

Lavon 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

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Survey and Management Summary

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

Reservoir Description: Lavon Reservoir is a 21,400-acre impoundment located on the East Fork Trinity River approximately 8 miles east of McKinney. Water level has fluctuated widely in the last decade yet has remained above or near the conservation elevation (492 feet above mean sea level) since 2015. Lavon Reservoir has high productivity. Habitat features consisted mainly of riprap along the dam and railroad bridges, dead trees and stumps, and rocky shoreline. Standing dead timber is prevalent in the upper reservoir. Aquatic vegetation is limited due to extreme water-level fluctuations.

Management History: Important sport fishes include White Bass, Largemouth Bass, crappie, and catfish. All species except Channel and Blue Catfish are managed with statewide regulations. Regulations meant to restrict harvest of large Channel and Blue Catfish were implemented in 2021. Florida Largemouth Bass have been stocked periodically to improve Largemouth Bass genetics. District staff served on a committee to develop a Watershed Protection Plan for Lavon Reservoir. Public education and monitoring for zebra mussels have focused on Lavon Reservoir to help prevent introduction and colonization.

Fish Community

- **Prey species:** Threadfin Shad and Gizzard Shad were present in moderate abundance and available as prey to most fishes. Bluegill and Longear Sunfish were abundant and provided a good prey base for sport fishes.
- **Catfishes:** Blue Catfish continued to be abundant with some larger individuals available to anglers. Channel Catfish continued to have low abundance.
- **Temperate basses:** White Bass abundance declined since the catch of record in 2019, but many legal-length fish were still available to anglers. Yellow Bass were numerous.
- **Largemouth Bass:** Largemouth Bass electrofishing catch rate was a new record. Elevated lake levels have improved reproduction and recruitment. Many legal-length fish were available to anglers.
- **Crappie:** White Crappie remained abundant with harvestable fish available to anglers. Most White Crappie reached legal-length by age one. Black Crappie were less abundant but catch rates have generally increased, with a record catch in 2022.

Management Strategies: Conduct general monitoring with electrofishing surveys, trap nets, and gill nets in 2026-2027. Collect genetic data for Largemouth Bass from electrofishing survey in 2026. Access and vegetation surveys will be conducted in 2026. Inform the public about the negative impacts of aquatic invasive species. Continue to evaluate mortality estimates for White Crappie.

Introduction

This document is a summary of fisheries data collected from Lavon Reservoir from 2022-2023. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2022-2023 data for comparison.

Reservoir Description

Lavon Reservoir is a 21,400-acre impoundment constructed in 1953 on the East Fork Trinity River. The reservoir is in Collin County approximately 8 miles east of McKinney and is operated and controlled by the U.S. Army Corps of Engineers (USACE). The original dam impounded 11,080 acres of water. In 1974, the dam was raised 12 feet which increased the surface area of the reservoir to 21,400 acres. Primary project purposes are municipal and industrial water supply, flood control, and recreation. Lavon Reservoir was eutrophic with a mean trophic state index (TSI) chl-*a* of 61.84 (Texas Commission on Environmental Quality 2022). Lavon has become more eutrophic in recent years possibly due to continued inflow from a regional sewage treatment facility and continued urbanization in the watershed. Habitat at time of sampling consisted of dead trees, rocks and boulders, riprap, and rocky shoreline. Native aquatic plants present were water willow and buttonbush. Water level has been at or near the conservation elevation since 2015 (Figure 1) following a prolonged drought and historic low lake levels. Other descriptive characteristics for Lavon Reservoir are in Table 1.

Angler Access

Lavon Reservoir has sixteen public boat ramps, and most are subject to periodic closures by the USACE due to water level fluctuations or maintenance. An up-to-date status of USACE parks and boat ramps is available at <http://www.swf-wc.usace.army.mil/lavon/>. Shoreline access to Lavon Reservoir is substantial and unlimited unless posted. Boat ramp characteristics appear in detail in Table 2.

Management History

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

1. Promote improved fish populations including Blue Catfish, White Bass, and Largemouth Bass.

Actions: Fishery improvements were reflected in updates on the TPWD web site. Fishing opportunities were promoted through media contacts and social media.
2. Introduce native aquatic vegetation species.

Action: Native aquatic vegetation (Illinois pondweed and white water lily) was introduced in 2023.
3. Continue public education regarding invasive species.

Actions: Signage has been maintained at boat ramps and concerns with invasive species have been discussed on social media.

Harvest regulation history: Except for Channel and Blue Catfish, sportfish in Lavon Reservoir are managed with statewide regulations. On September 1, 2021, the 12-inch minimum length limit (MLL) for Channel and Blue Catfish was changed to no MLL, with no more than 5 fish 20 inches or greater in length and no more than 1 fish 30 inches or longer retained in the combined 25 fish bag limit. This was part of a statewide effort to direct harvest towards smaller catfish and protect larger sizes. Current regulations are found in Table 3.

Stocking history: Lavon Reservoir has been stocked periodically with Florida Largemouth Bass since 1988 to enhance the trophy potential of the reservoir. In 2022, approximately 66,241 Lone Star Bass fingerlings were stocked into Lavon Reservoir. Lone Star Bass are 2nd generation offspring of pure Florida strain ShareLunker Largemouth Bass that have proven to be able to grow to \geq 13 pounds. The complete stocking history is in Table 4.

Water transfer: To augment municipal and industrial water, Lavon Reservoir receives inter-basin transfers from Cooper and Tawakoni Reservoirs which are within the Sulphur and Sabine River Basins, respectively. Water is also pumped into Lavon Reservoir from the East Fork Raw Water Supply Project near Seagoville, TX. Lavon Reservoir also receives outfall from a regional sewage treatment facility. Until 2009, water was pumped from Texoma Reservoir to Sister Grove Creek, a tributary of Lavon Reservoir. However, this transfer has been replaced by a direct pipeline from Texoma Reservoir to the North Texas Municipal Water District facility in Wylie, Texas.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lavon Reservoir (Bennett and Cummings 2019). Primary components of the OBS plan are listed in Table 5. All standard survey sites were randomly selected, and all standard surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2022). Jug lining for Blue Catfish utilized biologist-selected survey sites and followed the study design set by the primary investigators for a statewide evaluation of catfish age and growth.

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.

Trap netting – Crappie were collected using trap nets (10 net nights at 10 stations). Trap netting CPUE was recorded as the number of fish caught per net night (fish/nn). Ages for White Crappie were determined using otoliths from 67 randomly selected fish (range 6.6 to 14.4 inches), while ages for Black Crappie were determined using otoliths from 9 randomly selected fish (range 9.8 to 10.4 inches).

Gill netting – Blue Catfish, Channel Catfish, and White Bass were collected by gill netting (15 net nights at 15 stations). Gill netting CPUE was recorded as the number of fish caught per net night (fish/nn). Ages for Blue Catfish were determined using otoliths collected from 163 randomly selected fish (range 7.0 to 43.0 inches).

Jug lining – Blue Catfish were collected by jug lining (100 overnight sets, 3 hooks each), over three sampling periods (set day/pickup day) in January 2023. Ages for Blue Catfish were determined using otoliths collected from 91 randomly selected fish (range 12.0 to 35.0 inches). This was part of a statewide study and supplemented Blue Catfish caught in gill nets.

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

Habitat – A structural habitat survey was conducted in 2022 using the digital shapefile method, and a vegetation survey was conducted in 2022 using a random point intercept survey (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Water level – Source for water level data was the United States Geological Survey (USGS 2023).

Results and Discussion

Habitat: Littoral zone structural habitat consisted primarily of rocky shoreline and standing timber (Table 6). Native aquatic vegetation in the form of water willow had 8 percent occurrence in 2022 (Table 7). Buttonbush can provide substantial shoreline habitat during high water periods, so it was surveyed in 2022 as well with 42 percent occurrence along the shoreline. Water level fluctuations have limited the amount of aquatic vegetation in Lavon Reservoir.

Prey species: Electrofishing catch rates of Bluegill and Gizzard Shad were 169.0/h and 529.0/h, respectively. Index of Vulnerability (IOV) for Gizzard Shad was excellent, indicating that 91% of Gizzard Shad were available to existing predators, similar to previous years (Figure 2). Total CPUE of Gizzard Shad was considerably higher in 2022 compared to the 2018 survey (Figure 2). Total CPUE of Bluegill in 2022 was lower than total CPUE in 2018 and few individuals surpassed 7 inches (Figure 3). A diverse

sunfish fishery including Bluegill, Green Sunfish, Redear Sunfish, and Longear Sunfish provides additional forage for sportfish (Appendix A).

