

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

**Kurth Reservoir**

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## SURVEY AND MANAGEMENT SUMMARY

Largemouth Bass in Kurth Reservoir were surveyed in 2013 and 2015 using spring electrofishing. Reservoir permit holders were surveyed in 2015 with a mail-out questionnaire. 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:** Kurth Reservoir is an impoundment on a small, unnamed tributary of the Angelina River in the Neches River Basin. The City of Lufkin is the controlling authority and primary use of the reservoir is recreation. At conservation pool, Kurth Reservoir is 726 acres in size, has a shoreline length of 15 miles, and a mean depth of 15 feet. Boat and bank access is adequate, with one boat ramp present. Habitat in the lake consists of flooded timber and aquatic vegetation (primarily hydrilla). Most of the land surrounding the reservoir is used for timber production.
- **Management History:** Important sport fish include Largemouth Bass and Black Crappie. Largemouth Bass are managed with a 16-inch maximum length limit, which was implemented in 2013. All other sport fish are managed with statewide regulations. Hydrilla was first documented in Kurth Reservoir in 1999, and coverage reached 34% by 2002. In 2002, a vegetation management plan was developed and 2,000 triploid Grass Carp were stocked at a rate of 5 fish/vegetated acre in an attempt to reduce hydrilla coverage to 10-15%. Since triploid Grass Carp were stocked, hydrilla coverage has remained high (approximately 40 - 48% of surface area).
- **Fish Community**
  - **Prey species:** Fall electrofishing surveys, when prey abundance is normally assessed, could not be conducted due to dense vegetation coverage. However, Threadfin and Gizzard Shad, Bluegill, and Redear Sunfish were observed during the spring 2013 and 2015 electrofishing surveys, and growth rates of Largemouth Bass reflect adequate prey abundance.
  - **Catfishes:** Historically, catfish abundance at Kurth Reservoir has been limited. No Blue Catfish were caught during the last two gill net surveys. Channel Catfish catch rates from the last three survey years ranged from 0 – 0.8/nn. Gill netting was discontinued in 2015.
  - **Largemouth Bass:** Largemouth Bass were relatively abundant in spring electrofishing surveys. Population size structure indicated good recruitment and an abundance of fish 10-18 inches in length. The 2014 angler mail-out questionnaire indicated that trophy fish were also relatively abundant, as 672 Largemouth Bass in the weight range of 7-9.9 pounds and 46 fish  $\geq$  10.0 pounds were estimated as caught.
  - **Crappies:** Black Crappie were present in the reservoir. Angler catch (0.6/hour) and total spring quarter harvest (669 fish; March through May 2011) reflected an adequate crappie population.
- **Management Strategies:** Continue to monitor hydrilla coverage via annual aquatic vegetation surveys. Conduct spring electrofishing surveys in 2017 and 2019. Conduct angler mail-out survey in 2019, including questions concerning the sunfish and crappie fisheries. Continue to request Florida Largemouth Bass stockings. Communicate with the City of Lufkin regarding status of approved 2012 Boating Access Grant funds.

## INTRODUCTION

This document is a summary of fisheries data collected from Kurth Reservoir in 2013 and 2015. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. Historical data is presented with the 2013 and 2015 data for comparison.

### *Reservoir Description*

Kurth Reservoir is a 726-acre impoundment constructed in 1950 on a small, unnamed tributary of the Angelina River in the Neches River Basin (Table 1). It is located approximately 5 miles north of Lufkin and is operated and controlled by the City of Lufkin. Currently, the reservoir is only used for recreation, but future water use may include industrial and municipal needs. Secchi disc readings typically exceed six feet. Habitat at time of sampling consisted of overhanging brush, concrete, some standing timber, and emergent and submerged vegetation (Table 5). Hydrilla was first documented in 1999. During recent years, coverage has usually exceeded 47% of reservoir surface area. Public access is limited to a single boat ramp (Table 2). An information kiosk is located at the reservoir entrance.

### *Angler Access*

Kurth Reservoir has one public boat ramp (Table 2). Shoreline access is minimal and limited to the immediate boat ramp area. Due to issues with vandalism, angler access is controlled via a locked gate, and annual (\$150 fee) or 3-day permits (\$15 fee).

