

Daniel Reservoir

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

Prepared by:

Jacob Wright, Assistant District Management Supervisor
and
Michael Homer Jr., District Management Supervisor

Inland Fisheries Division
Abilene District, Abilene, Texas

Carter Smith
Executive Director

Craig Bonds
Director, Inland Fisheries

July 31, 2022



Contents

Contents	i
Survey and Management Summary	1
Introduction.....	2
Reservoir Description	2
Angler Access.....	2
Management History	2
Methods.....	3
Results and Discussion.....	4
Fisheries Management Plan for Daniel Reservoir, Texas	5
Objective-Based Sampling Plan and Schedule (2022-2026).....	7
Literature Cited.....	9
Tables and Figures	10
Reservoir Characteristics	10
Boat Ramp Characteristics.....	11
Harvest Regulations	11
Stocking History.....	12
Objective-Based Sampling Plan for 2020-2021	13
Aquatic Vegetation Survey	14
Gizzard Shad.....	17
Bluegill	18
Channel Catfish	19
Largemouth Bass	20
White Crappie.....	21
Proposed Sampling Schedule	22
APPENDIX A – Catch rates for all species from all gear types	23
APPENDIX B – Map of sampling locations.....	24
APPENDIX C – Catch Rate (CPUE) trends for legal and sub-legal size Largemouth Bass	24
APPENDIX D – Catch rate (CPUE) trends for legal and sub-legal size White Crappie	26
APPENDIX E – Catch rate (CPUE) trends for common prey species.....	27

Survey and Management Summary

Fish populations in Daniel Reservoir were surveyed in 2018-2022 using tandem hoop nets, electrofishing, and trap nets. Historical data are presented with the 2018-2022 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: Daniel Reservoir is a 950-acre impoundment constructed in 1948 on Gunsolus Creek. The reservoir is in Stephens County, approximately 65 miles northeast of Abilene, and it is owned and operated by the City of Breckenridge. The reservoir provides municipal water supply for the City of Breckenridge. Daniel Reservoir was nearly dry from fall 2003 to spring 2007. After filling in June 2007, the water level began to decline. By 2014, the reservoir was nearly 11 feet below conservation pool, but substantial rainfall refilled it in 2016. The reservoir's water level has fluctuated since but has not caused problems for angler access.

Management History: Important sport fishes include Largemouth Bass, Channel Catfish, and crappie. Previous management history included re-establishment of all sport and forage fish by stocking, inform anglers of new fishing opportunities, discuss water conservation and stricter water restriction trigger points for municipal water use with the City of Breckenridge. The most recent stockings included Florida Largemouth Bass in 2016 and 2017 after the lake refilled. Angler harvest of all sport fishes has been regulated according to statewide length and bag limits.

Fish Community

- **Prey species:** Gizzard Shad and Bluegill were the dominant species sampled, though Green Sunfish, Longear Sunfish, and sunfish hybrids were also present. Gizzard Shad relative abundance was higher than the previous survey, and most individuals were desirable prey fish sizes and available to sport fishes. Relative abundance of Bluegill was high, and most fish were sub-stock length. Quality-length Bluegill were uncommon.
- **Channel Catfish:** Channel Catfish relative abundance was high. Body conditions were poor to optimal though the size structure appeared to be desirably proportionate.
- **Largemouth Bass:** The reservoir had an excellent year producing its first two ShareLunker Legacy Class Largemouth Bass caught by anglers in 2022. During the monitoring survey, Largemouth Bass were relatively abundant. Catch of legal fish has declined since the last survey. Largemouth Bass body condition was optimal for most inch groups.
- **White Crappie:** White Crappie were greatly abundant, and legal fish up to 15 inches were available to anglers. Most crappie reached legal length within one or two years.

Management Strategies: Survey Channel Catfish, White Crappie, Black Crappie, Largemouth Bass, and forage fish populations every four years. Meet with the City of Breckenridge to discuss water use plans for Daniel Reservoir and strategies for water conservation. Promote the quality White Crappie and Largemouth Bass fishery to constituents. Inform the public of the threat of invasive species and their impacts.

Introduction

This document is a summary of fisheries data collected from Daniel Reservoir in 2018-2022. 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 2018-2022 data for comparison.

Reservoir Description

Daniel Reservoir is a 950-acre impoundment constructed in 1948 on Gunsolus Creek. The reservoir is in Stephens County approximately 65 miles northeast of Abilene, and it is owned and operated by the City of Breckenridge. The reservoir provides municipal water and recreation for the City of Breckenridge. Land use around the reservoir is primarily agricultural. The reservoir experiences substantial water level fluctuations, and nearly went dry prior to filling in 2007. After filling, the water level declined and by January 2014, the reservoir water level was nearly 11 feet below conservation pool. The U.S. Geological Survey's water level gauge was removed in 2014, and a new gauge has not been installed. The reservoir has experienced periodic water level fluctuations since receiving substantial inflow in 2016. Other descriptive characteristics for Daniel Reservoir are in Table 1.

Angler Access

Daniel Reservoir has three public boat ramps and no private boat ramps. All boat ramps were useable since the reservoir refilled in 2016. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the public boat ramp areas.

Management History

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

1. Discuss water use plan with the City of Breckenridge and the possible impacts on the fish populations.

Action: Spoke with a City of Breckenridge representative about the surface water pump that was to be installed for municipal use. The pump has not been installed, and no water has been removed from Daniel Reservoir during the survey period for municipal purposes. The city has used Daniel as a water source in the past but is currently relying on purchased water from West Central Texas Municipal Water District and raw surface water from Hubbard Creek Reservoir.
2. Determine a conservation and access threshold elevation at which the reservoir could be managed to allow controlling authority operations as well as provide adequate angler access to persist.

Action: Conservation thresholds were not calculated, and no further discussion has occurred since the City of Breckenridge is currently not using Daniel Reservoir water for municipal use. The city currently utilizes raw water purchased from West Central Texas Municipal Water District and raw surface water from Hubbard Creek Reservoir.
3. Continue to monitor fish populations to determine any changes in relative abundance, growth, and size structure that may correlate with water level fluctuations.

Action: Largemouth Bass were surveyed by electrofishing. Crappie were surveyed by trap netting. Channel Catfish were surveyed by tandem hoop netting. Relative abundance, growth, and size structure were determined for all fish species sampled.
4. Promote White Crappie fishing at Daniel Reservoir.

Action: Popular press articles were written that highlighted White Crappie fishing at Daniel Reservoir and were sent to local newspapers.

5. Prevent the spread of invasive species.

Action: Popular press articles were written about how to prevent the spread of invasive species and were sent to local newspapers and social media. All presentations to constituents and user groups discussed the importance of preventing the spread of invasive species. Signage was displayed at Daniel Reservoir's boat ramp to encourage users to comply with state laws requiring all the water to be drained from vessels once they leave the waterbody.

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

Stocking history: By early 2007, most of the fish previously stocked were assumed to be lost due to extremely low water level. All fishes reintroduced after the reservoir refilled in 2007 were part of a drought recovery plan to restore popular fisheries. During 2016 and 2017, Florida Largemouth Bass fingerlings were stocked. No fish were stocked from 2018-2021. The complete stocking history is shown in Table 4.

Vegetation/habitat management history: Daniel Reservoir has no history of management for vegetation or structural habitat.

Water transfer: No interbasin transfers are known to exist. A water usage plan was established during the winter of 2013-2014 to mix 15% Daniel Reservoir water with 85% Hubbard Creek Reservoir water by surface pumping it to a treatment plant controlled by the City of Breckenridge. Modifications of the use plan were made to adjust with water level fluctuations.

Methods

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

Electrofishing – Largemouth Bass, sunfishes, and Gizzard Shad were collected in fall 2021 by electrofishing (1.2 h at 14, 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 in winter 2021 using trap nets (5 net nights at 5 stations). Catch per unit effort for trap netting was recorded as the number of fish caught per net night (fish/nn). Ages for crappie were determined using otoliths from 21 randomly selected fish (range 9.1 to 10.9 inches).

Tandem hoop nets – Channel Catfish were collected in summer 2021 using 5 tandem hoop net series at 5 stations. Nets were baited with soap and deployed for two-nights set duration. Catch per unit effort for tandem hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series).

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.

