Lake Welsh

2023 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in Lake Welsh were surveyed in 2021 and 2023 using an electrofishing survey. Anglers were surveyed from December 2023 through February 2024 with a creel survey. Historical data are presented with the 2020-2024 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 Welsh is a 1,333-acre cooling reservoir for coal-fueled power generation located on Swaunano Creek in the Big Cypress River Basin. The reservoir is in Titus County. Habitat features consist of standing timber, rocky shoreline, riprap, and aquatic vegetation.

Management History: Largemouth Bass is the primary sport fish in Lake Welsh. Largemouth Bass have been managed under an 18-inch minimum length limit, 5 fish daily bag limit since September 1994. All other sport fishes in Lake Welsh have been managed with statewide regulations. Florida Largemouth Bass stockings in 1975 and 1976 were successful in establishing the Florida Largemouth Bass genetics in the population.

Fish Community

- **Prey species:** Threadfin and Gizzard Shad were present in the reservoir in low abundance, similar to past surveys. Electrofishing catch rate of Bluegill increased considerably between 2021 and 2023. No Bluegill over 6-inches in length observed. Additional sunfish species were present at lower abundances.
- **Largemouth Bass:** Largemouth Bass abundance remained high in 2021 and 2023. The population was balanced, with a good number of stock-sized fish (>8 inches), and fish above the legal 18-inch limit. All anglers interviewed at Lake Welsh targeted Largemouth Bass.

Management Strategies: Conduct electrofishing surveys in 2025 and 2027, and an aquatic vegetation survey in 2027. Additional vegetation surveys will be conducted annually from 2024-2027 to monitor non-native aquatic vegetation. Largemouth Bass will continue to be managed under the current 18-inch minimum length limit while all other sport fish will be managed under statewide harvest regulations.

Introduction

This document is a summary of fisheries data collected from Lake Welsh from 2020-2024. 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 2020-2024 data for comparison.

Reservoir Description

Lake Welsh is a 1,333-acre impoundment constructed in 1976 on Swaunano Creek in the Cypress River Basin. The reservoir is in Titus County approximately 10 miles southeast of Mount Pleasant. The controlling authority is American Electric Power Company. Lake Welsh is a cooling reservoir for coal-fueled power generation. It has a watershed of approximately 34 square miles and a shoreline length of 27 miles. Annual water level fluctuation was approximately 2 ft from 2013 to 2023 with two notable lower water periods in 2019 (3 ft low) and 2022 (5 ft low) (Figure 1). Habitat features consist of standing timber, rocky shoreline, and aquatic vegetation. Other descriptive characteristics for Lake Welsh are in Table 1.

Angler Access

Lake Welsh has one public boat ramp and no private boat ramps. American Electric Power controls the boat ramp and public parking area while Titus County maintains the public road that leads directly to the boat ramp. Recent improvements have been made by American Electric Power to the boat ramp parking area. However, additional issues at the boat ramp, such as water level and siltation, can cause difficulties launching a vessel. Shoreline access is limited to the public boat ramp area. Additional boat ramp characteristics are in Table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Stadig and Bister 2020) included:

1. Monitor and manage Largemouth Bass at an 18-inch minimum length limit to improve fishing quality.

   Action: Largemouth Bass and prey species were monitored using electrofishing during 2021 and 2023.

2. Conduct annual aquatic vegetation surveys to monitor hydrilla and other invasive species.

   Action: Aquatic vegetation surveys were conducted in August 2020 through 2023 to monitor hydrilla coverage and other invasive species.

Harvest regulation history: Largemouth Bass have been managed under an 18-inch minimum length limit, 5 fish daily bag limit since September 1994. All other sport fishes in Lake Welsh have been, and currently are, managed with statewide regulations. Current regulations are found in Table 3.

Stocking history: Florida Largemouth Bass were stocked in the reservoir in 1975 and 1976 (Table 4). Florida Largemouth Bass alleles have not dropped below 89% after stocking and thus were not sampled this survey period. Channel Catfish fingerlings were also stocked in 1975 and 1976. Blue Catfish were stocked in 1978 and Black Crappie were stocked from 1988 to 1990, but a self-sustaining fishery never developed for these species. The complete stocking history is presented in Table 4.

Vegetation/habitat management history: Hydrilla was the dominant vegetation type and continues to fluctuate in abundance and coverage as result from hot-water discharge from coal-fueled power generation. Hydrilla coverage in 2023 was above the 20-year average for Lake Welsh. Native emergent and floating species were present though in low densities (1% of the reservoir area) in 2023. Alligatorweed was observed in 2023 but has not expanded since 2015 and total coverage remains low. Alligatorweed Flea beetles were released in the spring of 2021 to mitigate plant abundance.

Water transfer: Lake Welsh receives supplemental water from Lake O' The Pines to help maintain necessary water levels to function as a cooling reservoir for the American Electric Power generation plant. This water transfer is within the Cypress River Basin.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Welsh (Stadig and Bister 2020). 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 2022).

Common names of fishes and their hybrids in this report are used following Page et al. (2023) with an exception for Largemouth Bass. While we recognize recent changes to black bass names, Texas reservoirs contain a mix of Florida Bass, Largemouth Bass, and their intergrade offspring. Therefore, Largemouth Bass is used in this report for simplicity as well as consistency with previous reports.

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad 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. To monitor Largemouth Bass growth (mean age at 14 inches), fish ages were determined using otoliths from 13 randomly selected fish (range 13.0 to 14.9 inches).

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 Neumann et al. (2012). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 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 and creel statistics.

