Lake Jacksonville

2020 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-4

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in Lake Jacksonville were surveyed in 2020 using fall electrofishing. Anglers were surveyed March through May 2021 with a creel survey. Historical data are presented with the 2020-2021 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: Lake Jacksonville is a 1,208-acre reservoir on Gum Creek in the Neches River basin, approximately four miles southwest of Jacksonville, Texas. Water level has been within two feet of conservation pool since 2013. The reservoir is clear and low in productivity. Land surrounding the reservoir is highly modified for residential development, and approximately 40% of the shoreline has bulkhead at the land/water interface.

Management History: Important sport fish include Largemouth Bass and crappie. Largemouth Bass are managed with a five fish daily bag; two of which may be less than 18 inches in length. Remaining species are managed under the statewide harvest regulations. Florida Largemouth Bass fingerlings have been stocked frequently since 2010. An integrated vegetation management plan was initiated in 1997 featuring triploid Grass Carp stocking, release of hydrilla flies, herbicide treatments, and native plant introduction. Vegetation surveys were conducted twice a year (pre-treatment in spring and annual in summer) to monitor changes from 2000-2008. Herbicide treatments were conducted annually through 2006. In 2006 and 2007 a total of 3,890 additional triploid Grass Carp were stocked (10 fish/hydrilla acre). In July 2007, a major flood event removed most of the hydrilla, and triploid Grass Carp herbivory prevented reestablishment. By summer 2008 hydrilla was reduced to trace coverage, and native vegetation was sparse. Vegetation surveys were conducted annually (at the peak of the growing season) from 2013-2016.

Fish Community:

- **Prey species:** Threadfin Shad and Gizzard Shad were present in the reservoir, but the prey community continued to be dominated by sunfish species. Redbreast Sunfish and Bluegill were the most abundant sunfish species. Electrofishing catch rate of all sunfish species combined (218/h) suggests abundance of sunfish is declining.

- **Black basses:** Black bass continue to support a popular fishery. Relative abundance was within the historical range; however, size structure and relative weights were lower than previous surveys. Relative abundance of Largemouth Bass $\geq$ 18 inches remains low.

Management strategies: Conduct bass-only spring electrofishing surveys to capture size classes unrepresented in fall surveys. Continue monitoring and tabulating results of Thursday night angling tournaments. Improve littoral habitat by establishing additional water willow colonies and contact stakeholders to gauge interest in additional littoral improvements. Maintain signage promoting the Clean-Drain-Dry campaign. Continue to manage Largemouth Bass under the current special-regulation and all other fish under statewide regulations.

Introduction

This document is a summary of fisheries data collected from Lake Jacksonville from 2020 through 2021. 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 fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2020-2021 data for comparison.

Reservoir Description

Lake Jacksonville is a 1,208-acre reservoir constructed in 1958 on Gum Creek, a tributary of the Neches River. It is in Cherokee County, approximately four miles southwest of Jacksonville and is operated and controlled by the City of Jacksonville. Primary water uses include municipal water supply and recreation. Lake Jacksonville is mesotrophic with a mean TSI chl-a of 41.62 (Texas Commission on Environmental Quality 2020). The majority of the shoreline is a combination of bulkhead and boat docks (38%), eroded shoreline with boat docks (28%), or featureless (26%; Ott and Bister 2001). While providing limited habitat, small amounts of native and non-native aquatic vegetation are present. Other descriptive characteristics for Lake Jacksonville are found in Table 1.

Angler Access

Lake Jacksonville has three public boat ramps (Table 2). ADA facilities and restrooms are available at the Peninsula Point boat ramp. Shore-fishing access is limited to the Lake Jacksonville Concession Area, the immediate area around the boat ramps, and the dam.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ott and Norman 2017) included:

1. Continue biennial electrofishing to monitor and evaluate the Largemouth Bass and prey population changes resulting from the regulation change. Re-establish a creel survey from December 2020 – May 2021 to determine Largemouth Bass fishery characteristics and angler opinion of regulation.

   Action: An electrofishing survey was not conducted in 2018, however a fall electrofishing survey was conducted in 2020. A spring quarter creel survey was conducted in 2021.

2. Continue monitoring and tabulating the results of the Thursday night Lake Jacksonville Open Bass Tournaments to supplement creel surveys.

   Action: Available tournament data (2013-2019) were tabulated and summarized (Appendix C).

3. Reduce vegetation survey sampling schedule to every other year (2018 & 2020) unless problematic species are reported or detected during electrofishing sampling.

   Action: Vegetation surveys have been further reduced to every four years due to the diminished vegetation community in the lake. A vegetation survey was conducted in 2020.

4. Provide Clean-Drain-Dry signage (as necessary) to the controlling authority for posting at the three boat ramps. Provide outreach information to local media regarding the Clean-Drain-Dry campaign.

   Action: Display of signage is current at all boat ramps.

Harvest regulation history: Sport fishes in Lake Jacksonville have been managed with statewide harvest

regulations except for an 18-inch minimum-length limit for Largemouth Bass in place from 2000-2013. On September 1, 2013 the regulation was changed to allow daily harvest of five Largemouth bass, only two of which can be <18 inches (Table 3).

Stocking history: Lake Jacksonville was stocked with grass carp in 2006 and 2007 as a biological control for hydrilla. **F**lorida Largemouth Bass have been stocked annually since 2010, excluding 2013 and 2017. The complete stocking history is provided in Table 4.

Vegetation/habitat management history: An integrated vegetation management plan was initiated hydrilla in 1997 in response to the introduction of hydrilla and featured low-density triploid Grass Carp stocking, herbicide treatments, and native plant introduction. Annual herbicide treatments were conducted (1997 – 2006), but hydrilla continued to expand to over 300 acres with approximately 95 acres of native vegetation. Additional triploid Grass Carp were stocked in 2006 at 10/hydrilla acre and the release of 750,000 hydrilla flies occurred between 2006 and 2007. In July 2007, a major flood event removed most of the hydrilla, and Grass Carp herbivory prevented reestablishment. By summer 2008 <1.0 acre of hydrilla and only approximately 30 acres of native vegetation were observed. No additional herbicide treatments or triploid Grass Carp stockings have been conducted and an estimated 25 (0.02/acre) Grass Carp are likely to be present at the time of this report, assuming 32% annual mortality (Kirk and Socha 2003). Vegetation surveys have not documented any additional hydrilla. Supplemental introduction of water willow was conducted in 2014 and 2015.

Water transfer: No inter basin transfers exist.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Jacksonville *(*Ott and Norman 2017*).* 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 – Fishes were collected by 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), 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). Index of vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics.

Creel survey – A roving creel survey was conducted from March 1 through May 31, 2021. Angler interviews were conducted on 5 weekend days and 4 weekdays to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Habitat – A comprehensive vegetation survey was conducted in 2020. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Water Level - Source for water level data was the United States Geological Survey (USGS 2021) website.

Results and Discussion

Habitat: A structural habitat survey was last conducted in 2000 (Ott and Bister 2009). Littoral habitat was primarily comprised of boat docks and vegetation was limited to trace amounts of emergent and floating-leaved species in 2020 (Table 6). The water willow colony planted in 2014 and 2015 (Ott and Norman 2017) remains intact and healthy but has not established outside of the initial planting location. Non-native species detected in 2020 included alligatorweed, giant reed, and elephant ear, all in small quantities.

