

Lake Bob Sandlin

2021 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-4

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in Lake Bob Sandlin were surveyed in 2021 using electrofishing and in 2022 using gill netting. Historical data are presented with the 2018-2022 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 Bob Sandlin is a 9,116-acre impoundment located on Big Cypress Creek in the Cypress River Basin. The lake is located in Titus, Camp, and Franklin counties. Habitat features consisted of standing timber, bulkhead, piers and docks, rock and gravel, and native aquatic plants. Coverage of alligatorweed has been low in recent years. Water hyacinth was observed for the first time in four years and was treated with herbicide to prevent any spread. It continues to be monitored by Texas Parks and Wildlife Department's (TPWD) Aquatic Habitat Enhancement team.

Management History: Important sport fish include Blue Catfish, Channel Catfish, White Bass, Largemouth Bass, and crappie. All sport fish at Lake Bob Sandlin have historically been managed with statewide regulations. In 2020, catfish regulations were changed. Lake Bob Sandlin was placed under a special exemption to promote trophy catfish in the lake. Florida Largemouth Bass and Blue Catfish have been stocked to improve angling opportunities.

Fish Community

- **Prey species:** Threadfin Shad were present in the reservoir. Electrofishing catch of Gizzard Shad was lower than the previous survey, but considerably higher than older surveys. Electrofishing catch of Bluegill in 2021 was comparable to the survey in 2017 but lower than 2019. Between the Gizzard Shad, Threadfin Shad, and Bluegill, there are plenty of individuals available as forage for sport fish. Redear Sunfish serve as an additional prey source for predators and grow to sizes desirable to anglers.
- **Catfishes:** Blue Catfish were stocked from 2008 – 2013 to establish a population. These stocked fish have survived and grown to create a fishery, but surveys have yet to document natural reproduction. Channel Catfish were more abundant in the 2022 gill netting survey than previous years. Flathead Catfish were present.
- **Black basses:** Largemouth Bass electrofishing catch rates have been stable over the last three surveys and fish condition continues to be adequate. Growth of Largemouth Bass increased from the 2019 to the 2021 survey. Spotted Bass catch rates declined, but they still provided additional angling opportunities.
- **Crappie:** White and Black Crappie have been collected during previous trap net surveys, but sampling was discontinued due to inconsistent data collection. Future monitoring will rely on angler catch data.

Management Strategies: Monitor the presence of invasive plants and work with the controlling authority to manage coverages and promote invasive species awareness. Continue to promote and monitor the Blue Catfish population. Continue to stock Florida Largemouth Bass every other year at a rate of 1,000 fish/km of shoreline.

Introduction

This document is a summary of fisheries data collected from Lake Bob Sandlin from 2018-2022. 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 2018-2022 data for comparison.

Reservoir Description

Lake Bob Sandlin is a 9,116-acre impoundment constructed in 1977 on Big Cypress Creek in the Cypress River Basin. It is located in Camp, Titus, and Franklin counties located approximately 10 miles equidistant between the cities of Pittsburg and Mt. Pleasant. The controlling authority is Titus County Fresh Water District No. 1. Primary water uses are municipal and industrial water supply and public recreation. The reservoir has a drainage area of approximately 128 square miles and a shoreline length of 85 miles. Average annual water fluctuation is generally 1-3 feet. Since 2010, reservoir water level has been as low as 9 feet below conservation pool (337.5 msl), but the last six years it has been stable (Figure 1). Habitat features consisted of standing timber, bulkhead, piers and docks, rock and gravel, and native aquatic plants. The reservoir is monitored annually for the presence of invasive non-native plants due to the historical presence of hydrilla and recent observations of water hyacinth. Other descriptive characteristics for Lake Bob Sandlin are recorded in Table 1.

Angler Access

Lake Bob Sandlin has seven public boat ramps. Water levels have fluctuated to low enough levels in the past for some ramps to become periodically unusable. Repairs to the concrete at the north Highway 21 bridge ramp are needed. Additional boat ramp characteristics are recorded in Table 2. Bank fishing access is limited. There is one fishing pier located at Lake Bob Sandlin State Park and one at Titus County Park.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Lechelt and Bister 2018) included:

1. Monitor and treat invasive aquatic vegetation as necessary on Lake Bob Sandlin. Provide technical guidance to property owners and controlling authorities regarding invasive aquatic plant management.

Action: Lake Bob Sandlin was surveyed every year for invasive aquatic vegetation. When water hyacinth was observed, TPWD's Aquatic Habitat Enhancement team conducted herbicide applications to minimize the spread.

2. Promote the Blue Catfish population as an additional angling opportunity. Monitor the Blue Catfish fishery for natural reproduction. Assess the development of the Blue Catfish fishery during an angler creel survey.

Action: Blue Catfish populations have been assessed every two years using spring gill nets. Currently, no natural reproduction has been observed. No creel survey was conducted in 2021/2022 as planned due to conflicting opportunities within the district. Despite not conducting the creel, anecdotal information indicates there is an active group of anglers fishing for Blue Catfish at Lake Bob Sandlin.

3. Stock Florida Largemouth Bass every other year at a rate of 1,000 fish/km of shoreline to maintain the quality Largemouth Bass fishery.

Action: Florida Largemouth Bass fingerlings were stocked in 2018 and 2020.

Harvest regulation history: All sport fishes except for Blue and Channel Catfish in Lake Bob Sandlin are currently managed with statewide regulations (Table 3). Largemouth Bass have been managed

under a 14-inch minimum length limit and 5-fish bag (in combination with Spotted Bass) since 1986. Other black bass were included under this regulation in 1988. In 2000, the 12-inch minimum length limit for Spotted Bass was dropped to no minimum length limit. The 12-inch minimum length limit and 25-fish daily bag for Channel and Blue Catfish (in any combination) was in effect since 1995. In 2020, new catfish regulations were enacted across the state of Texas with a special regulation for Lake Bob Sandlin. There is no minimum length limit for Blue and Channel Catfish with a daily bag limit of 25 fish (in any combination). Of those 25 fish, no more than 5 fish can be 20 inches or greater in length and no more than one of those five fish can be over 30 inches or greater in length. This exception is to promote a trophy catfish fishery in Lake Bob Sandlin. No change has occurred for Flathead Catfish with a minimum length limit of 18 inches and daily bag of 5 fish per day. Crappie have been managed under a 10-inch minimum length limit and 25-fish daily bag (combination of both species) since 1990.

Stocking history: Lake Bob Sandlin was stocked with Blue Catfish in 2008, 2009, 2010, 2012, and 2013. Channel Catfish were stocked in 1976, 1978, and 2000. Florida Largemouth Bass were introduced in 1977 and again stocked in 1998, 2006, 2007, and 2009. From 2010 to 2020, Florida Largemouth Bass were stocked every two years. The complete stocking history is recorded in Table 4.

Vegetation/habitat management history: Non-native vegetation was monitored annually, and coverage has been limited or non-existent in recent years. However, some shoreline property owners have experienced access issues due to alligatorweed and hydrilla in the past. Some submitted aquatic vegetation treatment proposals to conduct herbicide treatments or mechanically remove nuisance vegetation. Hydrilla coverage has been as high as 1,800 acres (20% of the reservoir surface area; Brice and Bister 2006), but even this level of coverage did not pose a biological concern in the reservoir or cause access issues at public boat ramps. Eurasian watermilfoil has been present in the past, but surveys have not detected any in recent years. In 2015, to further manage and control alligatorweed, 4,800 adult alligatorweed flea beetles were released. In 2017 and 2018, water hyacinth was found in multiple near-shore locations around the lake and physically removed.

Water transfer: Lake Bob Sandlin is primarily used for municipal water supply and recreation. No interbasin transfers are known to exist.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Bob Sandlin (Lechelt and Bister 2018). 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).

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

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.

Habitat – A structural habitat survey was conducted in 2021 due to the amount of new lakeside construction during the last 4 years. Vegetation surveys were conducted in 2018–2020 to monitor invasive plants including alligatorweed and water hyacinth. A full vegetation survey was conducted in 2021. All habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Water level – Source for water level data was the United States Geological Survey (USGS 2022).