Creel survey – A winter access-point creel survey was conducted from December 2023 through February 2024. 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 2022).

Habitat – A structural shoreline habitat survey was last conducted in 1995 and a survey of standing timber (open water structural habitat) was conducted in 2011. Results from these surveys are reported as minimal change to structural habitat has occurred since previous surveys. Annual nuisance aquatic vegetation surveys were conducted in 2020–2023 to monitor expansion of hydrilla. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Water level –Water level data was provided by the American Electric Power Company.

Results and Discussion

Habitat: Structural and shoreline habitat has not changed significantly since surveyed in 1995 and 2011, respectively. The shoreline is 90.4% natural shoreline with some soil cement (6.3%) and rip rap (3.3%) making up the remainder (Ryan and Brice 1996). Standing timber covered 32.7% of the reservoir surface area (Wright and Bister 2012). In 2023, native vegetation covered 14 acres of the reservoir's surface including American Lotus and shallow emergent species (<1%) (Table 6). Hydrilla coverage fluctuated in response to power plant activity and water temperature. Hydrilla coverage in 2023 was 186 acres (14%). Alligatorweed was present in low abundance.

Creel: Directed fishing effort was only observed for Largemouth Bass (100%) in 2023/2024 (Table 7). High directed angler effort for Largemouth Bass was also observed in previous winter creel surveys in 2007/2008 (98.7%) and 2015/2016 (95.6%). Total fishing effort in 2023/2024 was lower than in 2015/2016, however direct expenditures were higher ($228,471)in 2023/2024 than the previous winter

creel surveys (Table 8). Fifty-two percent of anglers traveled more than 50 miles to fish at Lake Welsh during the 2023/2024 winter creel period (Appendix C) and was lower than the 2007/2008 (73%) and 2015/2016 (64%) winter surveys. A lower proportion of anglers from the Dallas / Fort Worth area was observed in 2023/2024 compared to the previous two surveys.

Prey species: Gizzard Shad were present in the most recent electrofishing surveys, but catch rate was very low (6.0/h, Figure 2). Threadfin Shad were not present in 2023 but have been observed in previous surveys (Wright and Bister 2016; Stadig and Bister 2020). High water temperature from power generation during the summer months leads to lake-wide fish kills most years and is likely the cause of low shad abundance. Electrofishing catch rates of Bluegill were 544/h in 2021 and 2,118/h in 2023 (Figure 3). The size distribution of Bluegill in Lake Welsh primarily includes small individuals, with 97% of Bluegill observed in 2023 under five inches in length. The high abundance and small size of Bluegill in Lake Welsh provides ample forage for Largemouth Bass.

Largemouth Bass: The total catch rate of Largemouth Bass during the electrofishing surveys was variable over the past three surveys with 286/h in 2019, 166/h in 2021, and 228/h in 2023 (Figure 4). Catch rates of stock-size Largemouth Bass (8 inches or greater) in 2021 (159/h) and 2023 (188/h) were lower than 2019 (244/h) but were comparable to the 20-year average (159/h). Catch rates of 18-inch Largemouth Bass decreased from 20/h in 2019 to 16/h in 2023, however 18-inch fish remain available for angling opportunities in good abundance. In 2021, many quality-size bass (≥ 12”) were observed, inflating the PSD estimate to 82. This is likely the result of the abundant cohort of small individuals observed in 2019. Excluding the 2021 survey, size structure remains consistent on Lake Welsh with PSD of 63 in 2023 and a 20-year average of 59. Largemouth Bass growth rate was fast. The average age of 14-inch Largemouth Bass (13.0 – 14.7 inches) was 1.2 years (N = 13, Range = 1 – 3) in 2021 and 1.1 years in 2023 (N = 14, Range 1 – 2). The body condition of Largemouth Bass in 2021 and 2023 was good for most length groups with a mean $W_r \geq 90$, indicating adequate prey availability. Directed fishing effort for Largemouth Bass from December 2023 through February 2024 was 21,051 hours and catch per hour was 1.0 fish/h (Table 9). All Largemouth Bass of harvestable length were released by non-tournament anglers. The estimated number of Largemouth Bass harvested by live-release tournament anglers was considerably higher in 2023/2024 (1,344) compared to 2007/2008 (N = 351) and 2015/2016 (N = 0). Harvest fish from tournaments ranged in length from 18 to 23 inches (Figure 5).

Fisheries Management Plan for Lake Welsh, Texas

Prepared – July 2024

ISSUE 1: An 18-inch minimum length limit (5 fish daily bag limit) was implemented in September 1994 to improve Largemouth Bass fishing quality. Lake Welsh Largemouth Bass have fast initial growth rates and above average condition. Creel data indicates Lake Welsh is a popular winter bass fishing location particularly for tournament anglers and draws anglers from outside the local area. Aquatic vegetation provides excellent habitat for Largemouth Bass and prey species. Continued sampling of the Largemouth Bass population is necessary to monitor this fishery.

MANAGEMENT STRATEGIES

1. Monitor the Largemouth Bass and prey species with electrofishing in 2025 and 2027 to ensure the population benefits from the special harvest regulation.
2. Monitor Largemouth Bass growth (average age at 14 inches) to ensure protection of fish with the 18-inch minimum length limit is not having any adverse impacts on the population.
3. Monitor aquatic vegetation annually to assess habitat and detect any large-scale changes that may require further action.

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 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 (2024–2028)

Sport fish, forage fish, and other important fishes

Largemouth Bass are the primary sport fish in Lake Welsh. Known important forage species include Bluegill.