Catfishes: The Channel Catfish population continued to have low relative abundance with a gill net catch rate of 1.2/nn in 2023 (Figure 4). A Channel Catfish measuring 28 inches in length was sampled in 2023. Relative weights of Channel Catfish tend to range between 80 and 90, indicating poor body condition (Figure 4). Blue Catfish gill net catch rate was 11.7/nn in 2023, lower than the record high of 17.1/nn in 2019 (Figure 5). The number of Blue Catfish ≥ 20 inches and ≥ 30 inches has slightly declined since 2019, although an individual measuring 43 inches was collected in 2023 (Figure 5). Mean relative weight was above 90 for most size classes. Blue Catfish sampled by jug lining were larger on average with the longest individuals at 35 inches (Figure 6). Approximately 55 percent of the Blue Catfish collected with jug lines were ≥ 20 inches and five percent were ≥ 30 inches (Figure 6). The population contains many harvestable sizes of fish between 10- and 20-inches (Figures 5 and 6). Blue Catfish reached 20 inches in 7 or 8 years, and 30 inches in 13+ years ($N = 254$; range = 2 – 24 years). Total annual mortality was estimated at 14.8% for Blue Catfish aged 3-24 (Appendix E). Future monitoring should indicate if the new regulation increases the relative abundance of larger Blue Catfish in Lavon Reservoir.

Temperate Basses: Gill net catch rate of White Bass declined to 6.8/nn in 2023 from the record high of 22.2/nn in 2019, and similar to the 6.0/nn in 2015. Size structure increased as PSD was 81, indicating a larger proportion of quality-size fish (≥ 9 inches) in the population (Figure 7). Seventy-two percent of White Bass were available for harvest. Body condition was not as good as previous surveys. Yellow Bass were present in large numbers but were not enumerated for the 2023 survey.

Largemouth Bass: The electrofishing catch rate of Largemouth Bass was 133.0/h in 2022, higher than the 93.0/h in 2018 and a new catch of record (Appendix C). The catch rate of stock-length Largemouth Bass also increased to 51.0/h in 2022 from the 34.5/h in 2018. Size structure declined slightly as PSD was 45, and a large portion of sub-stock fish suggested excellent recruitment (Figure 8). Legal-length (14 inches) bass comprised 15 percent of the sample up to 21 inches in length. Body condition varied widely among size classes, as mean relative weight ranged from 88 to 112. Growth data was not obtained in 2022 because few bass sampled were between 13.0 and 14.9 inches in length. In 2018, Largemouth Bass reached legal-length in 2.3 years (Bennett and Cummings 2019).

Crappie: The trap net catch rate of White Crappie was 15.8/nn in 2022, consistent with previous surveys (Appendices A and C). Body condition was excellent, with mean relative weight over 100 for most size classes in 2022 (Figure 9). Most White Crappie reached legal-length (10 inches) by age one ($N = 30$; $RSE = 1.5$). In an effort to investigate the potential impacts of live sonar on the crappie population at Lake Lavon, we sought to estimate total annual mortality (TAM) of White Crappie. Otoliths were collected from 67 fish, yet just one of each age-3 and age-4 White Crappie were collected in ten nets. Further sampling was not conducted because it was unlikely to collect a substantial number of older crappie and we met our objective of collecting at least 50 stock-length fish. In spite of a low number of older fish, TAM was estimated at 85 percent and suggested a small proportion of crappie reach older ages in Lake Lavon. Analysis in the Fisheries Analysis and Modeling Simulator (FAMS; Slipke and Maceina 2014) suggested natural mortality is also high (44 percent). With high natural mortality, additional harvest restrictions beyond the statewide regulations would be unlikely to significantly increase abundance of crappie at Lake Lavon (Allen and Miranda 1995). The 2017-2018 creel survey on Lavon Reservoir showed a relatively high angler catch rate of crappie (2.9/h); however, the mean harvest rate was just 4.6 fish/angler and only 4.4 percent of crappie anglers were predicted to catch a limit of 25 fish (Bennett and Cummings 2019). So even if catch rates were to double, more restrictive harvest regulations would not substantially reduce harvest.

The trap net catch rate of Black Crappie was a record 5.1/nn in 2022, which was much higher than the historical average of 0.8/nn (Appendices A and C). Body condition was adequate, with mean relative weight over 90 for most size classes in 2022 (Figure 9). Black Crappie reached legal-length in 2.1 years ($N = 9$; range 2 – 3 years). Total CPUE for both species was 20.0/nn in 2022, similar to 2018 (17.9/nn),

and lower than the record 38.2/n in 2014 (Figure 9). In 2022, 31 percent of crappie were available for harvest (Figure 9).

Fisheries Management Plan for Lavon Reservoir, Texas

Prepared – July 2023

ISSUE 1: Lavon Reservoir has a history of producing Largemouth Bass ≥ 8 pounds. Anglers have entered 4 Lunker Class (8+ pounds) and 9 Elite Class (10+ pounds) fish into the Toyota ShareLunker program since 2018. Tournament data also shows fish ≥ 8 pounds (Appendix D). Lone Star Bass fingerlings were stocked in 2022. Further evaluation of Largemouth Bass can help to improve the trophy potential of this fishery.

MANAGEMENT STRATEGY

1. Monitor Largemouth Bass genetics in 2026 to assess Florida Largemouth Bass introgression. The last genetics survey was in 2014.
2. A future creel survey could estimate a potential increase in tournament activity and document catches of trophy Largemouth Bass.

ISSUE 2: A weighted catch-curve analysis was recently performed on White Crappie at Lavon Reservoir. Although it had a low sample size, it indicated total annual mortality may be as high as 85 percent. Further evaluation can determine implications to the fishery.

MANAGEMENT STRATEGIES

1. Perform a creel survey in the future (beyond the next sampling period) to assess crappie effort, catch, and harvest and the portion of anglers using live sonar.

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. 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 USACE to maintain signage at access points around the reservoir.
2. Inform marina owners about invasive species, and provide them with posters, literature, etc. so that they can educate their customers.
3. Educate the public about invasive species using 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 (2023–2027)

Sport fish, forage fish, and other important fishes

Important sport fish in Lavon Reservoir include Largemouth Bass, crappie, Blue and Channel Catfish, and White Bass. Important forage species include Bluegill Sunfish, Longear Sunfish, Gizzard Shad, and Threadfin Shad. The proposed sampling plan for 2023 to 2027 is summarized in Table 8.

Survey objectives, fisheries metrics, and sampling objectives

Largemouth Bass: Largemouth Bass ranked fourth in popularity behind anglers fishing for “anything” at Lavon Reservoir in a 2017 and 2018 creel survey. Sampling once every four years to collect long-term monitoring trend data will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation.

A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in fall 2026. Sampling will continue until a minimum of 50 stock-size fish are collected with an acceptable level of precision. The anticipated effort to collect at least 50 stock-size fish with RSE of CPUE-S ≤ 25 is 15 stations with 80% confidence. Thirteen Largemouth between 13.0 and 14.9 inches will be collected to estimate age at the minimum length limit (14 inches). Relative weight of Largemouth Bass ≥ 8 ” TL will be determined from their length/weight data (maximum of 10 fish weighed and measured per inch class). Fin clips from 30 random bass will be collected to evaluate Florida Largemouth Bass introgression.

Catfish: Catfish provide the second most popular fishery at Lavon Reservoir. Catch rates are typically low for Channel Catfish; however, sampling to achieve trend data objectives for Blue Catfish should allow detection of large-scale changes in the Channel Catfish population.

Fifteen randomly selected gillnet stations will be sampled in 2027. The anticipated effort to meet an RSE of CPUE-S ≤ 25 and collect at least 50 Blue Catfish is between 8 and 15 stations with 80% confidence. Additional net nights may be added if we determine objectives can be met with reasonable additional effort.

Crappie: Crappie are the most popular fishery at Lavon Reservoir. Black Crappie were first collected in 2006 and have slightly increased in abundance. Trend data on CPUE, size structure, age and growth, and body condition of White Crappie will be collected with trap nets every four years to monitor trends in the population. We estimate that the effort required to meet sampling objectives (RSE of CPUE-S ≤ 25 and collect at least 50 stock-size fish) for White Crappie to be between 10 and 15 net nights. This level of sampling should provide a sufficient number (13) of White Crappie between 9.0 and 10.9 inches to estimate growth to legal length (10 inches). Sampling to achieve trend data objectives for White Crappie should allow detection of large-scale changes in the Black Crappie population. We plan to sample a minimum of 10 random shoreline trap net stations; however, an additional 5 net nights will be sampled if objectives are not met with the initial 10 sampling stations.

