

# Lake Bardwell

## 2022 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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## Survey and Management Summary

Fish populations in Lake Bardwell were surveyed in 2022 using electrofishing and trap netting, and in 2023 using gill netting. Historical data are presented with the 2022/2023 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

**Reservoir Description:** Lake Bardwell is a 3,138-acre impoundment located on Waxahachie Creek in the Trinity River Basin approximately 3 miles southwest of Ennis, Texas. Normal annual water level fluctuation is within 2-4 feet of spillway elevation; however, significant flood events occurred in 2015, 2016, and 2018. From 2020–2023, elevation has remained within 3 feet of spillway elevation. Habitat consisted of featureless shoreline, eroded bank, and trace amounts of native emergent vegetation. Angler access and facilities are very good with five public access areas and one commercial marina.

**Management History:** Important sport fish include Hybrid Striped Bass, Largemouth Bass, crappie, and catfish. The management plan from the 2018 survey report included requested stockings of Hybrid Striped Bass fingerlings at 10–15 fish/acre annually and Blue Catfish fingerlings at 50 fish/acre in 2020 and 2021. Blue Catfish stockings transitioned to the years 2021 and 2022 due to logistical constraints during 2020.

### Fish Community

- **Prey species:** Threadfin Shad were abundant in the reservoir. Electrofishing catch of Gizzard Shad was also high, and nearly every encountered Gizzard Shad were available as prey to most sport fish.
- **Catfishes:** Blue and Channel Catfish were abundant and provide excellent angling opportunities. Supplemental stocking of Blue Catfish fingerlings has been conducted improve the population.
- **Temperate basses:** White Bass were present in the reservoir at relatively low levels of abundance. The Hybrid Striped Bass population are relatively abundant compared to population levels over the past decade as stocking has increased in recent years.
- **Largemouth Bass:** The abundance of Largemouth Bass was low, likely due to poor littoral habitat.
- **Crappie:** White Crappie were abundant and displayed excellent body condition.

**Management Strategies:** Continue stocking Hybrid Striped Bass at 15 fish/acre. Continue to supplement the poor reproductive success of the Blue Catfish population with Blue Catfish fingerlings at 50 fish/acre. Inform the public about the negative impacts of aquatic invasive species. Conduct an electrofishing survey in 2026, a trap net survey in 2026, a gill net survey in 2027, and a vegetation survey in 2026.

## Introduction

This document is a summary of fisheries data collected from Lake Bardwell in 2022–2023. 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 2022–2023 data for comparison.

## Reservoir Description

Lake Bardwell is a 3,138-acre impoundment constructed in 1965 on Waxahachie Creek. It is in Ellis County, approximately 3 miles southwest of Ennis, and is operated and controlled by the U.S. Army Corps of Engineers (USACE). Primary water uses include municipal water supply, flood control, and recreation. Lake Bardwell is classified as eutrophic with a Carlson's trophic state index (TSI) of 60 (TCEQ 2020). Habitat consisted of featureless shoreline, eroded bank, and small amounts of emergent vegetation. Water level has historically been within 3 feet of conservation level with occasional flood pulses (Figure 1; Water Data for Texas 2023). Other descriptive characteristics for Lake Bardwell are in Table 1.

## Angler Access

Lake Bardwell has five public boat ramps and one private boat ramp. All ramps were generally accessible over the most recent survey period (2022–2023). Additional boat ramp characteristics are presented in Table 2. High View Park, located southwest of the HWY 34 bridge, has adequate shoreline access for anglers, plus two enclosed fishing piers (available for a daily fee).

## Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Ott 2019) included:

1. Stock Hybrid Striped Bass fingerlings at 10–15 fish/acre annually.

**Action:** Hybrid Striped Bass fry were stocked at approximately 50 fish/acre in 2020. Hybrid Striped Bass fingerlings were stocked at approximately 15 fish/acre in 2021 and 2022.

2. Supplement the Blue Catfish population through supplemental stocking or habitat improvements and evaluate the efficacy of management actions.

**Action:** Blue Catfish fingerlings were stocked at approximately 50 fish/acre in 2021 and 2022. A gill net survey was conducted in 2023.

**Harvest regulation history:** All sport fishes in Lake Bardwell are managed with statewide harvest regulations (Table 3). Regulations have not changed since the last survey.

**Stocking history:** Lake Bardwell was first stocked with Florida Largemouth Bass in 1992 and again in 1998 (Table 4). Hybrid Striped Bass were first stocked in 1975; annual stockings were requested from 1995–2023 and stocking was conducted as available. Blue Catfish were initially stocked in 1966 with supplemental stockings in 2015, 2016, 2021, and 2022.

**Vegetation/habitat management history:** Historically, the aquatic vegetation community at Lake Bardwell has been low in diversity and abundance. Hydrilla was present in the past, increasing from trace amounts in 1997 to 15 acres in 2002 (Ott and Bister 2003), but declined to <0.5 acres without treatment by 2006 (Beck and Ott 2007) and has not been observed since.

**Water transfer:** Raw water from Richland-Chambers Reservoir has the potential to be introduced directly or indirectly into Lake Bardwell via a pumping station on the reservoir. Richland-Chambers Reservoir is within the Trinity River Basin and no water transfers outside of this basin are known to exist.

## Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Bardwell (Ott 2019). 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).

**Electrofishing** – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by daytime 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). Ages for crappie were determined using otoliths from 13 randomly selected fish (range 9.0 to 10.9 inches).

**Gill netting** – Blue Catfish, Channel Catfish, White Bass, and Hybrid Striped 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).

**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). Hybrid Striped Bass PSD was calculated according to Dumont and Neely (2011). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

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

**Water level** – Source for water level data was from the Water Data for Texas website (Water Data for Texas 2022).

## Results and Discussion

**Habitat:** Native vegetation was present in trace amounts (Table 6) with buttonbush as the only species encountered during our survey. Historic vegetation surveys have indicated comparably low coverages of native aquatic vegetation (2014 = <0.1%; 2018 = 2.5%).

**Prey species:** Threadfin Shad were present and abundant. Electrofishing catch rates of Gizzard Shad were abundant at 580.0/h. Index of Vulnerability (IOV) for Gizzard Shad was high, indicating that 100% of Gizzard Shad were available to existing predators (Figure 2). Total CPUE of Gizzard Shad has considerably increased compared to recent years (2014 = 286.0/h; 2018 = 180.0/h). The electrofishing catch rate of Bluegill was poor in 2022 (1.0/h; Figure 3), but Bluegill populations have historically remained at low levels in the reservoir (2014 = 20.0/h; 2018 = 31.0/h).

**Catfish:** The gill net catch rate of Blue Catfish was high at 19.3/nn (Figure 4) with supplemental Blue Catfish stocking contributing to an increase in overall catch rates over the last three surveys (Figure 4; 2017 = 3.8/nn; 2019 = 8.4/nn). The abundance of quality size (20 inches or longer) fish also increased in 2023 in comparison to prior surveys (2017 CPUE-20 = 0.7; 2019 CPUE-20 = 1.3/nn) with a CPUE-20 of 4.0/nn. The gill net catch rate of Channel Catfish was high in 2023 (15.8/nn) compared to prior surveys (2017 = 8.1/nn; 2019 = 4.5/nn; Figure 5). While overall abundance was relatively high, the abundance of quality-size Channel Catfish was low with a CPUE-16 of 1.1/nn in 2023, comparable to historic abundance of quality-size Channel Catfish (CPUE-16 2017 = 1.8/nn; CPUE-16 2019 = 0.4).