Low-density fisheries

Crappie: Crappie species are present in Lake Welsh, but population abundances are extremely low. Only one White Crappie has been observed during an electrofishing survey in 1996. Trap net Black Crappie CPUE from 1989-2003 ranged from 0.0 to 0.2 fish/nn. Trap netting has since been discontinued. Winter creel surveys in 2007/2008, 2015/2016 and 2023/2024 indicated that no directed effort or catch of crappie occurred. Sampling this population is unnecessary in FYs 2024-2028.

Channel Catfish: Channel Catfish are present in Lake Welsh, but the catch rates of recent surveys have been low and variable. From 1989-2012, catch per unit effort of stock sized fish (CPUE-S) in gill nets ranged from 2.6 to 25.4 fish/nn and only two of the last 9 gill net surveys collected more than 50 stock size fish. Winter creel data from 2023/2024 captured no directed effort for Channel Catfish at Lake Welsh. Sampling this population is unnecessary in FYs 2024-2028.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass are the most popular sport fish in Lake Welsh. Winter-quarter creel surveys from 2007/2008, 2015/2016 and 2023/2024 indicate Largemouth Bass angling comprised 95.6% - 100% of total angling effort. Largemouth Bass have been managed with an 18-in MLL regulation since 1994. The popularity and reputation for quality Largemouth Bass fishing at this reservoir warrants sampling time and effort.

Trend data on CPUE, size structure, and body condition (mean W_r) have been collected biennially since 1999 with fall nighttime electrofishing. Continuation of biennial trend data with night electrofishing in the fall of 2025 and 2027 will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation. Past sampling has achieved an RSE of CPUE-stock <25 with 12 randomly selected stations, so we are confident we will achieve this level of precision with the minimum sampling effort. However, an additional three random stations will be determined in the event extra sampling is necessary to meet sampling objectives (N ≥ 50 stock, RSE-Stock ≤ 25). A maximum of 15 stations will be sampled. Otoliths from 13 fish between 13.0 and 14.9 inches will be collected to determine mean age at 14 inches to identify whether growth issues are occurring due to overabundance of fish at this size range that may be caused by the 18-inch minimum length limit.

Bluegill: Bluegill are the primary forage species at Lake Welsh. Like Largemouth Bass, trend data on CPUE and size structure of Bluegill and other sunfish have been collected biennially since 1999. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in sunfish relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers of Bluegill for size structure estimation (PSD using 50 fish minimum) and relative abundance estimates (RSE $\leq$ 25 of CPUE-Total) at 12 stations with 80% confidence. No additional effort will be expended beyond that required to meet Largemouth Bass survey objectives. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

Threadfin Shad: Threadfin Shad are a secondary source of forage in Lake Welsh. Periodic fish kills caused by high water temperature have led to the absence of Threadfin Shad during some surveys, however, they were present in the 2021 fall electrofishing survey. Sampling effort based on sampling objectives for Largemouth Bass will be sufficient to determine presence or absence of shad species.

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Tables and Figures

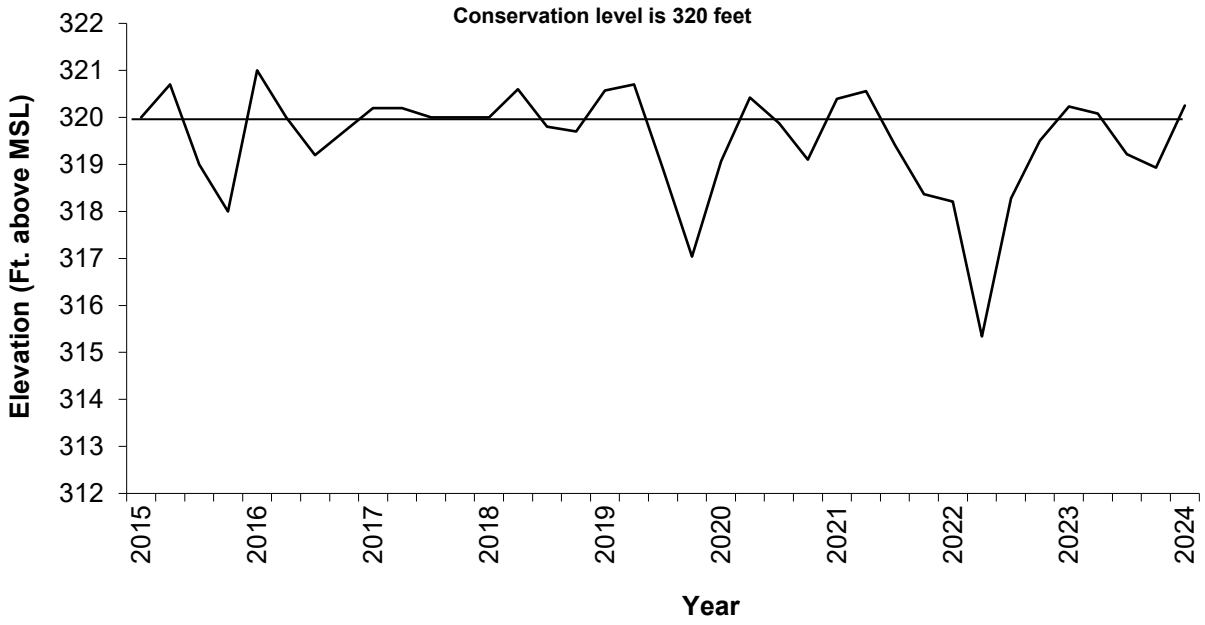


Figure 1. Monthly lake level in feet recorded for Lake Welsh, Texas, from the American Electric Power Company.