Results and Discussion

Habitat: New construction around Lake Bob Sandlin has caused a decrease in the amount of natural shoreline from 53.0 miles (Lechelt and Bister 2018) to 44 miles in 2021 (Table 6). Much of the construction has resulted in an increase of bulkhead and boat docks around the lake (Table 6). Native vegetation covered only about 1% of the reservoir surface area and was primarily located in the upper end of the reservoir (Table 7). This is a decrease in both native and non-native vegetation from the last report. After 3 years, water hyacinth was once again observed in Lake Bob Sandlin and was immediately sprayed with herbicide. Water hyacinth will continue to be monitored and sprayed as necessary. Alligatorweed continues to be present in the reservoir, but at low coverage (3 acres). Water hyacinth was observed in 2021 in Monticello Cove. There was too much to physically remove and herbicide treatments were conducted by the TPWD Aquatic Habitat Enhancement team. To improve fisheries habitat, TPWD along with the Titus County Freshwater District No. 1 deployed artificial habitat structures in 2021 at 6 different locations in the reservoir (https://tpwd.texas.gov/fishboat/fish/recreational/lakes/bob_sandlin/structure.shtml).

Prey species: Electrofishing catch rates of Gizzard Shad marginally decreased from the 2019 survey (259.0/h) to the 2021 survey (219.0/h; Figure 2), but both years had higher catch rates than 2017 (73.0/h). Index of Vulnerability (IOV) for Gizzard Shad was moderate, indicating that 68% of Gizzard Shad were available to existing predators; however, this was lower than IOV estimates in 2019 but substantially higher than IOV estimates in 2017 (Figure 2). Bluegill electrofishing catch rates were noticeably higher in 2019 (566.0/h) compared to 2017 (272.0/h) and 2021 (249.0/h; Figure 3). The size structure of Bluegill during the last three electrofishing surveys has remained dominated by smaller individuals (PSD range: 5–16) which are available as prey to most sport fish. Redear Sunfish catch rates decreased from 2019 (145.0/h) to 2021 (53.0/h; Figure 4), but individuals were caught up to 8 inches, providing additional angling opportunities.

Catfishes: Gill netting catch rates of Blue Catfish have been stable over the past two surveys with 4.0/nn in 2022 and 4.1/nn in 2020 (Figure 5). However, no small fish were collected that would have indicated natural reproduction. Body condition was good for Blue Catfish with mean W_r values at or above 90 for most inch groups. The gill netting catch rates of Channel Catfish have increased over the past three surveys from 5.8/nn in 2018 to 14.2/nn in 2022 (Figure 6). Body condition of Channel Catfish was good with average W_r for most inch groups above 90 (Figure 6). Two Flathead Catfish were observed during 2022 gill netting.

White Bass: White Bass catch in 2022 gill netting (4.5/nn) has declined from previous surveys (8.7/nn in 2020 and 2018; Figure 7). Abundance of fish has been historically low, but occasionally spawning conditions will be adequate to produce a good year-class of White Bass in this reservoir.

Spotted Bass: Total catch rate of Spotted Bass was 64.0/h in 2021 which was lower than 2019 (99.0/h) and 2017 (71.0/h; Figure 8). Size structure did increase from 2019 (PSD = 25) to 2021 (PSD = 39). Multiple individuals were caught over 10 inches and also exceeded 15 inches in 2021. While there was a decrease in the total catch rate of Spotted Bass, this species continues to provide an additional angling opportunity at Lake Bob Sandlin.

Largemouth Bass: The total electrofishing catch rates of Largemouth Bass have been consistent from 2017 (120.0/h), 2019 (168.0/h), and 2021 (145.0/h; Figure 9). Size structure of legal-sized Largemouth Bass has also been consistent for the last three surveys (PSD-14: 2017 = 25; 2019 = 28; 2021 = 29). The body condition of Largemouth Bass was adequate in 2021 with relative weights falling between 90 - 100 for most size classes. Growth of Largemouth Bass in Lake Bob Sandlin was fast in 2021 with an average age of 1.6 years at 14 inches (13.0 to 14.9 inches; N = 14; range = 1 – 3 years). This growth was faster than the last two surveys in 2017 (average = 2.1 years at 14 inches; N = 15; range = 1 – 3 years) and 2019 (average = 2.2 years at 14 inches; N = 13; range = 1 – 4 years).

Crappies: Historical sampling data for crappie has been inconsistent. Targeted sampling was discontinued in 2018 and future monitoring of crappie will rely on angler catch data from creel surveys to document large-scale changes in the Black and White Crappie populations.

Fisheries Management Plan for Lake Bob Sandlin, Texas

Prepared – July 2022

ISSUE 1: Invasive aquatic plants, specifically water hyacinth, potentially pose a threat to angler and boater access as well as outcompete desirable native vegetation. Water hyacinth was discovered on Lake Bob Sandlin during TPWD's annual vegetation survey. TPWD's Aquatic Habitat Enhancement team was informed and they treated the water hyacinth with herbicide. Given water hyacinth's fast growth rate and ability to inhibit lake access it will be important to closely monitor Lake Bob Sandlin in the future to ensure water hyacinth does not become a larger issue. Additionally, many neighboring lakes have become infested with giant salvinia. While Lake Bob Sandlin is currently not infested with giant salvinia, monitoring is required to help prevent its establishment.

MANAGEMENT STRATEGIES

1. Coordinate with TPWD's Aquatic Habitat Enhancement team to treat nuisance aquatic vegetation with herbicide when necessary.
2. Provide technical guidance to the controlling authority and property owners regarding invasive plant management.
3. Provide and maintain signage to controlling authority to post at all boater access sites.

ISSUE 2: Continue to promote the Blue Catfish population. Blue Catfish were introduced into Lake Bob Sandlin in 2008 to increase sportfish angling opportunities. Fingerlings were stocked in 2008, 2009, and 2010 at 50 fish/acre. Additional stockings with fewer fish were made in 2012 and 2013. Gill netting catch rates of Blue Catfish have stabilized, but natural reproduction has not been documented. The fishery is popular among anglers and a regulation was established to promote the trophy angling aspect of this fishery. Angling opportunities for Blue Catfish in Lake Bob Sandlin should be shared with the public.

MANAGEMENT STRATEGIES

1. Continue to monitor the Blue Catfish population for evidence of natural reproduction during gill netting surveys every two years.
2. Monitor angling effort and catch during the creel survey scheduled for 2023-2024.
3. Stock fingerling Blue Catfish every two years (beginning 2024) at a rate of 50/acre to supplement the limited reproduction and recruitment to support this popular fishery.

ISSUE 3: Lake Bob Sandlin supports a quality Largemouth Bass fishery and has a history of producing trophy fish. Fish have previously been observed up to 24 inches from prior electrofishing and creel surveys. During the last survey cycle, five ShareLunkers have been reported: three were Lunker status (≥ 8 pounds) and two were Elite status (≥ 10 pounds). In an effort to maintain a quality fishery, continued stocking of Florida Largemouth Bass is necessary.

MANAGEMENT STRATEGIES

1. Stock Lone Star Bass fingerlings, 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 biennially in 2023 and 2025.

2. Continue to encourage anglers to report catches of bass over 8 pounds to the ShareLunker program to provide supplemental reporting of trophy Largemouth Bass catches within the reservoir that can be tracked over time.

ISSUE 4: 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 lake stakeholders (e.g., marina owners, tackle shops) about invasive species and provide them with various literature (e.g., posters, pamphlets) to 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 (2022–2026)

Sport fish, forage fish, and other important fishes

Sport fishes in Lake Bob Sandlin include Largemouth Bass, Spotted Bass, Blue Catfish, Channel Catfish, Flathead Catfish, White Bass, and crappie. Known important forage species include Bluegill, Gizzard Shad, and Threadfin Shad. The proposed sampling schedule to meet the following OBS Plan can be found in Table 8.

Low-density/underutilized fisheries

White Bass: White Bass relative abundance has been variable in Lake Bob Sandlin. The 2013/2014 creel survey indicated that only 1.9% of anglers were specifically targeting White Bass. Even though the White Bass fishery is negligible, we will collect population data during routine spring gill netting in 2026 although no additional effort will be expended to sample this species.

