Cooper 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 Cooper Reservoir were surveyed using electrofishing and trap netting in 2023, and gill netting in 2022 and 2024. Historical data are presented with the 2022-2024 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: Cooper Reservoir is located in Delta and Hopkins Counties, Texas, on the Middle and South Forks of the Sulphur River. It was constructed by the U.S. Army Corps of Engineers for water supply and flood control. Water levels have fluctuated from 4 feet low to 1 foot high since 2020. Habitat features consisted of standing timber, rocks, native submerged vegetation, flooded terrestrial plants, and hydrilla.

Management History: Important sport fishes at Cooper Reservoir include Hybrid Striped Bass, White Bass, Blue Catfish, Channel Catfish, Largemouth Bass, and White Crappie. Annual requests are made to stock Hybrid Striped Bass at a rate of 10/acre.

Fish Community

- **Prey species:** Gizzard Shad, Threadfin Shad, and sunfish were observed during electrofishing surveys in the reservoir. No assessments were made of prey fish populations, but body conditions of game fish in Cooper Reservoir indicate adequate availability of prey species.
- **Catfishes:** Blue and Channel Catfish were present in the 2022 and 2024 gillnet surveys. Blue Catfish remain abundant while Channel Catfish catch rates continue to indicate a low-density population.
- **Temperate basses:** White Bass and hybrid striped bass were present in Cooper reservoir. Gillnet catch rates were variable in 2022 and 2024 but body conditions were good, indicating sufficient prey availability. Hybrid Striped Bass stocking requests are made annually at 10/acre.
- **Largemouth Bass:** Largemouth Bass catch rates increased, with a large young-of-the-year age class observed during the electrofishing survey in 2023. Improved littoral habitat and relatively stable water levels have likely contributed to increased recruitment of a rebounding population. Body conditions were good, indicating sufficient prey availability.
- **Crappie:** White and Black Crappie were present in the reservoir, but White Crappie make up the bulk of the population. Trap net catch rates declined in 2023 with no legal-size fish observed.

Management Strategies: Continue stocking hybrid striped bass at 10 fish/acre. Stock Lone Star Bass fingerlings at 1,000/km of shoreline when available and littoral habitat is deemed sufficient. Inform the public about the negative impacts of aquatic invasive species and work with the controlling authority as needed to provide technical guidance with aquatic nuisance species. Conduct electrofishing and trap net surveys in fall 2027, and a gillnet survey in spring 2028.

Introduction

This document is a summary of fisheries data collected from Cooper 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 2020-2024 data for comparison.

Reservoir Description

Cooper reservoir is an impoundment of the Sulphur River in Delta and Hopkins counties, Texas. The reservoir was constructed by the U.S. Army Corps of Engineers in 1991 for water supply, recreation, and flood control. The reservoir is eutrophic with a Chl-α TSI of 58.02 (Texas Commission on Environment Quality 2022). At conservation pool (440.0 feet msl), Cooper Reservoir is 19,280 surface acres, has a shoreline length of 125 miles, and a mean depth of 15 feet. Since 2015, the water level has consistently fluctuated around 5 feet. (Figure 1.). Other descriptive characteristics of Cooper Reservoir are presented in Table 1.

Angler Access

Cooper Reservoir has five public boat ramps and no private boat ramps. There are two units to Cooper Lake State Park, the South Sulphur Unit and Doctor's Creek Unit, each with public ramps and shoreline access areas and fishing piers available to customers paying the entry fee. Although public ramps at Tira and John's Creek are not located physically within the state park boundaries, they are administered by Cooper Lake State Park and subject to launch fees. There is limited shoreline access available at these boat ramps. During periods of extreme drought, boat ramps have been inaccessible because of low lake elevation. Additional boat ramp characteristics are in Table 2.

Management History

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

1. Maintain hybrid striped bass fishery.

   Action: Action: Annual requests for stocking of hybrid striped bass fingerlings at a rate of 10/acre were submitted; stockings occurred in 2021 (194,868), 2022 (402,106), 2023 (152,559) and 2024 (192,871). Gill netting surveys were conducted in 2022 and 2024 to monitor the hybrid striped bass population.

2. Monitor aquatic vegetation in Cooper Reservoir for suitable Largemouth Bass populations.

   Action: An aquatic vegetation survey was conducted in 2023 to assess the vegetation coverage.

3. Cooperate with the controlling authority to manage and prevent the spread of invasive vegetation species.

   Action: An aquatic vegetation survey was conducted in 2023 to monitor the coverage and distribution of Hydrilla and Alligatorweed. While growth of both invasive species has occurred, coverage of both species had not reached nuisance levels that required action.

Harvest regulation history Sport fishes in Cooper Reservoir are currently managed with TPWD statewide regulations. Prior to 2018, Largemouth Bass were managed with an 18-inch minimum length, five fish daily bag limit. Current regulations are found in Table 3.

Stocking history: Cooper Reservoir has received annual stockings of hybrid striped bass since 1996 except for 2000, 2001, 2010, 2012, 2019, and 2020. Florida Largemouth Bass were stocked in 2009,

2010, 2019 and most recently in 2021. Blue Catfish were stocked in 1991 and 1992. The complete stocking history is listed in Table 4.

Vegetation/habitat management history: Native vegetation has fluctuated in the past due to fluctuations in water levels. Hydrilla and Alligatorweed have been present in Cooper Reservoir for many years but have never reached nuisance levels.

Water transfer: Cooper Reservoir provides water supply storage for the North Texas Municipal Water District, the Sulphur River Municipal Water District, and the city of Irving. This water supply storage exists in the conservation pool between elevations 415.5 ft msl and 440.0 ft msl. The water intake structure is located on the south shore of the lake, which provides anywhere from 2.0 million gallons per day of water in the winter months to 5.0 million gallons per day in the summer months. No interbasin transfers are known exist.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Cooper Reservoir (Stadig and Norman 2020). Primary components of the OBS plan are listed in Table 5. Gill net and trap net survey sites were randomly selected, while electrofishing sites were biologist-selected. 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 only electrofishing was conducted using 12 daytime biologist selected stations (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. Weights were collected from stock size fish to infer prey availability. Electrofishing in 2023 was conducted with a GPP 5.0 electrofisher control box.

