

# Gilmer Reservoir

## 2020 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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## Survey and Management Summary

Fish populations in Gilmer Reservoir were surveyed in 2018 and 2020 using electrofishing and in 2021 using tandem hoop netting. Anglers were surveyed from June 2020 through May 2021 with a creel survey. Historical data are presented with the 2018-2021 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

**Reservoir Description:** Gilmer Reservoir is a 1,010-acre impoundment constructed on Kelsey Creek in the Big Cypress River basin and controlled by the City of Gilmer. Structural habitat consists primarily of natural shoreline features. Habitat is dominated by hydrilla and limited amounts of native aquatic plants.

**Management History:** Largemouth Bass have been managed with an 18-inch minimum length limit since the reservoir was opened to public fishing. The reservoir has developed a well-known trophy Largemouth Bass fishery. The Texas Parks and Wildlife Department has stocked Florida Largemouth Bass since 1996 and offspring of ShareLunker brood fish in 2011 to maintain this trophy fishery. Channel Catfish have been stocked in the reservoir, but a self-sustaining population failed to establish.

### Fish Community

- **Prey species:** Threadfin and Gizzard Shad were present in the reservoir. Catch rates of Gizzard Shad, Bluegill, and Redear Sunfish were higher during the fall 2020 electrofishing survey compared to surveys in 2016 and 2018. A good number of both Bluegill and Redear Sunfish were greater than 6 inches creating a good angling opportunity.
- **Catfishes:** Channel Catfish were surveyed as part of the tandem hoop net survey for crappie. While a self-sustaining population has not been observed, the few channel catfish that were caught were greater than 15 inches with relative weights over 100.
- **Largemouth Bass:** The Largemouth Bass population has been stable over the last three electrofishing surveys. There were a good number of Largemouth Bass of legal harvest size available to anglers. Additionally, most size classes had adequate body condition ( $W_r \geq 90$ ) indicating abundant prey availability. The majority of all anglers at Gilmer Reservoir fished for Largemouth Bass.
- **Crappie:** Traditional fall trap netting has not been successful collecting adequate population data for Black Crappie in the past. The 2020 spring tandem hoop netting survey collected more than 100 fish and should be a useful gear to survey crappie in the future. Crappie were the second-most sought-after fish species by all anglers at Gilmer Reservoir. Most of the crappie reached legal harvest size within two years.

**Management Strategies:** Continue stocking Largemouth Bass at 100 fish/acre every other year beginning in 2021. Conduct electrofishing surveys every other year beginning in 2022. Continue to investigate the use of baited tandem hoop nets in spring 2025 to collect and monitor Black Crappie. Monitor hydrilla and giant salvinia annually. Access and vegetation surveys will be conducted in 2024/2025.

## Introduction

This document is a summary of fisheries data collected from Gilmer Reservoir from 2018-2021. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2018-2021 data for comparison.

## Reservoir Description

Gilmer Reservoir is a 1,010-acre impoundment on Kelsey Creek in the Cypress River basin approximately 4.5 miles northwest of Gilmer, Texas. It was constructed by the City of Gilmer for municipal water and public recreation. Gilmer reservoir opened in 2000 and opened to public fishing on September 29, 2001. The reservoir has a conservation pool level of 315 msl. The shoreline is mostly undeveloped and consists of natural features. Gilmer Reservoir stakeholders met in September 2019 to discuss potential modification and use of reservoir shoreline mitigation land. As per the reservoir permit requirements, there is a buffer strip between the reservoir conservation level (315 feet msl) and the flood pool elevation line (322 feet msl). Representatives from TPWD's Inland Fisheries and Wildlife Divisions will assume a technical guidance role should the City of Gilmer choose to further pursue this matter. While only trace amounts of Hydrilla were present during August 2020, observations in October 2020 saw an increase in hydrilla acreages to what appeared to historic levels. Native aquatic vegetation covers about 4 percent of the reservoir surface area. Water level data were not available for this reservoir due to the lack of a gauging station. Other descriptive characteristics for Gilmer Reservoir are in Table 1.

## Angler Access

Gilmer Reservoir has one public boat launch east of the causeway on FM 852, which consists of two separate boat ramps and a courtesy dock. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the area near the boat ramps.

## Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Bister and Lechelt 2017) included:

1. Continue management of Largemouth Bass fishery to maintain trophy fish potential.
 

**Action:** Florida Largemouth Bass fingerlings were stocked (100/acre) every other year since 2011. Fall electrofishing surveys were conducted in 2018 and 2020 to monitor relative abundance (CPUE), body condition (mean  $W_r$ ), and growth (mean age at 14 inches).
2. Using tandem-series hoop nets baited with soap to assess gear effectiveness for crappie sampling on Gilmer Reservoir.
 

**Action:** Tandem-series hoop nets baited with soap were deployed in the spring of 2021 to sample crappie populations.
3. Conduct annual aquatic vegetation surveys to monitor hydrilla and other invasive species.
 

**Action:** Aquatic vegetation surveys were conducted in August 2017 through 2020 to monitor hydrilla coverage and other invasive species.

**Harvest regulation history:** Gilmer Reservoir was opened under statewide fish regulations in 2001 for all species except Largemouth Bass. Largemouth Bass have been managed with an 18-inch minimum limit since the reservoir was opened to public fishing. Current regulations are found in Table 3.

**Stocking history:** Prior to and immediately following impoundment, Gilmer Reservoir was stocked with Bluegill, Channel Catfish, Florida Largemouth Bass, and Threadfin Shad. In recent years, Florida

Largemouth Bass have been stocked every other year since 2011 to improve the trophy potential of the fishery. Offspring of ShareLunker Largemouth Bass were stocked in 2011 and in 2020. The complete stocking history is in Table 4.

**Vegetation/habitat management history:** Coverage of aquatic vegetation in Gilmer Reservoir has been stable in past years. Even though hydrilla has been present for many years, it has not caused access-related problems in the reservoir. Giant salvinia was discovered at the boat ramp during a creel survey in January 2013 before it was eradicated. Giant salvinia was discovered again at the boat ramp in 2020. It was removed by hand as well as sprayed with herbicide. No giant salvinia have been observed since, and the boat ramp will continue to be monitored.

**Water transfer:** No interbasin water 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 Gilmer Reservoir (Bister and Lechelt 2017). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

**Electrofishing** – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1 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. Ages for Largemouth Bass were determined using otoliths from 13 randomly selected fish (range 13.0 to 14.9 inches) in 2018 and from 13 randomly selected fish (range 13.0 to 14.9 inches) in 2020.

**Tandem hoop nets** – Black Crappie and Channel Catfish were collected using tandem hoop net series at 10 stations. Nets were baited with soap and deployed for 2-night soak durations. CPUE for tandem hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series). Ages for Black Crappie were determined using otoliths from 14 randomly selected fish (range 9.0 to 10.9 inches).

