

Buffalo Springs Reservoir

2024 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 Buffalo Springs Reservoir were surveyed in 2022 and 2024 using electrofishing, 2024 using trap netting, and in 2023 and 2025 using gill netting. Historical data are presented with the 2022-2025 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: Buffalo Springs Reservoir is a 225-acre impoundment constructed in 1960 on Yellowhouse Draw, a tributary of the North Fork of the Double Mountain Fork of the Brazos River, approximately 5 miles southeast of Lubbock, Texas. It is controlled and operated by the Lubbock County Water Control and Improvement District Number 1 and used for recreational purposes. Water level was stable and nutrient levels in the reservoir are extremely high. Fish habitat consists primarily of native emergent vegetation, boulders, and artificial fish habitats.

Management History: The sport fish populations have been managed with statewide regulations. Intensive Striped Bass stocking has been used to manage an overabundant Gizzard Shad population with good success.

Fish Community

- **Prey species:** Electrofishing catch of Gizzard Shad was high, and most Gizzard Shad were available as prey to sport fish. Electrofishing catch of Bluegill was also high, and most Bluegill were 6-inches long or smaller.
 - **Catfishes:** The Channel Catfish abundance was good with most fish greater than 12 inches. Fish greater than 20 inches were also observed in the survey. Body condition for all sizes was good.
 - **Striped Bass:** Striped bass were present in the reservoir; however, catch rate was lower than expected. Low catch rate may be attributed to two fish kills at the reservoir prior to sampling.
 - **Largemouth Bass:** Largemouth Bass were abundant with legal-size fish available to anglers. Body condition was good for all sizes.
- White Crappie:** White Crappie were abundant with legal-size fish available to anglers. Body condition for most sizes was excellent.

Management Strategies: Based on current information, the reservoir should continue to be managed with existing regulations. Continue stocking Striped Bass to help maintain control of the Gizzard Shad population. Striped Bass fingerlings should be stocked on an alternating basis at a rate of 15/acre and 40/acre in two consecutive years and then two years of no stocking based on protocols established during research conducted by Schramm et al. (2000). The reservoir should be monitored for *P. parvum* and associated fish kills. Mitigation of kills by stocking should be conducted as soon as practical.

Introduction

This document is a summary of fisheries data collected from Buffalo Springs Reservoir from 2022-2025. 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 2022-2025 data for comparison.

Reservoir Description

Buffalo Springs is a 225-acre reservoir impounded in 1960 on Yellowhouse Draw, a tributary of the North Fork of the Double Mountain Fork of the Brazos River, located 5 miles southeast of Lubbock, Texas. It is owned by the Lubbock County Water Control and Improvement District Number 1 and used for recreational purposes. The City of Lubbock, TX discharges its treated effluent into Yellowhouse Draw which allows water level in the lake to remain stable; however, nutrient levels are extremely high. Buffalo Springs is characterized as a eutrophic lake with a mean Trophic State Index chl-a of 69.08 (Texas Commission on Environmental Quality 2024). Bank and boat access were good, and ADA compliant facilities were available. The reservoir experienced a significant *Prymnesium parvum* (golden algae) kill in 2003 which had a major impact on the fisheries. The reservoir experienced another major kill in 2005 and smaller golden algae kills over the last several years. Additional reservoir characteristics are presented in Table 1.

Angler Access

Buffalo Springs Reservoir has three public boat ramps. Due to stable water level all boat ramps were available to anglers. Additional boat ramp characteristics are listed in Table 2. Shoreline access is good; fishing is allowed in all open areas of the shoreline on the reservoir, except for the bridge located near the marina. There is also a covered fishing dock located near the marina bridge and several small public fishing docks located around the reservoir. Most fishing docks have access ramps or are constructed at ground level making them more accessible to people with disabilities. A new floating dock was installed in 2024 using Conservation License Plate funds.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Clayton and Huber 2021) included:

1. Stock fingerling Striped Bass on an alternating basis where they are stocked at a rate of 15/acre and 40/acre in two consecutive years followed by two years of no stocking.

Action: Buffalo Springs was stocked with Striped Bass at a rate of approximately 20/acre in 2022 and 50/acre in 2023. Striped Bass were not stocked in 2024 or 2025.
2. Maintain contacts with reservoir management authority to monitor for fish kills and conduct *P. parvum* sampling. If notified of a fish kill, to determine if kill is *P. parvum* related.

Action: A strong working relationship has been maintained with the lake manager and staff, and water samples have been routinely evaluated.
3. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir; contact and educate marina owners about invasive species, and provide them with posters, literature, etc... so that they can in turn educate their customers; educate the public about invasive species through the use of media and the internet; and make a speaking point about invasive species when presenting to constituents and user groups.

Action: Presentations have been given to the Regional water planning group, the Buffalo Springs Board of Directors, and various area civic groups and school groups. Interviews and new releases concerning invasive species have been done for area newspapers.

Stories and posts have been added to the district Facebook page. Invasive species literature has been sent to the Buffalo Springs controlling authority and placement of signage has been advised.

Harvest regulation history: Sport fishes in Buffalo Springs Reservoir have been and continue to be managed with statewide regulations (Table 3).

Stocking history: Buffalo Springs Reservoir has been stocked with Blue Catfish, Channel Catfish, Striped Bass, Bluegill, and Florida Largemouth Bass multiple times since 2003 in an effort to mitigate the effects of fish kills and reestablish populations. The reservoir was experimentally stocked with Walleye (1978-1981) Red Drum (1983), and Northern Pike (1975-1976) with limited success. The reservoir was last stocked in 2023 with Striped Bass. The complete stocking history is in Table 4.

Vegetation/habitat management history: Vegetation in Buffalo Springs Reservoir is limited to mainly cattail and a small amount of bulrush. To maintain shoreline fishing access, the water authority has periodically removed problematic vegetation with the use of an excavator and herbicides. In May 2016, 131 artificial habitats were installed adjacent to 14 public access areas on the West side of the reservoir. In June 2020, 50 Georgia Cubes, 50 Spider Blocks, and 50 Crappie Condos were placed around the Crappie House and around three public access areas on the East side of the reservoir.

Water transfer: Buffalo Springs Reservoir is primarily used for recreation. 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 Buffalo Springs Reservoir (Clayton and Huber 2021). Primary components of the OBS plan are listed in Table 5. Survey sites for electrofishing and gill netting were randomly selected, and all were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2024). Trap net survey sites were biologist selected.