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, 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 Neumann et al. (2012). Hybrid striped bass PSD was calculated according to Dumont and Neely (2011). TPWD has stocked both hybrid striped bass crosses (palmetto bass and sunshine bass) in the past. Even though PSD length categories and standard weight equation were developed based on palmetto bass populations, they are applied to sunshine bass under the assumption that there is little difference in the growth of the two hybrids. 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 vegetation survey was conducted in 2023 to monitor native vegetation and the expansion of hydrilla. 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: The water level in Cooper Reservoir has remained within 4 feet (above or below) of conservation pool since 2020 allowing Buttonbush and American Lotus to occupy 2240 acres combined, or 11.6% of lake coverage in 2023 (Table 6). Hydrilla and Alligatorweed are still present in the reservoir (55.0 acres each) and serve a more beneficial role than nuisance at these rates of coverage. Submersed vegetation observed included stargrass and pondweed. Total native vegetation coverage increased after the drought conditions in 2015 but declined between the 2019 and 2023 vegetation surveys.

Prey species: Threadfin shad, Gizzard shad, and sunfish were observed during the 2023 bass-only electrofishing survey. Relative weights for Largemouth bass, catfishes, and temperate bass indicate a sufficient prey base.

Catfishes: Blue Catfish were abundant with gill net catch rates of 50.3/nn in 2022, and 31.9/nn in 2024 (Figure 2). These catch rates were higher than the previous catch rate of 7.4/nn in 2016. Size distribution in 2024 was primarily smaller individuals (PSD = 18), which is comparable to the 2016 (PSD = 33) and 2022 (PSD = 35) surveys. High catch rates and good relative weights (W_r range = 91 – 113) for stock-size Blue Catfish in 2024 indicate a quality fishery. Blue Catfish harvest only made up about 25% of the total number of catfish harvested (Stadig and Norman 2020).

The gill net catch rates of Channel Catfish were 2.7/nn in 2022 and 1.8/nn in 2024, which remained similar to the 2016 survey (CPUE = 2.1/nn; Figure 3). Size structure also continued to be dominated by smaller individuals with PSD values of 11 and 0 in 2022 and 2024 respectively. Data collected over the previous three surveys continues to indicate a low-density Channel Catfish population.

Temperate Bass: The gill net catch rate of White Bass was 9.4/nn in 2022 and decreased to 3.5/nn in 2024, reflecting a similar catch rate to the 2016 survey (CPUE = 4.4/nn; Figure 4). Relative weights ranged from 82-119 over the last two surveys, indicating a sufficient prey base. No data on age and growth was obtained in 2024 due to inadequate sample size.

The gill net catch rate of hybrid striped bass was 0.5/nn in 2022 and 0.8/nn in 2024 (Figure 5). Despite low gill net catch rates of hybrid striped bass, they accounted for 30.7% of directed effort (52.2% effort with White Bass included) in the last creel survey (Stadig and Norman 2020). Low and variable temperate bass catch rates are likely influenced by spring spawn movements, when gill netting is typically conducted.

Largemouth Bass: The electrofishing catch rate of Largemouth Bass dramatically increased from 8.5/h in 2011 to 123.0/h in 2023 (Figure 6). A standard nighttime survey was conducted in 2019 following recent stockings of Largemouth Bass, but results were poor (Stadig and Norman 2020). Size structure from the 2023 survey indicated a rebounding population (PSD = 20) with a strong year-class observed in 2023. This is likely the result of an increase in inundated terrestrial habitat and submersed vegetation, providing refuge for juvenile Largemouth Bass. Body condition in 2023 was good (relative weights above 90) for all stock-size fish.

Crappie: Black Crappie were present in the reservoir, however White Crappie continued to make up the bulk of the population. The trap net catch rate of White Crappie declined considerably from 12.5/nn in 2019 to 0.6/nn in 2023 (Figure 8). Despite a low sample size in 2023, the crappie caught were healthy with good body condition (relative weights above 95). Although the sampling plan specified an additional 10 net nights to meet the goal of 50 stock-size fish, it was decided that the sampling goal would not be attained through additional sampling. An age and growth assessment was not completed due to insufficient sample size.

Fisheries Management Plan for Cooper Reservoir, Texas

Prepared – July 2024

ISSUE 1: Hybrid striped bass have been a part of the fishery at Cooper Reservoir since 1996. Annual stocking of hybrid striped bass is required to sustain the population and maintain a fishery. Fry can be substituted at the appropriate rate if fingerlings are not produced or available.

MANAGEMENT STRATEGY

1. Stock hybrid striped bass fingerlings annually at 10 fish/acre or equivalent fry rates.
2. Continue to conduct spring gill net surveys every four years to monitor the hybrid striped bass population.

ISSUE 2: Several years of drought resulted in very poor littoral habitat, and likely very poor year classes of Largemouth Bass. The rebounding lake levels over the last two survey cycles resulted in expansive flats of inundated terrestrial vegetation and submersed species that provided excellent habitat for juvenile fish. With increased electrofishing catch rates and a large age class observed in 2023, the Largemouth Bass population could improve over the next several years.

MANAGEMENT STRATEGIES

1. Continue to monitor aquatic vegetation in Cooper Reservoir for suitable Largemouth Bass populations.
2. Request Lone Star Bass fingerling stockings, which are 2nd generation offspring of pure Florida strain ShareLunker Largemouth Bass that have proven to be able to grow to ≥ 13 pounds, at a rate of 1,000/km shoreline when available and when aquatic vegetation is suitable.
3. Sampling objectives outlined in the OBS plan will focus on monitoring Largemouth Bass size structure to help justify stockings.

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. Continue biannual Zebra mussel sampling on Cooper Reservoir.
2. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.

3. Contact and educate state park staff about invasive species, and provide them with posters, literature, etc… so that they can in turn educate their patrons.
4. Educate the public about invasive species through the use of media and the internet.
5. Make a speaking point about invasive species when presenting to constituent and user groups.
6. 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 Cooper Reservoir include Hybrid Striped Bass, White Bass, Blue Catfish, Channel Catfish, Black Crappie, White Crappie, and Largemouth Bass. Important forage species have historically included Threadfin Shad, Gizzard Shad, and sunfishes.