**Temperate Basses:** The gill net catch rate of White Bass was 3.8/nn in 2023 (Figure 6) and declined substantially from the prior survey (2019 CPUE = 19.6/nn). Historic catch rates have indicated that this population is extremely variable in the reservoir (1.0/nn–25.3/nn from 2005–2019) likely due to variable water levels (Figure 1) that can dramatically affect White Bass spawning conditions. Water levels during the 2019 survey were relatively high at approximately four feet above conservation level compared to approximately conservation level during the 2023 survey and the 2017 survey, which saw comparable catch rates (6.4/nn). Hybrid Striped Bass stocking has contributed to an increase in the number of fish observed during gill netting (11.0/nn) during the 2023 survey (Figure 7) which substantially increased compared to the 2019 (0.5/nn) and 2017 (3.6/nn) surveys.

**Largemouth Bass:** The daytime electrofishing catch rate of Largemouth Bass was low in 2018 (8.0/h; Figure 8). Low catch of stock sized Largemouth Bass in the most recent survey (7.0/h) is comparable to historic nighttime surveys (2006–2018 range = 11.0/h–17.0/h). Poor littoral habitat (Table 6) has likely contributed to the low catch rates of Largemouth Bass in the reservoir. While the Largemouth Bass fishery is of a relatively lower density, the only creel conducted on this reservoir (2006/2007) indicated that this is a negligible fishery (2% directed effort).

**Crappie:** The trap net catch rate of White Crappie was high at 23.9/nn in 2022, which was much higher than prior surveys (2010 = 4.0/nn; 2014 = 7.5/nn; Figure 9). While abundant, the number of legal-size fish was relatively low with a CPUE-10 of 2.5/nn, which was lower than the prior survey (2014 CPUE-10 = 4.5/nn). Growth for White Crappie was moderate; average age at 10 inches was 2.0 years (N = 13, 9.1 to 10.7 inches in length). Mean relative weight was over 100 for all size classes in 2022 indicating an abundance of prey in the reservoir and that the population is unlikely to be stunted. Black Crappie were also present, but abundance was low (1.2/nn).

# Fisheries Management Plan for Lake Bardwell, Texas

Prepared – July 2023

**ISSUE 1:** Hybrid Striped Bass have been a part of the overall fishery at Lake Bardwell since the early 2000s. Multiple challenges have prevented consistent stockings historically resulting in an inconsistent fishery; however, recent stockings have led to an increase in abundance. Annual stocking of Hybrid Striped Bass is required to sustain the population and maintain this fishery.

## MANAGEMENT STRATEGY

1. Stock Hybrid Striped Bass fingerlings annually at 15 fish/acre. If fingerlings are not available to meet stocking requests, stock with fry at 100 fish/acre, if feasible.
2. Promote the fishery via social media and press releases during stockings.
3. Assess the Hybrid Striped Bass fishery with a summer quarter creel survey.

**ISSUE 2:** Historically, natural recruitment of Blue Catfish at Lake Bardwell has not been consistent, which suggests supplemental stocking is necessary to sustain the population. The poor reproductive success could potentially be driven by the lack of suitable spawning cavities. Anecdotal information from local anglers suggest Lake Bardwell has the potential to produce trophy Blue Catfish. With evidence of poor natural recruitment, supplemental stocking is required to sustain this fishery.

## MANAGEMENT STRATEGIES

1. Stock Blue Catfish fingerlings at 50 fish/acre. Stocking plan will request fingerlings in subsequent years beginning in 2026 and 2027, followed by 3 years without stocking.
2. Consult with Lake Bardwell US Army Corps of Engineers staff about creating artificial catfish spawning habitat throughout Lake Bardwell.
3. Assess the Blue Catfish fishery with a summer quarter creel survey.

**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. Further, many reservoirs in the surrounding region of Lake Bardwell have Zebra Mussels present and it is important to ensure that these species do not spread to this reservoir as 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 or literature that they can in turn educate their customers.
3. Educate the public about invasive species using social media.
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 (2023–2027)

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

Important sport fishes in Lake Bardwell include Blue and Channel Catfish, White and Hybrid Striped Bass, and Black and White Crappie. Important forage species include Gizzard and Threadfin Shad.

### Low-density fisheries

**Largemouth Bass:** Largemouth Bass relative abundance is limited by the lack of suitable littoral habitat. Historic angler effort was low at Lake Bardwell for Largemouth Bass as this species accounted for approximately 2% of the total directed angling effort during the December 2006-May 2007 creel survey. Further, historic sampling suggests that achieving acceptable levels of precision would require an unfeasible amount of sampling effort (> 60 sites) to justify the results.

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

**Crappie:** During the only creel survey conducted on Lake Bardwell (December 2006 through May 2007) crappie represented 55% of the directed angler effort at Lake Bardwell and was the most popular fishery. Based on historic surveys, 10 trap nets have typically attained acceptable levels of precision (CPUE-Stock RSE < 25, Stock N > 50). This level of sampling should provide the secondary sampling objective of 13 specimens between 9.0 and 10.9 inches for aging. White Crappie trend data (CPUE, PSD,  $W_t$ ) will continue to be monitored during the fall of 2026 to detect population fluctuations. Five additional sites will be implemented if Stock N < 50 and Stock RSE does not approach 25. A maximum of 15 stations will be sampled. The crappie fishery will also be assessed through a summer-quarter access point creel survey from June 2026 through August 2026 to establish a current baseline in angler effort, catch, harvest, and expenditures that may spur further investigation. Five weekend days and four weekdays will be surveyed.

**Catfish:** Based on historic surveys, 10 gill nets have typically attained acceptable levels of precision (CPUE-Stock RSE < 25, Stock N > 50) to collect trend data (CPUE, PSD,  $W_t$ ) on Lake Bardwell. Further, as Blue Catfish recruitment is largely tied to stocking rates in Lake Bardwell, sampling is needed to evaluate stocking success. Ten randomly selected gill net sites will be sampled in the spring of 2027 to monitor Blue Catfish and Channel Catfish trend data (CPUE, PSD,  $W_t$ ). An additional five sites will be selected and utilized to meet acceptable levels of precision for the Blue Catfish fishery (CPUE-Stock RSE < 25, Stock N > 50). If acceptable levels of precision are not achieved for the Channel Catfish fishery, no additional collection will be conducted, and the species will be monitored as presence/absence. A maximum of 15 sites will be sampled. The catfish fishery will also be assessed through a summer-quarter



roving creel survey from June 2026 through August 2026 to establish a current baseline in angler effort, catch, harvest, and expenditures that may spur further investigation. Five weekend days and four weekdays will be surveyed.

**Temperate Bass:** The most recent Hybrid Striped Bass catch rate was the highest on record and came in conjunction with three consecutive years of stocking. The second highest catch rate for Hybrid Striped Bass on Lake Bardwell was 10.6 fish/net night recorded in 2005, comparably following three consecutive years of meeting the stocking request (10 fish/acre). Therefore, ten randomly selected gill net sites will be sampled in the spring 2027 to monitor Hybrid Striped Bass stocking success. If acceptable levels of precision are not achieved (CPUE-Stock RSE < 30, Stock N > 50), no additional collection will be conducted, and the species will be monitored as presence/absence. Historic sampling indicates that traditional sampling objectives for White Bass (CPUE-Stock RSE < 25, Stock N > 50) would require an unfeasible (> 60 sites) amount of sampling effort to justify the results. Therefore, 10 gill net sites will be sampled in spring 2027. This level of sampling may provide the sampling objective of 13 specimens between 9.0 and 10.9 inches for aging. If this precision is not achieved, no additional collection will be conducted, and the species will be monitored as presence/absence. The temperate bass fishery will also be assessed through a summer-quarter roving creel survey from June 2026 through August 2026 to establish a current baseline in angler effort, catch, harvest, and expenditures that may spur further investigation. Five weekend days and four weekdays will be surveyed.

