

Lake Tyler

2019 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 Tyler were surveyed in 2019 using electrofishing. Anglers were surveyed from December 2019 – May 2020 with a creel survey. Historical data are presented with the 2019-2020 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 Tyler is a 4,500-acre impoundment located on Mud Creek in the Angelina River Basin approximately 6 miles southeast of Tyler, Texas. Primary water uses included municipal water supply and recreation. Water level has remained within 2.5 feet of conservation pool since 2014. Lake Tyler has moderate to high productivity. Habitat features consisted of natural shoreline and native vegetation.

Management History: Important sport fish include Channel Catfish, White Bass, Largemouth Bass and crappie. Florida Largemouth Bass fingerlings have been stocked annually to increase the potential of large (>8 pounds) fish in the reservoir. Littoral hydrilla treatments (up to 200 feet from shore) were conducted in 2007 and annually from 2009-2011; no additional hydrilla treatments have been conducted since that time.

Fish Community

- **Prey species:** Threadfin Shad were present in the reservoir. Electrofishing catch rate of Gizzard Shad was low and only 45% were available as prey to most sport fish. Electrofishing catch rate of Bluegill was high and most were less than 6-inches long.
- **Catfishes:** No directed sampling efforts were conducted for catfish, however both Blue and Channel Catfish have been documented through creel surveys and recent water body record certifications.
- **White Bass:** No directed sampling efforts were conducted for White Bass, however winter-time rod and reel angling documented their presence.
- **Black bass:** Spotted Bass were present in the reservoir in low abundance. Largemouth Bass were moderately abundant and displayed both a balanced size structure and desired body condition. Largemouth Bass growth to legal length was moderate (average age at 14 inches was 3.0 years). Largemouth Bass were the most popular species targeted during the most recent creel survey, accounting for 52% of all angling effort.
- **Crappie:** Black and White Crappie were present in the reservoir and historically have provided a popular fishery. Crappie were the second most popular species targeted during the most recent creel survey, accounting for 43% of all angling effort.

Management Strategies: Continue stocking Florida Largemouth Bass at 1000/km of shoreline annually. Assist the controlling authority in preparing earthen rearing ponds for growing out 2-inch Channel Catfish and stock into Lake Tyler the following year. Inform the public about the negative impacts of aquatic invasive species and work with controlling authority as needed to provide technical guidance. Continue managing all sport fish under statewide harvest regulations.

Introduction

This document is a summary of fisheries data collected from Lake Tyler in 2019-2020. 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 2019-2020 data for comparison.

Reservoir Description

Lake Tyler is a 4,500-acre impoundment constructed in 1951 (East arm completed in 1967) on Mud Creek, a tributary of the Angelina River. It is located in Smith County approximately 6 miles southeast of Tyler, Texas and is operated and controlled by the city of Tyler. Primary water uses included municipal water supply and recreation. Lake Tyler was eutrophic with a mean TSI cl-a of 54.74 (Texas Commission on Environment Quality 2020). Habitat at time of sampling consisted of rocks, natural shoreline and native submersed and emergent vegetation. Abundant boat docks provide additional habitat for fish. Water level has remained within 2.5 feet of conservation pool since 2014 (Figure 1). Other descriptive characteristics for Lake Tyler are in Table 1.

Angler Access

Lake Tyler has six public boat ramps and no private boat ramps. Additional boat ramp characteristics are in Table 2. Shoreline access is available at all boat ramps, two city parks on the west arm, and at The Boulders camping and RV park (fee).

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ott and Norman 2016) included:

1. Combine historical data sets from Lake Tyler West and Lake Tyler East into one lake code and waterbody.
Action: Lake Tyler is now listed and managed as one waterbody.
2. Monitor the Largemouth Bass population with biennial electrofishing and stock Florida Largemouth Bass annually.
Action: Largemouth Bass were monitored in 2017 and 2019 with fall, night-time electrofishing. Florida Largemouth Bass were stocked annually since 2011.
3. Conduct comprehensive vegetation survey every four years and additional Aquatic Nuisance Species (ANS) surveys, as needed.
Action: A comprehensive survey was conducted in 2019; ANS survey was conducted in 2017.

Harvest regulation history: Sport fish in Lake Tyler are managed under statewide regulations (Table 3).

Stocking history: Florida Largemouth Bass and Channel Catfish are the most frequently stocked species at Lake Tyler. Florida Largemouth Bass were initially stocked in 1979, periodically stocked from 2002 to 2009, and annually since 2011. Adult Channel Catfish were stocked annually from 2004-2010 through a cooperative effort with Tyler Water Utilities (TWU) to compensate for limited natural recruitment. Stocking was temporarily discontinued in 2011 due to poor returns in rearing ponds. A complete stocking history is found in Table 4.

Vegetation/habitat management history: Hydrilla became locally abundant in Hill Creek (West Arm) during the mid-1990s but disappeared without treatment. In 2006, hydrilla was re-discovered near Langley Island and expanded to 204 acres reservoir-wide by 2010; the expansion prompted TWU to

contract for an herbicide treatment in fall of that year. In a compromise between TWU and local anglers, control was limited to a maximum of 200 feet from shore and only in front of residences. However, a prolonged drought reduced reservoir level below conservation pool from summer 2010 through spring 2014 and most submersed species were lost to desiccation; no additional herbicide treatments have been conducted. Beginning in 2014, alligatorweed became problematic and flea beetles were released in April 2015. Water hyacinth was identified at the marina ramp in 2008 and removed by hand. A second infestation was discovered in 2017 north of Hwy 64 on the east arm. Herbicide treatments were conducted in 2018, followed up by mechanical removal of isolated patches; no water hyacinth has been observed since the fall of 2019.

Water transfer: No interbasin transfers exist.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Tyler (Ott and Norman 2016). Primary components of the OBS plan are listed in Table 5. All surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1.0 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 and creel statistics.