**Statistics** – Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight ( $W_r$ )] were calculated for target fishes according to Anderson and Neumann (1996). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

**Creel survey** – An access-point creel survey was conducted from June 1<sup>st</sup>, 2020, through May 31<sup>st</sup>, 2021. 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 2017). Due to the COVID-19 pandemic, harvested fish were not measured to maintain proper social distancing and to minimize contact with anglers and their equipment. Instead, anglers were queried on the species and number of fish harvested and these responses were recorded.

**Habitat** – A structural habitat survey was conducted in 2012. Vegetation surveys were conducted in 2016–2020 to monitor expansion of hydrilla and other invasive plants and in 2020 for native plant species coverage. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

**Water level** – Water level data is not available for Gilmer Reservoir.

## Results and Discussion

**Habitat:** Structural habitat consisted primarily of standing timber and natural shoreline (Table 6). Native vegetation covered 42 acres of the reservoir which was greater than the 18 acres in 2016 (Bister and Lechelt, 2017). Hydrilla has historically been the dominant vegetation in Gilmer Reservoir. Only trace amounts of hydrilla were observed during the 2020 vegetation survey in August; however personal observation during October of 2020 indicated an increase in the coverage hydrilla. New acreage was not calculated, but anecdotally, levels were comparable to historical acreage of hydrilla. During October 2019, water levels in Gilmer Reservoir were drawn down for dam repair. This draw down may have stressed hydrilla causing a delay in the growth observed in 2020. The slow growth of hydrilla early in 2020 might have allowed for the increased growth in native vegetation observed in 2020. The giant salvinia was observed in the spring of 2020 and was mechanically removed and later remaining plants were treated with herbicide. Treatment efforts to eradicate Giant salvinia were successful.

**Creel:** Directed fishing effort by anglers on Gilmer Reservoir was greatest for Largemouth Bass (61%), followed by anglers fishing for crappie species and sunfish (25% and 9%, respectively; Table 8). The directed effort for crappie has increased over the last few creel surveys while the effort directed towards sunfish has decreased (Table 8). Total fishing effort for all species and direct expenditures at Gilmer Reservoir increased from the 2012/2013 creel survey (35,772 h and \$190,119, respectively) to the 2020/2021 survey (46,549 h and \$231,851, respectively; Table 9). Most anglers were from the surrounding area, though a few traveled greater distances (Appendix C).

**Prey species:** Gizzard Shad and Threadfin Shad were abundant during fall 2020 electrofishing (309.0/h and 284.0/h, respectively, Appendix A). Electrofishing catch per unit effort substantially increased in 2020 from 2018 and 2016 (30.9.0/h, 62.0/h, 185.0/h, respectively; Figure 1). Electrofishing catch rates of Bluegill were variable from 1,213/h in 2016 to 655.0/h in 2018 and 1,322.0/h in 2020 (Figure 2). There was also an increase in Redear Sunfish in 2020 (481.0/h) compared to the catch rate in 2018 (262.0/h; Figure 3). There were numerous Bluegill and Redear Sunfish <5 inches to serve as prey for larger predators (Figures 2 and 3). Bluegill and Redear Sunfish grew to 8 inches in length or greater, providing a good recreational opportunity for anglers (Figures 2 and 3).

The amount of directed effort for sunfish decreased in the 2020/2021 survey (4,395 h) compared to the 2012/2013 survey (6,196 h) and 2005/2006 survey (6,958 h; Table 10). While direct effort decreased, the catch rate of sunfish (number/h) was stable from 2020/2021 (3.7 fish/h) to 2012/2013 (3.3 fish/h) and 2005/2006 (3.2 fish/h; Table 10). The amount of harvest has also decreased from the 2005/2006 survey (19,287 fish) to the 2012/2013 survey (8,537 fish) and the 2020/2021 survey (7,872 fish).

**Channel Catfish:** Previous attempts to establish a Channel Catfish population in Gilmer Reservoir have been unsuccessful. While we did not have any specific sampling objectives for Channel Catfish in hoop nets, information was collected during the tandem hoop net survey for crappie. Population abundance remained low, which was likely due to substantial submerged aquatic vegetation and predation of smaller Channel Catfish by Largemouth Bass. Catch rate of Channel Catfish was 1.8 fish/series (Figure 4). All individuals caught were over the legal harvest length limit between 15 and 25 inches. All size classes were in great condition with relative weights over 110. Despite Channel Catfish being caught, no further sampling will be directed at Channel Catfish in Gilmer Reservoir due to low catch rates. Directed effort by anglers for catfish continues to be low (Table 8).

**Largemouth Bass:** Total catch rate of Largemouth Bass during the electrofishing survey has been stable from 2016 to 2018 and 2020 (242.0/h, 311.0/h, and 301.0/h, respectively; Figure 5). The catch-rate of legal harvest size Largemouth Bass (18 inches and over) increased from 2016 (6.0/h) to 2018 and 2020 (13.0/h in both years; Figure 5). The growth and longevity, along with the 18-inch minimum length limit allowed a good number of fish reach this size. Growth of Largemouth Bass in Gilmer Reservoir was good in 2018 and 2020. In 2018, the average age of 14-inch (13.0 – 14.6 inches) Largemouth Bass was 1.3 years (N = 13; range = 1 – 2 years) and in 2020 the average age at 14 inches (13.0 to 14.9 inches) was 1.6 years (N = 13; range = 1 – 2 years). The 18-inch minimum length limit is not causing adverse effects to Largemouth Bass populations in Gilmer Reservoir. Body condition was excellent in 2018 with most of the relative weights > 100. In 2020, the relative weights were also good (mean  $W_r$  > 90) with most legal harvest size inch groups having excellent relative weights (mean  $W_r$  > 100).

There was more directed effort expended towards Largemouth Bass in the 2020/2021 creel survey (7,587 h) compared to the two previous surveys conducted in 2005/2006 (3,905 h) or 2012/2013 (2,028 h; Table 11). Much of the increase in effort came from an increase in the amount of tournament effort. Catch rate (number/h) of Largemouth Bass was consistent between 2020/2021 (0.6 fish/h), 2012/2013 (0.7 fish/h), and 2005/2006 (0.7 fish/h). There was an increase in the amount of Largemouth Bass harvested during the 2020/2021 survey (182 fish) compared to 2012/2013 (76 fish) or 2005/2006 (89 fish). Most legally harvestable Largemouth Bass were released, ranging from 95 to 98% (Table 11).

**Crappie:** Only Black Crappie were caught in the spring tandem hoop net survey. Catch rate during the spring of 2021 was 10.7/h (Figure 6). The catch-rate of legal harvest size Black Crappie (10-inches and over) was 8.9/h indicating a good number of individuals available for harvest (Figure 6). Crappie were in

good condition with mean relative weight over 90 for most size classes in 2021 (Figure 6). Most of the Black Crappie reached 10 inches in total length (legal harvest size) by age 2 (N = 14, range = 2 - 3 years).