Habitat – An aquatic vegetation habitat survey was conducted in summer 2021 by using the digital shapefile method (TPWD Inland Fisheries Division, unpublished manual revised 2017).

Water level – No water level data were available for the reservoir during the monitoring period, as the U.S. Geological Survey's water level gauge was removed in 2014.

Results and Discussion

Habitat: Vegetation throughout the reservoir consisted of native emergent plants (14.21%) and flooded terrestrial plants (13.89%; Table 6). Standing timber, stumps (7.3%), native floating-leaved (0.1), and native submersed (<1%) were also observed during the most recent vegetation survey.

Prey species: Gizzard Shad and sunfishes have been the predominant prey species in the reservoir. Green Sunfish, Longear Sunfish, and hybrid sunfishes were also present in the 2021 survey. Electrofishing catch rate of Gizzard Shad was (449.0/h) in 2021, which was higher than the 2017 survey (192.0/h) but nearly half the rate of the 2015 survey (999.0/h; Figure 3). Much of this variation in catch may be attributed to fluctuating water levels and sampling effectiveness during that time frame. Index of Vulnerability for Gizzard Shad fluctuated from 100 in 2015, 89 in 2017, and 96 in 2021. This indicates most individuals were optimal prey sizes for sport fishes. Total catch rate of Bluegill in 2021 (657.0/h) was higher than CPUE-Total from surveys in 2017 (461.1/h) and 2015 (206.0/h; Figure 4). Bluegill PSD was consistently low over the past few surveys, which is likely attributed to high reproduction and presence of numerous sub-stock individuals in the samples.

Channel Catfish: Tandem hoop netting has only been conducted three times at the reservoir, with the first survey conducted in 2009 (Figure 5). The previous 2017 tandem hoop net survey produced a total catch rate of 79.3/tandem series, which was similar to the rate observed in the 2021 survey (73.8/tandem series). Channel Catfish ranged in size from 8-24 inches. Channel Catfish PSD increased from 21 (2017) to 32 (2021), which indicated that the population had increased representation of quality length fish (fish \geq 16 inches). Relative weights were poor to good, and there were no obvious trends in body condition in relation to length.

Largemouth Bass: The catch rate of Largemouth Bass in 2021 (62.0/h) was similar to the survey conducted in 2017 (64.3/h; Figure 6). Catch rate of stock size Largemouth Bass decreased from 53.1/h in 2017 to 28.0/h in 2021. Catch rates for legally harvestable individuals fluctuated from 2.0/h in 2015 to 24.9/h in 2017 to 10.0 in 2021. The PSD for Largemouth Bass increased from 16 in 2015 to 65 in 2017 and was slightly lower in 2021 (61), which suggested that size structure shifted to greater representation of fish \geq quality length. In 2016, the reservoir caught substantial rainfall after being about 11-12 feet low, which resulted in increased fish habitat and production of Largemouth Bass. Body conditions in 2021 were optimal for nearly all inch groups \geq stock length. Largemouth Bass were stocked during 2016 and 2017 to boost recruitment in the population. ShareLunker fingerlings were stocked in spring 2022. Two ShareLunker Legacy Class fish were caught in 2022: A 13.48-pound fish on 01/14/2022 and a 15.66-pound fish on 03/18/2022, with the latter being one of the top 50 largemouth bass ever caught in Texas (39th) and setting a new waterbody record. The prior waterbody record was about 12 lbs. caught in 2018.

White Crappie: Both White and Black Crappie exist at Daniel Reservoir, but White Crappie have been the dominant species. Catch rates for White Crappie fluctuated from 13.2/nn in 2015 to 100.8/nn in 2017 and to 39.4/nn in 2021 (Figure 7). Similarly, stock CPUE fluctuated from 6.6/nn in 2015 to 81.0/nn in 2017 to 32.2/nn in 2021. Catch rates of legally harvestable White Crappie were variable and fluctuated from 3.6/nn in 2015 to 35.1 in 2017 to 14.4/nn in 2021. Variability in relative abundance was likely attributed to water level fluctuation and changes in habitat availability. Since 2015, PSD has increased from 58 to 92 in 2021, indicating an improved size structure with greater representation of larger fish. Since 2015, White Crappie body conditions were optimal for most inch groups. Only four Black Crappie were caught in the 2021 survey.

Fisheries Management Plan for Daniel Reservoir, Texas

Prepared – May 2022

ISSUE 1: Historically, City of Breckenridge had considered installing surface water pump at Daniel Reservoir for municipal water use. Currently, future plans for a surface pump and municipal water use at the reservoir are uncertain. Municipal water uses in combination with drought-induced fluctuating water level could be detrimental to established fisheries.

MANAGEMENT STRATEGY

1. Reinitiate discussions with the City of Breckenridge regarding water use plans for Daniel Reservoir and discuss concerns surrounding the fisheries. Discuss the benefits of water conservation for fishing at Daniel Reservoir with the City of Breckenridge. Highlight the Largemouth Bass and White Crappie fisheries and explain how these fish populations are affected by water level fluctuation.

ISSUE 2: Daniel Reservoir currently does not have bank access structures or amenities such as a public restroom, developed campsites, or parking areas for boat trailers at the reservoir. Access improvements may provide better experiences for anglers and other visitors who frequent the reservoir.

MANAGEMENT STRATEGY

1. Discuss with the City of Breckenridge potential opportunities for access enhancements at Daniel Reservoir through the Boating Access Grant Program. .

ISSUE 3: Daniel Reservoir has an excellent White Crappie population with large numbers of harvestable-size fish with good body condition.

MANAGEMENT STRATEGIES

1. Write popular press articles on White Crappie fishing at Daniel Reservoir and distribute to newspapers in the surrounding cities within proximity to Daniel Reservoir.
2. Promote White Crappie fishing opportunities at Daniel Reservoir through media outlets.

ISSUE 4: Daniel Reservoir has a history of producing quality Largemouth Bass as well as other species including White Crappie and White Bass. The reservoir produced two ShareLunker Legacy Class fish in 2022, and one was one of the top 50 largest Largemouth Bass ever caught in Texas (39th) and set a new waterbody record. The lake record White Crappie was also caught in 2022 weighing over 3 lbs. Monitoring and promoting these fisheries is necessary.

MANAGEMENT STRATEGIES

1. Promote Largemouth Bass, White Crappie, and White Bass fishing at Daniel Reservoir through media outlets.
2. Continue to monitor Largemouth Bass population with electrofishing in fall 2025.
3. Collect a category II age sample and fin clips in 2025 to evaluate growth of Largemouth Bass as well as prevalence of FLMB alleles in the population.

ISSUE 5: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example,

zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches, and plugging engine cooling systems. Giant salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points.
2. Educate the public about invasive species by using media and the internet.
3. Make a speaking point about invasive species when presenting to constituent and user groups.
4. 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 (2022-2026)

Sport fishes, forage fish, and other important fishes: Daniel Reservoir's prey community is comprised mostly of Gizzard Shad and Bluegill. Important sport fish species include Channel Catfish, Largemouth Bass, Black Crappie, and White Crappie. Proposed sampling schedule is in Table 7.

Low-density fisheries: Flathead Catfish have been present in prior surveys, but many were thought to be lost because of the previous prolonged drought. Historical relative abundance of Flathead Catfish in monitoring surveys were low, and the species is currently considered to have low population density. Monitoring of presence/absence for low-density species will be conducted in conjunction with surveys for other sport fishes.

White Bass are an introduced species in Daniel Reservoir and were first observed in the 1994 gill netting survey when a single 12-inch fish was caught. Following that survey, White Bass had not been observed during routine monitoring until being caught in a 2013 trap netting survey. In the 2016 gill net survey, relative abundance of White Bass was low. Continuation of monitoring for presence/absence will be conducted with other sampling.

Survey objectives, fisheries metrics, and sampling objectives:

Prey Species: Gizzard Shad and Bluegill are the predominant prey species in the reservoir. Traditional monitoring of prey species had been conducted by electrofishing for 1.0 h at 12, 5-minute randomly selected stations. Historical surveys have achieved precise ($RSE \leq 25$) CPUE-Total estimates for Gizzard Shad and Bluegill with 1.0 h of sampling. Electrofishing will be conducted during fall 2025 to monitor prey species' relative abundance (i.e., CPUE-Total) and size structures. To monitor prey availability for Gizzard Shad, ≥ 50 fish will be collected to calculate and evaluate Index of Vulnerability. To evaluate the size structure (PSD) for Bluegill, 50 stock length fish will be attempted to be collected. If desired precision for Gizzard Shad and Bluegill relative abundance estimates and/or target sample sizes are not achieved, no additional sampling will be conducted unless additional electrofishing is needed to fulfill objectives set for Largemouth Bass.

