

Bastrop Reservoir

2022 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

Prepared by:

Mukhtar Farooqi, Assistant District Management Supervisor
and
Patrick Ireland, District Management Supervisor

Inland Fisheries Division
San Marcos/Austin District, San Marcos, Texas

David Yoskowitz, Ph.D.
Executive Director

Timothy Birdsong
Director, Inland Fisheries

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Survey and Management Summary

Fish populations in Bastrop Reservoir were surveyed in 2022 using electrofishing and tandem hoop netting. Historical data are presented with the 2019-2022 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: Bastrop Reservoir is a stable-level 906-acre impoundment of Spicer Creek, a tributary of the Colorado River, and is located northeast of the City of Bastrop, Bastrop County, Texas. The dam was constructed in 1965 to supply water for cooling a natural-gas-fired power plant operated by the Lower Colorado River Authority (LCRA). The reservoir has a shoreline development index of 10.5 and lies within a unique ecological area known as the Lost Pines, a 70 square mile area of the Post Oak Savannah ecological area comprised of loblolly pine forests.

Management History: Important sport fish include Largemouth Bass and Channel Catfish. Florida Largemouth Bass were last stocked in Bastrop Reservoir in 1992 to increase Florida Largemouth Bass genetic influence. A 14- to 21-inch slot length limit and a 5-fish daily bag limit (only one greater than 21 inches) for Largemouth Bass was implemented in 1993.

Fish Community

- **Prey species:** Electrofishing catch of Gizzard Shad was very low. The fish that were caught were too large to be available as prey for most sport fish. Electrofishing catch of Bluegill was high. While other prey species were in very low abundance, the Bluegill population was sufficient for existing predators.
- **Channel Catfish:** The Channel Catfish population was very low and had decreased significantly compared to the results of the 2018 survey.
- **Largemouth Bass:** Largemouth Bass were abundant. Population size structure had shifted to a greater number of fish within the slot. Body condition of fish in 2022 was good for all length classes and was an improvement from the 2020 and 2018 surveys. Growth was slow.

Management Strategies: The reservoir should continue to be managed under current regulations. Aquatic plant coverage should be monitored annually. Conduct a year-long creel survey in 2025-2026. Electrofishing surveys should be carried out in 2024 (bass-only, collecting otoliths for a category-3 age-and-growth analysis) and in 2026. Sampling with hoop nets should continue, concurrent with experimental jug line surveys in summer 2024 and 2026 to evaluate the Channel Catfish fishery. Inform the public about the negative impacts of aquatic invasive species.

Introduction

This document is a summary of fisheries data collected from Bastrop Reservoir from 2019-2022. 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 2019-2022 data for comparison.

Reservoir Description

Bastrop Reservoir is a stable-level 906-acre impoundment of Spicer Creek, a tributary of the Colorado River, and is located northeast of the City of Bastrop, Bastrop County, Texas. The dam was constructed in 1965 to supply water for cooling a natural-gas-fired power plant operated by the Lower Colorado River Authority (LCRA). Water level is maintained by pumping from the Colorado River. The reservoir has a shoreline development index of 10.5 and lies within a unique ecological area known as the Lost Pines, a 70 square mile area of the Post Oak Savannah ecological area comprised of loblolly pine forests. Bastrop Reservoir was eutrophic with a mean TSI chl-a of 61.8, (Texas Commission on Environmental Quality 2022). Habitat at time of sampling consisted mainly of standing timber, native submerged aquatic vegetation, primarily eel grass, and non-native hydrilla. Other descriptive characteristics for Bastrop Reservoir are listed in Table 1.

Angler Access

At the time of survey, Bastrop Reservoir had two public boat ramps and no private boat ramps. The two public ramps, North Shore Park and South Shore Park were controlled by the LCRA and required entrance fees. Additional boat ramp characteristics are in Table 2. Public bank access included a fishing pier and dock located in each park. A fish-cleaning station was also available at the South Shore Park.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Farooqi and De Jesus 2019) included:

1. Conduct a year-long creel survey in 2020-2021 to determine angler harvest preferences and catch characteristics for Largemouth Bass.

Action: The creel survey was postponed due to the emergence of two issues that required immediate attention. Creel data was needed for Fayette County Reservoir to help address an escalating user conflict between Largemouth Bass anglers and cast netters targeting tilapia. Following the Fayette survey, a creel survey was necessary at Canyon Lake to gather fisheries data to help address the competing issues of homeowners and anglers regarding the presence of hydrilla. The Bastrop creel survey was rescheduled for 2025-2026.

2. Conduct a category-3 age-and-growth survey in 2021 to determine growth rates with better precision than typical category-2 surveys.

Action: The category-3 age-and-growth survey was postponed and will be performed in 2024.

3. Consider changing harvest regulations for Largemouth Bass if predicated by the creel survey, electrofishing survey, and age-and-growth survey data during the next report cycle. Use predictive modeling to assess potential outcomes. .

Action: A harvest regulation change will be considered based on the data from the 2025-2026 creel survey and the 2024 category 3 age-and-growth survey.

4. Continue to promote harvest of sub-slot bass when possible, collaborating with partners such as the Texas Tournament Zone.

Action: Outreach efforts have included social media, public presentations, and one-on-one interactions with constituents and other user groups.

5. Communicate with the Lower Colorado River Authority to discuss the status of hydrilla and assist with management, if necessary.

Action: Hydrilla control was not deemed necessary during this reporting period.

6. Continue to monitor aquatic vegetation on an annual basis to monitor the community.

Action: Aquatic vegetation surveys were conducted annually from 2019 to 2022.

7. Continue with efforts to educate the public about invasive species such as zebra mussels through the use of various media platforms.

Action: Information on zebra mussels and invasive species in general was disseminated through the use of media, and in person.

Harvest regulation history: Sport fish in Bastrop Reservoir have been managed with statewide regulations, except for a special slot length limit regulation for Largemouth Bass. The 14- to 21-inch slot-length limit was implemented in 1993 to improve the population size structure. Current regulations are found in Table 3.

Stocking history: Bastrop Reservoir has not required stocking with any species since 1997, when Channel Catfish were stocked to supplement the population. Florida Largemouth Bass were stocked from 1983 to 1992 to increase Florida Largemouth Bass genetic influence. The complete stocking history is in Table 4.

Vegetation/habitat management history: Bastrop Reservoir has had a diverse and dynamic submersed aquatic vegetation community history. Aquatic plants offered excellent fish habitat and consistently met optimal levels for maintaining fish production for phylophitic species (Durocher et al. 1984, Dibble et al. 1996). The exotic species Hydrilla has been present in the reservoir and has been monitored closely with annual surveys to prevent operational issues at the power plant. Other exotics, Eurasian water milfoil remained present in the reservoir, though haven't presented operational concerns.

Water transfer: There are no inter-basin water diversion structures at Bastrop Reservoir.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Bastrop Reservoir (Farooqi and De Jesus 2019). Primary components of the OBS plan are listed in Table 5. All survey sites (Appendix A) 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, and Gizzard Shad were collected by electrofishing (1 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Ages for Largemouth Bass were determined using otoliths from 13 randomly selected fish (range 13.0 to 14.9 inches).