White Bass: White Bass are the fifth most sought-after fish at Lavon Reservoir. Gill net catch rates are variable for White Bass; however, spring gill net sampling to achieve objectives for Blue Catfish should provide enough data to detect large-scale changes in the White Bass population that may spur further investigation.

Sunfish and Shad: Bluegill Sunfish and Longear Sunfish, along with Gizzard and Threadfin Shad are the primary forage at Lavon Reservoir. We intend to collect trend data on abundance, size structure, and prey availability for forage species (along with sampling for Largemouth Bass) once every four years. Effort expended to achieve desired relative abundance estimates for Bluegill should be similar-to that required for Largemouth Bass.

Literature Cited

- Allen, M. S. and Miranda, L. E. 1995. An evaluation of the value of harvest restrictions in managing crappie fisheries. *North American Journal of Fisheries Management*, 15(4): 766-772.
- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. *Fisheries techniques*, 2nd edition. American Fisheries Society, Bethesda, Maryland.
- Bennett, D., and G. Cummings. 2019. Statewide freshwater fisheries monitoring and management program survey report for Lavon Reservoir, 2018. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-3, Austin.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. *North American Journal of Fisheries Management* 16:888-895.
- Guy, C. S., R. M. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. *Fisheries* 32(7): 348.
- Slipke, J. W., and M. J. Maceina. 2014. *Fishery Analysis and Modeling Simulator (FAMS)*. Version 1.64. American Fisheries Society, Bethesda, Maryland.
- Texas Commission on Environmental Quality. 2022. Trophic classification of Texas reservoirs. 2022 Texas Water Quality Inventory and 303 (d) List, Austin. 17 pp.
- United States Geological Society (USGS). 2023. National water information system: Web interface. Available: <http://waterdata.usgs.gov/tx/nwis> (July 2023).

Tables and Figures

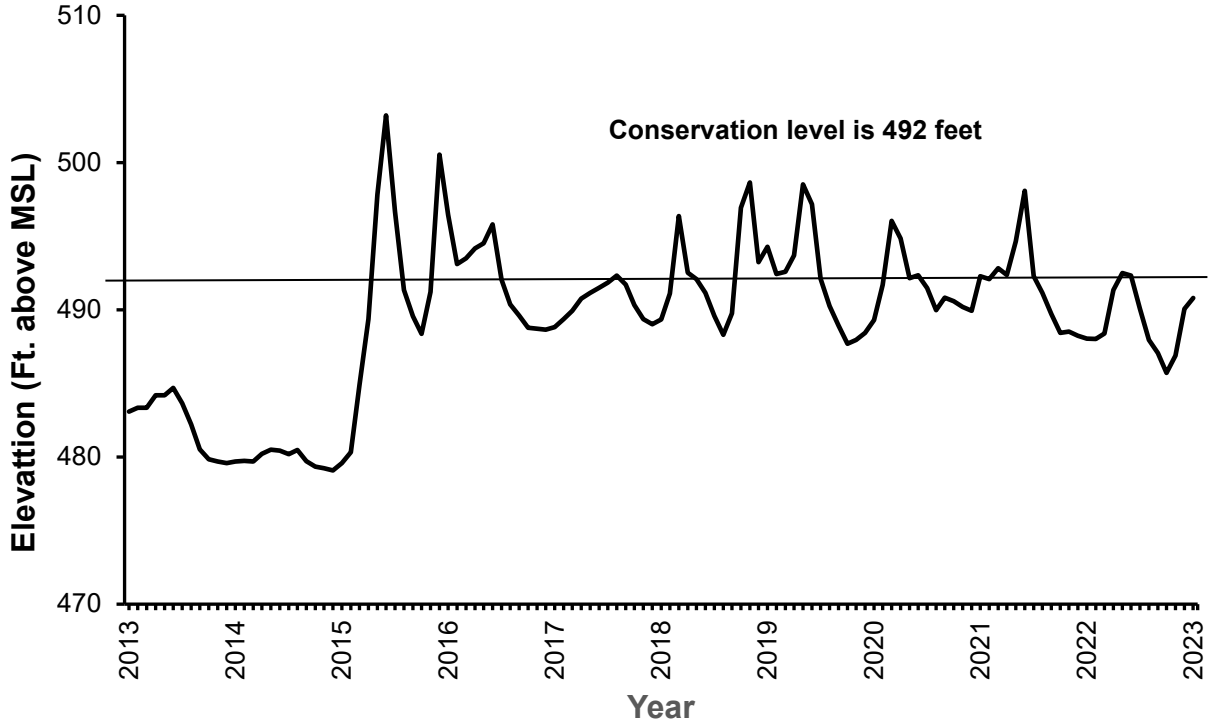


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lavon Reservoir, Texas

Table 1. Characteristics of Lavon Reservoir, Texas.

Characteristic	Description
Year constructed	1953
Controlling authority	U.S. Army Corps of Engineers
County	Collin
Reservoir type	Mainstream: East Fork Trinity River
Shoreline Development Index	5.9
Conductivity	286 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Lavon Reservoir, Texas, August 2022. Reservoir elevation at time of survey was 487.9 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Twin Groves	33.16593 -96.44157	Y	40	490	Fair. Extension is not feasible
Caddo Park	33.16247 -96.41896	Y	30	490	Park closed for maintenance.
Elm Creek	33.14009 -96.42500	Y	30	485	Adequate. Extension is not feasible
Lakeland Park	33.10315 -96.44589	Y	60	478	Park closed for repairs.
Tickey Creek	33.09562 -96.47443	Y	60	478	Adequate. Extension is not feasible
Pebble Beach	33.08451 -96.45275	Y	45	481	Park closed for repairs.
Little Ridge	33.06624 -96.45500	Y	60	478	Adequate. Extension is feasible.
Mallard Park	33.04860 -96.42698	Y	30	478	Adequate. Extension is feasible.
Lavonia Park	33.04178 -96.44335	Y	60	478	Adequate. Extension is feasible.
Clear Lake	33.05900 -96.48810	Y	45	478	Adequate. Extension is feasible.
Bratonia Park	33.11063 -96.52019	Y	20	490	Fair. Extension is not feasible
Highland Park	33.10782 -96.54063	Y	30	490	Fair. Extension is not feasible
Brockdale Park	33.07344 -96.54531	Y	30	484	Adequate. Extension is not feasible
Collin Park	33.05104 -96.53057	Y	85	478	Fair. Extension is feasible.
East Fork Park	33.03705 -96.51466	Y	105	478	Fair. Extension is feasible.
Avalon Park	33.04276 -96.49807	Y	60	474	Excellent. Park closed on weekends.

Table 3. Harvest regulations for Lavon Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (only 5 \geq 20 inches; 1 \geq 30 inches)	None
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-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. Objective-based sampling plan components for Lavon 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>Trap netting</i>			
White Crappie	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	$N = 50$ stock
	Age-and-growth	Mean length at age	$N =$ variable, all lengths
	Condition	W_r	10 fish/inch group (max)
<i>Gill netting</i>			
Blue Catfish	Abundance	CPUE–stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	$N \geq 50$ stock
	Condition	W_r	10 fish/inch group (max)
	Age-and-growth	Mean length at age	$N =$ variable, all lengths
White Bass	Abundance	CPUE–Total	None, practical effort

^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 5. Survey of structural habitat types, Lavon Reservoir, Texas, 2022. Shoreline habitat type units are in miles and standing timber and piers, boat docks, and marinas are in acres.

Habitat type	Estimate	% of total
Bulkhead	0.1 miles	0.1
Natural	41.2 miles	34.0
Rocky	79.7 miles	65.9
Piers, boat docks, marinas	100 acres	0.5
Standing timber	10,700 acres	50.0

Table 6. Survey of aquatic vegetation, Lavon Reservoir, Texas, 2014, 2018, and 2022. Surface area (acres) is listed with percent of total reservoir surface area in parentheses for 2018. Percent occurrence is listed for shoreline vegetation with lower and upper 95% confidence limits in parentheses (239 points) for 2022.

Vegetation	2014	2018	2022
American lotus	0.0	41 (0.2)	0.0
Water willow	0.0	2 (<0.1)	8 (5 to 12)
Button bush ^a	-	-	42 (36 to 48)

^aButton bush was not assessed before 2022.