The amount of directed fishing effort for crappie increased in the 2020/2021 survey (11,696 h) compared to the 2012/2013 survey (6,932 h) and 2005/2006 survey (6,479 h; Table 12). There was an increasing trend in crappie harvest from 2005/2006 (7,647 fish) to 2020/2021 (9,401 fish). Concurrently, there was also a decrease in the percent of legal harvest size crappie released from the 2005/2006 survey (39%) to the 2020/2021 survey (8%).



# Fisheries Management Plan for Gilmer Reservoir, Texas

Prepared – July 2021

**ISSUE 1:** Largemouth Bass have been managed with an 18-inch minimum length limit (5 fish daily bag limit) since Gilmer Reservoir opened for public fishing in 2001. A 14-lb ShareLunker Largemouth Bass was caught in 2011. More than 30 fish > 8 lbs. have been registered with the ShareLunker program since 2018. Approximately two thirds of the total angling hours at the reservoir were directed toward Largemouth Bass. Continued monitoring of the Largemouth Bass population is necessary to ensure the special harvest regulation is appropriate.

## MANAGEMENT STRATEGY

1. Monitor the Largemouth Bass and prey species with electrofishing in 2022 and 2024.
2. Monitor Largemouth Bass growth (average age at 14 inches), relative abundance, and condition to ensure the 18-inch minimum length limit is not having any adverse impacts on the population.
3. Stock Florida Largemouth Bass every other year at a rate of 1,000 fish/km of shoreline beginning in 2021 to maintain the trophy potential of the fishery.

**ISSUE 2:** Giant Salvinia was found at the boat ramp in January 2013 when it was removed by hand. It had not been observed since, until the spring of 2020 when it was once again found around the boat ramp. The immediate response to contain, remove, and spray with herbicide resulted in the elimination of the infestation. The boat ramp continues to be monitored for new growth of giant salvinia.

## MANAGEMENT STRATEGIES

1. Conduct periodic inspections of the boat ramp during regularly scheduled field sampling to look for any invasive aquatic plants.
2. Work with TPWD Game Wardens to patrol the boat ramp and check boat trailers for invasive species.
3. Continue to conduct annual surveys to monitor trends and estimate coverage of invasive aquatic plants.

**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 inter-basin water transfers to facilitate potential invasive species responses.

## Objective-Based Sampling Plan and Schedule (2021–2025)

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

Largemouth Bass is the primary sport fish in Gilmer Reservoir. The most important forage species are Bluegill, Redear Sunfish, Gizzard, and Threadfin Shad. The proposed sampling schedule to meet the following OBS plan can be found in Table 13.

### Low-density fisheries

**Channel Catfish:** Efforts to develop a Channel Catfish population in this reservoir using supplemental stocking have been unsuccessful. Direct angling effort during the June 2020 through May 2021 creel survey was just over 1% of the total angling effort. While Channel Catfish were caught in the tandem hoop nets, there will be no targeted sampling. Though length and weight will be recorded for any Channel Catfish caught during tandem hoop net survey for crappie.

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

**Largemouth Bass:** Largemouth Bass are the most popular sport fish in Gilmer Reservoir. Directed angling effort for Largemouth Bass was greater than 60% of total effort in recent creel surveys. Trend data on CPUE, size structure, and body condition (mean  $W_r$ ) have been collected biennially since 2008 with fall nighttime electrofishing. The population is managed with an 18-inch minimum length limit. Continuation of biennial trend data in this reservoir with fall nighttime electrofishing will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation.

A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in 2022 and 2024, but sampling will continue at random sites until 50 stock-size fish are collected and the RSE of CPUE-S is  $\leq 25$ . Past sampling has consistently achieved an RSE of CPUE-S  $< 25$ , so the minimum sampling effort should be sufficiently precise. However, up to 3 random stations will be determined in the event extra sampling is necessary.

Sampling objectives will include size structure (PSD and length frequency), growth (13 fish sample between 13.0 and 14.9 inches to determine mean age at 14 inches), relative abundance (CPUE-total and CPUE-stock), and condition (average  $W_r$  using lengths and weights from 10 fish per inch group).

**Crappie:** Although White Crappie have been observed in past surveys, only Black Crappie were observed during the 2020/2021 creel survey and tandem hoop net samples. Anglers targeting

crappie fished 11.6 hours/acre in 2020/2021. Growth of Black Crappie was excellent. The average age of 10-inch Black Crappie (9.0 to 10.9 inches) from the spring sampling in 2021 was 2 years (N = 14, range = 2 – 3 years).

As baited tandem hoop nets were successful, we will deploy 10 tandem hoop net series during the spring of 2025 to obtain crappie for age-and-growth. The objectives will be to collect fish to assess size structure (PSD and length frequency), age-and-growth (N=13, range 9.0 to 10.9 inches), relative abundance (CPUE-total, CPUE-stock, and CPUE-10), and condition (average  $W_r$  using lengths and weights from 10 fish per inch group).

**Prey Species:** Bluegill and Redear Sunfish are some of the primary forage fish in Gilmer Reservoir. Redear Sunfish are also present at larger sizes over 8 inches and may provide opportunity for panfish angling. Gizzard and Threadfin Shad were also extremely prevalent forage fish. Trend data on CPUE and size structure of Bluegill, other sunfish, and shad species have been collected biennially since 2008. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in sunfish relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient number of Bluegill for size structure estimation (PSD using 50 fish minimum) and relative abundance estimates ( $RSE \leq 25$  of CPUE-Total) at 12 stations with 80% confidence. No additional effort will be expended beyond that required to meet Largemouth Bass survey objectives. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

## Literature Cited

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## Tables and Figures

Table 1. Characteristics of Gilmer Reservoir, Texas.

Characteristic	Description
Year constructed	2000
Controlling authority	City of Gilmer
County	Upshur
Reservoir type	Tributary
Surface area	1,010 acres
Watershed area	24,214 acres
Shoreline development index	1.6
Conservation pool	315 ft msl
Conductivity	132 $\mu$ S/cm

Table 2. Boat ramp characteristics for Gilmer Reservoir, Texas, August 2013. Reservoir elevation at time of survey was 315 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
FM 852 Public Ramp	32.75301 -95.00607	Y	100	309	Excellent, no access issues

Table 3. Harvest regulations for Gilmer Reservoir, Texas.

Species	Bag limit	Length limit
Catfish, Channel	25	12-inch minimum
Bass, Largemouth	5	18-inch minimum
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Gilmer Reservoir, Texas. Size categories are FGL = fingerling, AFGL = advanced fingerling, and ADL = adult.