Tandem hoop nets – Channel Catfish were collected using 9 tandem hoop-net series at 9 stations. Nets were baited with Zote soap and deployed for 2-night soak durations. CPUE for tandem hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series).

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 ($RSE = 100 \times SE \text{ of the estimate/estimate}$) was calculated for all CPUE statistics.

Habitat – A structural habitat survey was conducted in 2022. Vegetation surveys were conducted in 2019–2022 to monitor expansion of hydrilla. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Results and Discussion

Habitat: Habitat surveys were conducted annually from 2019 to 2022. In 2022, the habitat consisted primarily of natural shoreline (Table 6; Appendix B) with non-native hydrilla, native emergent aquatic vegetation, and native submerged vegetation (Table 7; Appendix C). Native vegetation covered about 17.5 % of the reservoir's surface area compared to 13.0 % coverage by non-native vegetation (Table 7). When percent coverage of native and non-native submerged aquatic vegetation is combined, it falls within the range identified as suitable for a productive fishery (Durocher et al. 1984, Dibble et al. 1996). Non-native Eurasian watermilfoil (*Myriophyllum spicatum*) was present in 2021 (1.3 %) and 2022 (1.1 % coverage).

Species composition: Number and catch rate of all target species collected by all gear types from Bastrop Reservoir are shown in Appendix D.

Prey species: Of the prey species available, Bluegill, Redear Sunfish, and Gizzard Shad electrofishing catch rates were 193.0/h, 4.0/h, and 3.0/h, respectively. Gizzard Shad abundance was very low, and the IOV was zero. Only three fish were caught and none of these were small enough to be vulnerable to existing predators. Gizzard Shad electrofishing CPUE has been consistently low in recent surveys (Figure 1). Redear Sunfish catch rate was also very low, only 4 fish were caught. Total CPUE of Bluegill was 193.0/h compared to 130.0/h in 2018, and 177.0/h in 2014. Bluegill size structure continued to be dominated by smaller individuals, mostly ≤ 4 inches (Figure 2). While other prey species were in very low abundance, the Bluegill population was sufficient to support existing predators.

Channel Catfish: Bastrop Reservoir has supported a Channel Catfish fishery for years and has been promoted as a prime catfish destination in the district. Gill net total catch rate for Channel Catfish in 2003, 2007, and 2011 was 9.4/nn, 7.6/nn and 4.4/nn, respectively; with an historical average total catch rate of 6.5/nn from 1998 to 2011 (De Jesus and Magnelia 2011). However, a declining trend was noticeable. In addition, some anglers expressed concern about low catch rates. As a consequence, gill net surveys were terminated after 2011. Since 2014-2015, Channel Catfish have been sampled using hoop nets

instead of gill nets. Hoop nets have been shown to be an effective means of targeting Channel Catfish and also allows for live release (Cunningham and Cofer, 2000 and Wallace et al., 2011). Based on this, hoop netting should give a more accurate representation of the Channel Catfish population. In 2022, the total catch rate for Channel Catfish was 0.9 fish per series; while stock-size catch rate was 0.2 fish per series. A total of eight fish were caught. This did not meet the objective of collecting a minimum of 50 stock-size (≥ 11 inches) Channel Catfish for an RSE of 25 using 9 tandem sets. The results were similar in 2016 when CPUE was 0.3 fish per series and stock-size catch rate was 0.2 fish per series (Figure 3). However, the CPUE in 2018 was significantly higher at 4.6 fish per series, the stock-size catch rate was 3.4 fish per series, and a total of 41 fish were caught. Due to the highly variable nature of the catch rates, it is difficult to determine if the observed results were representative of the population. Thus, sampling with hoop nets should continue and consideration be given to concurrent experimental surveys with jug lines to fully evaluate these techniques for evaluating Channel Catfish in Bastrop Reservoir.

Largemouth Bass: This power-plant fishery is known for its quality fish in terms of numbers and size of Largemouth Bass, although trophy fish production is limited. The lake record is 9.9 pounds. The electrofishing catch rate of stock-length Largemouth Bass in 2022 was high (109.0/h), as was the case in 2020 (154.0/h) and 2018 (133.0/h) surveys (Figure 4). Since 2018 and 2020, population size structure has shifted to a greater number of fish within the slot. The catch rate of Largemouth Bass ≥ 14 inches (CPUE-14) increased to 39.0 /h in 2022, whereas it was 19.0/h in 2020 and 21.0/h in 2018 (Figure 4). Historically, bass ≥ 21 inches in length have been in low abundance (DeJesus and Farooqi 2015) and only one fish was sampled from 2010 to 2022. It is surmised that slow growth within the slot length limit makes it rare to see individuals live long enough to surpass the upper slot length of 21 inches. While trophy-size fish are seldom reported or sampled, this fishery has maintained itself as a quality-size, high-catch fishery. In 2022, PSD was 68 compared to 58 and 39 in 2020 and 2018 respectively. Body condition of fish sampled in 2022 was good for all length classes ($W_r \geq 90$) and was an improvement from the 2020 and 2018 surveys (Figure 4), where fish in the slot were in poor condition ($W_r \leq 85$). Largemouth Bass in Bastrop Reservoir reached 14 inches between age 2 to 4 (Figure 5) which is slower compared to values for the Edwards Plateau ecological area (Prentice 1987). Genetic analysis was not performed in 2022. In the past (2002 to 2014), Florida Largemouth Bass influence has remained relatively constant as Florida alleles have ranged from 74% to 86%, despite no Florida Largemouth Bass stockings since 1992 (Table 8; De Jesus and Farooqi 2015). Genetic analysis will be conducted in 2026.

Fisheries Management Plan for Bastrop Reservoir, Texas

Prepared – July 2023

ISSUE 1: The Largemouth Bass fishery is known for its quality fish, although trophy fish production is limited. Largemouth Bass growth within the slot has been historically poor, with few fish in older age classes exceeding 18 inches in length. There was only one bass collected that exceeded 21 inches in length during electrofishing surveys since 1998. The last creel survey was conducted in 2004. Up to date growth and harvest data are necessary to make an informed decision on the most appropriate harvest regulation. Data collected over the next four years will be used to evaluate the effectiveness of the 14-21-inch slot limit.

MANAGEMENT STRATEGIES

1. Conduct a year-long creel survey in 2025-2026 to determine angler harvest preferences and catch characteristics for Largemouth Bass.
2. Conduct a category-3 age-and-growth survey in 2024 to determine growth rates with better precision than typical category-2 surveys.
3. Conduct genetic analysis of Largemouth Bass in 2026 to determine Florida bass influence.

ISSUE 2: Hydrilla can potentially affect power plant operations if it grows out of control around the intake area. The plant has been monitored annually as a Tier II maintenance effort.

