

# E. V. Spence Reservoir

## 2023 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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## Survey and Management Summary

Fish populations in E. V. Spence Reservoir were surveyed in 2021 and 2023 using electrofishing and trap netting and in 2022 and 2024 using gill netting. Anglers were surveyed from June 2020 through May 2021 with a creel survey. Historical data are presented with the 2021-2024 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

**Reservoir Description:** E. V. Spence Reservoir is a 14,950-acre reservoir located on the Colorado River near Robert Lee, Coke County, Texas. It has a history of prolonged water level declines and has never filled to conservation pool. Golden alga *Prymnesium parvum* blooms caused substantial fish kills in the 2000's that effectively eliminated the fish community. Subsequently, low and moderate toxic conditions have been recorded on an annual basis.

**Management History:** The management of this reservoir has been impacted by chronic toxic golden alga blooms since 2001 and persistent low water levels. Florida strain Largemouth Bass, White Crappie, White bass, Bluegill, and Blue Catfish were stocked in years following significant water level rises in 2015 and 2018.

### Fish Community

- **Prey species:** Electrofishing catch of Gizzard Shad was highest on record with most small enough to be consumed by predators. Electrofishing catch of Bluegill was low.
- **Catfishes:** The Blue Catfish population continued to grow into larger size classes with many over 20 inches. The Channel Catfish gill net catch rate was low, however anglers harvested Channel Catfish up to 26 inches long. No Flathead catfish were observed during spring gill netting.
- **White Bass:** White Bass abundance in 2024 was highest on record for E. V. Spence Reservoir with many fish available from 13-15 inches.
- **Largemouth Bass:** Largemouth Bass abundance and size structure has declined over the past three surveys. However, Largemouth Bass were the most popular species for anglers with over 85% of all directed effort. Tournament effort for Largemouth Bass was 27.9% of all angler effort and tournament anglers weighed and released an estimated 1,521 bass.
- **White Crappie:** White Crappie were in low abundance with no fish over 10 inches observed in 2023. No angler effort was documented during the 2020-2021 creel survey.

**Management Strategies:** Conduct additional electrofishing and gill netting surveys in 2025-2026, and general monitoring surveys with trap nets, gill nets, and electrofishing surveys in 2027-2028. Access and vegetation surveys will be conducted in 2027. A roving creel survey will be conducted from June 2027 through May 2028.

## Introduction

This document is a summary of fisheries data collected from E. V. Spence Reservoir from 2020-2024. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2021-2024 data for comparison.

## Reservoir Description

E. V. Spence Reservoir is a 14,950-acre impoundment constructed in 1969 on the Colorado River. It is in Coke County near the town of Robert Lee and is approximately 45 miles north of San Angelo. It has a history of prolonged low water level and has never filled to conservation pool. The highest recorded water level occurred on June 16, 1987 when the reservoir was at 69% capacity and 12.5 feet below conservation pool. The reservoir is operated and controlled by the Colorado River Municipal Water District (CRMWD). Primary water uses include water supply and recreation. Land use around the reservoir is primarily pastureland. Golden alga *Prymnesium parvum* blooms occurred during winters from 2001-2011 (Appendix C) and caused major fish kills in the reservoir that essentially eliminated the fish community. In the years following the severe golden alga blooms, the reservoir suffered from extreme low water conditions. From 2011 to 2015 the reservoir remained below 5% capacity, reaching its lowest recorded level on September 27, 2012 (0.2% capacity and 88 feet below conservation pool). Since 2012, low to moderate toxic conditions have been recorded, but these blooms have not resulted in any major fish kills, however, minor fish kills limited primarily to Gizzard Shad have occurred. Water levels significantly improved in 2018 (Figure 1) due to record rainfall. However, water levels have been on a declining trend since 2019. E. V. Spence Reservoir was listed as eutrophic with a mean TSI Chl-a of 58.32 (Texas Commission on Environmental Quality 2022). Other descriptive characteristics for E. V. Spence Reservoir are shown in Table 1.

## Angler Access

E.V. Spence Reservoir has public boat ramps located at three CRMWD parks, however ramps at Wildcat and Paint Creek are the only ramps that are commonly used. Rough Creek ramp has been closed indefinitely as the ramp has not been useable since 1993. The Wildcat recreation area has three ramps built at different elevations to allow for use at different water levels. Bank access is good around ramps and CRMWD maintained day-use areas. Day pass fee is required at all ramps. Additional boat ramp characteristics are in Table 2.

## Management History

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

1. Monitor the Largemouth Bass population by conducting electrofishing surveys in 2021 and 2023, assessing genetics in 2023, and estimate Largemouth Bass effort from June 2020 through May 2021 through an access creel survey.

**Action:** All surveys and genetic assessments were conducted as planned.

2. Monitor the development of the Blue Catfish fishery through gill netting surveys in 2022 and 2024 and estimate angler effort and harvest from June 2020 through May 2021 through an access creel survey.

**Action:** All surveys were conducted as planned.

3. Conduct angler surveys to assess opinions on resuming stocking Striped Bass or hybrid striped bass in E. V. Spence Reservoir. Request stocking at 5/acre contingent on adequate water levels, prey abundance, and low golden algae levels.

**Action:** Efforts to stock Striped Bass or hybrid striped bass in E. V. Spence Reservoir were tabled due to ongoing drought conditions. No angler opinion data was collected during the 2020-2021 creel survey.

4. Cooperate with the CRMWD to post signage, educate the public about invasive species, and track existing and future inter-basin water transfers to facilitate potential invasive species responses.

**Action:** The San Angelo District continued to work with the CRMWD to post signage and to educate the public on invasive species threats through media outlets.

**Harvest regulation history:** Sport fish in E. V. Spence Reservoir are currently managed with statewide regulations (Table 3).

**Stocking history:** Striped Bass were stocked nearly every year from 1969 to 2000, however, stockings were discontinued after 2007 due to drought and golden algae. Florida-strain Largemouth Bass were stocked frequently since 2000. No stockings occurred from 2009 to 2012 due to low water and toxic golden alga blooms. Blue Catfish were stocked from 2016-2019. The complete stocking history is shown in Table 4.

**Vegetation/habitat management history:** E. V. Spence Reservoir has no significant vegetation/habitat management history.

**Water transfer:** The CRMWD uses this reservoir as one of its three major sources of surface water. The CRMWD provides raw water (non-potable) to rural users and municipal and industrial (oil/gas) customers. Municipal customers include the cities of Big Spring, Snyder, Stanton, Midland, and Odessa. The City of Robert Lee also uses this reservoir for their raw water source. The City of San Angelo also has infrastructure at this reservoir capable of pumping water for their municipal needs. Their facility has not been used since the early 2000's. There are no inter-basin transfers. Historically, transfers occurred between E. V. Spence, Colorado City Reservoir, and Moss Creek City Reservoir.

## Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for E. V. Spence Reservoir (Wright 2020). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

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

**Electrofishing** – Largemouth Bass, sunfishes, 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.

**Trap netting** – Crappie were collected using trap nets (10 net nights at 10 stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn).

**Gill netting** – Blue Catfish, Channel Catfish, and White Bass were collected by gill netting (10 net nights at 10 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

**Genetics** – Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2022). Micro-satellite DNA analysis was used to determine genetic composition of individual fish since 2005. Electrophoresis analysis was used prior to 2005.

**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.

**Creel survey** – An access-point creel survey was conducted from 2020 through 2021. The creel period was June through May. Angler interviews were conducted on 5 weekend days and 4 weekdays per quarter to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

**Habitat** – A vegetation survey was conducted in 2023. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

**Water level** – Source for water level data was the United States Geological Survey (USGS 2024).

## Results and Discussion

**Habitat:** A structural habitat survey was last conducted in 2007 (Farooqi and Scott 2008) and little has changed since then. Nearly all shoreline consists of a mix of rock and clay substrate and the amount of flooded terrestrial habitat varies along with water level. No aquatic vegetation was observed in 2023 and historically this reservoir has not supported aquatic vegetation.

**Golden Algae:** Golden alga cell densities and toxicity have remained relatively low and in general have had negligible impact on the fisheries at E. V. Spence Reservoir. This is in stark contrast to the 2001-2011 period when highly toxic blooms occurred nearly every year (Wright 2020). Since 2014, only one highly toxic bloom has been documented (February 2020) and cell densities have remained under 20,000

cells/ml. This level of golden alga toxicity has resulted in minor fish kills consisting primarily of Gizzard Shad.

**Creel:** Directed fishing effort by anglers was highest for Largemouth Bass (85.4%), followed by anglers fishing for catfish (10.1%, Table 6). Total fishing effort was 36,871 hours and direct expenditures was \$313,663 during the 2020-2021 creel period (Table 7). Angler reported ZIP codes revealed that 62.6% of anglers traveled less than 100 miles to fish E.V. Spence Reservoir with a mean one-way travel distance of 81 miles among all anglers. The most common cities where anglers traveled from included San Angelo (18.0%), Midland (16.0%), Odessa (10.2%), Andrews (5.8%), Sweetwater (4.9%), and Abilene (3.9%).