Table 1. Characteristics of Lake Welsh, Texas.

Characteristic	Description
Year constructed	1976
Controlling authority	American Electric Power Company
County	Titus
Reservoir type	Tributary, cooling
Shoreline Development Index	5.3
Conductivity	480 µS/cm

Table 2. Boat ramp characteristics for Lake Welsh, Texas, August 2023. Reservoir elevation at time of survey was approximately 865 above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
County Rd 4855	33.07473 -94.84585	Y	40	312	Adequate parking, boat ramp issues at low water levels

Table 3. Harvest regulations for Lake Welsh, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (only 10 ≥ 20 inches)	None
Catfish, Flathead	5	18-inch minimum
Bass, Largemouth	5	18-inch minimum
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Lake Welsh, Texas. FRY = Fry; FGL = fingerling; AFGL = advanced fingerling;, UNK = unknown.

Species	Year(s) Stocked	Number Stocked	Life Stage
Blue Catfish	1978	33,230	UNK
Channel Catfish	1975	64,115	AFGL
	1976	50,000	AFGL
	Total	114,115	
Florida Largemouth Bass	1975	73,350	FRY
	1976	55,000	FRY
	Total	128,350	
Black Crappie	1988	34,125	UNK
	1989	36,769	UNK
	1990	69,176	UNK
	Total	140,070	
Flathead Catfish	1978	68	UNK
	1979	4,800	UNK
	Total	4,868	
Threadfin Shad	1982	16,000	AFGL

Table 5. Objective-based sampling plan components for Lake Welsh, Texas 2020–2024.

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	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad [a]	Abundance	CPUE–Total	
	Size structure	PSD, length frequency	
	Prey availability	IOV	

[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 Welsh, Texas, 2019–2023. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2019	2020	2021	2022	2023
Native submersed					
Native floating-leaved	17 (1.3)				7.4 (0.5)
Native emergent	0.01 (0.01)				6.6 (0.4)
Non-native					
Alligatorweed (Tier III)*	6 (0.4)	7 (0.5)	6 (0.4)	2.3 (0.2)	3.7 (0.3)
Hydrilla (Tier III)*	265 (20)	336 (25)	87 (6.5)	126 (9.4)	186.4 (14)

* Tier III is Watch Status

Table 7. Percent directed angler effort by species for Lake Welsh, Texas, 2023–2024. Survey periods were from 1 December through 29 February.

Species	2007/2008	2015/2016	2023/2024
Channel Catfish	1.3	4.4	0
Largemouth Bass	98.7	95.6	100

Table 8. Total fishing effort (h) for all species and total directed expenditures at Lake Welsh, Texas, 2023-2024. Survey periods were from 1 December through 29 February. Relative standard error is in parentheses.

Creel statistic	2007/2008	2015/2016	2023/2024
Total fishing effort	13,437 (52)	26,947 (41)	21,051 (54)
Total directed expenditures	$108,733 (59)	$161,680 (47)	$228,471 (60)

