McClellan Reservoir

2017 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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TEXAS PARKS & WILDLIFE

SPORT FISH RESTORATION

Contents

Survey and Management Summary

Fish populations in McClellan Reservoir were surveyed in 2017 using electrofishing and in 2018 using trap netting and gill nets. Historical data are presented with the current 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: McClellan Reservoir is a 405-acre reservoir located 64 miles east of Amarillo, Texas, on McClellan Creek in the Red River Basin. It is owned and operated by the United States Forest Service as part of the Black Kettle National Grassland and is used for recreational purposes. No water level data is recorded for the reservoir, but it has a history of extreme water level fluctuations. The reservoir has gone dry three times since 2000. The reservoir was completely dry in 2014 and filled to near capacity in May, 2015. The maximum estimated water depth for the reservoir is 25 feet. The reservoir currently (April 5, 2018) has a maximum depth of about 7 feet. Boat access consisted of two public boat ramps. Only the north ramp is accessible to anglers. The shoreline is 100% accessible to bank anglers. There are no handicap-specific facilities. Primary habitat consisted of smartweed growing along mud bank mixed with cobble.

Management History: Important sport fish have historically included Largemouth Bass, White Crappie and Channel Catfish. The US Forest Service did extensive excavation within the basin in 2001 and 2002 with the goal of improved water retention. Harvest of sport fishes is managed with statewide regulations. Since refilling in 2015, the reservoir was stocked with Largemouth Bass and Channel Catfish in 2016.

Fish Community

- **Prey species:** Bluegill catch rate increased from 2016 to 2017, and the population was dominated by 5-inch fish. No Gizzard Shad were sampled in 2016 or 2017.
- **Catfishes:** Channel Catfish ranging from 9 to 22 inches total length were surveyed with gill nets.
- **Largemouth Bass:** The electrofishing catch rate for Largemouth Bass has increased from 58.0/h in 2016 to 154.7/h in 2017. Size structure was still dominated by smaller individuals, but there has been an increase in the number of legal-size fish.
- **White Crappie:** No White Crappie were collected during the sampling period.

Management Strategies: Based on current information, and due to extreme water level fluctuations, sport fishes should continue to be managed with existing statewide regulations.

Introduction

This document is a summary of conditions at McClellan Reservoir in 2017-2018. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. No fisheries data was collected in 2013-2014 due to extreme drought conditions.

Reservoir Description

McClellan Reservoir is a 405-acre impoundment constructed in 1938 on McClellan Creek. It is located in Gray County approximately 64 miles east of Amarillo and is owned and operated by the US Forest Service, Black Kettle National Grassland. Primary water use is recreation. No water level data is recorded for the reservoir, but it has a history of extreme water level fluctuations. The maximum estimated water depth for the reservoir is 25 feet. Extensive excavation was done within the reservoir basin in 2001 and 2002 to allow for better water retention. As of April 5, 2018 the reservoir had a maximum depth of about 7 feet. Habitat in 2017 consisted of mud shoreline and small areas of cobble. The only aquatic plant present was smartweed. Other descriptive characteristics for McClellan Reservoir are in Table 1.

Angler Access

McClellan Reservoir has two public boat ramps and no private boat ramps. The north boat ramp is open to public use but the south ramp has been closed due to danger of falling trees which were killed by fire. Extension of the ramps is not feasible due to slope issues. Additional boat ramp characteristics are in Table 2. The entire shoreline area is accessible to anglers. There are no handicap-specific facilities.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Munger and Clayton 2014) included:

1. The current drought of record has caused the reservoir to experience extreme low water levels and it has gone dry three times since 2000. The management strategy was to stock Channel Catfish, Largemouth Bass, and Bluegill at standard rates when water levels permitted.

   Action: Bluegill were not stocked in 2014, due to the reservoir being dry. After being completely dry in 2014 through early 2015, the reservoir filled to near capacity. It was stocked in 2016 with Channel Catfish and Largemouth Bass.

2. Boating access at the two public access sites (North Ramp and South Ramp) was not possible due to low water level in 2013 through 2015. Neither boat ramp can be extended because the lake bottom levels out at the end of the ramp with no access to deeper water.