**Prey species:** The electrofishing catch rate of Gizzard Shad was 409.0/h in 2023 which was the highest on record for E. V. Spence Reservoir (Figure 2). Additionally, the IOV for Gizzard Shad was excellent with 98% of all Gizzard Shad available to existing predators. Since 2015, total CPUE of Gizzard Shad has fluctuated from 133.3/h to 409.0/h while IOV has fluctuated from 55-98, indicating an overall quality prey base. Total CPUE of Bluegill in 2023 was only 2.0/h and overall catch rates have remained low (Figure 3). Since 2015 the total catch rate of Bluegill has never exceeded 50.0/h and is likely related to the lack of aquatic vegetation or appropriate cover. Despite the low catch rates of sunfish species, relative weights for Largemouth Bass and Blue Catfish generally ranged from mid-90's to the mid-100's indicating sufficient forage in the reservoir.

**Blue Catfish:** The Blue Catfish population has continued to expand from stockings conducted from 2016-2019. The gill net catch rate of stock-size Blue Catfish was 13.1/nn in 2024, an increase from 5.5/nn in 2022 and 10.7/nn in 2020 (Figure 4). Size structure has also improved as Blue Catfish have grown into larger size classes, PSD has increased from 4 in 2020, to 7 in 2022, to 24 in 2024, indicating that 24% of all stock-size catfish were at least 20 inches long. Relative weights ( $W_r$ ) were generally near or above 100 for most size classes and displayed an increasing trend with fish length. Directed fishing effort for Catfish species was generally low with 0.66 h/acre and total harvest for Blue Catfish of 181 (Table 8). Lengths of Blue Catfish harvested during the 2020-2021 creel survey ranged from 13-24 inches (Figure 6) which was proportionate with the size of Blue Catfish observed in the gill net surveys during that time. Only 17% of legal-size Blue Catfish were released by anglers (Table 8). Sampling objectives were met for size structure ( $N \geq 50$ ) metrics; however, abundance ( $RSE = 30$ ) was not met. Overall, sampling data indicate a quality Blue Catfish population with increasing abundance of fish over 20 inches.

**Channel Catfish:** The gill net catch rate of Channel Catfish was 2.5/nn in 2024, which was a slight increase from 0.8/nn in 2022 and 0.1/nn in 2020 (Figure 5). Channel Catfish ranged from 9-17 inches and relative weights were adequate for most inch groups. Harvest of Channel Catfish was estimated to be 1,096, ranged in size from 14-26 inches in length (Figure 6), and 29% of legal-size fish were released by anglers (Table 8). Although gill net catch rates were low, Channel Catfish were the most harvested species in E. V. Spence Reservoir and provide good recreational opportunities for anglers.

**White Bass:** The gill net catch rate of White Bass increased significantly with a total catch rate of 7.3/nn in 2024, higher than the 0.2/nn observed in both 2022 and 2020 (Figure 7). White Bass ranged in size from 10-15 inches and relative weights exceeded 100 for all inch classes. Size structure was excellent in 2024 with many White Bass exceeding 13 inches. Angler effort for White Bass aligned with the low abundance observed in the 2020 and 2022 gill net surveys; directed effort in 2020-2021 was 1.1% (Table 6) and no harvest was observed.

**Largemouth Bass:** The electrofishing catch rate of stock-length Largemouth Bass was 20.0/h in 2023, lower than the 34.7/h in 2021 and 165.0/h in 2019 (Figure 8). The 20.0/h catch rate in 2024 was the lowest since 2015. Size structure was balanced in 2021 as PSD and PSD-P was 46 and 23, respectively, however, few Largemouth Bass over 14 inches were collected in 2023 which precluded size structure estimation. Due to low catch rates, we were unable to collect enough fish for mean age-at-length estimation. Body condition was adequate in 2023 with relative weights ranging from 90-110 for most size classes of fish and was similar to previous surveys. The overall decline in electrofishing catch rates and size structure was likely influenced by declining water levels and increasing water conductivity, which may have negatively impacted sampling efficiency. Additionally, falling water levels reduced available

structural habitat in which to sample, further impacting catch rates. Thus, it is difficult to say if the declines observed were a true reduction in abundance or a function of reduced sampling efficiency. Sampling objectives were met for abundance ( $RSE \leq 25$ ), condition, and genetics ( $N = 30$ ), however size structure and mean age-at-length metrics were not met due to lower-than-expected catch rates. Florida Largemouth Bass influence has remained high as Florida alleles have ranged from 80 to 94% over the two most recent surveys (Table 10). The percentage of pure Florida Largemouth Bass was high and has ranged from 24 to 70%. E. V. Spence Reservoir has had four ShareLunker entries since 2018, all within the 8 lb. Lunker size class ranging from 8.00 to 9.25 lb. Despite the excellent genetic composition of the bass population, declining water levels have created less than optimal conditions for bass growth. However, due to the high levels of Florida strain genetics, the reservoir is primed for significant trophy bass production when favorable environmental conditions return.

Largemouth Bass were the most popular species among anglers with 85.4% of all directed fishing effort (Table 6). Total catch rate for anglers was 0.53 fish/h. Non-tournament harvest for Largemouth Bass was low with only 204 Largemouth Bass harvested with a 96% legal release rate (Table 9). Bass tournaments were popular at E. V. Spence Reservoir with a total of 10,284 hours of tournament effort and 1,521 Largemouth Bass weighed in and released (Table 9). Tournament effort made up over one-quarter (27.9%) of all angler effort during the 2020-2021 creel survey (Table 6). Size range of tournament retained bass was 14-23 inches with 18 inches the most common size (Figure 9). Florida Largemouth Bass influence has remained high as Florida alleles have ranged from 80 to 94% over the two most recent surveys (Table 10). The percentage of pure Florida Largemouth Bass was high and has ranged from 24 to 70%. E. V. Spence Reservoir has had four ShareLunker entries since 2018, all within the 8lb. Lunker size class ranging from 8.00 to 9.25 lb.

**White Crappie:** The trap net catch rate of White Crappie was 2.5/nn in 2023, down from 10.2/nn in 2021, but similar to 1.0/nn in 2019. The PSD-P was 41 in 2021, indicating that 41% of all stock size crappie were large enough to harvest, however, in 2023 no crappie above 10 inches were collected (Figure 10). Mean relative weight were variable in 2023 ranging from 85-114, however relative weights were excellent in 2021 with most inch classes above 130 (Figure 10). No directed angler effort and no harvest were documented for White Crappie during the 2020-2021 creel survey. Overall, the White Crappie population in E. V. Spence Reservoir has fluctuated in abundance and size structure and provides a marginal fishery for anglers.



# Fisheries Management Plan for E. V. Spence Reservoir, Texas

Prepared – July 2024

**ISSUE 1:** Largemouth Bass are the most sought-after species at E. V. Spence Reservoir with significant tournament effort and trophy potential due to relatively high (> 80%) Florida strain genetics. Continued monitoring of these populations is necessary to keep up to date information on this important population.

## MANAGEMENT STRATEGY

1. Monitor Largemouth Bass and prey populations with electrofishing in 2025 and 2027.
2. Assess angler effort, catch rate, and harvest with a roving creel survey in 2027-2028.
3. Assess Largemouth Bass genetics in 2027.

**ISSUE 2:** Blue Catfish were stocked in E. V. Spence Reservoir from 2016-2019 and since then an excellent fishery has developed. Gill net catch rates for Blue Catfish are the highest in San Angelo District waters and fish have rapidly grown into larger size classes. Continued monitoring is necessary to keep up to date information on this important population.

## MANAGEMENT STRATEGY

1. Monitor Blue Catfish with gill netting in 2026 and 2028.
2. Assess angler effort, catch rate, and harvest with a roving creel survey in 2027-2028.

**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 CRMWD 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 (2024–2028)

### Sport fish, forage fish, and other important fishes

Sport fishes in E.V. Spence include Blue and Channel Catfish, White Crappie, White Bass, and Largemouth Bass. Known important forage species include Gizzard Shad and Sunfish species.

### Low-density fisheries

None.