Creel: Total angling effort for the March through May 2021 creel (15,382 hours) represented an increase from the 2012-2013 survey (Table 7). Black basses continued to be the most sought-after species, however directed effort (49%) decreased from previous surveys. Crappie were the second-most popular species targeted, accounting for 17 % of directed effect. Angler expenditures ($49,327) for the 2021 spring quarter were greater than previous surveys conducted from December-May (Table 8). Total effort and expenditures may be underestimated as night tournaments for black basses remain popular and this information is not captured in standard creel surveys. Historical anecdotal information obtained from the Lake Jacksonville Open Tournament coordinator indicates that an average of 54 anglers (range = 16 - 92) participate in the Thursday night tournament on a weekly basis from March – October (Appendix C). Angler opinion data was not collected during creel interviews, however anecdotal reports suggest strong support of the current Largemouth Bass regulation among anglers.

Prey species: Gizzard and Threadfin shad continued to be present in the reservoir in low densities (Appendix A). Index of Vulnerability (IOV) for Gizzard Shad was only 16, indicating that most were too large for predators to consume (Figure 2). Threadfin Shad electrofishing catch rate (14.0/h) was lower than the 2016 (30.5/h), 2012 (49.0/hr) and 2008 (111.0/hr) surveys, indicating a decline in Threadfin Shad relative abundance. As in previous surveys, the prey community was dominated by sunfishes, however the combined catch rate (218.0/h; Appendix A) was substantially lower than 2016 (499.0/h) and 2012 (808.0/h; Ott and Norman 2013). Redbreast Sunfish and Bluegill continued to be the most abundant sunfish species with electrofishing catch rates of 124.0/hr and 51.0/hr, respectively (Figures 3 and 4). Longear Sunfish were also collected (42.0/h). Most sunfish collected were less than 6 inches.

Black basses: Spotted Bass were collected by electrofishing at a higher rate (88.0/h) in 2020 relative to 2016 (59.5/h) and 2014 (29.0/h), indicating an increasing trend in spotted bass abundance (Figure 5). The population is dominated by individuals less than 13 inches in length. No spotted bass were documented during the creel period (Figure 6). Anecdotal information indicates that this species makes up a substantial proportion of the tournament catch in the Thursday night tournaments.

Electrofishing total catch rate of Largemouth Bass in 2020 (42.0/h; Figure 7) was similar to the previous two surveys, however size structure was lower (PSD = 23) and below the 40-70 target range for a balanced population. Additionally, no Largemouth Bass $\geq$ 18 inches were collected in 2020. Sampling objectives were not met for abundance (RSE-S $\leq$ 25) or size structure (N $\geq$ 50 stock) estimates. Additional effort was not expended to meet sampling objectives due to the size of the waterbody and historically low catch rates. The mean relative weight *(W_r)* for most size classes (85 – 95) was lower than 2016 (≥100), suggesting the observed decrease of available prey may have limited Largemouth Bass growth. Electrofishing did not provide enough specimens necessary for age-and-growth assessment. Ott and Norman (2013) reported that growth trajectory was normal to age-2 (mean = 14.4 inches) but flattened out past that age. Despite poor electrofishing efficiency and low apparent abundance of Largemouth Bass $\geq$ 18 inches, Lake Jacksonville continued to support a popular fishery as indicated by the 2021 creel survey (Table 9; Figure 8) and the four-hour Thursday night Jacksonville Open Bass Tournaments (Appendix C). From 2013-2019, night tournament anglers weighed-in an average of 6 fish over 18 inches each tournament.

Crappie: Black and White Crappie are present in the reservoir and have provided a popular fishery. Directed fishing effort, catch per hour, and total harvest for Crappie was 2,612 h, 1.0 fish/h, and 520 fish, respectively, from March – May 2021 (Table 10). Harvested fish ranged in length from 10— 14 inches (Figure 9).

Fisheries Management Plan for Lake Jacksonville, Texas

Prepared – July 2021

ISSUE 1: Lake Jacksonville continues to support a popular Largemouth Bass fishery and is a venue for tournaments where fish ≥ 18 inches are commonly caught and weighed. A 14.13 lbs. Largemouth Bass was weighed in at a night tournament in November of 2020 and was the first Legacy (> 13-pound) entry into the TPWD ShareLunker program for Lake Jacksonville. Fall electrofishing data indicate a decreasing trend in Largemouth Bass size structure and condition in Lake Jacksonville, however these data may not accurately reflect the Largemouth Bass population. The decrease in the littoral vegetation and improved water clarity likely diminished the sampling efficiency of fall surveys over the past ten years. Additional strategies are needed to improve the precision of Largemouth Bass trend data to determine if apparent declining trends are accurate or a consequence of diminished sampling efficiency.

MANAGEMENT STRATEGIES

1. Conduct bass-only spring electrofishing survey in 2022 at randomly selected sites in addition to fall electrofishing every four years. Electrofishing surveys conducted during the spring tend to capture large size classes as they occupy littoral habitat for spawning, providing insight into the size classes missing from fall electrofishing surveys.

2. Supplement creel and electrofishing surveys by monitoring and tabulating the results of the Thursday night Lake Jacksonville Open Bass Tournaments to document trophy Largemouth Bass and to monitor tournament trends over time.

3. Promote TPWD ShareLunker program among angler groups and various tournaments.

ISSUE 2: Littoral habitat and vegetation in Lake Jacksonville has declined over the past 20 years due to shoreline development, reservoir aging, historic water fluctuations, and introduction of grass carp. As a result, sunfish abundance and Largemouth Bass size structure and condition (W_r) has declined. Improvements to littoral habitat are essential to restore the dominant prey species and sportfish in Lake Jacksonville.

MANAGEMENT STRATEGIES

1. Establish additional water willow colonies in locations of suitable habitat throughout the lake.

2. Contact stakeholders (i.e., City of Jacksonville, Lake Jacksonville Association, and angler groups) to assess interest in cooperative efforts to improve littoral habitat along modified shorelines. Improvements may include establishing additional colonies of water willow or other appropriate native vegetation species along bulkhead or deploying structural habitat within the littoral zone.

3. Conduct structural habitat survey in 2024 in conjunction with vegetation survey.

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 (2021-2025)

Sport fish, forage fish, and other important fishes

Sport fishes in Lake Jacksonville include Channel Catfish, White Bass, Largemouth Bass, and crappie. Important forage species include sunfishes and to a lesser extent, Threadfin and Gizzard Shad.

Low-density fisheries

White Bass have historically been very low in abundance and appear to be habitat limited. Although this species may be caught opportunistically, there was no directed effort for this species in the 2021 or any prior creel survey. Channel Catfish are present, but recruitment is limited, and no directed effort has been documented over the last two creel periods (Table 7).

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Black basses supported the highest directed angling effort at Lake Jacksonville (49%) in the 2021 spring quarter creel survey. Largemouth Bass CPUE-S from the last three electrofishing surveys ranged from 13.0 to 24.5 fish/h (RSE range = 23-31) and was dominated by fish <14 inches in length. Largemouth Bass population trend data will continue to be monitored for relative abundance, size distribution, growth, and condition with electrofishing in 2024 (Table 11). A bass-only electrofishing survey will also be conducted in the spring of 2022 in attempt to improve catch rates of stock sized fish needed for adequately estimating size distribution. A total of 12, five-minute electrofishing stations will be randomly generated, and no sampling objectives will be set as the previous four surveys have not met the listed sampling objectives and the current effort is sufficient to survey a reservoir this size. Due to consistently poor catch rates from traditional fall surveys, the 2024 fall survey will be conducted with biologist-selected sites. The mean age at 14 inches will be estimated in 2024 to continue monitoring long-term trends in growth. If a minimum of 13 specimens between 13.0 - 14.9 inches in length are not collected, additional bass-only sampling will be conducted until sampling objectives are met. The Largemouth Bass fishery will be assessed directly through a spring quarter roving creel survey in 2029 to estimate angling effort, catch rates, and expenditures. Five weekend days and four weekdays will be surveyed to provide direct estimates of angler effort, catch rate, and harvest of black basses.

