

Lake Palestine

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 Palestine were surveyed in 2021 using electrofishing and in 2022 using low-frequency electrofishing and gill netting. Anglers were surveyed with a creel survey from June 2021 through May 2022. Historical data are presented with the 2021–2022 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 Palestine is a 25,560-acre impoundment located on the Neches River approximately 15 miles southwest of Tyler, Texas. Water level has remained within 3 feet of conservation pool since 2012. Lake Palestine has high productivity. Habitat features consisted of standing timber, rocks, aquatic vegetation, and boat docks.

Management History: Important sport fish include White Bass; Hybrid Striped Bass; Largemouth Bass; White and Black Crappie; and Blue, Channel, and Flathead Catfish. The management plan from the 2017 survey report included stocking Hybrid Striped Bass at 10 fish/acre every year and Florida Largemouth Bass annually at 1,000/km of shoreline. Channel and Blue Catfish were intensively sampled in 2022 as part of a statewide effort to characterize important catfish fisheries as well as conduct a gear evaluation of TPWD standardized gill net surveys. A revised trophy Blue and Channel Catfish harvest regulation allowing 25 fish per day (of which no more than five could be greater than 20 inches, and one could be greater than 30 inches) replaced the Blue and Channel catfish regulation on Lake Palestine in September 2021.

Fish Community

- **Prey species:** Threadfin Shad were abundant and comprised the bulk of the reservoir forage base. Electrofishing catch of Gizzard Shad was moderate and approximately 87% of Gizzard Shad were available as prey to most sport fish. Electrofishing catch of Bluegill was moderate and most were less than 5-inches long serving as supplemental prey.
- **Catfishes:** Blue, Channel, and Flathead Catfish are present within the reservoir. Blue and Channel Catfish were abundant and provide excellent angling opportunities. Approximately 9% of anglers were targeting catfishes during the 2021/2022 creel survey.
- **Temperate basses:** Hybrid Striped Bass (Palmetto Bass and Sunshine Bass) were recently stocked at approximately 15 fish/acre in 2021 and catch rates substantially increased during the most recent spring gill net survey. White Bass catch rates were moderate, with the relative abundance of White Bass increasing from previous surveys, indicative of a rebounding population from a significant fish kill in 2018. Angling effort was low with approximately 3% of anglers targeting temperate basses during the 2021/2022 creel survey.
- **Black basses:** Largemouth Bass were moderately abundant and displayed good body condition (mean $W_r = 94$). Largemouth Bass growth to legal length was fast (age at 14 inches long was 1.8 years) and size structure was excellent (PSD = 63). Black basses were the most sought-after species with approximately 43% of anglers targeting black basses during the 2021/2022 creel survey.
- **Crappie:** Black and White Crappie were present in the reservoir and historically have provided a popular fishery. Angling effort for crappie was high (2nd most sought-after species) with approximately 33% of anglers targeting crappie during the 2021/2022 creel survey.

Management Strategies: Continue annual stockings of Hybrid Striped Bass at 10 fish/acre and Florida Largemouth Bass at 1,000/km of shoreline. Monitor the spread of invasive non-beneficial aquatic species with annual vegetation surveys and continue to apply consistent treatments on areas where salvinia species are abundant. Conduct a bass-only spring electrofishing survey in 2023, fall electrofishing survey in 2025, and spring gill net survey in 2026. Inform the public about the negative impacts of aquatic invasive species.

Introduction

This document is a summary of fisheries data collected from Lake Palestine in 2021–2022. 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 2021–2022 data for comparison.

Reservoir Description

Lake Palestine is a 25,560-acre impoundment constructed in 1962 (enlarged to current size in 1971) on the Neches River. The lake is located within Cherokee, Anderson, Henderson, and Smith Counties approximately 15 miles southwest of Tyler, Texas. The reservoir is operated and controlled by the Upper Neches Municipal River Authority. Primary water uses include municipal water supply and recreation. Lake Palestine is eutrophic with a mean trophic state index (TSI) chl-*a* of 62.6 (Texas Commission on Environmental Quality 2020). Habitat at time of sampling consisted of rocks, standing timber, native and non-native aquatic vegetation, and boat docks. Water level has been high and stable since 2012; drought conditions in 2011-2012 reduced water levels to five feet below conservation pool (Figure 1). Other descriptive characteristics for Lake Palestine are in Table 1.

Angler Access

Lake Palestine has five public boat ramps and ten pay-to-use boat ramps. Additional boat ramp characteristics are in Table 2. Shoreline access for most of the reservoir is limited to the public boat ramp areas and the fishing dock located at Deep End Ramp. The Chandler River Park offers excellent bank access along the Neches River both above and below Highway 31.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Norman and Ott 2017) included:

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

Action: Hybrid Striped Bass were stocked at approximately 15 fish/acre in 2021.

2. Stock Florida Largemouth Bass annually at 1,000/km of shoreline.

Action: Florida Largemouth Bass were stocked annually from 2018–2021 and ShareLunker Largemouth Bass fingerlings were stocked in 2021.