Survey objectives, fisheries metrics, and sampling objectives

Catfishes: Historical survey results indicate gill net surveys are effective at monitoring Blue and Channel Catfish trend data (CPUE, PSD, W_r) on Cooper Reservoir. Gill net surveys will be conducted every four years to continue monitoring both species for large-scale changes in the population that may spur further investigation. In the spring of 2028, a minimum of 10 randomly selected gill net sites will be sampled, with up to 10 additional sites, if necessary, to estimate relative abundance with an RSE-Stock ≤ 25 along with relative weights and size structure of at least 50 stock-size fish, for Blue Catfish. Due to historically low catch rates of stock-sized Channel Catfish, no objectives will be set for this fishery. No additional effort will be conducted if survey objectives are not met after 20 total net nights. Lower precision (RSE ≤ 35) of CPUE estimates will be acceptable, if necessary, to make historical comparisons.

Temperate Bass: White Bass and Hybrid Striped Bass population data will be collected every four years during spring gill net surveys. To monitor the fishery, trend data on relative abundance, body condition, size structure, and growth are desired (measured by CPUE, PSD, W_r, and age at minimum length limit [10 inches and 18 inches for White Bass and Hybrid Striped Bass, respectively]). Temperate bass will be collected in gill net sets for catfish, and no additional effort will be expended beyond that directed at catfish.

Largemouth Bass: Cooper Reservoir produced four ShareLunker entries between 1998 and 2000; the likely remnants of adult Florida Largemouth Bass stocked immediately following impoundment. Despite these early successes, the Largemouth Bass population has historically been very difficult to sample and electrofishing CPUEs have generally been low. Largemouth Bass also have the second lowest directed fishing pressure within Cooper Reservoir with only 2% of total angling effort. However, rebounding vegetation cover and recent stocking efforts produced a strong age class observed in 2023. Standard night-time surveys have historically produced poor catch rates, suggesting alternative sampling approaches may be needed to adequately monitor the population. An exploratory daytime biologist-selected electrofishing survey in 2023 showed increased catch rates, justifying a continuation of monitoring the population for trends in relative abundance with an RSE-Stock ≤ 25, along with relative weights and size structure of at least 50 stock-size fish. A minimum effort of 18 randomly selected nighttime electrofishing stations will be conducted, and an additional six random stations generated in the event additional sampling is required to meet OBS plan objectives for Largemouth Bass in fall 2027.

Crappies: Both White and Black Crappie are present in Cooper Reservoir; however, Black Crappie are low in abundance. Crappie also had the lowest directed angling effort of all fish populations in Cooper Reservoir at 1% during the previous creel survey, but it is worthy to note the creel survey period was conducted only during the summer season to target the Temperate Bass fishery. Although sampling for

crappies has produced variable results, historical data indicates Cooper Reservoir has the ability to sustain a White Crappie fishery. In the fall of 2027 a minimum of 10, randomly selected single-cod shoreline trap net sites will be sampled, and up to 10 additional nets will be set, if needed, to collect at least 50 stock-size individuals. Thirteen fish (9.0 – 10.9 inches) will be subsampled to determine average age at legal length.

Prey Species: Gizzard Shad, Threadfin Shad, and sunfish are important prey species on Cooper Reservoir. Historically, traditional electrofishing surveys have produced variable catch rates for these prey species. Relative abundance (CPUE) and size structure (PSD) for shad and sunfish will be measured during electrofishing sampling conducted in fall 2027 for Largemouth Bass. Relative weights (W_r) of Largemouth Bass, Catfish, and Temperate Bass, along with IOV for Gizzard Shad, will be used to gauge prey base availability. No sampling objectives will be set for prey species.

Habitat: A comprehensive assessment of aquatic vegetation species will be conducted every four years using the digital shapefile method to quantify total vegetative coverage. The next assessment is scheduled for summer 2027.

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Tables and Figures

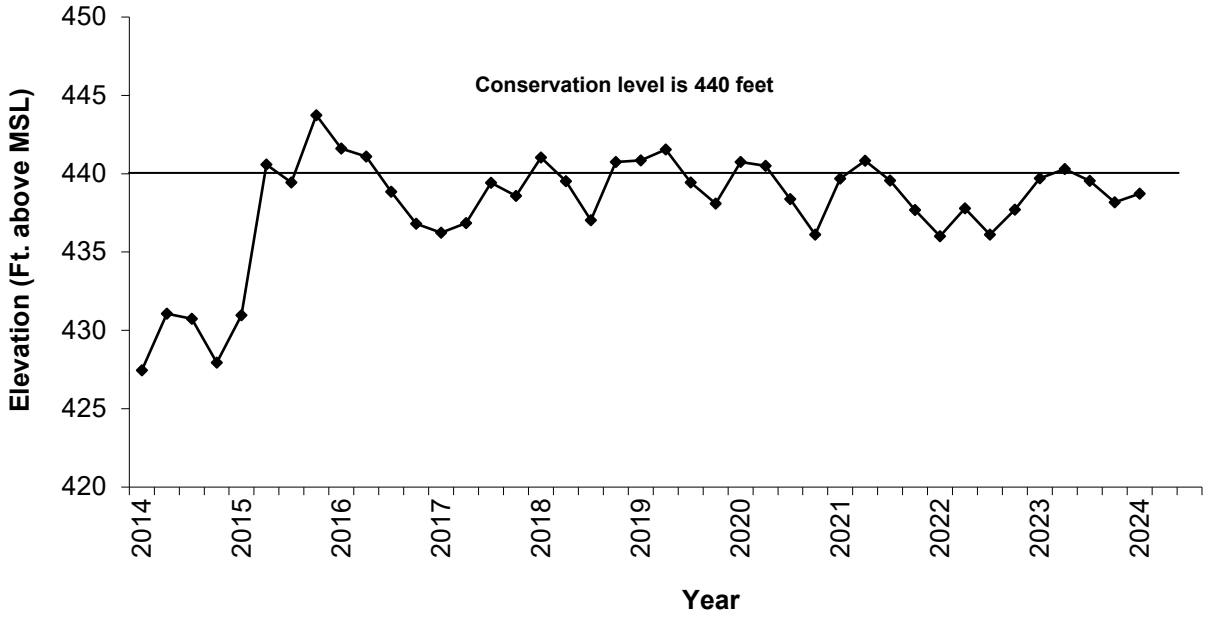


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Cooper Reservoir, Texas, from the United States Geological Survey (USGS). The solid horizontal line represents the conservation pool elevation at 440.0 ft msl.

Table 1. Characteristics of Cooper Reservoir, Texas.