Crappie: Historical sampling data for crappie has been inconsistent. Targeted sampling was discontinued in 2018 and future monitoring of crappie will rely on angler catch data from creel surveys to document large-scale changes in the Black and White Crappie populations.

Survey objectives, fisheries metrics, and sampling objectives

Black Bass: Largemouth Bass and Spotted Bass are popular sport fishes in Lake Bob Sandlin. The 2013/2014 creel survey indicated that 35% of anglers were specifically targeting black basses.

Largemouth Bass and Spotted Bass have always been managed under the statewide regulation: daily bag of 5 (combination of both species), 14-inch minimum length limit for Largemouth Bass and no length limit for Spotted Bass. Trend data on CPUE, size structure, and condition has been collected biennially since 2001 with fall nighttime electrofishing (except for 2011 when electrofishing was conducted during the day due to safety concerns as a result of low water conditions). Continuation of biennial trend data with fall nighttime electrofishing will allow for determination of any large-scale changes in Largemouth Bass and Spotted Bass populations that may spur further investigation. Given that Largemouth Bass have higher catch rates and are likely preferred over Spotted Bass by anglers due to their larger maximum size, our sampling goals will be based off the catch of Largemouth Bass.

Trend data will be assessed with a minimum of 12 randomly selected 5-min electrofishing nighttime sites during 2023 and 2025. Sampling will continue at random sites until 50 stock-sized fish are collected and the RSE of CPUE-Stock is ≤ 25 . Historic sampling indicates that we can achieve appropriate levels of precision (RSE of CPUE-Stock ≤ 25) with the minimum sampling effort. An additional 6 random stations will be determined in the event they are necessary to meet our sampling objectives. A maximum of 18 stations will be sampled.

Sampling objectives for Largemouth Bass will include the metrics of size structure (PSD and length frequency), growth (mean age at 14 inches using a sample size of 13 fish between 13.0 and 14.9 inches), relative abundance (stock-sized fish $N > 50$, CPUE-Stock with RSE ≤ 25), and body condition (mean W_r using lengths and weights from 10 fish per inch group).

Population trend data will also be collected for Spotted Bass (PSD, length frequency, and body condition). However, sampling objectives set for Largemouth Bass will determine the extent of electrofishing effort.

Catfish: Channel Catfish, Blue Catfish, and Flathead Catfish are all present in Lake Bob Sandlin. The 2013/2014 creel survey indicated that 13.8% of anglers were specifically targeting catfishes. Enhancing angling opportunities for catfishes has been a management focus at Bob Sandlin in recent years, specifically for Blue Catfish. From 2008-2013 more than 1,500,000 Blue Catfish fingerlings were stocked to provide additional sport fishing opportunities. A new regulation for Channel and Blue Catfish was implemented September 2021 in which there is no minimum length limit and a daily bag of 25 (of which, no more than 5 fish can be over 20 inches and no more than 1 over 30 inches). Flathead Catfish continue to be managed with 5 fish daily bag limit and 18-inch minimum length limit.

Historically, standard gill netting surveys have been conducted every four years to collect trend data on CPUE, size structure, and body condition for catfish. Beginning in 2016, gill netting was conducted every two years to monitor the Blue Catfish population. These surveys showed that Blue Catfish stockings were successful; however, no evidence of natural reproduction has been documented. Continuation of standard spring gill net surveys will allow for determination of any large-scale changes in Channel Catfish and Blue Catfish populations that may spur further investigation. Additionally, we will use gill net sampling to determine if Blue Catfish are naturally reproducing. Our sampling objective is to collect at least 50 Channel Catfish with an RSE ≤ 25 for CPUE. The presence of Blue Catfish < 11 inches will be used to evaluate natural reproduction. We will set 10 gill nets overnight in random locations. An additional 5 gill nets will be set if we do not reach our sampling objective for Channel Catfish. No more than 15 gill nets will be set.

Sampling metrics for Channel Catfish and Blue Catfish will include size structure (PSD and length frequency), relative abundance (CPUE-total and CPUE-stock), and body condition (mean W_r using lengths and weights from 10 fish per inch group).

Anecdotal evidence suggests that a Flathead Catfish fishery (primarily hand fishing) exists in Lake Bob Sandlin; however, little is known about the population. Low-frequency electrofishing was conducted in the

fall of 2015 and 2017 to collect general population information on Flathead Catfish. However, we were unable to capture any Flathead Catfish in 2015 (12 stations) and only 2 were captured in 2017 (14 stations). Low-frequency electrofishing proved to be unsuccessful in capturing enough Flathead Catfish to accurately describe the population and will not be used in future sampling plans. Presence/absence of Flathead Catfish will be noted during standard gill net collections and creel surveys.

Forage Fish: Gizzard Shad, Threadfin Shad, and Bluegill are the important forage species at Lake Bob Sandlin. Trend data on CPUE and size structure of these prey species has been collected biennially since 2013 (prior to 2013, electrofishing surveys were conducted every 4 years). Continuation of electrofishing sampling in 2023 and 2025, as per Largemouth Bass above, will allow for monitoring of large-scale changes in prey species relative abundance and size structure. Historic sampling effort, based on achieving sampling objectives for Largemouth Bass, has been sufficient in collecting the desired numbers of Bluegill for size structure estimation (PSD; 50 fish) and Gizzard Shad size structure (IOV; 50 fish). No additional effort will be expended to collect additional Gizzard Shad and Bluegill 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.

Creel Survey: A roving angler creel survey will be conducted from June 2023 through May 2024 for general monitoring of total fishing effort, angler expenditures, directed angling effort for all sport fish, catch rates, and the number of fish harvested.

Habitat: Aquatic invasive plants are a threat to native habitat at Lake Bob Sandlin. Water hyacinth, specifically, potentially poses a threat to angler and boater access as well as outcompete desirable native vegetative species. While Lake Bob Sandlin is currently not infested with giant salvinia, this reservoir is at high risk for giant salvinia introduction. Annual aquatic vegetation monitoring is required to identify potential threats to boating and angling access so control, and rapid response efforts can be implemented to reduce or eliminate threats associated with invasive aquatic plants. Each summer the reservoir will be circumnavigated, and any invasive species encountered will be documented and geo-located.