Sunfishes and shad: Sunfish species, Threadfin Shad, and to a lesser extent Gizzard Shad are the primary forage species at Lake Jacksonville. Bluegill CPUE is variable, ranging from 45.0/hr in 2014, 130.5/h in 2016 and 51.0/h in 2020. Redbreast sunfish continue to be the most abundant sunfish with CPUE of 94.0/hr in 2014, 205.0/hr in 2016 and 124.0/hr in 2020. CPUE for Gizzard Shad was low and IOV

was high, suggesting the contribution of this species to the prey base is negligible. Sunfishes and shad species will be sampled in 2024 for continuation of trend information for relative abundance (CPUE) and size structure (PSD for sunfishes and IOV for Gizzard Shad). Sampling intensity and schedule will be the same as is proposed for Largemouth Bass. Largemouth Bass body condition and growth will provide additional information on forage abundance and vulnerability.

Crappie: Crappie represented 17% (0.4 hours/acre) of the directed angler effort during the March – May 2021 creel survey (Table 10; Figure 9). White and Black Crappie were harvested. Historically White Crappie were not observed in angler creels, however, were more abundant than Black Crappie in 2021. Historically, crappies were sampled every four years with 5 single-cod, shoreline set trap nets in late fall. However, this sampling was determined to be unreliable and was discontinued after 2008. A more cost-effective method is to monitor the fishery directly through a spring quarter roving creel survey. Five weekend days and four weekdays will be surveyed in the spring of 2029 to provide direct estimates of angling effort, catch rate and harvest of crappie.

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.

DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

Guy, C. S., R. M. Newmann, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution length categories. North American Journal of Fisheries Management 31: 722-725.

Kirk, J. P. and R. C. Socha 2003. Longevity and Persistence of Triploid Grass Carp Stocked into the Santee Cooper Reservoirs of South Carolina. Journal of Aquatic Plant Management. 41: 90-92.

Ott, R. A. and T. J. Bister. 2001. Statewide freshwater fisheries monitoring and management program survey report for Lake Jacksonville, 2000. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-30, Austin. 32 pp.

Ott, R. A. and D. L. Bennett. 2009. Statewide freshwater fisheries monitoring and management program survey report for Lake Jacksonville, 2008. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-34, Austin. 29 pp.

Ott, R. A. and J. D. Norman. 2013. Statewide freshwater fisheries monitoring and management program survey report for Lake Jacksonville, 2012. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-3, Austin. 32 pp.

Ott, R. A. and J. D. Norman. 2017. Statewide freshwater fisheries monitoring and management program survey report for Lake Jacksonville, 2016. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-3, Austin. 32 pp.

Texas Commission on Environmental Quality. 2020. Trophic Classification of Texas Reservoirs: 2020 Texas water quality inventory and 303 (d) list. 15 pp. https://wayback.archive-it.org/414/20200910072305/https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/20txir/2020_trophic.pdf

United States Geological Survey. 2021. *Real-time Data for Texas lakes and Reservoirs* https://waterdata.usgs.gov/tx/nwis/uv/?site_no=08032200 (May 2021)

Tables and Figures

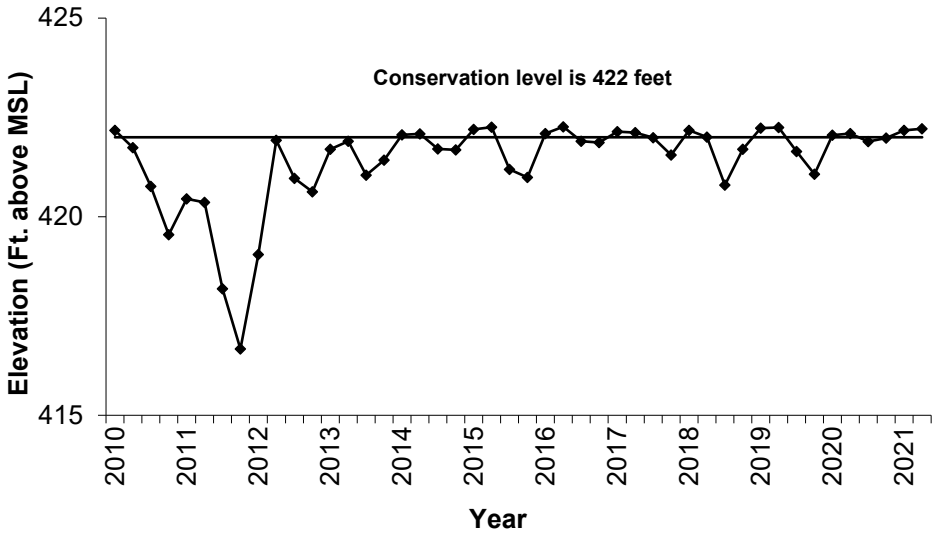


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Jacksonville, Texas. Horizontal line represents conservation level.

Table 1. Characteristics of Lake Jacksonville, Texas.

Characteristic	Description
Year completed	1958
Controlling authority	City of Jacksonville
County	Cherokee
Reservoir type	Tributary
Shoreline Development Index (SDI)	4.9
Conductivity	80 uS/cm

Table 2. Boat ramp characteristics for Lake Jacksonville, Texas, August 2020. Reservoir elevation at time of survey was 422 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Peninsula Point	31.92111 -95.29023	Y	40	418	Accessible
Northwest Ramp	31.94174 -95.29750	Y	20	419	Accessible
Southshore Park	31.90176 -95.30862	Y	15	420	Accessible, shallow slope

Table 3. Harvest regulations for Lake Jacksonville, 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[a]	18-inch minimum (2 may be < 18 inches)
Bass, Spotted	5[a]	None
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

[a] Daily bag for Largemouth Bass and Spotted Bass = 5 fish in any combination.

Table 4. Stocking history of Lake Jacksonville, Texas. FGL = fingerling; ADL = adults; FRY = fry; UNK = unknown.

Year	Number	Size
	Threadfin Shad	
1987	2,500	ADL
2011	39,900	ADL
Total	42,400	
	Blue Catfish	
1975	2,000	UNK
1987	6,149	FGL
Total	8,149	
	Channel Catfish	
1967	2,000	UNK
1968	2,500	UNK
1969	2,500	UNK
1970	2,000	UNK
1971	2,000	UNK
1973	2,000	UNK
1974	2,000	UNK
1978	17,500	UNK
1979	4,000	UNK
1980	2,000	UNK
1981	2,000	UNK
1982	4,000	ADL
1983	4,000	FGL
1986	4,011	FRY
1994	295	ADL
Total	52,806	
	Palmetto Bass	
1974	15,000	UNK
1979	14,000	UNK
1981	16,349	UNK
1983	15,584	UNK
Total	60,933	
	Largemouth Bass	
1973	4,000	UNK
1974	24,000	UNK
Total	28,000	
	Florida Largemouth Bass	
1975	67,000	FGL
1976	138,000	FGL
1977	47,200	FGL
1977	85,000	FRY
1978	138,053	FGL
1979	4,000	FGL
1999	135,300	FGL
2000	135,222	FGL
2005	441,000	FRY
2006	86,081	FGL
2007	120,790	FGL
2010	121,200	FGL
2011	120,935	FGL
2012	120	ADL
2014	125,121	FGL
2015	120,895	FGL
2016	135,272	FGL
2018	132,931	FGL
2019	47,905	FGL
2020	39,130	FGL
Total	2,241,155	
	White Crappie	
1988	180,143	FGL
Total	180,143	
	Black Crappie	
1968	1,500	UNK
1969	2,000	UNK
1970	2,000	UNK
1988	118,946	FGL
1990	69,638	FRY
1992	85,312	FRY
Total	279,396	
	Grass Carp (triploid)	
1997	100	ADL
1998	100	ADL
2006	1,390	ADL
2007	2,500	ADL
Total	4,090	

