

Lake Quitman

2021 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 Quitman were surveyed in 2021 using electrofishing, trap netting, and tandem hoop netting. Historical data are presented with the 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 Quitman is an 814-acre impoundment located in Wood County, Texas, on Dry Creek, a tributary of the Sabine River. It was constructed by Wood County for recreation and flood control. Habitat consists primarily of natural shoreline, boat docks, and emergent aquatic vegetation. Water hyacinth is also present in small quantities.

Management History: Important sport fish included Largemouth Bass, White Crappie, and Channel Catfish. Florida Largemouth Bass were initially introduced in 1980 and the most recent stocking was in 2020. Efforts to mitigate the loss of fish habitat due to reservoir shoreline development included planting water willow in 2013 and 2014. Treatment efforts for water hyacinth have included physical removal as well as aquatic herbicide applications.

Fish Community

- **Prey species:** Threadfin Shad and Gizzard Shad were present, and most Gizzard Shad were available as prey to most sport fish. Electrofishing catch of Bluegill was high, and most fish were less than 5-inches long.
- **Catfishes:** The Channel Catfish population exhibited an increasing number of fish available to anglers. Fish condition was poor.
- **Largemouth Bass:** Largemouth Bass were present; however, few legal-size fish were available to anglers. Fish condition was moderate.
- **White Crappie:** White Crappie were abundant with legal-size fish available to anglers. Most crappie reached legal size within three years.

Management Strategies: Conduct general monitoring surveys with trap nets, baited tandem hoop nets, electrofishing, and creel surveys in 2025-2026. Access and vegetation surveys will be conducted in 2025. Seek opportunities and partners for vegetation restoration. Continue biennial stocking of Largemouth Bass. Inform the public about the negative impacts of aquatic invasive species.

Introduction

This document is a summary of fisheries data collected from Lake Quitman in 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 2021 data for comparison.

Reservoir Description

Lake Quitman is an 814-acre impoundment constructed in 1962 on Dry Creek, a tributary of the Sabine River. It is located in Wood County approximately 5 miles north of Quitman, Texas, and is operated and controlled by Wood County. Primary water uses included recreation and flood control. Lake Quitman is eutrophic with a mean trophic state index (TSI) chl-a of 65.44 (Texas Commission on Environmental Quality 2020). Habitat consisted primarily of natural shoreline, limited native emergent vegetation, and boat docks. Water hyacinth was first discovered in September 2001 in the western one-third of the reservoir and persists in a limited area in Brushy Creek. Since that time, treatment activities have included manual removal and herbicide applications. Other descriptive characteristics for Lake Quitman are in Table 1.

Angler Access

Boat access at Lake Quitman consists of three public boat ramps and several private individual and community restricted boat ramps (Table 2). Bank fishing access was adequate within three day-use areas.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Cartabiano and Storey 2018) included:

1. Stock FLMB fingerlings at a rate of 100/acre in 2019 and 2020
 - Action:** Approximately 25,000 FLMB fingerlings were stocked in 2020.
2. Improve littoral habitat through native vegetation restoration, deployment of artificial habitat structures.
 - Action:** A grant request for artificial structures was submitted in 2019 but funding was not awarded. Since then, reduced staff forced a change in habitat project prioritization.

Harvest regulation history: Historically, all sport fishes in Lake Quitman have been managed with statewide regulations (Table 3). The statewide regulation for Blue Catfish, Channel Catfish, and their hybrids were changed September 1, 2021 to a 25 fish daily bag, with no minimum length and only 10 allowed over 20 inches.

Stocking history: Lake Quitman was stocked with Florida Largemouth Bass (FLMB) in 2008, 2009, and 2020. FLMB (311 adults) were initially introduced in 1980 and also stocked in 1999 and 2000. Channel Catfish were introduced in 1982 and a fishery persists. Flathead Catfish and Green x Redear Sunfish hybrids were stocked in 1971. Striped Bass were stocked in 1972 and the fishery did not persist. A complete stocking history is in Table 4.

Vegetation/habitat management history: Water hyacinth was first documented in September 2001 and has persisted in limited areas. Treatment efforts have consisted of periodic manual removal and installation of containment boom in 2013 by district staff and periodic spraying with aquatic herbicides by Aquatic Habitat Enhancement (AHE) staff. Alligatorweed has not required treatment. American waterwillow was introduced in multiple locations in 2013 and 2014 to attempt to improve aquatic habitat.

Water transfer: No interbasin transfers are known to exist.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Quitman (Cartabiano and Storey 2018). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1 hr 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.

Trap netting – Crappie were collected using trap nets (5 net nights at 5 stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn). Ages for White Crappie were determined using otoliths from 13 randomly selected fish (range 9.0 to 10.9 inches).

Tandem hoop nets – Channel Catfish were collected using 9 tandem hoop-net series at 9 stations in August 2021. Nets were baited with soap and deployed for 2-night soak durations. CPUE for tandem hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series). Fish for age and growth estimates were not collected per OBS plan.

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.

Habitat – An aquatic vegetation survey was performed according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Results

Habitat: A structural habitat survey was last conducted in 2013 (Bennett and Storey 2014). The aquatic vegetation in 2021 was dominated by emergent species (bulrush, cattails, maidencane, and waterwillow) but coverage was very limited, accounting for 1.1% of reservoir surface area (Table 6). Alligatorweed and water hyacinth were both present in the reservoir, but they have been kept under control..