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, White Crappie, sunfishes, and Gizzard 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. Electrofishing after 2023 was conducted using a Smith-Root Apex electrofisher, while previous surveys used GPP 5.0 electrofisher.

Trap netting – Crappie were collected using trap nets (5 net nights at 5 biologist selected stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn).

Gill netting – Channel Catfish, Striped bass, and White Crappie were collected by gill netting (7 net nights at 7 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

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 and IOV. Relative standard error ($RSE = 100 \times SE \text{ of the estimate/estimate}$) was calculated for all CPUE and creel statistics.

Habitat – A structural habitat survey and a vegetation survey was conducted in August 2024. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2024).

Water level – There is no water level gauge on the reservoir; however, the lake maintains a constant level at conservation pool due to a constant flow of treated effluent from the City of Lubbock, TX.

Results and Discussion

Habitat: Primary habitat was natural shoreline (75%) followed by bulkhead (18.7%) (Table 6). Aquatic vegetation was mainly limited to cattail and very small amount of bullrush, primarily along natural shoreline areas (Table 7). A planted area for White Water Lilly that had expanded from 3 plants to an area of approximately 100 sq ft appears to have been eliminated from the reservoir. There is currently no trace of White Water Lilly in the reservoir.

Prey species: Electrofishing catch rates of Gizzard Shad and Bluegill were 636.0/h and 440.0/h, respectively in 2024. Index of Vulnerability (IOV) for Gizzard Shad was good, indicating 67% of Gizzard Shad were available to existing predators; this was similar to previous years (Figure 1). In the 2024 survey, total CPUE of Gizzard Shad was considerably higher than 2022 and slightly higher than the 2020 survey (Figure 1). Research that was done with stocking Striped Bass in the mid 1990's (Schramm et al. 2000) was able to restructure the Gizzard Shad population from predominantly large to small individuals; Index of Vulnerability increased from a low of 3 in 1987 to a high of 94 in 2012. Since 2012, the IOV has fluctuated between 94 and 57. Total CPUE of Bluegill in 2024 (440.0/h) was much lower than total CPUE

in 2022 (1,146.0/h) and similar to 2020 (380.0/h; Figure 2). While most Bluegill were still small enough to be utilized as prey a PSD of 62 in 2024 shows a shift to slightly larger individuals (Figure 2).

Channel Catfish: The gill net catch rate of Channel Catfish was 6.9/nn in 2025; similar to previous surveys (Figure 3). The relative abundance appears good, most fish sampled were greater than 12 inches, and fish over 20 inches were sampled during all survey years (Figure 3). Body condition (Wr) for all sizes classes was near or greater than 90 (Figure 3). OBS objectives were not achieved.

Striped bass: The gill net catch rate of Striped Bass was 2.4/nn in 2025, down from 6.9/nn in 2023 and 19.5/nn in 2021 (Figure 4). The unexpected low total catch rate of fish in 2025 can most likely be attributed to accidental sludge and treatment media releases from the City of Lubbock's wastewater treatment plant due to maintenance and heavy rain events in March and July 2024; each release resulted in angler reported fish kills. The March reported kill consisted of small numbers of adult fish each day over about an 8-day period. In July an angler reported "thousands" of unspecified adult fish over the 4th of July weekend; this kill was confirmed by the Buffalo Springs Lake manager and Lubbock County Game Warden. Due to the size of the reservoir (225 acres) and the excessive amount of effort required to achieve specific OBS objectives, objectives consisted of general trend monitoring.

Largemouth Bass: The electrofishing catch rate of stock-length Largemouth Bass was 51.0/h in 2024, similar to 62.0/h in 2022 and 54.0/h in 2020 (Figure 5). Overall abundance remained similar throughout the survey period. The abundance of legal-sized fish has fluctuated with a CPUE-14 ranging from 54.0 to 16.0, and PSD varied from 46 to 67 during the survey periods (Figure 5). Body condition in 2024 was good (relative weight over 90) for all size classes of fish (Figure 5). OBS objectives for abundance (RSE-Stock ≤ 25) and size structure ($N \geq 50$ of stock size fish) were achieved.

White Crappie: The crappie CPUE has fluctuated greatly since *P. parvum* blooms began in 2003; trap net catch rates are highly variable from year to year. Due to high variability, trap net catch rates for Buffalo Springs Reservoir provide little more than presence/absence data. In 2020 it was determined that presence/absence data could be obtained through other survey techniques. Since very few White Crappie were observed during the 2024 electrofishing survey, five trap nets were used in fall 2024; trap nets were placed near artificial structures to evaluate the impact of recently installed artificial habitats. The trap net catch rate of White Crappie was 33.4/nn in 2024, much higher than in 2012 (0.2/nn) and 2008 (8.2/nn; Figure 6). Mean relative weight was 100 or greater for most size classes in 2024 and was similar to values observed during other surveys (Figure 6). Research done by Schramm et al. (2000) indicated that restructuring the Gizzard Shad population may have increased the abundance of White Crappie approximately 4 years after the initial research stocking rates in 1992 and 1993. Resuming the consistent Striped Bass stocking regime in 2018 suggests another increase in White Crappie abundance as indicated by the record high CPUE=33.4/nn observed in the 2024 survey. The OBS objective of Presence/Absence was achieved.

Fisheries Management Plan for Buffalo Springs Reservoir, Texas

Prepared – July 2025

ISSUE 1: Striped Bass are an important top-level predator in Buffalo Springs Reservoir, and they provide additional recreation to anglers. Historically, Buffalo Springs was characterized as having an overabundant Gizzard Shad population comprised mostly of adult shad too large to be used as prey. Schramm et al. (2000) found that the Gizzard Shad population in Buffalo Springs could be restructured to be more conducive to predation by stocking large numbers of Striped Bass. Striped Bass do not reproduce in Buffalo Springs and stocking is required to maintain their abundance. The recent IOV's for Gizzard Shad indicate that the consistent stockings of Striped Bass have stabilized the size structure of Gizzard Shad making the majority of them more available to predators.

MANAGEMENT STRATEGY

1. Stock fingerling Striped Bass on an alternating basis where they are stocked at a rate of 15/acre and 40/acre in two consecutive years (2026 and 2027) followed by two years of no stocking (2028 and 2029).

ISSUE 2: The reservoir experienced a severe fish kill in 2003 due to *P. parvum*. There have been repeated smaller kills in the years following the initial kill, but these have been much smaller and primarily restricted to the upper reservoir.