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Tables and Figures

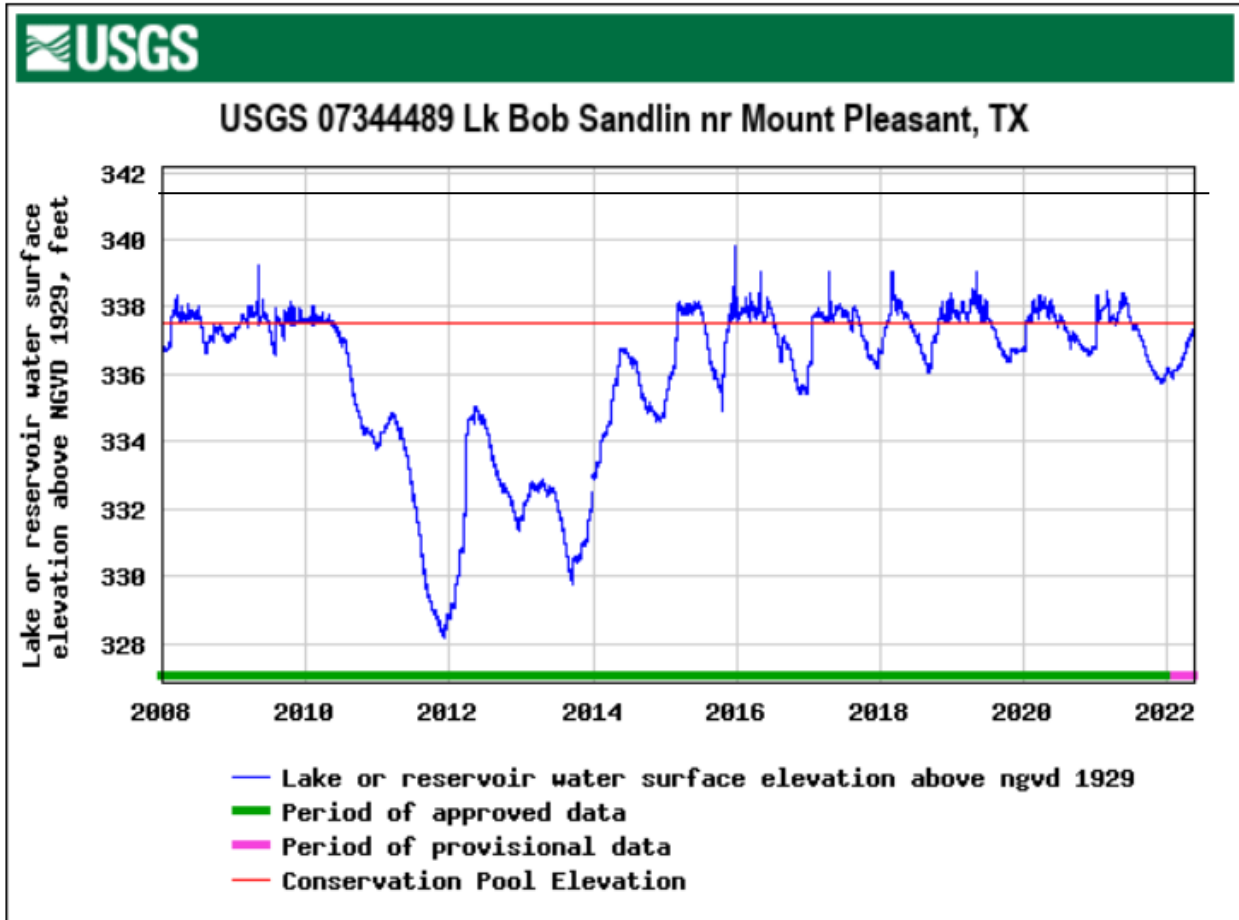


Figure 1. Water level elevations in feet above mean sea level (MSL) recorded for Lake Bob Sandlin, Texas.

Table 1. Characteristics of Lake Bob Sandlin, Texas.

Characteristic	Description
Year constructed	1977
Controlling authority	Titus County Freshwater District No. 1
Counties	Camp, Titus, Franklin
Reservoir type	Mainstream
Shoreline Development Index	5.5
Conductivity	139 μ S/cm

Table 2. Boat ramp characteristics for Lake Bob Sandlin, Texas, August 2021. Reservoir elevation at time of survey was 336.75 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Titus County Water District Park	33.09426 -95.01371	Y	20	329.75	Excellent
Titus County Water District Park-3 rd lane	33.09426 -95.01371	Y	20	324.25	Excellent
Barefoot Bay Marina	33.05208 -95.02199	Y	20	329.75	Excellent
Hwy 21 Bridge South	33.09484 -95.09355	Y	20	330.25	Good
Hwy 21 Bridge North	33.04758 -95.09647	Y	10	327.75	Poor, repair needed
Bob Sandlin State Park	33.04790 -95.09473	Y	30	327.75	Excellent
Titus County Park	33.08274 -95.05701	Y	20	332.75	Good
Titus County Old Ramp	33.09141 -95.01288	Y	20	327.25	Good

Table 3. Harvest regulations for Lake Bob Sandlin, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 ^a (in any combination)	None
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Largemouth	5 ^b	14-inch minimum
Bass, Spotted	5 ^b	None
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

^a Of which, only 5 > 20 inches and 1 > 30 inches

^b Daily bag for Largemouth Bass and Spotted Bass = 5 fish in any combination.

Table 4. Stocking history of Lake Bob Sandlin, Texas. FRY = fry; FGL = fingerling; AFGL = advanced fingerling; ADL = adults.

Species	Year	Number	Life stage
Blue Catfish	2008	456,126	FGL
	2009	470,431	FGL
	2010	502,086	FGL
	2012	105,810	FGL
	2013	<u>45,993</u>	FGL
	Total	1,580,446	
Channel Catfish	1976	42,498	AFGL
	1978	149,315	AFGL
	2000	<u>812</u>	AFGL
	Total	192,625	
Florida Largemouth Bass	1977	450,000	FRY
	1998	238,477	FGL
	2006	385,675	FGL
	2007	455,600	FGL
	2009	456,468	FGL
	2010	480,554	FGL
	2012	500,450	FGL
	2014	459,619	FGL
	2016	125,620	FGL
	2018	124,345	FGL
	2020	<u>66,586</u>	FGL
	Total	3,743,394	
Rainbow Trout	1998	2,200	ADL

Table 5. Objective-based sampling plan components for Lake Bob Sandlin, Texas 2021–2022.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ stock
	Age-and-growth	Age at 14 inches	$N = 13, 13.0 - 14.9$ inches
	Condition	W_r	10 fish/inch group (max)
Bluegill ^a	Abundance	CPUE–Total	
	Size structure	PSD, length frequency	$N \geq 50$
Gizzard Shad ^a	Abundance	CPUE–Total	
	Size structure	PSD, length frequency	$N \geq 50$
	Prey availability	IOV	$N \geq 50$
Threadfin Shad ^a			Presence/Absence
<i>Gill netting</i>			
Channel Catfish	Abundance	CPUE–stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ stock
	Condition	W_r	10 fish/inch group (max)
Blue Catfish	Natural recruitment		Presence of fish < 11 inches

^a No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

Table 6. Survey of structural habitat types, Lake Bob Sandlin, Texas, 2021. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Bluff	1.48 miles	1.7
Bulkhead	10.75 miles	12.2
Bulkhead with boat docks	25.75 miles	29.3
Natural	44.16 miles	50.3
Natural with boat docks	3.65 miles	4.2
Rocky	1.72 miles	1.9
Rocky with boat docks	0.35 miles	0.4
Standing timber	1,678.0 acres	18.4

Table 7. Survey of aquatic vegetation, Lake Bob Sandlin, Texas, 2018–2021. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2018 ^a	2019 ^a	2020 ^a	2021
Native floating-leaved				47.3 (0.5)
Native emergent				15.0 (0.2)
Native submerged				39.3 (0.4)
Non-native				
Water Hyacinth (Tier I)*	< 1 (0.1)			< 1 (0.1)
Alligatorweed (Tier III)*	1 (0.1)	3 (0.1)	2 (0.1)	1 (0.1)

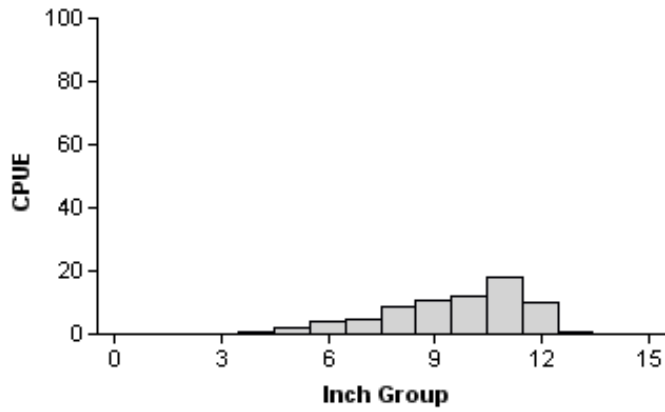
* Tier I is Immediate Response; Tier III is Watch Status

^aOnly non-native plants were surveyed in 2018-2020.