MANAGEMENT STRATEGY

1. Continue to survey aquatic vegetation on an annual basis to monitor the community.

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 (*Dreissena polymorpha*) 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 (*Salvinia molesta*) 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. Currently, zebra mussels have not established themselves in Bastrop Reservoir.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to ensure there is adequate signage at access points around the reservoir.
2. Educate the public about invasive species through the use of various media.
3. Make a speaking point about invasive species when presenting to constituent and user groups.

ISSUE 4: Historically, there was a quality Channel Catfish fishery at Bastrop Reservoir, however a declining trend was noticeable in the gill netting data. In addition, some anglers expressed concern about low catch rates. The results from hoop net surveys have been inconclusive so far.

MANAGEMENT STRATEGY

1. Sampling with hoop nets should continue, concurrent with jug line surveys in 2024 and 2026 to evaluate the Channel Catfish fishery.

Objective-Based Sampling Plan and Schedule (2023–2027)

Sport fish, forage fish, and other important fishes

Sport fishes in Bastrop Reservoir include Largemouth Bass and Channel Catfish. Known important forage species include Bluegill, Redear Sunfish, Gizzard Shad and Threadfin Shad.

Negligible fisheries

White Crappie: White Crappie were stocked in Bastrop reservoir in 1992 and are present, but population abundance is very low, based on poor captures in historic trap netting surveys. A creel survey in 2004 did not identify directed effort for this species, revealing little interest by anglers to pursue this species at Bastrop reservoir. Sampling for White Crappie is not a priority for the 2023-2027 sampling period.

Blue Catfish: Blue Catfish were stocked in Bastrop Reservoir from 1969 to 1971 and are expected to be present in low abundance. Anecdotal catch reports for this species by anglers in recent years are the only evidence of their existence in the lake. Water conditions at this power plant reservoir do not provide the typical habitat features of lakes where Blue Catfish flourish. Gill netting surveys from 2006 to 2011 have failed to collect Blue Catfish specimens. Sampling for Blue Catfish is not a priority for the 2023-2027 sampling period.

Flathead Catfish: Flathead Catfish were present in low abundance, based on gill netting surveys conducted between 1998 and 2011. During this time, CPUE total averaged 0.8 fish/nn, and ranged between 0.2 and 2.0 fish/nn. A creel survey in 2004 did not identify directed effort for this species, revealing little interest by anglers to pursue this species at Bastrop reservoir. Sampling for Flathead Catfish is not a priority for the 2023-2027 sampling period.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass is the most popular sport fish in Bastrop Reservoir based on a 2004 creel survey. Results from that creel survey showed directed angling effort for Largemouth Bass to be 17 hours/acre and accounted for 69% of the total directed effort. Largemouth Bass are managed with a 14- to 21-inch slot regulation. While few fish grow past the slot, this lake is known for quality fish and good angling catch rates (0.77/h in 2004 creel survey). Trend data on CPUE, size structure, and body condition have been collected biennially since 2002 with fall nighttime electrofishing. The population exhibits good relative abundance, and anglers are anecdotally somewhat satisfied with the fishing. Most were satisfied with the restrictive harvest regulation in the 2004 creel survey. Continuation of biennial trend data in this clear reservoir with night electrofishing in the fall will allow for determination of any large-scale changes in the Largemouth Bass population. A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in fall 2024 (bass-only) and 2026, but sampling will continue at

random sites until 50 stock-size fish are collected and the RSE of CPUE-S is ≤ 25 (the anticipated effort to meet both sampling objectives is 12-15 stations with 80% confidence). Exclusive of the original 12 random stations, three additional random stations will be pre-determined in the event some extra sampling is necessary. If failure to achieve either objective has occurred after one night of sampling and objectives can be attained with 6-12 additional random stations, another night of effort will be expended. A bass-only electrofishing survey will be conducted in fall 2024. Fish will be collected for a category-3 age-and-growth survey to collect a target of 200 fish between 5.9 inches and 19.7 inches (10 per inch-group). A year-long creel survey in 2025-2026 will be conducted to gather Largemouth Bass catch characteristics and angler opinions, which was last carried out in 2004. For Largemouth Bass, a sample of fin clips from 30 fish will be used for genetic analysis in 2026.

Channel Catfish: The 2004 creel survey indicated Channel Catfish angling comprised 3.7% of total angling effort (a distant second to Largemouth Bass at 69%). Gill netting total CPUE ranged from 4.4 to 9.4 fish/nn (6.6 fish/nn average) from 2001 to 2011 (when the last survey was done), providing only an average of 32 stock-size and larger fish per survey. Information is needed to monitor size structure and body condition with greater precision. Hoop nets have been shown to be an effective means of targeting Channel Catfish and also allows for live release (Cunningham and Cofer, 2000 and Wallace et al., 2011). Standard gill net surveys were replaced by tandem hoop net surveys set for two nights starting in 2015. Setting a minimum of nine tandem hoop nets, with a soak time of two nights, should achieve the sampling objective (50 Channel Catfish ≥ 11 inches; RSE of CPUE-S ≤ 0.25). A minimum of nine randomly selected tandem hoop netting sites will be sampled in summer 2024 and 2026, but sampling will continue at random sites until 50 stock-size fish are collected and the RSE of CPUE-S is ≤ 25 (the anticipated effort to meet both sampling objectives is nine stations with 75% confidence). Exclusive of the original nine random stations, nine additional random stations will be pre-determined in the event additional sampling is necessary. If failure to achieve either objective has occurred after one soak session, and objectives can be attained with up to nine additional random stations, another soak session of effort will be expended. Jug lines will be used on an experimental basis concurrent with hoop nets to compare the efficacy of both techniques.

Sunfish and Threadfin Shad: Bluegill, Redear Sunfish, Redbreast Sunfish, Threadfin Shad, and Gizzard Shad are the primary forage at Bastrop Reservoir. Like Largemouth Bass, trend data on CPUE and size structure of these sunfish have been collected biennially since 1996. Abundance of Threadfin Shad will also be measured as a function of CPUE during those surveys. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in sunfish relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers of sunfish for size structure estimation (PSD and IOV; 50 fish minimum at 12 randomly selected 5-min electrofishing sites with 80% confidence) but not for relative abundance estimates (RSE ≤ 25 of CPUE-Total; anticipated effort is 25-30 stations). At the sampling effort needed to achieve sampling objectives for Largemouth Bass, the expected RSE for CPUE-T is 30 for sunfish species combined. No additional effort will be expended to achieve an RSE of 25 for CPUE of sunfish. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density. Relative weight of Largemouth Bass ≥ 8 " TL will be determined from their length/weight data.

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Tables and Figures

Table 1. Characteristics of Bastrop Reservoir, Texas.