Characteristic	Description
Year constructed	1991
Controlling authority	U.S. Army Corps of Engineers
County	Delta and Hopkins
Reservoir type	Mainstem
Shoreline Development Index	6.42
Conductivity	150 µS/cm

Table 2. Boat ramp characteristics for Cooper Reservoir, Texas, August 2023. Reservoir elevation at time of survey was 439.99 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Tira	33.31181 -95.61077	Y	93	431	Excellent, no access issues
Doctor's Creek	33.34318 -95.66298	Y	87	428	Excellent, no access issues
John's Creek	33.32413 -95.73598	Y	32	432	Excellent, no access issues
Honey Creek	33.29000 -95.67619	Y	43	430	Excellent, no access issues
Gull's Creek	33.29421 -95.65205	Y	111	430	Excellent, no access issues

Table 3. Harvest regulations for Cooper Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (only 10 ≥ 20 inches)	None
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, hybrid striped	5	18-inch minimum
Bass, Largemouth	5	14-inch minimum
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Cooper Reservoir, Texas. FRY = fry, FGL = fingerling, ADL = adults, UNK = unknown

Species	Year	Number	Size
Blue Catfish	1991	3,500	FGL
	1992	482,075	FGL
	Total	485,575	
Channel Catfish	1991	12,500	FGL
	Total	12,500	
Bluegill	1991	41,600	FRY
	Total	41,600	
Largemouth Bass	1991	151	ADL
	1991	5,142	FGL
	1992	192	ADL
	1992	1,929,012	FGL
	1993	30	ADL
	1993	481,745	FGL
	1993	200,084	FRY
	1997	482,879	FGL
	1998	482,084	FGL
	1999	484,695	FGL
	2000	9,132	FGL
	2002	489,878	FGL
	2002	477,289	FGL
	2009	475,672	FGL
	2010	365,041	FGL
	2019	208,899	FGL
	2021	197	ADL
	Total	6,092,122	
Palmetto Bass (white bass x striped bass hybrid)	1996	146,573	FGL
	1998	193,665	FGL
	1999	97,749	FGL
	2002	94,410	FGL
	2003	95,100	FGL
	2004	167,707	FGL
	2005	190,388	FGL
	2006	142,178	FGL
	2007	188,931	FGL
	2008	192,522	FGL
	2009	90,775	FGL
	2011	104,070	FGL
	2013	172,684	FGL
	2014	76,204	FGL

	2016	92,536	FGL
	2017	1,890,261	FRY
	2018	91,465	FGL
	2024	192,871	FGL
	Total	4,220,089	
Sunshine Bass (white bass x striped bass hybrid)	2015	147,174	UNK
	2021	194,868	FGL
	2022	402,106	FGL
	2023	152,559	FGL
	Total	896,707	

Table 5. Objective-based sampling plan components for Cooper Reservoir, Texas 2023–2024.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE–Stock	No objective set
	Size structure	PSD, length frequency	
	Condition	W_r	
Gill netting			
Blue Catfish	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
Channel Catfish	Abundance	CPUE–Stock	RSE ≤ 25
	Size structure	PSD, length frequency	
White Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 30
	Size structure	PSD, length frequency	N ≥ 50 stock
	Age-and-growth	Age at 10 inches	N = 13, 9.0 – 10.9 in
Hybrid Striped Bass	Presence-absence	CPUE–Total	No objective set
	Condition	W_r	
Trap netting			
Crappie	Size structure	PSD, length frequency	N = 50
	Age-and-growth	Age at 10 inches	N = 13, 9.0 – 10.9 inches
	Condition	W_r	

Table 6. Survey of aquatic vegetation, Cooper Reservoir, Texas, 2007–2023. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2007	2015	2019	2023
Native submersed			54.0 (0.3)	22.0 (0.1)
Native terrestrial		244.1 (<0.1)	70.4 (87.0) [a]	1283 (6.7)
Native emergent	3,457.2 (18.2)		1,469.96 (7.7)	957.0 (5.0)
Non-native				
Hydrilla (Tier III)*	16.0 (<0.1)	1.1 (<0.1)	2.9 (<0.1)	55.0 (0.3)
Alligatorweed (Tier III)*		0.2 (<0.1)	0.3 (<0.1)	55.0 (0.3)