3. Work with controlling authority, local game wardens, marina operators and homeowners to identify future fish kills and promptly coordinate with TPWD Kills and Spills Team (KAST) biologists to determine a strategy to address any fish kills in a timely manner.

Action: Communication with Lake Palestine stakeholders (e.g., controlling authority, marina operators, homeowners) and the KAST biologists has led to the development of adaptive strategies with prompt responses to any future fish kills.

Harvest regulation history: An experimental 12-inch minimum-length limit was established for White Bass on September 1, 1992, but it reverted to the statewide 10-inch minimum-length limit on September 1, 2003. Beginning September 1, 2011, the 12-inch minimum-length, 25 per day bag limit on Blue and Channel Catfish was revised to no minimum length, allowing harvest of 50 per day (of which, no more than five \geq 20 inches in length). Beginning September 1, 2021, Blue and Channel Catfish regulations were once again revised to allow 25 fish per day with no minimum length (of which, no more than five \geq 20 inches in length, and only one \geq 30 inches in length). Current regulations are found in Table 3.

Stocking history: Hybrid Striped Bass and Florida Largemouth Bass have been the most frequently stocked species at Lake Palestine. Hybrid Striped Bass fingerlings were first stocked in 1987. Stocking

continues to maintain the Hybrid Striped Bass fishery. Largemouth Bass were stocked in 1971 and Florida Largemouth Bass were initially stocked in 1981 and have been stocked periodically to enhance the trophy potential of the fishery. Lake Palestine was initially stocked with Channel and Blue Catfish in 1971. Supplemental stockings of Blue Catfish were conducted in the late-1970s and mid-1980s. Over 34,000 ShareLunker Largemouth Bass fingerlings have been stocked since 2013. The complete stocking history is in Table 4.

Vegetation/habitat management history: Giant salvinia was detected around the boat ramps at FM 315 and the Villages Marina in 2008 and 2009. These plants were removed by hand preventing further spread of the species at that time. Both common and giant salvinia were detected in large amounts during 2017 and have persisted in the reservoir since. Both species were most recently (2022) prevalent in the upper end of the reservoir (particularly in Kickapoo and Indian Creek) and within Saline Bay. Herbicide treatment efforts for salvinia species were 13.0 acres in 2018/2019, 10.0 acres in 2019/2020, 267.5 acres in 2020/2021, and 196.2 acres in 2021/2022. Cold weather events in January 2018 and again in February 2021 initially reduced salvinia in Lake Palestine; however, plant coverage increased by the end of summer following both events. In 2022, TPWD began using private contractors to assist with treating salvinia species on Lake Palestine. The current salvinia management plan calls for bimonthly (every other month) herbicide treatments November through March and monthly treatments May through September, focusing efforts during the growing season.

Water transfer: 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 Palestine (TPWD, unpublished). 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), unless mentioned otherwise.

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1.5 hours at 18, five-minute 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 and Channel Catfish; White Bass; and Hybrid Striped Bass (Palmetto and Sunshine Bass) were collected by gill netting (30 net nights at 30 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

Low-frequency electrofishing – Blue Catfish were collected by low-frequency electrofishing using the methods described by Bodine et al 2016. Biologist selected habitats were sampled to supplement catches of larger sized (> 20 inches) Blue Catfish during the statewide evaluation of catfish fisheries. CPUE for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Statistics – Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), terminology modified by Guy et al. 2007], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Hybrid Striped Bass PSD was calculated according to Dumont and Neely (2011). Index of Vulnerability (IOV) was calculated for Gizzard Shad (DiCenzo et al. 1996). Standard error (SE) was calculated for structural indices and IOV. Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE and creel statistics.

Creel survey – A roving creel survey was conducted from June 2021 through May 2022. Angler interviews were conducted on five weekend days and four weekdays per quarter to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

Habitat –An arial vegetation survey was conducted in 2021 to assess coverage of native and non-native vegetation.

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

Results and Discussion

Habitat: Native vegetation covered 1% of the reservoir's surface area, primarily dominated by giant cutgrass species in 2021 (Table 6). Prior vegetation surveys have indicated comparably low coverages of native aquatic vegetation (2013 = 1.0%; 2017 = <0.1%). Alligator weed was the primary non-native species present during the 2021 survey (<0.1%). While salvinia species was not completely absent during the 2021 survey, coverage declined to levels that were not detected within the arial survey, presumably in relation to the strong freeze event in 2020.

Creel: During the 2021/2022 creel, directed fishing effort was highest for anglers targeting black bass species (43.0%), followed by crappie species (32.6%), anything they could catch (11.4%), catfish species (9.2%), and temperate bass species (3.2%; Table 8). Total fishing effort was estimated at 238,887 hours for all species and increased from the previous lake-wide creel survey (2013/2014 = 182,319 hours). Total fishing expenditures increased for the reservoir since the last lake-wide survey (approximately \$1.5 million in 2021/2022 compared to approximately \$1.0 million in 2013/2014). However, 2013/2014

expenditures when adjusting for inflation were approximately \$1.3 million (Bureau of Labor Statistics 2022) displaying only marginal increases in expenditures.