### Survey objectives, fisheries metrics, and sampling objectives

**Largemouth Bass:** Largemouth Bass are the most sought-after species for E. V. Spence Reservoir, and it is a popular location for many local bass club tournaments. Monitoring the Largemouth Bass population is necessary due to its popularity and potential for trophy bass. Our objectives are to monitor trends in abundance, size structure, condition, and growth. Continuation of biennial trend data in this reservoir with night electrofishing in the fall will allow for determination of any large-scale changes in the Largemouth Bass population. A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in fall 2025 and 2027 (Table 11). Sampling objectives are to obtain 50 stock-size fish for size structure estimation and an RSE of CPUE-Stock  $\leq 25$ . Twelve random stations will be sampled, and six additional random stations will be pre-determined in the event some extra sampling is necessary. A maximum of 18 stations will be sampled. Fin samples will be taken from 30 fish and submitted for genetic analysis in 2027. Otoliths from 13 fish between 13.0 and 14.9 inches will be collected to determine mean age at 14 inches in 2025 and 2027. Angler effort and harvest will be assessed with a roving creel survey will be conducted from June 2027 through May 2028 (Table 11).

**Blue Catfish:** Blue Catfish fingerlings were stocked from 2016-2019 and an excellent fishery has since developed. Blue Catfish catch rates in 2020 and 2024 were the two highest on record for the San Angelo District and indicate excellent survival of stocked fish. Monitoring the development of this fishery is a high priority. Our objectives are to monitor trends in Blue Catfish abundance, size structure, and condition. Our objectives will be to collect 50 stock-size fish for size structure analysis and achieve a CPUE-Stock RSE  $\leq 25$ . Ten randomly selected stations will be sampled in 2026 and 2028 (Table 11). Based on recent sampling results, 10 nets should be adequate to meet these objectives. Angler effort and harvest will be assessed with a roving creel survey will be conducted from June 2027 through May 2028.

**Channel Catfish:** Channel Catfish are present in E. V. Spence Reservoir, but gill net catch rates have been 2.5/nn or less over the past three surveys. Despite low catch rates in the gill nets, catfish anglers made up over 10% of the total angler effort and an estimated 1,096 channel catfish were harvested during the 2020/2021 creel survey. As per the Blue Catfish objectives, Channel Catfish will be sampled with 10 gill nets sets in spring 2026 and 2028 with the objectives to monitor length frequency, condition, and abundance (Table 11). However, no level of precision will be set for Channel Catfish sampling

objectives. Angler effort and harvest will be assessed with a roving creel survey will be conducted from June 2027 through May 2028.

**White Bass:** Historically, White Bass abundance has been low in E. V. Spence Reservoir, however, most recently in 2024 abundance was high with excellent numbers of legal-size fish. Due to the cyclical nature of White Bass populations, catch rates can be highly variable from year to year. White Bass have the potential to have significant populations in E. V. Spence Reservoir following years of strong recruitment and as such should be monitored. As per the Blue Catfish objectives, White Bass will be sampled with 10 gill nets sets in spring 2026 and 2028 with the objectives to monitor length frequency, condition, and abundance (Table 11). However, no level of precision will be set for White Bass sampling objectives. Angler effort and harvest will be assessed with a roving creel survey will be conducted from June 2027 through May 2028.

**White Crappie:** White Crappie abundance has fluctuated widely since efforts to boost the population through stockings in 2016 and 2019, with trap net catch rates ranging from 1.0 to 10.2 fish/nn over the past three surveys. White Crappie will be monitored with 10 trap nets in 2027 (Table 11) with objectives to monitor length frequency, condition, and abundance. However, no level of precision will be set for White Crappie sampling objectives. Angler effort and harvest will be assessed with a roving creel survey will be conducted from June 2027 through May 2028 (Table 11).

**Gizzard Shad and Bluegill:** Gizzard Shad is the primary forage fish in E. V. Spence Reservoir. Sampling effort based on sampling objectives for Largemouth Bass will be sufficient to determine IOV and CPUE-Total of Gizzard Shad and CPUE-Total and size structure of Bluegill. No additional sampling effort will be expended to achieve an  $RSE \leq 25$  for CPUE-Total for Gizzard Shad or Bluegill.

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## Tables and Figures

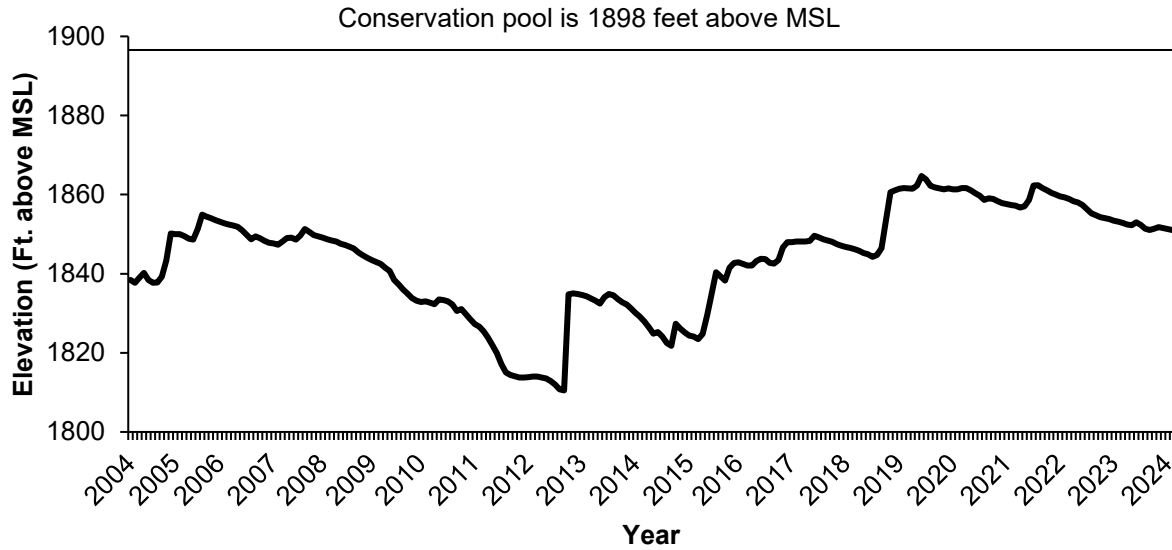


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for E. V. Spence Reservoir, Texas.

Table 1. Characteristics of E. V. Spence Reservoir, Texas.

Characteristic	Description
Year constructed	1969
Controlling authority	Colorado River Municipal Water District
County	Coke
Reservoir type	Mainstem of the Colorado River
Conductivity	3452 $\mu\text{S}/\text{cm}$
Shoreline Development Index (SDI)	8.00

Table 2. Boat ramp characteristics for E. V. Spence Reservoir, Texas, September 2023. Reservoir elevation at time of survey was 1,851 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Wildcat Recreation Area, Ramp #1	31.88601 -100.5323	Y	20	1852	Closed due to low water. Extension is not feasible
Wildcat Recreation Area, Ramp #2	31.88883 -100.5311	Y	20	1848	Closed due to low water. Extension is not feasible
Wildcat Recreation Area, Ramp #3	31.89137 -100.5338	Y	20	1838	Good. Extension is not feasible
Paint Creek	31.91149 -100.5822	Y	20	1840	Good. Extension is not feasible
Rough Creek	31.97720 -100.5878	Y	20	1866	Out of water. Closed indefinitely

Table 3. Harvest regulations for E. V. Spence 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, 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 E. V. Spence Reservoir, Texas. Size categories are FRY =<1 inch, FGL = 1-3 inches, AFGL = 8 inches, ADL = Adult, and UNK = unknown.

Species	Year(s) Stocked	Number of Years	Number Stocked	Size
Threadfin Shad	1980-1984	4	13,900	UNK
Blue Catfish	1971-1981	5	229,908	UNK
	1988	1	15	ADL
	1992-2019	7	734,863	FGL
Channel Catfish	1968-1972	5	285,850	UNK
	2003-2013	5	822,883	FGL
Flathead Catfish	1969-1973	3	5,851	UNK
	2019	1	10,513	FGL
White Bass	1982	1	100	UNK
	2016	1	60	ADL
Striped Bass	1975-1982	6	311,448	UNK
	1969-2007	22	1,302,915	FGL
	1988-1996	3	2,073,353	FRY
Palmetto Bass	1975	1	51,748	UNK
Bluegill	2002-2016	6	1,357,200	FGL
Smallmouth	1980-1982	3	292,154	UNK
	1985	1	258	ADL
Largemouth Bass	1968-1973	6	876,086	UNK
	2005	1	100,885	FGL
Florida Largemouth Bass	1980-2020	15	2,112,899	FGL
White Crappie	2005-2019	3	543	ADL
Green X Redear Sunfish	1971-1972	2	72,700	UNK

Table 5. Objective-based sampling plan components for E. V. Spence Reservoir, Texas 2021–2024.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	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	$W_r$	10 fish/inch group (max)
	Genetics	% FLMB	$N = 30$ , any age
Bluegill <sup>a</sup>	Abundance	CPUE–Total	RSE $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$
Gizzard Shad <sup>a</sup>	Abundance	CPUE–Total	RSE $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$
	Prey availability	IOV	$N \geq 50$
<i>Trap netting</i>			
White Crappie	Abundance	CPUE–Total	Exploratory
	Size structure	length frequency	Exploratory
	Condition	$W_r$	10 fish/inch group (max)
<i>Gill netting</i>			
Blue Catfish	Abundance	CPUE–stock	RSE-Stock $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$ stock
	Condition	$W_r$	10 fish/inch group (max)

<sup>a</sup> No additional effort will be 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 can provide information on forage abundance, vulnerability, or both relative to predator density.



