

# Kurth Reservoir

## 2018 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-3

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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## Survey and Management Summary

Largemouth Bass in Kurth Reservoir were surveyed in 2019 using spring electrofishing. Reservoir permit holders were surveyed in 2019 with a mail-out questionnaire. Historical data are presented with the 2018-2019 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% of reservoir surface area by 2002. In 2002, at the request of the controlling authority, 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%. This stocking had little effect on hydrilla coverage, and all these fish have likely died due to natural mortality. During the last five years, hydrilla coverage has gradually declined from a coverage of 40.0% to 25.9%.

### Fish Community

- **Prey species:** Prey abundance is normally assessed with fall electrofishing surveys. Fall surveys have not been conducted since 2003 due to gear inefficiency related to dense, matted vegetation coverage over 15 feet in depth. However, Threadfin and Gizzard Shad, Bluegill, and Redear Sunfish were observed during the spring 2017 and 2019 electrofishing surveys. Largemouth Bass size structure, growth, and body condition reflected 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:** The Largemouth Bass fishery is the most popular (87% of directed fishing effort). Largemouth Bass were relatively abundant in spring electrofishing surveys. Population size structure indicated high and consistent recruitment and an abundance of fish 10-18 inches in length. The 2019 angler mail-out questionnaire indicated that trophy fish were also relatively abundant. A total of 583 Largemouth Bass 7-9.9 pounds and 31 fish  $\geq$  10.0 pounds were estimated as caught.
- **Crappies:** Black Crappie were observed during spring electrofishing surveys in 2017 and 2019. Crappies are the second most popular fishery with 8% of the directed fishing effort.

**Management Strategies:** Continue to manage Largemouth Bass harvest with a 16-inch maximum length limit to maintain angling quality. Collect angler catch of trophy Largemouth Bass via mail-out survey to justify Florida Largemouth Bass stockings. Request annual stockings of Florida Largemouth Bass to maximize trophy fish abundance.

## Introduction

This document is a summary of fisheries data collected from Kurth Reservoir in 2018-2019. 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 2018-2019 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. Hydrilla was first documented in 1999, and reservoir surface area coverage has ranged from 25 to 40% during most years. Water levels are relatively stable and maintained within two feet of full pool via pumping from the Angelina River.

## 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 (\$120) or 3-day permits (\$15) can be acquired from the City of Lufkin.

## Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Ashe and Driscoll 2015) included:

1. Continue to monitor aquatic vegetation annually. If hydrilla coverage expands beyond acceptable coverage prompting controlling authority or recurrent public complaints, meet with all constituents to develop a vegetation management plan.  
**Action:** Vegetation surveys have been conducted annually and hydrilla coverage has averaged approximately 33%. The City of Lufkin has not reported problems with the current hydrilla coverage.
2. Maintain the 16-inch maximum length limit, 5 fish daily bag limit and request FLMB annually at a rate of 100 fish/acre. Monitor success of the regulation via biennial spring electrofishing surveys and angler mail-out surveys. Examine Largemouth Bass growth every four years.  
**Action:** The length and bag limits have been maintained. FLMB have been stocked annually. Spring electrofishing surveys were conducted in 2017 and 2019. In 2019, a mail-out survey was sent to all permit holders.
3. Assist the City of Lufkin with securing grant funds to improve parking, boat ramp, and amenities.  
**Action:** The City of Lufkin expanded the parking area, improved the boat ramp, and installed a boat dock.
4. Incorporate questions regarding the crappie and sunfish fisheries in the angler mail-out survey.  
**Action:** Questions were incorporated into the survey regarding directed effort associated with the crappie and sunfish fisheries.

**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 and 2015-2018. Sharelunker Largemouth Bass were stocked in 2018. Blue Catfish were introduced in 1995. Palmetto Bass were stocked annually from 1994-1998. The complete stocking history is in Table 4.

**Vegetation/habitat management 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, Abitibi requested a triploid Grass Carp stocking in an effort to reduce hydrilla coverage to 10-15%. Coverage initially declined following the stocking, then quickly rebounded. No additional hydrilla control efforts have occurred since this single stocking event.