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

[a] Vegetation is measured as shoreline miles

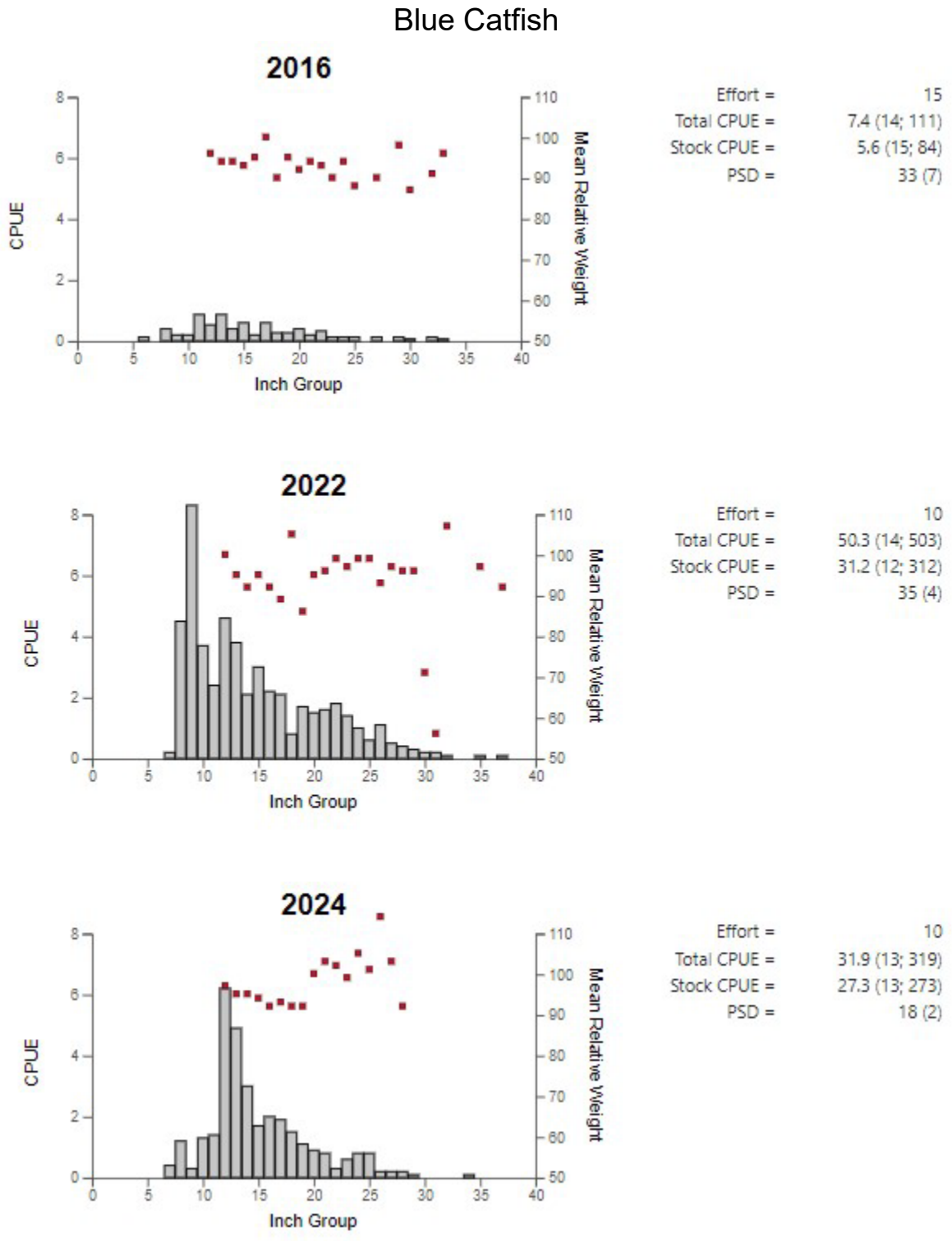


Figure 2. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Cooper Reservoir, Texas, 2016, 2022, and 2024.

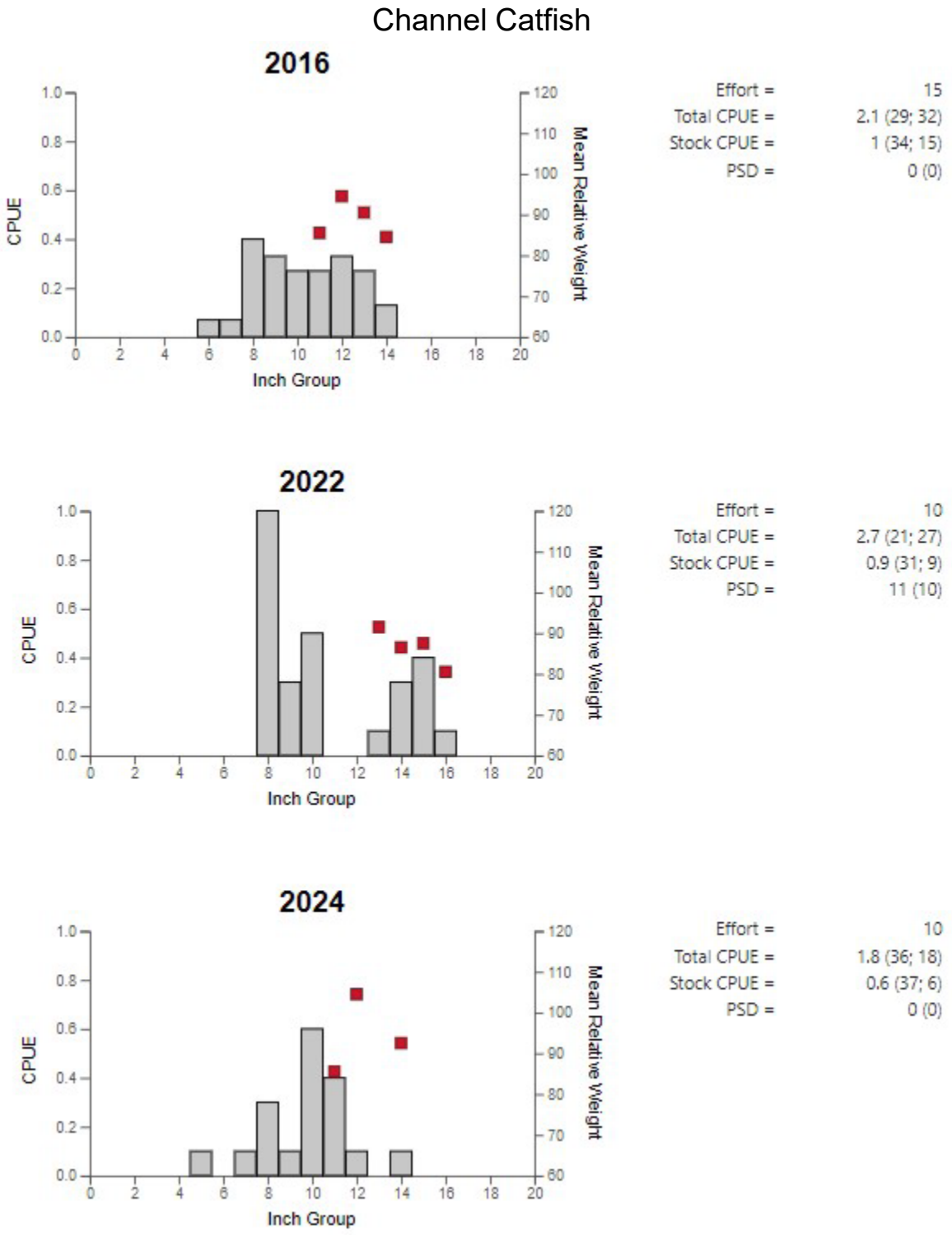


Figure 3. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Cooper Reservoir, Texas, 2016, 2022, and 2024.