Gizzard Shad

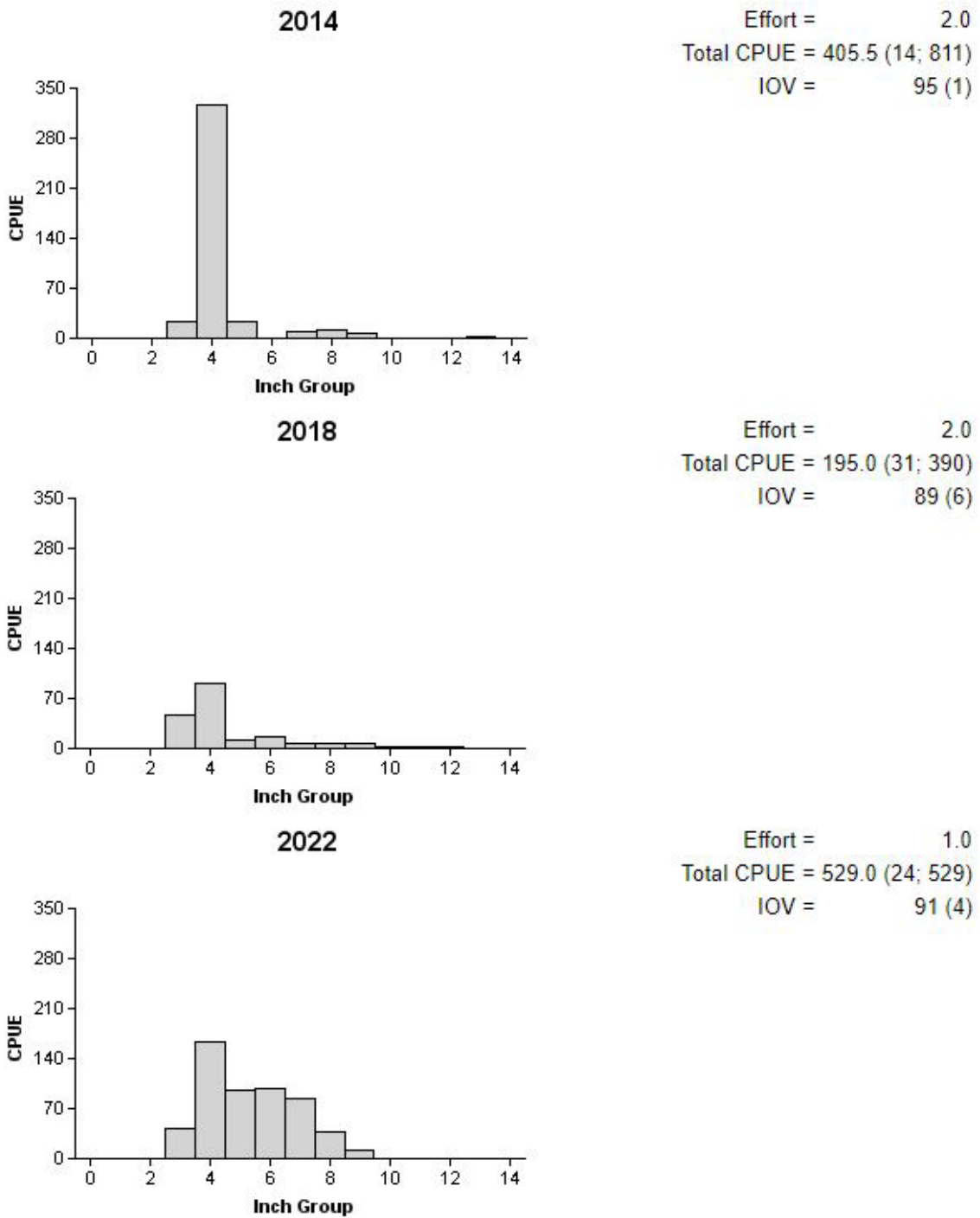


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lavon Reservoir, Texas, 2014, 2018, and 2022.

Bluegill

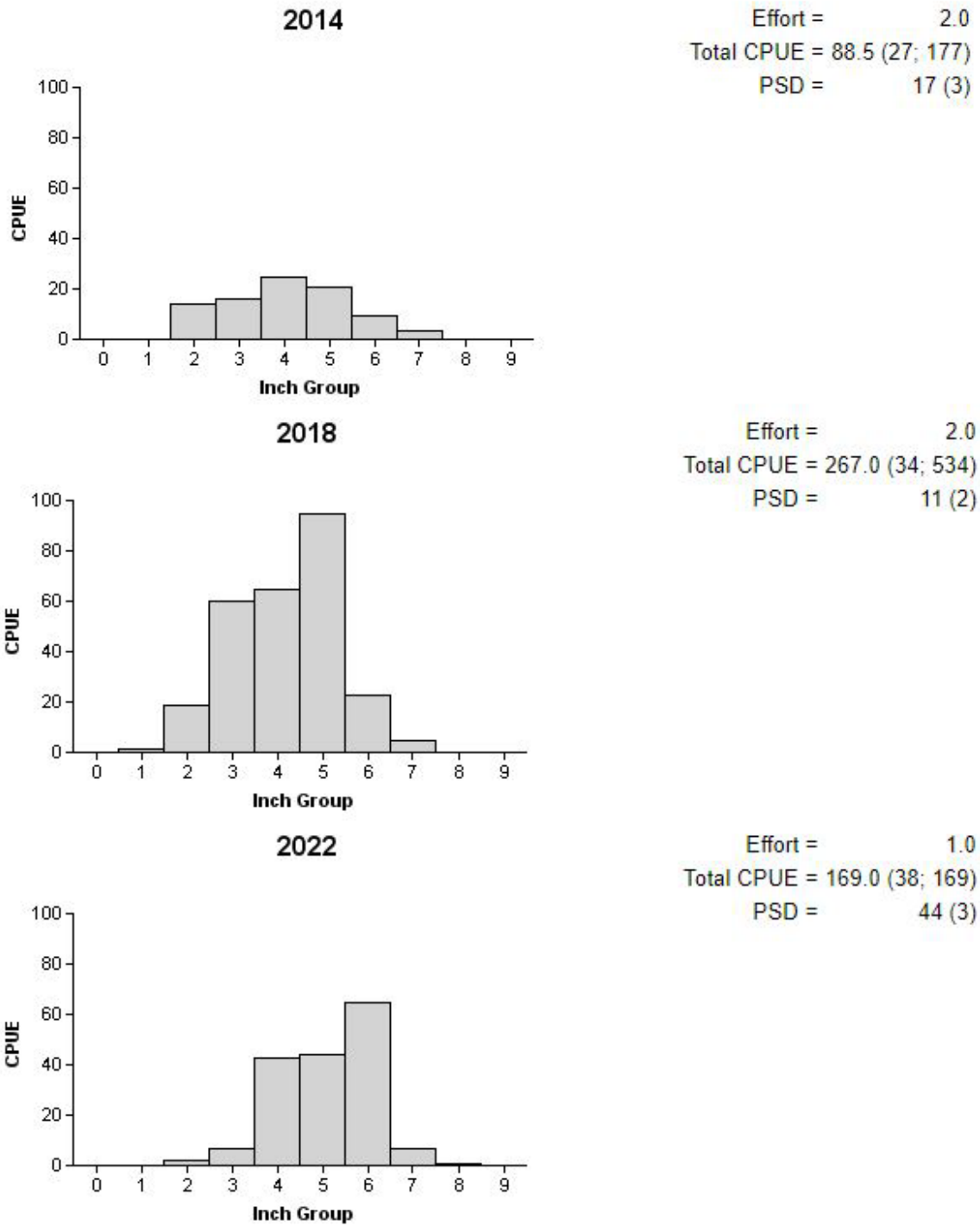


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lavon Reservoir, Texas, 2014, 2018, and 2022.