**Prey Species:** Gizzard Shad and Threadfin Shad are the primary forage species at Lake Bardwell; however, there is not currently justification to conduct an electrofishing survey on the reservoir. In order to assess prey availability, the relative weights of Hybrid Striped Bass and Catfish will be utilized as surrogate measures.

**Habitat:** A complete-reservoir comprehensive vegetation survey will continue to be conducted in 2026 to monitor the littoral habitat within the reservoir and additionally, conduct a structural habitat survey in 2026..

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## Tables and Figures

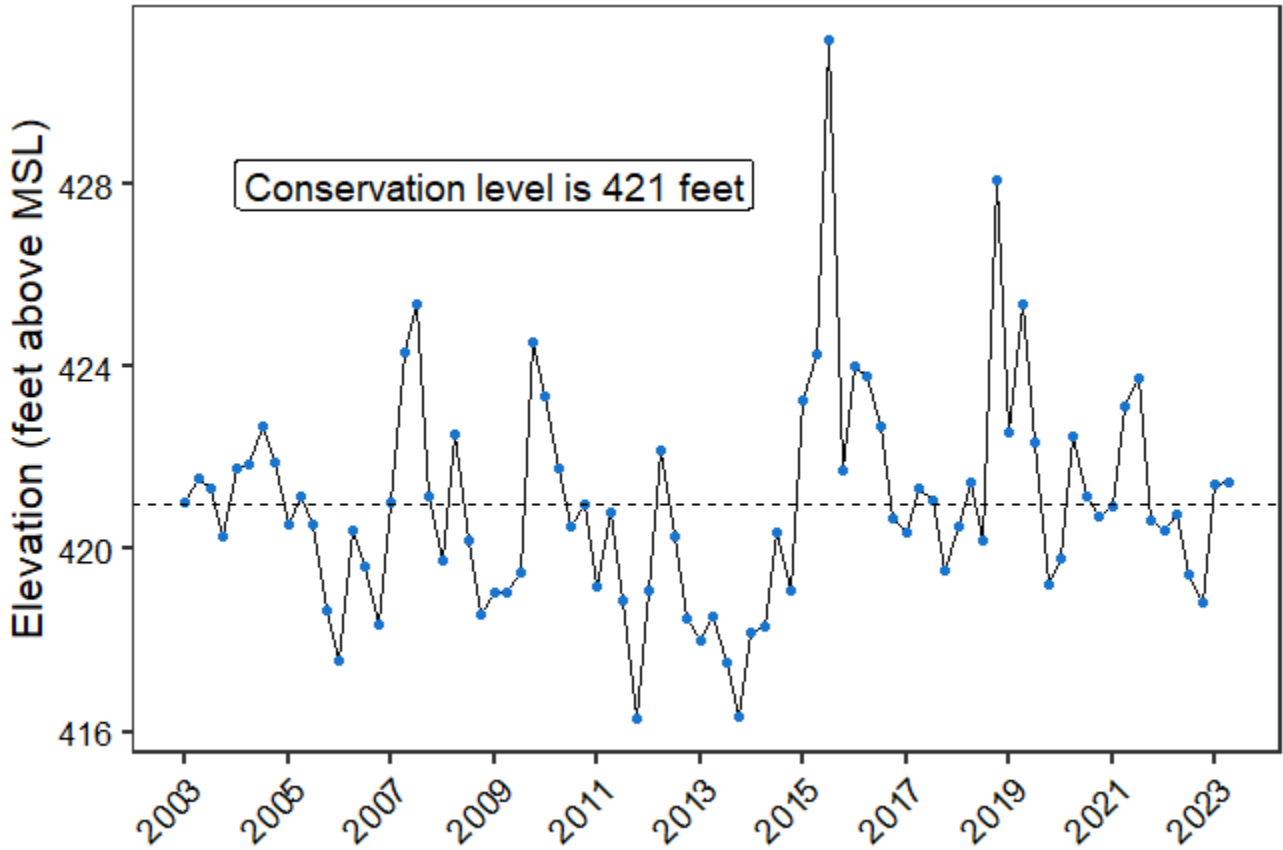


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Bardwell, Texas (2003–2023). Dashed line indicates conservation level.

Table 1. Characteristics of Lake Bardwell, Texas.

Characteristic	Description
Year constructed	1965
Controlling authority	U.S. Army Corps of Engineers
County	Ellis
Reservoir type	Tributary
Shoreline Development Index (SDI)	2.9
Conductivity	330 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Lake Bardwell, Texas, August 2022. Reservoir elevation at time of survey was 420.5 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Mustang	32.299838 -96.670085	Y	20	416.5	Excellent, no access issues
Love Park	32.265512 -96.641254	Y	20	414.5	Excellent, no access issues
Waxahachie Creek	32.290374 -96.678326	Y	40	417.0	Excellent, no access issues
Mott Park	32.256965 -96.659408	Y	20	414.5	Excellent, no access issues
Highview Park	32.264207 -96.658731	Y	20	413.5	Excellent, no access issues
Highview Marina	32.264016 -96.660451	N	20	413.5	Excellent, no access issues

Table 3. Harvest regulations for Lake Bardwell, Texas.

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

Species	Year	Number	Size
Blue Catfish	1966	7,000	FGL
	2015	158,274	FGL
	2016	157,983	FGL
	2021	151,997	FGL
	2022	<u>116,026</u>	FGL
	Total	591,280	
Channel Catfish	1966	22,000	FGL
	1972	<u>2,000</u>	FGL
	Total	24,000	
Striped Bass	1967	300,000	FRY
	1968	15,150	FGL
	1969	20,470	FGL
	1970	23,400	FGL
	1981	35,023	UNK
	1983	35,950	UNK
	1994	<u>71,552</u>	FGL
	Total	501,545	
Hybrid Striped Bass	1975	20,000	UNK
	1995	61,700	FGL
	1996	53,600	FGL
	1997	53,692	FGL
	1998	54,373	FGL
	2002	35,909	FGL
	2003	47,000	FGL
	2004	47,338	FGL
	2005	47,610	FGL
	2007	32,098	FGL
	2010	1,930,469	FRY
	2011	34,211	FGL
	2013	49,109	FGL
	2014	22,303	FGL
	2015	32,862	FGL
	2016	47,393	FGL
	2017	11,199	FGL
	2020	150,000	FRY
	2021	47,244	FGL
	2022	50,281	FGL
2023	<u>48,062</u>	FGL	
Total	2,876,453		
Florida Largemouth Bass	1992	178,811	FGL
	1998	<u>178,500</u>	FRY
	Total	357,311	
Largemouth Bass	1966	670,000	FRY
Green × Redear Sunfish	1966	3,400	UNK
	1972	<u>1,000</u>	UNK
	Total	4,400	

Table 5. Objective-based sampling plan components for Lake Bardwell, Texas 2019–2023.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Daytime electrofishing</i>			
Largemouth Bass	Presence-absence	CPUE-Total	No set objective
	Size structure	PSD, length frequency	
	Condition	$W_r$	
Bluegill	Abundance	CPUE-Total	No objective set
	Size structure	PSD, length frequency	
Gizzard Shad	Abundance	CPUE-Total	No objective set
	Prey availability	IOV	
<i>Trap netting</i>			
Crappie	Abundance	CPUE-Stock	RSE-Stock $\leq 25$
	Size structure	PSD, length frequency	$N \geq 50$
	Age-and-growth	Age at 10 inches	$N = 13, 9.0 - 10.9$ inches
<i>Gill netting</i>			
Blue Catfish	Abundance	CPUE-Stock	No set objective
	Size structure	PSD, length frequency	
Channel Catfish	Abundance	CPUE-Total	No set objective
	Size structure	PSD, length frequency	
Temperate Bass	Presence-absence	CPUE-Total	No set objective