Table 6. Percent directed angler effort by species for E. V. Spence Reservoir, Texas, 2020–2021. Survey periods were from 1 June through 31 May.

Species	2020/2021
Catfishes	10.1
White Bass	1.1
Largemouth Bass	85.4
<i>Tournament</i>	27.9
<i>Non-Tournament</i>	57.5
Anything	3.4

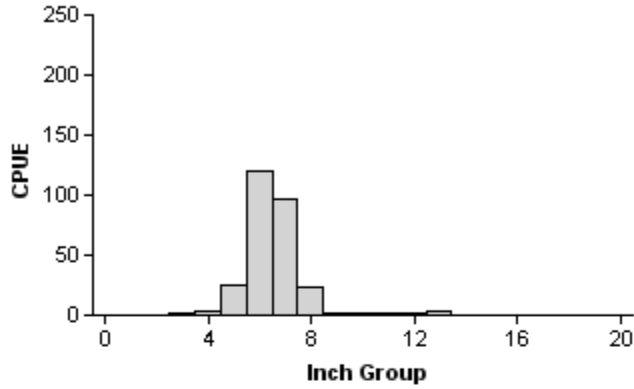
Table 7. Total fishing effort (h) for all species and total directed expenditures at E. V. Spence Reservoir, Texas, 2020-2021. Survey periods were from 1 June through 31 May. Relative standard error is in parentheses.

Creel statistic	2020/2021
Total fishing effort	36,871 (21)
Total directed expenditures	\$313,663 (43)

## Gizzard Shad

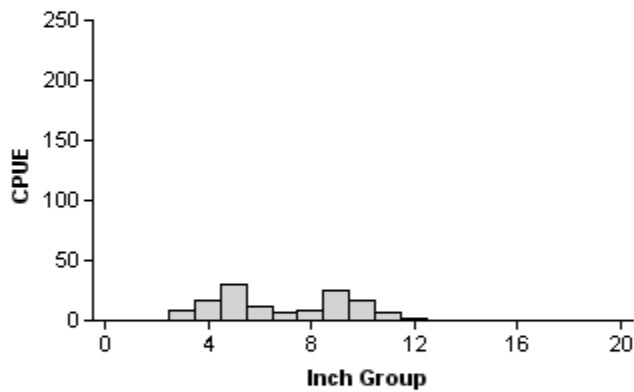
2019

Effort = 1.0  
 Total CPUE = 278.0 (33; 278)  
 IOV = 88 (4)



2021

Effort = 1.5  
 Total CPUE = 133.3 (20; 200)  
 IOV = 55 (9)



2023

Effort = 1.0  
 Total CPUE = 409.0 (36; 409)  
 IOV = 98 (1)

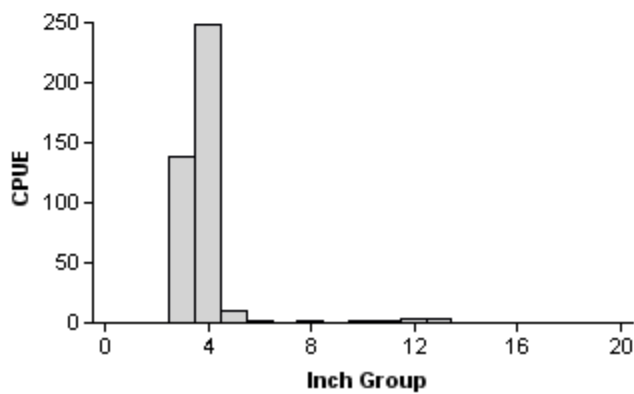


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, E. V. Spence Reservoir, Texas, 2019, 2021, and 2023.

## Bluegill

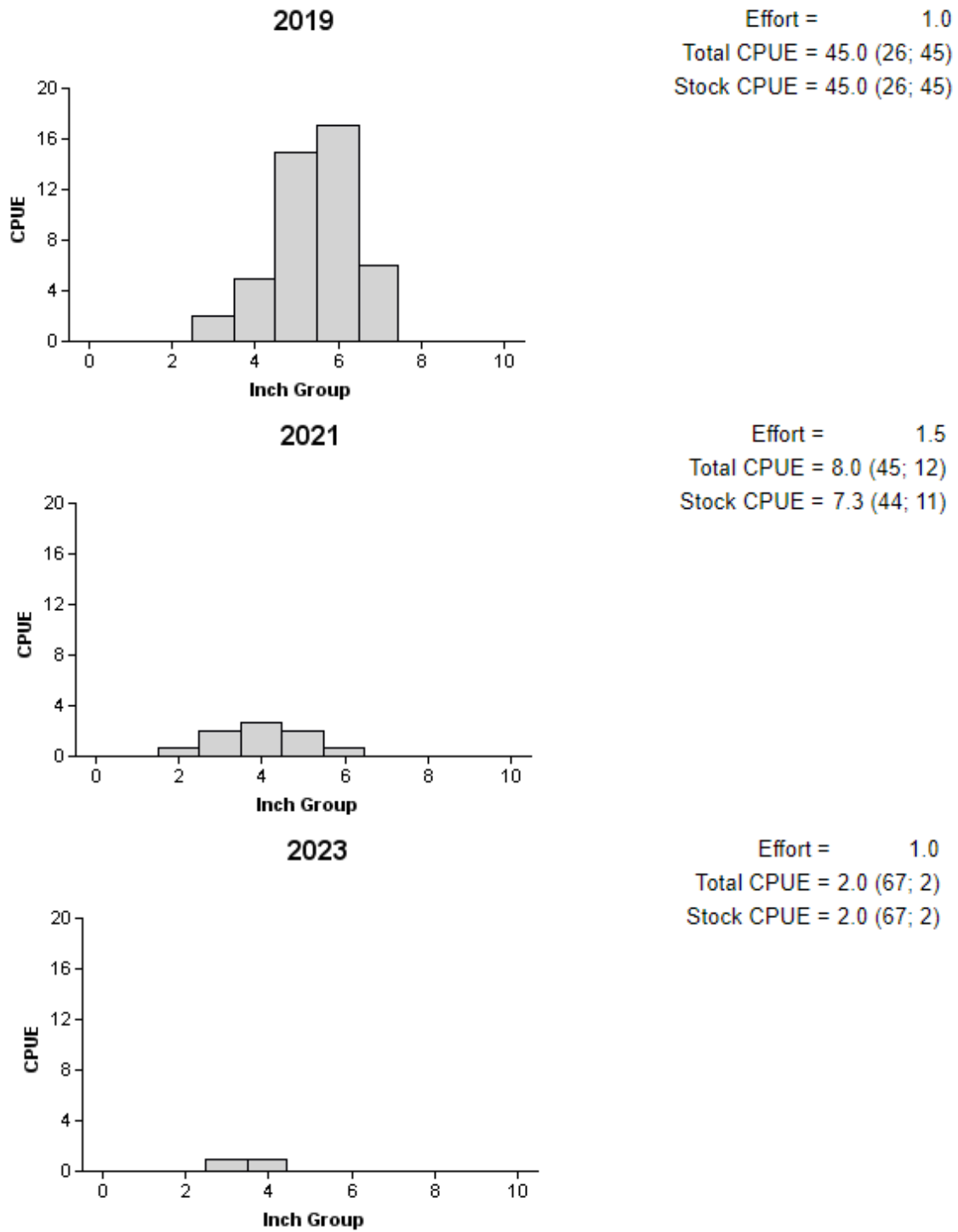


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, E. V. Spence Reservoir, Texas, 2019, 2021, and 2023.