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Ashe and Driscoll 2011) included:

1. Continue to monitor aquatic vegetation annually. If hydrilla coverage expands beyond acceptable coverage prompting controlling authority complaint or call for action within the next 4 years, meet with controlling authority officials and angling public to develop a vegetation management plan.  
**Action:** Vegetation surveys have been conducted annually and hydrilla coverage has averaged approximately 45%. The City of Lufkin has not reported problems with the current hydrilla coverage.
2. Continue to recommend access improvements to the controlling authority.  
**Action:** Access improvements have been recommended to the City of Lufkin. The city was approved for a 2012 Boater Access Grant (\$104,000) that included parking and boat ramp improvements, a restroom and an access dock, but funds have not been distributed.
3. Stock FLMB at a rate of 100 fish per acre annually.  
**Action:** FLMB were stocked in 2011 and 2012 at a rate of 100 fish/acre.
4. Recommend a 16-inch maximum length limit for Largemouth Bass, with an exemption for Sharelunker entries.  
**Action:** Anglers expressed their acceptance of the proposed regulation change via the 2010 mail survey. In September 2013, Largemouth Bass regulations were changed to a 16-inch maximum length limit with a 5 fish bag limit

**Harvest regulation history:** In 2013, a 16-inch maximum length limit was implemented for Largemouth Bass. All other sport fishes are currently managed with statewide regulations (Table 3).

**Stocking history:** Triploid Grass Carp (2,000) were stocked in 2002. Florida Largemouth Bass were stocked periodically from 1977-2002, and annually from 2008-2012. Blue Catfish were introduced in

1995. Palmetto Bass were stocked annually from 1994-1998. The complete stocking history is in Table 4.

**Vegetation/habitat history:** Hydrilla was first documented in Kurth Reservoir in 1999. In 2002, hydrilla coverage had expanded to cover 34% of the reservoir surface area. At this time, Abitibi Consolidated owned the reservoir. Due to potential concerns regarding industrial water usage at their paper mill, triploid Grass Carp was stocked in an effort to reduce hydrilla coverage to 10-15%. Coverage initially declined following the stocking, but has averaged approximately 45% during recent years. Native vegetation (cattail, spikerush, American lotus, and pondweed) comprised 9% of the surface area (Table 5).

**Water transfer:** No interbasin water transfers exist. Kurth Reservoir is currently used for recreation, but future uses may include industrial and municipal supplies.

## METHODS

Largemouth Bass were collected by electrofishing (1 hour at 12, 5-min stations) during March 2013 and 2015. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. 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) and structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], were calculated according to Anderson and Neumann (1996). Relative standard error ( $RSE = 100 \times SE \text{ of the estimate/estimate}$ ) was calculated for all CPUE statistics. Average age of Largemouth Bass (13.5 – 14.5 inches) was determined from otoliths (N=13).

An access creel survey (9 days) was conducted from March through May 2011 to assess angler use and catch in accordance with the Fishery Assessment Procedures (Ashe and Driscoll 2011; TPWD, Inland Fisheries Division, unpublished manual revised 2014). Total angler catch of Largemouth Bass  $\geq 4$ , 7, and 10 pounds was also estimated. Additionally, all reservoir permit holders were sent a mail-out questionnaire in both January 2011 and 2015 to estimate angling frequency, satisfaction, and trophy bass catch (Appendix C).

## RESULTS AND DISCUSSION

**Habitat:** Littoral zone habitat consisted of overhanging brush, emergent and submerged vegetation, and concrete. Hydrilla was the most abundant habitat type, as coverages ranged from 40–48% over the past five years (Table 5). Overall angler opinion regarding hydrilla coverage was equally split between satisfactory and too much (mean score of 2.5 on a scale of 1-3) (Appendix A). Approximately 45% of the reservoir is difficult to access when hydrilla is matted on the surface (July through October).

**Creel:** An access point creel survey was conducted in the spring of 2011. Total estimated angling effort was 13,294 hours (18.3 hours/acre; Table 7). The Largemouth Bass fishery was most popular (83% of angling effort), followed by crappie and sunfish, respectively (Table 6).

A total of 122 and 320 mail surveys were sent to 2010 and 2014 reservoir permit holders, respectively, with reporting rates of 43 and 46% (Appendix A). Average days fished/respondent were similar between years (18 in 2010; 15 in 2014), but total estimated fishing days increased from 2,159 to 4,460 days due to increased permit holders.