Table 1. Objective-based sampling plan components for Lake Jacksonville, Texas 2020–2021.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
	Condition	W_r	10 fish/inch group (max)
Bluegill [a]	Abundance	CPUE–Total	
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad [a]	Abundance	CPUE–Total	
	Prey availability	IOV	N ≥ 50

[a] No additional effort will be expended to achieve an RSE ≤ 25 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 aquatic vegetation, Lake Jacksonville, Texas, 2014, 2015, 2016, and 2020. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2014[a]	2015[a]	2016	2020
Native floating-leaved				Trace[1]
Native emergent			0.7 (<0.1)	2.33 (<0.2)[2]
Non-native				
Alligatorweed (Tier III) *	Trace	0.8 (<0.1)	0.7 (<0.1)	Trace
Giant reed (Tier III) *			0.7 (<0.1)	1.34 (<0.1)
Elephant ear (Tier III) *			Trace	Trace

[a] Aquatic Nuisance Species survey only
*Tier III is watch status.

[1] White water-lily
[2] Cutgrass, smart weed, water primrose, spatterdock, American lotus, arrowhead, pickerelweed, blue waterleaf

Table 7. Percent directed angler effort by species for Lake Jacksonville, Texas, 2008-2009, 2012-2013, and 2021. Survey periods for 2008-2009 and 2012-2013 were from 1 December through 31 May. Survey period for 2021 was 1 March through 31 May.

Species	2008/2009	2012/2013	2021
Channel Catfish	0	4	0
Sunfishes	11	0	0
Black Bass	68	76	49
Crappie	14	11	17
Anything	7	9	34

Table 8. Total fishing effort (h) for all species and total directed expenditures at Lake Jacksonville, Texas 2008-2009, 2012-2013, and 2021. Survey periods for 2008-2009 and 2012-2013 were from 1 December through 31 May. Survey period for 2021 was 1 March through 31 May. Relative standard error is in parentheses.

Creel statistic	2008/2009	2012/2013	2021
Total fishing effort	9,656 (20)	7,329 (23)	15,382 (48)
Total directed expenditures	$36,990 (49)	$20,935 (45)	$49,327 (119)

Gizzard Shad

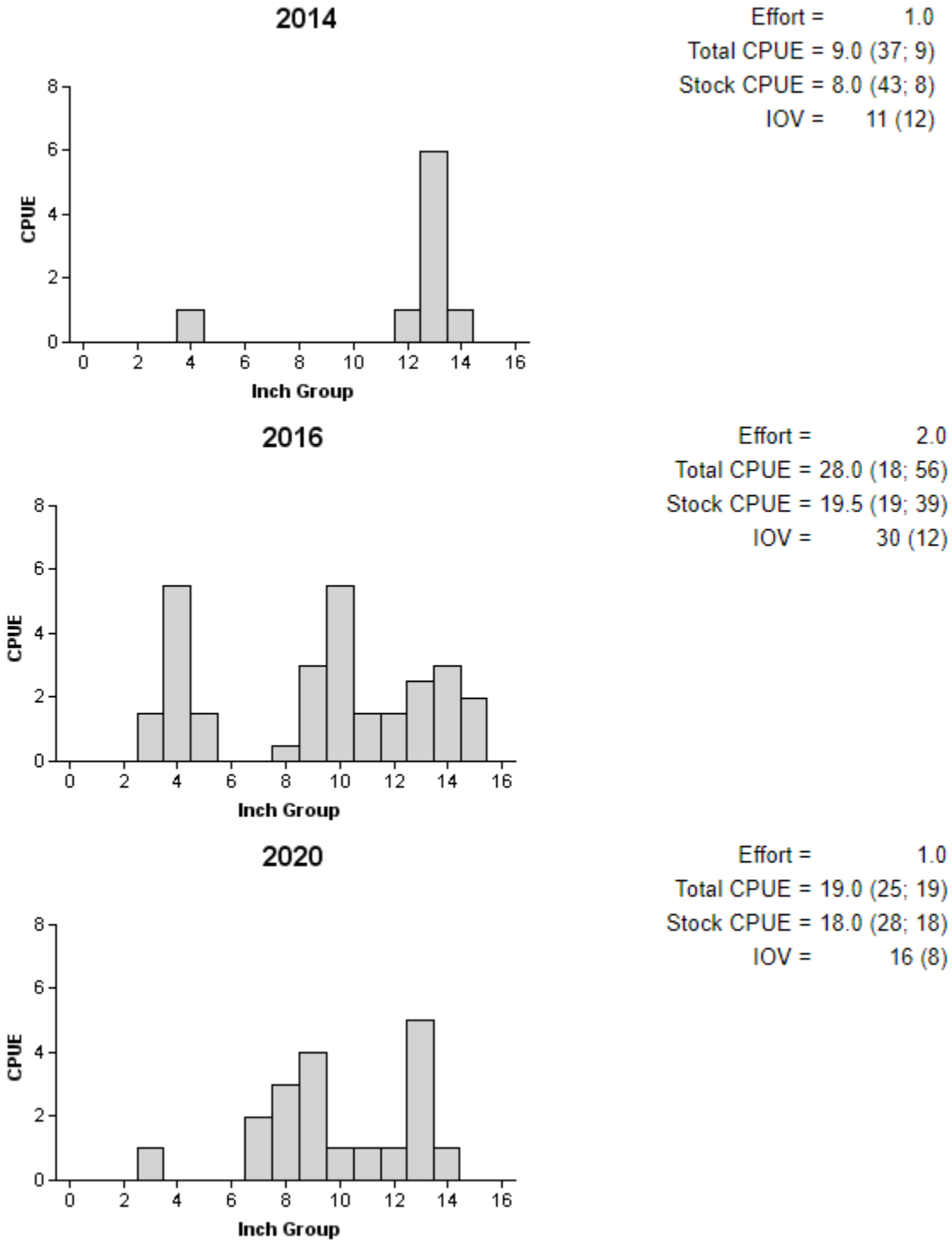


Figure 2. Number of Gizzard Shad caught per hour (CPUE), and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Jacksonville, Texas, 2014, 2016 and 2020.