Creel survey – A roving creel survey was conducted from December 2019 through May 2020. Angler interviews were conducted on 5 weekend days and 4 weekdays per quarter 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 vegetation survey was conducted in 2019. 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 2020).

Results and Discussion

Habitat: Vegetation coverage has historically fluctuated, likely attributable to fluctuating water levels. Favorable aquatic vegetation has increased in recent years, covering 7% of the reservoir in 2019. Coontail was more abundant (47 surface acres) in the 2019 survey and a fringe of *Panicum* (57 surface acres) surrounded the majority of the shoreline (Table 6). The last structural habitat survey was conducted in 2003 (Ott and Bister 2004).

Creel: Prior to combining both waterbodies in 2017, creel surveys were conducted separately on Lake Tyler West and Lake Tyler East. Historical data from these two reservoirs can be found in either management report from 2016 (Ott and Norman 2016). Largemouth Bass and crappie were the two most popular sport fish targeted during the most recent creel survey, accounting for 52% and 43% of all directed effort (Table 7). Total angling effort for the creel period was estimated at 99,290 hours and anglers spent an estimated \$344,048 in direct expenditures (Table 8).

Prey species: The primary prey base continued to be Threadfin Shad and sunfish. Electrofishing catch rates of Bluegill and Gizzard Shad were 482.0/h and 60.0/h, respectively. Index of Vulnerability (IOV) for Gizzard Shad was similar to previous surveys, indicating that 45% of Gizzard Shad were available to existing predators (Figure 2). Total CPUE of Gizzard Shad was lower than the previous two surveys (90.5/h, 2013; 109.5/h, 2015). Total CPUE of Bluegill was lower than 2015 (776.0/h) but higher than 2013 (393.0/h); size structure continued to be dominated by small individuals (Figure 3).

Catfish: Blue and Channel Catfish are present in the reservoir. Directed fishing effort, catch per hour, and total harvest for Channel Catfish was 4,118 h, 1.3 fish/h, and 5,428 fish, respectively, from December 2019–May 2020 (Table 9). Harvested fish ranged in length from 13-24 inches (Figure 4). Catfish accounted for 4% of total directed fishing effort.

Black bass: Spotted Bass were present in the reservoir in low abundance. The 2019 Largemouth Bass electrofishing catch rate (88.0/h) was lower than the previous two surveys (2015 and 2017; Figure 5).

Size structure was similar over the past three surveys and suggested a balanced population (PSD range = 40 - 52). Body condition of Largemouth Bass was desirable (Wr range = 85-110) and was consistent across size classes. Growth was moderate; average age at 14 inches (13.0 to 14.8 inches) was 3.0 years ($N = 13$; range = 2-5 years).

Directed fishing effort, catch per hour, and total harvest for Largemouth Bass was 51,119 h, 0.6fish/h, and 6,086 fish, respectively, over the last creel period (Table 10). Anglers released an estimated 74% of legal fish caught; the majority of harvested fish were between 14 to 18 inches. Approximately 94% ($N=42,906$) of Largemouth Bass caught and released were less than 4 lbs., while 6% ($N=2,316$) were between 4-7 lbs. Historically, both lakes were popular tournament destinations, however no tournaments were documented during the most recent creel survey. This can likely be attributed to COVID-19 social distancing orders that forced most tournaments scheduled in March-April 2020 to be postponed.

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 42,269 h, 2.5 fish/h, and 44,356 fish, respectively, from December 2019–May 2020 (Table 11). Harvested fish ranged in length from 10—14 inches (Figure 7). Crappie accounted for 43% of total directed fishing effort.

Fisheries Management Plan for Lake Tyler, Texas

Prepared – July 2020

ISSUE 1: Anecdotal tournament results, recent lake record (12.82 pounds), and creel data indicate Lake Tyler has the potential to produce trophy Largemouth Bass. However, electrofishing data suggests the population consists primarily of small fish (83% of fish collected were < 14 inches). The prey base is excellent (abundant Threadfin Shad and sunfish) and fish reach legal length on average within 3.0 years. The most recent creel survey indicated 74% of legal-length fish were released. Given the adequate growth, abundant forage, and moderate harvest rates, stocking Florida Largemouth Bass should increase trophy fish abundance.

MANAGEMENT STRATEGY

1. Stock Florida Largemouth Bass fingerlings every year at 1000/km of shoreline to increase the trophy potential in the reservoir. Sampling objectives outlined in the OBS plan will be focused on monitoring Largemouth Bass size structure to help justify and continue stocking.

ISSUE 2: The low-density Channel Catfish population continues to be hindered by recruitment problems. A cooperative effort between the TWU and TPWD had produced and stocked 27,765 advanced fingerling Channel Catfish prior to temporarily discontinuing the program for re-evaluation. TWU has cleaned up the rearing ponds and has expressed interest to restart the program.

MANAGEMENT STRATEGIES

1. Request 2-inch fingerlings for stocking in TWU ponds annually, beginning in 2021.
2. Advise and assist TWU with maintaining water quality in their ponds until fish are harvested and stocked into Lake Tyler.

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, when appropriate.
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 (2020–2024)

Sport fish, forage fish and other important fishes

Sport fish in Lake Tyler include Largemouth Bass, crappie, Channel Catfish and White Bass. Important forage species include Gizzard and Threadfin Shad, and sunfishes.

Low-density fisheries

White Bass and Channel Catfish have historically been present in the reservoir however gill net surveys have produced low and variable catch rates. The historical data suggests it would take > 50 net nights to estimate size structure or relative abundance with 80% confidence. Large-scale changes for both species will be monitored with a creel survey during the winter and spring quarters of 2023/2024.