**Prey species:** Prey species have not been monitored with fall electrofishing since 2003 due to abundant, surface-matted hydrilla (shoreline to 18-foot depths) that restricts sampling efficiency. However, growth rates and visually observed condition of Largemouth Bass reflect abundant prey populations.

**Catfishes:** Historically, catfish abundance at Kurth Reservoir has been limited. Although Blue Catfish were introduced in 1995 (Table 4), few have been caught during gill net surveys, with none observed in 2007 and 2011. Similarly, Channel Catfish gill net catch rates from the last three survey years ranged from 0 – 0.8/nn. Beginning in 2015, gill net surveys were discontinued.

**Largemouth Bass:** Spring electrofishing surveys reflect stable and high Largemouth Bass abundance and recruitment, as catch rates were 133.0/h, 234.0/h, and 127.0/h, in 2011, 2013, and 2015, respectively (Figure 2). The PSD range was 67-93, indicating high abundance of quality-sized fish. During the spring creel survey period in 2011, anglers spent an estimated 11,093 hours (15.3 h/acre) targeting Largemouth Bass (Ashe and Driscoll 2011) (Table 9). Total estimated catch was 5,896 fish; 3,492 were  $\geq$  14 inches (12% were harvested). An estimated 842, 65, and 21 fish  $> 4$ ,  $> 7$ , and  $> 10$  lbs were caught during the 2011 spring quarter creel survey, which accounted for 27% of all legal-sized fish caught (Table 9 and Figure 3). Growth rate was adequate, as average age at 14 inches was 3.2 years (fish were collected in May and assigned additional year due to arbitrary birthday of January 1). Since 2007, FLMB alleles ranged from 43 to 50% and no pure FLMB were collected (Table 10).

The angler mail-out survey indicated that the average size of the largest bass caught/respondent was 7.0 pounds in 2010 and 6.0 pounds in 2014. Overall estimated catch of 7.0-9.9 pound fish was 423 fish in 2010 and 672 fish in 2014. Likewise, estimated catch of fish  $\geq$  10 pounds increased from 28 to 46 (Appendix A).

**Crappies:** Historically, trap net catch rates have been low (0.2/nn) and no surveys have been conducted since 2006.

Creel data in 2011 reflected a productive crappie fishery that was second only to the black bass fishery in terms of total fishing effort (11.5%) (Table 6). During the spring of 2011, average angler catch was 0.6/h, with 669 fish harvested (Table 11; Figure 4).

## Fisheries management plan for Kurth Reservoir, Texas

Prepared – June 2015.

**ISSUE 1:** Hydrilla in Kurth Reservoir was first documented by TPWD in 1999. In 2002, hydrilla coverage reached 34% of the reservoir surface area. At the request of Abitibi Consolidated (controlling authority during this time), triploid Grass Carp were stocked at a rate of 5 fish/vegetated acre in 2002 to reduce hydrilla coverage due to potential concerns regarding industrial water usage. Currently, the City of Lufkin uses the lake for recreational purposes only. During the last five years, hydrilla coverage has averaged approximately 45%, and angler opinion regarding abundance is equally split between “about right” and “too much.”

### MANAGEMENT STRATEGY

1. Continue to monitor aquatic vegetation annually. If hydrilla coverage expands beyond acceptable coverage within the next 4 years prompting increased complaints from the angling public or controlling authority, meet with stakeholders to develop a vegetation management plan.

**ISSUE 2:** Largemouth Bass abundance and size structure reflect a quality population. Trophy bass production is also relatively high. The 2014 mail-out survey estimated an annual angler catch of 718 Largemouth Bass  $\geq$  7 pounds, and 46 fish  $\geq$  10 pounds.

### MANAGEMENT STRATEGIES

1. To maximize trophy fish production, maintain the current 16-inch maximum length limit, 5-fish bag limit and request FLMB annually at a rate of 100 fish/acre.
2. Monitor the success of the regulation via biennial spring electrofishing surveys and angler mail-out surveys of all reservoir permit holders (every four years). Examine Largemouth Bass growth every four years.

**ISSUE 3:** In 2011, recommendations were provided to the City of Lufkin regarding improvements to the boat ramp (i.e. road surface repairs and boat ramp improvements). In 2012, the city was approved for a Boater Access Grant (\$104,000) that included parking and boat ramp improvements, a restroom and an access dock, but funds have not been distributed.