Redbreast Sunfish

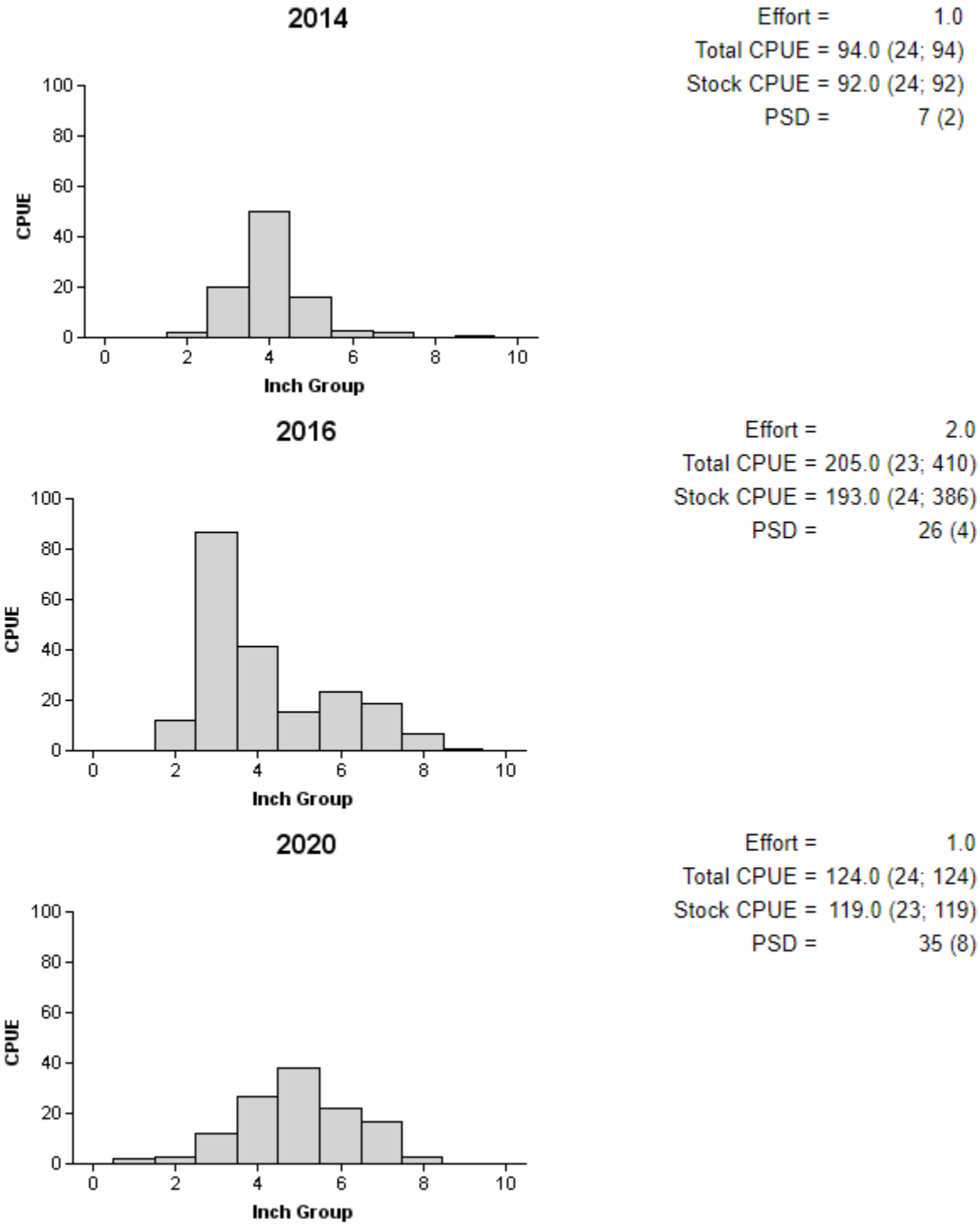


Figure 3. Number of Redbreast Sunfish caught per hour (CPUE), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Jacksonville, Texas, 2014, 2016, and 2020.

Bluegill

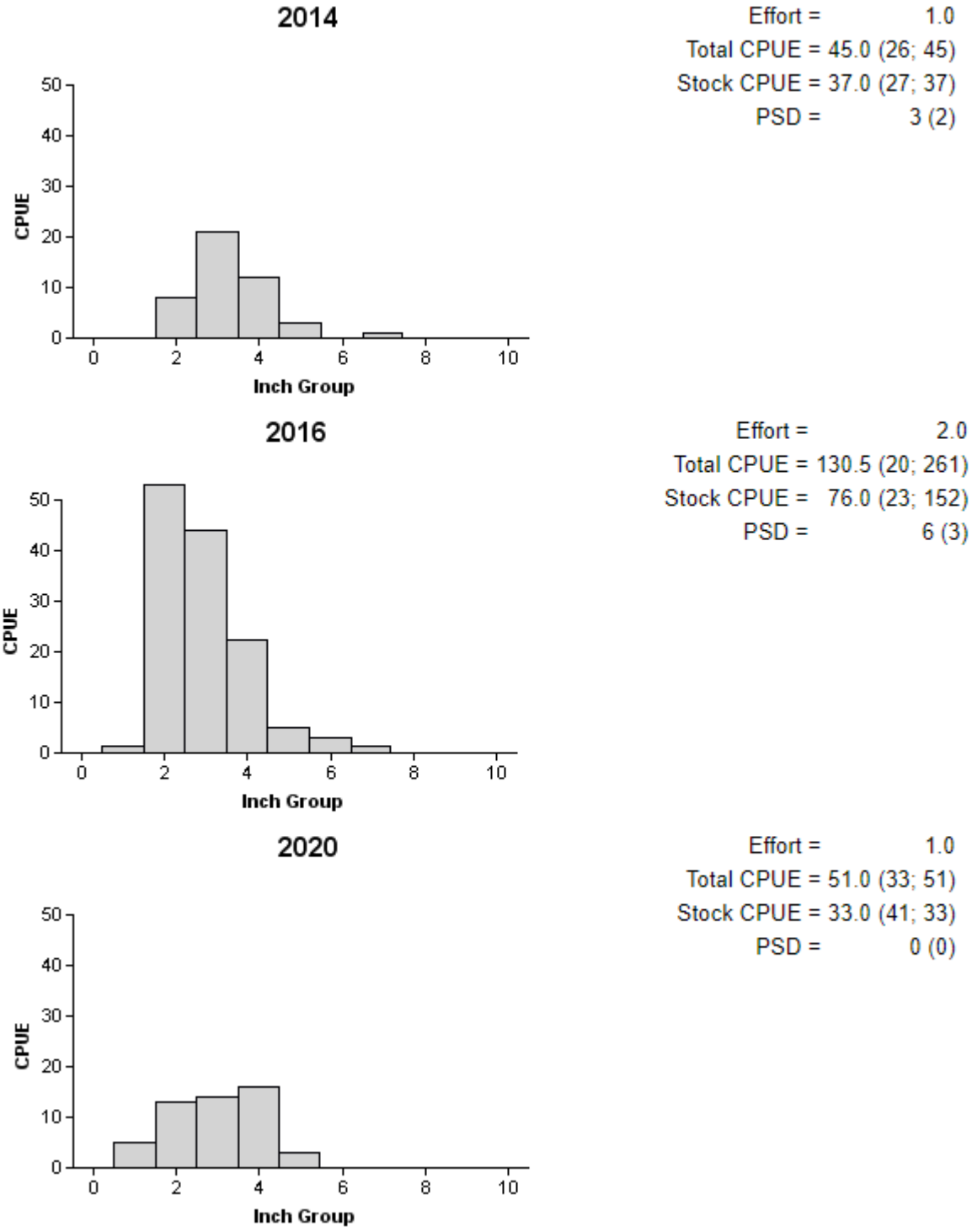


Figure 4. Number of Bluegill caught per hour (CPUE), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Jacksonville, Texas, 2014, 2016 and 2020.