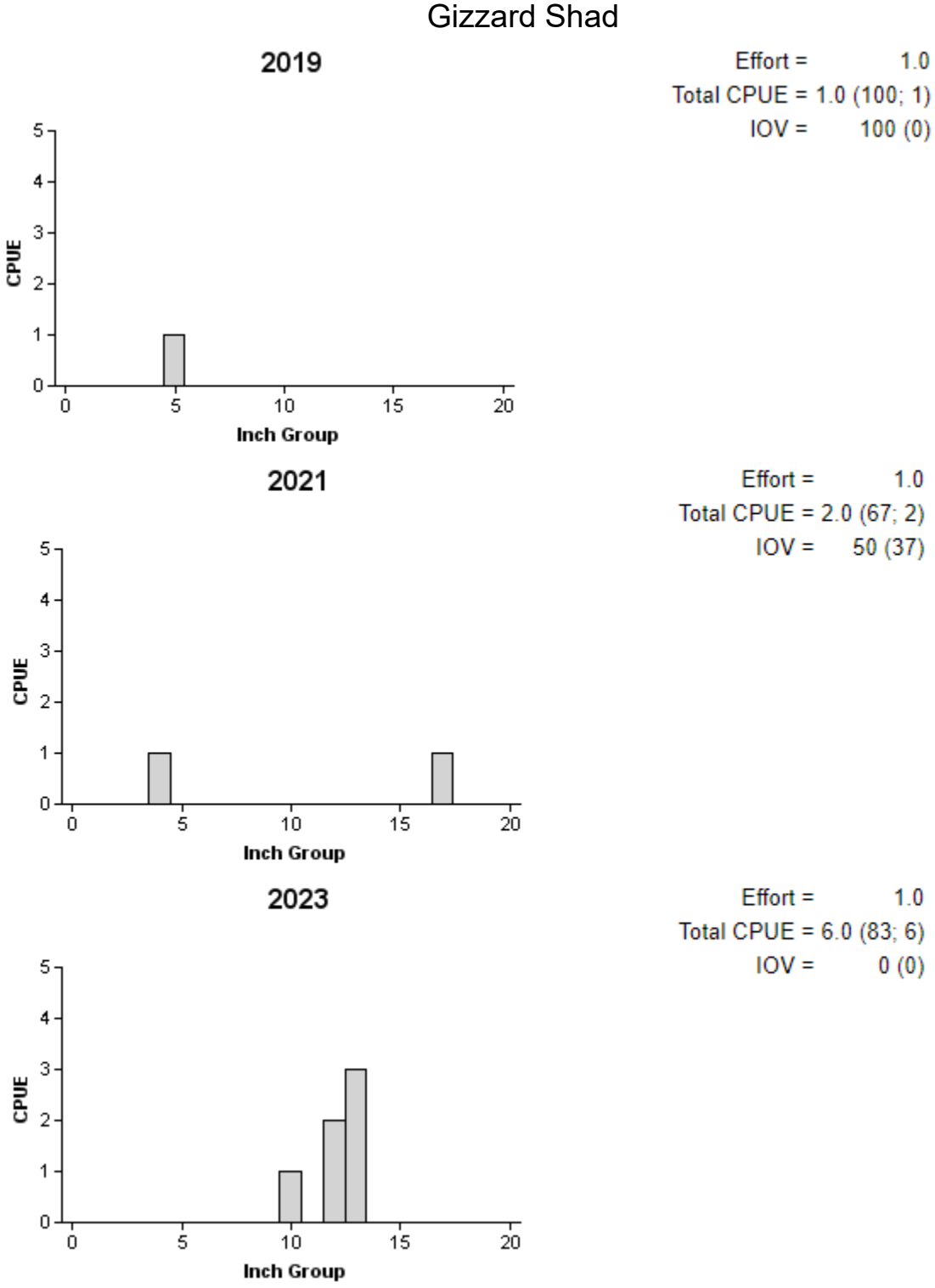


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Welsh, Texas, 2019, 2021, and 2023.

Bluegill

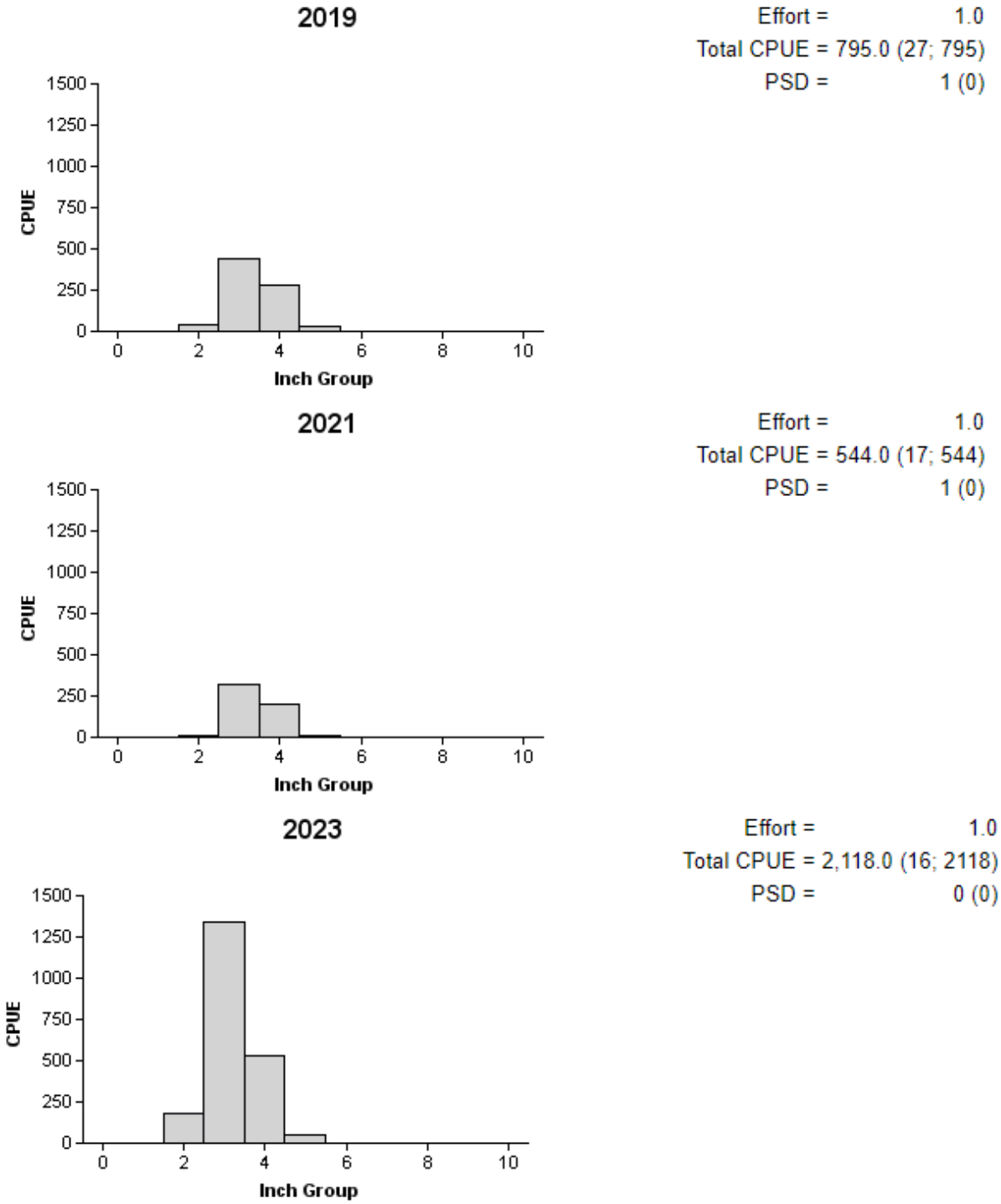


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Welsh, Texas, 2019, 2021, and 2023.