### MANAGEMENT STRATEGY

1. Assist the City of Lufkin with securing grant funds.

**ISSUE 4:** Anglers target crappie and sunfish at Kurth Reservoir, but trap netting and fall electrofishing are not effective.

### MANAGEMENT STRATEGY

1. Incorporate questions regarding the crappie and sunfish fisheries into the 2018 angler mail-out survey.

**ISSUE 5:** 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 annual aquatic vegetation surveys, biennial spring electrofishing surveys, and a mandatory access point survey (Table 12). Annual aquatic vegetation surveys are required to monitor hydrilla coverage that may become problematic. Biennial electrofishing surveys are required to monitor the effectiveness of the 16-inch maximum length limit for Largemouth Bass. Additionally, an angler mail survey of all reservoir permit holders will be conducted every four years.



## 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, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.
- Ashe, D., and T. Driscoll. 2011. Statewide freshwater fisheries monitoring and management program survey report for Kurth Reservoir, 2010. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-35, Austin.
- Guy, C.S., R.M. Neuman, D.W. Willis, and R.O. Anderson. 2007. Proportional size distribution (PSD): A further refinement of population size structure index terminology. Fisheries 32(7):348.

Table 1. Characteristics of Kurth Reservoir, Texas .

Characteristic	Description
Year Constructed	1950
Controlling authority	City of Lufkin
County	Angelina
Reservoir type	Secondary stream
Shoreline Development Index (SDI)	3.75
Conductivity	175 umhos/cm

Table 2. Boat ramp characteristics for Kurth Reservoir, Texas, May, 2015. Reservoir elevation at time of survey was 197.5 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Public	31.44976 -94.70399	Y	20	191.5	Ramp is operational. Ramp and parking need improvements.

Table 3. Harvest regulations for Kurth 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: Spotted	5 <sup>a</sup>	None
Bass: Largemouth	5 <sup>a,b</sup>	16-inch maximum
Crappie: White and Black, their hybrids and subspecies	25 (in any combination)	10-inch minimum

<sup>a</sup> Bag limit for Spotted and Largemouth Bass is 5 in the aggregate.

<sup>b</sup> 5 fish bag limit; only fish 24 inches or greater may be retained alive in a livewell and immediately weighed using personal scales. Bass weighing 13 pounds or more may be donated to the ShareLunker Program; otherwise fish must be immediately released.

Table 4. Stocking history of Kurth Reservoir, Texas. FGL = fingerling; ADL = adult; UNK = unknown.

Species	Year	Number	Size
Black Crappie	1969	2,000	FGL
	Total	2,000	
Blue Catfish	1995	60,041	FGL
	1996	41	ADL
	Total	60,082	
Florida Largemouth Bass	1977	32,000	FRY
	1994	41,572	FGL
	1998	40,000	FGL
	2001	13,996	FGL
	2002	56,851	FGL
	2008	78,129	FGL
	2009	75,404	FGL
	2010	73,743	FGL
	2011	74,116	FGL
	2012	74,172	FGL
	Total	559,983	
Palmetto Bass	1982	5,795	UNK
	1994	8,835	FGL
	1995	103,845	FRY
	1996	11,787	FGL
	1997	12,230	FGL
	1998	12,708	FGL
	Total	155,200	
Triploid Grass Carp	2002	2,000	FGL
	Total	2,000	

Table 5. Survey of aquatic vegetation, Kurth Reservoir, Texas, 2010-2014. Acreage of each species and percent of total surface area coverage (in parentheses) are presented.

Species	2010	2011	2012	2013	2014
American lotus	22 (3.0)	20 (27.5)	20 (27.5)	34 (4.7)	33 (4.5)
Spikerush	7 (<1)	7 (<1)	7 (<1)	7 (<1)	7 (<1)
Cattail	23 (3.2)	23 (31.7)	23 (31.7)	26 (3.6)	21 (2.9)
Pondweed	55 (7.6)	<1	<1	29 (4.0)	7 (<1)
Hydrilla (Tier III)*	346 (47.7)	344 (47.4)	344 (47.4)	346 (47.7)	291 (40.0)

\* Tier III is Watch Status

Table 6. Percent directed angler effort by species for Kurth Reservoir, Texas, March through May 2007 and 2011.

Species	Year	
	2007	2011
Sunfish	2.6	5.1
Black Bass	82.7	83.4
Crappie	7.6	11.5

Table 7. Total fishing effort (h) for all species and total directed expenditures at Kurth Reservoir, Texas, March through May 2007 and 2011.