Spotted Bass

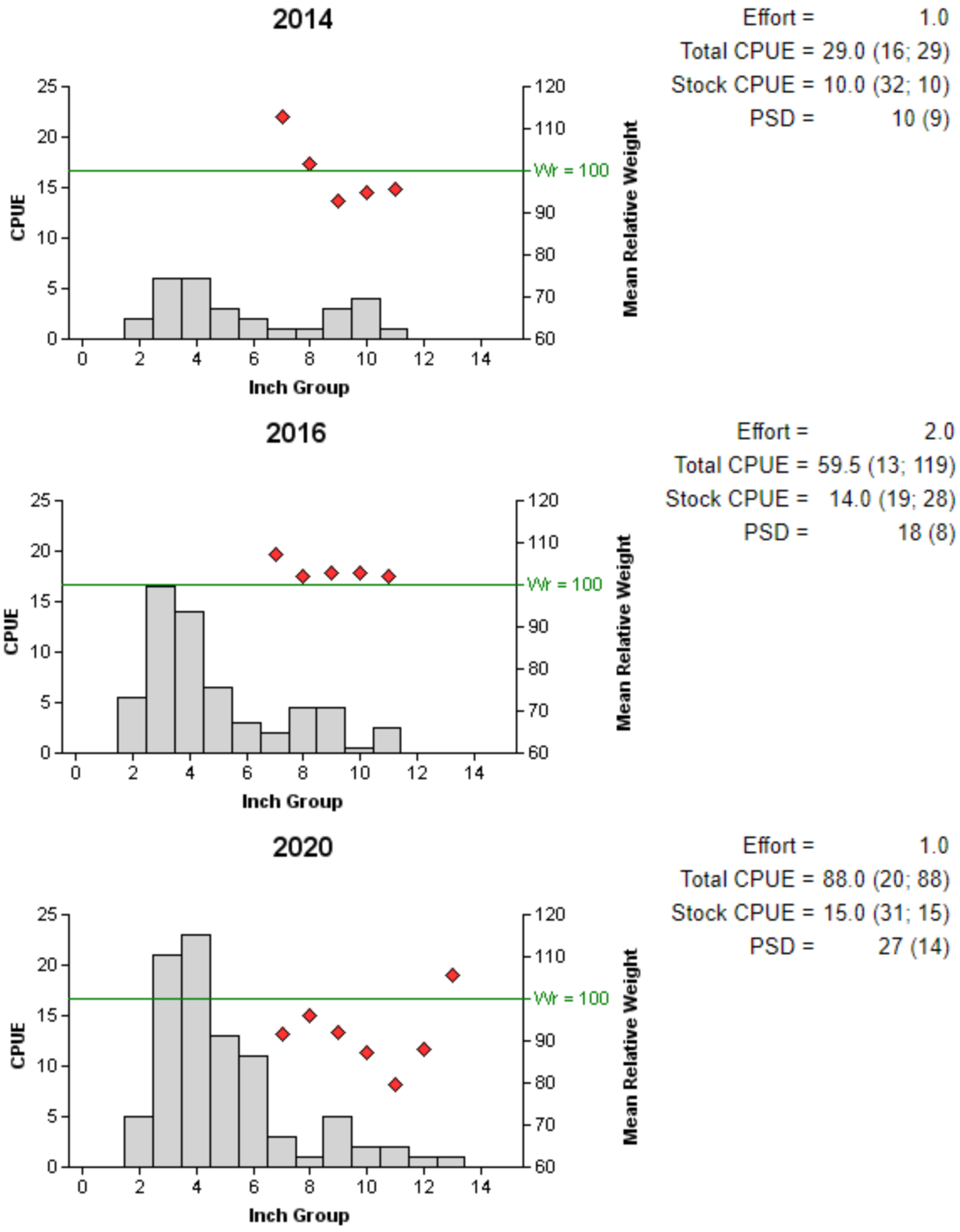


Figure 5. Number of Spotted Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE are in parentheses) for fall electrofishing surveys, Lake Jacksonville, Texas, 2014, 2016, and 2020.

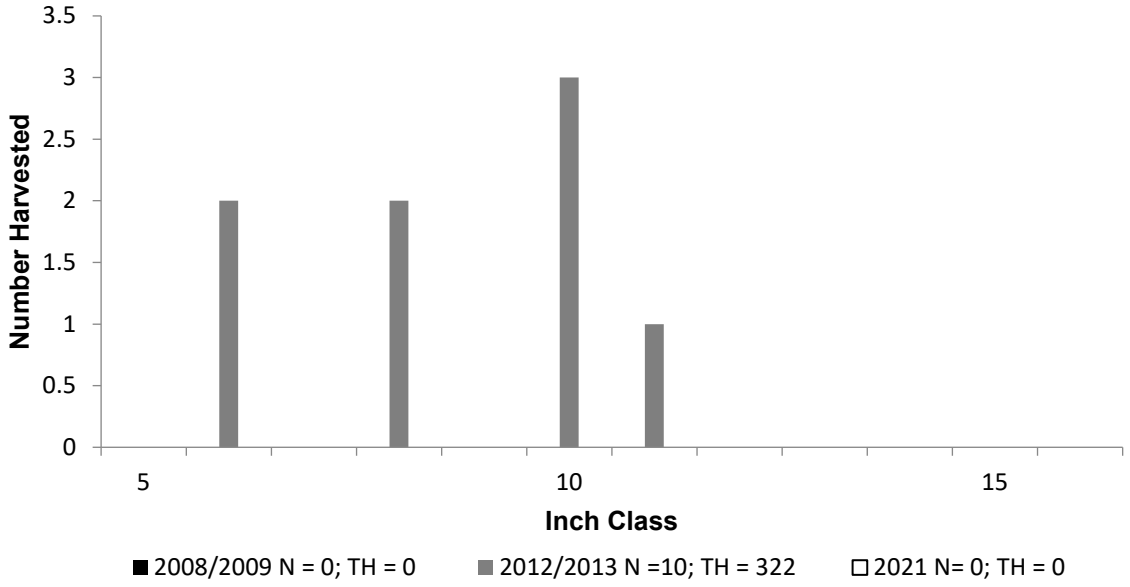


Figure 6. Length frequency of harvested Spotted Bass from all anglers observed during creel surveys at Lake Jacksonville, Texas, 2008-2009, 2012-2013, and 2021. Survey periods for 2008-2009 and 2012-2013 were from 1 December through 31 May. Survey period for 2021 was 1 March through 31 May. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