Survey objectives, fisheries metrics and sampling objectives

Crappie: Historical trap net data fluctuated among survey years; catch rates were very dependent upon sample location resulting in overall poor survey precision. Due to the unpredictability of trap net survey success and the large sample size required to reliably estimate crappie trend data (CPUE, PSD, W_r), trap net surveys were discontinued in 2011. Inferences about the crappie population and identification of potential applied management actions will be made from data collected with creel surveys in 2024

Largemouth Bass: Largemouth Bass are the most popular sport fish in Lake Tyler and receive high angling pressure (11.4 angling hours/acre). Due to the relative importance of this fishery, Largemouth Bass trend data on relative abundance, size structure, body condition, and growth (CPUE, PSD, W_r , average age at 14") will continue to be monitored with biennial nighttime electrofishing, alternating between spring (2021) and fall (2023) surveys. The spring sampling should result in a more accurate size structure estimate, as fall surveys have been typically dominated by fish < 12 inches in length; anecdotal evidence and creel survey data indicate quality bass are present in the reservoir. Historical fall electrofishing data suggests that sampling objectives ($RSE \leq 25$, $N > 50$) can be met with 12-18 randomly selected 5-minute sampling sites. Otoliths will be removed from 13 specimens (13.0- 14.9 inches), if available, during the 2023 survey for age and growth analysis and fin clips will be taken from 30 individuals for genetic analysis

Prey Species: Gizzard Shad, Threadfin Shad and sunfish are important prey species in Lake Tyler. Long-term trend data is desired for these populations to evaluate their relative abundance (CPUE) and size structure (PSD). Relative weights of the Largemouth Bass population, along with size structure of Bluegill and the IOV of Gizzard Shad, will be used to gauge prey fish availability for sport fishes from electrofishing sampling conducted in fall 2023. No sampling objectives will be set for prey species.

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Tables and Figures

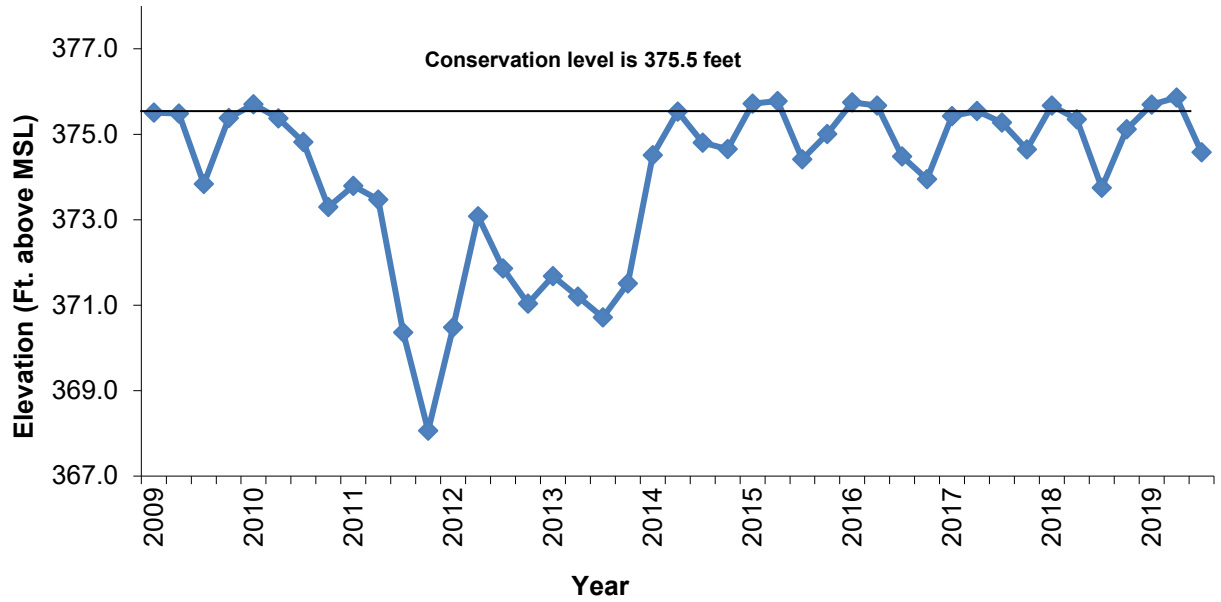


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Tyler, Texas.

Table 1. Characteristics of Lake Tyler, Texas.

Characteristic	Description
Year constructed	1951 (East arm added in 1967)
Controlling authority	Tyler Water Utilities
County	Smith
Reservoir type	Tributary
Shoreline Development Index	4.4
Conductivity	100 μ S/cm

Table 2. Boat ramp characteristics for Lake Tyler, Texas July, 2019. Reservoir elevation at time of survey was 375 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public (fee)	Parking capacity (N)	Elevation at end of boat ramp (ft.)	Condition
Lake Tyler Marina	32.21456 -95.18102	Y	50	367.0	Excellent, no access issues
Hill Creek	32.23319 -95.17985	Y	30	368.5	Excellent, no access issues
The Boulders	32.24436 -99.17369	Y	30	369.0	Excellent, no access issues
Highway 64	32.27777 -95.11380	Y	50	372.5	Access compromised when elevation drops >3 ft. below conservation pool. Extension is not feasible.
Omen Road East	32.22931 -95.11660	Y	20	372.5	Usable at near full pool only. Extension is feasible
Omen Road West	32.23743 -99.91345	Y	30	369.5	Excellent, no access issues

Table 3. Harvest regulations for Lake Tyler, 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	14-inch minimum
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 Tyler, Texas. FGL = fingerling; AFGL = advanced fingerling; FRY = fry; ADL = adult; UNK = unknown.