Prey species: Electrofishing catch rates of Bluegill and Gizzard Shad were 403.0/h and 546.0/h, respectively. Index of Vulnerability (IOV) for Gizzard Shad was higher than IOV estimates in previous years, indicating that 90% of Gizzard Shad were available to existing predators (Figure 1). Total CPUE of Bluegill in 2021 was similar to the 2017 survey, and size structure continued to be dominated by small individuals (Figure 2).

Channel Catfish: The hoop net catch rate of Channel Catfish was 7.4/nn in 2021. While sampling objectives (RSE-Stock \leq 25, $N \geq$ 50 stock) were not met, the sample size and survey precision were deemed adequate to detect large-scale changes in the catfish population. The 2021 survey suggested an improved size structure (PSD = 38) compared to the previous survey (PSD = 4; Figure 3). Body condition of most size class were poor ($W_r < 85$).

Black Bass: The electrofishing catch rate of stock-length Largemouth Bass was 33.0/h in 2021, lower than the 2017 survey (CPUE-stock = 48.9/h) and higher than the 2013 survey (CPUE-stock = 24.0/h; Figure 4). Insufficient numbers of fish were collected to achieve sampling objectives for age-and-growth and size structure, however additional effort was not deemed warranted due to low catch rates. Size structure continues to be dominated by fish below the legal length limit (14 inches). Body condition in 2021 was adequate for most size classes of fish and was similar to body condition in previous surveys (Figure 4). The Largemouth Bass population is likely impacted by turbid water and subsequently limited littoral habitat. Spotted Bass remained present in the reservoir in low densities (Figure 5).

White Crappie: The trap net catch rate of White Crappie was 27.5/nn in 2021, higher than the previous two surveys. Size structure (PSD = 88) was similar to the previous two surveys (Figure 6). White Crappie displayed moderate condition, with mean W_r above 85 for most size classes of fish. White Crappie reached 10 inches in total length (legal size) by age 2, however most were legal size by age 3. Average age at 10 inches (9.3 to 10.9 inches) was 2.8 years (N = 13; range = 2-3 years).

Fisheries Management Plan for Lake Quitman, Texas

Prepared – July 2013

ISSUE 1: Prey species are abundant in Lake Quitman and appear to be gradually increasing. Aquatic habitat in Lake Quitman is limited and may influence the poor size structure of Largemouth Bass. Restoration of native aquatic vegetation and other habitat enhancements would benefit Largemouth Bass.

MANAGEMENT STRATEGY

1. Continue to seek opportunities to improve aquatic habitat through the introduction of native emergent aquatic plants, such as American lotus, white water lily, and water willow.
2. Seek local partners interested in coordinating efforts to improve habitat.

ISSUE 2: Water hyacinth, first documented in Lake Quitman in September 2001, poses risks to the reservoir ecosystem and recreational access. It is imperative to continue close monitoring and implement treatment activities when necessary. Its distribution and abundance have been monitored annually through aquatic vegetation surveys. Whenever feasible, treatment efforts have included manual removal and herbicide spraying.

MANAGEMENT STRATEGIES

1. Continue monitoring water hyacinth annually and assist in removal efforts if needed.

Objective-Based Sampling Plan and Schedule (2022–2026)

Sport fish, forage fish, and other important fishes

Sport fishes in Lake Quitman include Largemouth Bass, crappie, Channel Catfish, and Flathead Catfish. Gizzard Shad and Bluegill are the primary prey species.

Low-density fisheries

Spotted Bass: Spotted Bass are present in Lake Quitman in low abundance. Any incidental data on Spotted Bass collected during future sampling for Largemouth Bass during creel and electrofishing surveys will be recorded.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Although Lake Quitman has traditionally supported a popular Largemouth Bass fishery, in spring 2018 bass anglers only accounted for 14% of total directed effort and few legal-length fish have been collected in the last three electrofishing surveys. Sampling Lake Quitman's Largemouth Bass fishery will be used to monitor general trend data (every four years) of relative abundance, size structure, body condition, and growth. These data will allow for determination of any large-scale changes in the population that may initiate further investigation. A minimum of 12 randomly selected nighttime electrofishing stations will be sampled with up to six additional stations if RSE objective ($RSE \leq 25$) is not met. A spring quarter roving creel survey will be conducted from March through May 2026 to estimate fishing effort, catch, and harvest rates of black basses and to assess trophy potential of the fishery (Table 7).

Crappie: Both White and Black Crappie are present in Lake Quitman; however, White Crappie are the predominant species caught by anglers. Crappie accounted for 54% of the total angling effort during the 2018 creel survey. Crappie relative abundance, size structure, body condition, and growth will be monitored every four years to detect any large-scale population fluctuations. A survey consisting of 5 randomly selected single-cod, shoreline trap net sets will be conducted in fall 2025 to assess the status of crappie populations in the reservoir. No additional sampling will be conducted if sampling objectives are not met ($N \geq 50$). A spring quarter roving creel survey will be conducted from March to May 2026 to estimate fishing effort and harvest (Table 7).