Species	Year(s) Stocked	Number of Years	Number Stocked	Size
Bluegill	2000	1	216,422	FGL
	Total		216,422	
Channel Catfish	1996-2001	4	105,654	FGL
	1997	1	400	ADL
	2000	1	4,125	AFGL
	Total		110,179	
Florida Largemouth Bass	2019	1	22,047	FGL
	2017	1	104,630	FGL
	1996-2015	12	744,520	FGL
	1997	1	3,439	AFGL
	Total		874,636	
ShareLunker Largemouth Bass	2011	1	30,891	FGL
	2020	1	3,353	AFGL
	Total		34,244	
Threadfin Shad	1997	1	2,000	ADL
	2002	1	6,000	ADL
	Total		8,000	

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

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>Tandem hoop netting</i>			
Crappie	Size Structure	PSD, length frequency	$N = 50$
	Age-and-growth	Age at 10 inches	$N = 13$ , 9.0 – 10.9 inches

<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. Survey of structural habitat types, Gilmer Reservoir, Texas, 2012. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Natural	7.5 miles	100.0
Standing timber	367.0 acres	36.3



Table 7. Survey of aquatic vegetation, Gilmer Reservoir, Texas, 2017–2020. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2017	2018	2019	2020
Native submersed				19.0 (1.8)
Native floating-leaved				1.1 (trace)
Native emergent				21.5 (2.1)
Non-native				
Giant salvinia (Tier I) <sup>a</sup>	0	0	0	0
Hydrilla (Tier III)*	314.0 (31.1)	217.0 (21.5)	75.0 (7.4)	<1 (trace)
Alligator Weed (Tier III)*	0	0	1.0 (trace)	<1 (trace)

\*Tier I is immediate Response, Tier III is Watch Status

<sup>a</sup> Giant Salvinia not found during surveys but has been reportedly found at the boat ramp and control measures implemented.

Table 8. Percent directed angler effort by species for Gilmer Reservoir, Texas. Survey periods were from June 2005 through May 2006, June 2012 through May 2013, and June 2020 through May 2021.

Species	2005/2006	2012/2013	2020/2021
Catfish	1.1	0.4	1.5
Crappie	13.6	19.4	25.1
Sunfishes	14.6	17.3	9.4
Largemouth Bass	65.4	62.4	60.5
Anything	5.4	0.6	3.5

Table 9. Total fishing effort (h) for all species and total directed expenditures at Gilmer Reservoir, Texas. Survey periods were from June 2005 through May 2006, June 2012 through May 2013, and June 2020 through May 2021. Relative standard error is in parentheses.

Creel statistic	2005/2006	2012/2013	2020/2021
Total fishing effort	47,719 (10)	35,772 (15)	46,549 (21)
Total directed expenditures	\$189,245 (17)	\$190,119 (34)	\$231,851 (46)

### Gizzard Shad

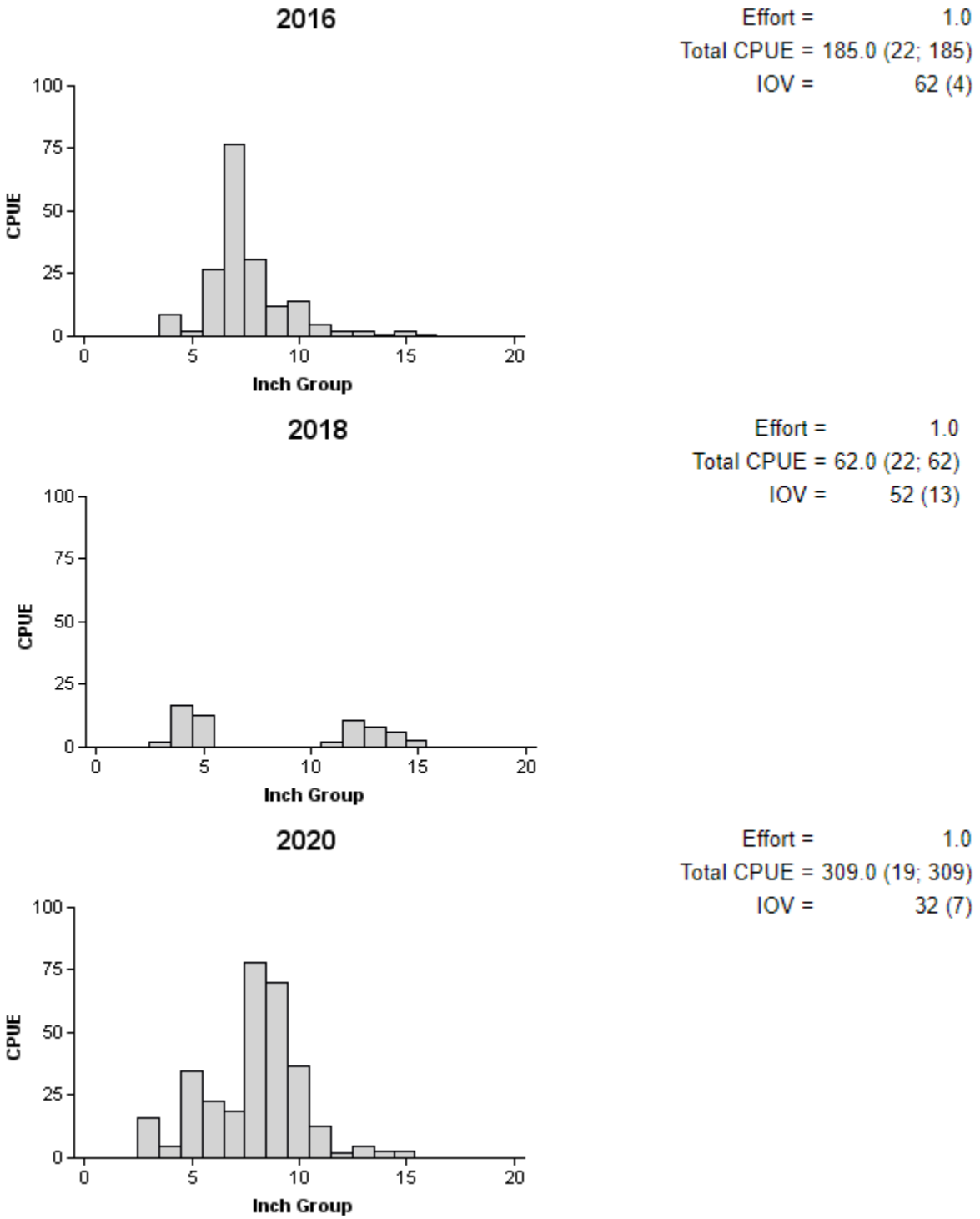


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Gilmer Reservoir, Texas, 2016, 2018, and 2020.