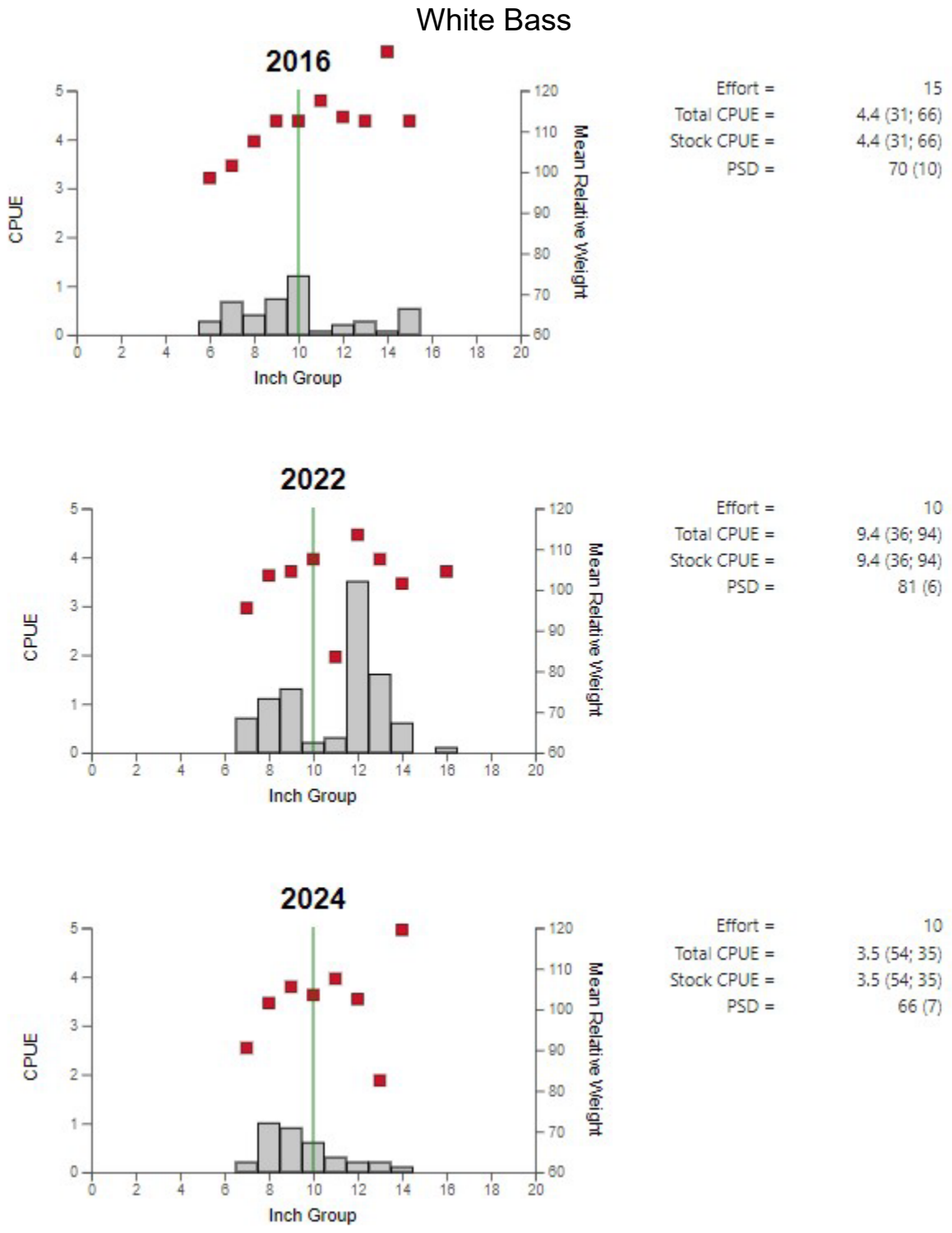


Figure 4. Number of White Bass caught per net night (CPUE, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Cooper Reservoir, Texas, 2016, 2022, and 2024. Vertical line indicates minimum length limit.