Channel Catfish

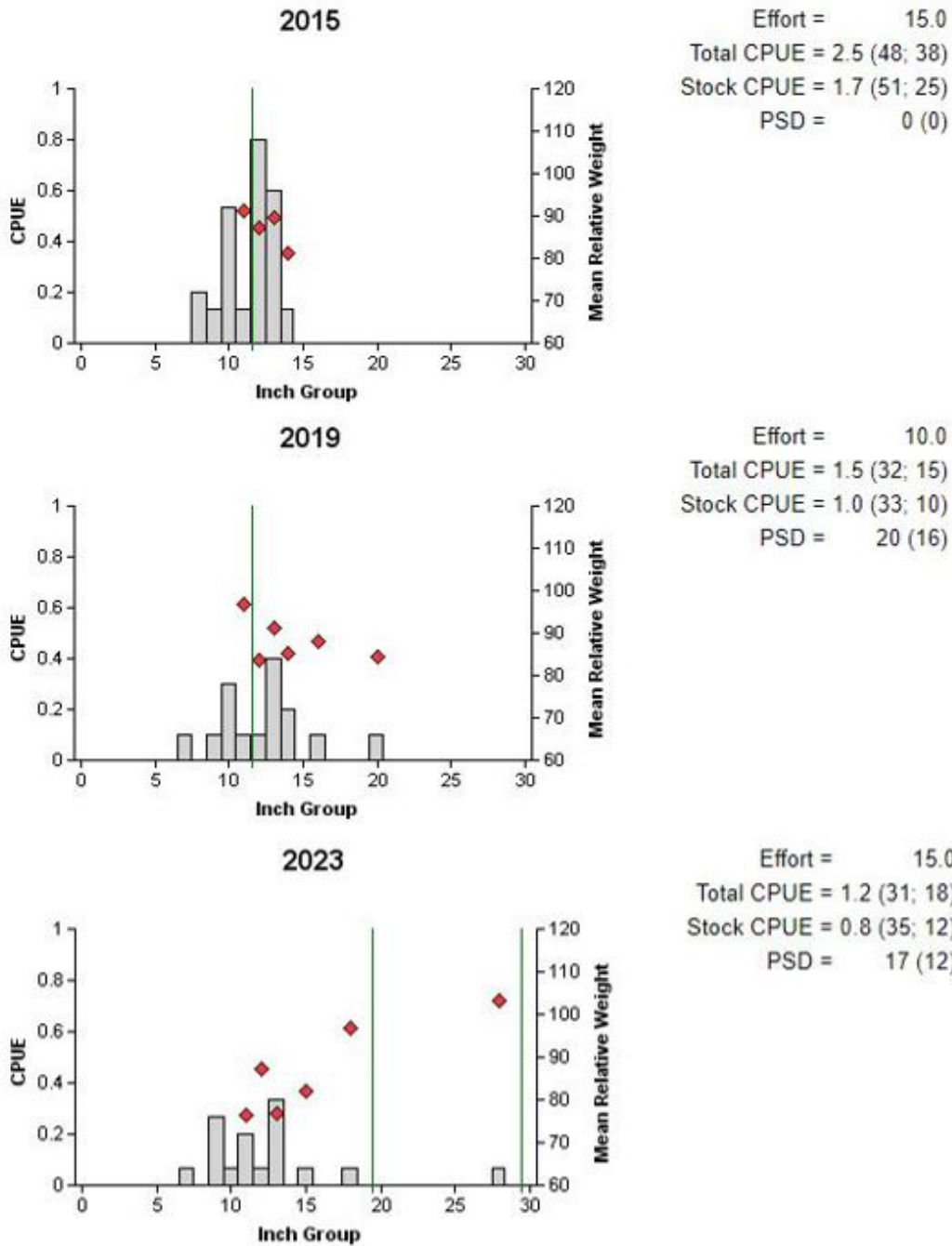


Figure 4. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lavon Reservoir, Texas, 2015, 2019, and 2023. Vertical line for 2015 and 2019 indicates minimum length limit, and vertical lines for 2023 indicate the 20- and 30-inch demarcations for the new catfish regulation.

Blue Catfish

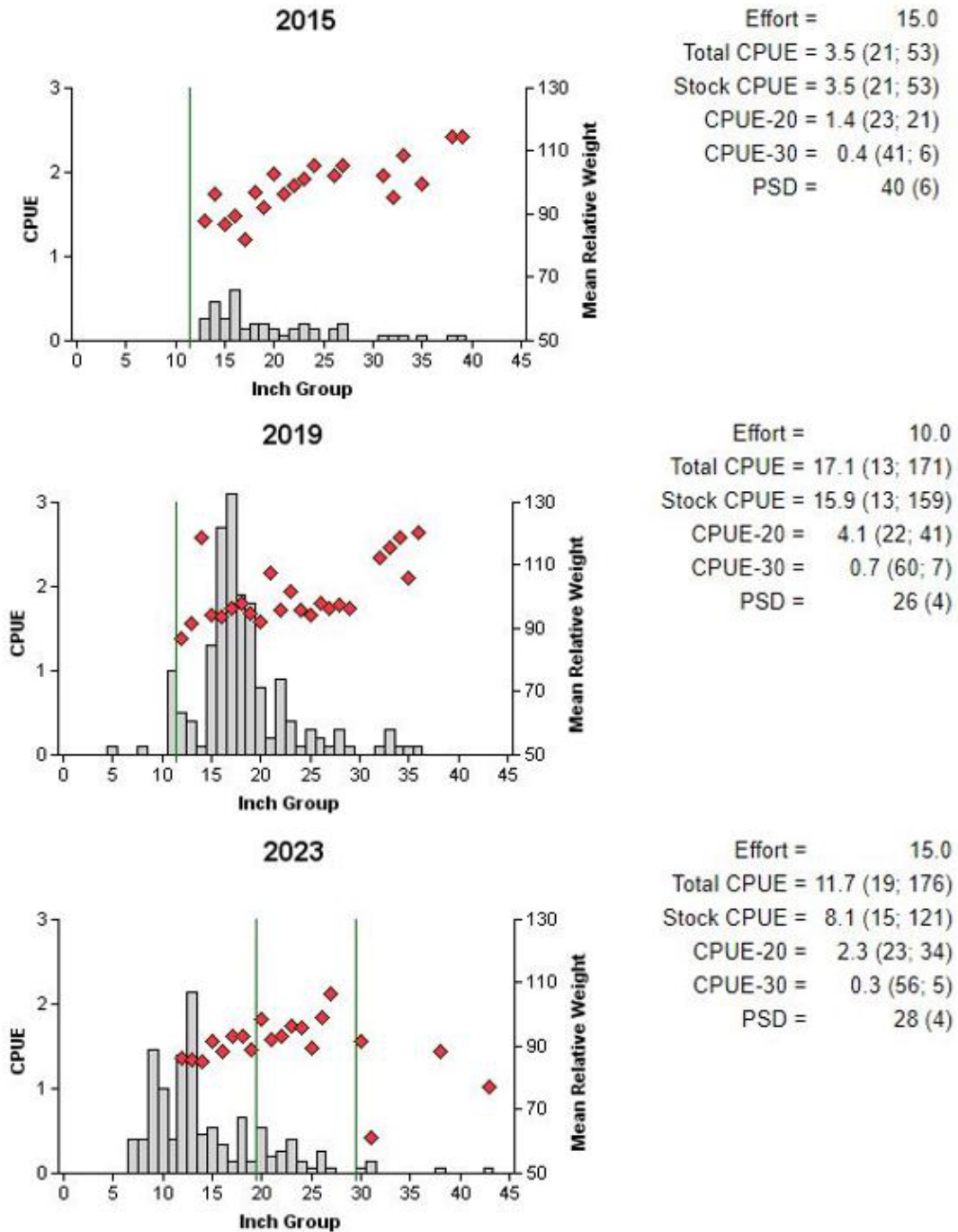


Figure 5. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lavon Reservoir, Texas, 2015, 2019, and 2023. Vertical line for 2015 and 2019 indicates minimum length limit, and vertical lines for 2023 indicate the 20- and 30-inch demarcations for the new catfish regulation.