## Bluegill

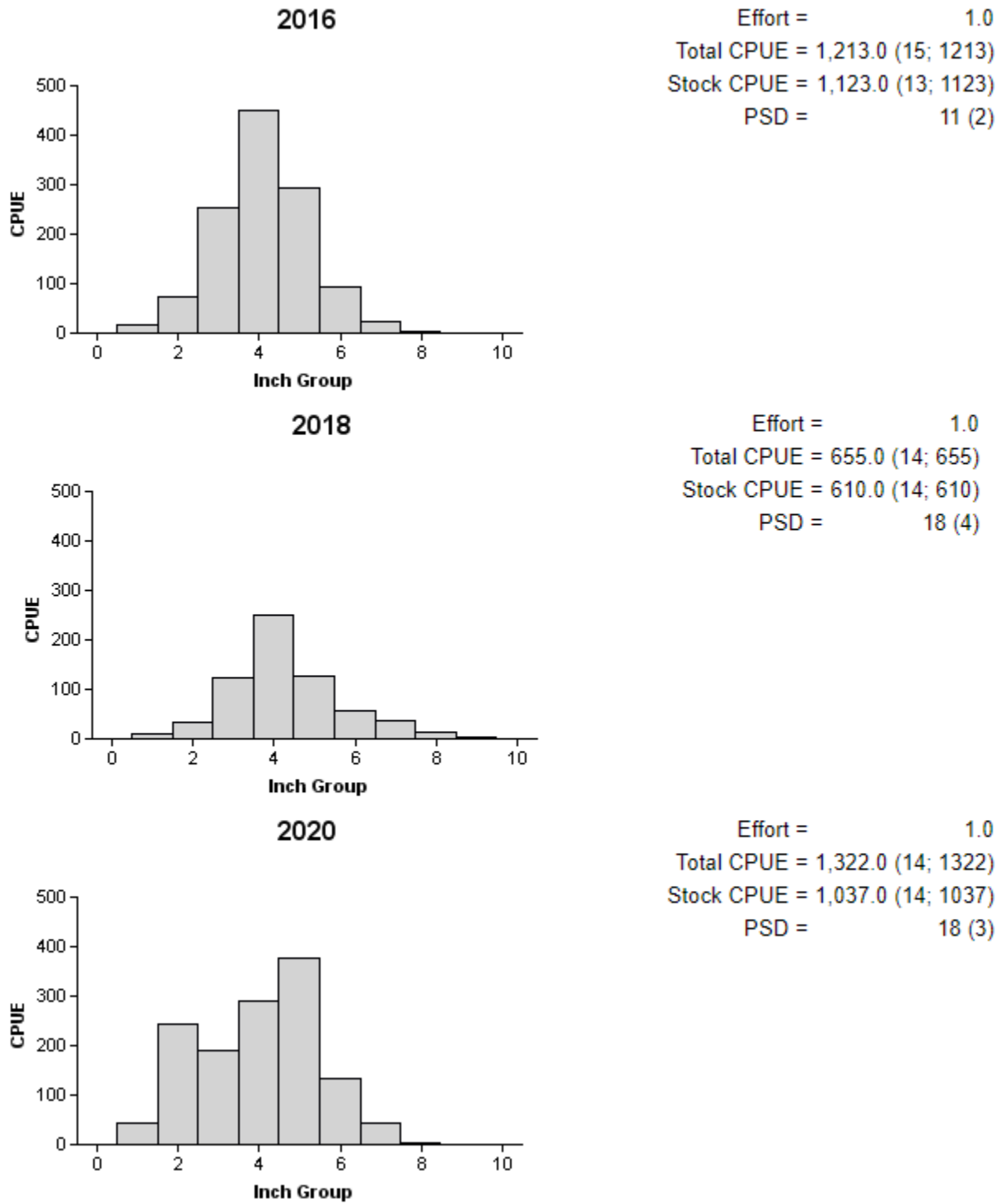


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Gilmer Reservoir, Texas, 2016, 2018, and 2020.

## Redear Sunfish

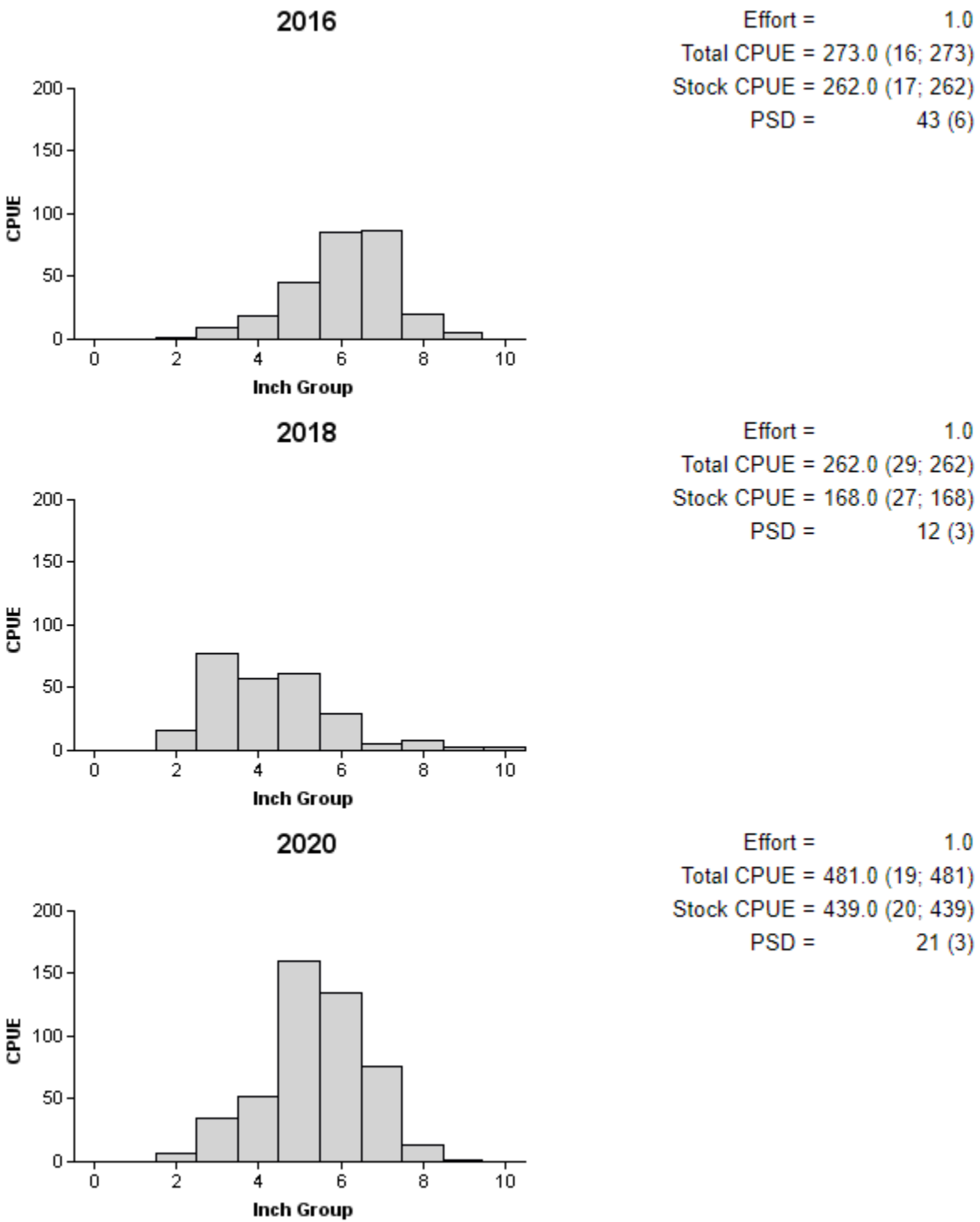


Figure 3. Number of Redear Sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Gilmer Reservoir, Texas, 2016, 2018, and 2020.