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

## Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Kurth Reservoir (TPWD unpublished). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

**Electrofishing** – Largemouth Bass were collected by spring electrofishing (1 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

**Statistics** – Sampling statistics (CPUE for various length categories) and structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007] were calculated for Largemouth Bass according to Anderson and Neumann (1996). Standard error (SE) was calculated for structural indices. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for Largemouth Bass CPUE statistics.

**Creel survey** – All reservoir permit holders were sent a mail-out questionnaire in January 2019 to estimate 2018 angling frequency, satisfaction, directed fishing effort, and trophy bass catch (Appendix C). The mean responses were calculated from returned surveys and expanded to account for non-reporting.

**Habitat** – A structural habitat survey was conducted in 2006 (Ashe and Driscoll 2007). Vegetation surveys were conducted in 2015–2018 to monitor hydrilla coverage. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

## Results and Discussion

**Habitat:** Littoral zone structural habitat consisted primarily of submerged vegetation, concrete, and overhanging brush (Ashe and Driscoll 2007). During the last five years, hydrilla coverage has declined from 40% (2014) to 26% coverage (2018) (Table 6). Native vegetation (cattail, spikerush, American lotus, pondweed, and bulrush) comprised 8% of the surface area. When coverage exceeds 25%, a few anglers complain regarding excess vegetation. However, even when coverage approaches 40%, the Largemouth Bass population displays no negative effects (i.e., growth rates are adequate and body condition is desirable).

**Creel:** Mail-out surveys were sent to all reservoir permit holders in 2010 (122), 2014 (320), and 2019 (403), and reporting rates were 43%, 46%, and 46% respectively (Appendix A). Directed angling effort was highest for Largemouth Bass (87%), followed by anglers fishing for crappies (8%) and sunfishes (5%) (Table 7). Total angling effort was high (59.1 hours/acre) (Appendix A). Average days fished/respondent were similar among years (18 in 2010; 15 in 2014; and 15 in 2019), but total estimated fishing days increased from 2,159 to 5,422 days due to the increased number of 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 gillnet survey years (2004, 2007, and 2011) ranged from 0 – 0.8/nn (Ashe and Driscoll 2011). Beginning in 2015, gill net surveys were discontinued.

**Largemouth Bass:** Spring electrofishing surveys reflected stable and high Largemouth Bass abundance and recruitment, with catch rates of 127.0/h, 144.0/h, and 195.0/h, in 2015, 2017, and 2019, respectively (Figure 1). The PSD range was 70-93, indicating high abundance of quality-sized fish. The 2019 mail-out survey estimated anglers spent over 50 hours/acre targeting Largemouth Bass (Appendix A). As

reflected by the increase in permit holders and overall number of days fished, directed effort for Largemouth Bass has increased substantially. An estimated 583 fish 7-9.9 pounds and 31 fish  $\geq$  10 pounds were caught during 2018, reflecting relatively high trophy potential.

**Crappies:** Data from the 2019 mail-out survey reflected that 8% of the directed angler effort was for crappie, which is consistent with results from previous creel surveys (Table 7).

# Fisheries Management Plan for Kurth Reservoir, Texas

Prepared – July 2019

**ISSUE 1:** Historically, hydrilla has been problematic, interfering with water intake for industrial purposes. Currently, the City of Lufkin operates the reservoir solely for recreation and no water is withdrawn. The Largemouth Bass population continues to exhibit adequate growth, abundance, and desired size structure even at hydrilla coverage approaching 40%. However, the City's water use practices may change and some of the angling public has expressed that dense coverage is undesirable.

## 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 mail-out survey for 2018 estimated an annual angler catch of 583 Largemouth Bass  $\geq$  7 pounds and 31 fish  $\geq$  10 pounds.