Creel statistic	2007	2011
Total fishing effort	8,191	13,294
Total directed expenditures	\$25,608	\$50,333

## Sunfish

Table 8. Creel survey statistics for sunfish (Bluegill and Redear Sunfish) for Kurth Reservoir from March - May 2007 and 2011, where total harvest is the estimated number of sunfish harvested by all anglers. Relative standard errors (RSE) are in parentheses. There was no directed angler effort for sunfish in 2007.

Creel Survey Statistic	2007	2011
Directed effort (h)	-	675.9 (60)
Directed effort/acre	-	0.9 (60)
Total catch per hour	-	5.9 (35)
Total harvest	1,714.1 (96)	1,605 (72)
Harvest/acre	2.4 (96)	2.2 (72)
Percent legal released	61.9	70.2

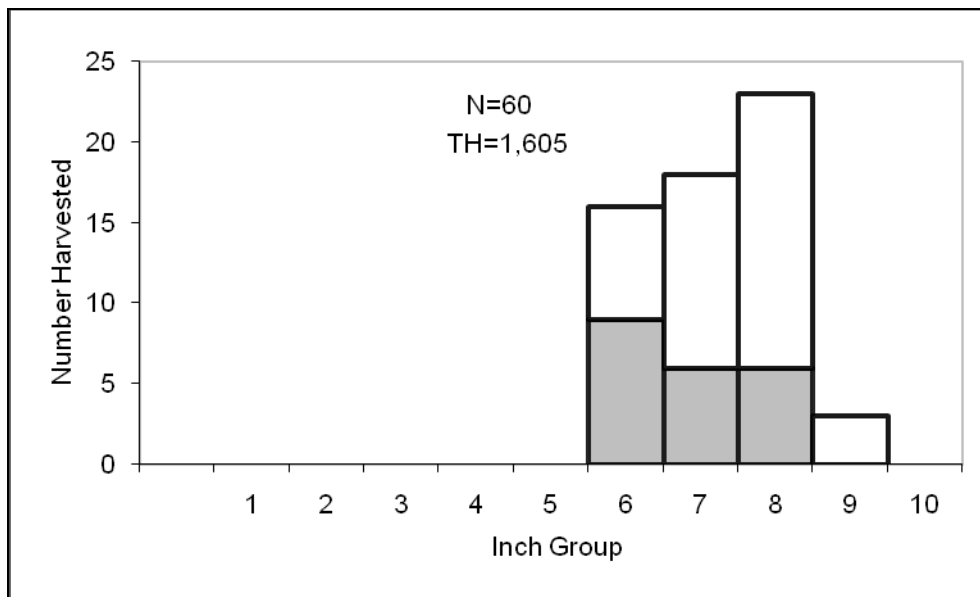
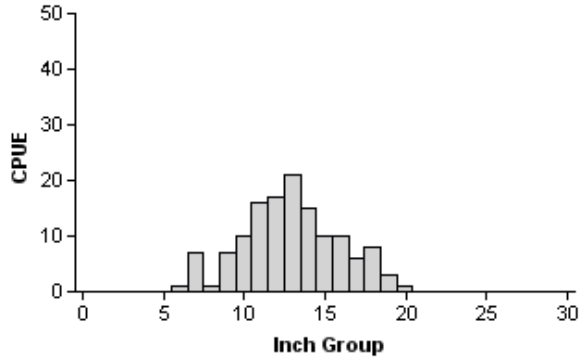


Figure 1. Length frequency of harvested Bluegill (grey) and Redear Sunfish (white) observed during creel surveys at Kurth Reservoir, Texas, March - May 2011, all anglers combined. N is the total number of harvested Bluegill and Redear Sunfish combined observed during creel surveys, and TH is the total estimated harvested Bluegill and Redear Sunfish for the creel period.