Characteristic	Description
Year constructed	1965
Controlling authority	Lower Colorado River Authority
County	Bastrop
Reservoir type	Power plant cooling reservoir
Shoreline Development Index	10.5
Conductivity	972 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Bastrop Reservoir, Texas, August 2022. Reservoir elevation at time of survey was 449 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
North Shore Park	30.16571 -97.28069	Y	54	443	Good
South Shore Park	30.14109 -97.28503	Y	36	443	Good

Table 3. Harvest regulations for Bastrop Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (only 10 \geq 20 inches)	None
Catfish, Flathead	5	18-inch minimum
Bass, Largemouth	5 (only 1 \geq 21 inches)	14- to 21-inch slot
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history for Bastrop Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Black Crappie x White Crappie	1993	90,400	FRY	0.9
	1994	110,753	FRY	0.9
	1995	103,738	FRY	0.9
	Total	304,891		
Blue Catfish	1969	4,425	UNK	0.0
	1970	4,615	UNK	0.0
	1971	4,644	UNK	0.0
	Total	13,684		
Channel Catfish	1969	5,517	AFGL	7.9
	1970	4,683	AFGL	7.9
	1971	4,610	AFGL	7.9
	1982	500	UNK	0.0
	1990	6,208	ADL	11.2
	1997	8,300	AFGL	7.0
	Total	29,818		
Florida Largemouth Bass	1983	41,713	FGL	2.0
	1984	17,056	FGL	3.0
	1990	90,551	FRY	0.8
	1991	771	ADL	9.0
	1991	90,872	FGL	1.3
	1992	59,509	FGL	1.1
	1992	31,101	FRY	0.9
	Total	331,573		
Green Sunfish x Redear Sunfish	1972	1,980		0.0
	Total	1,980		
Kemp's Largemouth Bass	1985	46,314		1.0
	1986	45,400		1.0

Table 4. Stocking history for Bastrop Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Palmetto Bass (Striped X White Bass hybrid)	Total	91,714		
	1972	1,800	FGL	1.5
	1973	9,760	FGL	1.5
	1974	10,400	UNK	0.0
	1975	9,086	UNK	0.0
	Total	31,046		
Peacock Bass	1978	519		0.0
	1979	3,234		0.0
	Total	3,753		
White Crappie	1992	94,577	FRY	0.6
	Total	94,577		

Table 5. Objective-based sampling plan components for Bastrop Reservoir, Texas 2022–2023.

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	RSE ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$
Gizzard Shad ^a	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$
	Prey availability	IOV	$N \geq 50$
<i>Tandem hoop netting</i>			
Channel Catfish	Abundance	CPUE–stock	RSE–Stock ≤ 25
	Size structure	length frequency	$N \geq 50$ stock
	Condition	W_r	10 fish/inch group (max)

^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, Bastrop Reservoir, Texas, 2022. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Bulkhead	1.68 miles	10.0
Bulkhead with boat docks	0.18 miles	1.0
Natural	14.64 miles	84.0
Natural with boat docks	0.02 miles	< 1.0
Rocky	0.87 miles	5.0
Rocky with boat docks	0.03 miles	< 1.0
Standing timber	21.00 acres	2.0

Table 7. Survey of aquatic vegetation, Bastrop Reservoir, Texas, 2019–2022. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2019	2020	2021	2022
Native submersed	44.1 (4.9)	44.0 (4.8)	124.7 (13.7)	71.6 (7.9)
Native floating-leaved	0.0	0.0	0.0	0.0
Native emergent	81.1 (8.9)	90.6 (10.0)	95.5 (10.5)	87.0 (9.6)
Non-native				
Hydrilla (Tier II)*	133.7 (14.8)	135.8 (14.9)	58.3 (6.5)	108.4 (11.9)
Eurasian watermilfoil (Tier III)*	0.0	0.0	12.3 (1.3)	10.5 (1.1)

*Tier I is Immediate Response, Tier II is Maintenance Response, and Tier III is Watch Status

Gizzard Shad

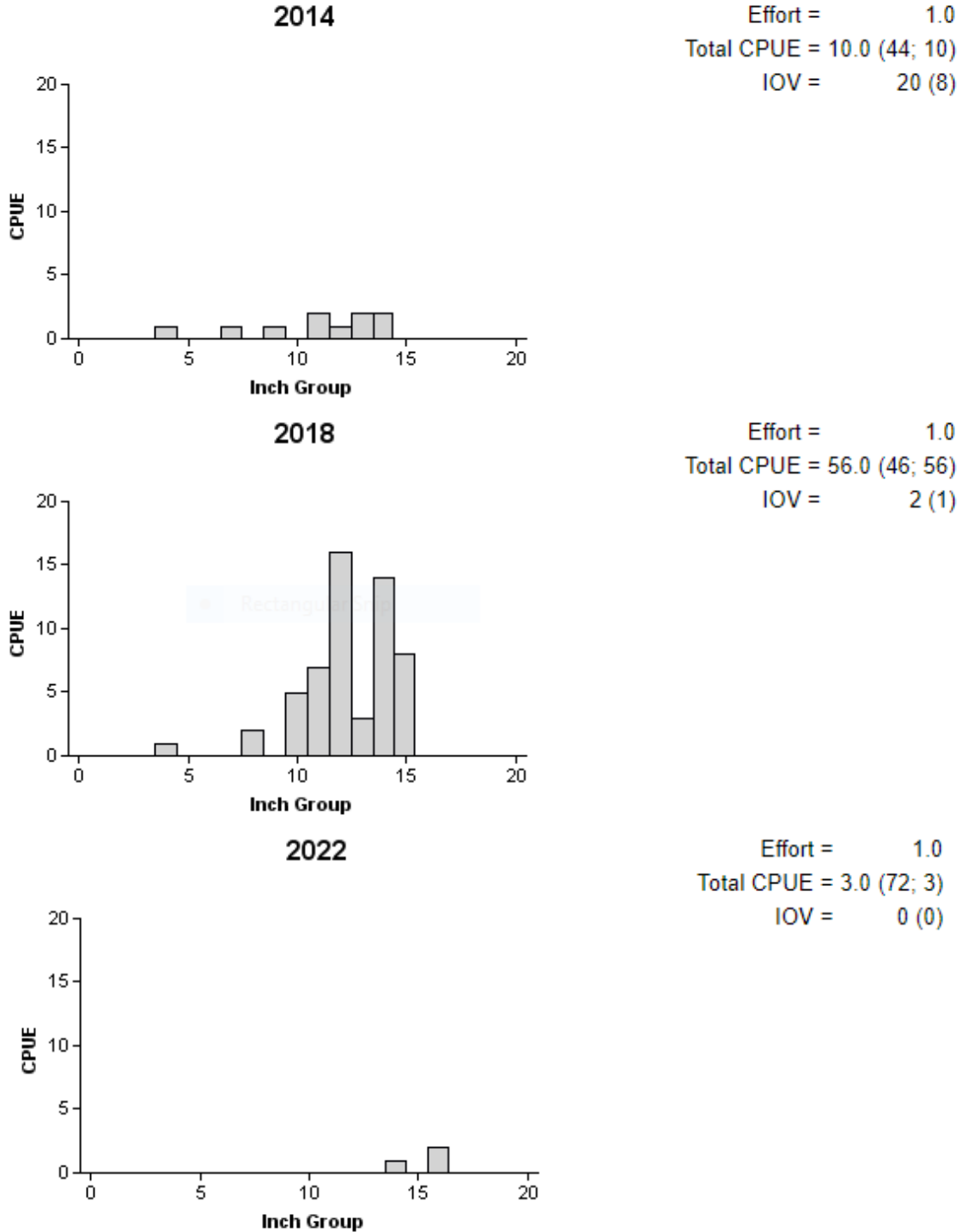


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Bastrop Reservoir, Texas, 2014, 2018, and 2022.