MANAGEMENT STRATEGIES

1. Maintain contacts with reservoir management authority to monitor for fish kills.
2. Conduct *P. parvum* sampling If notified of a fish kill, to determine if kill is *P. parvum* related.

ISSUE 3: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches, and plugging engine cooling systems. Giant salvinia and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc... so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.

4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future interbasin water transfers to facilitate potential invasive species responses.

Objective-Based Sampling Plan and Schedule (2025–2029)

Sport fish, forage fish, and other important fishes

Sport fishes in Buffalo Springs Reservoir have historically included Channel Catfish, Striped Bass, Largemouth Bass, and White Crappie. The primary forage is Gizzard Shad and Bluegill.

Low-density fisheries

Blue Catfish are typically collected in gill nets at a rate of 0.2/nn or lower, and a 2019 creel survey indicated no directed effort toward this species.

Survey objectives, fisheries metrics, and sampling objectives

Channel Catfish: Channel Catfish populations have been impacted by golden algae since 2003, and trend data on relative abundance and size structure of Channel Catfish has been collected biennially since 2005. Continuation of trend data will allow for general monitoring of large-scale changes in relative abundance and size structure. Catch rates from 2021 to 2025 have been fairly consistent; based upon 2021, 2023, and 2025 survey results, gill net sampling effort needed to achieve sampling objectives for relative abundance (CPUE-S; $RSE \leq 25$ with 80% confidence), and effort for size structure estimation (PSD; 50 fish minimum with 80% confidence) is approximately 9 random gill net stations. Effort needed to achieve the same objectives using baited hoop nets could require 11 or more stations. Because this reservoir is a small (225 acres), harvest-oriented fishery, general monitoring on a biennial basis is adequate for observing large scale changes in trend data for the population. For 2027 and 2029 a total of 7 random gill net stations will be sampled each year; objective will be to monitor trends of population, and no additional effort will be expended to improve precision (Table 8).

Striped Bass: Striped Bass populations have been impacted by golden alga since 2003, and trend data on relative abundance of Striped Bass has been collected biennially since 2005. Continuation of trend data will allow for general monitoring of any large-scale changes in relative abundance. Catch rates have been highly variable ranging from a low of 0.4/nn (2009, 2013, 2015) to 19.8/nn (2021). Based upon 2021, 2023, and 2025 survey results, achieving a relative abundance precision of $RSE \leq 25$ of CPUE-S with 80% confidence could require as many as 22 random gill net stations, and effort for size structure estimation (PSD; 50 fish minimum with 80% confidence) exceeds 9 random stations. As Buffalo Springs Reservoir has a total surface area of 225 acres, this amount of effort would equate to one gill net station per 10 acres. Continuing the recent consistent stocking will most likely result in better catch rates and increased fishing pressure in the future. For the 2025-2029 survey period Striped Bass data will be collected biennially using the Channel Catfish gill net sampling strategy of 7 random gill nets in 2027 and 2029; objective will be to monitor trends of population, and no additional effort will be expended to improve precision (Table 8).

Largemouth Bass: Largemouth Bass populations have been impacted by golden algae since 2003; however, trend data on relative abundance and size structure of Largemouth Bass has been collected biennially since 1996 with fall nighttime electrofishing. Continuation of trend data will allow for general monitoring of any large-scale changes in the Largemouth Bass population that may spur further

investigation. Analysis of the past two surveys (2022 and 2024) indicated that it would require 12 electrofishing sites to achieve a relative abundance precision of CPUE-S with $RSE \leq 25$. Effort for size structure estimation (PSD: 50 fish minimum with 80% confidence) would require 13 random sites. Twelve randomly selected 5-min electrofishing sites will be sampled in 2026 and 2028 (Table 8). Fin clips will be collected from a minimum of 30 Largemouth Bass for genetic analysis in fall 2026. No additional effort will be expended to improve precision.

White Crappie: White Crappie populations have been impacted by golden algae since 2003. Trap net catch rates of White Crappie have been highly variable. Trend data, using trap nets, has only been able to determine presence/absence of the species; in 2012 only one White Crappie was sampled. Due to potential future golden algae impacts, general monitoring on a quadrennial basis will allow for the evaluation of presence/absence of White Crappie. To determine presence/absence we will document any White Crappie observed in the 2026 and 2028 electrofishing surveys (Table 8). In order to continue the evaluation of the impact of recently installed artificial habitats, additional effort will include five biologist selected trap net stations in 2028 (Table 8).

Prey species: Gizzard Shad and Bluegill are the primary forage at Buffalo Springs Reservoir. Trend data has been collected biennially since 1996. Continuation of sampling, as per Largemouth Bass above, will allow for general monitoring of large-scale changes in relative abundance and size structure. No additional effort will be extended beyond what is used for Largemouth Bass sampling.

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Tables and Figures

Table 1. Characteristics of Buffalo Springs Reservoir, Texas.

Characteristic	Description
Year constructed	1960
Controlling authority	Lubbock County WC&ID No. 1
County	Lubbock
Reservoir type	Tributary
Shoreline Development Index	3.65
Conductivity	1,665 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Buffalo Springs Reservoir, Texas, August 2024. Reservoir elevation at time of survey was at conservation pool (approximately 3020 feet above mean sea level).

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Marina Ramp	33.53056 -101.70933	Y	30	Unknown	Excellent, no access issues
Water Park Ramp	33.53255 -101.70460	Y	15	Unknown	Excellent, no access issues
Old Gate Ramp	33.53241 -101.72361	Y	30	Unknown	Excellent, no access issues

Table 3. Harvest regulations for Buffalo Springs Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (only 10 $\geq$ 20 inches)	None
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Striped	5	18-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 Buffalo Springs Reservoir, Texas. FRY = fry, FGL = fingerling; ADL = adults; UNK = unknown.