Species	Year	Number	Size
Blue Catfish	1971	8,569	FGL
	1975	50,000	FGL
	Total	58,569	
Channel Catfish	1967	24,000	FGL
	1969	137,600	FGL
	2004	8,000	ADL
	2005	5,000	ADL
	2006	4,450	ADL
	2007	5,000	ADL
	2008	1,990	ADL
	2009	2,475	ADL
	2010	850	ADL
	Total	189,365	
White Bass	1993	192	ADL
Palmetto Bass	1975	50,000	UNK
	1977	49,976	UNK
	1979	49,500	UNK
	1980	267	UNK
	Total	149,743	
Largemouth Bass	1967	120,200	FGL
	1974	989,000	FGL
	Total	1,109,200	
Florida Largemouth Bass	1979	2,470	ADL
	1997	124,593	FGL
	1998	122,647	FGL
	2002	120,824	FGL
	2003	34,040	FRY
	2003	113,812	FGL
	2004	111,663	FGL
	2005	112,507	FGL
	2008	225,826	FGL
	2009	230,905	FGL
	2011	228,657	FGL
	2012	233,354	FGL
	2013	240,088	FGL
	2014	117	ADL
	2015	123,810	FGL
	2016	119,989	FGL
	2017	122,249	FGL
	2018	126,151	FGL
	2019	123,680	FGL
Total	2,517,382		

Table 4. Stocking history continued.

Species	Year	Number	Size
Green X Redear Sunfish	1974	25,000	FGL
ShareLunker Largemouth Bass	2014	26	ADL
	2020	5,050	AFGL
	Total	5,076	

Table 5. Objective-based sampling plan components for Lake Tyler, Texas 2019–2020.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Relative Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ 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	Relative Abundance	CPUE–Total	
	Size structure	PSD, length frequency	$N \geq 50$
Gizzard Shad ^a	Relative Abundance	CPUE–Total	
	Prey availability	IOV	$N \geq 50$

^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 Tyler, Texas, 2012–2019. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2012	2015	2019
Chara/southern naiad	644 (14)		
Chara		260 (6)	
Coontail		tr	47(1)
Pondweed		2 (<1)	17 (<1)
Variable-leaf watermilfoil	3 (<1)		
Spatterdock	7 (<1)	23 (<1)	41 (<1)
Spatterdock/maidencane		70 (2.0)	
Coontail			
American lotus	4 (<1)		7 (<1)
Maidencane/ <i>Panicum</i>	27 (<1)	174 (4)	57 (1)
Bulrush		tr	2(<1)
Water primrose		4 (<1)	tr
Bladderwort			6(<1)
Buttonbush			44 (1)
White Water Lilly			77(2)
Cutgrass			tr
Bushy Pondweed			tr
Non-native			
Alligatorweed (Tier III)*	50 (1)	4 (<1)	tr
Hydrilla (Tier III)*	tr		

* Tier III is Watch Status

Table 7. Percent directed angler effort by species for Lake Tyler, Texas. Survey period was December 2019 – May 2020.

Species	2019/2020
Catfish	4.2
Largemouth Bass	51.7
Crappie	42.7
Anything	1.4

Table 8. Total fishing effort (h) for all species and total directed expenditures at Lake Tyler, Texas. Survey period was December 2019 – May 2020. Relative standard error is in parentheses.

Creel statistic	2019/2020
Total fishing effort	99,290 (12)
Total directed expenditures	\$344,048 (37)