   Action: Neither ramp can be extended due to leveling out at the end of the ramp, and the basin has already been deepened. The entire shoreline is accessible to bank anglers, and discussions have been held with the controlling authority about applying for boater access grant money to construct a new ramp in another section of the reservoir.

3. Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically.

   Action: Cooperated with the controlling authority and educated the public during contacts about the risks of invasive species.

Harvest regulation history: Sport fishes in McClellan Reservoir have always been managed with statewide harvest regulations (Table 3).

Stocking history: The earliest recorded stocking for McClellan Reservoir is 1965. Six experimental stockings of Palmetto Bass were conducted between 1979 and 1992. Smallmouth Bass were stocked in

1984, and Paradise Bass (hybrid Yellow Bass X Striped Bass) were stocked in 1977. Saugeye were stocked from 1999 to 2011 to control the White Crappie population. Stocking has been conducted to re-establish sport fish communities following drought periods. The complete stocking history is in Table 4.

Vegetation/habitat management history: McClellan Reservoir has no vegetation or habitat management history.

Water transfer: No interbasin transfers are possible as there is no connection to any other drainage.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for McClellan 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 2015).

Electrofishing – Largemouth Bass and sunfishes were collected by electrofishing (0.8 hour at 9, 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.

Gill netting – Channel Catfish were collected by gill netting (3 net nights at 3 stations); CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

Trap netting – White Crappie sampling was conducted by trap netting (5 net nights at 5 stations). CPUE for trap netting was recorded as the number of fish per net night (fish/nn).

Statistics – Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target fishes 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 all CPUE statistics.

Habitat – A structural habitat survey and a vegetation survey were conducted in September 2017. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2015). Vegetation was surveyed by circumnavigating the reservoir and documenting all vegetation encountered.

Water level – No water level data is recorded for the reservoir.

Results and Discussion

Habitat: A habitat survey was conducted in September 2017. Littoral zone habitat consisted primarily of natural shoreline with submerged terrestrial vegetation and Smartweed (Table 6). Smartweed was the only aquatic vegetation observed in the reservoir (Table 7).

Prey species: Bluegill relative abundance in 2017 (CPUE=252.0/h) was higher than in 2016 (CPUE =166.0/h; Figure 1). OBS objectives for Bluegill were met. Since no Gizzard Shad were collected, that objective was not met.

Channel Catfish: The Channel Catfish gill net CPUE for 2018 was 8.7/nn. Mean relative weights of most size classes was less than 100 (Figure 2). Neither Channel Catfish CPUE-stock objective nor RSE objective of ≤30 was met. A total of 28 stock-sized Channel Catfish were collected from 3 gill net stations.

Largemouth Bass: Largemouth bass relative abundance in 2017 (CPUE=154.7/h) was greatly increased from the 2016 survey (CPUE=58.0/h) (Figure 3). All fish collected in 2016 were smaller than the legal harvest length of 14 inches, but the 2017 survey showed fish growing to harvestable length. The PSD has increased from 0 to 33. Mean relative weights of legal fish were over 110 (Figure 3). OBS objectives for Largemouth Bass were met.

White Crappie: No White Crappie were collected by any sampling method during this survey period. No OBS objectives were set for this species.

Fisheries Management Plan for McClellan Reservoir, Texas

Prepared - July 2018

ISSUE 1: Weather conditions since 2000 have resulted in the reservoir basin completely drying three times which defeats fisheries management actions. The Climate Prediction Center predicts that the Pacific Decadal Oscillation will persist resulting in below-average precipitation in the Texas Panhandle for another 20 to 30 years. The current drought in the Texas Panhandle is forecast to persist at least through the end of the year with average to below average rainfall (NOAA 2018).

MANAGEMENT STRATEGY

1. Monitor reservoir fishery and water level to keep the public informed of current conditions.

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. Educate the public about invasive species through the use of media and the internet.
3. Make a speaking point about invasive species when presenting to constituent and user groups.

Objective-Based Sampling Plan and Schedule (2018-2022)

Sport fish, forage fish and other important fishes

Sport fishes in McClellan Reservoir include Channel Catfish and Largemouth Bass. The primary forage is Bluegill.

Low-density fisheries

No low density fisheries are currently known to exist.