Bluegill

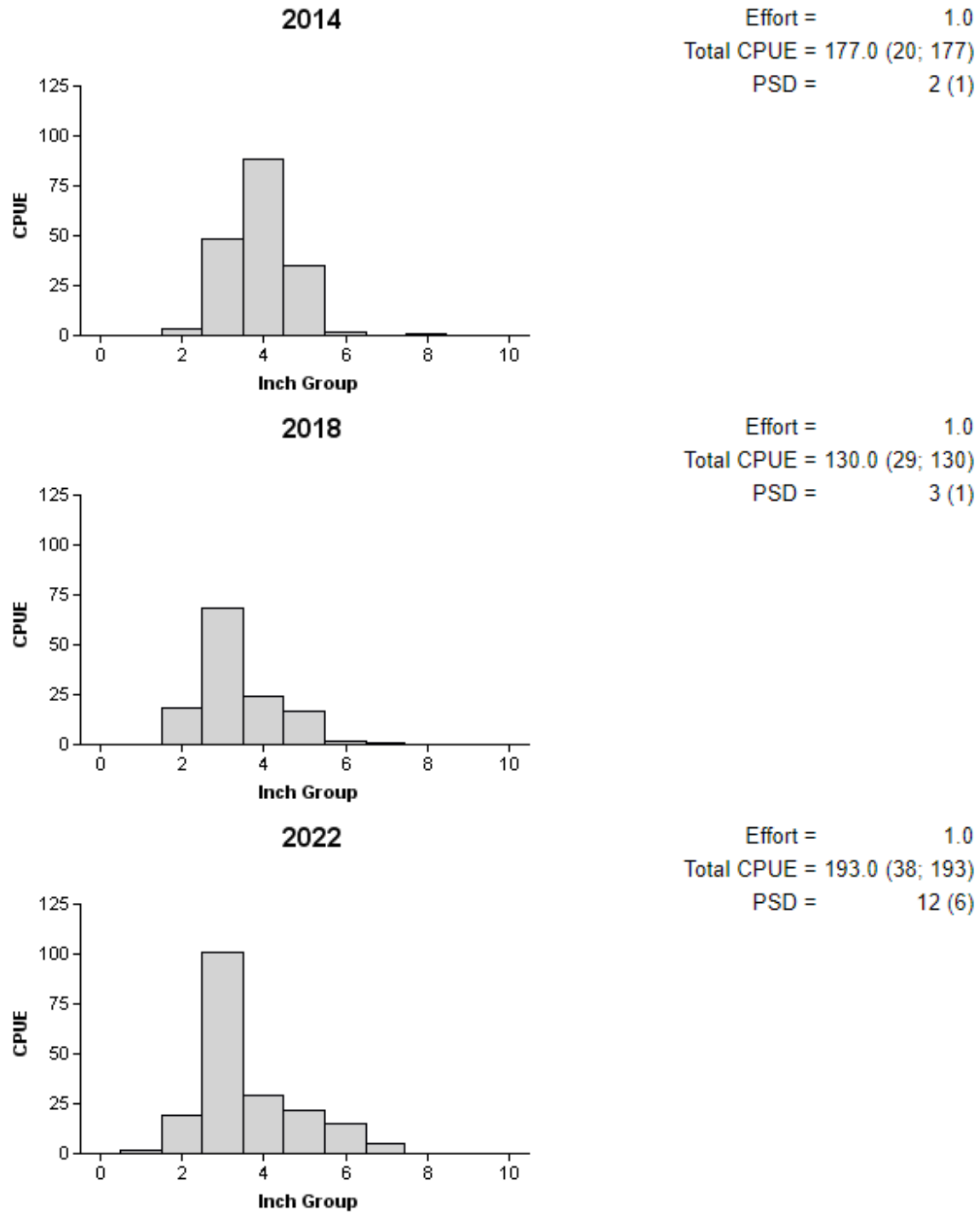


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Bastrop Reservoir, Texas, 2014, 2018, and 2022.