## MANAGEMENT STRATEGIES

1. To maximize trophy fish production, maintain the current 16-inch maximum length limit, 5-fish bag limit.
2. Continue collecting angler catch of trophy Largemouth Bass by conducting angler mail-out survey of all permit holders every four years.
3. Conduct annual stockings of FLMB to maximize trophy fish potential.

**ISSUE 3:** Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels 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 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.

## Objective-Based Sampling Plan and Schedule (2019–2023)

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

Sport fishes in Kurth Reservoir include Largemouth Bass, crappies, and sunfishes. Important forage species include Bluegill and Threadfin Shad.

### Low-density fisheries

Historically, anecdotal information indicates that the crappie fishery has been cyclical but productive during some years. However, the percent of annual angling effort directed at crappies has only averaged approximately 10%. Trap netting was discontinued in 2006 due to low catch (<1.0/n). No future directed sampling is planned. The annual angling effort directed at crappies will be monitored via mail-out surveys to all lake permit holders in 2023.

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

**Largemouth Bass:** Largemouth Bass are the most popular sport fish in Kurth Reservoir, accounting for approximately 85% of the annual angling effort. The reservoir currently supports an abundant, high-quality Largemouth Bass fishery. Largemouth Bass have been managed with a 16-inch maximum length limit since 2013 to increase trophy bass numbers. Since 2003, trend data on CPUE and size structure have been collected biennially with spring electrofishing. The population is abundant, recruitment rates have been high and steady, and size structure has been desirable and stable. Continuation of trend data with night electrofishing in the spring (biennially, 2021 and 2023) will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation. The minimum of 12 randomly selected 5-min electrofishing sites will be sampled, but the anticipated effort to meet sampling objectives (N = 50 stock-size fish; RSE-S is  $\leq 25$ ) is 6-8 stations with 80% confidence.

The Largemouth Bass fishery (i.e., angling effort and satisfaction, harvest, and annual catch of fish > 7 and > 10 pounds) will be monitored with a mail-out survey sent to all lake permit holders in January 2023.

In addition, average age of Largemouth Bass between 330 and 381 mm (Category 2; N = 13) will be estimated in 2023. Fish will be collected during the fall instead of from spring sampling when annuli formation could confound age estimates.

**Prey species:** Bluegill and Threadfin Shad are the primary forage at Kurth Reservoir. No directed sampling has occurred for prey species since 2003 due to inefficiencies related to fall electrofishing. Few sunfish and shad are observed during spring electrofishing surveys targeting Largemouth Bass, so no future directed sampling is planned. However, growth rate and relative weight of Largemouth Bass will provide insight regarding prey species abundance and availability.

## 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. 2007. Statewide freshwater fisheries monitoring and management program survey report for Kurth Reservoir, 2006. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-32, Austin.
- 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.
- Ashe, D., and T. Driscoll. 2015. Statewide freshwater fisheries monitoring and management program survey report for Kurth Reservoir, 2014. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-5, Austin.
- Guy, C. S., R. M. Neumann, 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.

## Tables and Figures

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	3.75
Conductivity	175 uS/cm

Table 2. Boat ramp characteristics of Kurth Reservoir, Texas, March 2019. 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	192	Ramp is in good condition

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> 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
	2015	49,385	FGL
	2016	68,610	FGL
	2017	80,169	FGL
	2018	68,541	FGL
Total	826,688		
Sharelunker Largemouth Bass	2018	8,957	FGL
	Total	8,957	
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. Objective-based sampling plan components for Kurth Reservoir, Texas 2018–2019.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock $\leq$ 25
	Size structure	PSD, length frequency	N $\geq$ 50 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
<i>Mail survey</i>			
Largemouth Bass	Trend information on angler utilization	Angler effort, harvest, and catch of large fish (> 7 pounds)	
Crappies	Trend information on angler utilization	Angler effort	
Sunfishes	Trend information on angler utilization	Angler effort	

Table 6. Survey of aquatic vegetation, Kurth Reservoir, Texas, 2014–2018. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