Survey objectives, fisheries metrics, and sampling objectives

Channel Catfish: Due to the frequency of drying that occurs in the reservoir, Channel Catfish will be stocked when the reservoir catches a significant amount of water following a drying event. An exploratory hoop net survey will then be conducted during the summer following a stocking event to evaluate stocking success. If the reservoir does not go dry, an exploratory hoop net survey will be conducted in summer 2021.

Largemouth Bass: Due to the frequency of drying that occurs in the reservoir, Largemouth Bass will be stocked when the reservoir catches a significant amount of water following a drying event. An exploratory nighttime electrofishing survey will then be conducted during the fall following a stocking event to evaluate stocking success. If the reservoir does not go dry, an exploratory nighttime electrofishing survey will be conducted in fall 2021.

White Crappie: There are farm ponds located just above the reservoir in the watershed. During periods of heavy rain these farm ponds have a history of overflowing and introducing White Crappie into the reservoir. McClellan Reservoir has a history of becoming overpopulated with stunted White Crappie. White Crappie will be monitored for presence/absence during above mentioned sampling for Largemouth Bass and Channel Catfish.

Prey Species: Due to the frequency of drying that occurs in the reservoir, Bluegill will be stocked when the reservoir catches a significant amount of water following a drying event. An exploratory nighttime electrofishing survey will then be conducted for Largemouth Bass during the fall following a stocking event to evaluate stocking success; during this electrofishing survey, prey species will be evaluated for presence/absence. If the reservoir does not go dry, an exploratory nighttime electrofishing survey will be conducted in fall 2021. No additional effort will be expended beyond what is used for Largemouth Bass sampling.

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, 2nd edition. American Fisheries Society, Bethesda, Maryland.

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.

Munger, C. and J. Clayton. 2014. Statewide freshwater fisheries monitoring and management program survey report for McClellan Reservoir, 2013. Texas Parks and Wildlife Department, Federal Aid In Sport Fish Restoration, Grant F-30-R, Performance Report, Austin.

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Tables and Figures

Table 1. Characteristics of McClellan Reservoir, Texas.

Characteristic	Description
Year constructed	1938
Controlling authority	US Forest Service
County	Gray
Reservoir type	Tributary
Shoreline Development Index	2.05
Conductivity	230 µmhos/cm

Table 2. Boat ramp characteristics for McClellan Reservoir, Texas, September 2017. Reservoir elevation at time of survey was approximately 2925 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
North Ramp	35.21352 -100.87255	Y	10	2930	Out of water. Extension is not feasible
South Ramp	35.2094 -100.86563	Y	10	2940	Out of water. Extension is not feasible

Table 3. Harvest regulations for McClellan 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 McClellan Reservoir, Texas. Size categories: FRY = <1 inch, FGL = 1-3 inches, ADL = adults, UNK = unknown.

Species	Year	Number	Size
Bluegill	2010	25,331	FGL
Blue Catfish	1979	2,375	UNK
	1980	17,000	UNK
	1981	8,790	UNK
	1982	20,250	UNK
	1986	26,354	FGL
	1991	20,250	FGL
	1999	41,180	FGL
	2000	80	ADL
	2008	3,416	FGL
	2010	25,155	FGL
	Total	190,181	
Channel Catfish			
	1965	14,000	UNK
	1967	5,000	UNK
	1968	4,500	UNK
	1969	4,000	UNK
	1970	5,000	UNK
	1971	6,000	UNK
	1972	10,000	UNK
	1973	10,000	UNK
	1976	4,000	UNK
	1977	4,000	UNK
	1978	4,050	UNK
	1991	20,000	FGL
	1995	19,840	FGL
	1995	1,000	ADL
	1996	20,380	FGL
	2003	309	ADL
	2005	8,000	FGL
	2007	5,662	FGL
	2009	1,999	FGL
	2010	183	ADL
	2016	34,145	FGL
	Total	182,068	
Flathead Catfish	1978	20	UNK
Palmetto Bass	1979	4,000	UNK
	1983	3,900	UNK
	1985	12,383	FRY
	1986	6,700	FGL
	1987	13,350	FGL
	1992	5,168	FGL
	Total	45,501	

Table 4. Stocking history continued.