Species	Year	Number	Size
Northern Pike	1975	2,719	UNK
	1976	5,940	UNK
	Total	8,659	
Blue Catfish	1984	13,120	UNK
	2003	5,635	FGL
	2007	25,164	FGL
	2009	24,432	FGL
	Total	68,351	
Channel Catfish	1966	12,500	UNK
	1967	13,000	UNK
	1968	12,000	UNK
	1969	5,500	UNK
	1970	12,540	UNK
	1971	15,000	UNK
	1972	10,500	UNK
	1973	10,000	UNK
	1974	5,000	UNK
	1975	5,000	UNK
	1977	5,000	UNK
	2005	58	ADL
	Total	106,098	
Flathead Catfish	1973	1,500	UNK
Striped Bass	1983	11,450	UNK
	1984	11,000	FGL
	1986	13,500	FGL
	1988	2,416	FGL
	1988	25,000	FRY
	1989	28,400	FRY
	1990	5,110	FGL
	1991	4,500	FGL
	1992	39,566	FGL
	1992	11,055	FRY
	1993	50,450	FGL
	1998	3,486	FGL
	1999	9,487	FGL
	2002	3,428	FGL
	2003	9,752	FGL
	2005	3,686	FGL
	2006	11,619	FGL
	2008	3,988	FGL
	2013	3,705	FGL
	2015	8,351	FGL
	2017	5,200	FGL
	2018	3,830	FGL
	2019	11,664	FGL
	2022	4,401	FGL

Table 4. Stocking history continued

Species	Year	Number	Size
Striped Bass continued	2023	11,048	FGL
	2023	295	ADL
	Total	296,387	
Green X Redear Sunfish	1970	5,000	UNK
Bluegill	2004	64,550	FGL
	2007	24,597	FGL
	Total	89,147	
Largemouth Bass	1966	36,000	FGL
	1967	10,500	FGL
	1968	6,450	FGL
	1969	5,000	FGL
	1970	10,000	FGL
	1971	7,000	FGL
	1991	3,050	FGL
	Total	78,000	
Florida Largemouth Bass	1982	3,000	FGL
	1983	10,500	FGL
	1984	2,400	FRY
	1985	2,000	FGL
	2003	24,316	FGL
	2004	25,019	FGL
	2005	25,105	FGL
	2007	24,361	FGL
	2009	24,008	FGL
	2011	24,141	FGL
	Total	164,850	
Walleye	1978	1,124,775	FRY
	1979	500,000	FRY
	1980	1,102,500	FRY
	1981	2,345,000	FRY
	Total	5,072,275	
Red Drum	1983	27,900	UNK

Table 5. Objective-based sampling plan components for Buffalo Springs Reservoir, Texas 2024–2025.

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 ≥ 50 stock
Bluegill ^a	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad ^a	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Prey availability	IOV	N ≥ 50
White Crappie	Exploratory	Presence/Absence	N ≥ 1
<i>Gill netting</i>			
Channel Catfish	Abundance	CPUE–stock	RSE–Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
Striped Bass	Abundance	CPUE–stock	Practical effort, trend data
	Size structure	PSD, length frequency	Practical effort, trend data
<i>Trap netting</i>			
White Crappie	Exploratory	Presence/Absence	N ≥ 1

^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 structural habitat types, Buffalo Springs Reservoir, Texas, 2024. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Natural shoreline	6.0 miles	75.0
Bulkhead	1.5 miles	18.7
Rock shore	0.4 miles	5.0
Bulkhead = piers	0.1 acres	1.3

Table 7. Survey of aquatic vegetation, Buffalo Springs Reservoir, Texas, 2008–2024. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2008	2012	2016	2020	2024
Native emergent	4.6 (1.9%)	5.6 (2.3%)	6.1 (2.8%)	6.1 (2.8%)	1.9 (0.8%)
Native floating-leaved				<1.0 (<1%)	

Gizzard Shad

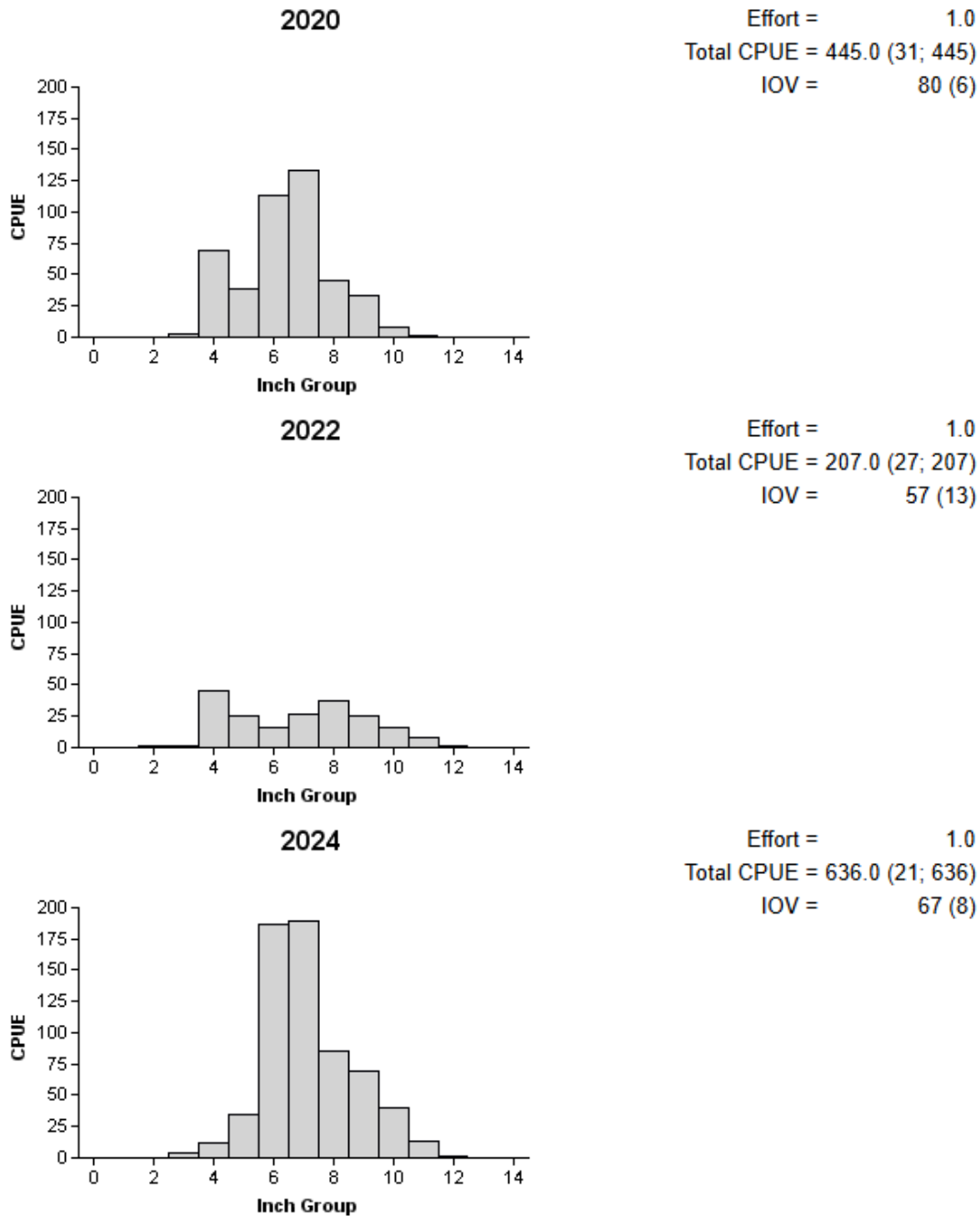


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Buffalo Springs Reservoir, Texas, 2020, 2022, and 2024.