Largemouth Bass: Largemouth Bass support a popular fishery at the reservoir, and they have been managed by statewide regulations. Daniel Reservoir is known for producing sizable Largemouth Bass. Two ShareLunker Legacy Class fish were caught in 2022. Traditionally, Largemouth Bass have been monitored by fall electrofishing. Largemouth Bass relative abundance has been variable, which is likely linked to water level fluctuation and changes in habitat availability. Continuation of monitoring trends in relative abundance and size structure is necessary to inform fisheries biologists about the status of the fishery, disseminating information to constituents, as well as to ascertain needs for stocking. Electrofishing will be conducted during fall 2025 for 1.0 h at 12, 5-minute randomly selected stations. The CPUE-Total and CPUE-Stock fish will be calculated at a target precision of $RSE \leq 25$; the CPUE-14 will be estimated, but no target for precision will be set. A sample of ≥ 50 stock-size fish will be obtained to evaluate size structure (PSD), and 5 fish per inch-group will be weighed to evaluate body condition. A Category II age sample will be collected from 13 fish, 13.0-14.9 inches to assess age at legal length. If precision and/or sample size objectives are not achieved, up to an additional hour of sampling (12, 5-minute stations) may be added if deemed feasible. If age and growth sample objective is not achieved, non-random stations may be used. Fin clip samples will be collected from 30 fish of any size to determine genetic composition of Largemouth Bass for Florida Largemouth Bass (FLMB) genetic influence.

Channel Catfish: Historical monitoring has been conducted with gill nets and tandem hoop nets. From 1997 to 2016, three gill netting surveys were conducted, and catch rates were variable from 1.6-8.6/n (Effort= 5 net nights/survey). Gill netting surveys did not produce sample sizes > 50 fish, and precision was low ($RSE \geq 30$). Tandem hoop netting has been effective at catching desirable sample sizes for evaluating size structure and body condition, though precision of CPUE estimates has been variable. Tandem hoop nets will be used to sample Channel Catfish in summer 2022 at five randomly selected stations. The CPUE-Total and Stock CPUE will be calculated at a target precision of $RSE \leq 30$. A sample of ≥ 50 stock length fish will be obtained to evaluate size structure (PSD), and 5 fish per inch group will be

weighed to evaluate body condition. If sampling objectives are not achieved, up to five additional tandem series will be deployed if deemed feasible.

White and Black Crappie: Daniel Reservoir has produced numerous sizeable crappie with great body conditions. A new lake record White Crappie at 3.24 pounds was caught on 02/21/2022. Both White and Black Crappie have been managed with statewide harvest regulations, and they have been traditionally monitored by trap netting. White Crappie have been more abundant than Black Crappie in previous surveys. Prior surveys have suggested that the White Crappie population can provide ample legally harvestable fish in good body condition. Trap netting effort of 5-10 net nights has been effective in producing desirable sample sizes for effectively monitoring changes in size structure and body condition, though precision of CPUE estimates have been variable. Trap netting will be conducted in fall 2025 to monitor trends in relative abundance, size structure (i.e., PSD), and body condition. Data collected will be used to inform fisheries biologists about the status of the crappie fishery and disseminating information to constituents. Trap nets will be deployed overnight at 5 randomly selected stations to sample White and Black Crappie. Target precision for both crappies combined CPUE-Total and stock CPUE will be $RSE \leq 30$; there will be no target precision for CPUE-10. A sample of ≥ 50 White Crappie \geq stock size will be collected to assess size structure. Five fish per represented inch-group will be sampled to evaluate White Crappie body condition. If objectives for White Crappie are not achieved, up to five additional trap nets may be set if deemed feasible.

Literature Cited

- Goldstrohm, N., and M. D. Homer. 2018. Statewide freshwater fisheries monitoring and management program survey report for Daniel Reservoir, 2017. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- 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. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7): 348.

Tables and Figures

Table 1. Characteristics of Daniel Reservoir, Texas.

Characteristic	Description
Year constructed	1948
Conservation pool	1,278 feet above mean sea level
Dead pool	1,250 feet above mean sea level
Controlling authority	City of Breckenridge
County	Stephens
Reservoir type	Tributary
River basin ¹	Brazos (120601)
Sub-basin ¹	Hubbard (12060105)
Watershed ¹	Gunsolus Creek (1206010505)
Sub-watershed ¹	Upper Gunsolus Creek (120601050502)
Shoreline Development Index	4.0
Conductivity	259-435 $\mu\text{S/cm}$

¹U.S. Geological Survey Hydrologic Unit Code

Table 2. Boat ramp characteristics for Daniel Reservoir, Texas, May 2022.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
1	32.64771 -98.87036	Y	5	1,277	Good; Accessible
2	32.64573 -98.87123	Y	5	1,266	Good; Accessible
3	32.64527 -98.87373	Y	5	1,264	Good; Accessible

Table 3. Harvest regulations for Daniel Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (in any combination)	No minimum length; only 10 can be ≥20 inches
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Largemouth	5	14-inch minimum
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Daniel Reservoir, Texas. FGL = fingerling; FRY = fry; AFGL = advanced fingerling; ADL = adults.

Species	Year	Number	Size
Gizzard Shad	2007	200	ADL
Threadfin Shad	2007	100	ADL
Channel Catfish	2007	90,314	FGL
Inland Silverside	2007	200	ADL
Bluegill	2007	200	ADL
	2007	89,679	FGL
	Total	89,879	
Florida Largemouth Bass	1983	48,072	FGL
	1991	95,000	FGL
	1995	95,785	FGL
	1997	95,502	FGL
	2007	233,338	FRY
	2007	46,148	FGL
	2007	629	AFGL
	2016	96,359	FGL
	2017	93,056	FGL
	Total	803,889	
White Crappie	2007	40	ADL

Table 5. Objective-based sampling plan components for Daniel Reservoir, Texas 2020-2021.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE–Total and CPUE–Stock	RSE–Stock \leq 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	5 fish/inch group (max)
Bluegill ^a	Abundance	CPUE–Total	RSE \leq 25
	Size structure	PSD, length frequency	N \geq 50 stock
Gizzard Shad ^a	Abundance	CPUE–Total	RSE \leq 25
	Size structure	Length frequency	N \geq 50
	Prey availability	IOV	N \geq 50
<i>Trap netting</i>			
Crappie	Abundance	CPUE–Total and CPUE–Stock	RSE–Stock \leq 25
	Size structure	PSD, length frequency	N \geq 50 stock
	Age-and-growth	Age at 10 inches	N = 13, 9.0 – 10.9 inches
	Condition	W_r	5 fish/inch group (max)
<i>Tandem hoop netting</i>			
Channel Catfish	Abundance	CPUE–Total and CPUE–Stock	Practical effort
	Size structure	PSD, length frequency	Practical effort

^a No additional effort was expended to achieve an RSE \leq 25 for CPUE of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition provided information on forage abundance, vulnerability, or both relative to predator density.