## Largemouth Bass

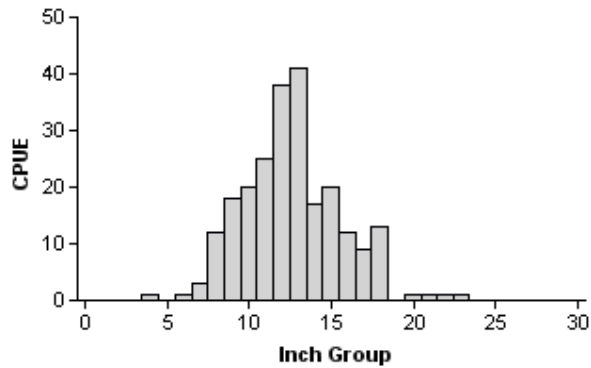
2011

Effort = 1.0  
 Total CPUE = 133.0 (12; 133)  
 Stock CPUE = 125.0 (12; 125)  
 PSD = 73 (5.3)



2013

Effort = 1.0  
 Total CPUE = 234.0 (9; 234)  
 Stock CPUE = 229.0 (8; 229)  
 PSD = 67 (4.3)



2015

Effort = 1.0  
 Total CPUE = 127.0 (17; 127)  
 Stock CPUE = 122.0 (17; 122)  
 PSD = 93 (2)

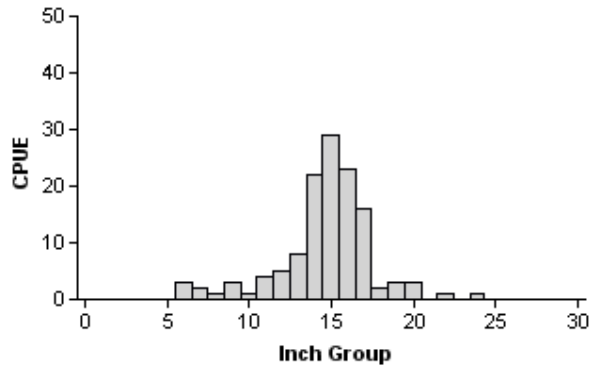


Figure 2. Number of Largemouth Bass caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Kurth Reservoir, Texas, 2011, 2013, and 2015.

## Largemouth Bass

Table 9. Creel survey statistics for Largemouth Bass for Kurth Reservoir, Texas from March through May 2007 and 2011, where total catch per hour is for anglers targeting Largemouth Bass and total harvest is the estimated number of Largemouth Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses. For estimated catch of 4, 7, and 10-pound fish, the percentages of total catch are provided.

Creel Survey Statistic	2007	2011
Directed effort (h)	6,766.9 (50)	11,092.5 (20)
Directed effort/acre	9.3 (50)	15.3 (20)
Total catch per hour	0.6 (15)	0.6 (16)
Total catch		
4 – 6.9 pound fish	NA	842 – 14.3%
7 – 9.9 pound fish	NA	65 – 1.1%
≥ 10 pound fish	NA	21 – 0.4%
Total harvest	455 (67)	401 (68)
Harvest/acre	0.6 (67)	0.6 (68)
Percent legal released	80.9	88.5