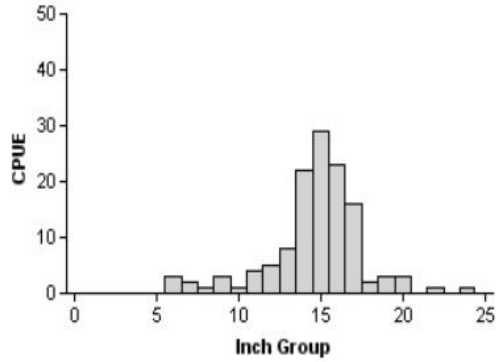
Species	2014	2015	2016	2017	2018
American lotus	33 (4.5)	30 (4.1)	22 (3.0)	22 (3.0)	26 (3.6)
Spikerush	7 (<1)	0	3 (<1)	3 (<1)	3 (<1)
Cattail	21 (2.9)	21 (2.9)	22 (3.0)	22 (3.0)	21 (2.9)
Pondweed	7 (<1)	7 (<1)	2 (<1)	2 (<1)	4 (<1)
Hydrilla (Tier III)*	291 (40.0)	276 (38.0)	220 (30.3)	220 (30.3)	188 (25.9)
White water lily	0	0	6 (<1)	6 (<1)	0
Bulrush	0	0	0	0	<1 (<1)

\*Tier III is Watch Status

Table 7. Percent directed angler effort by species for Kurth Reservoir, Texas, 2007, 2011, 2018. Survey periods were from 1 March through 31 May for 2007 and 2011, and 1 January through 31 December for 2018. Directed effort for 2007 and 2011 was determined via an access creel survey, whereas 2018 data were collected via a mail survey to all permit holders.

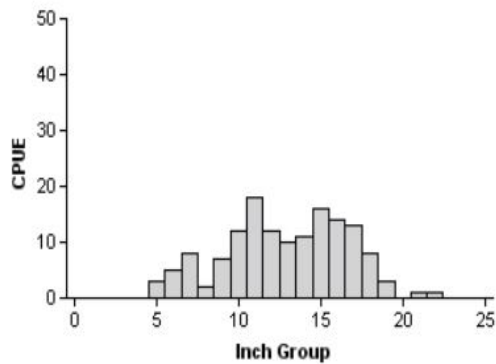
Species	2007	2011	2018
Sunfishes	2.6	5.1	5.0
Black basses	82.7	83.4	87.0
Crappie	7.6	11.5	8.0
Anything	7.1	0.0	0.0

## Largemouth Bass 2015



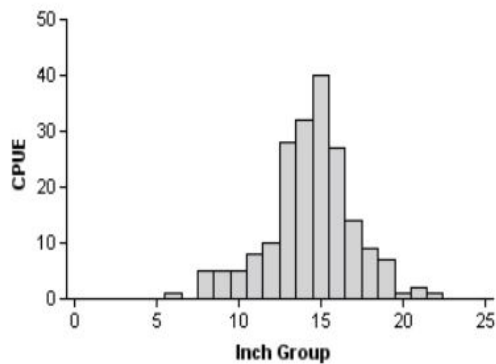
Effort = 1.0  
 Total CPUE = 127.0 (17; 127)  
 Stock CPUE = 122.0 (17; 122)  
 PSD = 93 (2)  
 PSD-16 = 40 (4)

## 2017



Effort = 1.0  
 Total CPUE = 144.0 (11; 144)  
 Stock CPUE = 128.0 (12; 128)  
 PSD = 70 (5)  
 PSD-16 = 31 (5)

## 2019



Effort = 1.0  
 Total CPUE = 195.0 (10; 195)  
 Stock CPUE = 194.0 (10; 194)  
 PSD = 88 (5)  
 PSD-16 = 33 (4)

Figure 1. Number of Largemouth Bass caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Kurth Reservoir, Texas, 2015, 2017, and 2019.



## Proposed Sampling Schedule

Table 8. Proposed sampling schedule for Kurth Reservoir, Texas. Survey period is June through May. Standard survey denoted by S and additional survey denoted by A.