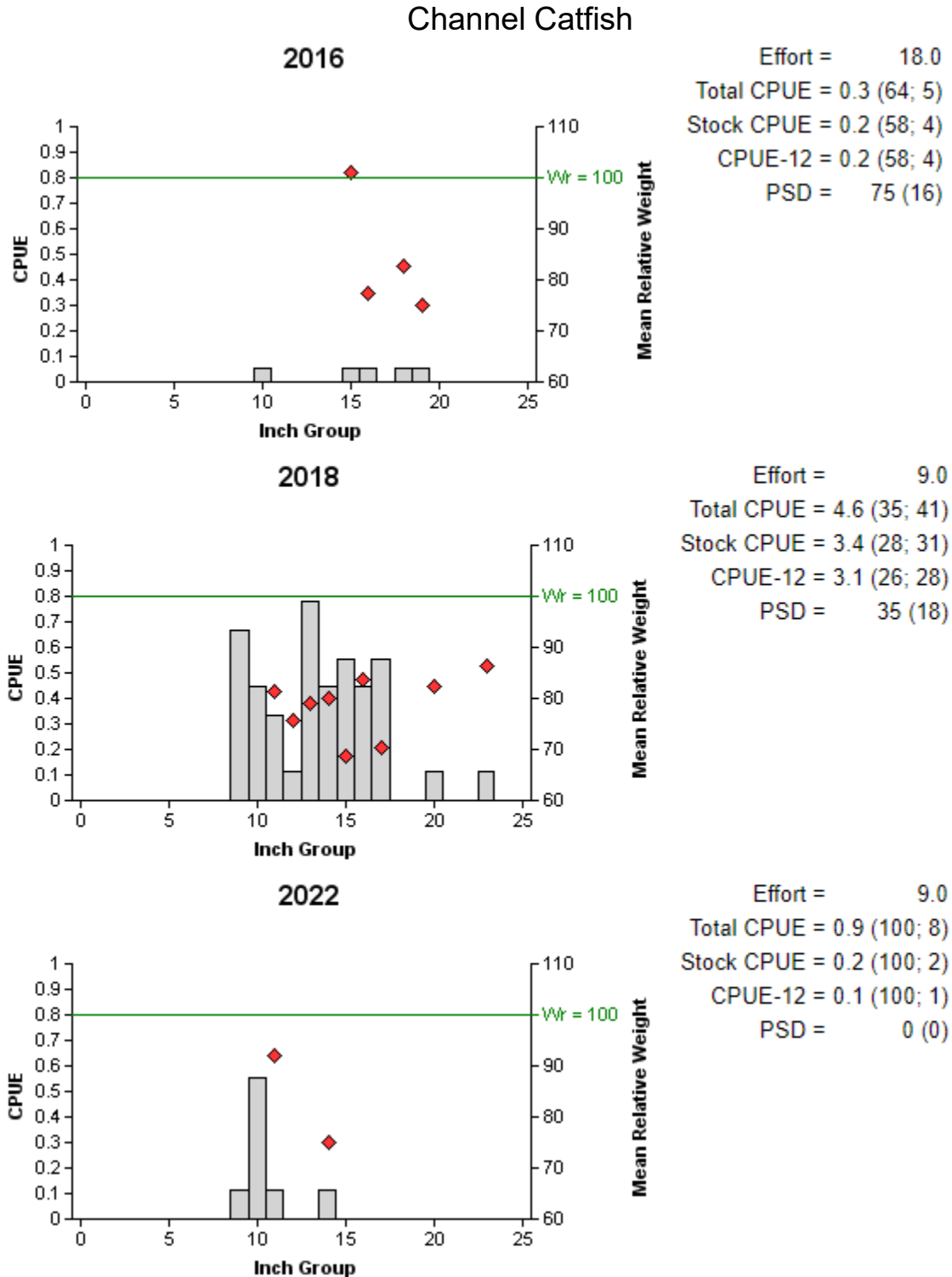


Figure 3. Number of Channel Catfish caught per hoop net series (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for tandem hoop net surveys, Bastrop Reservoir, Texas, summer 2016, 2018, and 2022.

Largemouth Bass

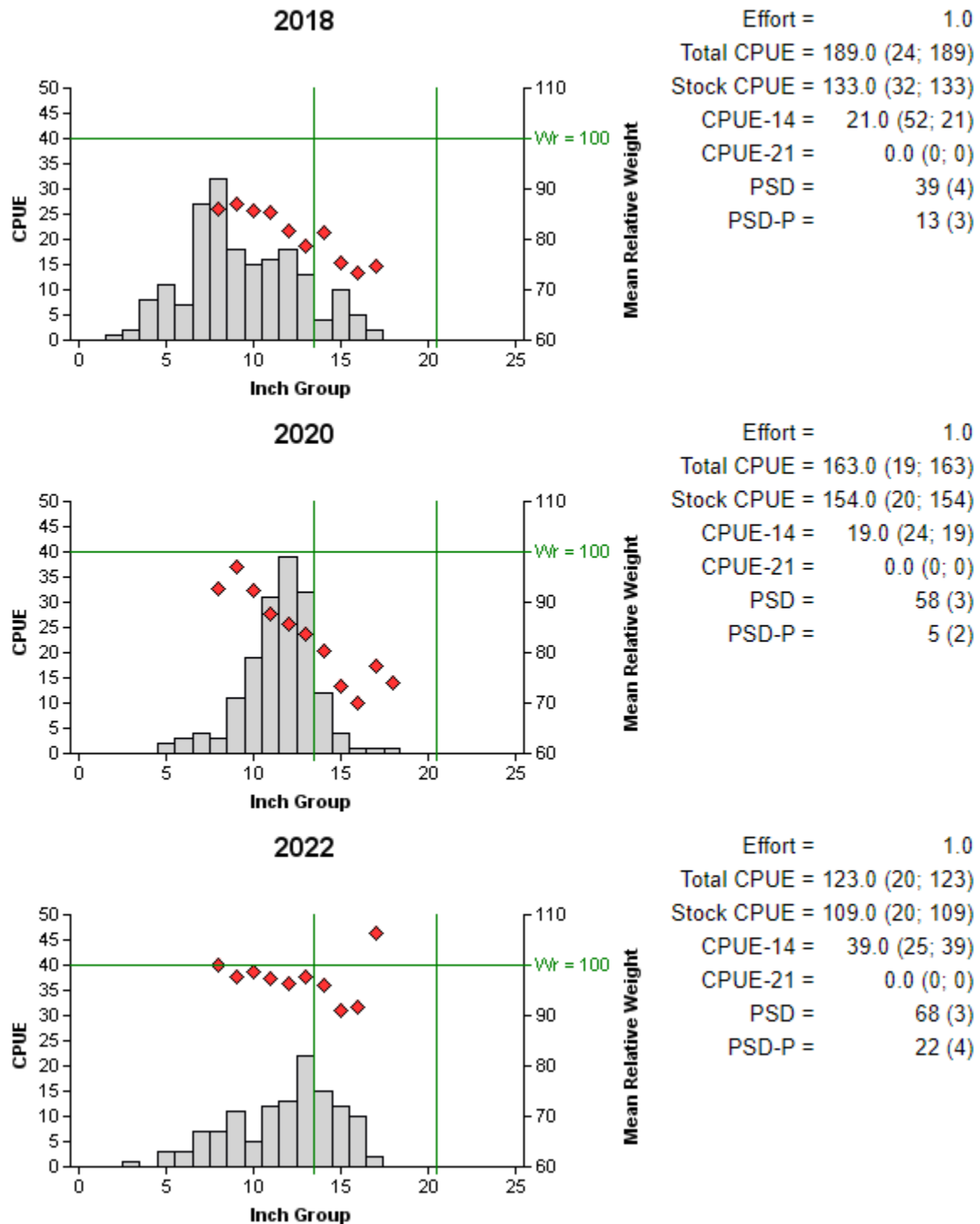


Figure 4. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure) for fall electrofishing surveys, Bastrop Reservoir, Texas, 2018, 2020, and 2022.

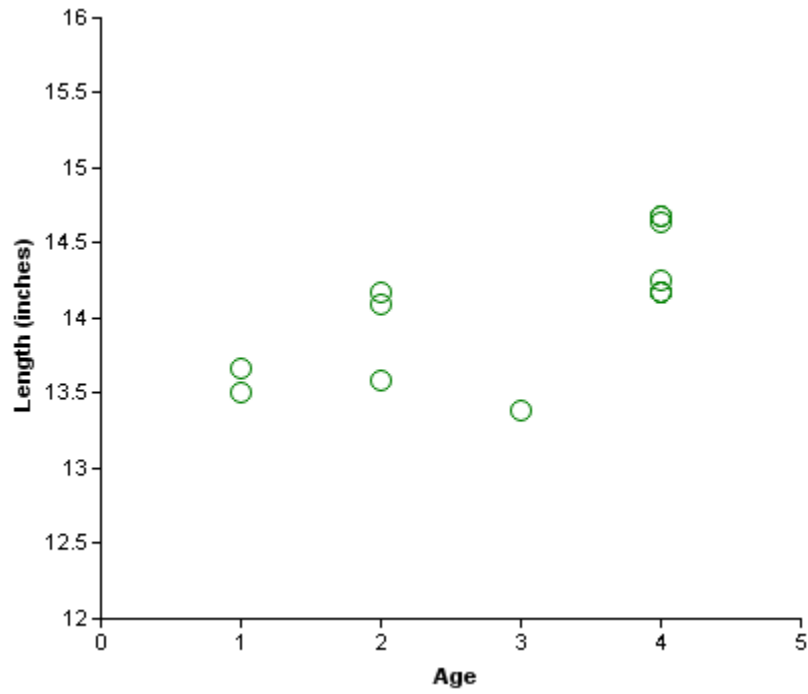


Figure 5. Length at age for Largemouth Bass (N = 13) collected from electrofishing at Bastrop Reservoir, Texas, October 2022.