Largemouth Bass

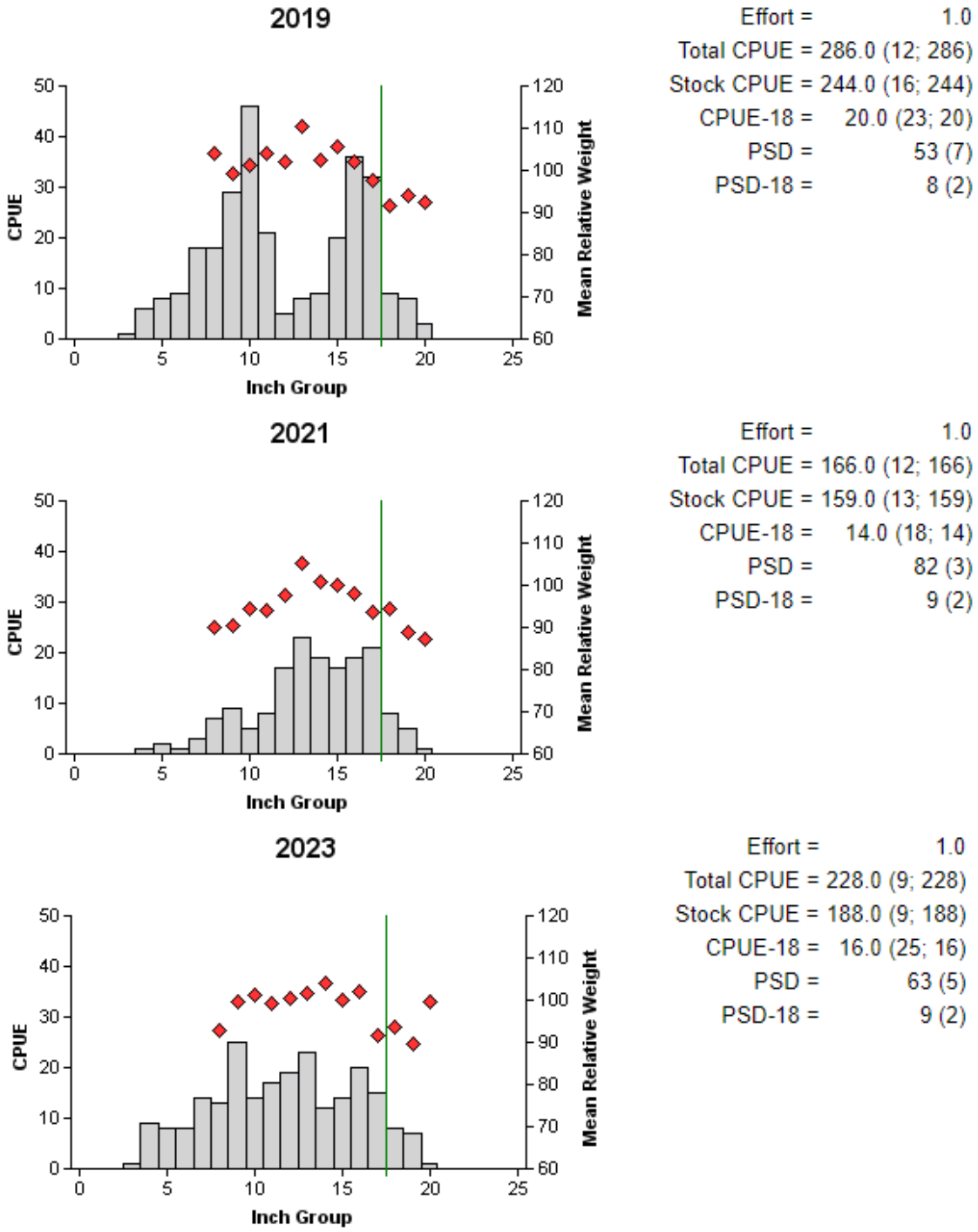


Figure 4. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Welsh, Texas, 2019, 2021, and 2023. Vertical line indicates minimum length limit.

Table 6. Creel survey statistics for Largemouth Bass at Lake Welsh, Texas, from December 2007 through February 2008, December 2015 through February 2016, and December 2023 through February 2024. 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.

Statistic	2007/2008	2015/2016	2023/2024
Surface area (acres)	1,333	1,333	1,333
Directed angling effort (h)			
Tournament	6,629 (53)	5,994 (43)	17,141 (54)
Non-tournament	6,636 (53)	19,775 (41)	3,911 (57)
All black bass anglers combined	13,265 (52)	25,769 (41)	21,051 (54)
Angling effort/acre	10.0 (52)	19.3 (41)	15.8 (54)
Catch rate (number/h)	0.8 (9)	0.8 (7)	1.0 (8)
Harvest			
Non-tournament harvest	0 (0)	28 (84)	0 (0)
Harvest/acre	0.0 (0)	0.02 (84)	0.0 (0)
Tournament weigh-in and release	351 (97)	0 (0)	1,344 (86)
Release by weight			
<4.0 lbs		24,010 (42)	16,629 (61)
4.0-6.9 lbs		2,355 (50)	617 (77)
7.0-9.9 lbs		0 (0)	21 (266)
≥10.0 lbs		0 (0)	0 (0)
Percent legal released (non-tournament)	100	99	100