Channel Catfish: Sampling Lake Quitman's Channel Catfish fishery will be used to monitor general trend data (every four years) of relative abundance, size structure, body condition, and angler effort, catch, and harvest. These data will allow for determination of any large-scale changes in the population that may initiate further investigation. A survey consisting of 10 randomly selected baited tandem hoop nets sets will be conducted in summer 2025 to assess the status of Channel Catfish in the reservoir. Sampling objectives will be set at capturing 50 stock-sized fish with an $RSE\text{-}Stock \leq 25$. Due to historically low catch rates, if objectives are not met at 10 sets and catch rates remain low, no additional stations will be sampled. A spring quarter roving creel survey will be conducted from March through May 2026 to estimate fishing effort, catch, and harvest of catfish (Table 7).

Prey Species: Gizzard Shad and Bluegill are the primary prey species in Lake Quitman. 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. Prey species will be sampled using the effort expended to sample the Largemouth Bass fishery in fall 2025 (Table 7).

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Tables and Figures

Table 1. Characteristics of Lake Quitman, Texas.

Characteristic	Description
Year constructed	1962
Controlling authority	Wood County
County	Wood
Surface area	814 acres
Reservoir type	Tributary
Mean depth	10.0 ft
Maximum depth	25.0 ft
Shoreline Development Index	3.39
Conductivity	130 μ S/cm

Table 2. Boat ramp characteristics for Lake Quitman, Texas, August 2021. Reservoir elevation at time of survey was 395 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
East Dam	32.85896 -95.45095	Y	30	391	Adequate
West Dam	32.86011 -95.45878	Y	5	393	Adequate, Extension is feasible
North Access	32.87566 -95.44687	Y	3	393	Adequate for small boats/kayaks, Parking limited

Table 3. Harvest regulations for Lake Quitman, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 ^a (in any combination)	None
Catfish, Flathead	5	18-inch minimum
Bass, Largemouth	5	14-inch minimum
Bass: Spotted	5 ^b	None
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

^a Of which, only 10 can be 20 inches or greater in length.

^b Daily bag for Largemouth Bass, and Spotted Bass = 5 fish in any combination.

Table 4. Stocking history of Lake Quitman, Texas. FGL = fingerling; AFGL = advanced fingerling; ADL = adults.

Year	Number	Size
<u>Channel Catfish</u>		
1982	8,205	
1986	40,230	AFGL
1992	40,000	AFGL
Species Total	88,435	
<u>Flathead Catfish</u>		
1971	200	
<u>Striped Bass</u>		
1972	2,610	
<u>Green x Redear Sunfish</u>		
1971	5,000	
<u>Florida Largemouth Bass</u>		
1980	311	ADL
1999	81,443	FGL
2000	82,267	FGL
2008	80,145	FGL
2009	80,972	FGL
2020	25,030	FGL
Species Total	350,158	

Table 5. Objective-based sampling plan components for Lake Quitman, Texas 2021.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	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	
Bluegill ^a	Abundance	CPUE–Total	
	Size structure	PSD, length frequency	
Gizzard Shad ^a	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$
	Prey availability	IOV	$N \geq 50$
<i>Trap netting</i>			
Crappie	Size structure	PSD, length frequency	$N = 50$
	Age-and-growth	Age at 10 inches	$N = 13, 9.0 - 10.9$ inches
<i>Tandem hoop netting</i>			
Channel Catfish	Abundance	CPUE–stock	RSE-Stock ≤ 25
	Size structure		$N \geq 50$ stock

^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 Quitman, Texas, 2013–2021. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2013	2017	2021
Native emergent	4.0 (0.5)	4.6 (0.6)	6.3
Non-native			
Alligatorweed (Tier III)*	10.0 (0.1)	50.0 (0.7)	2.9
Water hyacinth (Tier II)*	30.0 (0.4)	10.0 (0.1)	trace