## Blue Catfish

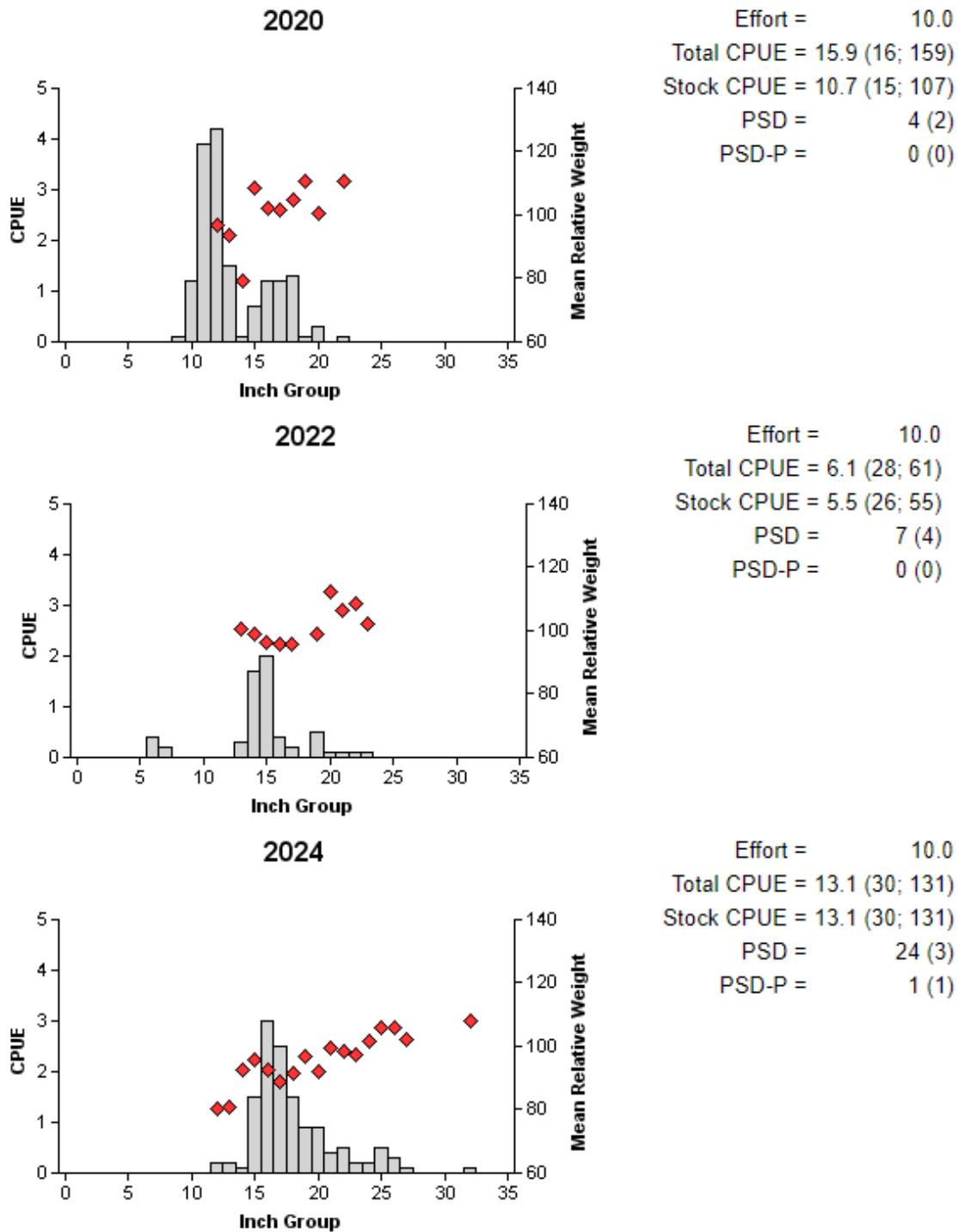


Figure 4. Number of Blue Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, E. V. Spence Reservoir, Texas, 2020, 2022, and 2024.

## Channel Catfish

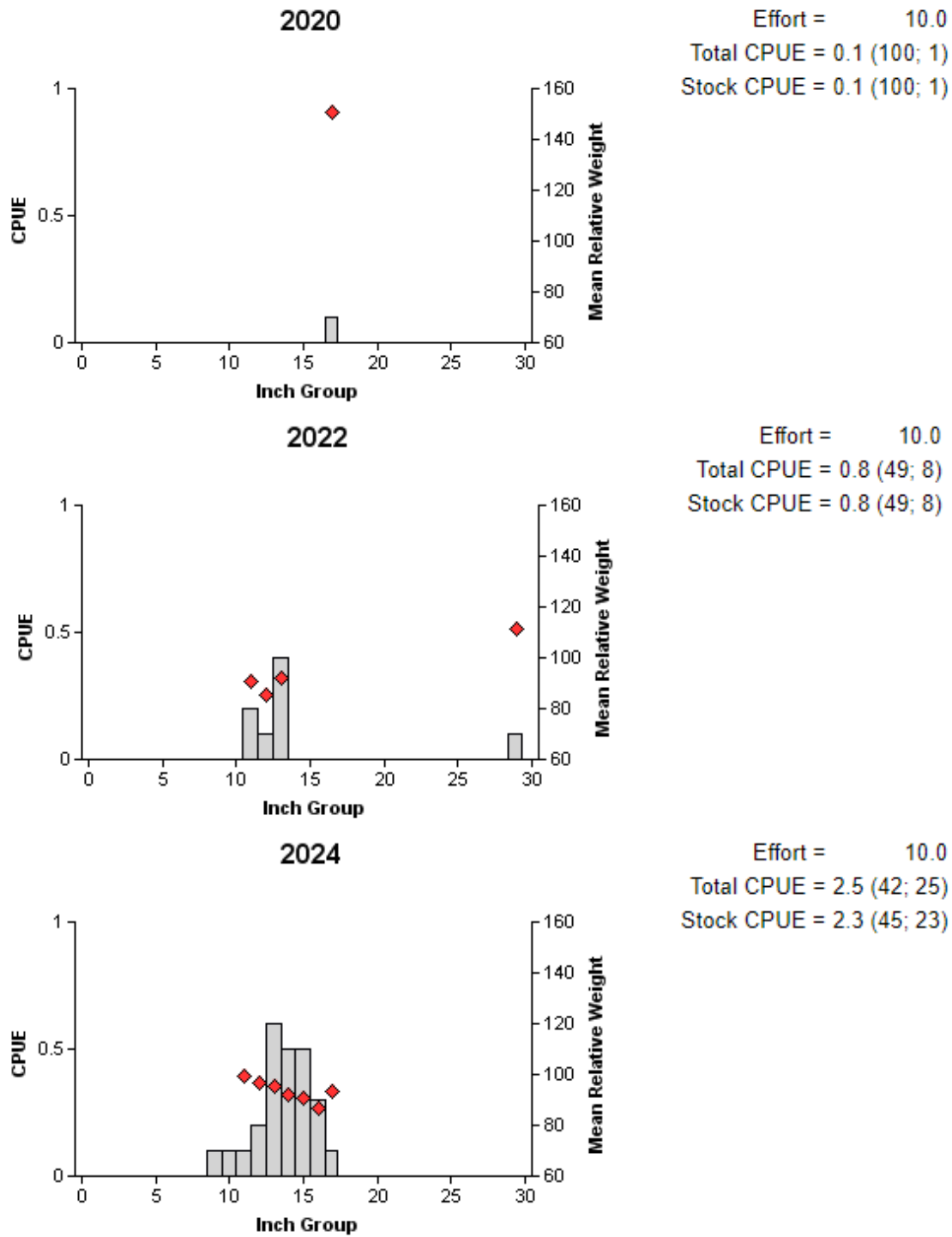


Figure 5. Number of Channel Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, E. V. Spence Reservoir, Texas, 2020, 2022, and 2024.

Table 8. Creel survey statistics for Catfishes at E. V. Spence Reservoir, Texas, from June 2020 through May 2021. Total catch per hour is for anglers targeting Catfishes and total harvest is the estimated number of Blue and Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year
	2020/2021
Surface area (acres)	5,703
Directed effort (h)	3,749 (35)
Directed effort/acre	0.66 (35)
Total catch per hour	0.39 (53)
Total harvest	1,277 (88)
Blue Catfish	181 (97)
Channel Catfish	1,096 (87)
Harvest/acre	0.22 (88)
Percent legal released (Combined)	28
Blue Catfish	17
Channel Catfish	29