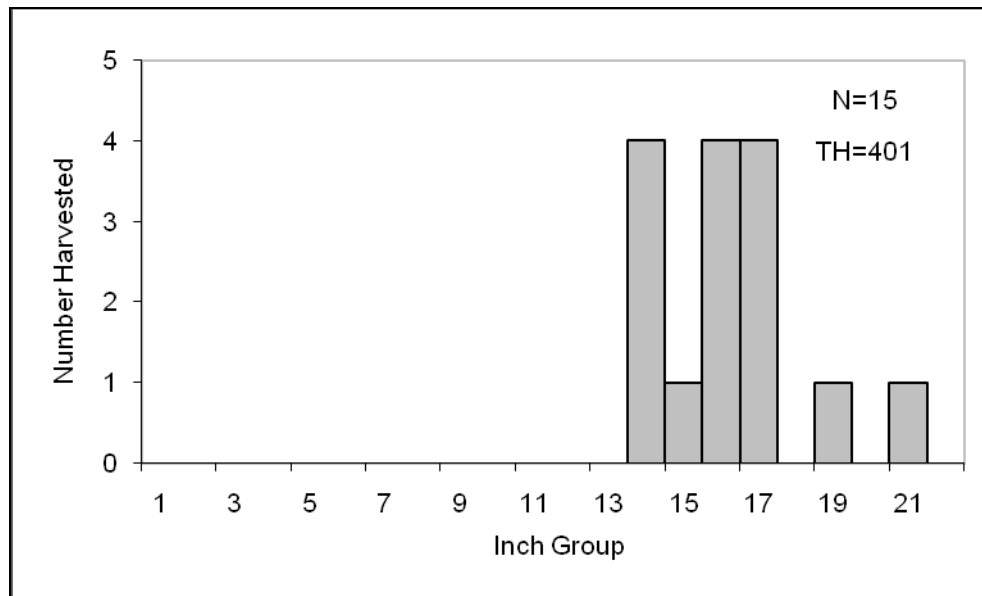


Figure 3. Length frequency of harvested Largemouth Bass observed during creel surveys at Kurth Reservoir, Texas, March - May 2011, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 10. Results of genetic analysis of Largemouth Bass collected by spring electrofishing, Kurth Reservoir, Texas, 2007, 2010, and 2015. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
2007	79	0	78	1	49.7	0.0
2010	30	0	30	0	41.0	0.0
2015	30	0	30	0	43.0	0.0



## Crappies

Table 11. Creel survey statistics for crappie (Black and White) for Kurth Reservoir, Texas from March - May 2007 and 2011, where total catch per hour is for anglers targeting crappie and total harvest is the estimated number of crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses. There was no observed White Crappie harvest in 2011.

Creel Survey Statistic	2007	2011
Directed effort (h)	622.6 (68)	1,525.2 (41)
Directed effort/acre	0.9 (68)	2.1 (41)
Total catch per hour	1.3 (59)	0.6 (105)
Total harvest	1,346.8 (82)	668.7 (100)
Harvest/acre	1.9 (82)	0.9 (100)
Percent legal released	20.4	8.8

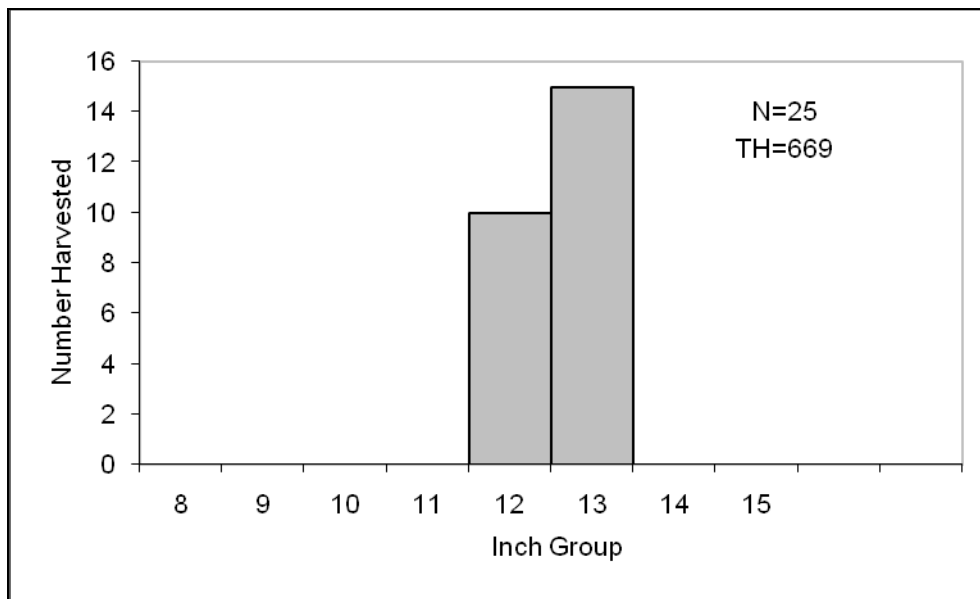


Figure 4. Length frequency of harvested Black Crappie observed during creel surveys at Kurth Reservoir, Texas, March - May 2011, all anglers combined. N is the number of harvested Black Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period. There was no observed White Crappie harvest.

Table 12. Proposed sampling schedule for Kurth Reservoir, Texas. Survey period is June through May. Standard survey denoted by S and additional surveys denoted by A.