Gizzard Shad

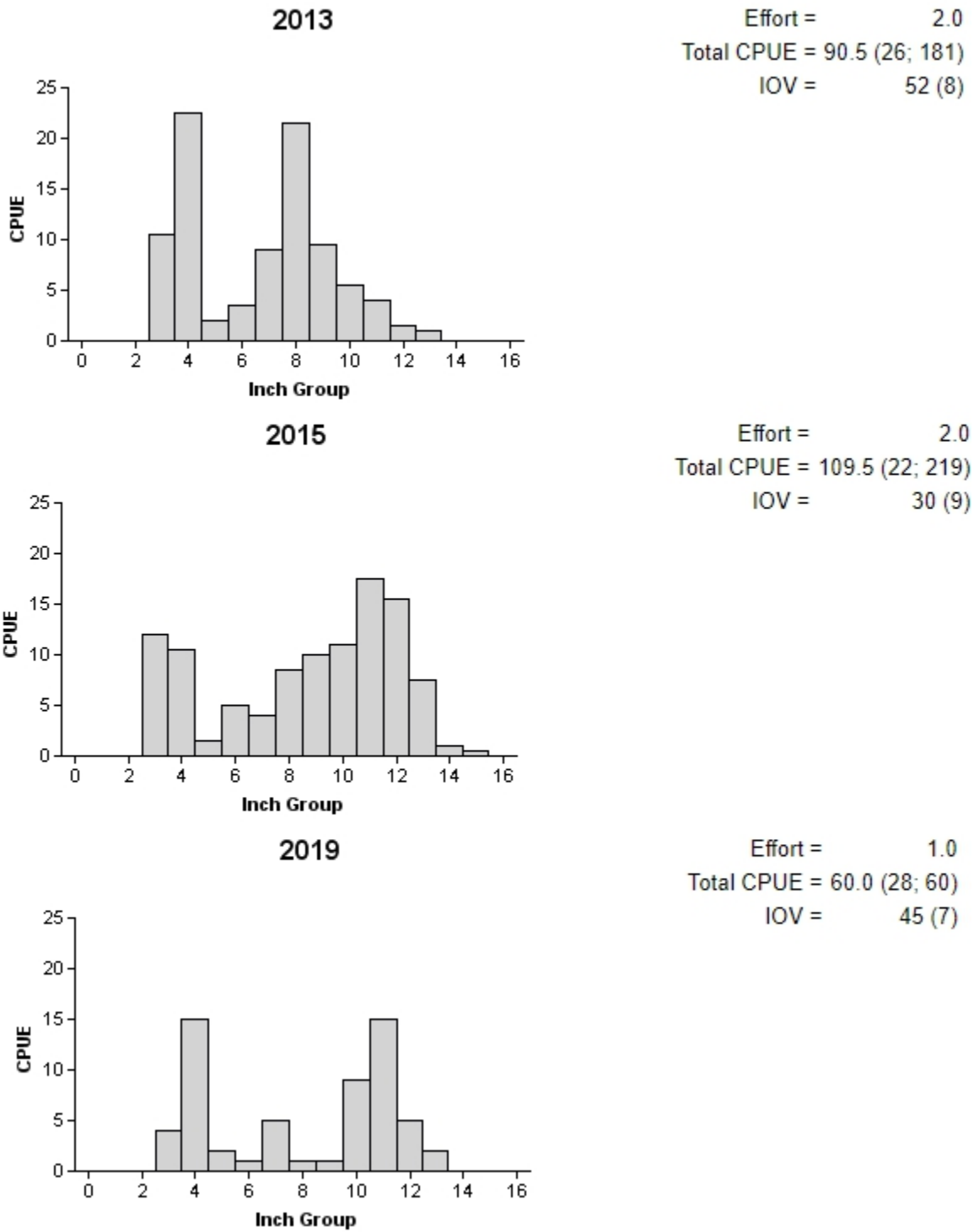


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Tyler, Texas, 2013, 2015 and 2019.

Bluegill

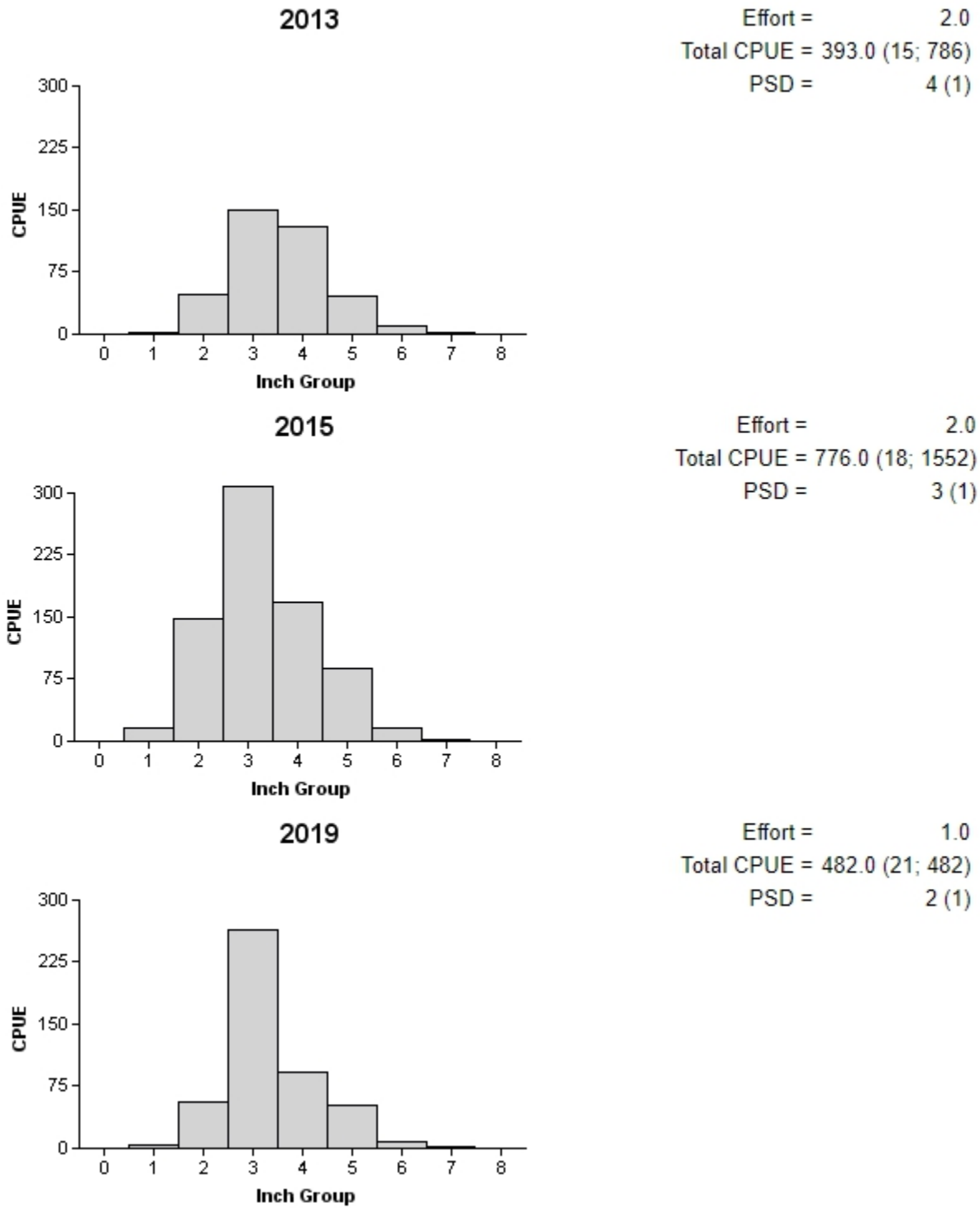


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Tyler, Texas, 2013, 2015 and 2019.