*Tier II is Maintenance, Tier III is Watch Status

Gizzard Shad

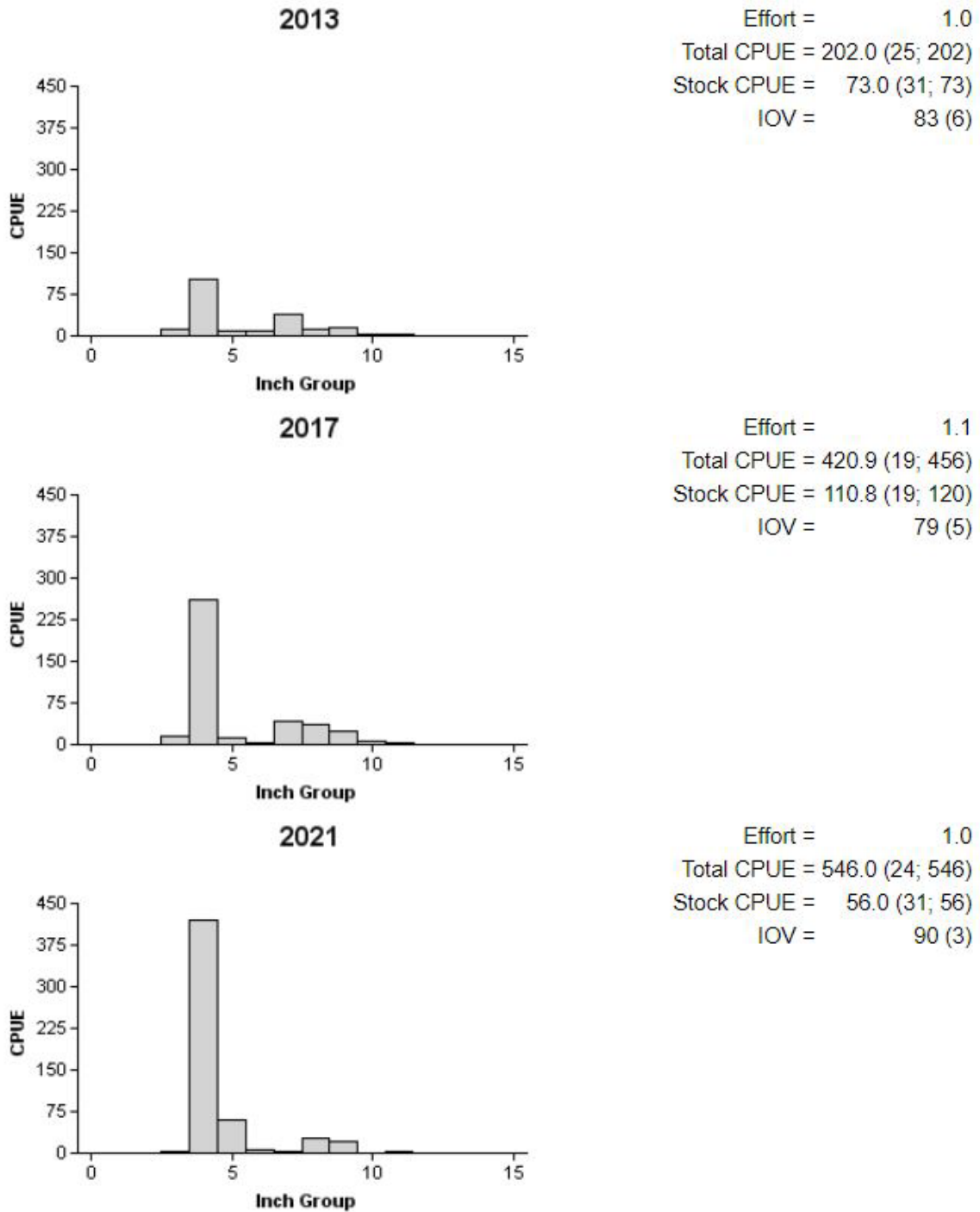


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Quitman, Texas, 2013, 2017, and 2021.