Table 6. Survey of aquatic vegetation, Daniel Reservoir, Texas, 2021. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	Acres (Percent Coverage)
Native submersed	<1
Native floating-leaved	1 (0.1)
Native emergent	135 (14.2)
Standing timber, stumps	69 (7.3)
Flooded terrestrial vegetation	132 (13.9)

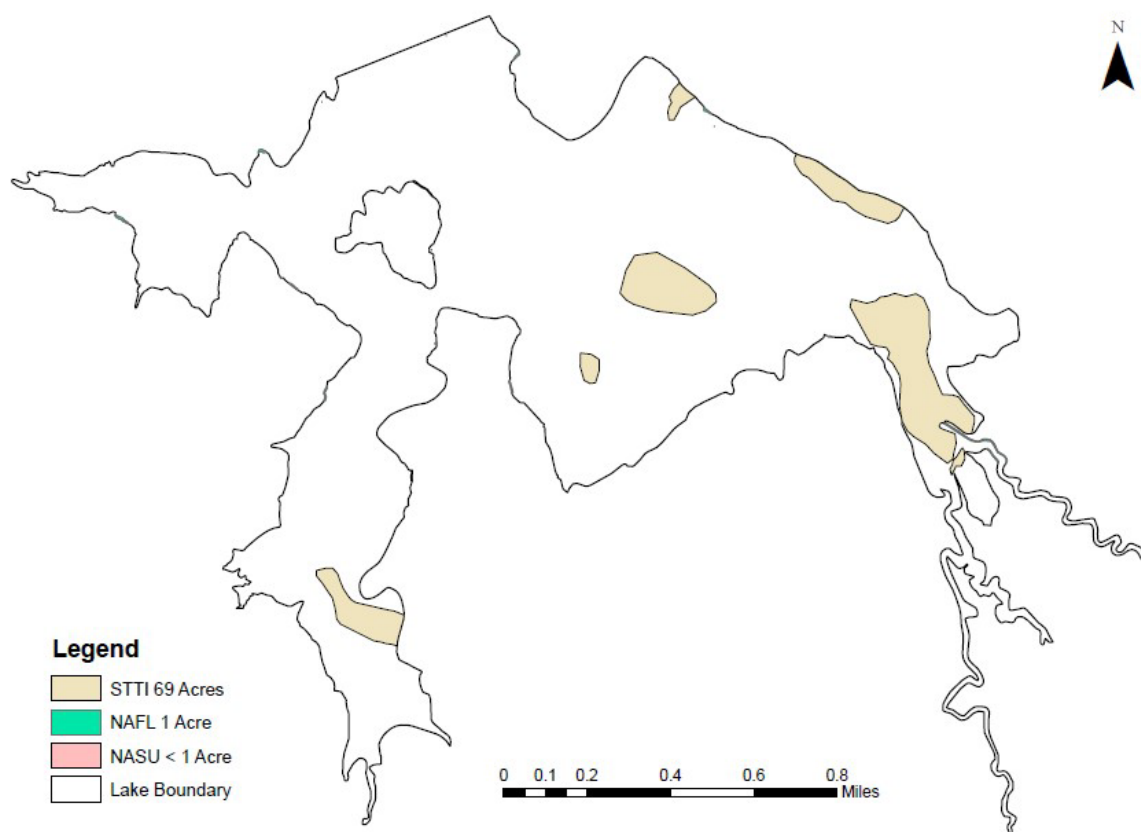


Figure 1. Approximate location and coverage of standing timber, stumps (STTI), native floating leaved (NAFL), and native submersed (NASU) aquatic vegetation.

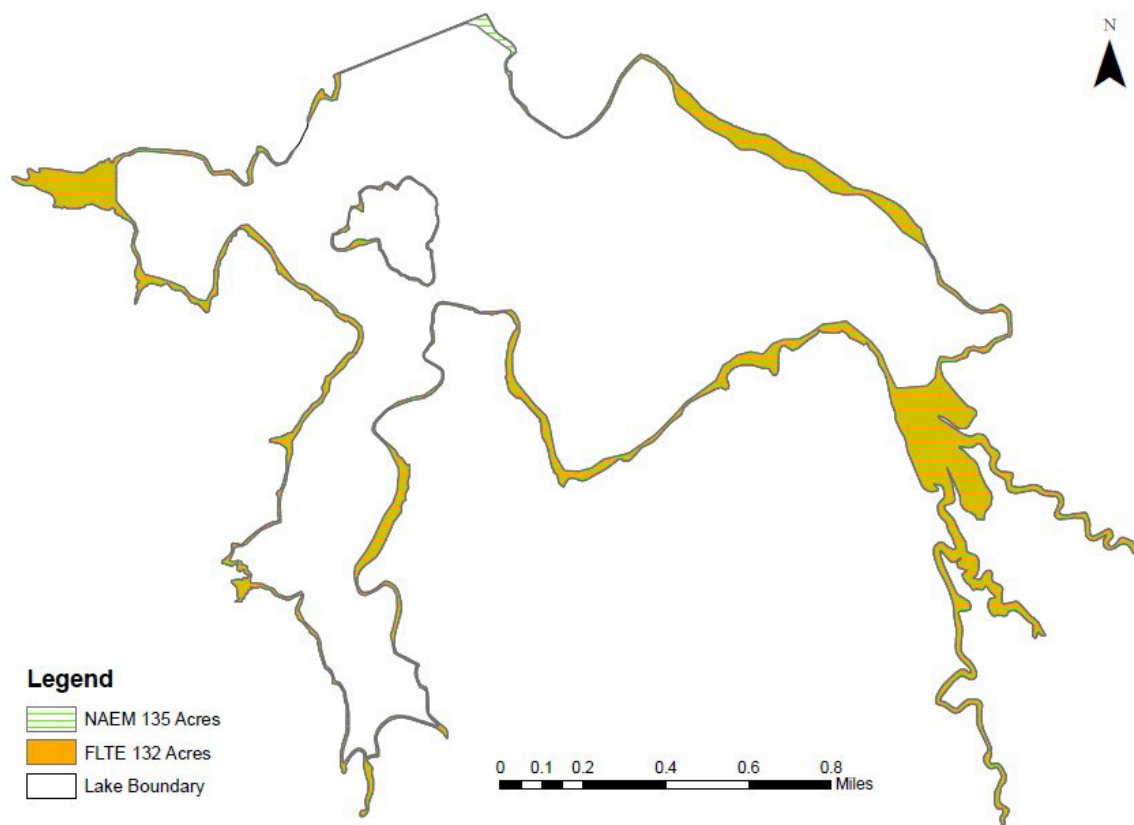


Figure 2. Approximate location and coverage of native emergent (NAEM) aquatic vegetation and flooded terrestrial vegetation (FLTE).