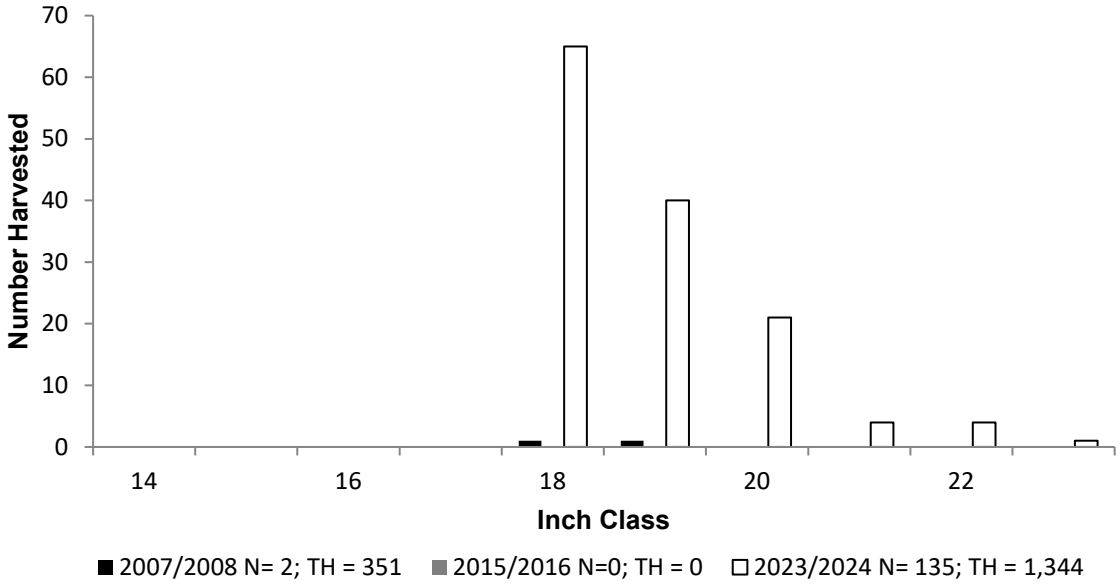


Figure 5. Length frequency of live-release tournament Largemouth Bass observed during creel surveys at Lake Welsh, Texas, December 2007 through February 2024. N is the number of live-release Largemouth Bass observed during creel surveys, and NTH is the estimated live-release tournament harvest for the creel period.

Proposed Sampling Schedule

Table 7. Proposed sampling schedule for Lake Welsh, Texas. Survey period is June through May. Electrofishing surveys are conducted in the fall.

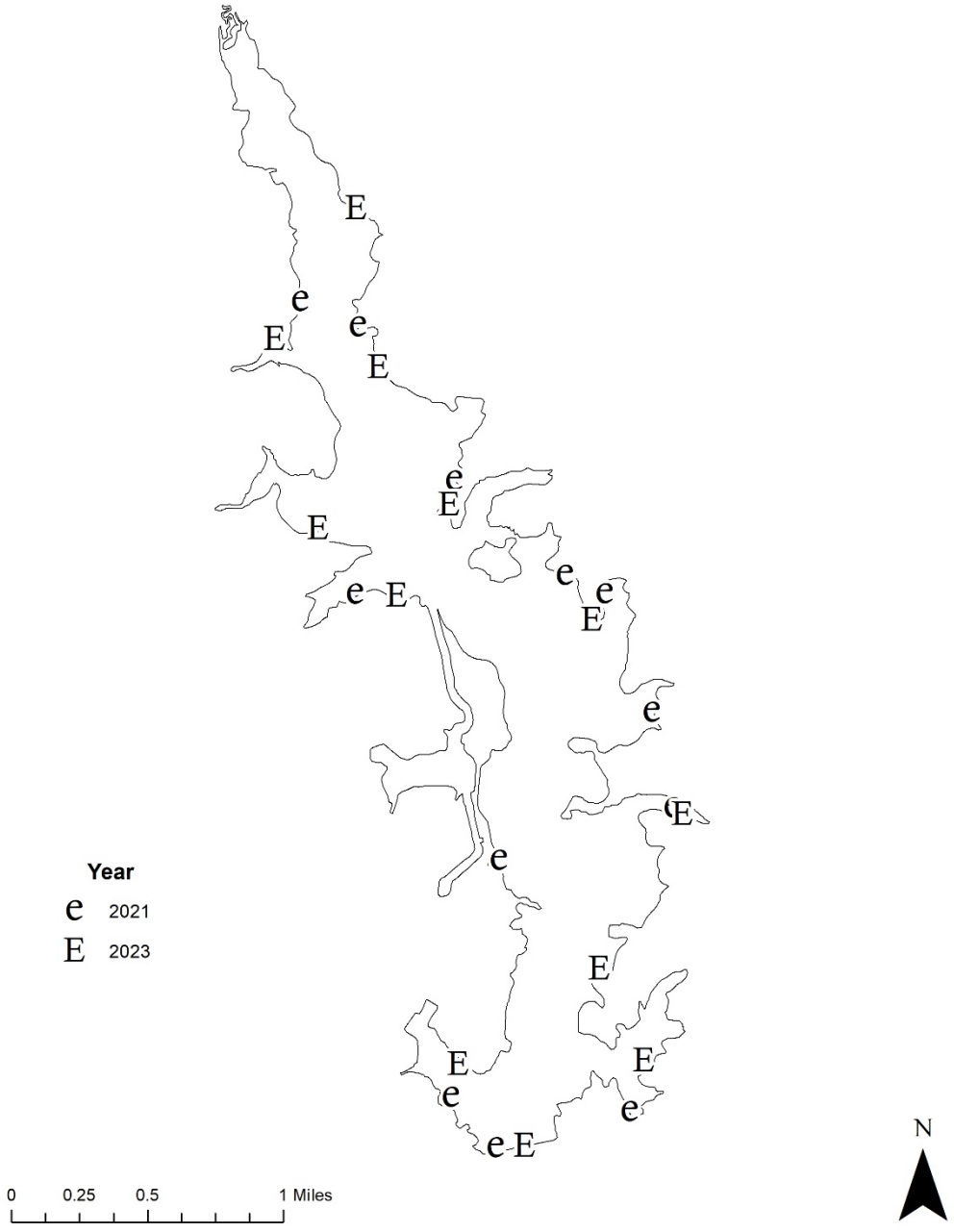
	Survey year			
	2024-2025	2025-2026	2026-2027	2027-2028
Angler Access				X
Vegetation	X	X	X	X
Electrofishing		X		X
Report				X

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 Lake Welsh, Texas, 2021 - 2023. Sampling effort was 1 hour for electrofishing.