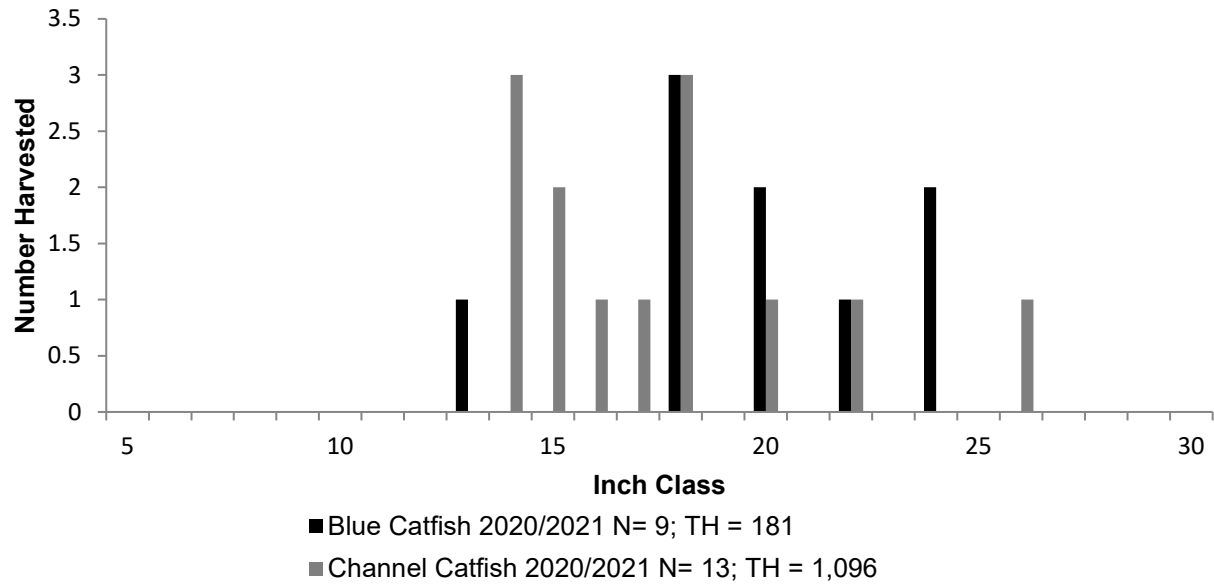


Figure 6. Length frequency of harvested Blue and Channel Catfish observed during creel surveys at E. V. Spence Reservoir, Texas, June 2020 through May 2021, all anglers combined. N is the number of harvested Blue and Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

## White Bass

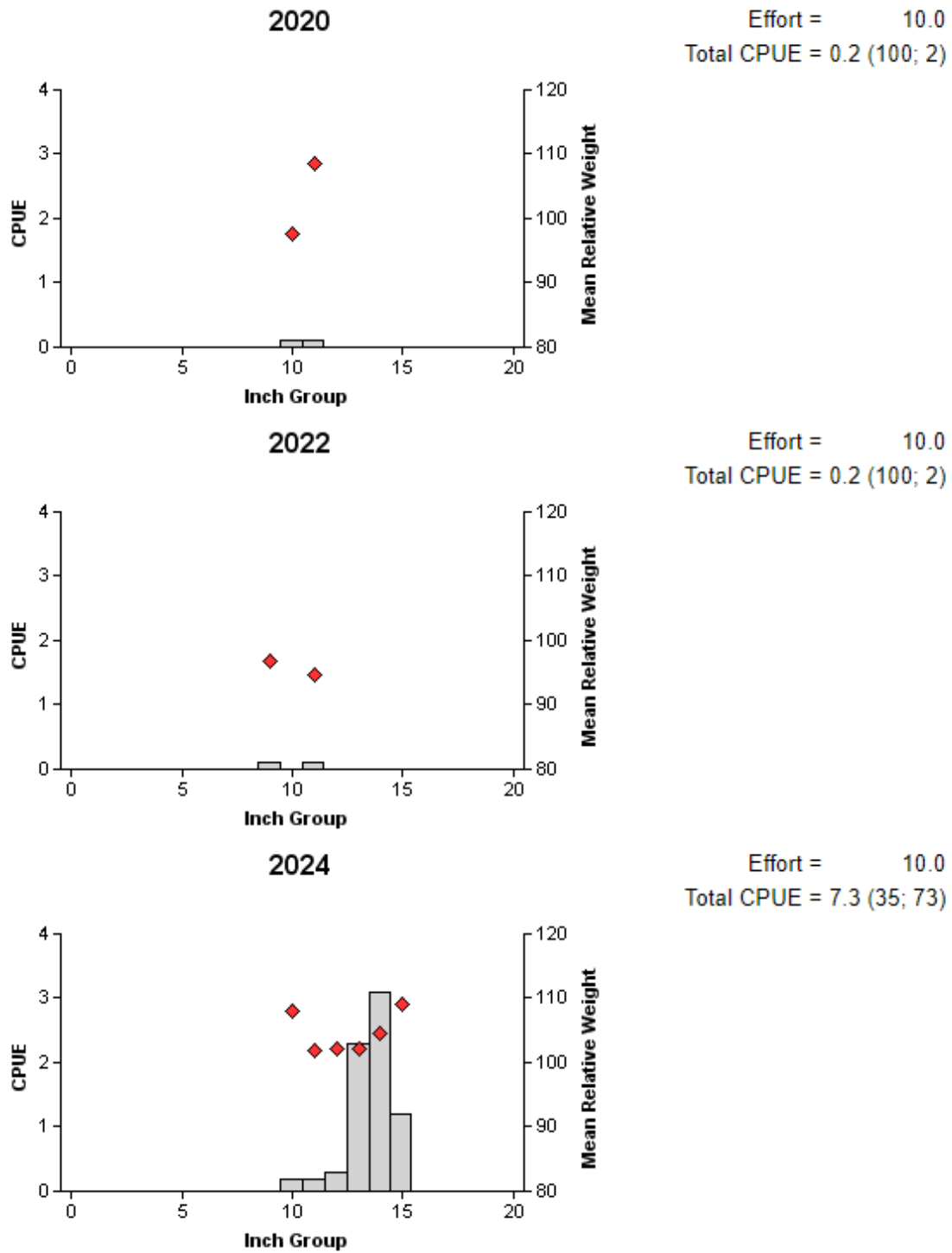


Figure 7. Number of White Bass caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, E. V. Spence Reservoir, Texas, 2020, 2022, and 2024.



## Largemouth Bass

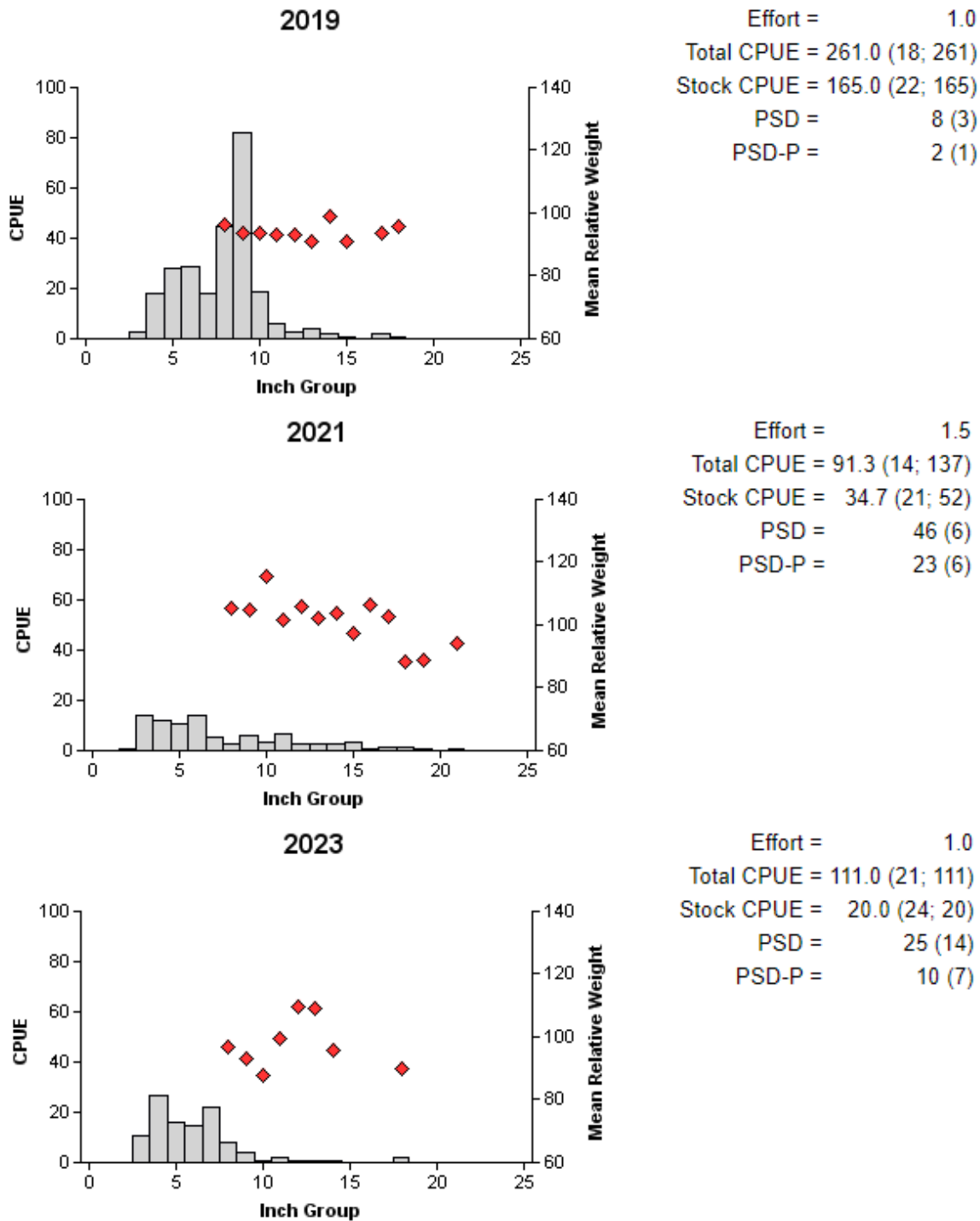


Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, E. V. Spence Reservoir, Texas, 2019, 2021, and 2023.