Species	Year	Number	Size
Paradise Bass	1977	17,000	UNK
Smallmouth Bass	1984	19,350	FGL
Largemouth Bass	1965	10,000	UNK
	1967	5,000	UNK
	1968	3,000	UNK
	1969	2,500	UNK
	1970	5,000	UNK
	1995	20,106	FGL
	2004	33,900	FGL
	2010	31,265	FGL
	2016	35,701	FGL
	Total	146,472	
Florida Largemouth Bass	1986	20,046	FGL
	1992	17,941	FGL
	2003	19,929	FGL
	2008	32,793	FGL
	Total	90,709	
Saugeye	1999	22,600	FGL
	2000	21,444	FGL
	2008	30,042	FGL
	2010	489,450	FRY
	2010	12,063	FGL
	2011	41,429	FGL
	Total	617,028	

Table 5. Objective-based sampling plan components for McClellan Reservoir, Texas 2017 – 2018.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE - Stock	RSE – Stock ≤ 30
	Size Structure	PSD, length frequency	N ≥ 50 Stock
Bluegill [a]	Abundance	CPUE - Total	RSE ≤ 30
	Size Structure	PSD, length frequency	N ≥ 50
Gizzard Shad [a]	Abundance	CPUE - Total	RSE ≤ 30
	Size Structure	Length frequency	N ≥ 50
	Prey availability	IOV	N ≥ 50
Gill netting			
Channel Catfish	Abundance	CPUE – Stock	RSE – Stock ≤ 30
	Size Structure	PSD, length frequency	N ≥ 50 Stock

[a] No additional effort will be expended to achieve an RSE ≤ 30 for CPUE of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

Table 6. Survey of structural habitat types, McClellan Reservoir, Texas, 2017. Shoreline habitat type units are in miles.

Habitat type	Estimate	% of total
Natural shoreline	3.23 miles	93.4
Rip Rap	0.23 miles	6.6
Standing Timber	47.83 acres	25.7

Table 7. Survey of aquatic vegetation, McClellan Reservoir, Texas 2017. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2017
Smartweed	34.18 (18.4%)