Bluegill

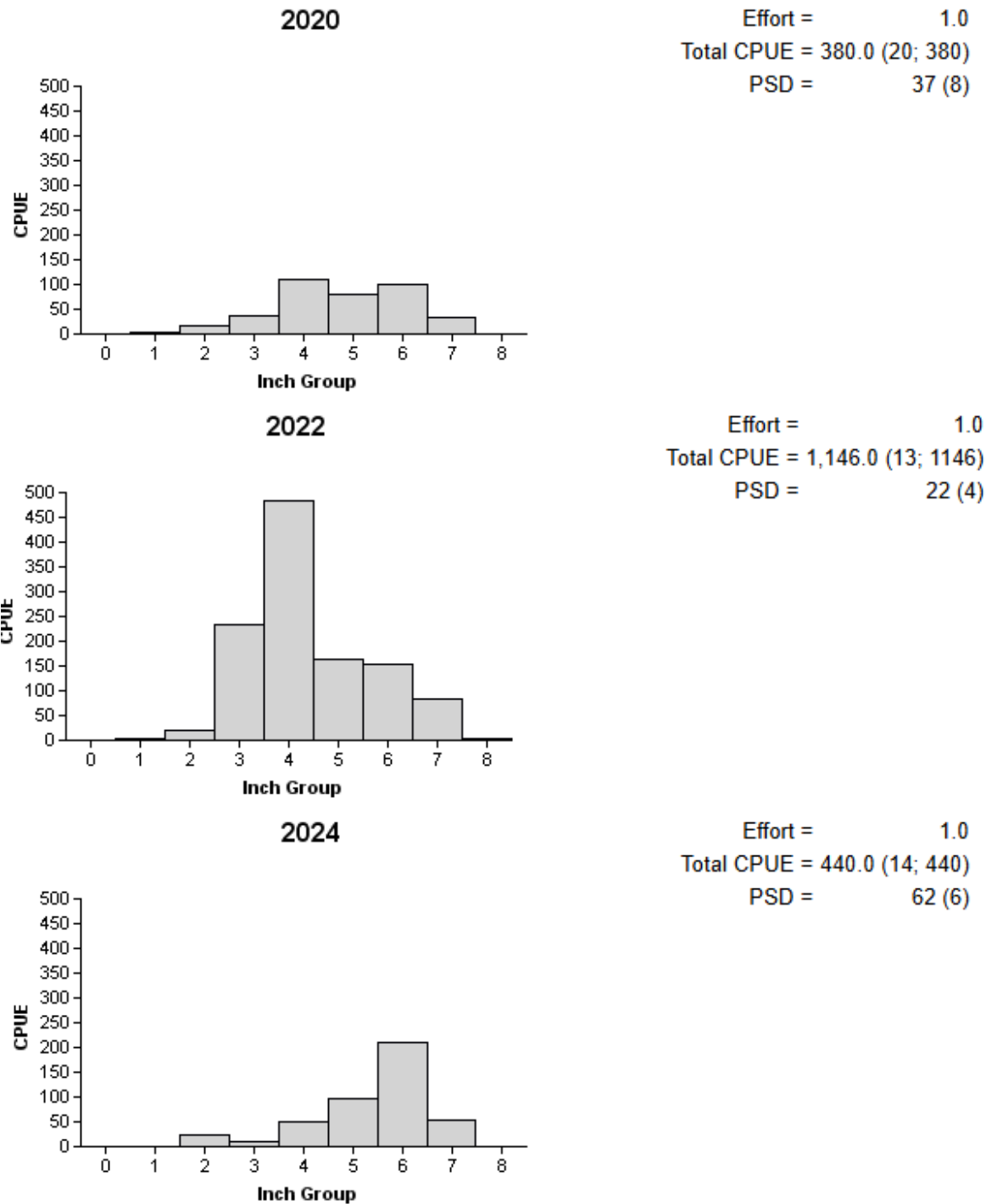


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Buffalo Springs Reservoir, Texas, 2020, 2022, and 2024