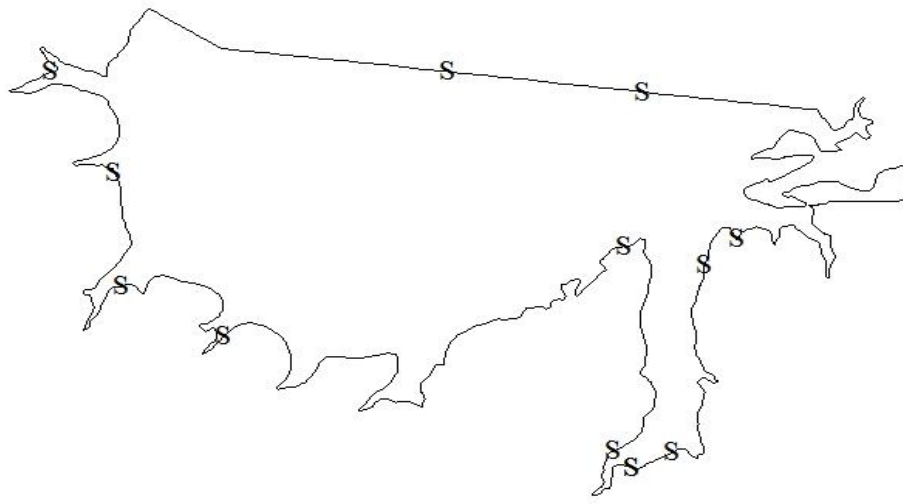
Survey year	Electrofish (Spring)	Trap net	Gill net	Habitat		Access	Angler mail-out	Report
				Structural	Vegetation			
2015-2016					A			
2016-2017	A				A			
2017-2018					A			
2018-2019	A				S	S	A	S

**APPENDIX A**

Mail-out survey statistics from annual permit holders at Kurth Reservoir, Texas, 2010 and 2014. Surveys were conducted in January 2011 and 2015. Satisfaction score for fishing quality is on a 1-5 scale (1 - not satisfied, 2 - slightly satisfied, 3 - moderately satisfied, 4 - very satisfied, and 5 - extremely satisfied). Satisfaction score for vegetation coverage is on a 1-3 scale (1 - not enough, 2 - about right, and 3 - too much).

Survey Statistic	2010	2014
Number of permit users	122	320
Survey reporting rate	43%	46%
Mean number of days fished / respondent	17.7	14.5
Estimated total number of days fished	2,159	4,640
Mean satisfaction score of fishing quality	3.8	3.5
Mean targeting trophy sized bass	55.4	54.0
Mean targeting numbers of bass regardless of size	44.6	46.0
Mean satisfaction score of vegetation coverage	2.5	2.5
Average largest Largemouth Bass caught / respondent	7.0	6.0
Estimated number of Largemouth Bass caught 7.0-9.9 pounds	423	672
Estimated number of Largemouth Bass caught $\geq$ 10.0 pounds	28	46

**APPENDIX B**



0.45 0.225 0 0.45 Miles



Location of sampling sites, Kurth Reservoir, Texas, 2015. Spring electrofishing stations are indicated by S.

**APPENDIX C**

**Texas Parks and Wildlife Department  
Inland Fisheries Division**

You purchased a Kurth Lake fishing permit in 2014. This is a questionnaire that is part of official research being conducted by Texas Parks and Wildlife concerning Kurth Lake.

Information gained from this questionnaire will enable TPWD to make most informed decisions regarding future fisheries management strategies. Your cooperation is extremely important to the completion of this research. Your answers will not be connected with your name and all information you provide will remain strictly confidential.

Please take the time to complete this questionnaire and return it in the enclosed postage-paid envelope. If you should have any questions, please contact Todd Driscoll, District Fisheries Biologist (409) 698-9114; todd.driscoll@tpwd.texas.gov

1. How many times did you fish at Kurth Lake during calendar year 2014? \_\_\_\_\_ times

2. Overall, how satisfied are you with fishing at Kurth Lake? **(Circle one)**

Not at all Satisfied      Slightly Satisfied      Moderately Satisfied      Very Satisfied      Extremely Satisfied  
1                                      2                                      3                                      4                                      5

3. Which is most important to you when targeting bass at Kurth Lake? **(Circle one)**

- 1 The chance to catch large numbers of bass regardless of their size
- 2 The chance to catch a trophy bass

4. During calendar year 2014, how many total largemouth bass did you and other anglers fishing with you catch that were:

\_\_\_\_\_ Greater than 7 pounds                      \_\_\_\_\_ Greater than 10 pounds

5. In 2014, what was the weight of the largest bass caught by you or other anglers fishing with you? \_\_\_\_\_ pounds

6. In terms of recreational fishing, do you believe the amount of aquatic vegetation in Kurth Lake is **(Circle one)**

Not Enough	About Right	Too Much
1	2	3

Please provide any other comments below:

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