Bluegill

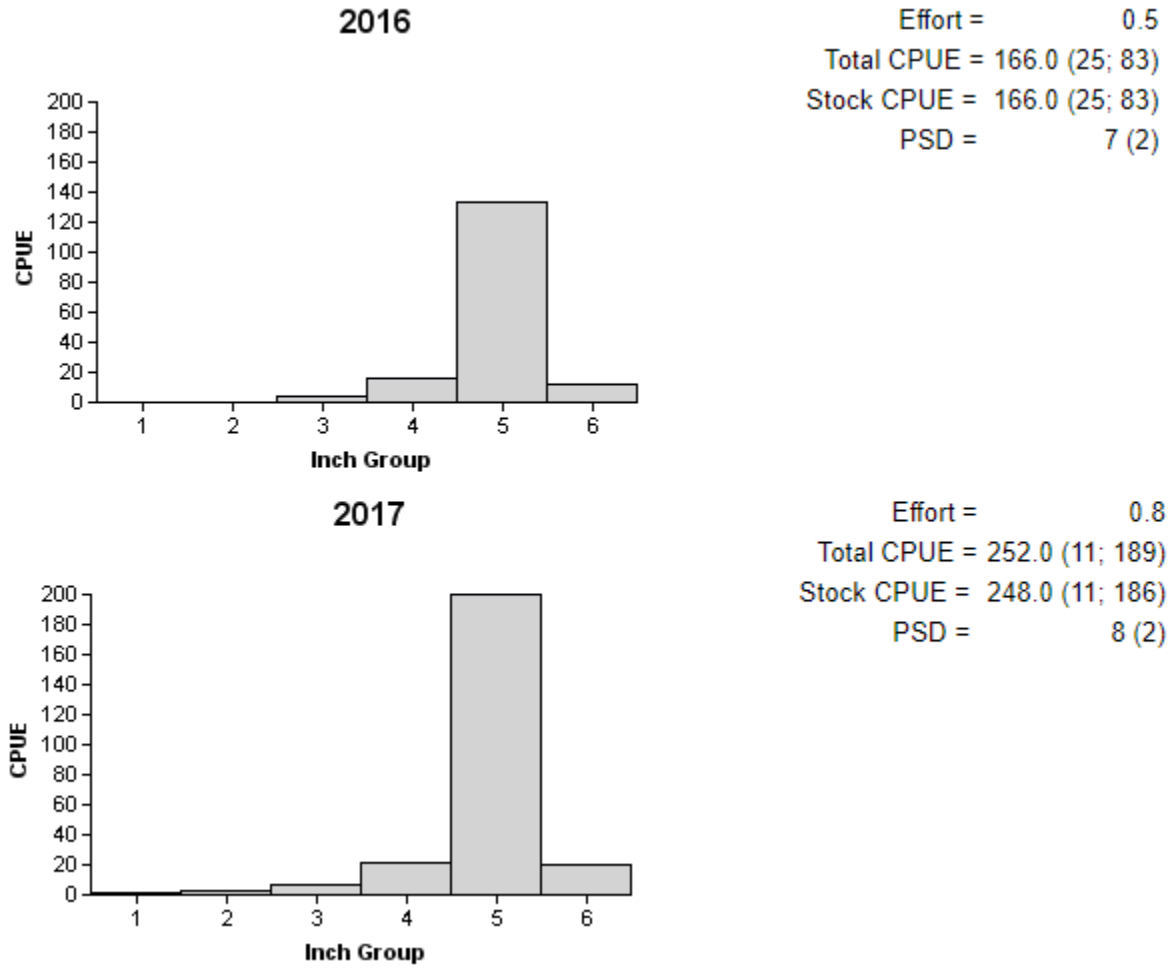


Figure 1. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, McClellan Reservoir, Texas, 2016 and 2017.

Channel Catfish

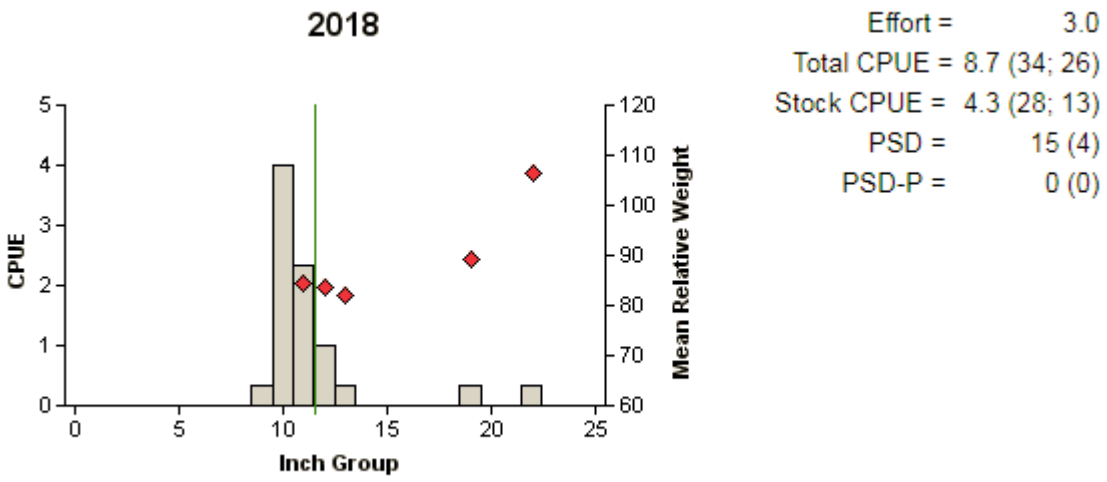


Figure 2. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, McClellan Reservoir, Texas, 2018. Vertical line represents minimum length limit of 12 inches.