Channel Catfish

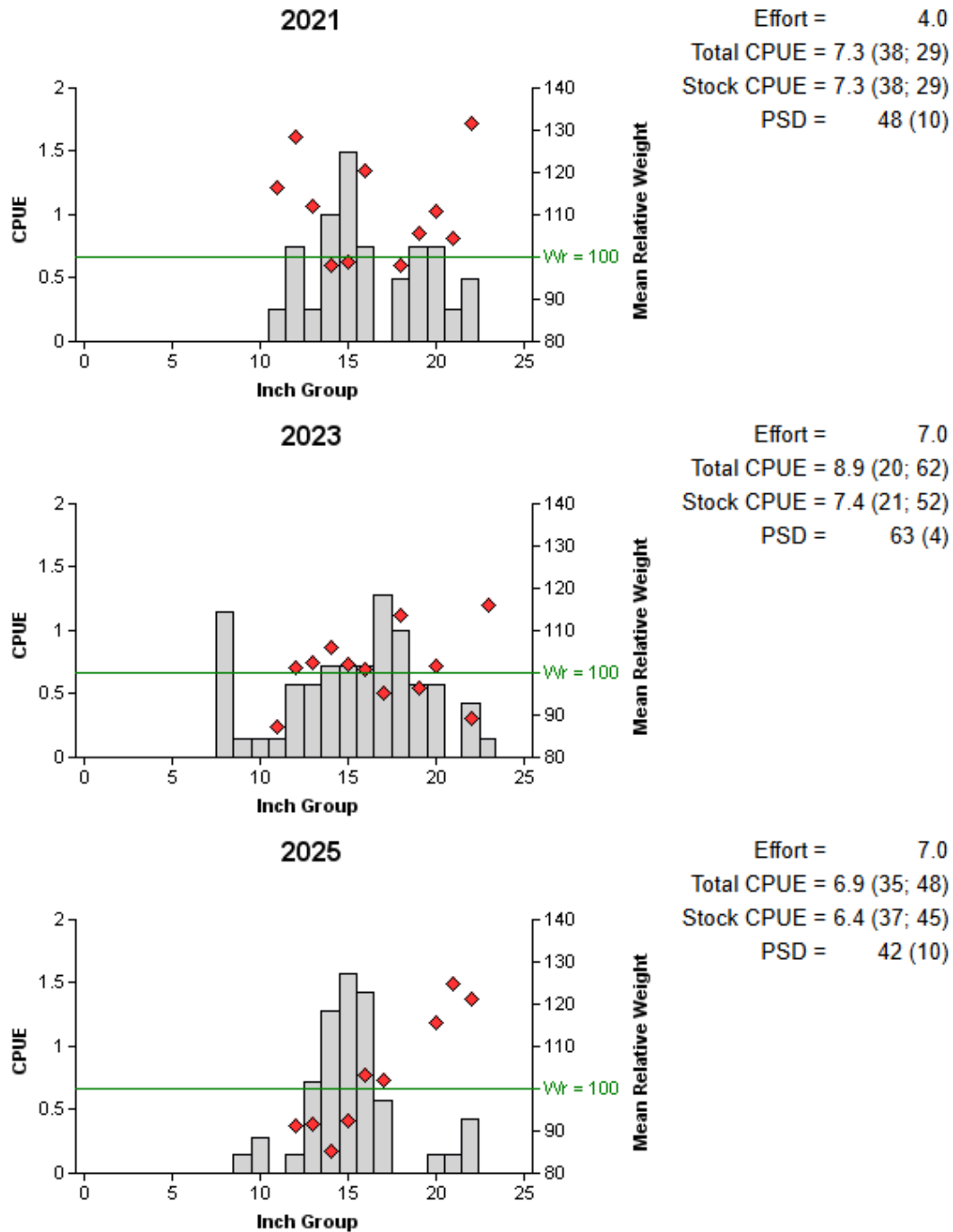


Figure 3. Number of Channel Catfish caught per net night (CPUE) mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Buffalo Springs Reservoir, Texas, 2021, 2023, and 2025. Horizontal line represents relative weight of 100.

Striped Bass

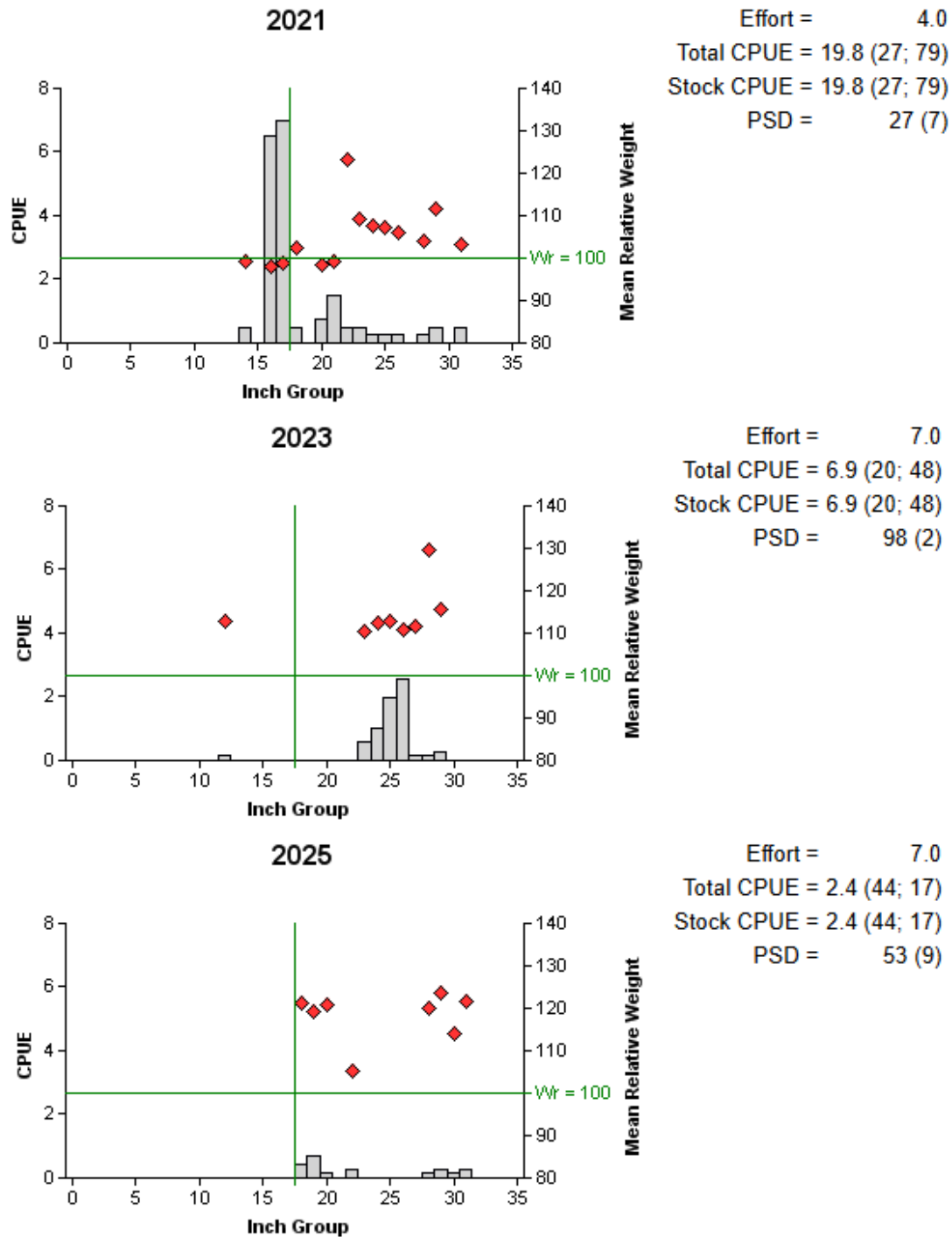


Figure 4. Number of Striped Bass caught per net night (CPUE) mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Buffalo Springs Reservoir, Texas, 2021, 2023, and 2025. Vertical line represents minimum length limit of 18 inches, and horizontal line represents relative weight of 100.