Gizzard Shad

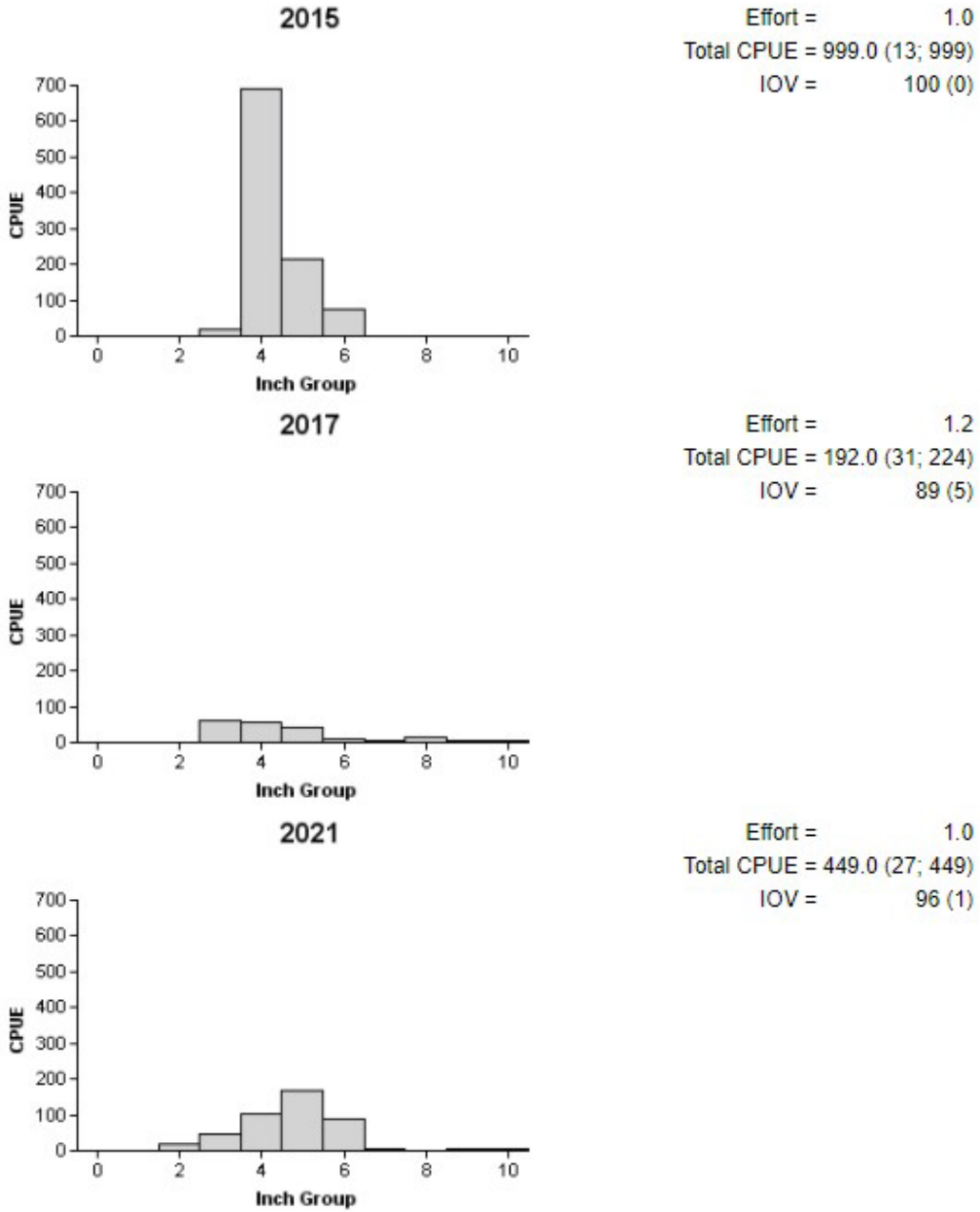


Figure 3. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Daniel Reservoir, Texas, 2015, 2017, and 2021.

Bluegill

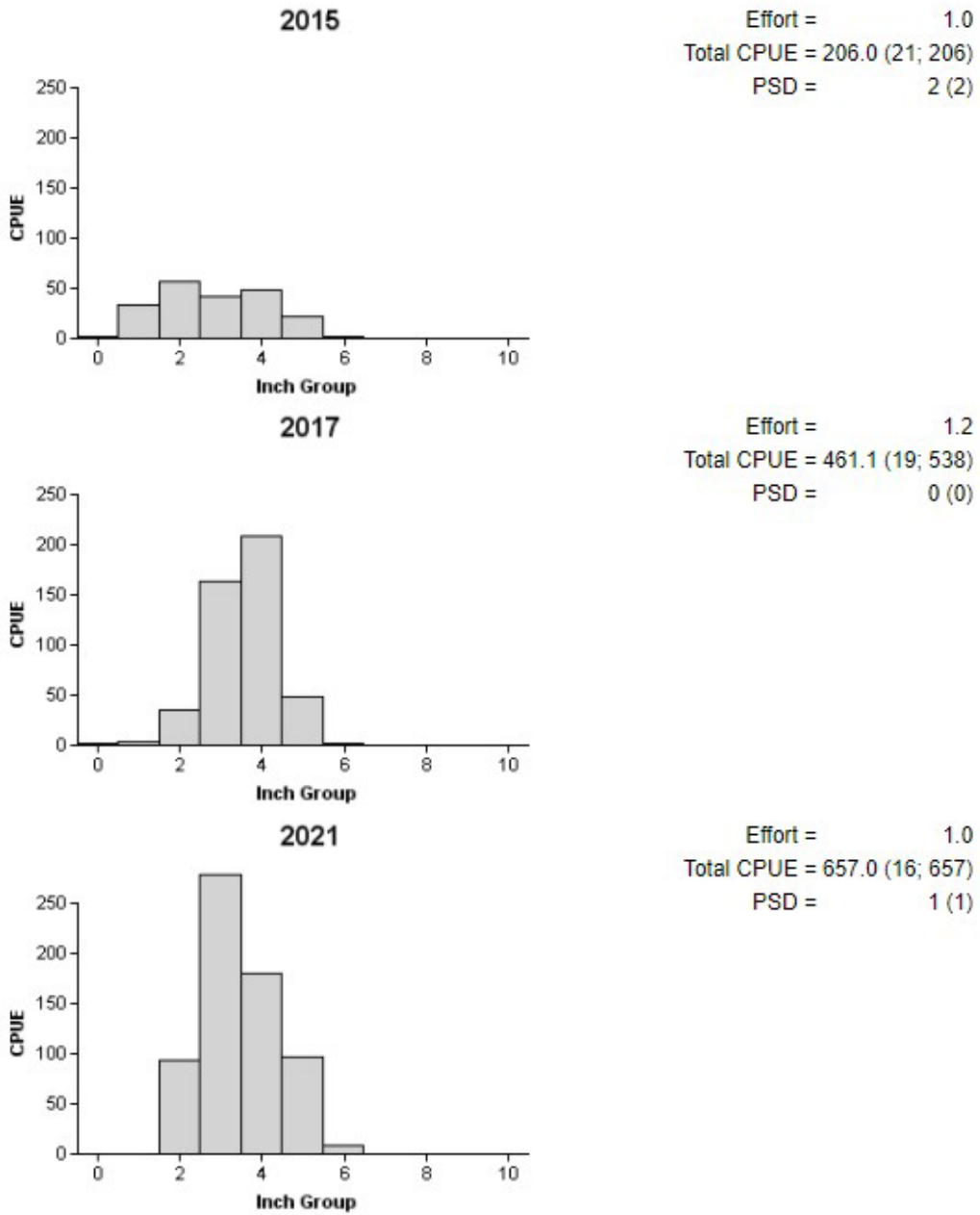


Figure 4. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Daniel Reservoir, Texas, 2015, 2017, and 2021.

Channel Catfish

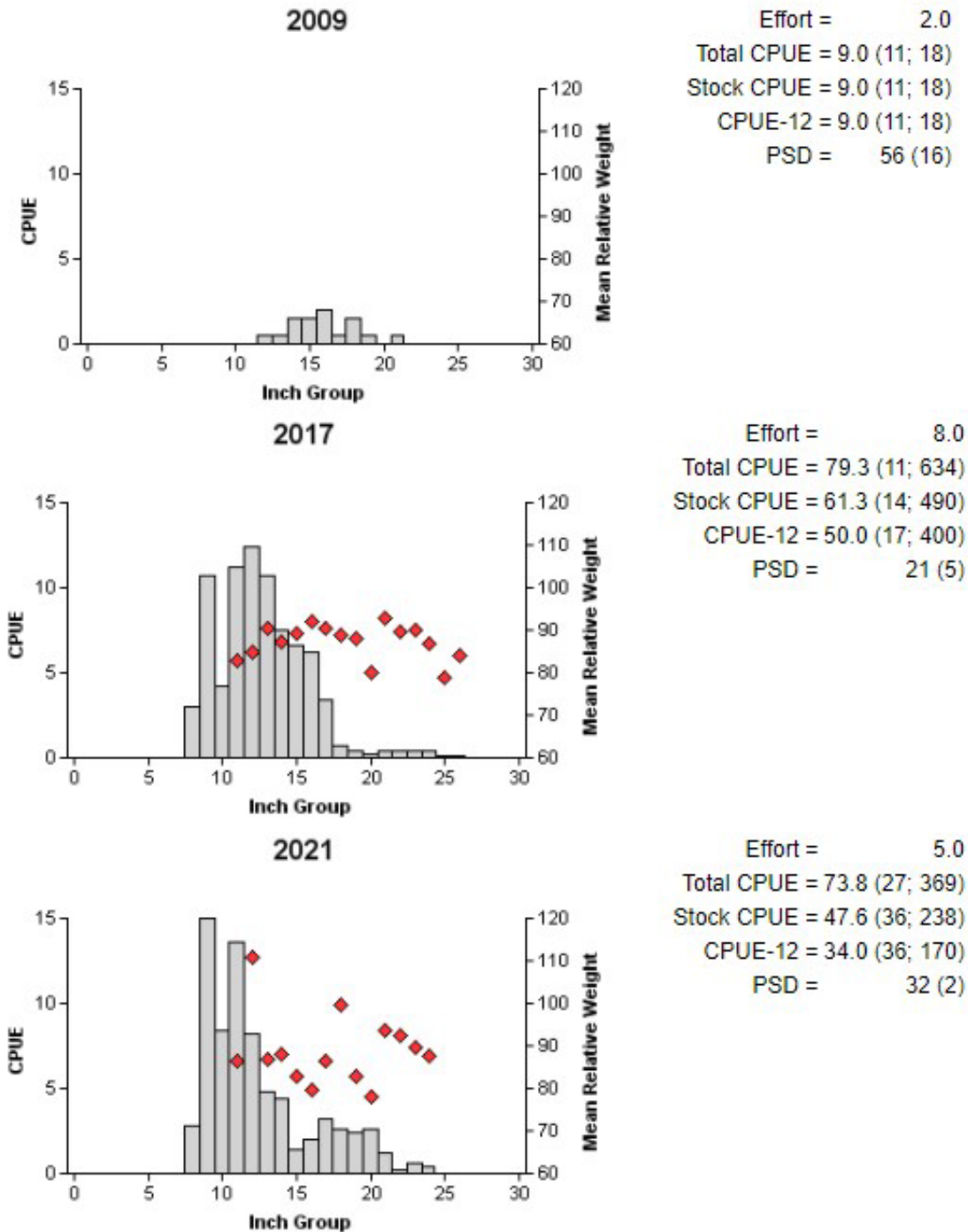


Figure 5. Number of Channel Catfish caught per series (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for summer tandem hoop net surveys, Daniel Reservoir, Texas, 2009, 2017 and 2021.