Table 6. Survey of aquatic vegetation, Lake Bardwell, Texas, 2014, 2018, and 2022. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2014	2018	2022
Native submersed			
Pondweed	Trace		
Native emergent			
American lotus	Trace		
Bull tongue	Trace		
Cattail	Trace		
Smartweed	Trace	1.4 (<0.1)	
Rattle box		59.4 (1.9)	
Black willow		8.4 (0.3)	
Buttonbush			Trace

## Gizzard Shad

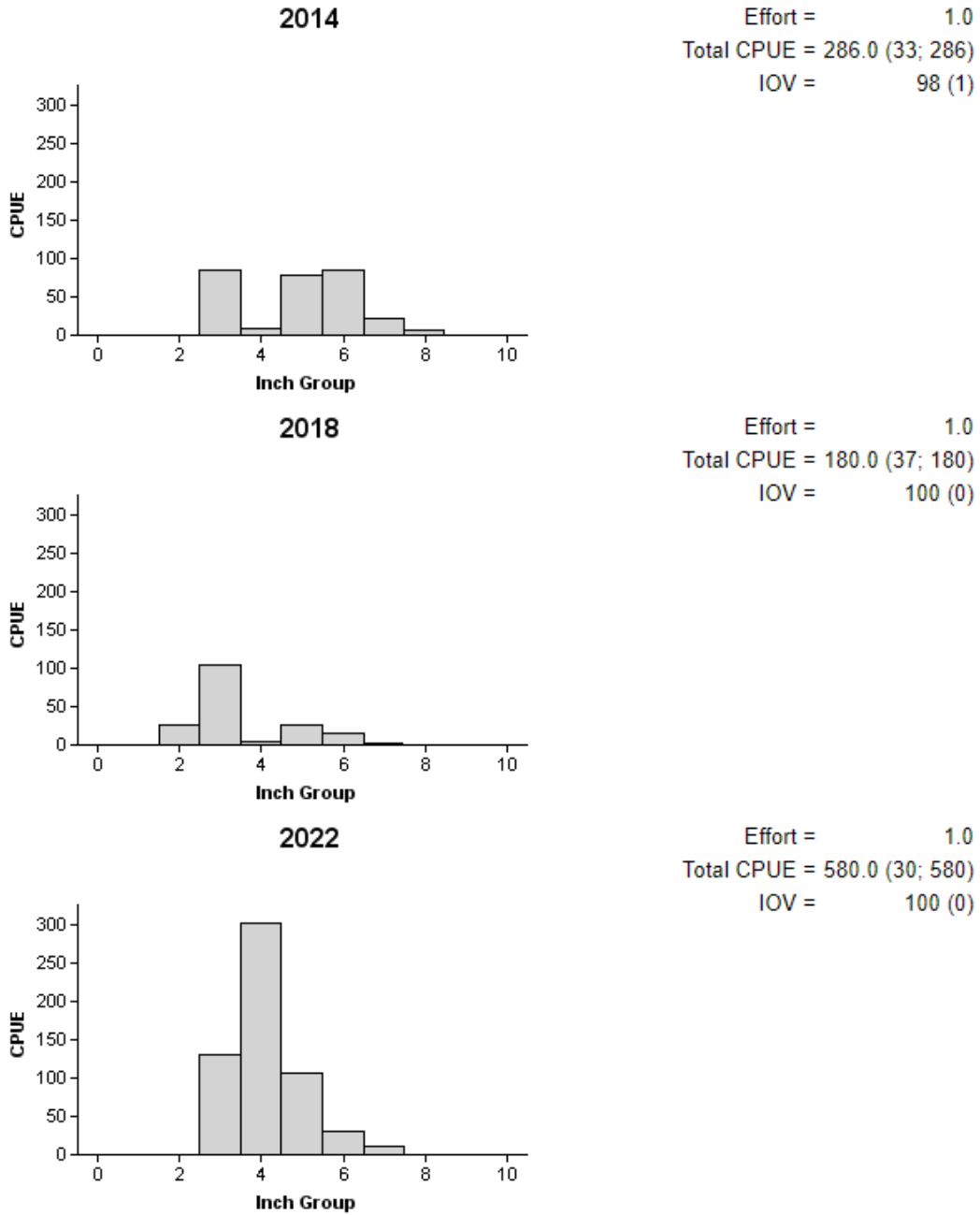


Figure 2. Number of Gizzard Shad caught per hour (CPUE, bars), mean relative weight (diamonds), and index of vulnerability (IOV; RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Bardwell, Texas, 2014, 2018, and 2022.