Prey species: Electrofishing catch rates of Gizzard Shad, Bluegill, and Threadfin Shad were 114.0/h, 213.3/h, and 5,277.0/h, respectively. Index of Vulnerability (IOV) for Gizzard Shad was excellent, indicating that 87% of Gizzard Shad were available to existing predators, with a higher IOV than prior surveys (2013 and 2017 IOV = 73; Figure 2). Total CPUE of Gizzard Shad has remained relatively stable over the previous three surveys (range: 112.0–165.3/h). Total CPUE of Bluegill has also remained relatively stable over the previous three surveys (range: 213.3–261.3/h) and size structure continues to be dominated by small individuals (PSD = 26; Figure 3). Total CPUE for all sunfish species was high (314.0/h) and 77% of sunfish species captured were \leq 5-inches. Threadfin Shad abundance has substantially increased during the 2021 survey (2017 CPUE = 151.7/h; 2021 CPUE = 5,277.0/h). Overall, ample prey is available to support existing sport fish populations.

Catfish: Blue Catfish were abundant with a gill net catch rate of 19.0/nn during the 2022 survey. These catch rates were comparable to the 2018 survey (17.4/nn) and noticeably increased from the 2016 survey (8.9/nn). Size structure was dominated by smaller individuals (PSD = 13; Figure 4); however, this size structure was comparable to the 2016 (PSD = 17) and 2018 (PSD = 27) surveys. While the recent gill net data suggests a population comprised primarily of smaller fish, the 2022 LFE survey collected several larger Blue Catfish (CPUE-20 = 29.8/h; Appendix C). A relatively high LFE catch rate, coupled with excellent relative weights for Blue Catfish \geq 20-inches (mean W_r = 110) indicate the potential for the reservoir to sustain a trophy Blue Catfish fishery. Channel Catfish populations were also abundant with a gill net catch rate of 11.4/nn in 2022. Channel Catfish catch rates were similar over the past three surveys (2016 CPUE = 12.8/nn; 2018 CPUE = 9.5/nn). The Channel Catfish size structure has remained consistently dominated by smaller individuals over the previous three gill net surveys (PSD range: = 0–1; Figure 6). Body conditions of both Channel (mean W_r = 90) and Blue Catfish (mean W_r = 91) were indicative of ample forage.

The percent directed fishing effort for catfish species considerably declined during the 2021/2022 creel survey (9.2%) compared to the two previous lake-wide surveys, where catfish species were the most sought-after fish species (33.5% in 2013/2014 and 42.6% in 2009/2010). With this decline in the proportion of direct effort, a concurrent decline was observed in total directed effort (61,054 hours in 2013/2014 and 19,674 hours in 2021/2022). The percentage of legal released catfish has seen an increasing trend during lake-wide creel surveys (2009/2010: 5%, 2013/2014: 32%, 2021/2022 66%; Table 9), providing evidence of shifting behaviors surrounding a traditionally harvest-oriented fishery. Changes in reservoir catfish regulations may have influenced this trend; however, since September 2011, no minimum length limit has existed for the catfish fishery.

Temperate basses: The gill net catch rate of White Bass was 3.4/nn in 2021, an increase from prior surveys (2018 CPUE = 0.3/nn, 2016 CPUE = 0.0/nn). The observed increase in catch indicated a rebounding population following a substantial fish kill. The gill net catch rate of Hybrid Striped Bass was also noticeably higher in 2022 (CPUE = 5.4/nn) compared to the 2018 (CPUE = 0.2/nn) and 2016 (CPUE = 1.2/nn) surveys. In 2021, Hybrid Striped Bass were stocked at a high rate (approximately 15 fish per acre) and the increased CPUE indicates that this stocking was very successful. Directed fishing effort for temperate basses (White Bass and Hybrid Striped Bass) was low (3.2%; Table 7); but comparable to the 2013/2014 (2.5%) and 2009/2010 (2.7%) lake-wide surveys.

Black basses: The electrofishing catch rate of Largemouth Bass was moderate at 55.3/h and comparable among prior surveys (2015 CPUE = 86.4/h; 2017 CPUE = 73.3/h). Stock-CPUE in the most recent survey (34.0/h) was also moderate and comparable to prior surveys (2017 Stock-CPUE = 46.4/h; 2015 Stock-CPUE = 43.5/h). Trends in size structure have remained stable for Largemouth Bass (2015 PSD = 57, 2017 PSD = 53, 2021 PSD = 63; Figure 13) with a marginal increase in PSD from prior surveys. The size structure of the Largemouth Bass fishery is indicative of a balanced population. Growth of Largemouth Bass was fast with an average age at 14 inches of 1.8 years (N = 13; range = 1 – 2 years). Body condition of Largemouth Bass was indicative of ample forage in 2021 (mean W_r = 94). Florida

Largemouth Bass influence increased with the most recent genetic analysis (2021) indicating the highest historic percentage of Florida alleles at 63% (Table 12; 1994–2013 range: 31–50%). The electrofishing catch rate of Spotted Bass was moderate with a CPUE of 32.7/h and comparable among prior surveys (2015 CPUE = 25.6/h; 2017 CPUE = 49.0/h), providing evidence that the Spotted Bass fishery continues to supplement the overall black bass fishery.