Table 9. Creel survey statistics for Largemouth Bass at E. V. Spence Reservoir, Texas, from June 2020 through May 2021. Catch rate is for all anglers targeting Largemouth Bass. Harvest is partitioned by the estimated number of fish harvested by non-tournament anglers and the number of fish retained by tournament anglers for weigh-in and release. The estimated number of fish released by weight category is for anglers targeting Largemouth Bass. Relative standard errors (RSE) are in parentheses.

Statistic	2020/2021
Surface area (acres)	5,703
Directed angling effort (h)	
Tournament	10,284 (33)
Non-tournament	21,203 (23)
All black bass anglers combined	31,487 (22)
Angling effort/acre	5.5 (22)
Catch rate (number/h)	0.53 (24)
Non-tournament catch rate	0.48 (31)
Tournament catch rate	0.65 (26)
Harvest	
Non-tournament harvest	204 (94)
Harvest/acre	0.04 (94)
Tournament weigh-in and release	1,521 (63)
Release by weight	
<4.0 lb.	9,348 (49)
4.0-6.9 lb.	746 (74)
7.0-9.9 lb.	10 (98)
≥10.0 lb.	0 (-)
Percent legal released (non-tournament)	96

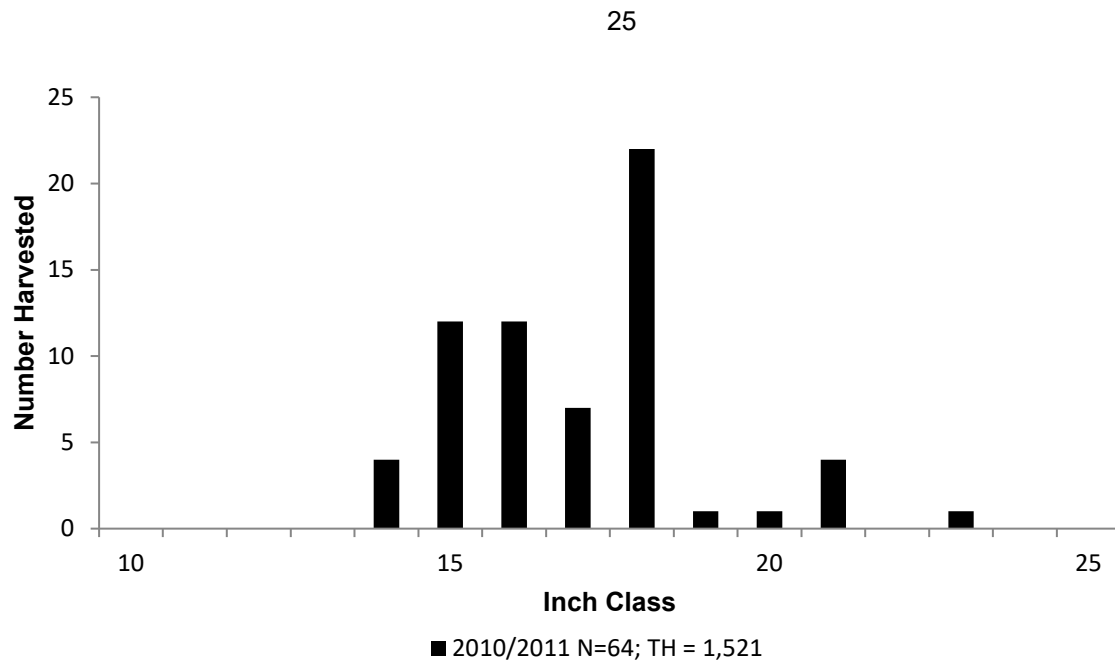


Figure 9. Length frequency of tournament harvested (weigh-in and released) Largemouth Bass observed during creel surveys at E. V. Spence Reservoir, Texas, June 2020 through May 2021, all anglers combined. N is the number of tournament-harvested Largemouth Bass observed during creel surveys, and TH is the estimated tournament-harvest for the creel period.

Table 10. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, E. V. Spence Reservoir, Texas, 1993, 1997, 1999, 2019, and 2023. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
1993	30	2	26	2	55.0	6.7
1997	29	8	21	0	75.0	27.6
1999	10	4	6	0	73.0	40.0
2019	30	21	9	0	94.0	70.0
2023	29	7	22	0	80.0	24.0

## White Crappie

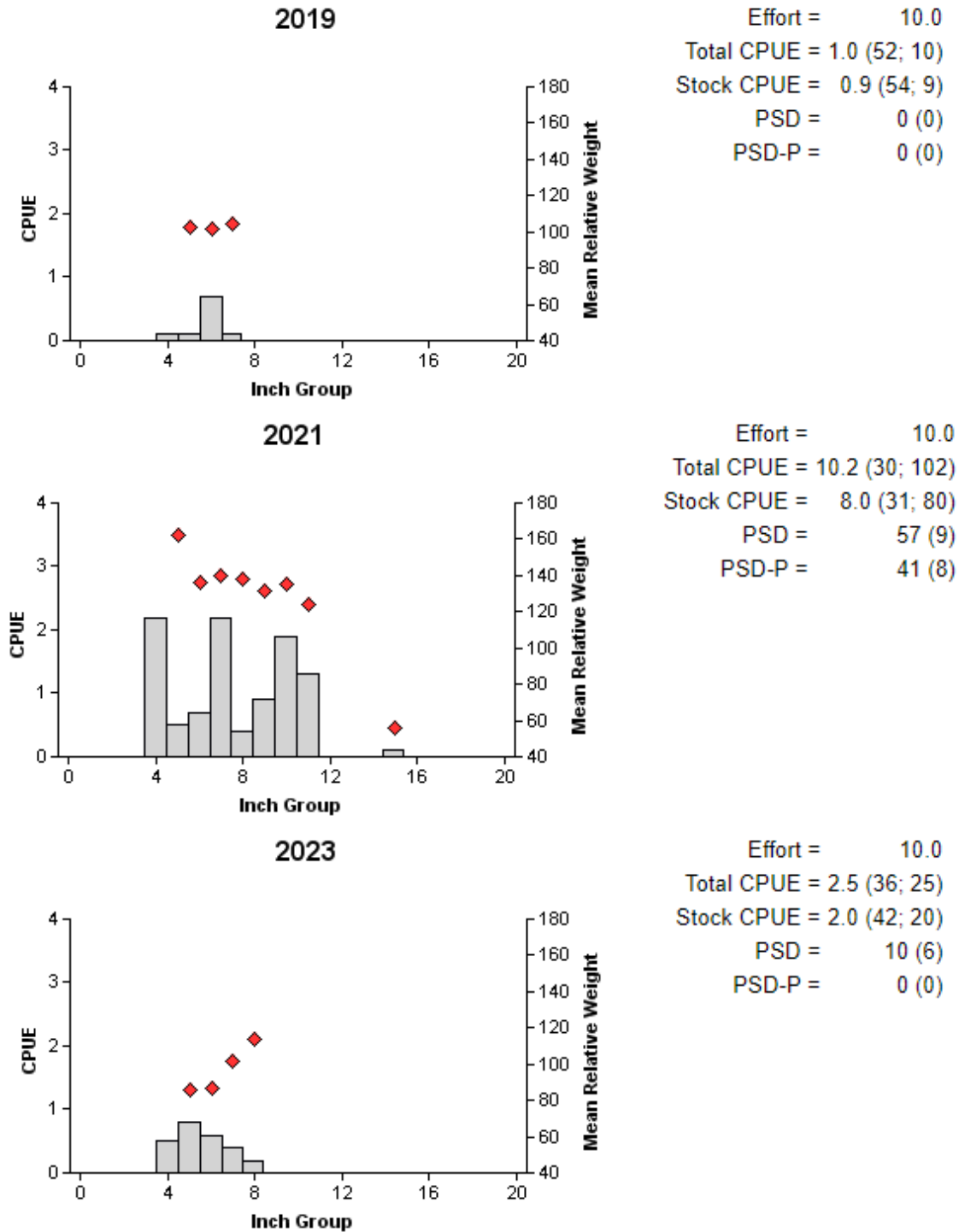


Figure 10. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, E. V. Spence Reservoir, Texas, 2019, 2021, and 2023.