Channel Catfish

Table 9. Creel survey statistics for Channel Catfish at Lake Tyler, Texas, from December 2019 through May 2020. Total catch per hour is for anglers targeting Channel Catfish and total harvest is the estimated number of Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	2019/2020
Surface area (acres)	4,500
Directed angling effort (h)	4,118 (37)
Angling effort/acre	0.92 (37)
Total catch per hour	1.33 (70)
Total harvest	5428 (67)
Harvest/acre	1.21 (67)
Percent legal released	0.0

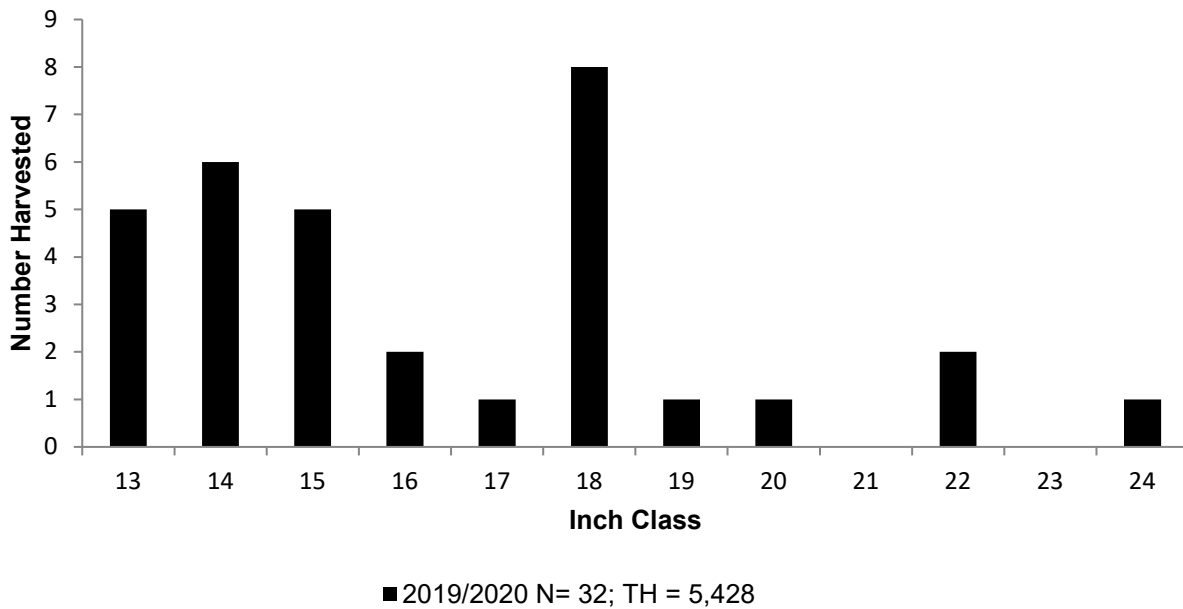


Figure 4. Length frequency of harvested Channel Catfish observed during creel surveys at Lake Tyler, Texas, December 2019 through May 2020, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth Bass

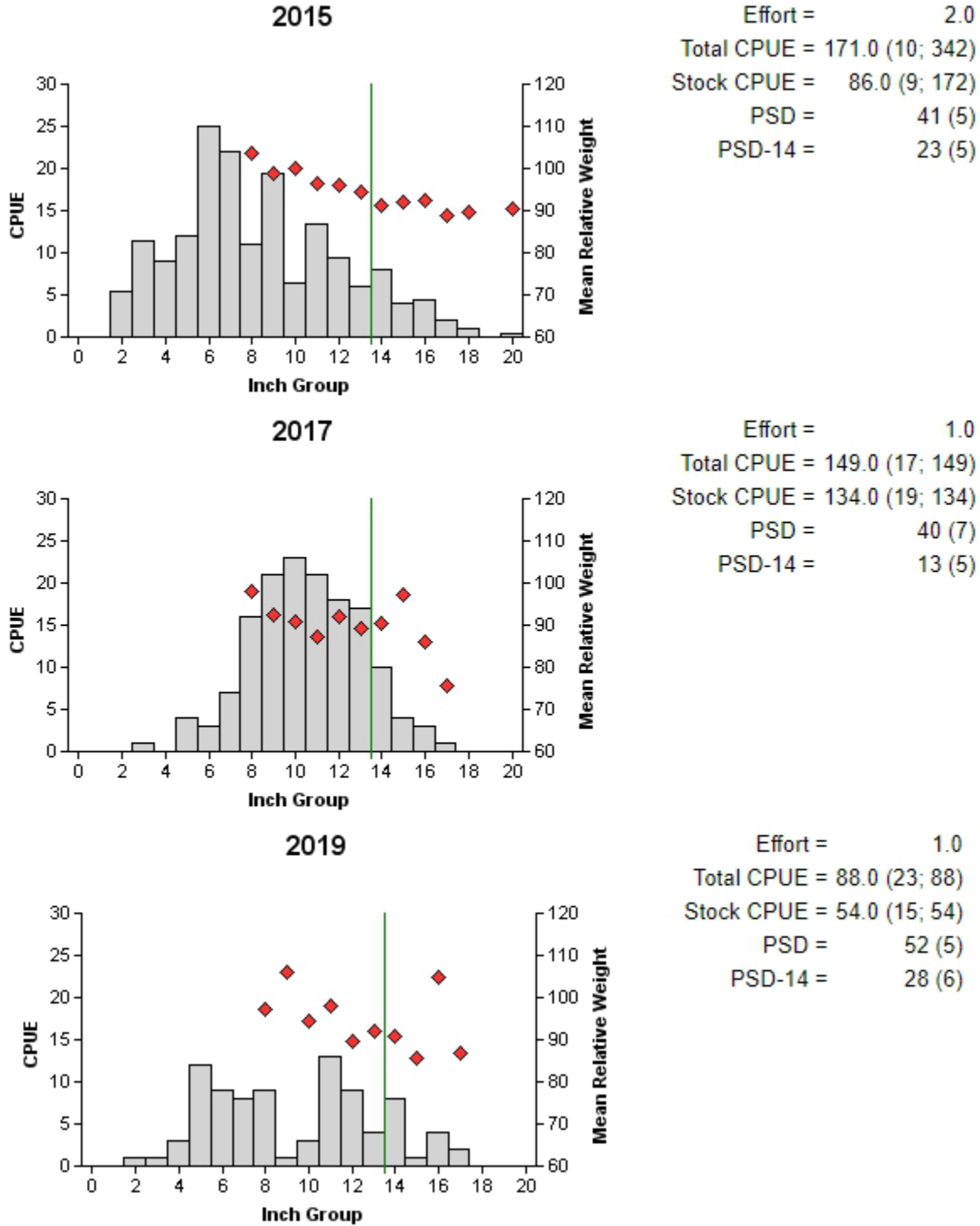


Figure 5. Number of Largemouth Bass caught per hour (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Tyler, Texas, 2015, 2017 and 2019. Vertical line indicates minimum length limit.