## Bluegill

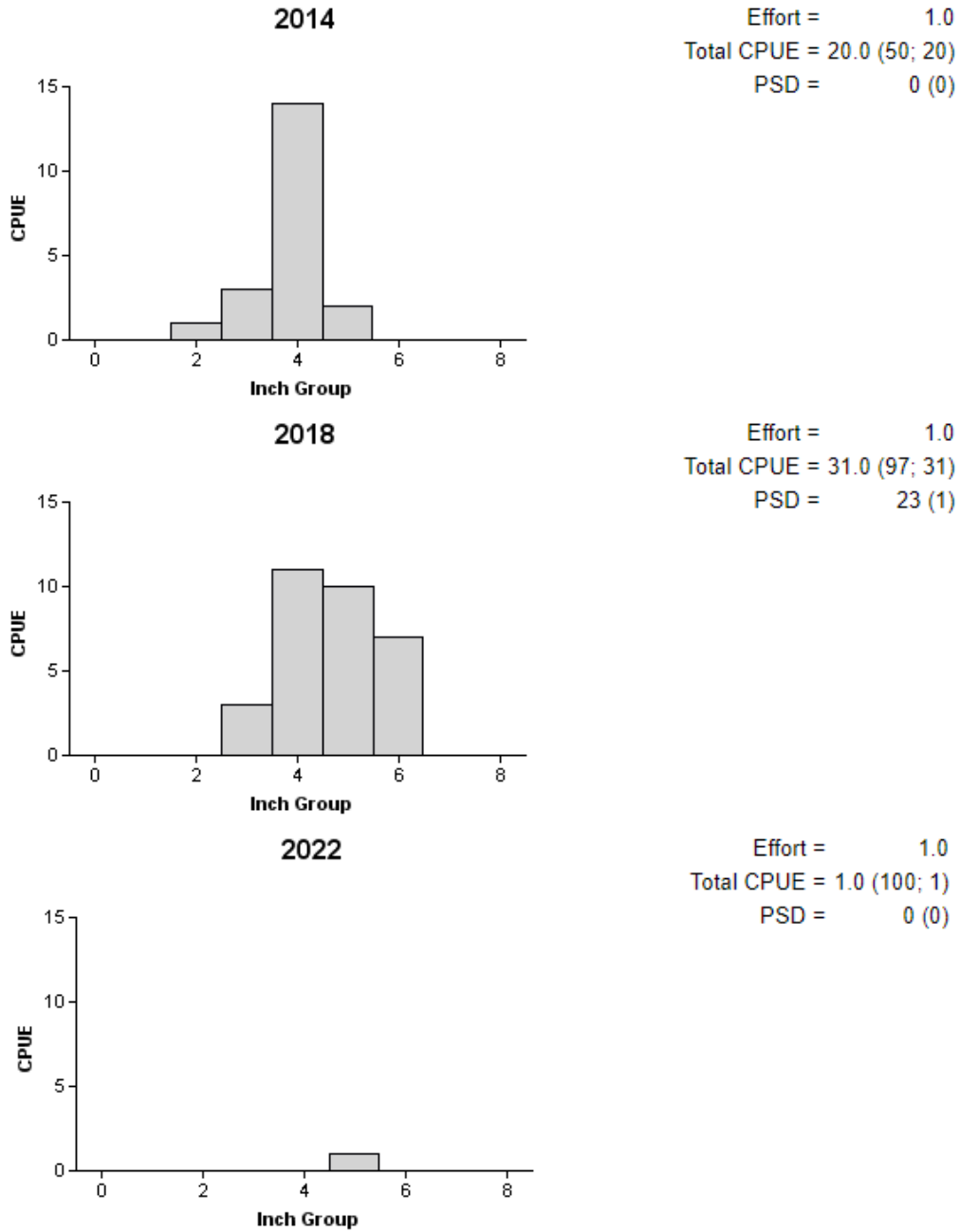


Figure 3. Number of Bluegill caught per hour (CPUE, bars) and PSD (RSE and N for CPUE and SE for PSD are in parentheses) for fall electrofishing surveys, Lake Bardwell, Texas, 2014, 2018, and 2022.

## Blue Catfish

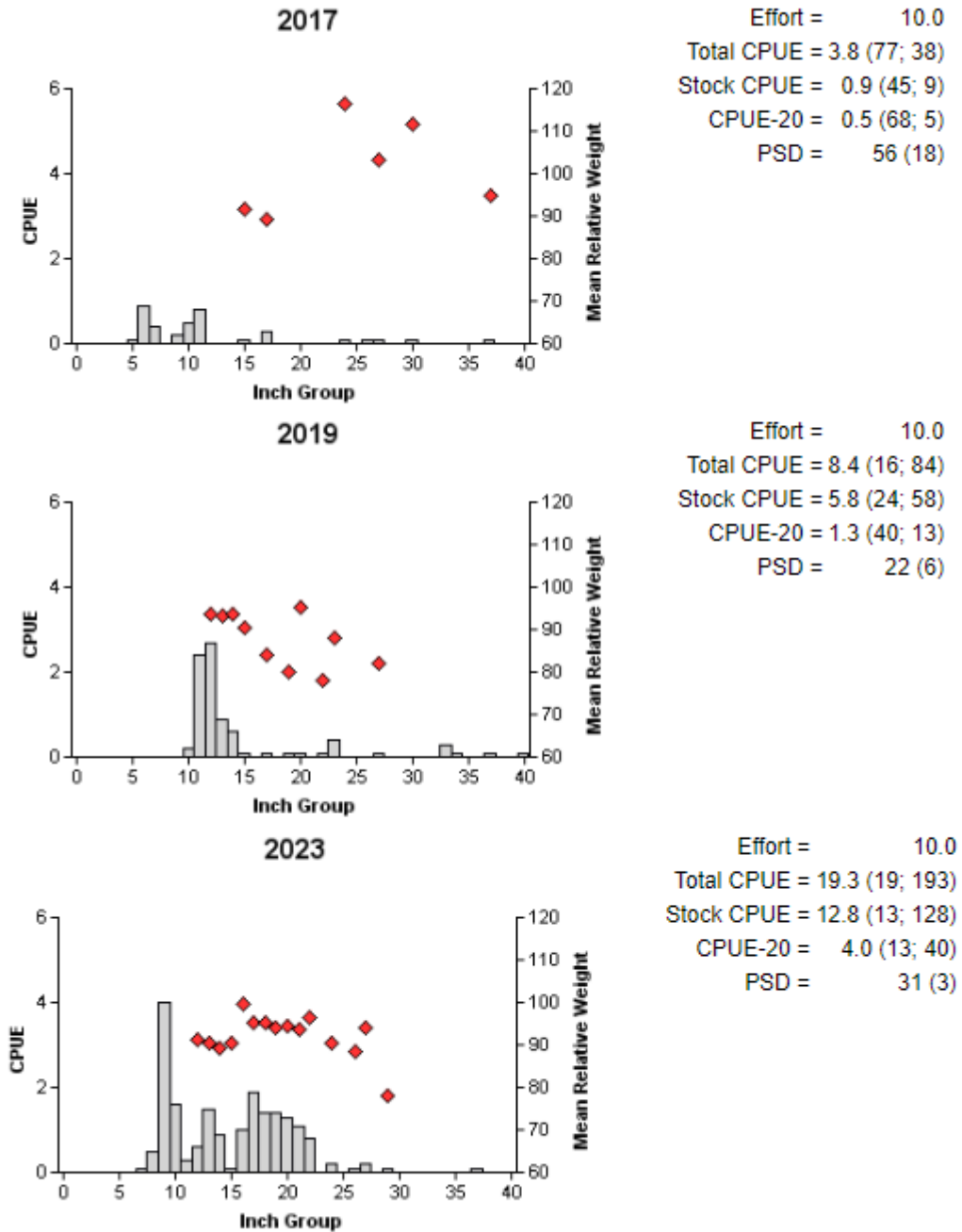


Figure 4. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and PSD (RSE and N for CPUE and SE for PSD are in parentheses) for spring gill net surveys, Lake Bardwell, Texas, 2017, 2019, and 2023. CPUE-20 represents the catch rates of quality sized Channel Catfish (20 inches or greater).