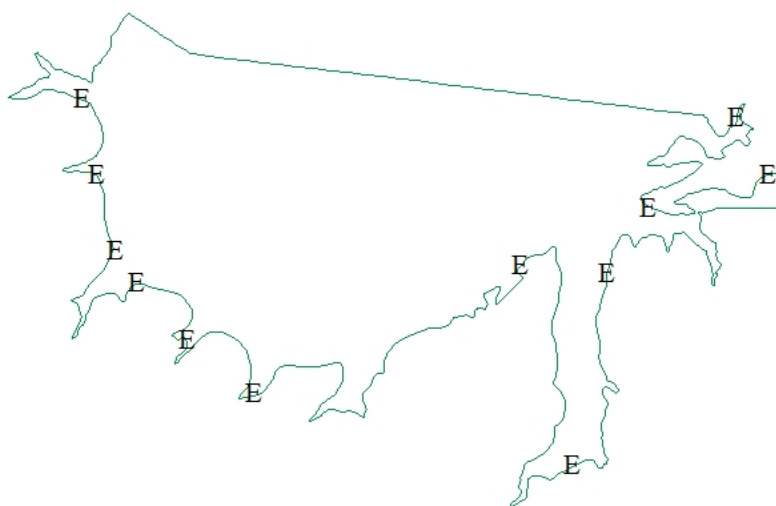
	Survey year			
	2019-2020	2020-2021	2021-2022	2022-2023
Angler Access				S
Vegetation	A	A	A	S
Electrofishing – Spring		A		S
Mail survey				A
Report				S

## APPENDIX A – Mail-out survey statistics

Mail-out survey statistics from annual permit holders at Kurth Reservoir, Texas, 2010, 2014, and 2018. 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	2018
Number of permit users	122	320	403
Survey reporting rate	43%	46%	46%
Mean number of days fished/respondent	17.7	14.5	14.8
Estimated total number of days fished	2,159	4,640	5,422
Angling effort/acre			59.1
Largemouth Bass harvest/acre			2.7
Mean satisfaction score of fishing quality	3.8	3.5	3.7
Mean satisfaction score of vegetation coverage	2.5	2.5	2.5
Average largest Largemouth Bass caught/respondent	7.0	6.0	6.1
Estimated number of Largemouth Bass caught 7.0-9.9 pounds	423	672	583
Estimated number of Largemouth Bass caught $\geq$ 10.0 pounds	28	46	31

## APPENDIX B – Map of sampling locations



0.4 0.2 0 0.4 Miles



Location of sampling sites, Kurth Reservoir, Texas, 2019. Electrofishing stations are indicated by E. Water level was near full pool at time of sampling.

## APPENDIX C – 2018 mail survey

### Texas Parks and Wildlife Department Inland Fisheries Division

You purchased a Kurth Lake fishing permit in 2018. This is a questionnaire that is part of official research by TPWD concerning Kurth Lake. Your answers 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 2018? \_\_\_\_\_ times
2. Given the total number of days in 2018 you fished from Question 1, how many of these days did you fish for:  
Bass: \_\_\_\_\_ days Crappie: \_\_\_\_\_ days Sunfish: \_\_\_\_\_ days Other: \_\_\_\_\_ days
3. What was the average length in hours of each day you fished Kurth Lake in 2018? \_\_\_\_\_ hours
4. 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

5. During calendar year 2018, how many total largemouth bass did you and other anglers fishing with you catch that were:  
       \_\_\_\_\_ Greater than 7 pounds                      \_\_\_\_\_ Greater than 10 pounds
6. In 2018, what was the weight of the largest bass caught by you or other anglers fishing with you? \_\_\_\_\_ pounds
7. Approximately how many harvestable-sized bass (16 inches in length or less) did you keep in 2018?  
       \_\_\_\_\_ fish
8. In terms of recreational fishing, do you believe the amount of aquatic vegetation in Kurth Lake is

Not Enough	About Right	Too Much
1	2	3

Please provide any other comments below (continue on back if necessary):

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