Table 10. Creel survey statistics for sunfishes at Gilmer Reservoir, Texas, from June 2005 through May 2006, June 2012 through May 2013, and June 2020 through May 2021. Total catch per hour is for anglers targeting sunfish and total harvest is the estimated number of sunfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistics	Year		
	2005/2006	2012/2013	2020/2021
Surface area (acres)	1,010	1,010	1,010
Directed effort (h)	6,958 (15)	6,196 (22)	4,395 (28)
Directed effort/acre	6.9 (15)	6.1 (22)	4.4 (28)
Total catch per hour	3.2 (17)	3.3 (33)	3.7 (38)
Total harvest	19,287 (42)	8,537 (40)	7,872 (62)
Sunfish (unidentified)	78 (1097)	435 (120)	2,770 (78)
Bluegill	18,270 (32)	7,922 (33)	4,837 (43)
Redear Sunfish	939 (156)	180 (170)	264 (240)
Harvest/acre	19.1 (42)	8.5 (40)	7.8 (62)
Percent released	41%	45%	51%

## Channel Catfish

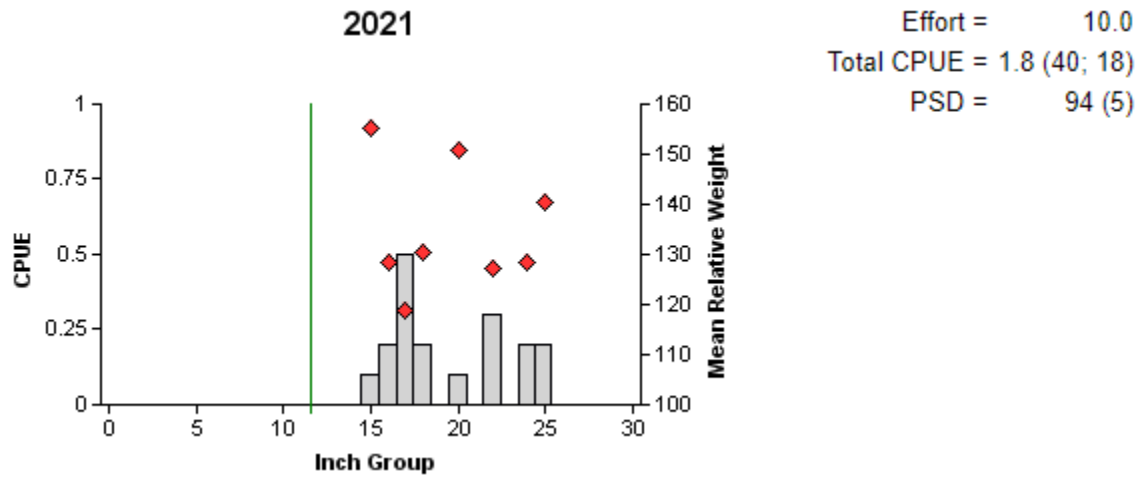


Figure 4. Number of Channel Catfish caught per series (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring tandem hoop net surveys, Gilmer Reservoir, Texas, 2021. Vertical line indicates minimum length limit at time of survey.

### Largemouth Bass

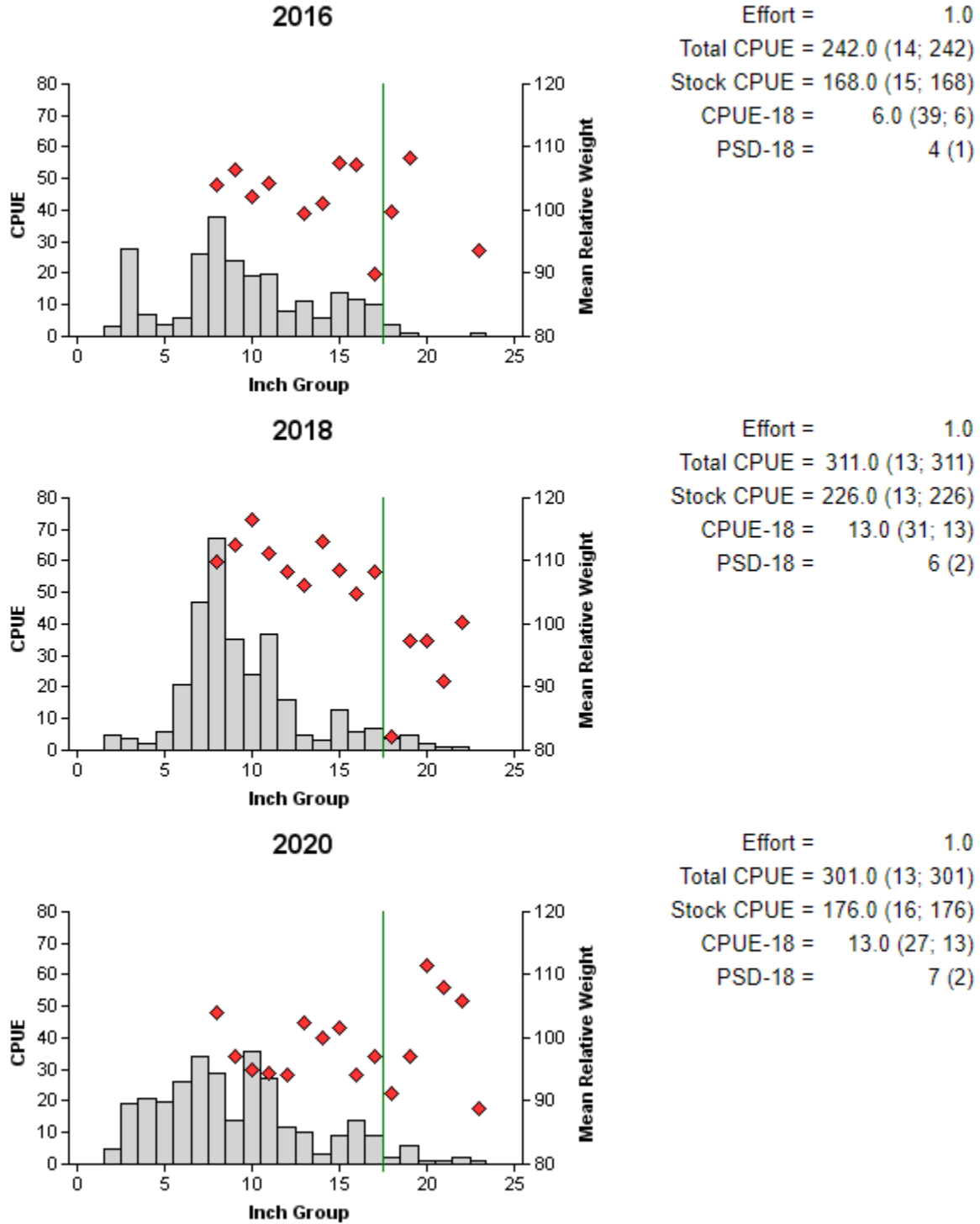


Figure 5. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Gilmer Reservoir, Texas, 2016, 2018, and 2020. Vertical line indicates minimum length limit at time of survey.