Largemouth Bass

Table 8. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Bastrop Reservoir, Texas, 2002, 2006, and 2014. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

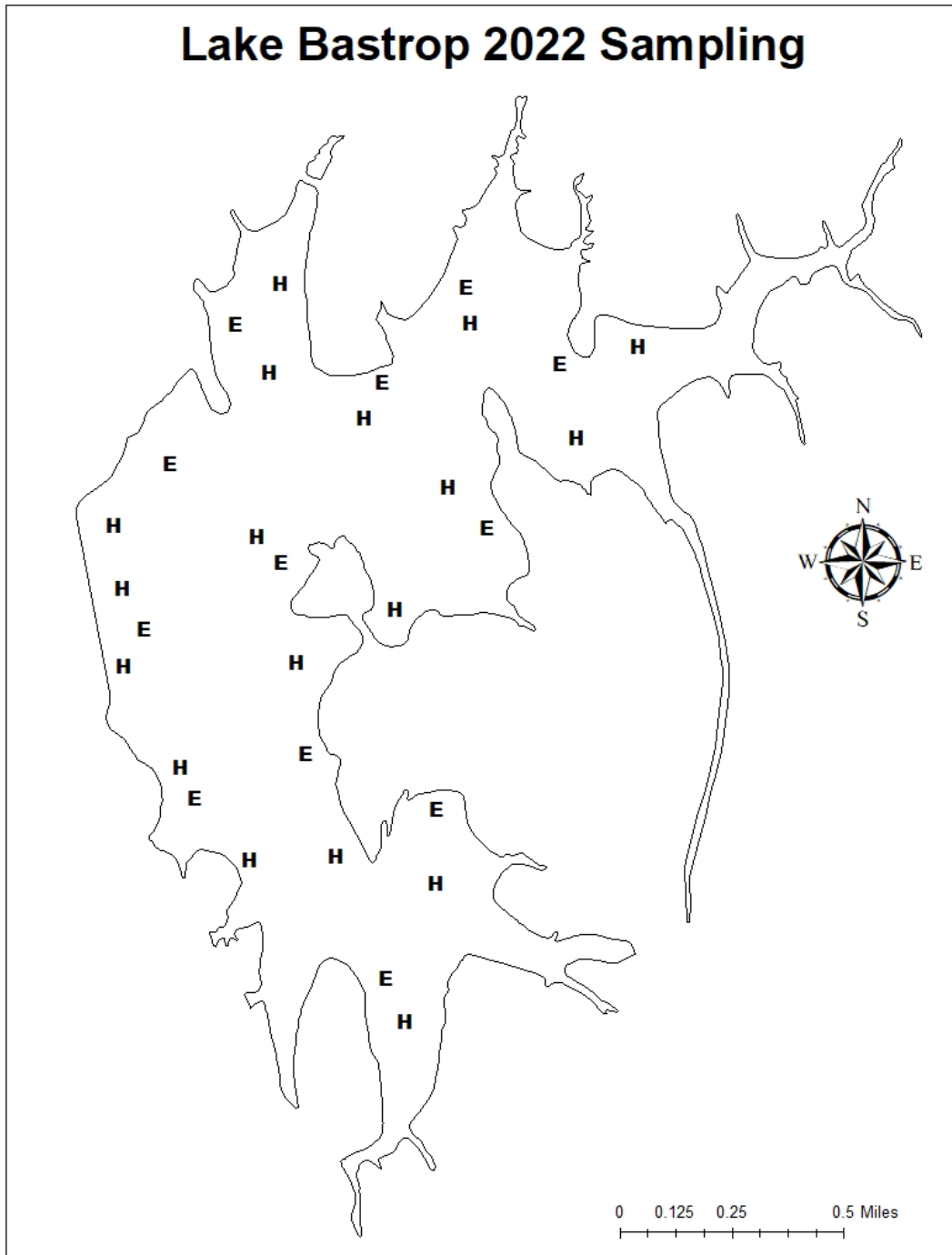
Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
2002	29	16	13	0	86.4	55.2
2006	30	3	27	0	74.0	10.0
2014	30	0	30	0	81.0	0.0

Proposed Sampling Schedule

Table 9. Proposed sampling schedule for Bastrop Reservoir, Texas. Survey period is June through May. Hoop and jug line surveys are conducted in the summer, while electrofishing surveys are conducted in the fall.

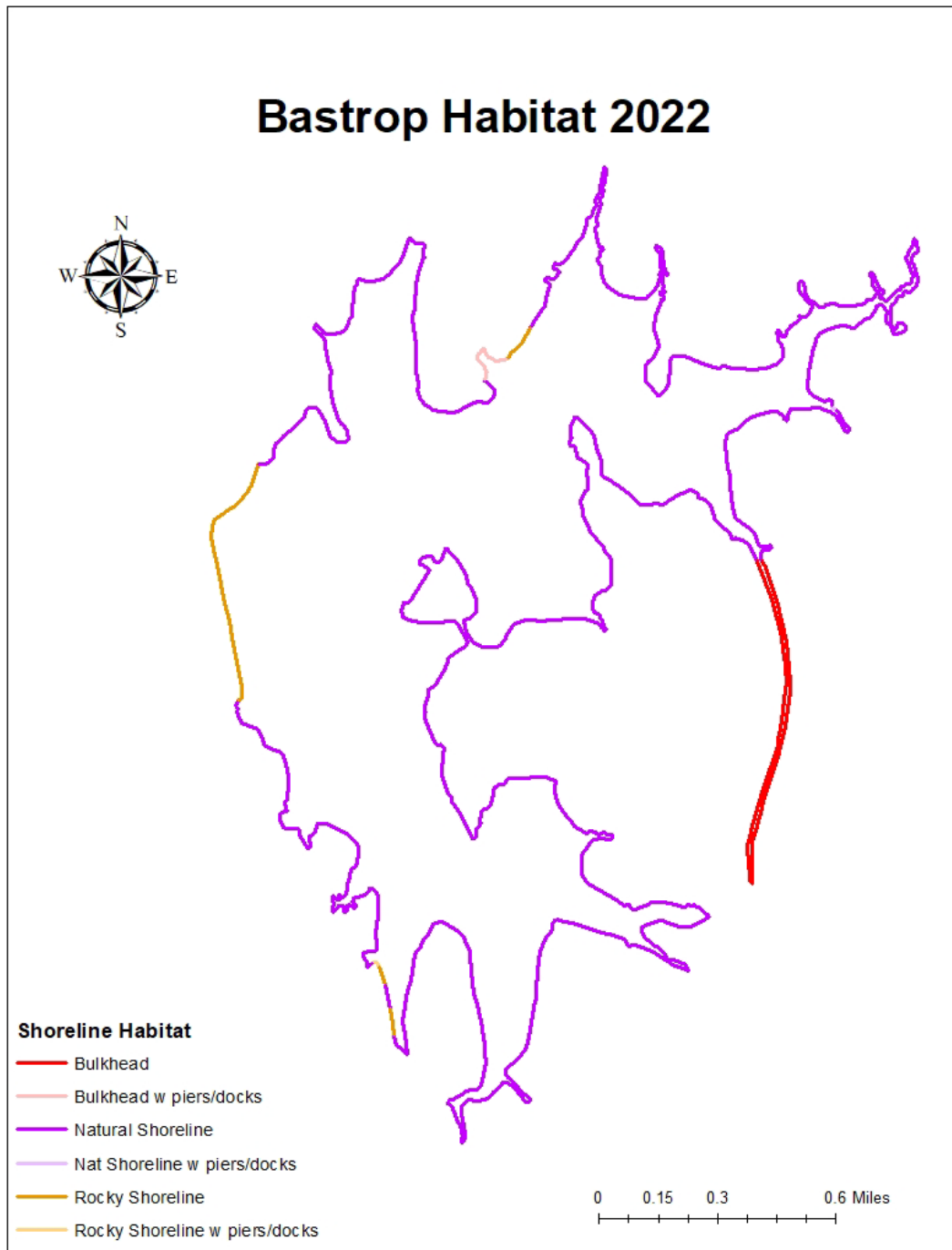
	Survey year			
	2023-2024	2024-2025	2025-2026	2026-2027
Angler access				X
Structural habitat				X
Vegetation	X	X	X	X
Electrofishing		X		X
Baited tandem hoop netting		X		X
Jug lines		X		X
Creel survey			X	
Report				X