## Channel Catfish

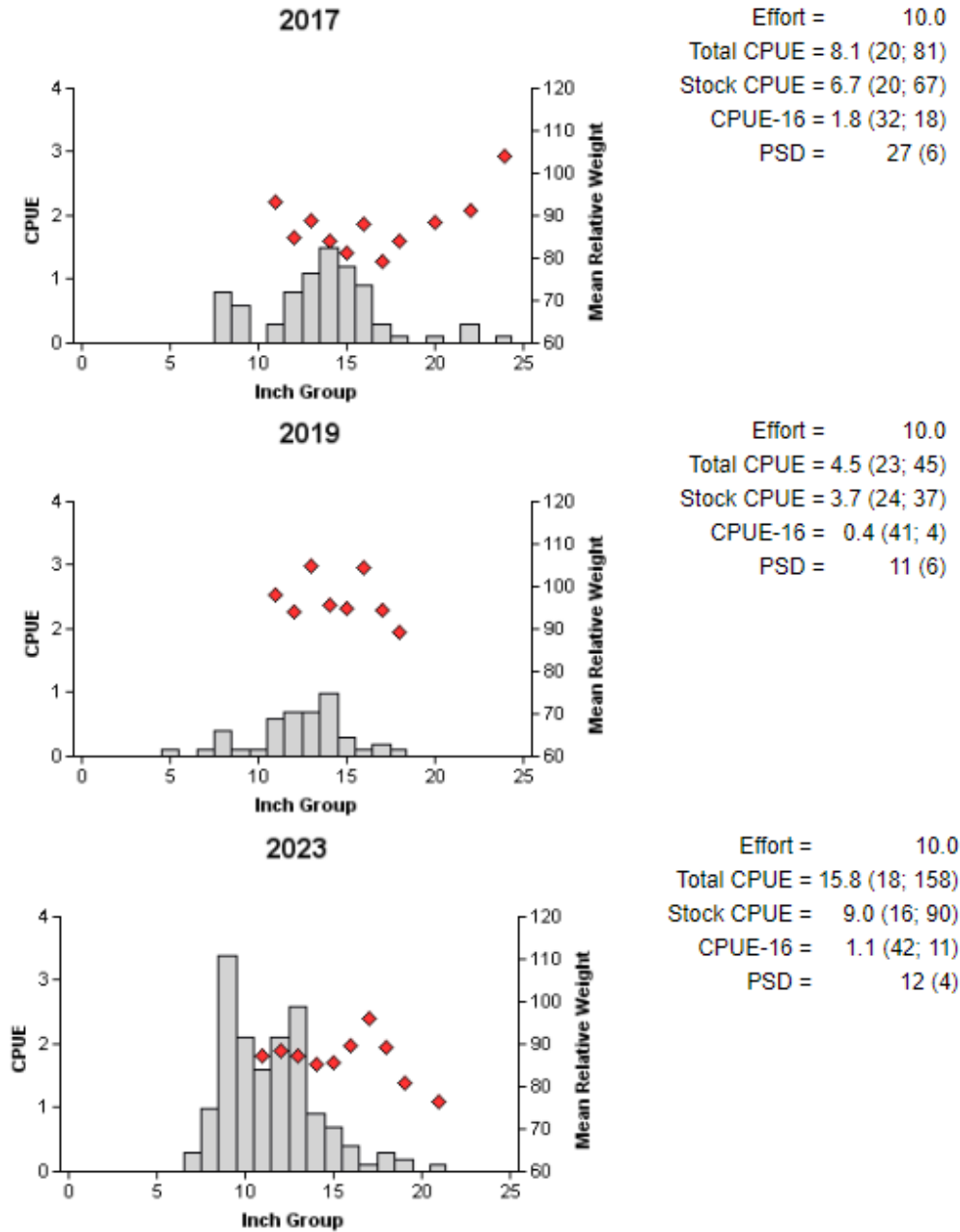


Figure 5. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and PSD (RSE and N for CPUE and SE for PSD are in parentheses) for spring gill net surveys, Lake Bardwell, Texas, 2017, 2019, and 2023. CPUE-16 represents the catch rates of quality sized Channel Catfish (16 inches or greater).

## White Bass

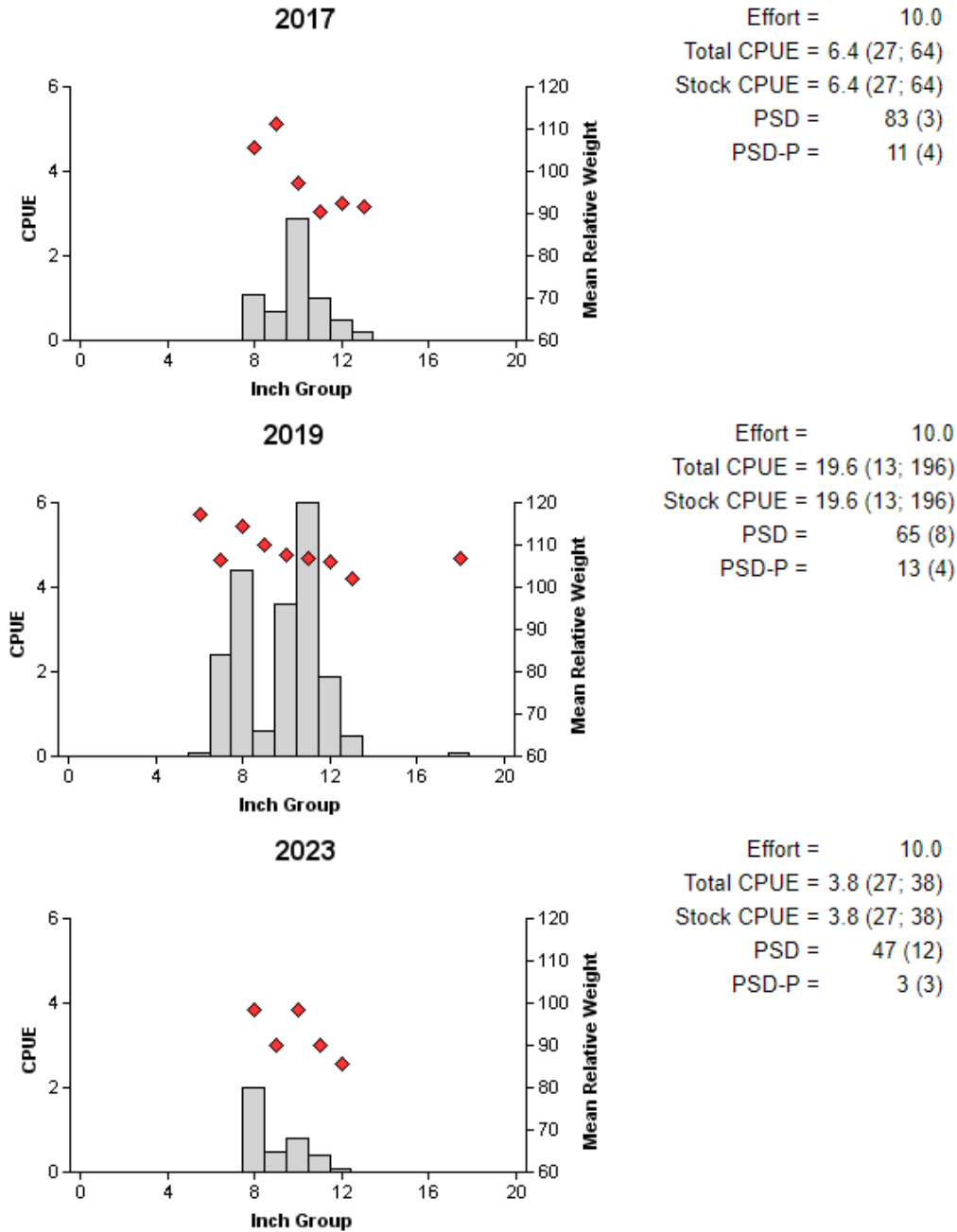


Figure 6. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Bardwell, Texas, 2017, 2019, and 2023.