Table 11. Creel survey statistics for Largemouth Bass at Gilmer Reservoir, Texas, from June 2005 through May 2006, June 2012 through May 2013, and 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	2005/2006	2012/2013	2020/2021
Surface area (acres)	1,010	1,010	1,010
Directed angling effort (h)			
Tournament	3,905 (25)	2,028 (33)	7,587 (31)
Non-tournament	27,306 (14)	20,282 (19)	20,561 (21)
All black bass anglers combined	31,212 (11)	22,311 (16)	28,148 (22)
Angling effort/acre	30.9 (11)	22.1 (16)	27.9 (22)
Catch rate (number/h)	0.7 (12)	0.7 (17)	0.6 (32)
Harvest			
Non-tournament harvest	89 (119)	76 (164)	182 (98)
Harvest/acre	<0.1 (119)	0.08 (164)	0.2 (98)
Tournament weigh-in and release	180 (209)	51 (374)	26 (350)
Release by weight <sup>1</sup>			
<4.0 lbs	-	-	14,293 (46)
4.0-6.9 lbs	-	1,670 (56)	2,193 (54)
7.0-9.9 lbs	-	279 (68)	113 (100)
≥10.0 lbs	-	-	19 (231)
Percent legal released (non-tournament)	98%	96%	95%

<sup>1</sup> Release by weight was not recorded during the 2005/2006 creel surveys. Release by weight was not recorded for bass <4.0 lbs during the 2012/2013 creel survey.

### Black Crappie

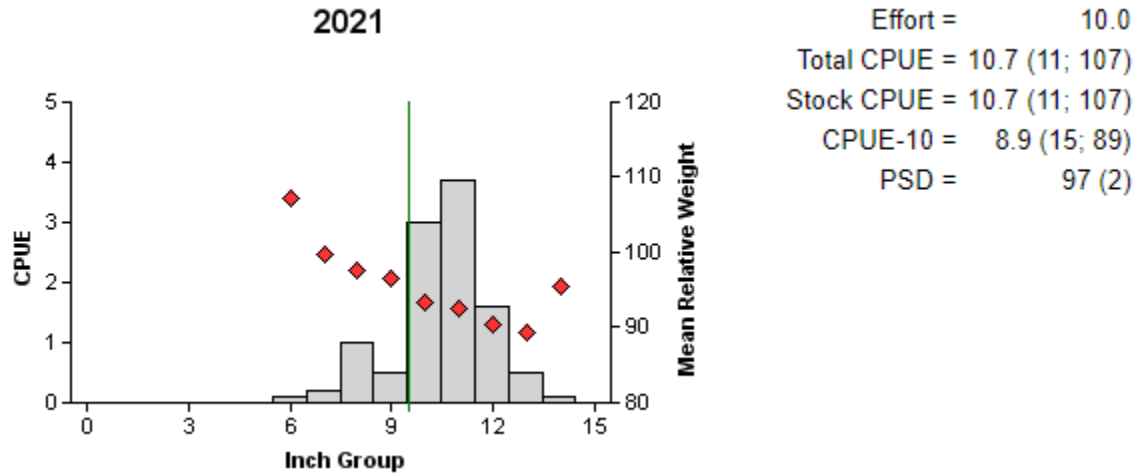


Figure 6. Number of Black Crappie caught per series (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring tandem hoop netting surveys, Gilmer Reservoir, Texas, 2021. Vertical line indicates minimum length limit.

Table 12. Creel survey statistics for Crappie at Gilmer Reservoir, Texas, from June 2005 through May 2006, June 2012 through May 2013, and June 2020 through May 2021. Total catch per hour is for anglers targeting crappie and total harvest is the estimated number of crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistics	Year		
	2005/2006	2012/2013	2020/2021
Surface area (acres)	1,010	1,010	1,010
Directed effort (h)	6,479 (18)	6,932 (20)	11,696 (25)
Directed effort/acre	6.4 (18)	6.8 (20)	11.6 (25)
Total catch per hour	2.9 (30)	1.6 (32)	1.2 (31)
Total harvest	7,647 (47)	11,029 (56)	9,401 (43)
Harvest/acre	7.6 (47)	10.9 (22)	9.3 (43)
Percent legal released	39%	3%	8%

## Proposed Sampling Schedule

Table 13. Proposed sampling schedule for Gilmer Reservoir, Texas. Survey period is June through May. Tandem-hoop netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall.