Table 10. Creel survey statistics for Largemouth Bass at Lake Tyler, Texas, from December 2019 through May 2020. Catch rate is for all anglers targeting Largemouth Bass. Harvest is partitioned by the estimated number of fish harvested by non-tournament anglers and the number of fish retained by tournament anglers for weigh-in and release. The estimated number of fish released by weight category is for anglers targeting Largemouth Bass. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	2019/2020
Surface area (acres)	4,500
Directed angling effort (h)	51,119 (20)
Angling effort/acre	11.4 (20)
Catch rate (number/h)	0.6 (17)
Harvest	6,086 (11)
Harvest/acre	1.35 (11)
Release by weight	
<4.0 lbs.	42,906 (54)
4.0-7.0 lbs.	2,316 (66)
Percent legal released (non-tournament)	74

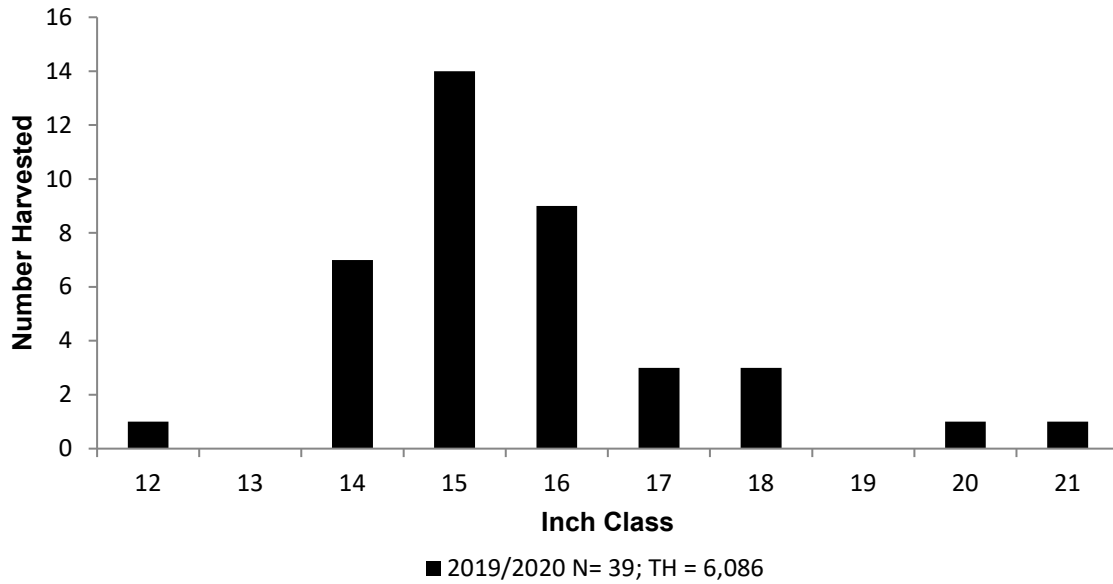


Figure 6. Length frequency of harvested Largemouth Bass observed during creel surveys at Lake Tyler, Texas, December 2019 through May 2020, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Crappie

Table 11. Creel survey statistics for Crappie at Lake Tyler, Texas, December 2019 through May 2020. 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	2019/2020
Surface area (acres)	4,500
Directed effort (h)	42,268 (20)
Directed effort/acre	9.4 (20)
Total catch per hour	2.5 (38)
Total harvest	44,356(40)
White Crappie	22,498 (40)
Black Crappie	21,858 (39)
Harvest/acre	9.9 (40)
Percent legal released	3

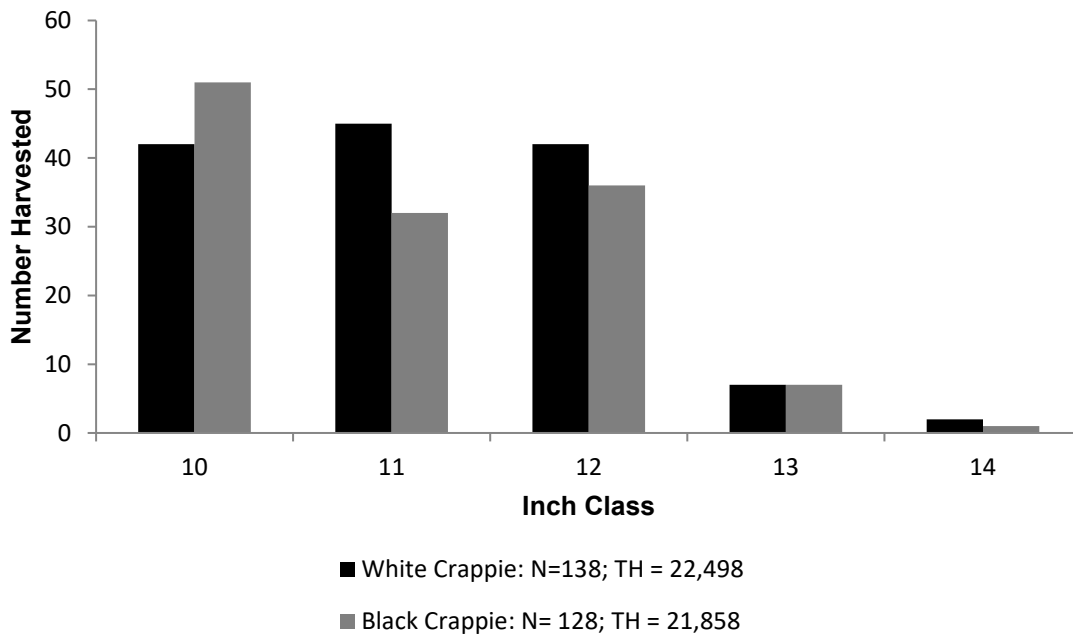


Figure 7. Length frequency of harvested Black and White Crappie observed during creel surveys at Lake Tyler, Texas, December 2019 through May 2020, all anglers combined. N is the number of harvested crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Proposed Sampling Schedule