Blue Catfish

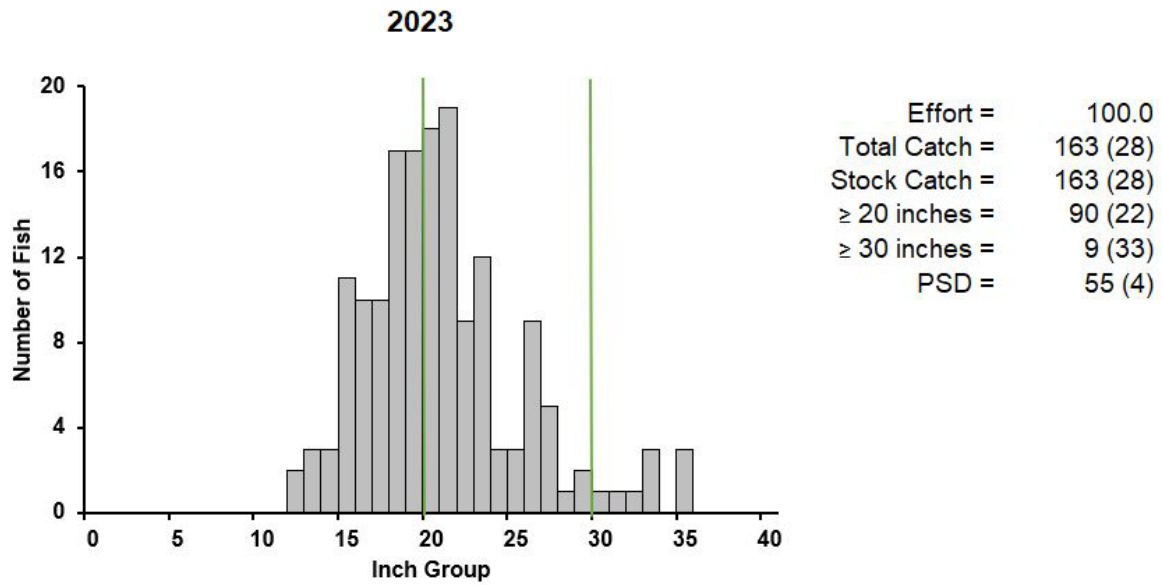


Figure 6. Number of Blue Catfish caught and population indices (RSE for catch statistics and SE for size structure are in parentheses) for late winter jug line surveys, Lavon Reservoir, Texas, 2023. Vertical lines indicate the 20- and 30-inch demarcations for the new catfish regulation.

White Bass

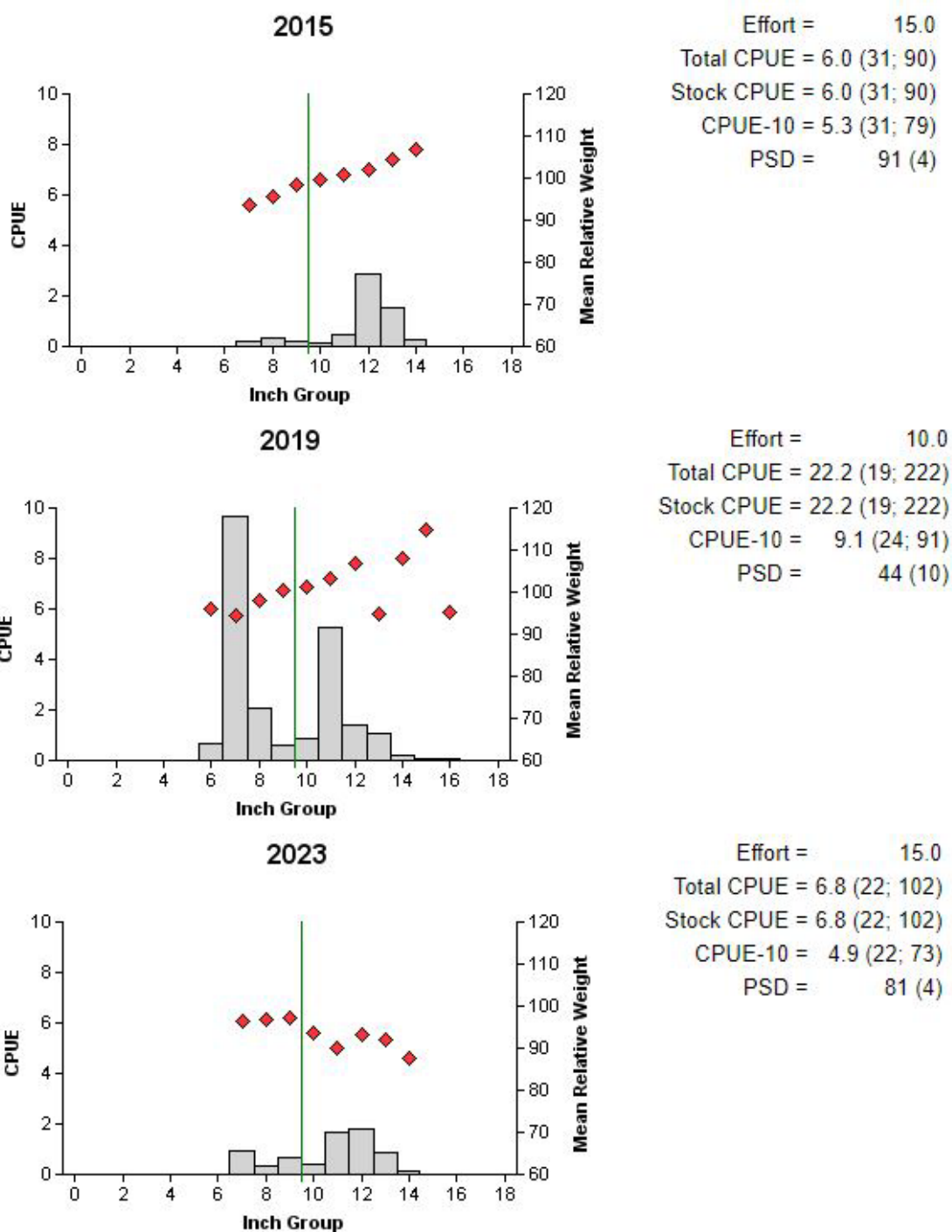


Figure 7. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lavon Reservoir, Texas, 2015, 2019, and 2023. Vertical line indicates minimum length limit.

Largemouth Bass

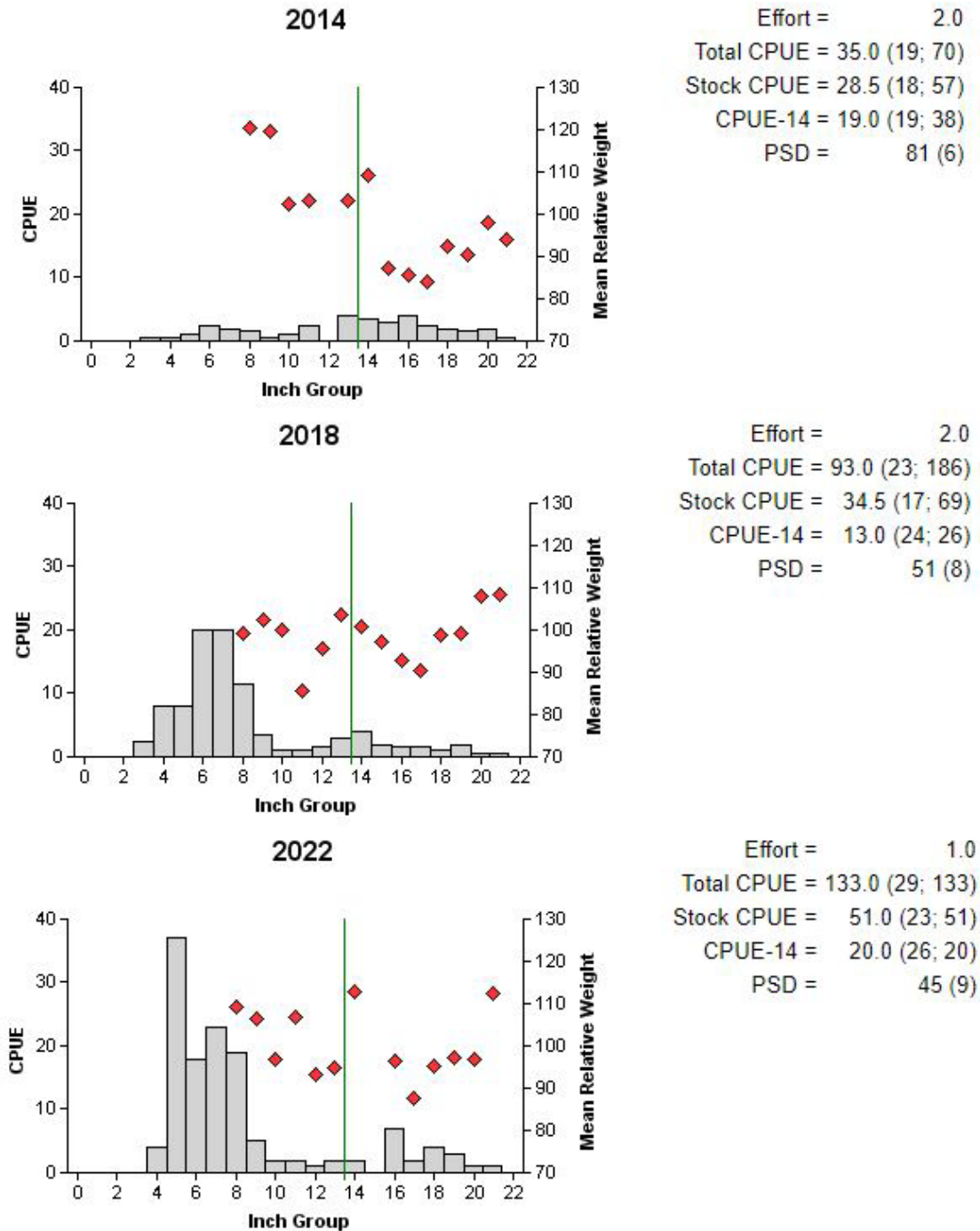


Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lavon Reservoir, Texas, 2014, 2018, and 2022. Vertical line indicates minimum length limit.