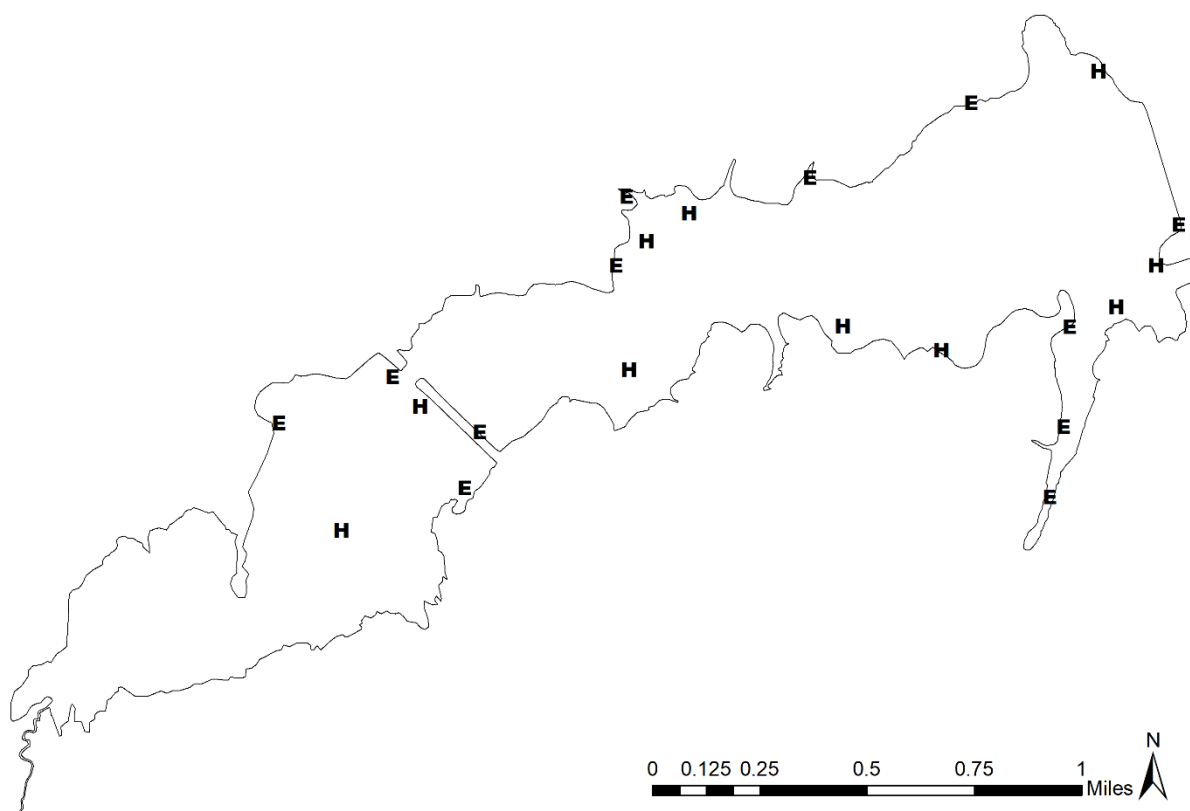
	Survey year			
	2021-2022	2022-2023	2023-2024	2024-2025
Angler Access				X
Structural Habitat				X
Vegetation	X	X	X	X
Electrofishing – Fall		X		X
Baited tandem hoop netting				X
Report				X

## 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 Gilmer Reservoir, Texas, 2020-2021. Sampling effort was 1 hour for electrofishing and 10 net series for tandem-hoop netting.

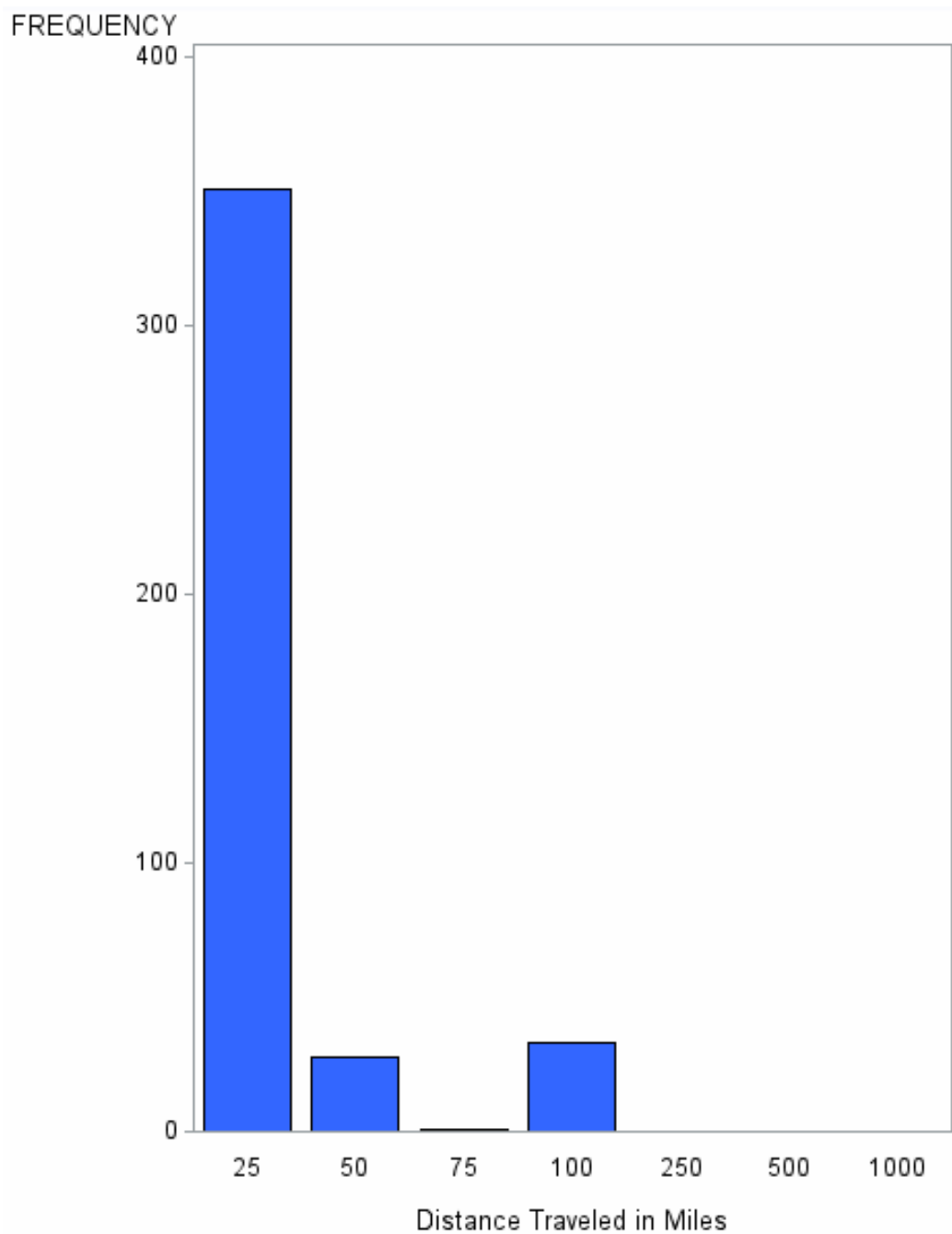
Species	Electrofishing		Tandem-Hoop Net	
	N	CPUE (RSE)	N	CPUE (RSE)
Gizzard Shad	309	309.0 (19)		
Threadfin Shad	284	284.0 (17)		
Channel Catfish			18	1.80 (40)
Warmouth	5	5.0 (69)		
Bluegill	1322	1322.0 (14)		
Longear Sunfish	183	183.0 (37)		
Redear Sunfish	481	481.0 (19)		
Redspotted Sunfish	19	19.0 (65)		
Largemouth Bass	301	301.0 (13)		
Black Crappie			107	10.7 (11)

## APPENDIX B – Map of sampling locations



Location of sampling sites, Gilmer Reservoir, Texas, 2020-2021. Electrofishing and tandem hoop netting stations are indicated by E and H, respectively. Water level was near full pool at time of sampling.

## APPENDIX C – reporting of creel ZIP code data



Frequency of anglers that traveled various distances (miles) to Gilmer Reservoir, Texas, as determined from the June 2020 through May 2021 creel survey.



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