Gizzard Shad

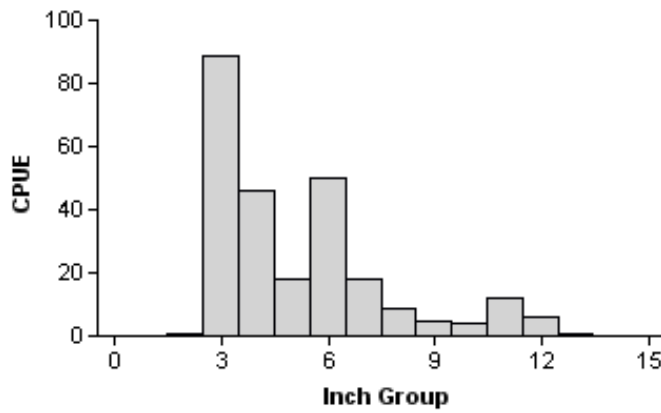
2017

Effort = 1.0
 Total CPUE = 73.0 (27; 73)
 IOV = 16 (7)



2019

Effort = 1.0
 Total CPUE = 259.0 (35; 259)
 IOV = 86 (4)



2021

Effort = 1.0
 Total CPUE = 219.0 (17; 219)
 IOV = 68 (5)

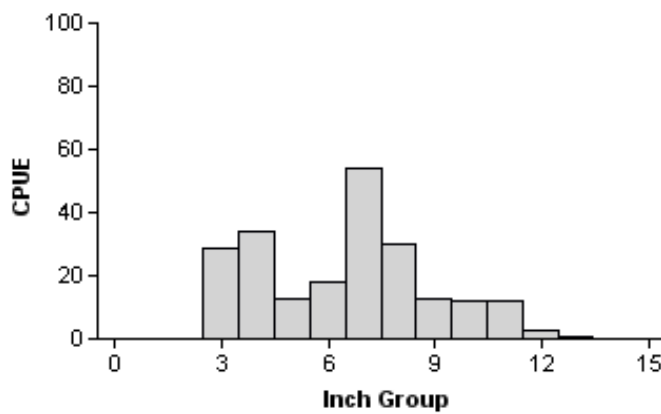


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Bob Sandlin, Texas, 2017, 2019, and 2021.

Bluegill

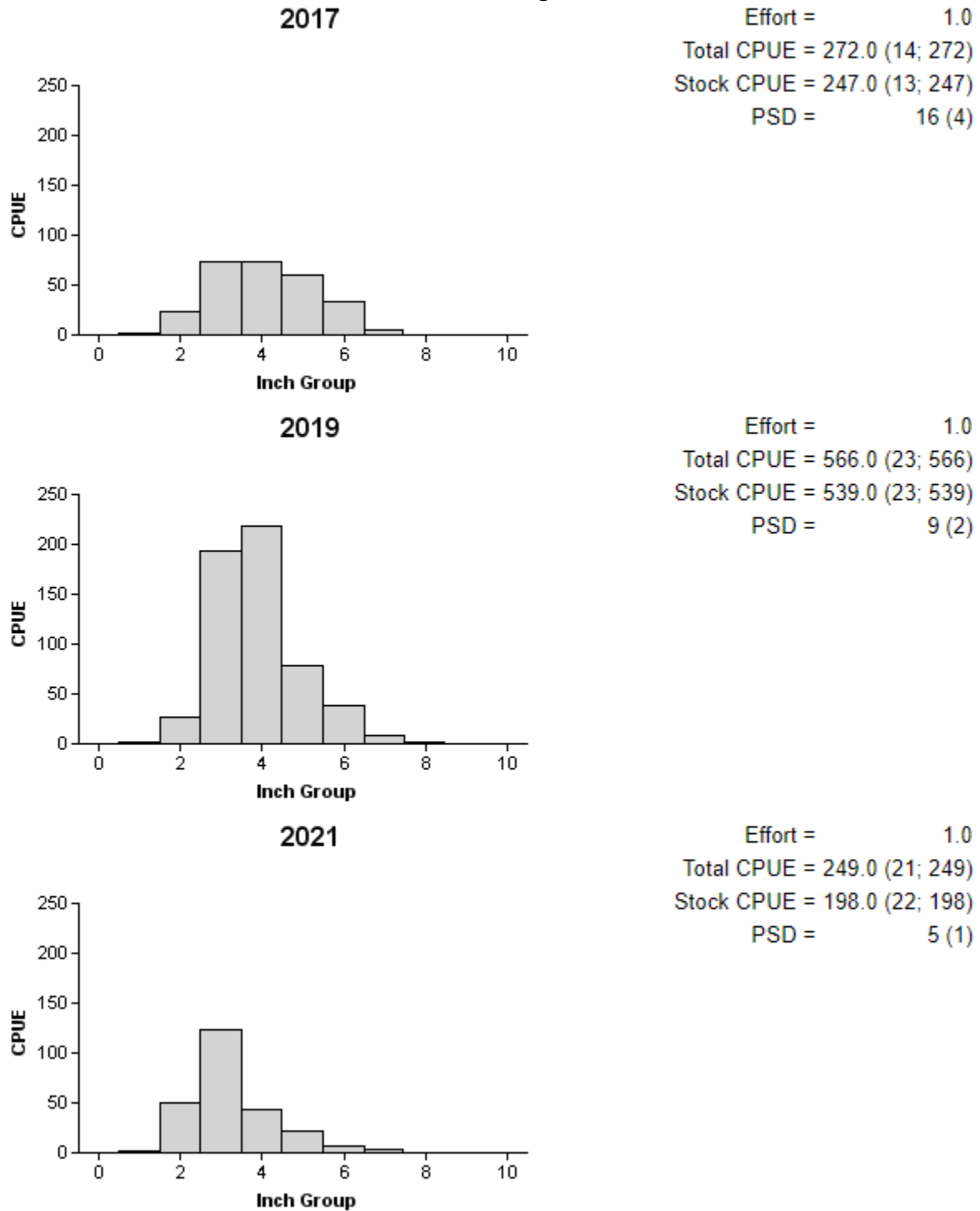


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Bob Sandlin, Texas, 2017, 2019, and 2021.

Redear Sunfish

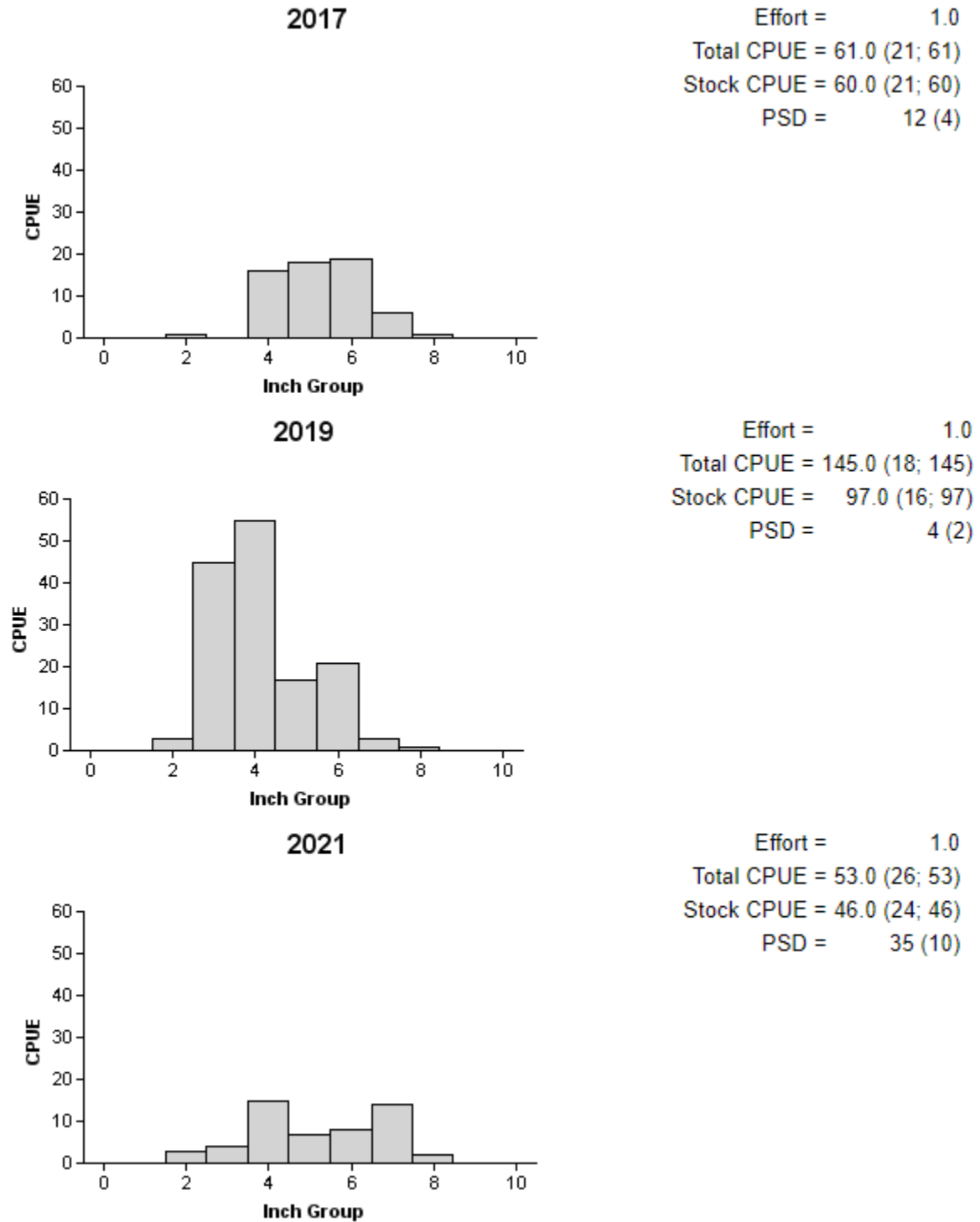


Figure 4. Number of Redear Sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Bob Sandlin, Texas, 2017, 2019, and 2021.