A plurality of anglers targeted black bass with 43.0% of total directed effort during the most recent creel survey. The percentage of directed effort for black basses has displayed an increasing trend from prior surveys (2009/2010 = 17.4%, 2013/2014 = 25.2%; Table 7) which coincides with an increasing number of trophy Largemouth Bass seen in the 2021/2022 creel. Five-hundred and thirty-three released Largemouth Bass were estimated at 7 pounds or greater (> 1% of total Largemouth Bass released) in 2021/2022 creel compared to 0 in the 2013/2014 creel. Black bass tournament effort was a significant proportion of total black bass effort (37.8%), and comparable to proportions of black bass tournament effort estimated during prior lake-wide surveys (2009/2010 = 47.2% and 2013/2014 = 43.8%; Table 11). Most non-tournament legal-length Largemouth Bass were released (91%). Black bass catch rates were moderately low (0.6/h) during the 2021/2022 creel and these catch rates were identical to the most recent lake-wide black bass catch rate (2013/2014: 0.6/h).

Crappie: Black and White Crappie are present in the reservoir and provide a popular fishery. Crappie were the 2nd most sought-after species group during the most recent creel survey (Table 7). Percent directed fishing effort (32.6%) substantially increased relative to the 2013/2014 lake-wide survey (11.1%; Table 7). The crappie fishery is harvest-oriented as only 6% of legal-sized crappie were released, a decline from 22% observed during the 2013/2014 lake-wide survey (Table 13).

Fisheries Management Plan for Lake Palestine, Texas

Prepared – July 2022

ISSUE 1: Hybrid Striped Bass have been a part of the overall fishery at Lake Palestine since the early 1990s. Multiple challenges have prevented consistent stockings in recent years, resulting in an inconsistent fishery. Annual stocking of Hybrid Striped Bass is required to sustain the population and maintain this fishery.

MANAGEMENT STRATEGY

1. Stock Hybrid Striped Bass fingerlings annually at 10 fish/acre. If fingerlings are not available to meet stocking requests, stock with fry at 100 fish/acre, if feasible.
2. Promote the fishery via social media and press releases during stockings.

ISSUE 2: The Largemouth Bass fishery in Lake Palestine remains popular among anglers as this was the most sought-after fish species during the most recent creel survey. The lake has produced three TPWD Legacy Class ShareLunker entries, most recently with an entry in January 2021. During the most recent creel survey (2021/2022), over 1% of the Largemouth Bass released were estimated at 7 pounds or greater, a percentage strongly indicative of a trophy fishery and comparable to other trophy Largemouth Bass fisheries throughout the state. Moreover, anecdotal tournament results indicate numerous landings of trophy sized fish. Given the fast growth and abundant forage, stocking Lone Star Largemouth Bass is likely to maintain trophy abundance. Additionally, spring electrofishing surveys generally provide a better overall picture of size structure within a reservoir compared to fall surveys, specifically for larger fish. Collecting spring electrofishing data will provide additional insight into the trophy Largemouth Bass population in the reservoir.

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 \geq 13 pounds, at a rate of 1,000/km shoreline.
2. Promote TPWD ShareLunker program to improve supplemental reporting of trophy Largemouth Bass catches within the reservoir.
3. Sampling objectives outlined in the OBS plan will focus on monitoring Largemouth Bass size structure to help justify continued stockings.

ISSUE 3: Salvinia species (giant and common) are prevalent within Lake Palestine as evidenced by aquatic nuisance surveys (ANS) and pose serious threats to both angling and boating access and native vegetative habitat. Annual treatment efforts have been ongoing since 2018 and will persist on an annual basis to mitigate the spread of this species. Moreover, many other 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. Invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling

and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Continue efforts conducting bimonthly (every other month) herbicide treatments November through March and monthly treatments May through September, focusing efforts during the growing season in locations where salvinia species are prevalent.
2. Conduct annual ANS surveys to monitor the effectiveness of treatments.
3. Work with Aquatic Habitat Enhancement (AHE) Team to explore the use and effectiveness of giant salvinia weevils (*Cyrtobagous salviniae*) to mitigate the impact and distribution of salvinia species in the reservoir.
4. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
5. Contact and educate marina owners about invasive species and provide them with various literature to educate their customers.
6. Educate the public about invasive species using various media outlets.
7. Make a speaking point about invasive species when presenting to constituent and user groups.
8. Keep track of (i.e., map) existing and future interbasin 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 Palestine include Largemouth Bass; Blue, Channel and Flathead Catfish; White Bass; Hybrid Striped Bass; and Black and White Crappie. Important forage species include Gizzard Shad, Threadfin Shad, and sunfishes.

Survey objectives, fisheries metrics, and sampling objectives

Crappie: Historical trap net data has fluctuated among survey years; catch rates were very dependent upon sample location resulting in overall poor survey precision. The results of prior trap net surveys suggest at least 48 net nights may be necessary to estimate relative abundance with an acceptable level of precision ($RSE \leq 25$). Due to the unpredictability of trap net survey success and the large sample size required to reliably estimate crappie trend data (CPUE, PSD, W_i), trap net surveys are no longer conducted on Lake Palestine. Inferences about the crappie population and identification of potential applied management actions will continue to be made from data collected through lake-wide creel surveys conducted every four years.