Crappie

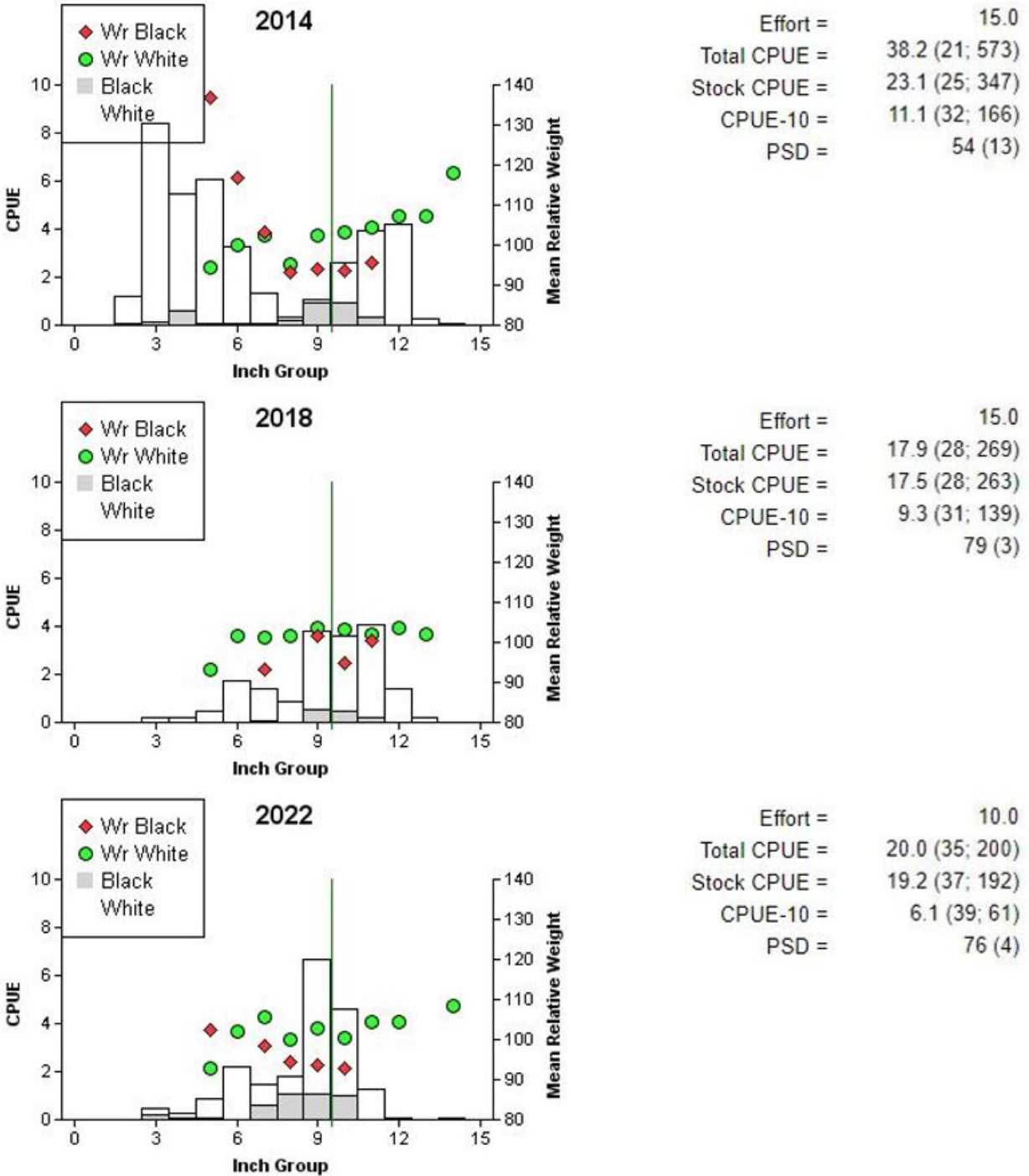


Figure 9. Number of Crappie caught per net night (CPUE, bars), mean relative weight (diamonds and circles), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Lavon Reservoir, Texas, 2014, 2018, and 2022. Vertical line indicates minimum length limit.

Proposed Sampling Schedule

Table 8. Proposed sampling schedule for Lavon 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.

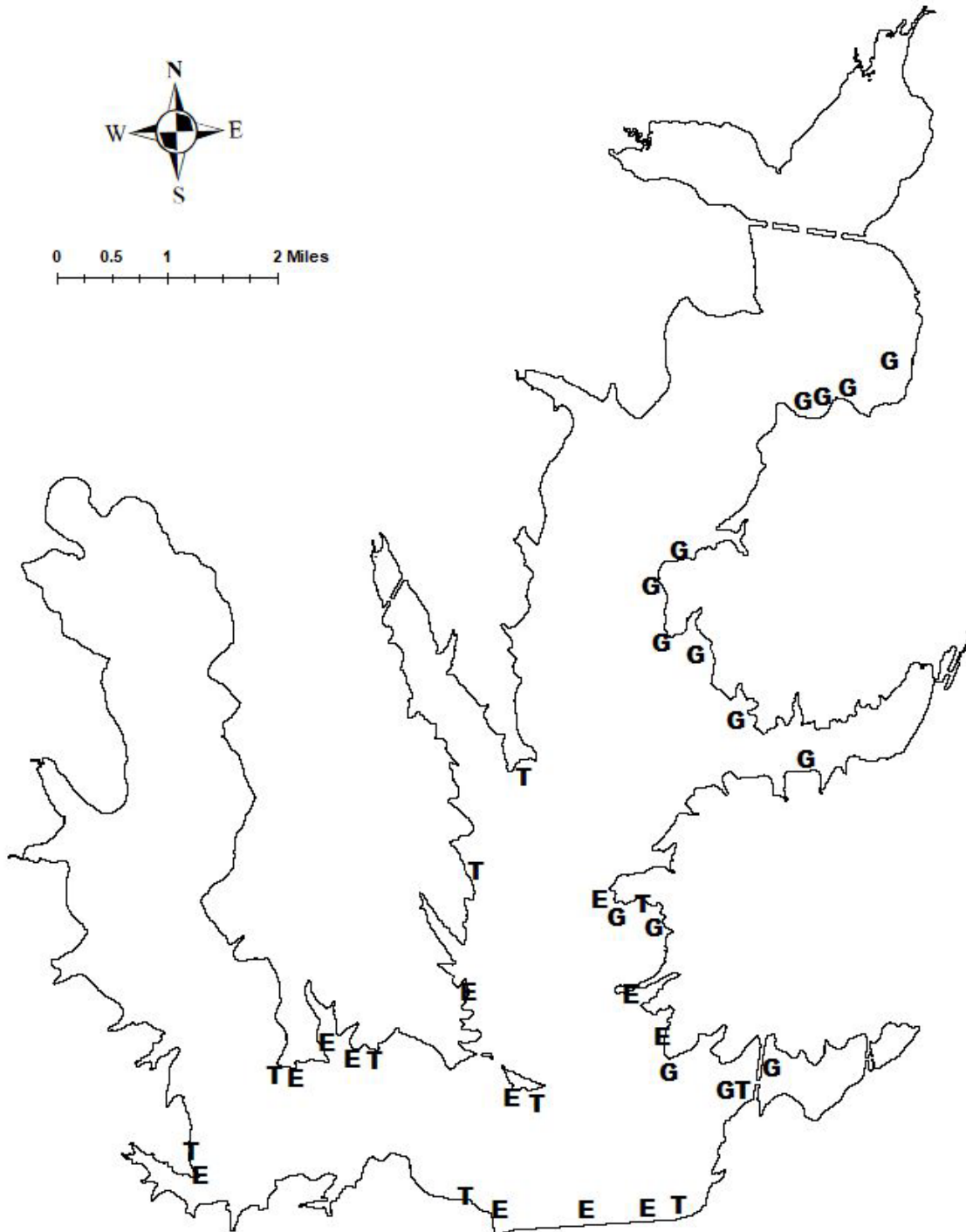
	Survey year			
	2023-2024	2024-2025	2025-2026	2026-2027
Angler Access				X
Structural Habitat				X
Vegetation				X
Electrofishing – Fall				X
Trap netting				X
Gill netting				X
Creel survey				
Report				X