## Proposed Sampling Schedule

Table 11. Proposed sampling schedule for E. V. Spence 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.

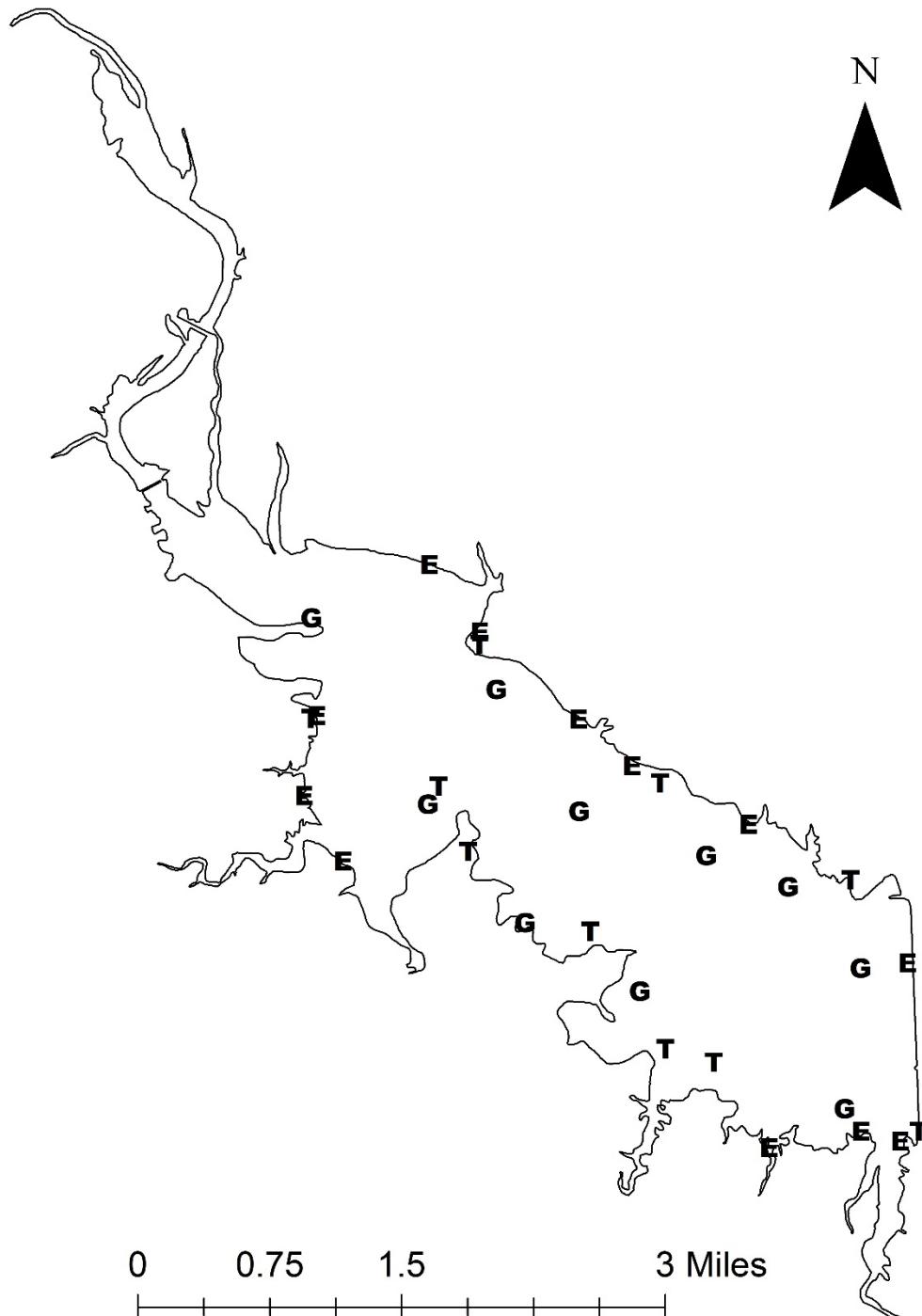
	Survey year			
	2024-2025	2025-2026	2026-2027	2027-2028
Angler Access				X
Structural Habitat				X
Vegetation				X
Electrofishing – Fall		X		X
Trap netting				X
Gill netting		X		X
Creel survey				X
Report				X

## 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 E. V. Spence Reservoir, Texas, 2023-2024. Sampling effort was 10 net nights for gill netting, 10 net nights for trap netting, and 1 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					409	409.0 (36)
Blue Catfish	131	13.1 (30)				
Black Bullhead	1	0.1 (100)				
Channel Catfish	25	2.5 (42)				
White Bass	73	7.3 (35)				
Green Sunfish					14	14.0 (30)
Bluegill					2	2.0 (67)
Largemouth Bass					111	111.0 (21)
White Crappie			25	2.5 (36)		

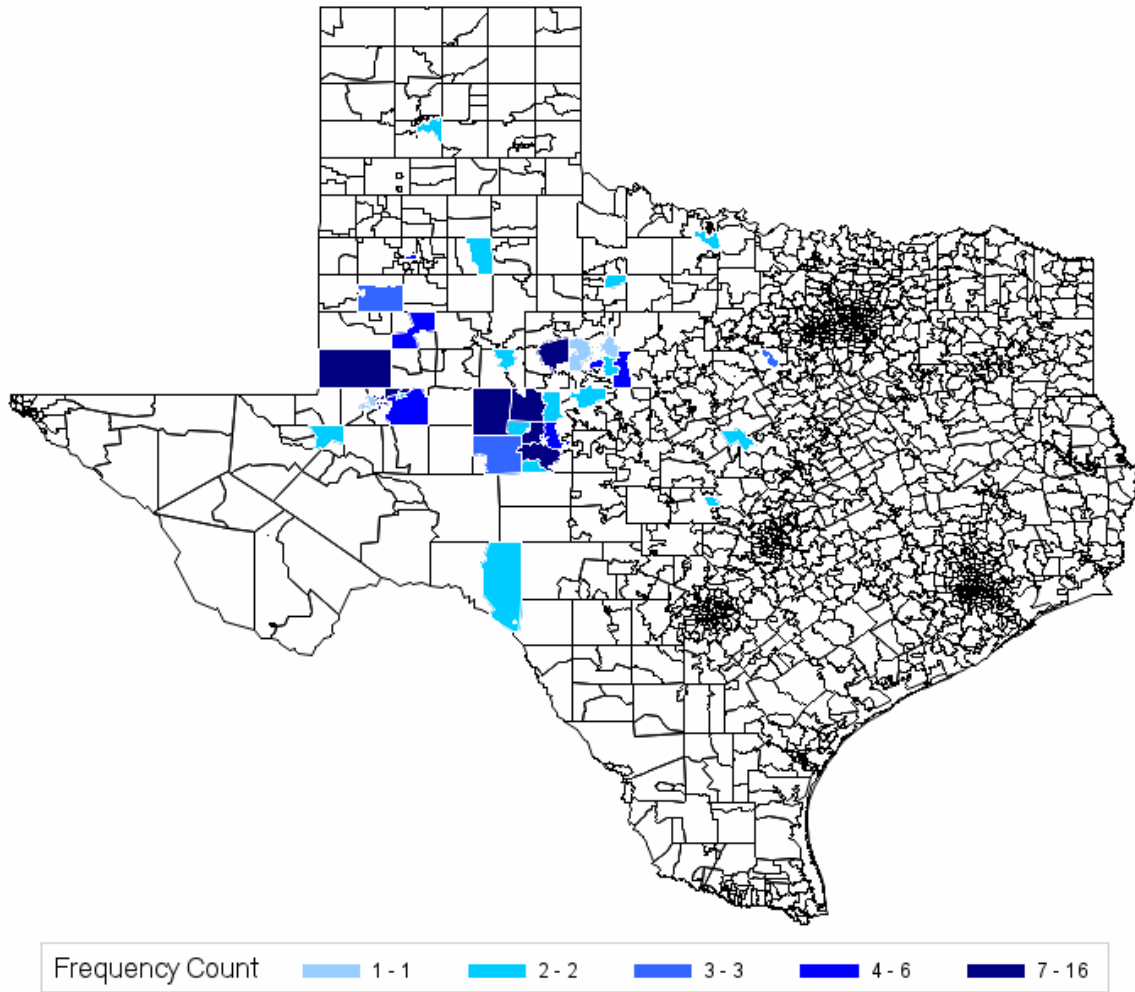
## APPENDIX B – Map of sampling locations



Location of sampling sites, E. V. Spence Reservoir, Texas, 2023-2024. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was approximately 47 feet below conservation pool at time of sampling.



## APPENDIX C – Reporting of angler ZIP codes



Location, by ZIP code, and frequency of anglers that were interviewed at E. V. Spence Reservoir, Texas, during the June 2020 through May 2021 creel survey.



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