Largemouth Bass

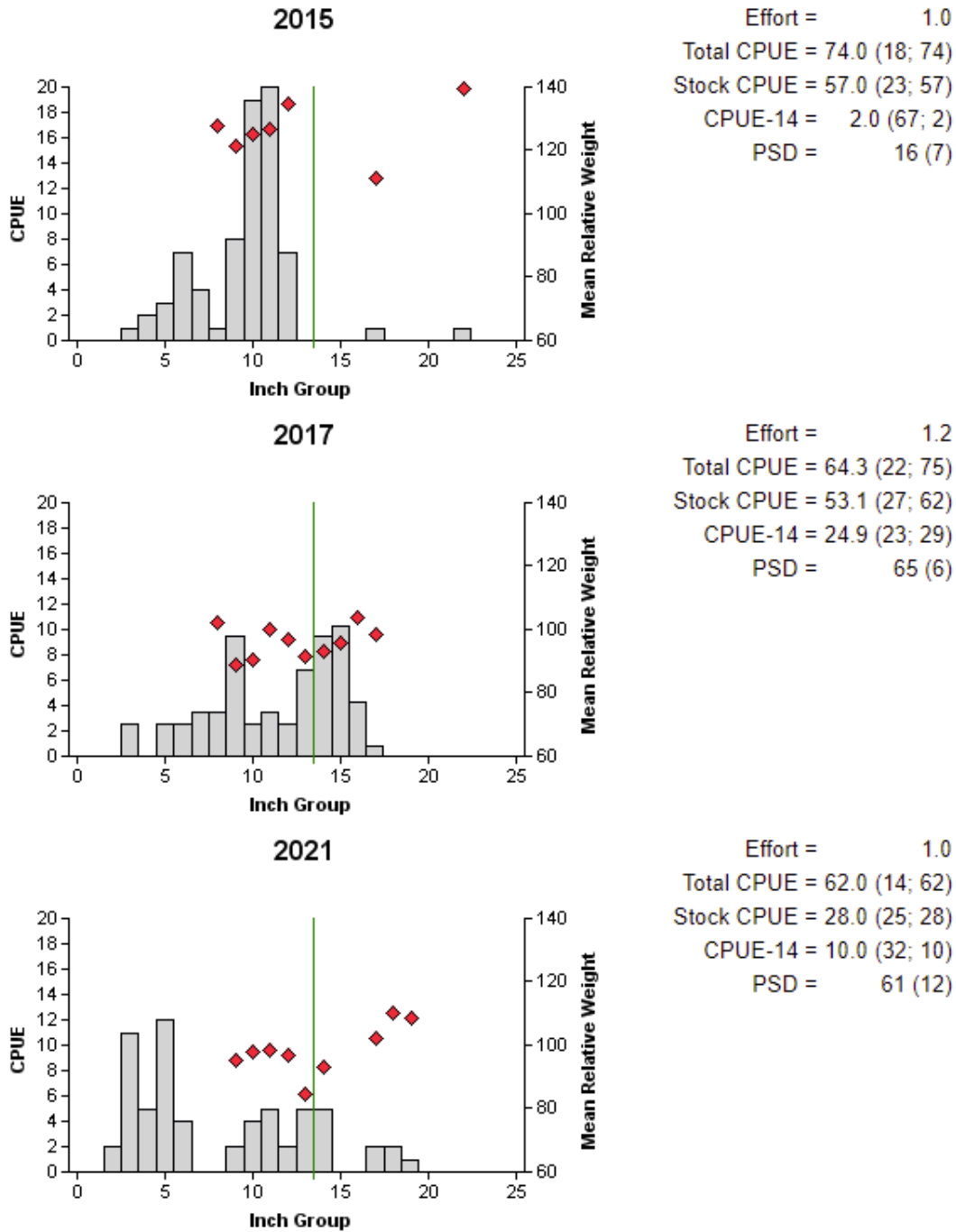


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Daniel Reservoir, Texas, 2015, 2017, and 2021. Vertical line indicates the minimum length limit.

White Crappie

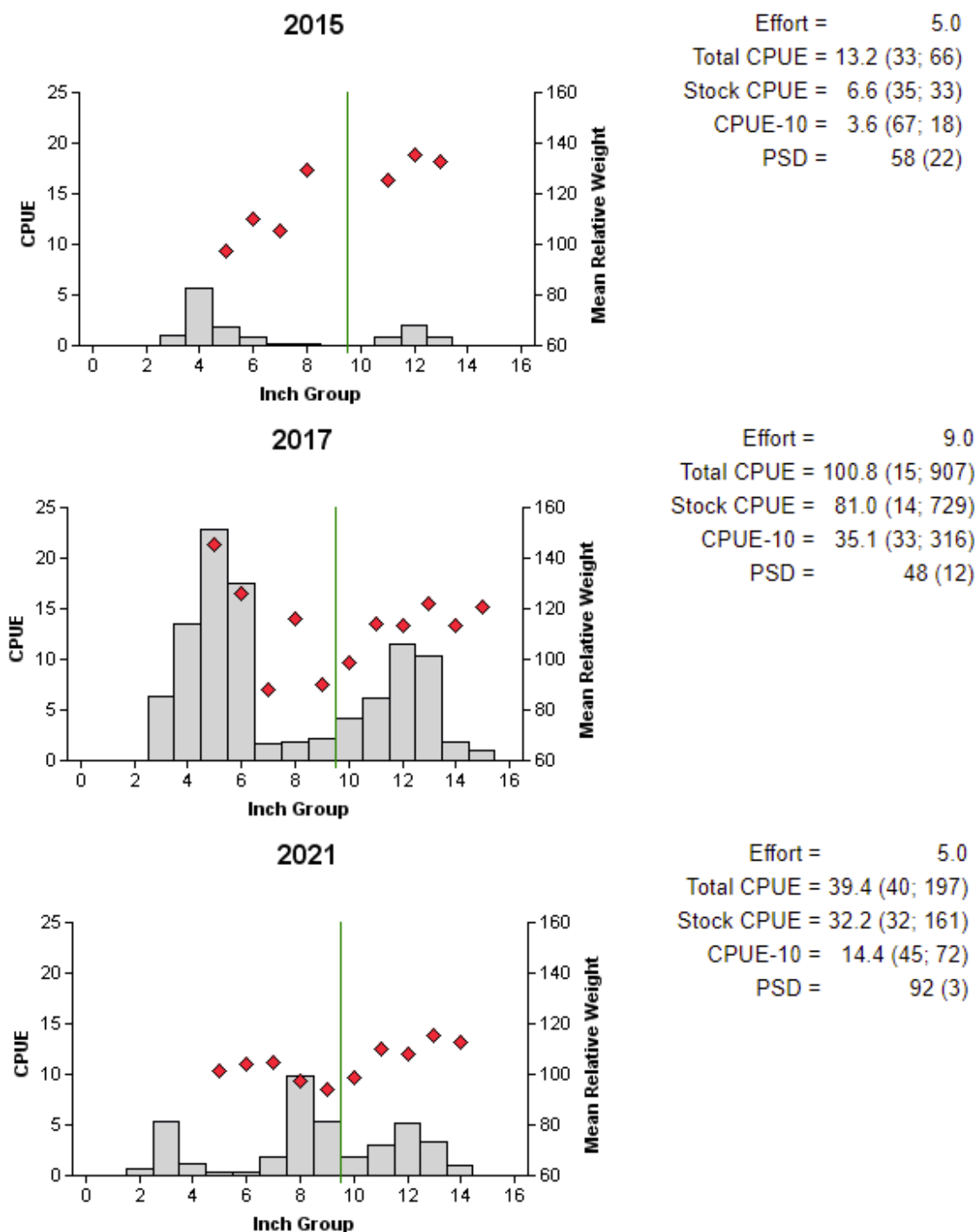


Figure 7. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Daniel Reservoir, Texas, 2015, 2017, and 2021. Vertical line indicates the minimum length limit.