APPENDIX A – Sampling locations



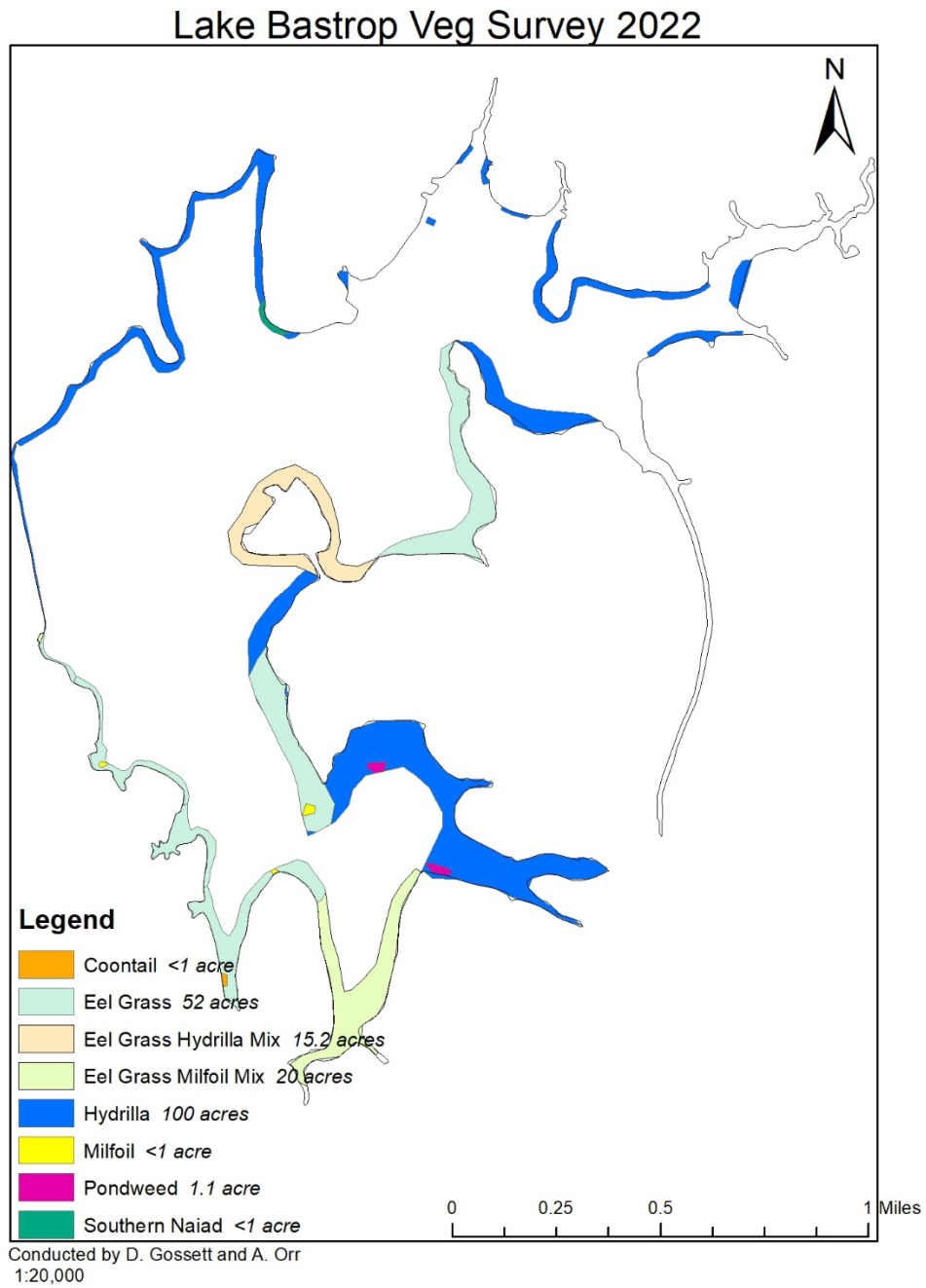
Location of sampling sites, Bastrop Reservoir, Texas, 2022-2023. Hoop net and electrofishing stations are indicated by H and E, respectively. Water level was near full pool at time of sampling.

APPENDIX B – Structural Habitat



Structural habitat survey map for Bastrop Reservoir, Texas, September 2022.

APPENDIX C – Aquatic vegetation



Aquatic vegetation survey coverage map for Bastrop Reservoir, Texas, September 2022.

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

Number (N) and catch rate (CPUE and RSE in parentheses) of all target species collected from all gear types from Bastrop Reservoir, Texas, 2022-2023. Sampling effort was 9 tandem series for hoop netting (2-night soak duration) and 1 hour for electrofishing.

Species	Electrofishing		Hoop Netting	
	CPUE	N	CPUE	N
Gizzard Shad	3.0	3 (72)		
Channel Catfish			0.9	8 (100)
Bluegill	193.0	193 (38)		
Redear Sunfish	4.0	4 (56)		
Largemouth Bass	123.0	123 (20)		



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