Catfishes: Historical survey results indicate gill net surveys are effective at monitoring Blue and Channel Catfish trend data (CPUE, PSD, W_i) on Lake Palestine. Gill net surveys will be conducted every four years to continue monitoring both species for large-scale changes in the population that may spur further investigation. In the spring of 2026, a minimum of 10 randomly selected gill net sites will be sampled, with up to 5 additional sites, if necessary, to estimate relative abundance with an $RSE\text{-}Stock \leq 25$ along with relative weights and size structure of at least 50 stock-size fish, for Blue Catfish. Due to historically low

catch rates of stock-sized Channel Catfish, no objectives will be set for this fishery. No additional effort will be conducted if survey objectives are not met after 15 total net nights. Lower precision ($RSE \leq 35$) of CPUE estimates will be acceptable, if necessary, to make historical comparisons.

Largemouth Bass: Largemouth Bass represent a significant fishery in Lake Palestine as black bass were the most sought-after species during the most recent creel survey. Additionally, a recent ShareLunker Legacy Class (≥ 13 pounds) entry (January 2021) and anecdotal tournament results are indicative of the trophy potential offered in this reservoir. Due to the importance of the fishery, trend data on relative abundance, body condition, size structure, and growth are desired for monitoring this fishery (measured by CPUE, PSD, W_r , and age at 14 inches). These data will allow for determination of any large-scale changes in the Largemouth Bass population that may initiate further investigation. Historical electrofishing data suggests that sampling objectives ($RSE\text{-Stock} \leq 25$ for CPUE-Stock, $N \geq 50$ for stock-size fish) can be obtained by sampling 12–18 stations. A minimum effort of 18 randomly selected nighttime electrofishing stations will be conducted and an additional six random stations generated in the event additional sampling is required to meet OBS plan objectives for Largemouth Bass in fall 2025 (Table 14). During the fall survey, a sample of 13 fish, if captured, will be aged near the minimum length limit (13.0 to 14.9 inches). Additionally, in the spring 2023 these objectives ($RSE\text{-Stock} \leq 25$ for CPUE-Stock, $N \geq 50$ for stock-size fish) will remain for Largemouth Bass to gather data characterizing the size structure and abundance of the larger size classes (PSD, CPUE-16).

Temperate Bass: White Bass and Hybrid Striped Bass population data will be collected every four years during spring gill net surveys. To monitor the fishery, trend data on relative abundance, body condition, size structure, and growth are desired (measured by CPUE, PSD, W_r , and age at minimum length limit [10 inches and 18 inches for White Bass and Hybrid Striped Bass, respectively]). Historic survey results suggest a large amount of effort (>72 gill-net nights) would be required to estimate relative abundance and size structure with acceptable precision for temperate bass species. While trend data will be difficult to estimate, it will be necessary to document the survival of stocked Hybrid Striped Bass within the reservoir. No sampling objectives will be set for White Bass and Hybrid Striped Bass, and population data will be gathered during gill net surveys aimed at monitoring catfish species in the spring 2026. Additional inferences about the population may be obtained through lake-wide creel surveys conducted every four years.

Prey Species: Gizzard Shad, Threadfin Shad and sunfish are important prey species in Lake Palestine. Long-term monitoring trend data is desired for these populations to evaluate their relative abundance (CPUE) and size structure (PSD). Relative weights of the Largemouth Bass population, along with size structure of Bluegill and the IOV of Gizzard Shad, will be used to gauge prey fish availability for sport fishes from electrofishing sampling conducted in fall 2025. No sampling objectives will be set for prey species.

Angler Data: Historically, the Lake Palestine fishery has been monitored through angler creel surveys to monitor angling trends (species targeted, effort, catch and directed expenditures). Angler trend data will continue to be monitored with a yearlong (four quarter) creel from June 2025 through May 2026. Each quarter of the creel will consist of 5 randomly selected weekend creel days and 4 randomly selected weekday creel days.

Habitat: Aquatic invasive plants are a serious issue at Lake Palestine. Salvinia species (common and giant), specifically, pose potential threats to angler and boater access as well as outcompete desirable native species. To curb the proliferation of the species, a contract has been secured with a private aquatic vegetation management company to consistently treat areas where this species is abundant. Annual ANS surveys will be conducted within the affected areas of the reservoir. The results of each survey will be used to determine further management efforts (e.g., expanded survey, increased herbicide treatments, containment booms). A complete-reservoir comprehensive vegetation survey will be conducted in 2025, to monitor the littoral habitat within the reservoir.