Bluegill

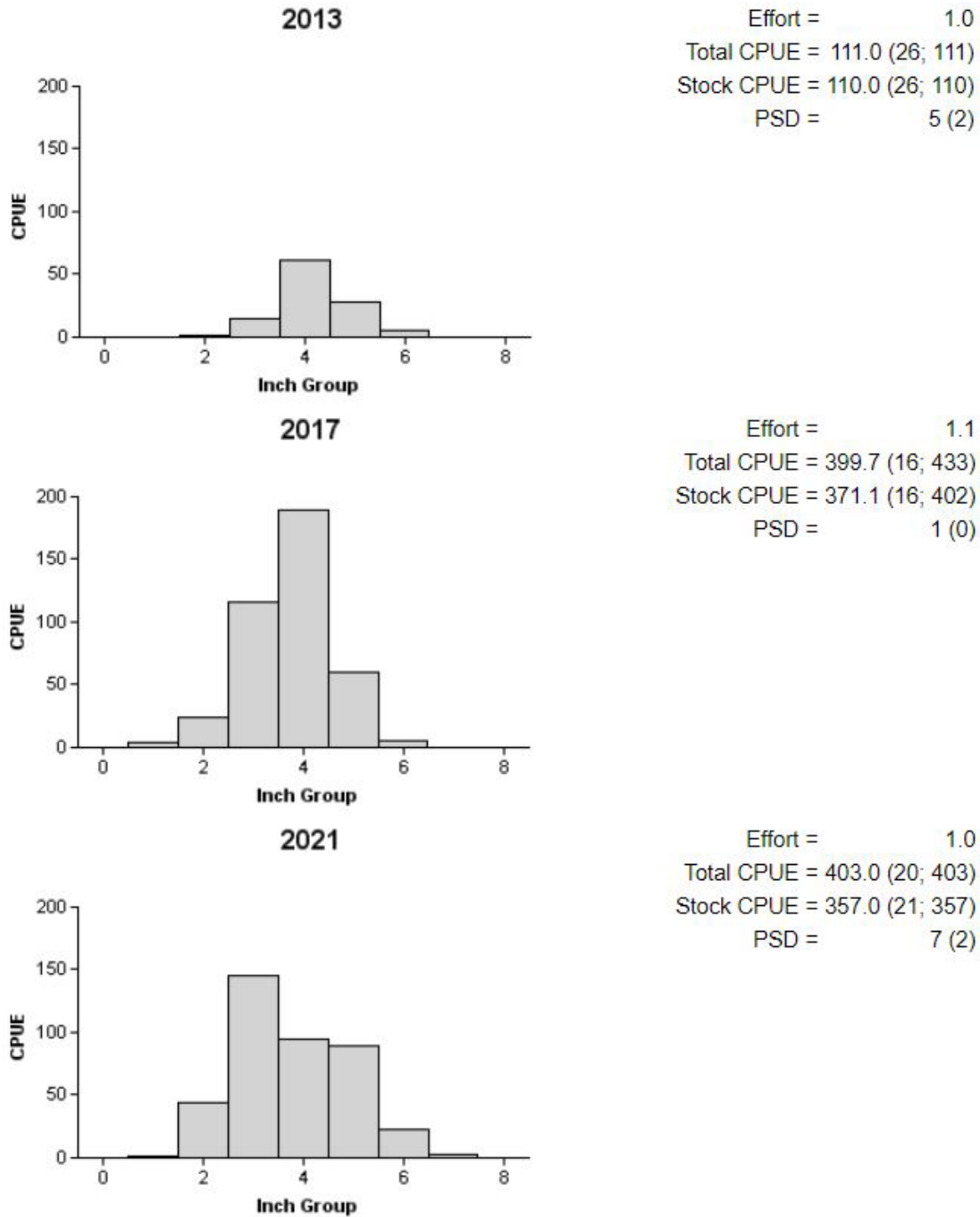


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Quitman, Texas, 2013, 2017, and 2021.

Channel Catfish

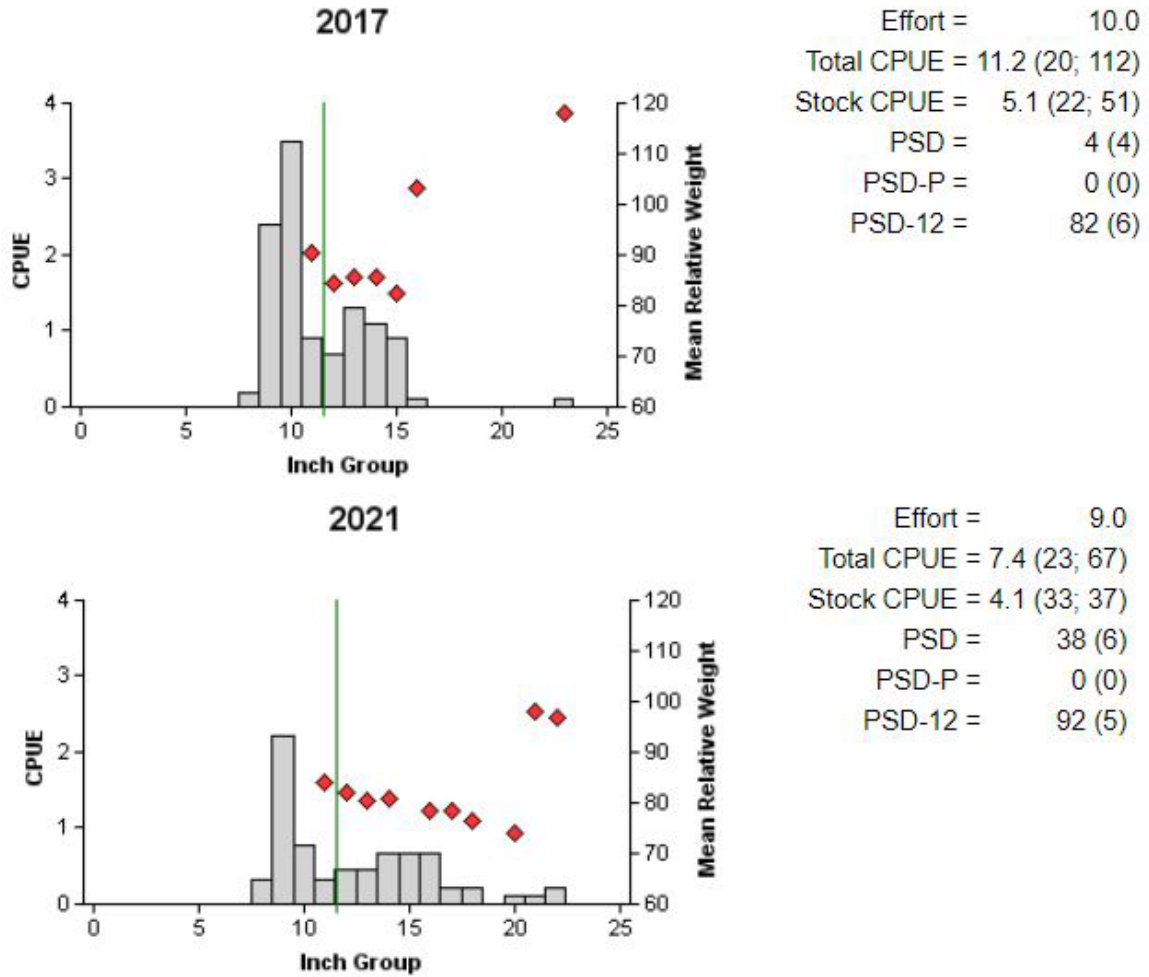


Figure 3. Number of Channel Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring hoop net surveys, Lake Quitman, Texas, 2017, and 2021.