Largemouth Bass

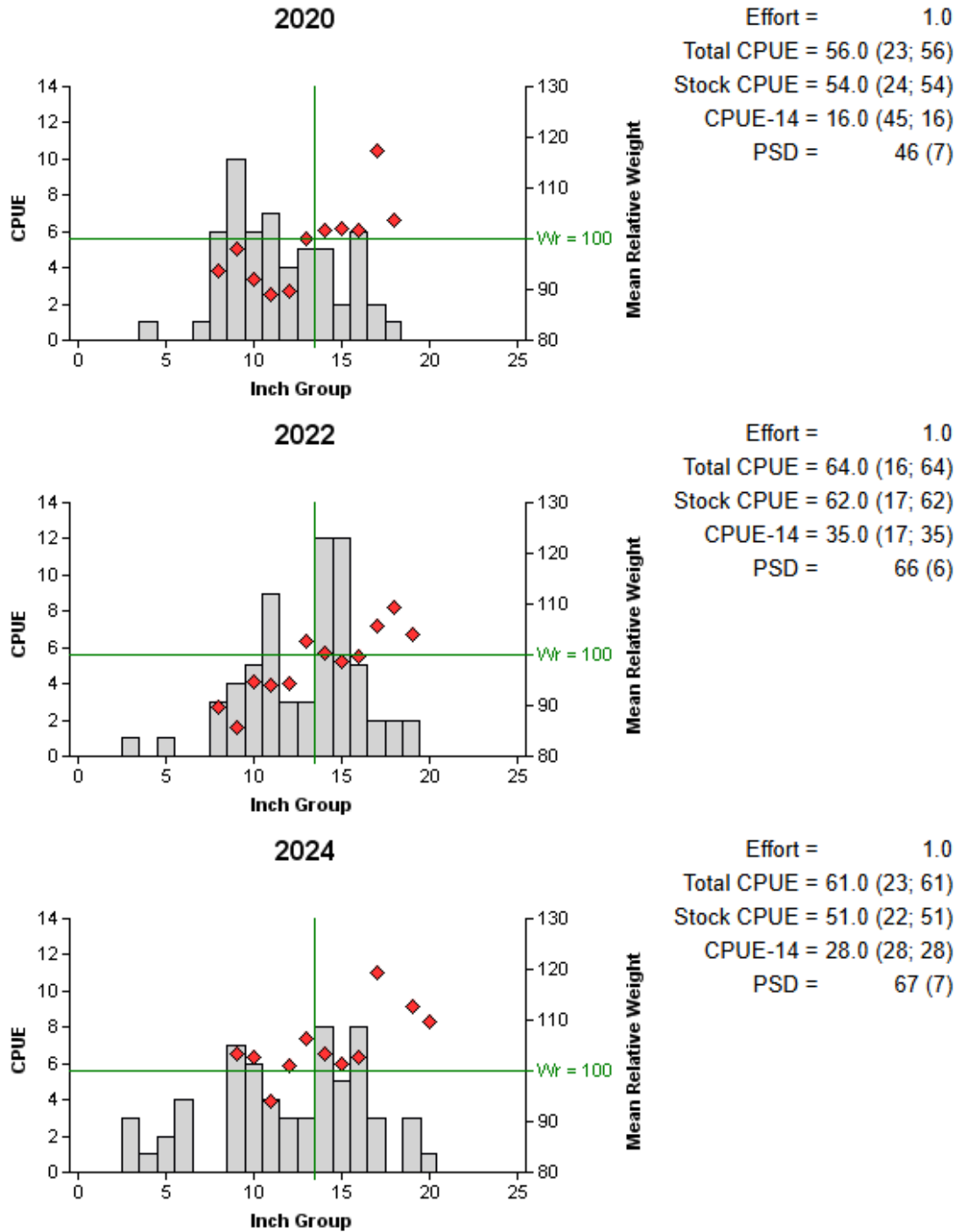


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Buffalo Springs Reservoir, Texas, 2020, 2022, and 2024. Vertical line represents minimum length limit of 14 inches, and horizontal line represents relative weight of 100.