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Tables and Figures

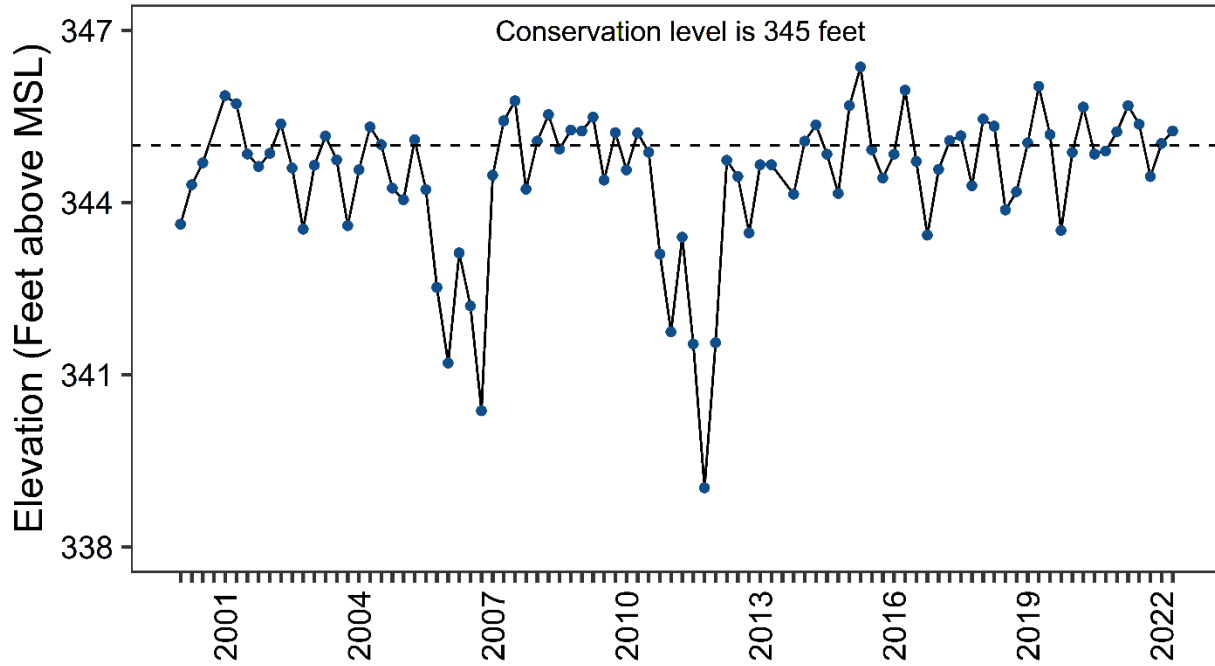


Figure 1. Quarterly water level elevations (Winter 2000–Spring 2022) in feet above mean sea level (MSL) recorded for Lake Palestine, Texas (Water Data for Texas 2022).

Table 1. Characteristics of Lake Palestine, Texas.

Characteristic	Description
Year constructed	1962, enlarged to present size in 1971
Controlling authority	Upper Neches River Municipal Water Authority
Counties	Cherokee, Anderson, Henderson, and Smith
Reservoir type	Mainstem
Shoreline Development Index	6.1
Conductivity	150 μ S/cm

Table 2. Boat ramp characteristics for Lake Palestine, Texas, July 2021. Reservoir elevation at time of survey was 345 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft.)	Condition
Chandler River Park	35.31508 -95.45243	Y	100	Unknown	Accessible, shallow slope
Westberry Landing	32.27371 -95.45450	Y	15	342	Accessible, shallow slope
Villages Marina	32.21769 -95.46845	Y	200	337	Accessible
Kickapoo Public Ramp	32.26883 -95.50222	Y	50	339	Accessible, shallow slope
Flat Creek Public Ramp	32.19642 -95.51115	Y	40	338	Accessible
Flat Creek Marina	32.19383 -95.50816	Y	75	Unknown	Accessible
Lake Palestine Marina	32.16607 -95.42659	Y	50	Unknown	Accessible
Saline Bay Public Ramp	32.17317 -95.44653	Y	50	339	Accessible at full pool, limited access during low water
Lakeside Getaway	32.17026 -95.45250	Y	20	Unknown	Accessible
Camper's Cove	32.15462 -95.44998	Y	30	Unknown	Accessible
Palestine Pines	32.15711 -95.46541	Y	40	Unknown	Accessible
Lake Palestine Motor Inn	32.13105 -95.48400	Y	30	Unknown	Temporarily out of service
Lake Palestine Resort	32.12325 -95.48809	Y	40	337	Accessible
Big Steve's RV Resort & Marina	32.68353 -95.47359	Y	10	Unknown	Accessible, shallow slope
Deep End Public Ramp	32.05373 -95.44238	Y	75	338	Accessible

Table 3. Harvest regulations for Lake Palestine, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids, and subspecies	25 ^a (in any combination)	No minimum length
Flathead Catfish	5	18-inch minimum
White Bass	25	10-inch minimum
Hybrid Striped Bass	5	18-inch minimum
Largemouth Bass	5 ^b	14-inch minimum
Spotted Bass	5 ^b	None
Crappie: White and Black Crappie, their hybrids, and subspecies	25 (in any combination)	10-inch minimum

^a In the 25-fish bag, no more than five fish 20 inches or greater in length may be retained, and no more than one of those can be 30 inches or longer.

^b Daily bag limit is five fish for all black bass species in any combination.

Table 4. Stocking history of Lake Palestine, Texas. FGL = fingerling; ADL = adults; FRY = fry.