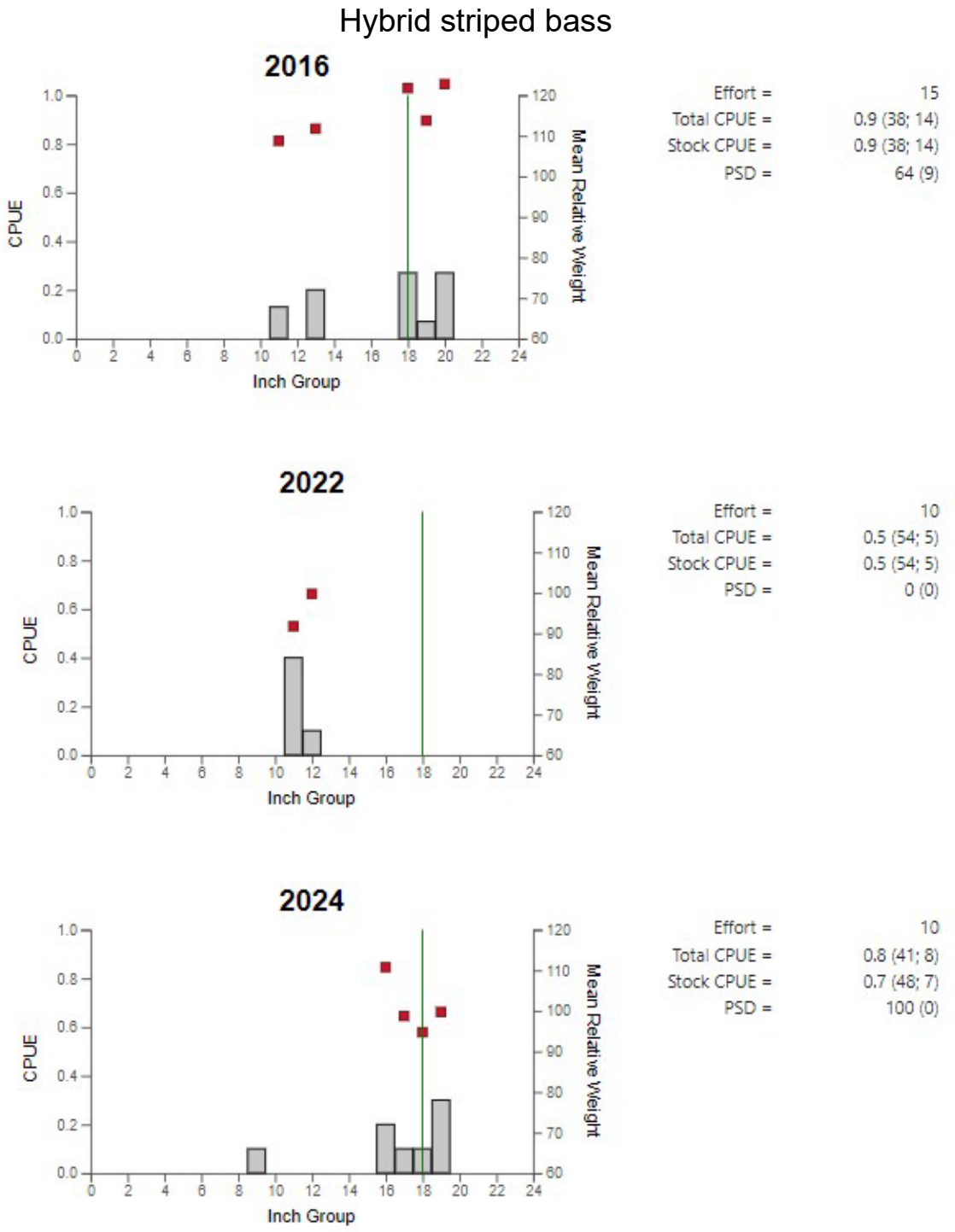


Figure 5. Number of hybrid striped bass caught per net night (CPUE, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Cooper Reservoir, Texas, 2016, 2022, and 2024. Vertical line indicates minimum length limit.

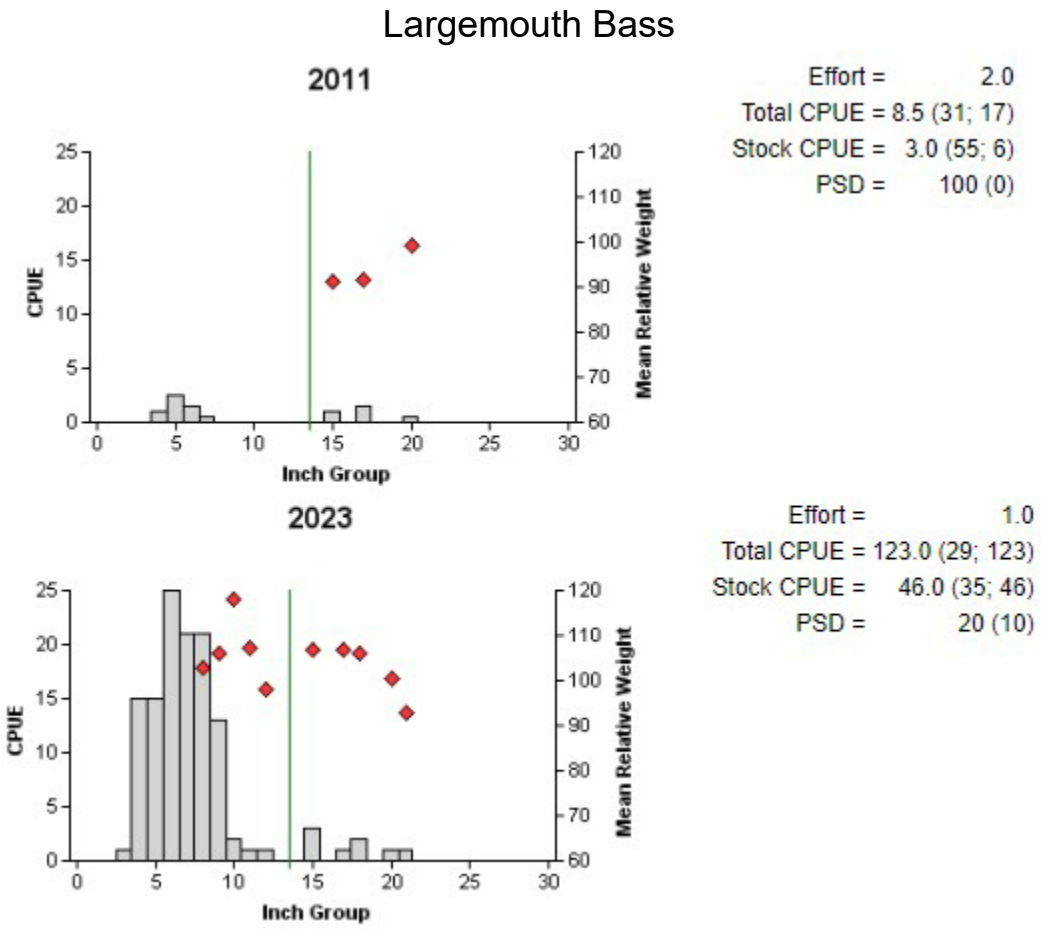


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall daytime electrofishing surveys, Cooper Reservoir, Texas, 2011 and 2023. Vertical line indicates minimum length limit.

Largemouth Bass

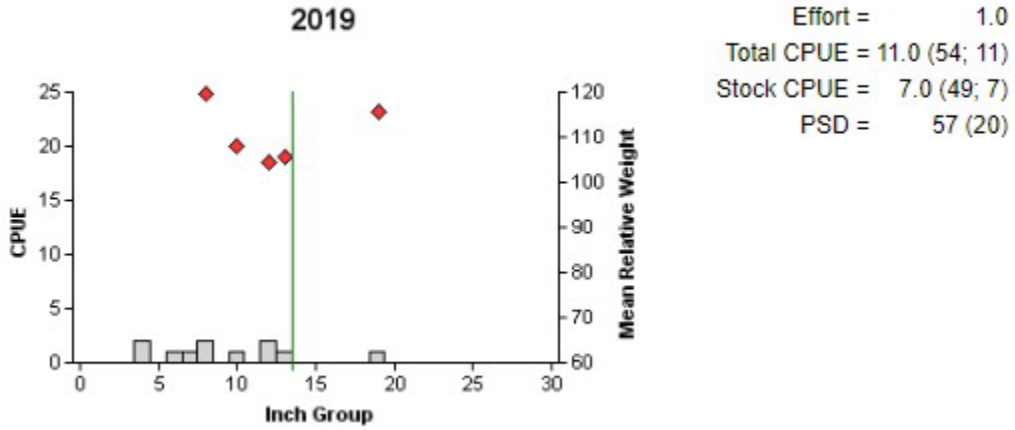


Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall nighttime electrofishing surveys, Cooper Reservoir, Texas, 2019. Vertical line indicates minimum length limit.