Largemouth Bass

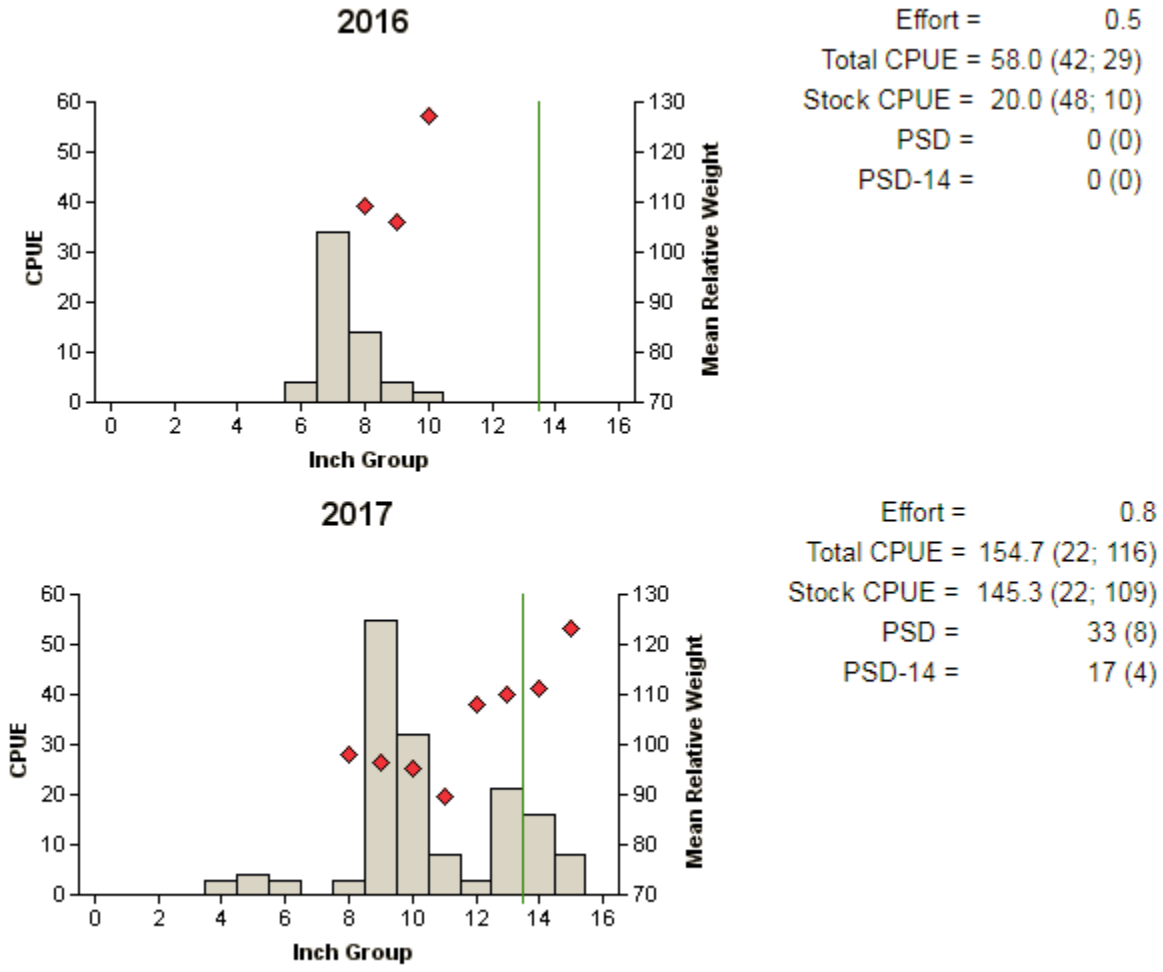


Figure 3. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, McClellan Reservoir, Texas, 2016 and 2017. Vertical line represents minimum length limit of 14 inches.

Proposed Sampling Schedule

Table 8. Proposed sampling schedule for McClellan 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.