Largemouth Bass

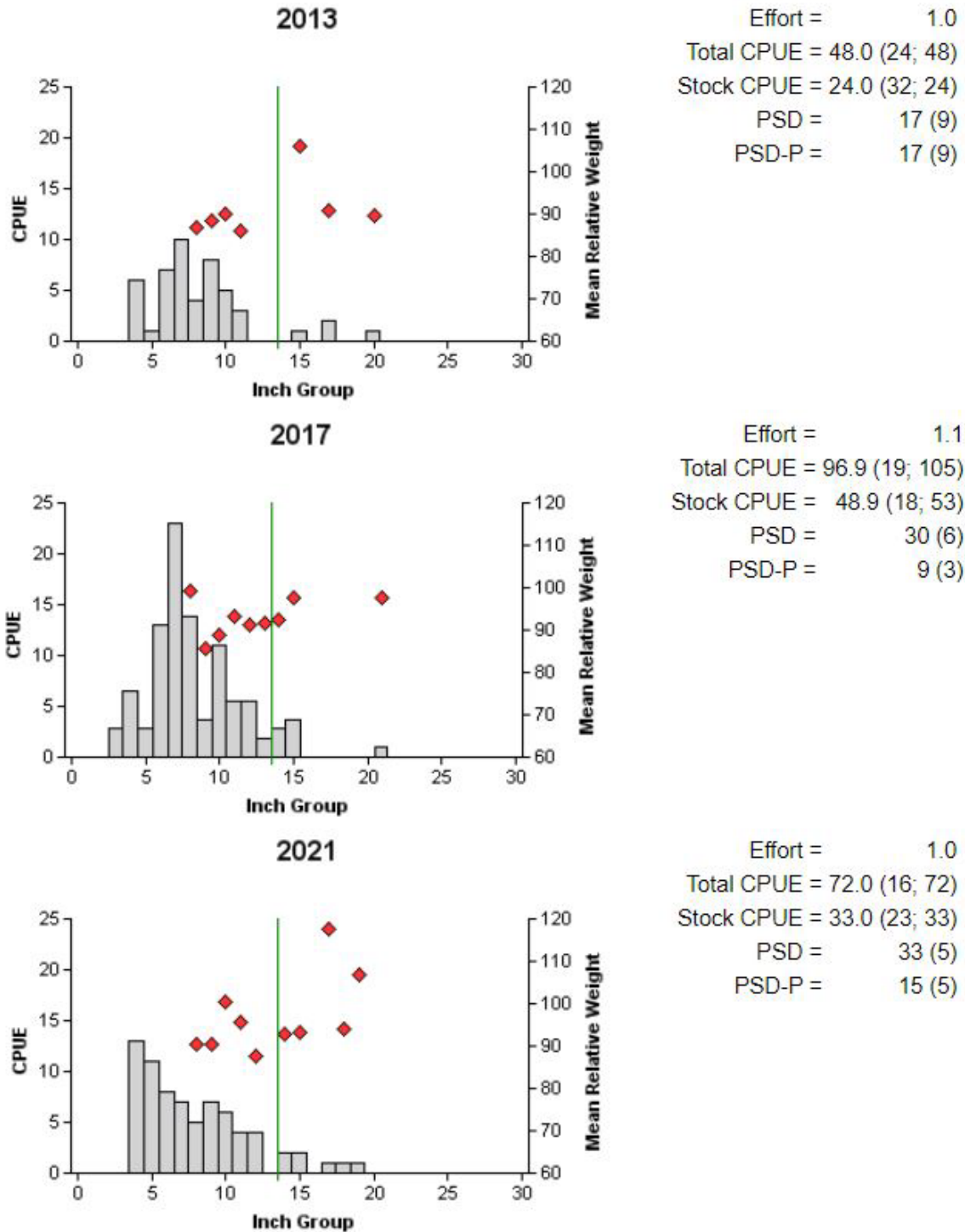


Figure 4. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Quitman, Texas, 2013, 2017, and 2021.