Species	Year	Number	Size
Threadfin Shad	1984	<u>2,500</u>	ADL
	Total	2,500	
Blue Catfish	1971	35,960	FGL
	1978	5,400	FGL
	1979	7,830	FGL
	1986	<u>250,140</u>	FGL
	Total	299,330	
Channel Catfish	1971	154,746	FGL
	1972	45,000	FGL
	1973	<u>126,940</u>	FGL
	Total	326,686	
Hybrid Striped Bass	1978	139,615	FGL
	1979	227,800	FGL
	1982	295,035	FGL
	1991	257,270	FGL
	1992	390,867	FGL
	1993	1,093,700	FGL and FRY
	1994	385,747	FGL
	1995	385,400	FGL
	1996	281,670	FGL
	1997	255,021	FGL
	1998	255,217	FGL
	2002	191,250	FGL
	2003	58,530	FGL
	2004	122,131	FGL
	2005	101,117	FGL
	2007	1,195,830	FRY
	2007	100,000	FGL
	2008	143,907	FGL
	2009	100,937	FGL
	2011	101,611	FGL
	2013	653,517	FGL and FRY
	2014	344,765	FGL
	2015	199,014	FGL
2016	124,256	FGL	
2017	112,148	FGL	
2021	357,150	FGL	
2022	<u>461,778</u>	FGL	
Total	8,335,283		
Largemouth Bass	1971	<u>1,600,000</u>	FGL
	Total	1,600,000	

Table 4. Stocking history (continued).

Florida Largemouth Bass	1981	21,410	FGL
	1982	19,000	FGL
	1983	25,500	FGL
	1984	292,310	FGL
	1997	255,500	FGL
	1998	256,518	FGL
	1999	255,000	FGL
	2000	255,472	FGL
	2004	441,191	FGL
	2005	589,360	FGL
	2008	499,961	FGL
	2009	651,015	FGL
	2012	642,967	FGL
	2013	1,923	FGL
	2014	72,676	FGL
	2015	223,897	FGL
	2016	172,901	FGL
	2017	235,271	FGL
	2018	348,151	FGL
	2019	347,154	FGL
	2020	192,018	FGL
2021	352,165	FRY	
Total	6,151,360		
Lone Star Largemouth Bass ^a	2022	339,985	FGL
	Total	339,985	
ShareLunker Largemouth Bass ^b	2013	4,558	FGL
	2014	14,332	FGL
	2021	10,849	FGL
	Total	34,297	
Walleye	1974	2,580,000	FRY
	1975	2,250,000	FRY
	1976	1,000,000	FRY
	Total	5,830,000	

^a 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.

^b ShareLunker Largemouth Bass are 1st generation offspring from angler-donated Largemouth Bass \geq 13 pounds from the Toyota ShareLunker program.

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

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing: Fall</i>			
Largemouth Bass	Abundance	CPUE–Stock	RSE–Stock \leq 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 \leq 25
	Size structure	PSD, length frequency	$N \geq$ 50
Gizzard Shad ^a	Abundance	CPUE–Total	RSE \leq 25
	Prey availability	IOV	$N \geq$ 50
<i>Electrofishing: Spring</i>			
Largemouth Bass	Abundance	CPUE–Stock	RSE–Stock \leq 25
	Size structure	PSD, length frequency	$N \geq$ 50 stock
<i>Gill netting</i>			
Blue Catfish	Abundance	CPUE–Stock	RSE–Stock \leq 25
	Size structure	PSD, length frequency	$N \geq$ 50 stock
Channel Catfish	Abundance	CPUE–Total	No set objective
	Size structure	PSD, length frequency	
Temperate Bass	Presence-absence	CPUE–Total	No set objective
<i>Creel Survey</i>			
Sportfish	Angler trend data	Angler effort, angler CPUE, harvest, and size structure of harvest	No set objective

^a No additional effort will be expended to achieve an RSE \leq 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 aquatic vegetation, Lake Palestine, Texas, 2013, 2017, and 2021. Surface area (acres) is listed with percent of total reservoir surface area in parentheses. Surveys in 2013 and 2017 conducted using the digital shapefile method according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017). The survey in 2021 was conducted utilizing an arial coverage survey. Although other data confirms that salvinia species were present during 2021, salvinia species were not detected during the arial survey.

Vegetation	2013	2017	2021
Native submersed			
Muskgrass	4 (<0.1)	0	0
Pondweed	7 (<0.1)	0	0
Wild celery	Trace	0	0
Water stargrass	Trace	0	0
Native floating-leaved			
Spatterdock	15 (<0.1)	45 (<0.1)	23 (<0.1)
Native emergent			
American lotus	203 (0.9)	95 (<0.1)	0
Cattail	4 (<0.1)	0	0
Giant cutgrass	13 (<0.1)	35 (<0.1)	212 (0.8)
Maidencane	2 (<0.1)	5 (<0.1)	0
Square stem spike rush	0	Trace	0
Panicum species	1 (<0.1)	2 (<0.1)	4 (<0.1)
Water primrose	10 (<0.1)	0	0
Water willow	6 (<0.1)	7 (<1)	0
Non-native			
Alligatorweed (Tier III)	0	2 (<0.1)	13 (<0.1)
Hydrilla (Tier III)	Trace	0	0
Salvinia (Tier I)	0	0	0

*Tier I is immediate response, Tier III is watch status

Table 7. Percent directed angler effort by species for Lake Palestine, Texas, 2009–2022. Survey periods were from June through May.