Blue Catfish

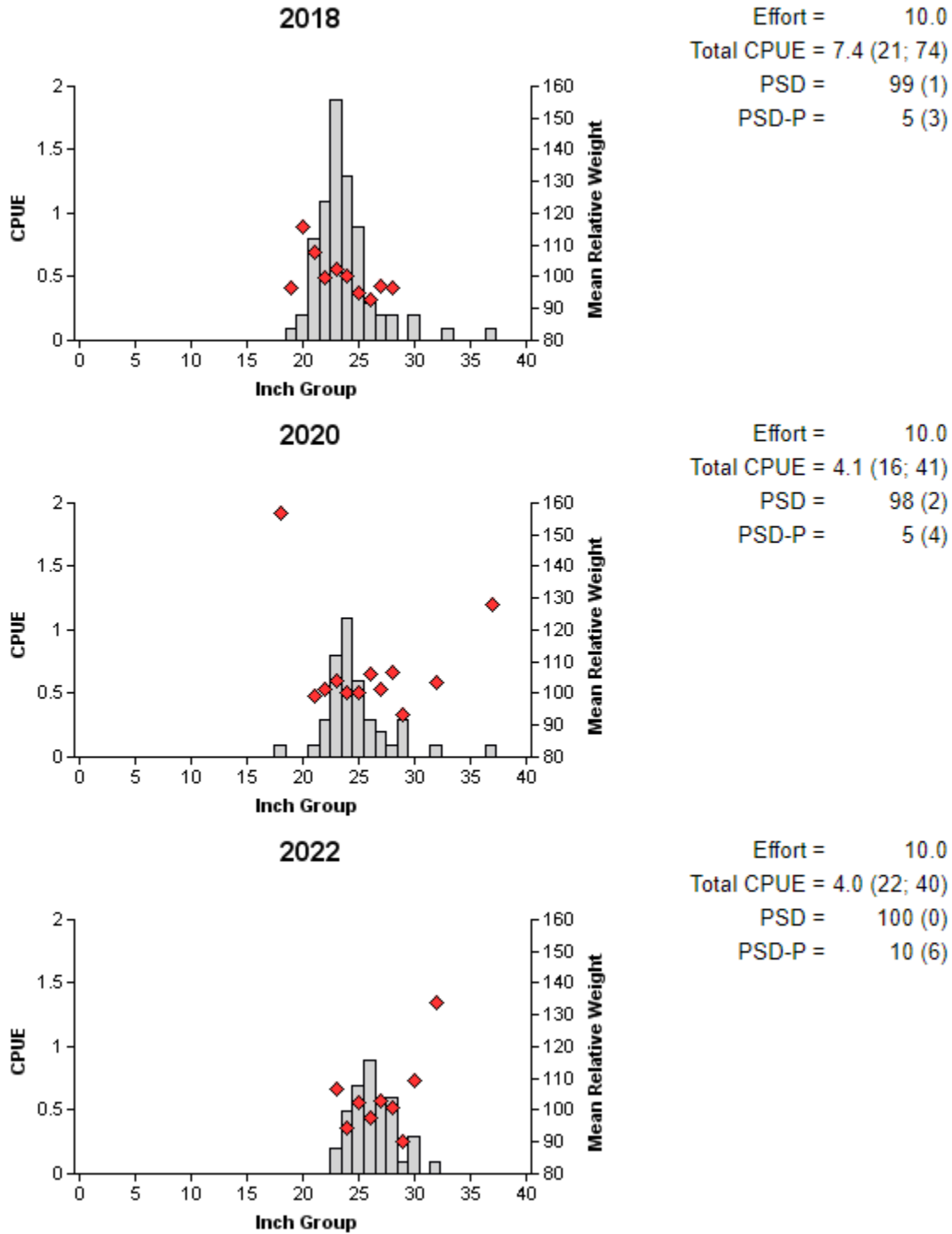


Figure 5. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Bob Sandlin, Texas, 2018, 2020, and 2022.

Channel Catfish

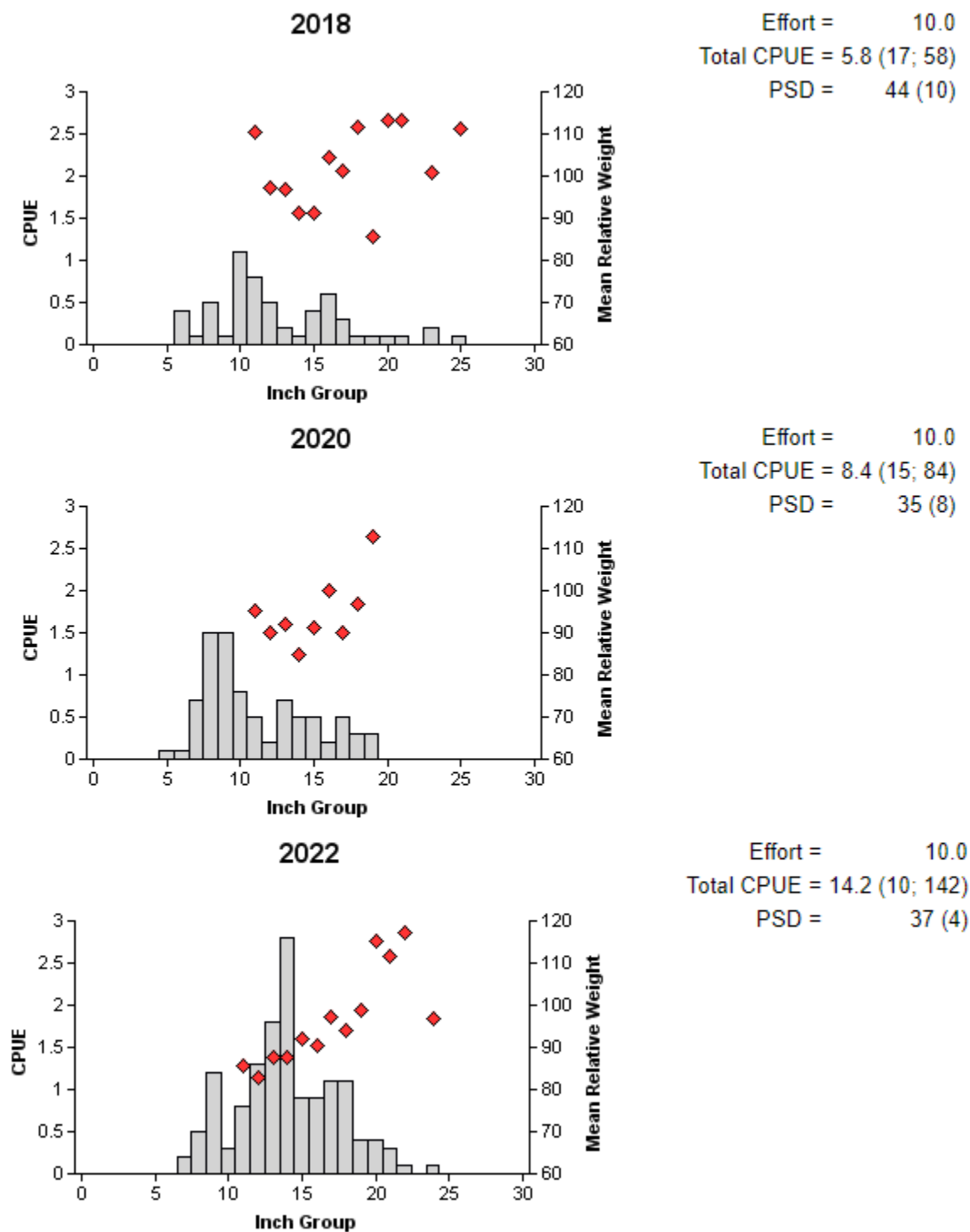


Figure 6. Number of Channel Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Bob Sandlin, Texas, 2018, 2020, and 2022.