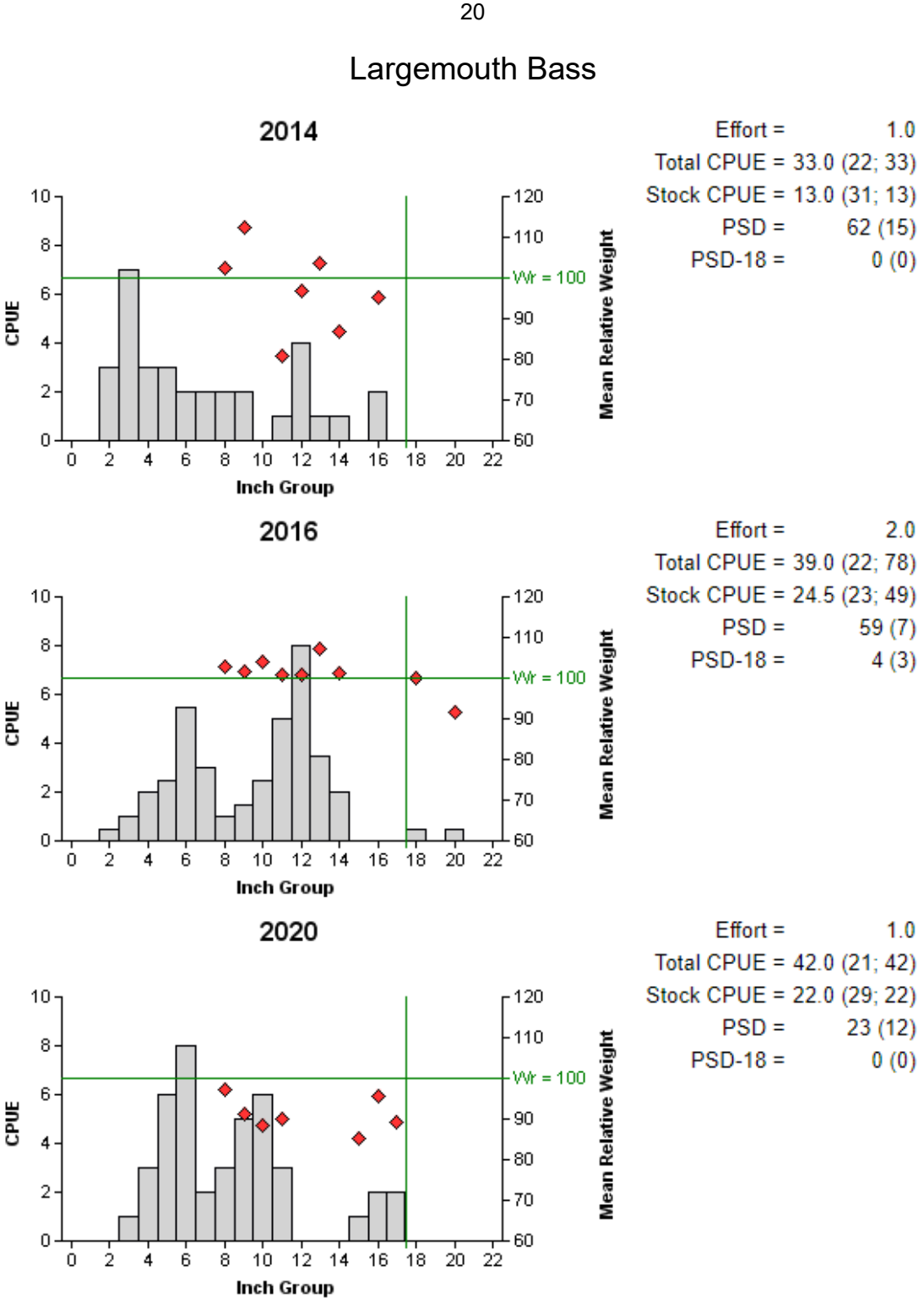


Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE are in parentheses) for fall electrofishing surveys, Lake Jacksonville, Texas, 2014, 2016, and 2020. Vertical line represents length limit and horizontal line indicates optimal W_r.

Table 9. Creel survey statistics for Largemouth Bass at Lake Jacksonville, TX from 2008-2009, 2012-2013, and 2021. Survey periods for 2008-2009 and 2012-2013 were from 1 December through 31 May. Survey period for 2021 was 1 March through 31 May. Catch rate is for all anglers targeting black basses. The estimated number of fish released by weight category is for anglers targeting black basses. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year		
	2008/2009	2012/2013	2021
Surface area (acres)	1,208	1,208	1,208
Directed angling effort (h)	6,588 (29)	5,590 (22)	7,486 (49)
Angling effort/acre	5.4 (29)	4.6 (22)	6.2 (49)
Catch rate (number/h)	1.8 (33)	1.2 (42)	1.2 (28)
Harvest	204 (74)	22 (100)	37 (81)
Harvest/acre	0.2 (74)	>0.1 (100)	>0.1 (81)
Release by weight			
<4.0 lbs		3,596 (42)	26,408 (72)
4.0-6.9 lbs			
7.0-9.9 lbs			275 (118)
≥10.0 lbs			
Percent legal released	32	50	98

Note: Tournament data reported in Appendix C not captured by the standard creel survey

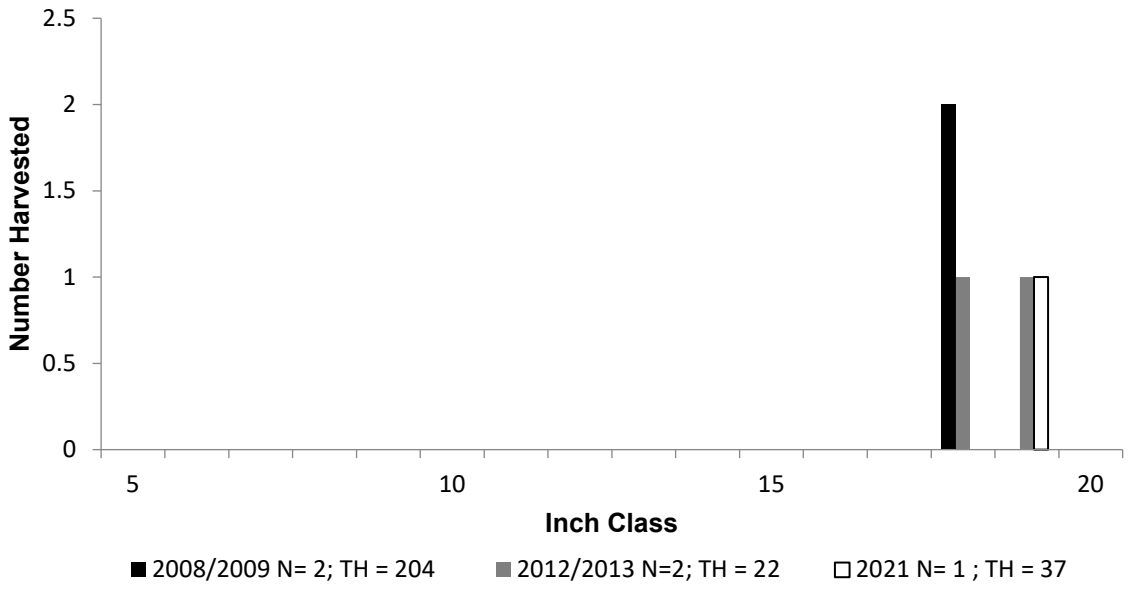


Figure 8. Length frequency of harvested Largemouth Bass from all anglers observed during creel surveys at Lake Jacksonville, Texas, 2008-2009, 2012-2013, and 2021. Survey periods for 2008-2009 and 2012-2013 were from 1 December through 31 May. Survey period for 2021 was 1 March through 31 May. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Crappie

Table 10. Creel survey statistics for crappie at Lake Jacksonville December 2008 through May 2009, and December 2012 through May 2013. 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.

Creel Survey Statistic	Year		
	2008/2009	2012/2013	2021
Surface area (acres)	1,208	1,208	1,208
Directed effort (h)	1,318 (63)	818 (36)	2,612 (55)
Directed effort/acre	1.1 (63)	0.7 (36)	2.2 (55)
Total catch per hour	7.9 (0)	1.2 (42)	1.0 (72)
Total harvest	102 (157)	1,555 (97)	520 (91)
White Crappie	-	-	284 (90)
Black Crappie	102 (157)	1,555 (97)	236 (92)
Harvest/acre	0.1 (49)	1.3 (97)	0.4 (91)
Percent legal released	99	0	75