Spotted Bass

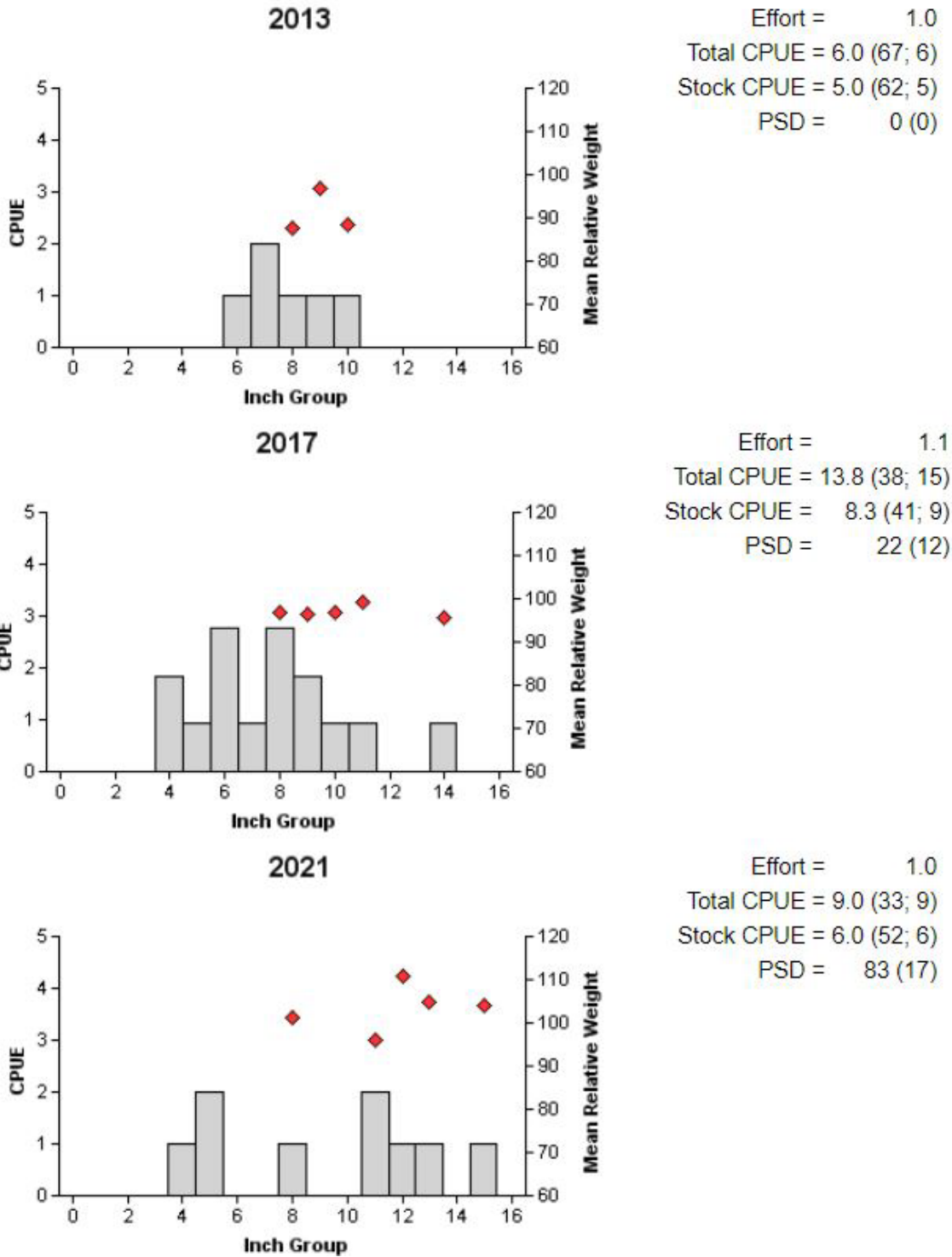


Figure 5. Number of Spotted Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Quitman, Texas, 2013, 2017, and 2021