Proposed Sampling Schedule

Table 7. Proposed sampling schedule for Daniel Reservoir, Texas. Survey period is June through May. Tandem hoop netting surveys are conducted in the summer, gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall.

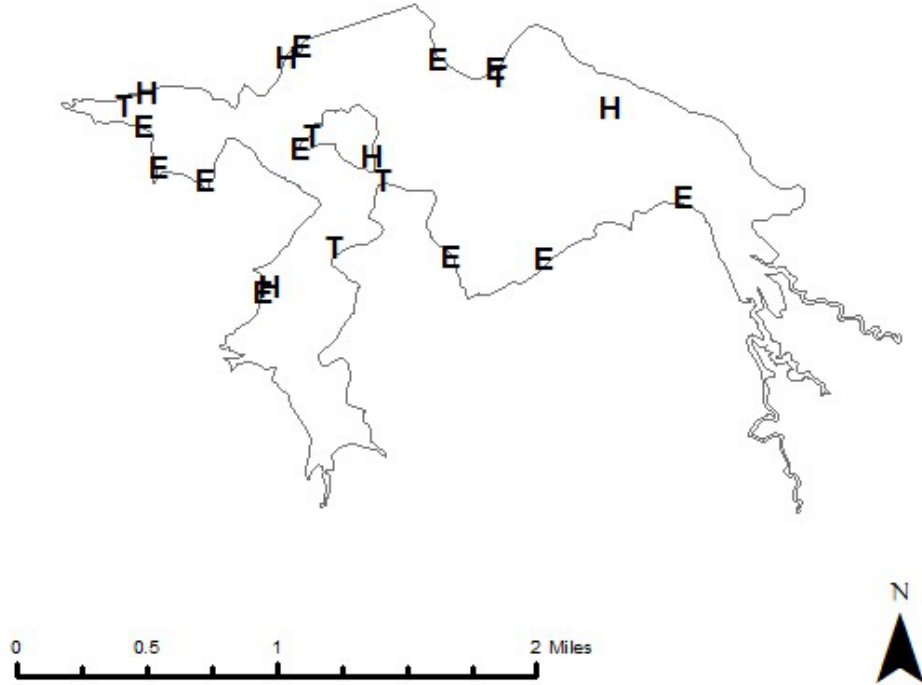
	Survey year			
	2022-2023	2023-2024	2024-2025	2025-2026
Angler Access				X
Structural Habitat				X
Vegetation				X
Electrofishing – Fall				X
Trap Netting				X
Baited Tandem Hoop Netting				X
Report				X

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 Daniel Reservoir, Texas, 2021-2022. Sampling effort was 5 net nights for trap netting, 5 tandem series for hoop netting, and 1 hour for electrofishing.

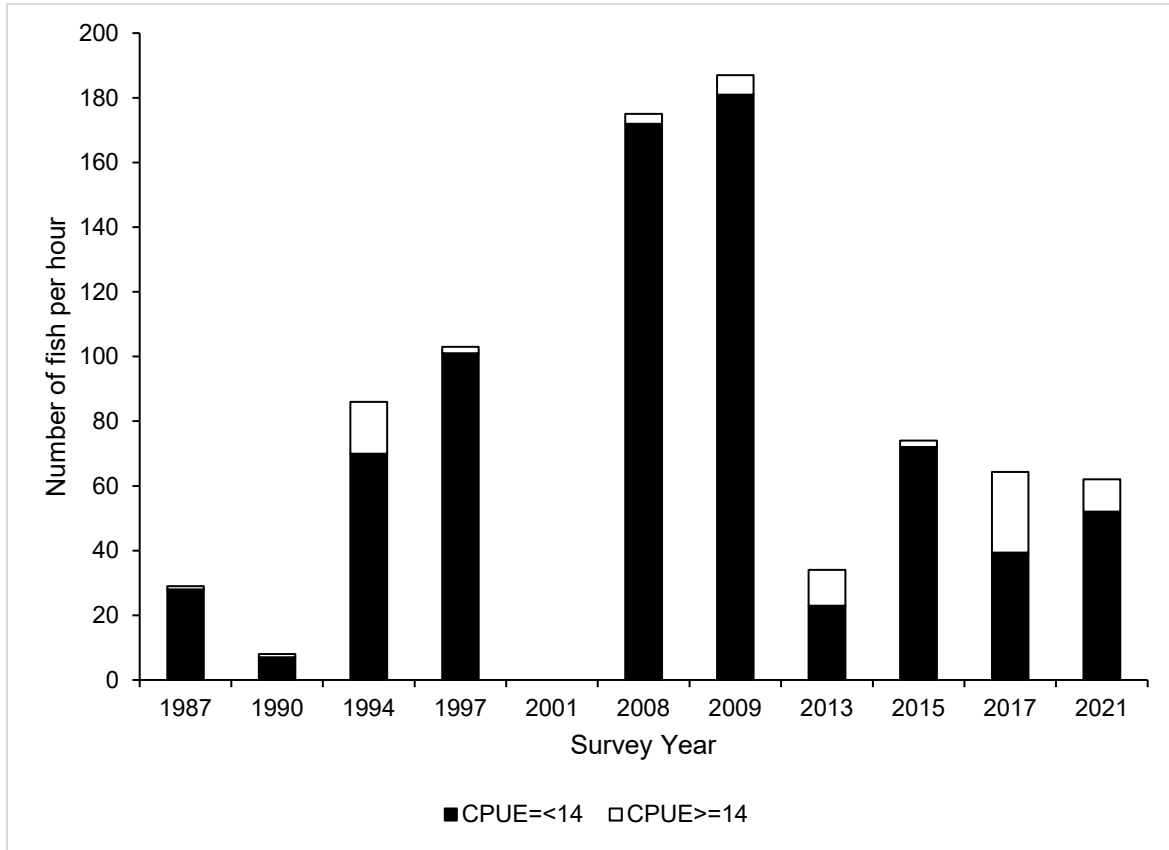
Species	Hoop Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					449	449 (27)
Channel Catfish	369	73.80 (27)				
Green Sunfish					45	45 (40)
Bluegill					657	657 (16)
Longear Sunfish					217	217 (17)
Hybrid Sunfish					2	2 (67)
Largemouth Bass					62	62 (14)
White Crappie			197	39.40 (40)		
Black Crappie			4	0.8 (100)		