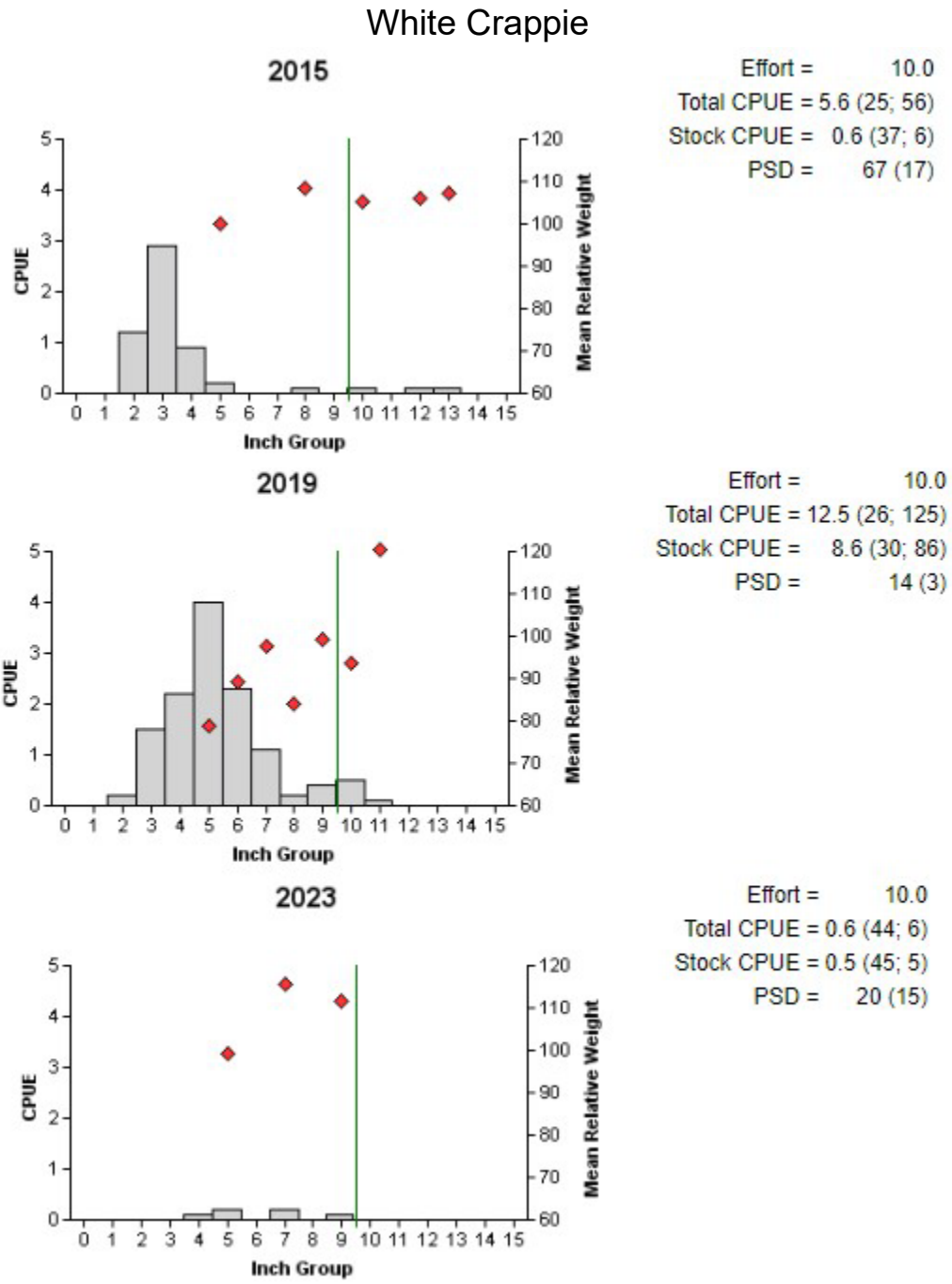


Figure 8. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Cooper Reservoir, Texas, 2015, 2019, and 2023. Vertical line indicates minimum length limit.

Proposed Sampling Schedule

Table 7. Proposed sampling schedule for Cooper 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
Vegetation				X
Electrofishing – Fall*				X
Trap netting				X
Gill netting				X
Report				X

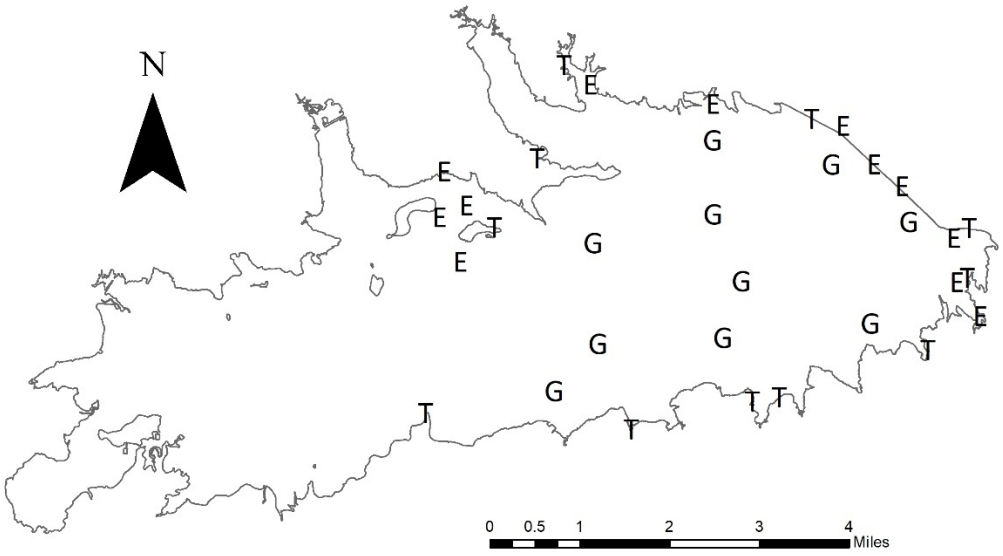
*Nighttime survey

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 Cooper Reservoir, Texas, 2023-2024. Sampling effort was 10 net nights for gill netting, 10 net nights for trap netting, and 1 hour for bass-only electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Blue Catfish	319	31.9 (27)				
Channel Catfish	18	1.8 (42)				
White Bass	35	3.5 (57)				
Hybrid striped bass	8	0.8 (46)				
Largemouth Bass					123	123.0 (29)
White Crappie			6	0.6 (49)		
Black Crappie			3	0.3 (55)		

APPENDIX B – Map of sampling locations



Location of sampling sites, Cooper Reservoir, Texas, 2023-2024. 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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