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 standard gear types from Lavon Reservoir, Texas, 2022-2023. Sampling effort was 15 net nights for gill netting, 10 net nights for trap netting, and 1 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					529	529.0 (24)
Threadfin Shad					323	323.0 (37)
Blue Catfish	176	11.7 (19)				
Channel Catfish	18	1.2 (31)				
White Bass	102	6.8 (22)				
Green Sunfish					9	9.0 (55)
Warmouth					12	12.0 (66)
Bluegill					169	169.0 (38)
Longear Sunfish					76	76.0 (35)
Redear Sunfish					4	4.0 (100)
Largemouth Bass					133	133.0 (29)
White Crappie			158	15.8 (46)		
Black Crappie			51	5.1 (27)		

APPENDIX B – Map of sampling locations



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

APPENDIX C – Historical Catch Rates

Historical catch rates of targeted species by standard gear type for Lavon Reservoir, Texas, 1996 to 2018.

Gear	Species	Year								Avg.
		1996 ^a	1999	2002 ^b	2006 ^b	2009	2010 ^b	2014 ^b	2018 ^b	
Gill Netting (fish/net night)	Blue Catfish	1.1	8.3	14.8	16.7	15.5	15.1	3.5	17.1	11.5
	Channel Catfish	1.9	2.5	0.9	1.5	1.3	3.7	2.5	1.5	2.0
	Flathead Catfish	0.0	0.0	0.0	0.1	0.0	0.1		0.0	0.0
	White Bass	3.8	3.8	2.5	0.1	11.8	2.0	6.0	22.2	6.5
	Striped Bass	1.3	1.5	0.1	0.1	0.1	0.2		0.0	0.5
Electrofishing (fish/hour)	Gizzard Shad	202.5	215.5	209.5	208.0		2450.0	405.5	195.0	615.2
	Threadfin Shad	120.5	330.0	58.5	832.0		170.5	14.0	54.0	225.6
	Green Sunfish	1.5	4.0	0.0	0.0		6.5	4.0	2.0	2.6
	Warmouth	0.5	3.0	2.5	8.0		14.5	4.5	5.5	5.5
	Orangespotted Sunfish	0.0	0.0	2.5	0.0		1.0	16.0	2.5	3.1
	Bluegill	33.0	40.5	79.0	91.0		283.5	88.5	267.0	126.1
	Longear Sunfish	4.0	88.0	66.5	65.5		244.5	85.5	85.0	91.3
	Redear Sunfish	0.0	0.0	0.0	1.0		3.0	0.0	1.5	0.8
Largemouth Bass	9.0	66.0	18.5	43.0		114.5	35.0	93.0	54.1	
Trap Netting (fish/net night)	White Crappie	3.5	17.8	17.5	22.2		9.8	34.8	16.7	17.6
	Black Crappie	0.0	0.0	0.0	0.1		0.9	3.4	1.3	0.8

^a Trap netting was conducted in January 1997.

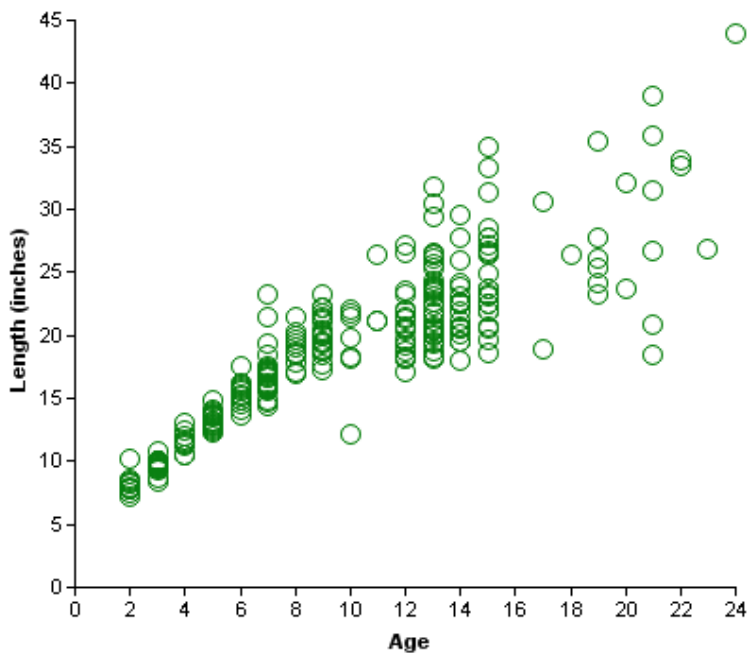
^b Gill netting was conducted in the spring of the following year.

APPENDIX D – Select Statistics from the Lake Lavon Working Man’s Bass Fishing Series

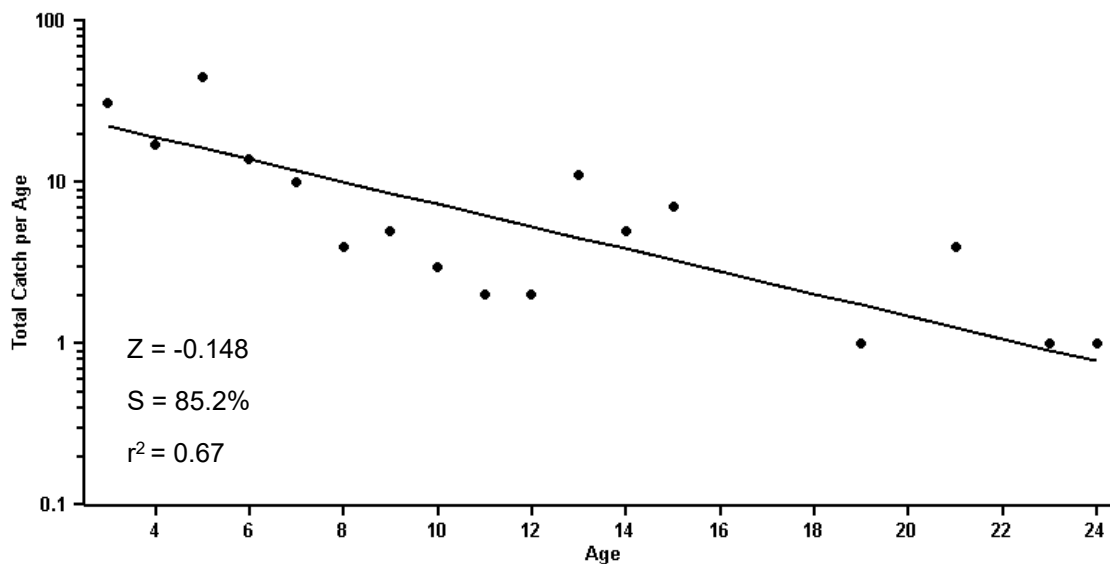
Date	Winning Weight (lbs.)	Big Bass (lbs.)
5/4/2023	22.8	7.5
4/27/2023	22.5	11.9
4/21/2023	18.5	5.4
4/14/2023	22.1	7.3
4/7/2023	14.7	6.5
9/17/2022	17.8	4.8
9/15/2022	5.6	5.6
9/1/2022	16.6	6.6
8/25/2022	7.6	5.5
8/18/2022	13.8	5.3
8/4/2022	17.1	7.5
7/7/2022	12.9	5.6
6/30/2022	19.9	7.1
6/9/2022	18.2	7.1
5/26/2022	21.1	5.8
5/19/2022	14.6	5.9
5/12/2022	23.1	7.0
5/5/2022	6.9	6.8
4/28/2022	18.4	8.0
4/21/2022	23.9	6.1
4/14/2022	36.1	8.8

Source: <https://www.facebook.com/lavonbassfishing>

APPENDIX E – Blue Catfish Age and Growth.



Length at age for Blue Catfish collected from gill nets and juglines (N=252) at Lavon Reservoir January through March 2023.



Catch curve regression of Lavon Reservoir Blue Catfish (N=176) collected in gill nets 2023, where Z is total annual mortality rate and S is annual survival rate.



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