### Hybrid Striped Bass

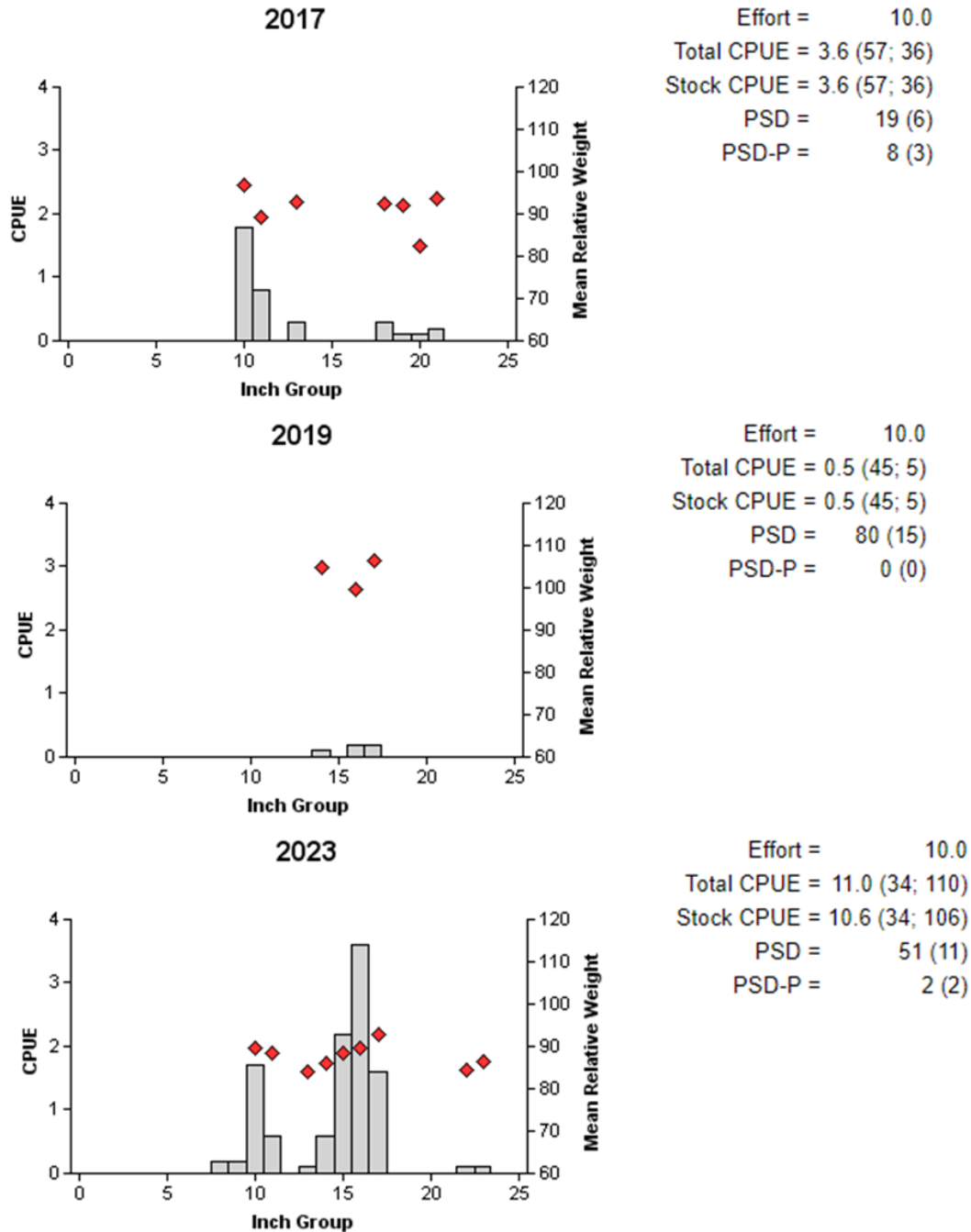


Figure 7. Number of Hybrid Striped Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Bardwell, Texas, 2017, 2019, and 2023.

## Largemouth Bass

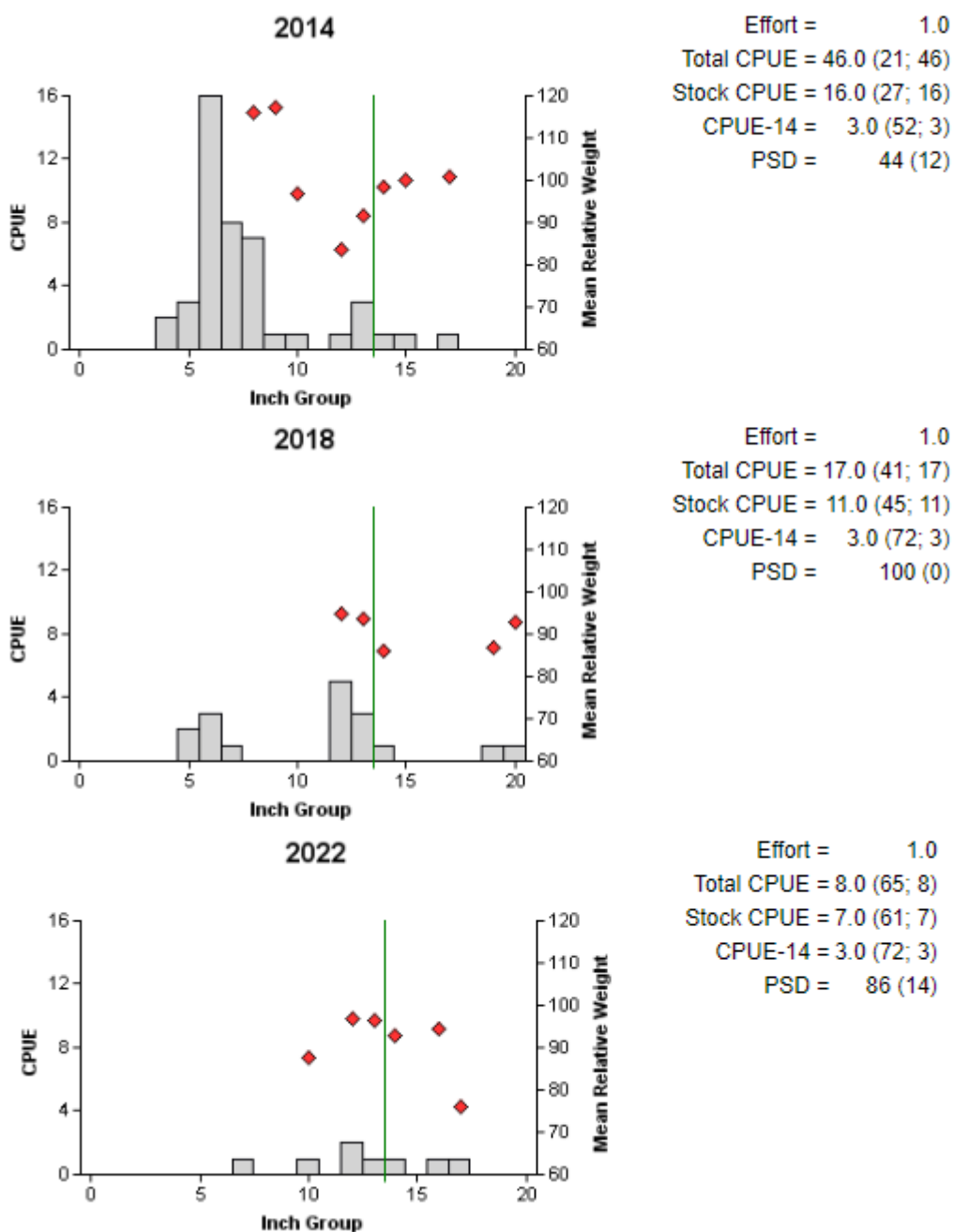


Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Bardwell, Texas, 2014, 2018, and 2022.