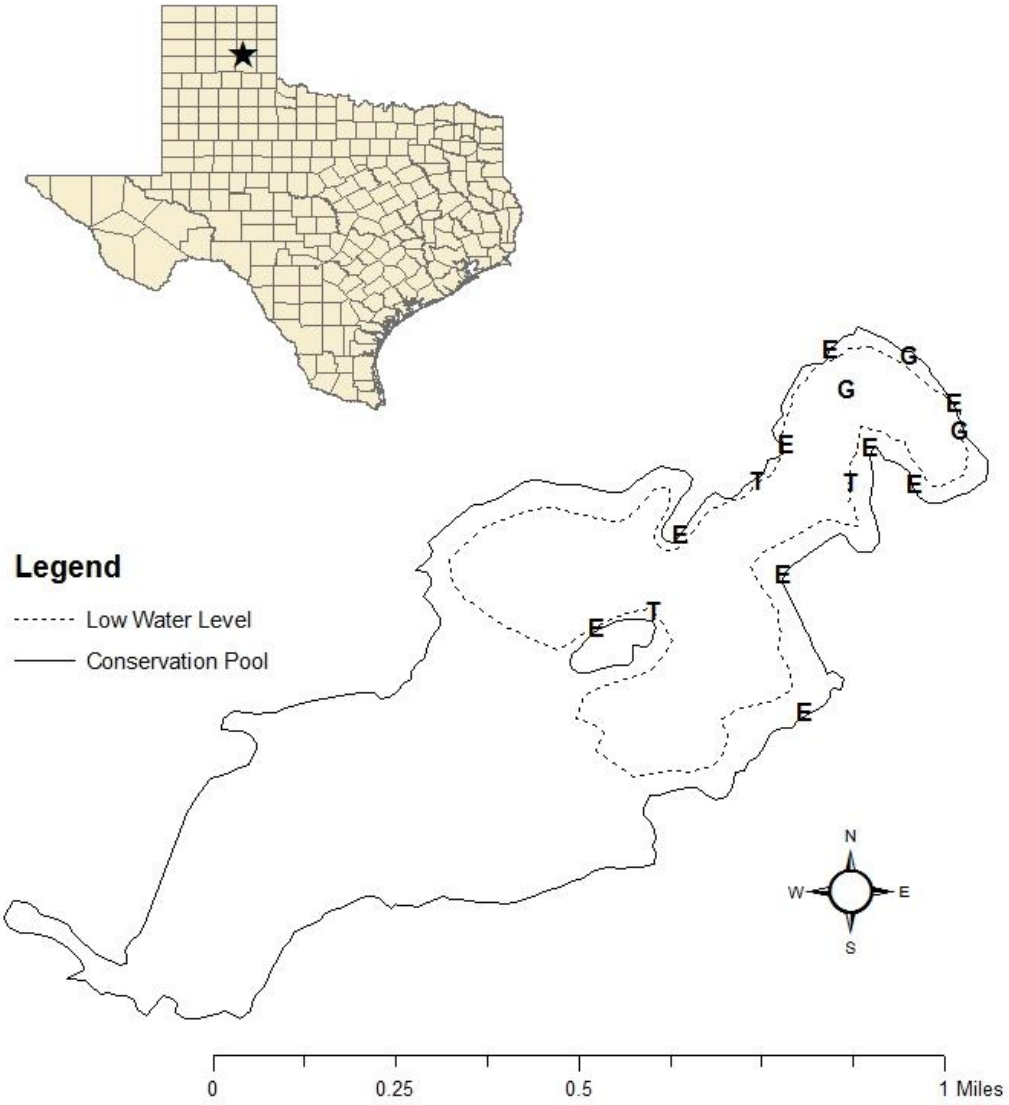
	Survey year			
	2018-2019	2019-2020	2020-2021	2021-2022
Angler Access				S
Structural Habitat				S
Vegetation				S
Electrofishing – Fall				S
Electrofishing – Spring				
Electrofishing – Low frequency				
Trap netting				
Gill netting				
Baited tandem hoop netting	A		A	
Creel survey				
Report				S

APPENDIX A – Catch rates for all species from all gear types

Number (N), relative standard error (RSE) and catch rate (CPUE) of all target species collected from all gear types from McClellan Reservoir, Texas, 2017-2018. Effort: Electrofishing = 0.75 hours, Gill Netting = 3 Net/Nights, Trap Netting = 5 Net/Nights.

Species	Electrofishing	N (RSE) Electro	Gill Netting	N (RSE) Gill	Trap Netting	N (RSE) Trap
Golden shiner			23.33	70 (24)		
Black bullhead			48.00	144 (1)	2.00	10 (39)
Channel catfish	26.67	20 (25)	8.67	26 (34)		
Green sunfish	44.00	33 (43)	1.00	3 (58)	3.00	15 (47)
Bluegill	252.00	189 (11)	92.67	278 (19)	49.80	249 (53)
Largemouth bass	154.67	116 (22)	9.67	29 (24)	0.20	1 (100)

Appendix B – Map of sampling locations



Location of electrofishing (E), trap netting (T), and gill netting (G) sites, McClellan Reservoir, Texas, 2017-2018. Reservoir at time of sampling was approximately 18 feet below Conservation Pool.

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