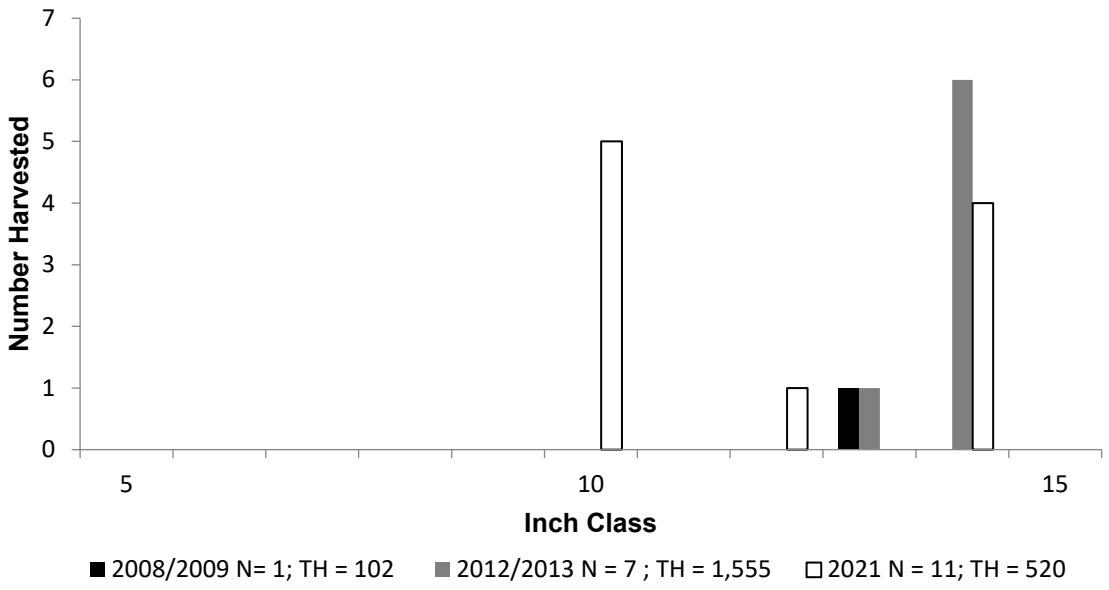


Figure 9. Length frequency of harvested crappie from all anglers observed during creel surveys at Lake Jacksonville, Texas, 2008-2009, 2012-2013, and 2021. Survey periods for 2008-2009 and 2012-2013 were from 1 December through 31 May and from 1 March through 31 May 2021. N is the number of harvested crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 11. Proposed sampling schedule for Lake Jacksonville, Texas. Survey period is June through May.

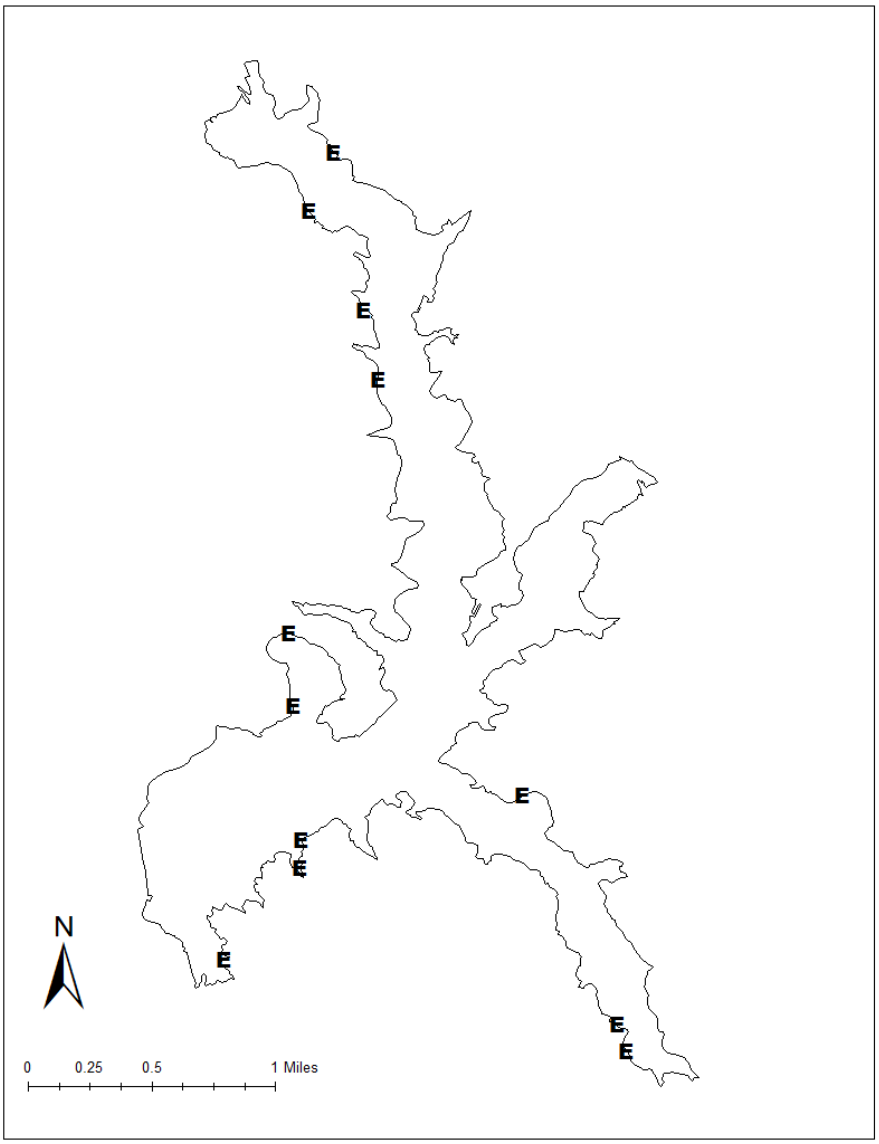
	Survey year			
	2021-2022	2022-2023	2023-2024	2024-2025
Angler Access				X
Vegetation				X
Structural Habitat				X
Electrofishing – Fall				X
Electrofishing – Spring	X			
Report				X

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

Number (N) and catch rate (CPUE) (RSE in parenthesis) of all target species collected by electrofishing from Lake Jacksonville, Texas, 2020. Sampling effort was 1 hour.

Species	Electrofishing	
	N	CPUE
Gizzard Shad	19	19.0 (25)
Threadfin Shad	14	14.0 (47)
Redbreast Sunfish	124	124.0 (24)
Warmouth	1	1.0 (100)
Bluegill	51	51.0 (33)
Longear Sunfish	42	42.0 (24)
Spotted Bass	88	88.0 (20)
Largemouth Bass	42	42.0 (21)

APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Jacksonville, Texas, 2020. Fall electrofishing stations are indicated by E. Water level was near full pool at time of sampling.

APPENDIX C -Results of Thursday Night Lake Jacksonville Open Angling Tournaments

Summary results (SD in parenthesis) of Thursday Night Lake Jacksonville Open angling tournaments, 2013-2019. Tournament rules allow legal-length Largemouth Bass or Spotted Bass of any size as part of the 5-fish bag ([A] changed to a 3-fish bag in September, 2013).

		Annual average				
Year	Events (#)	Anglers (#)	> 18" weighed (#)	Winning bag wt (lbs)	Largest fish (lbs)	Total effort (hrs)
2013[A]	33	39 (6.4)	5.5 (9.5)	9.2 (2.5)	9.6	4,996
2014	36	46.9 (8.3)	4.9 (17)	9.4 (3.2)	10.3	6,564
2015	33	51.6 (5.8)	5.6 (11.6)	9.7 (2.7)	8.7	6,604
2016	33	60.7 (7.3)	5.7 (14.6)	10.3 (3.3)	9.1	7,768
2017	36	69.8 (6.8)	5.9 (13.6)	9.6 (3)	9.6	9,468
2018	35	56 (7.1)	6.5 (14.2)	11.5 (2.8)	10.2	7,836
2019	21	56.8 (5.1)	6.6 (8.6)	11.2 (3.4)	11.2	4,772
Total	227	54.3 (16.2)	5.7 (3.0)	10.0 (2.6)	11.2	48,008

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