White Bass

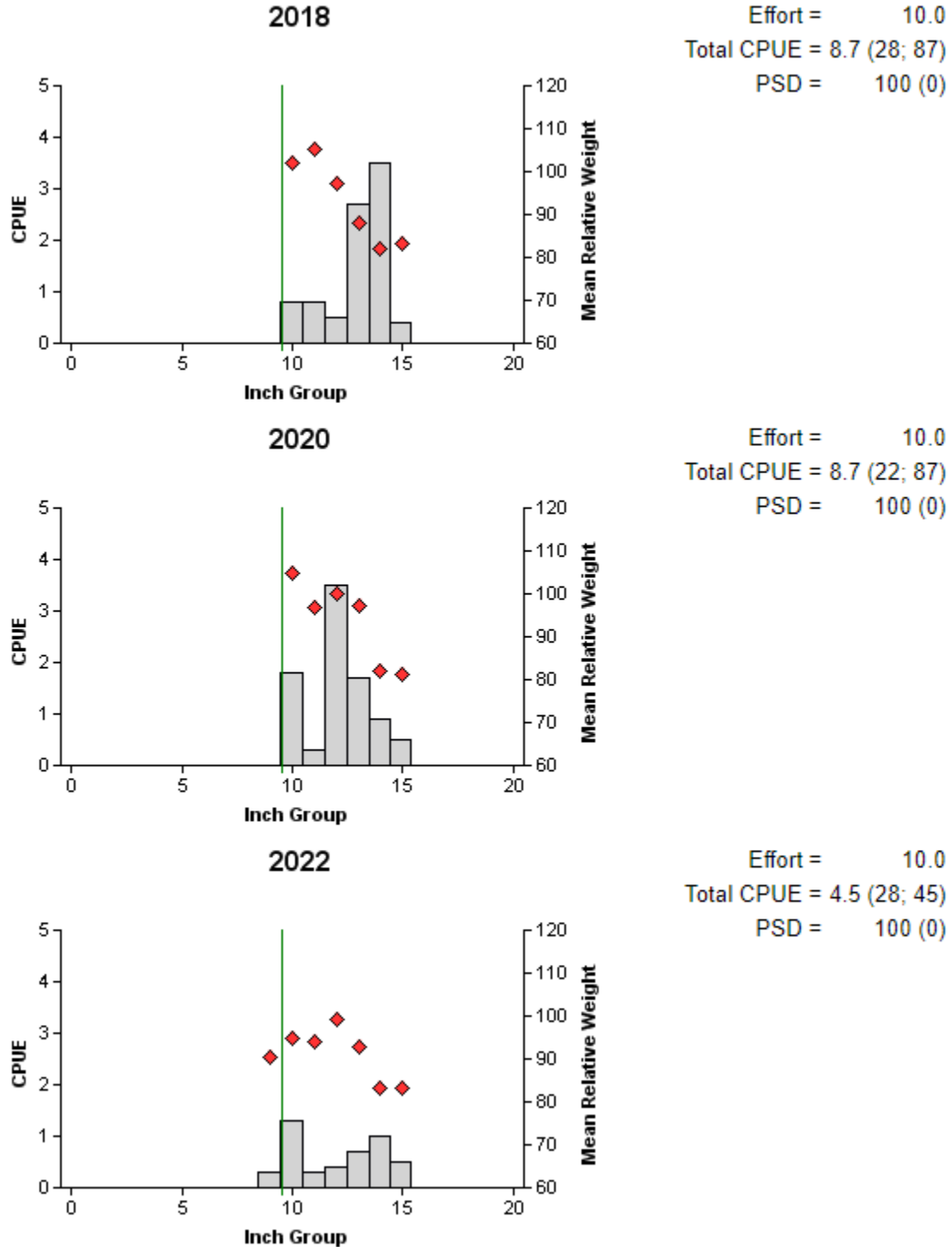


Figure 7. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Bob Sandlin, Texas, 2018, 2020, and 2022. Vertical line indicates minimum length limit.

Spotted Bass

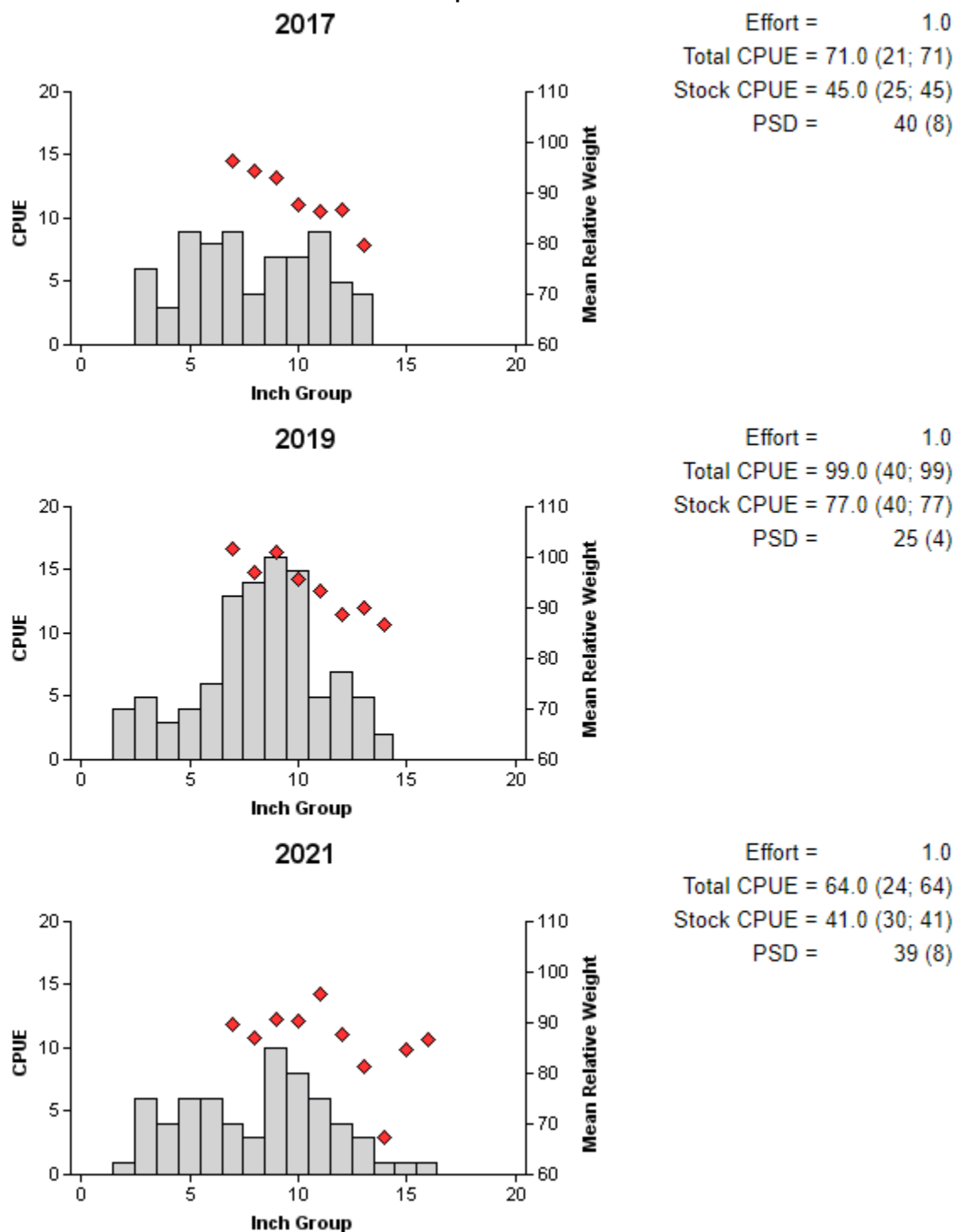


Figure 8. Number of Spotted Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Bob Sandlin, Texas, 2017, 2019, and 2021.