Species	Electrofishing (2021)		Electrofishing (2023)	
	N	CPUE	N	CPUE
Gizzard Shad	2	2 (67)	6	6 (83)
Threadfin Shad	2	2 (67)		
Green Sunfish			10	10 (46)
Warmouth			3	3 (72)
Orangespotted Sunfish			13	13 (49)
Bluegill	544	544 (17)	2,118	2,118 (16)
Longear Sunfish	6	6 (39)	81	81 (24)
Redear Sunfish	23	23 (30)	78	78 (21)
Redspotted Sunfish			7	7 (86)
Largemouth Bass	166	166 (12)	228	228 (9)

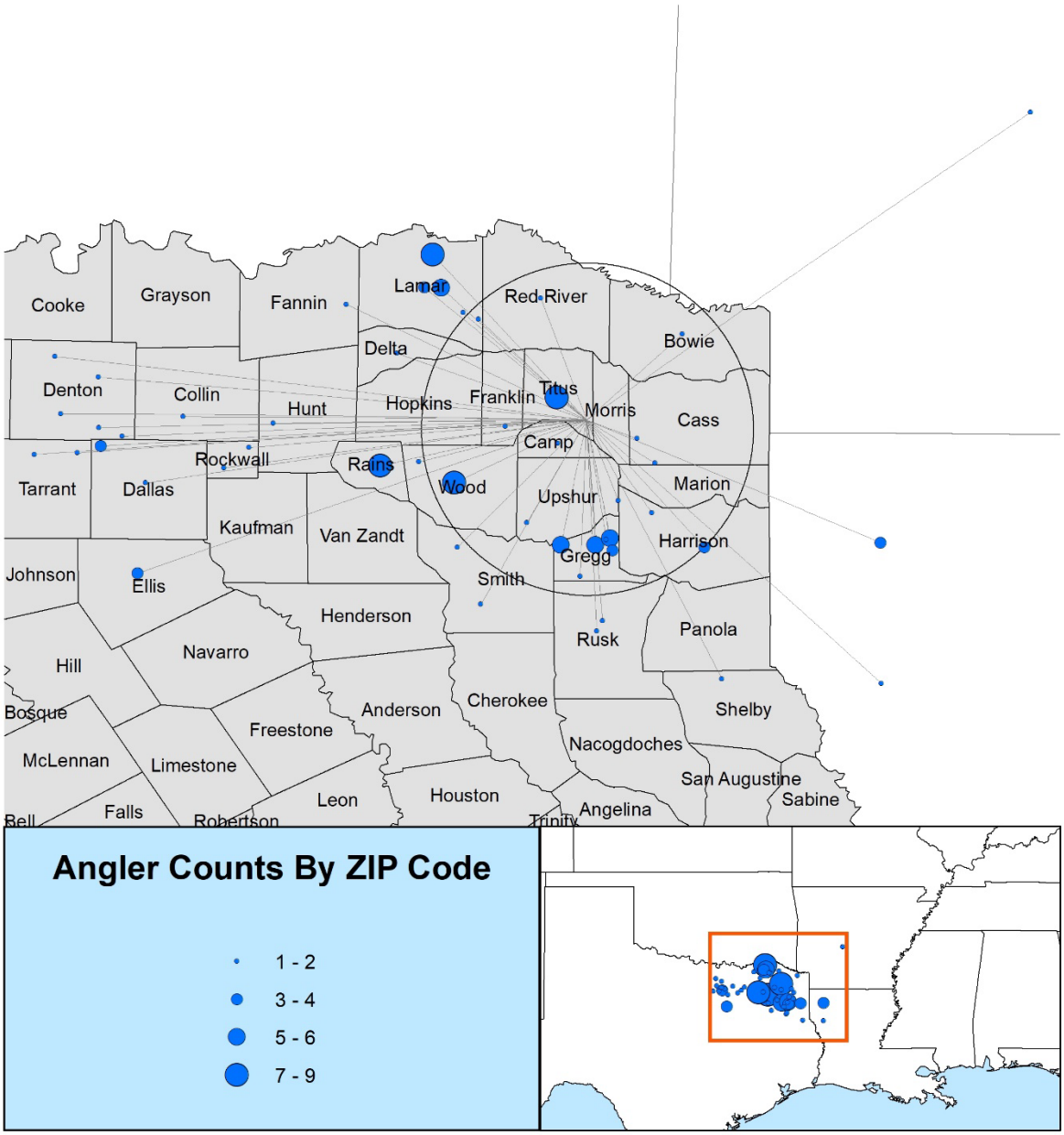
APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Welsh, Texas, 2021- 2023. Electrofishing stations are indicated by uppercase E (2023) and lowercase e (2021). Water level was approximately 2 ft below full pool at time of sampling.

APPENDIX C – Reporting of creel ZIP code data

Lake Welsh, December 2023 through February 2024



Location, by ZIP code, and frequency of anglers that were interviewed at Lake Welsh, Texas, during the December 2023 through February 2024 creel survey. Circle indicates 50-mile radius from Lake Welsh.

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