Table 12. Proposed sampling schedule for Lake Tyler, Texas. Survey period is June through May. Standard (S) electrofishing surveys are conducted in the fall while additional (A) electrofishing surveys are conducted in the spring.

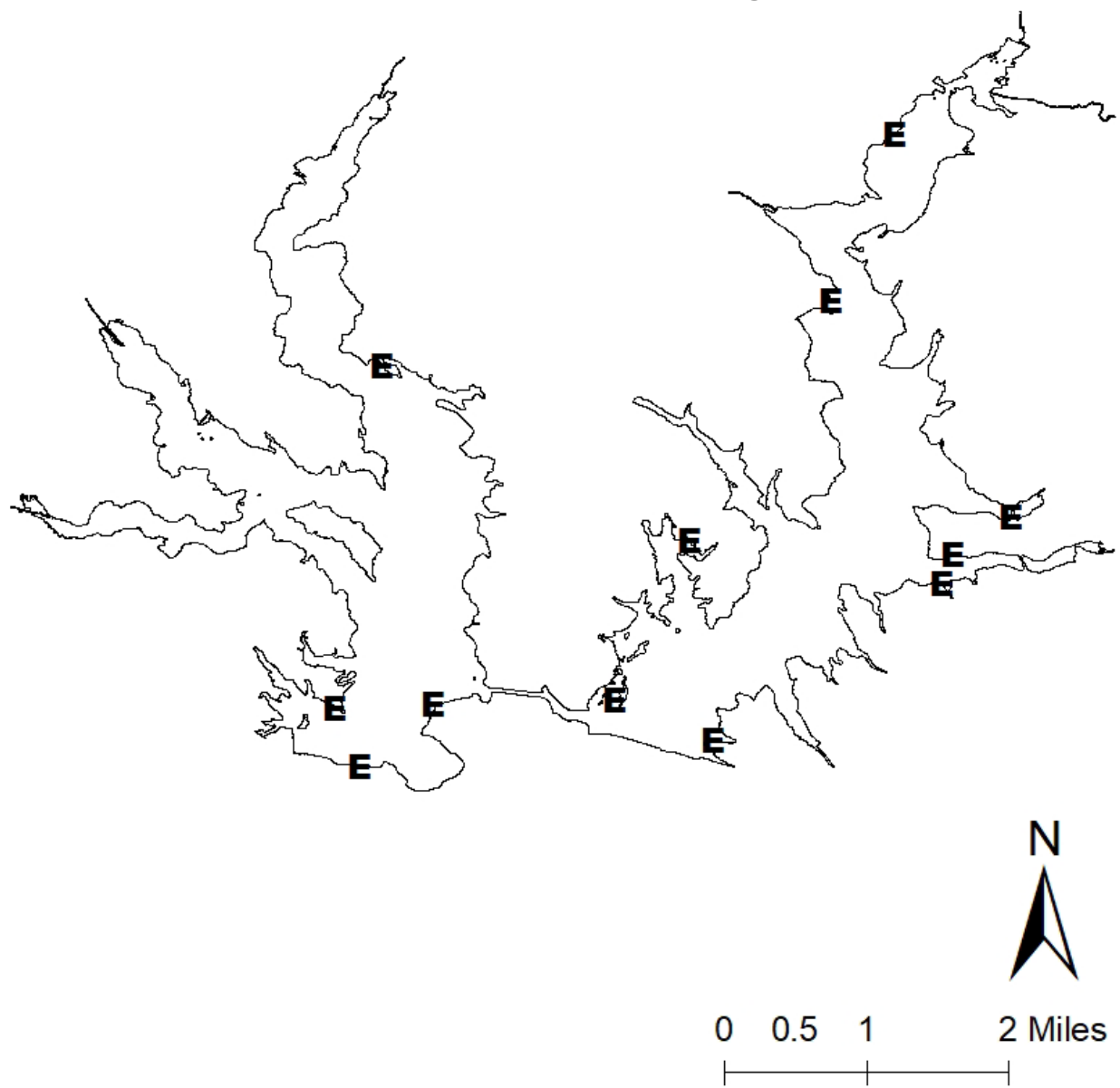
	Survey year			
	2020-2021	2021-2022	2022-2023	2023-2024
Angler access				S
Vegetation				S
Electrofishing				S
Electrofishing (bass only)	A			
Creel survey				S
Report				S

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

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Lake Tyler, Texas, 2019-2020. Sampling effort was 1 hour of electrofishing.

Species	N	CPUE
Gizzard Shad	60	60.0 (28)
Threadfin Shad	951	951.0 (26)
Redbreast Sunfish	46	46.0 (45)
Bluegill	482	482.0 (21)
Longear Sunfish	1	1.0 (100)
Redear Sunfish	61	61.0 (29)
Warmouth	34	34.0 (39)
Orangespotted Sunfish	1	1.0 (100)
Spotted Bass	3	3.0 (52)
Largemouth Bass	88	88.0 (23)

APPENDIX B – Map of sampling locations



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



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