White Crappie

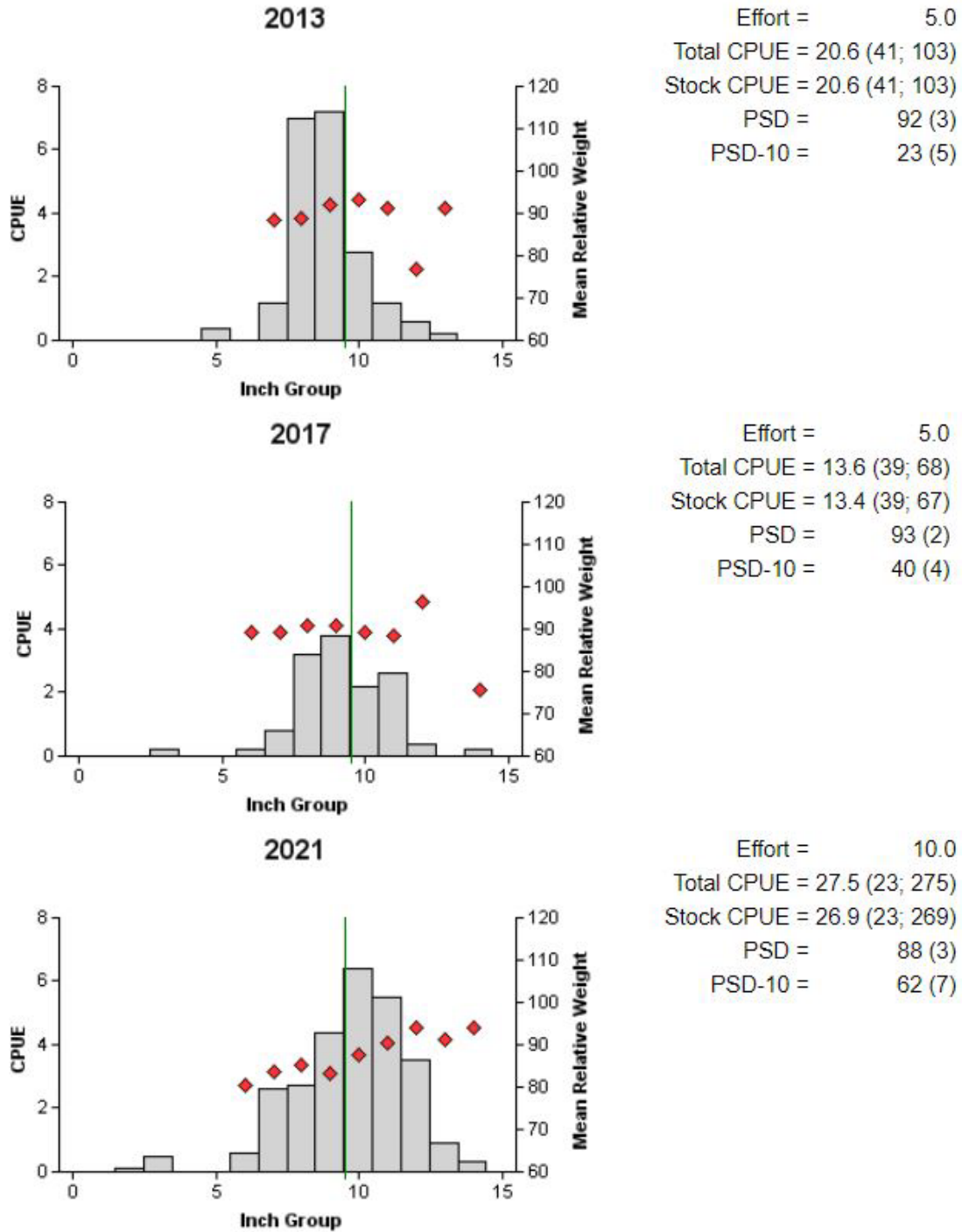


Figure 6. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Lake Quitman, Texas, 2013, 2017, and 2021. Vertical line indicates minimum length limit.

Proposed Sampling Schedule

Table 7. Proposed sampling schedule for Lake Quitman, Texas. Survey period is June through May. Creel survey will be conducted in the spring, while electrofishing, trap netting and baited tandem hoop netting surveys are conducted in the fall.

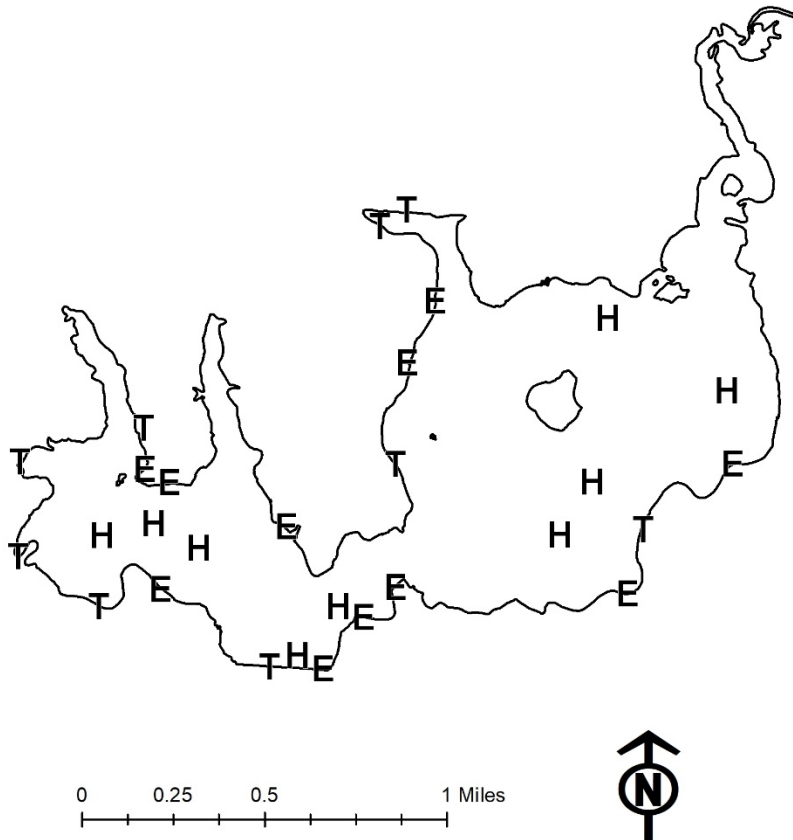
	Survey year			
	2022-2023	2023-2024	2024-2025	2025-2026
Angler Access				X
Vegetation	X	X	X	X
Electrofishing – Fall				X
Trap netting				X
Baited tandem hoop netting				X
Creel survey				X
Report				X

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 all gear types from Lake Quitman, Texas, 2021. Sampling effort was 9 net nights for hoop netting, 10 net nights for trap netting, and 1 hour for electrofishing.

Species	Electrofishing		Trap Netting		Hoop Netting	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad	546	546.0 (24)				
Threadfin Shad	247	247.0 (39)				
Channel Catfish					67	7.44 (23)
Redbreast Sunfish	2	2.0 (100)				
Warmouth	3	3.0 (52)				
Bluegill	403	403.0 (20)				
Longear Sunfish	105	105.0 (18)				
Spotted Bass	9	9.0 (33)				
Largemouth Bass	72	72.0 (16)				
White Crappie			275	27.5 (23)		
Black Crappie			8	0.8 (55)		

APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Quitman, Texas, 2021. Trap net, hoop net, and electrofishing stations are indicated by T, H, and E, respectively. Water level was near full pool at time of sampling.



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