White Crappie

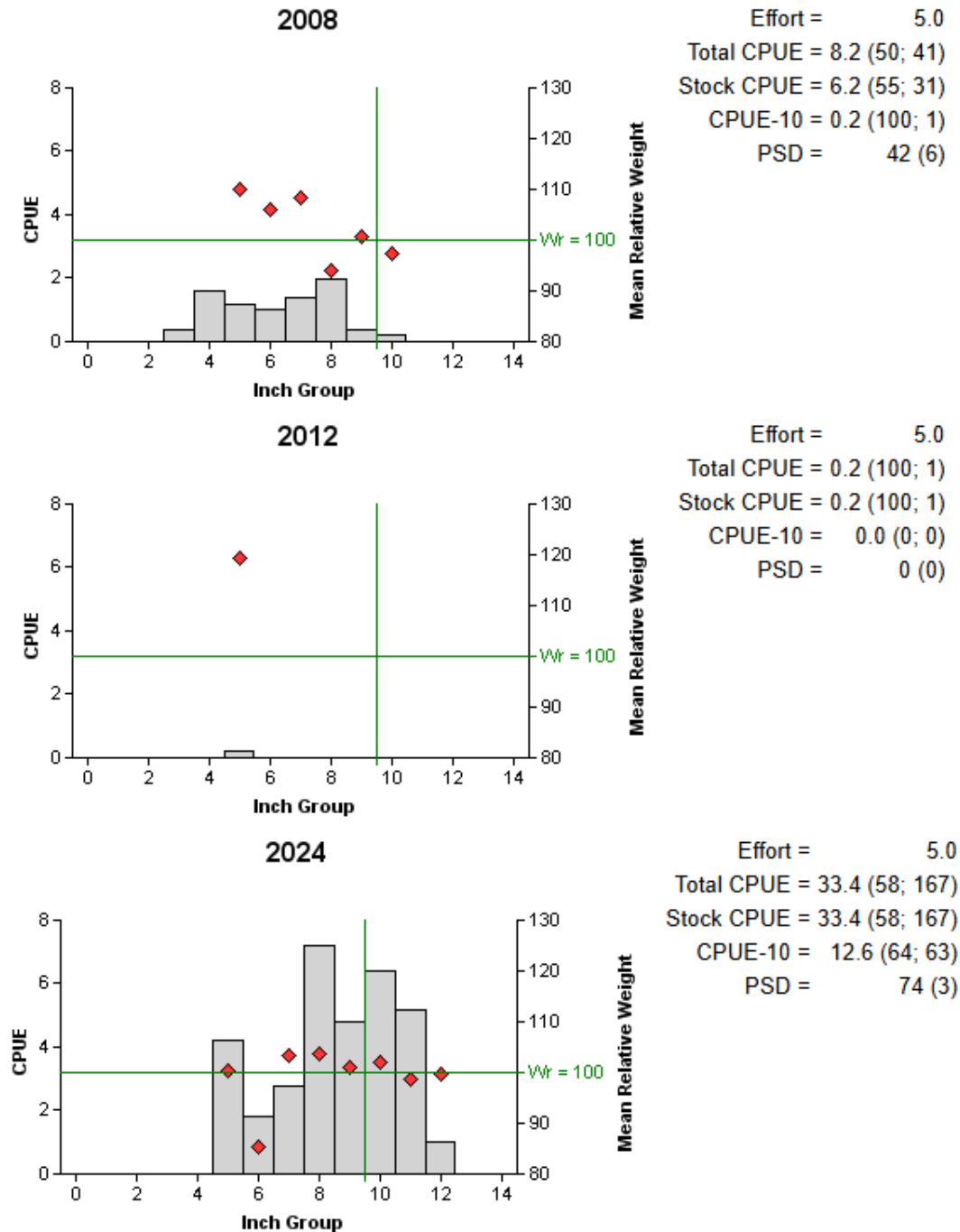


Figure 6. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Buffalo Springs Reservoir, Texas, 2008, 2012, and 2024. Vertical line represents minimum length limit of 10 inches, and horizontal line represents relative weight of 100.

Proposed Sampling Schedule

Table 8. Proposed sampling schedule for Buffalo Springs Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall.

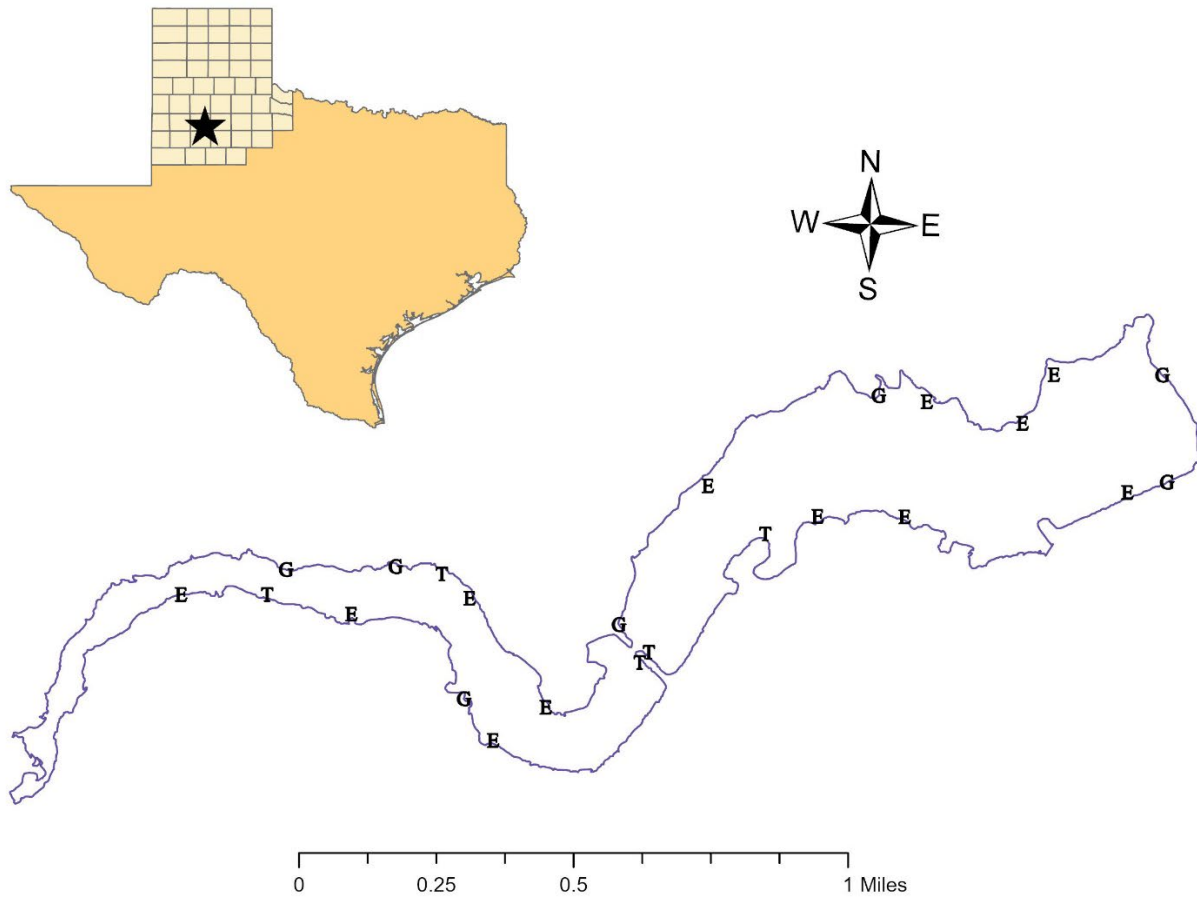
	Survey year			
	2025-2026	2026-2027	2027-2028	2028-2029
Angler Access				X
Structural Habitat				X
Vegetation				X
Electrofishing – Fall		X		X
Trap netting				X
Gill netting		X		X
Creel survey				
Report				X

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 Buffalo Springs Reservoir, Texas, 2024-2025. Sampling effort was 7 net nights for gill netting, 5 net nights for trap netting, and 1 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad	223	31.9 (27)	71	14.2 (98)	636	636.0 (21)
Common Carp	75	10.7 (22)			155	155.0 (26)
Blue Catfish	1	0.1 (100)				
Black Bullhead	127	18.1 (8)	30	6.0 (37)	17	17.0 (63)
Channel Catfish	48	6.9 (35)			10	10.0 (61)
Striped Bass	17	2.4 (44)				
Green Sunfish	2	0.3 (100)	1	0.2 (100)	218	218.0 (32)
Bluegill	7	1.0 (53)	287	57.4 (47)	440	440.0 (14)
Longear Sunfish			4	0.8 (61)	45	45.0 (37)
Readeare Sunfish					1	1.0 (100)
Largemouth Bass	9	1.3 (56)			61	61.0 (23)
White Crappie	38	5.4 (34)	167	33.4 (58)	13	13.0 (31)

APPENDIX B – Map of sampling locations



Location of sampling sites, Buffalo Springs Reservoir, Texas, 2024-2025. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was at full pool at time of sampling.



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