APPENDIX B – Map of sampling locations



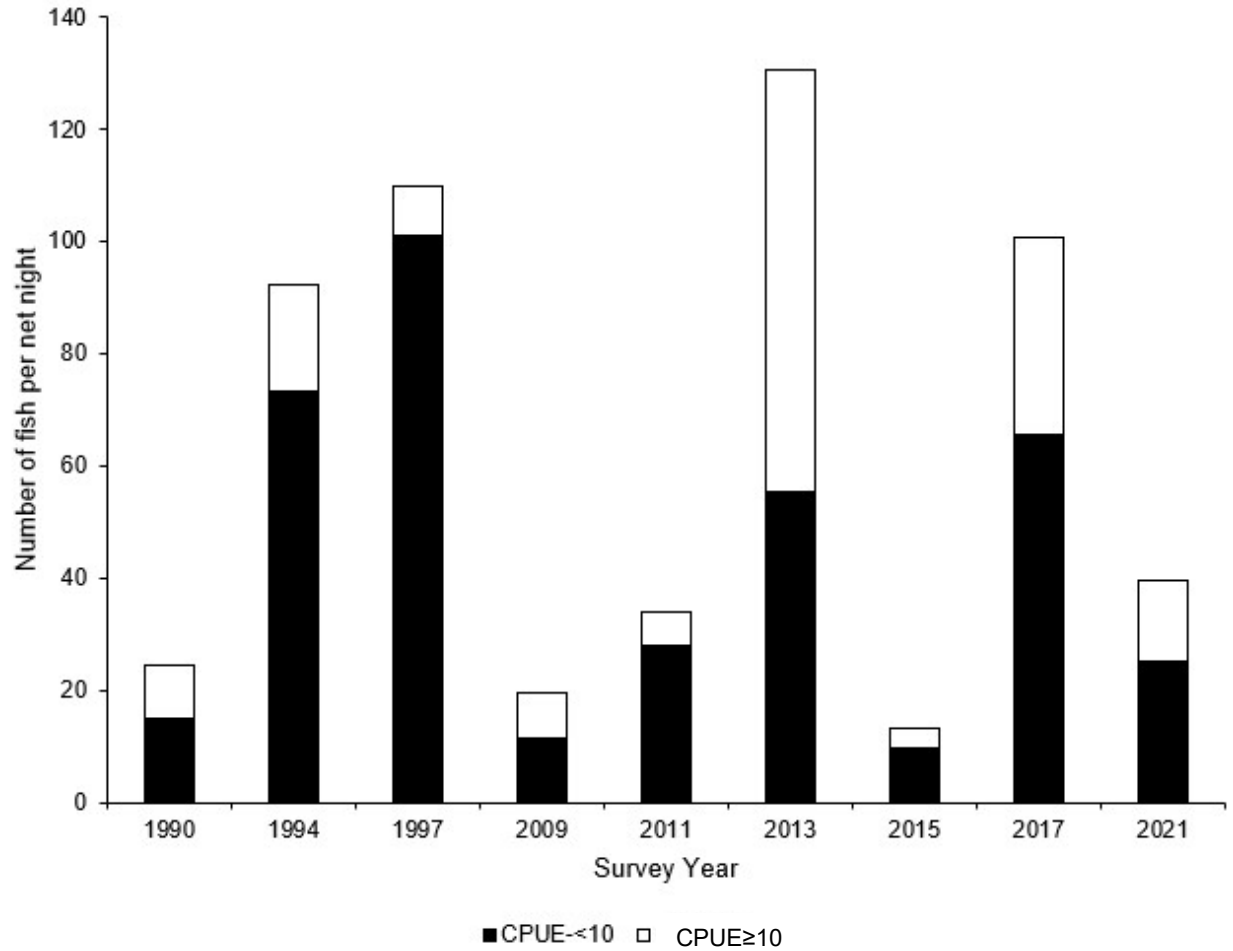
Location of sampling sites, Daniel Reservoir, Texas, 2021. Trap net, tandem hoop net, and electrofishing stations are indicated by T, H, and E, respectively. Water level was about 2 feet low at time of sampling.

APPENDIX C – Catch rate (CPUE) trends for legal and sub-legal size Largemouth Bass



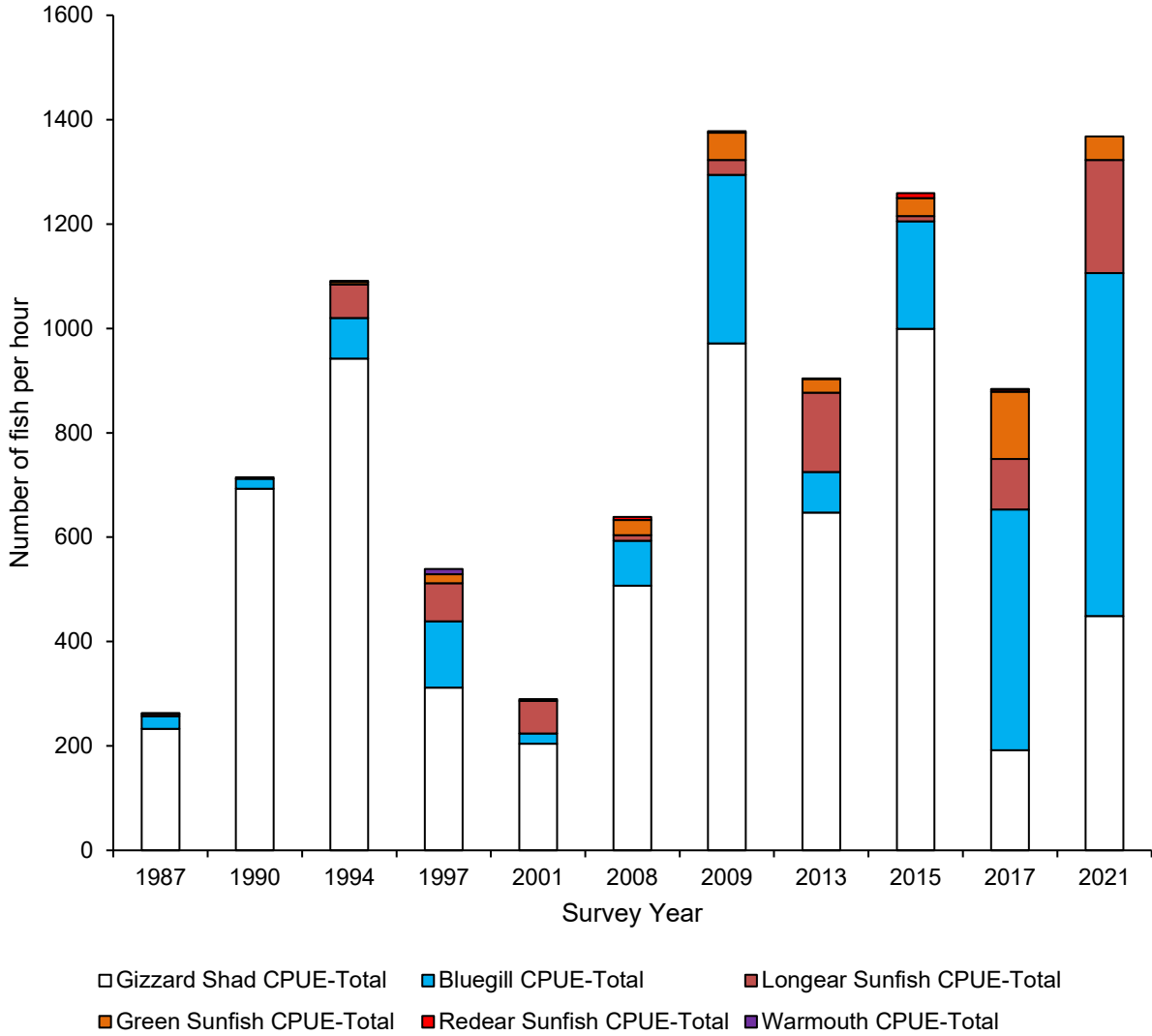
Historical trends in catch rates of legal (CPUE \geq 14) and sub-legal size (CPUE \leq 14) largemouth Bass.

APPENDIX D – Catch rate (CPUE) trends for legal and sub-legal size White Crappie



Historical trends in catch rates of legal (CPUE ≥ 10) and sub-legal size (CPUE < 10) White Crappie.

APPENDIX E – Historical catch rates (CPUE) for common prey species sampled in electrofishing surveys



Historical catch rates of commonly sampled prey species in fall electrofishing surveys, Daniel Reservoir, Texas, 1987-2022.



Life's better outside.®

In accordance with Texas State Depository Law, this publication is available at the Texas State Publications Clearinghouse and/or Texas Depository Libraries.

© Texas Parks and Wildlife, PWD RP T3200-1283 (08/22)

TPWD receives funds from the USFWS. TPWD prohibits discrimination on the basis of race, color, religion, national origin, disability, age, and gender, pursuant to state and federal law. To request an accommodation or obtain information in an alternative format, please contact TPWD on a Text Telephone (TTY) at (512) 389-8915 or by Relay Texas at 7-1-1 or (800) 735-2989 or by email at accessibility@tpwd.texas.gov. If you believe you have been discriminated against by TPWD, please contact TPWD, 4200 Smith School Road, Austin, TX 78744, or the U.S. Fish and Wildlife Service, Office for Diversity and Workforce Management, 5275 Leesburg Pike, Falls Church, VA 22041.