Largemouth Bass

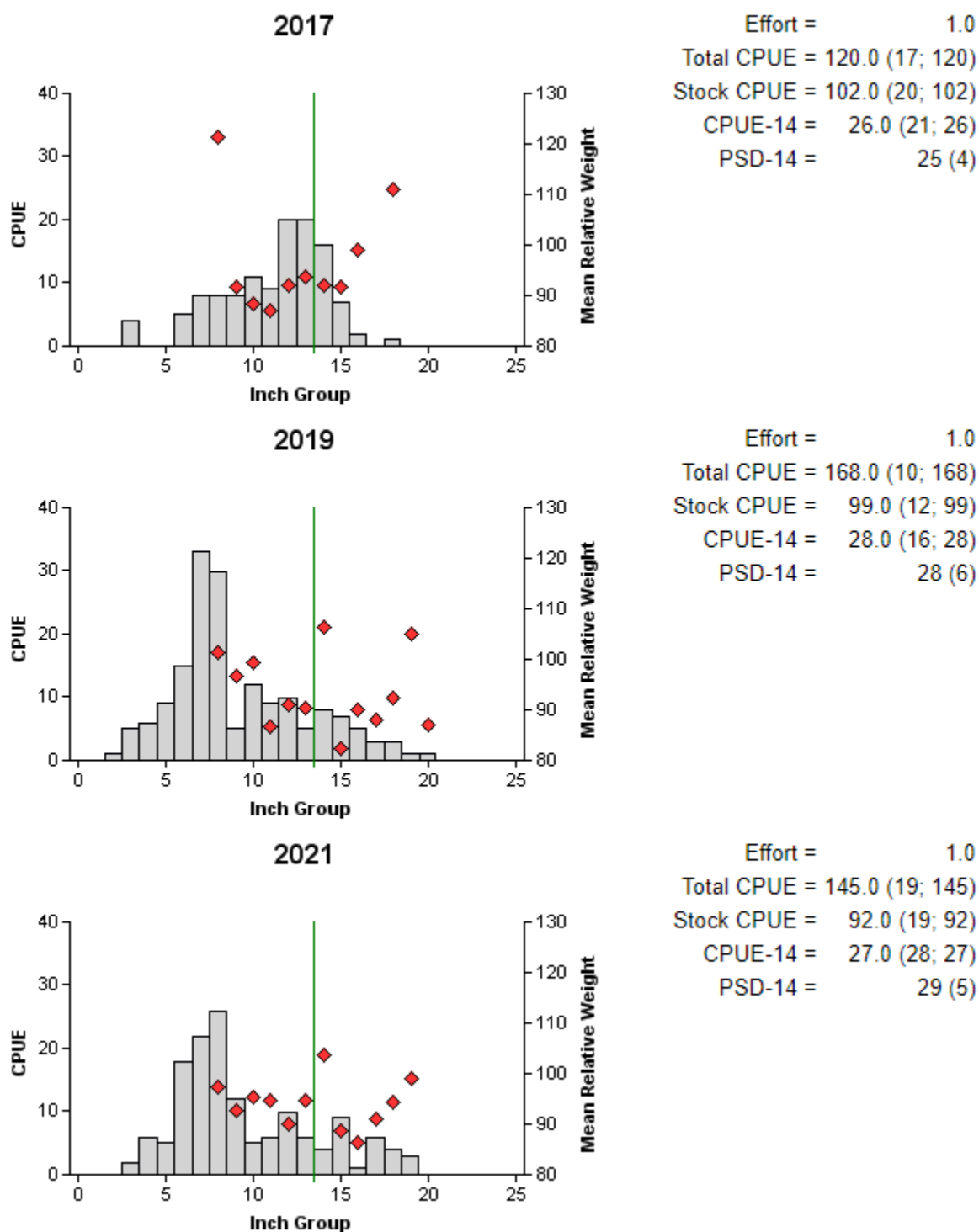


Figure 9. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Bob Sandlin, Texas, 2017, 2019, and 2021. Vertical line indicates minimum length limit.

Proposed Sampling Schedule

Table 8. Proposed sampling schedule for Lake Bob Sandlin, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall.

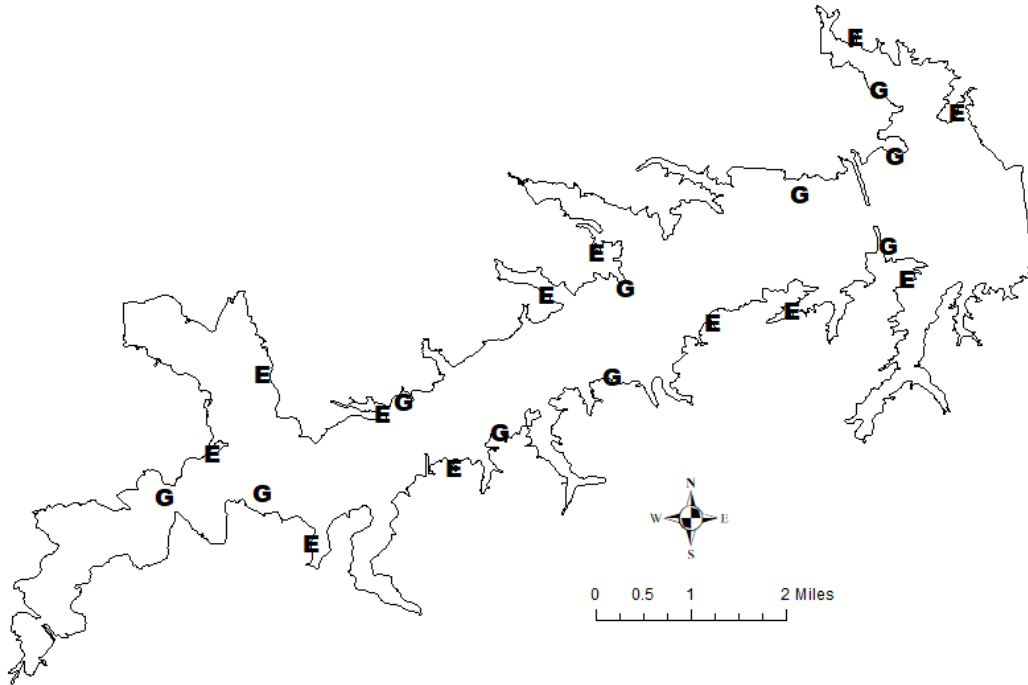
	Survey year			
	2022-2023	2023-2024	2024-2025	2026-2027
Angler Access				X
Structural Habitat				X
Vegetation	X	X	X	X
Electrofishing – Fall		X		X
Gill netting		X		X
Creel survey		X		
Report				X

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

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Lake Bob Sandlin, Texas, 2021-2022. Sampling effort was 10 net nights for gill netting and 1 hour for electrofishing.

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			219	219.0 (17)
Threadfin Shad			137	137.0 (36)
Blue Catfish	40	4.0 (22)		
Channel Catfish	142	14.2 (10)		
Flathead Catfish	2	0.2 (67)		
White Bass	45	4.5 (28)		
Warmouth			7	7.0 (33)
Bluegill			249	249.0 (21)
Longear Sunfish			80	80.0 (19)
Redear Sunfish			53	53.0 (26)
Spotted Bass			64	64.0 (24)
Largemouth Bass			145	145.0 (19)

APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Bob Sandlin, Texas, 2021-2022. Gill net and electrofishing stations are indicated by G and E, respectively. Water level was about 2 feet low during electrofishing and near full pool at time of gill netting.



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