collected in 10 trap net-nights in fall 2014. Vertical line represents the minimum length limit for harvestable-size fish.

Table 5. Proposed sampling schedule for Champion Creek Reservoir, Texas. Survey period is June through May. Electrofishing and trap netting surveys are conducted in the fall, while gill netting surveys are conducted in the spring. Standard surveys denoted by S and additional surveys denoted by A.

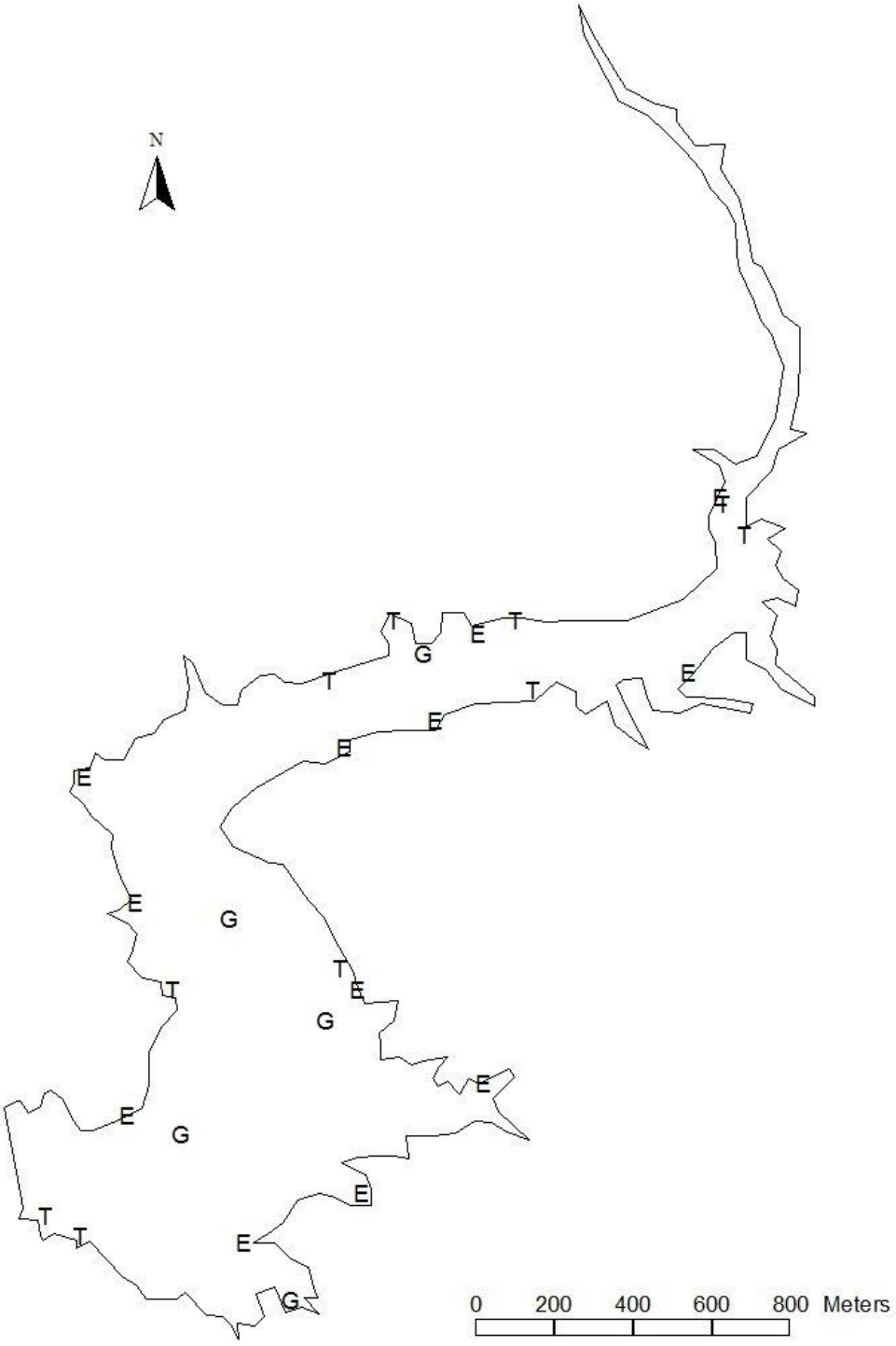
Survey year	Electrofish	Trap net	Gill net	Vegetation	Access	Report
2015-2016						
2016-2017						
2017-2018						
2018-2019	S			S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Champion Creek Reservoir, Texas, 2014-2015. Sampling effort was 1 hour for electrofishing, 10 net-nights for trap netting, and 5 net-nights for gill netting. Zero fish were collected in 5 gill net-nights.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad			1	0.1	410	410.0
Common carp			321	32.1		
River carpsucker			12	1.2		
Blue Catfish			23	2.3		
Channel Catfish			729	72.9		
Flathead Catfish			1	0.1		
White Bass			20	2.0		
Green sunfish					1	1.0
Bluegill					4	4.0
Longear sunfish					1	1.0
Largemouth Bass					38	38.0

APPENDIX B



Location of sampling sites, Champion Creek Reservoir, Texas, 2014-2015. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was approximately 48 feet below conservation pool at time of sampling and reservoir surface area 219 acres. Map was constructed to approximately represent actual water level.