## White Crappie

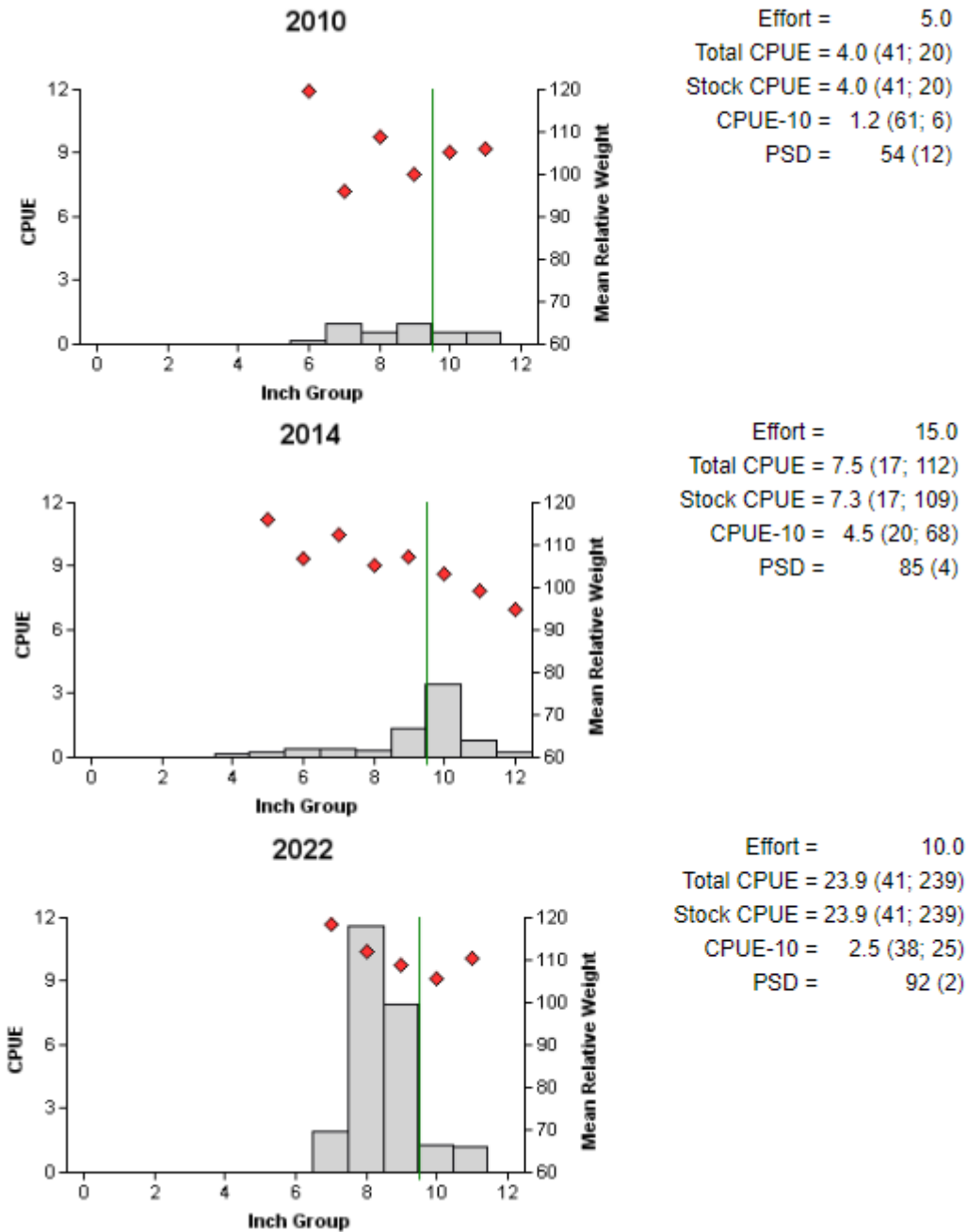


Figure 9. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Lake Bardwell, Texas, 2010, 2014, and 2022. Vertical line indicates minimum length limit.

## Proposed Sampling Schedule

Table 7. Proposed sampling schedule for Lake Bardwell, 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			
	2023-2024	2024-2025	2025-2026	2026-2027
Vegetation				X
Structural Habitat				X
Creel – Summer				X
Trap netting				X
Gill netting				X
Report				X

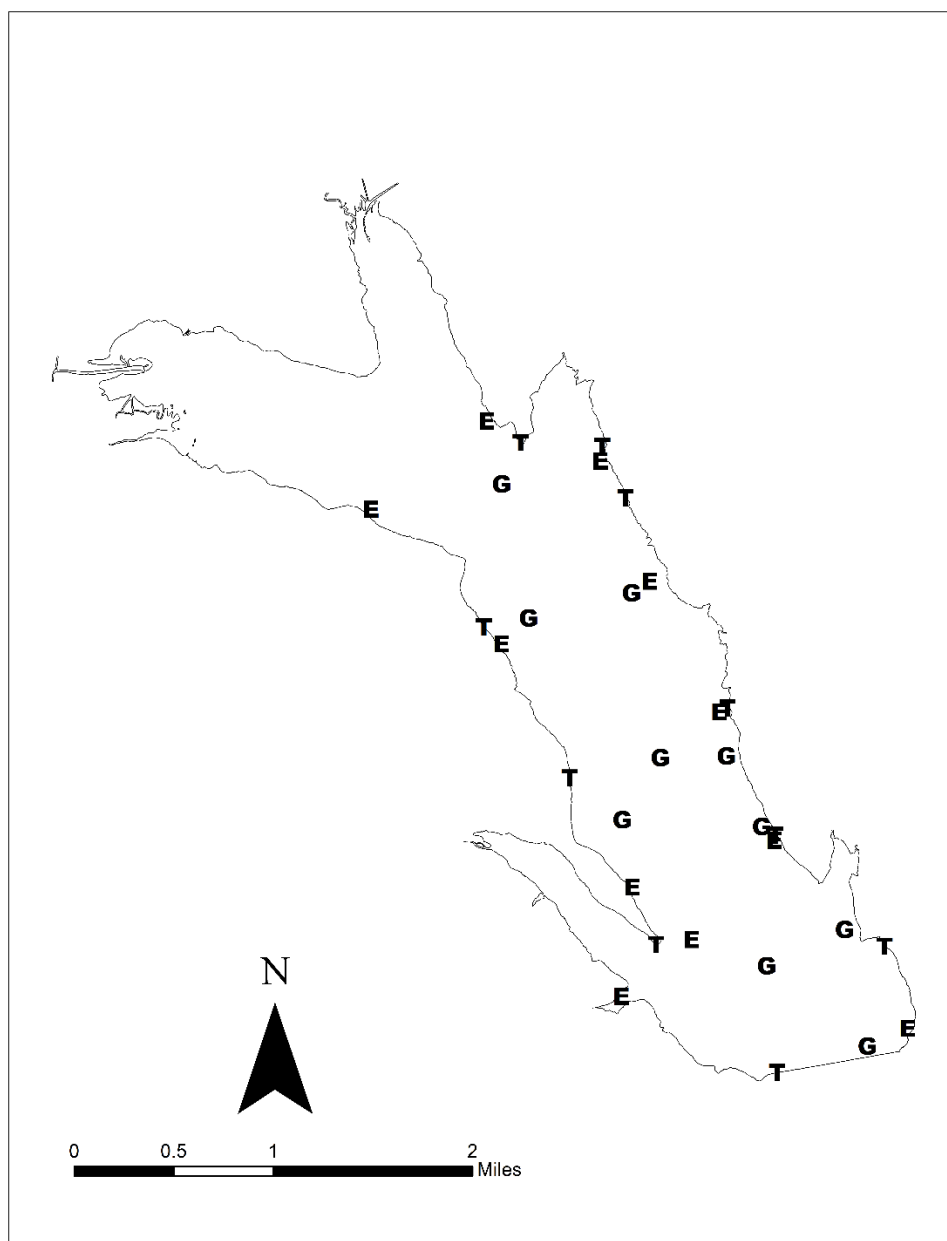


## APPENDIX A – Catch rates for all species from all gear types

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Lake Bardwell, Texas, 2022-2023. 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					580	580.0 (30)
Threadfin Shad					4,096	4,096.0 (33)
Blue Catfish	193	19.3 (19)				
Channel Catfish	158	15.8 (18)				
Flathead Catfish	1	0.1 (100)				
White Bass	38	3.8 (27)				
Hybrid Striped Bass	110	11.0 (34)				
Green Sunfish					1	1.0 (100)
Bluegill					1	1.0 (100)
Largemouth Bass					8	8.0 (65)
White Crappie			239	23.9 (41)		
Black Crappie			12	1.2 (74)		

## APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Bardwell, Texas, 2022-2023. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was near full pool at time of sampling.



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