Species	2009/2010	2013/2014	2021/2022
Catfish species	42.6	33.5	9.2
Temperate basses	2.7	2.5	3.2
Sunfishes	0.9	1.0	0.6
Black basses	17.4	25.2	43.0
Crappie species	18.8	11.1	32.6
Anything	17.6	26.2	11.4

Table 8. Total fishing effort (h) for all species and total directed expenditures at Lake Palestine, Texas, 2009-2022. Survey periods were from June through May. Relative standard error (RSE) is in parentheses.

Creel statistic	2009/2010	2013/2014	2021/2022
Total fishing effort	220,929 (17)	182,319 (13)	238,887 (15)
Total directed expenditures	1,054,911 (30)	1,074,263 (44)	\$1,539,481 (35)

Gizzard Shad

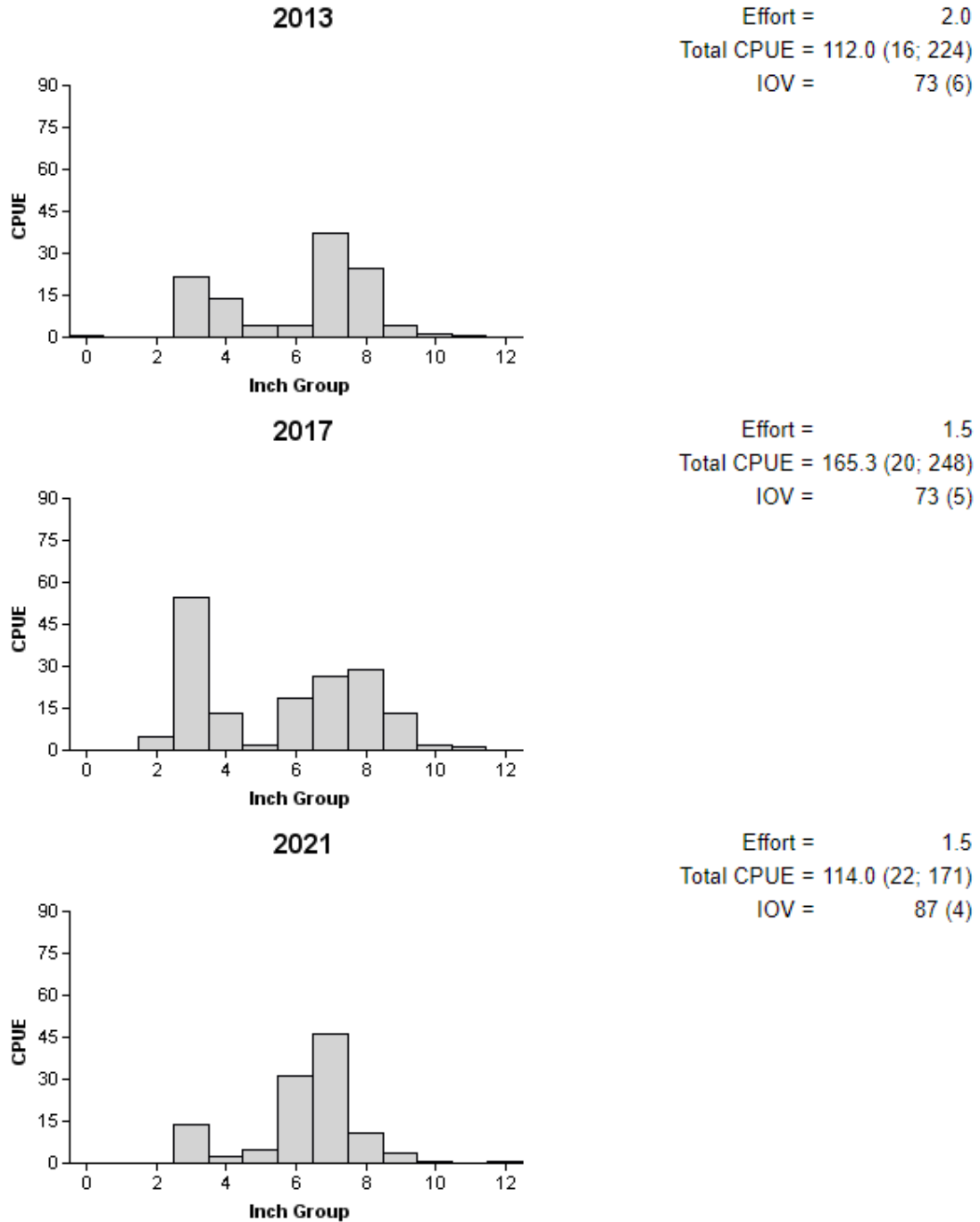


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Palestine, Texas, 2013, 2017, and 2021.

Bluegill

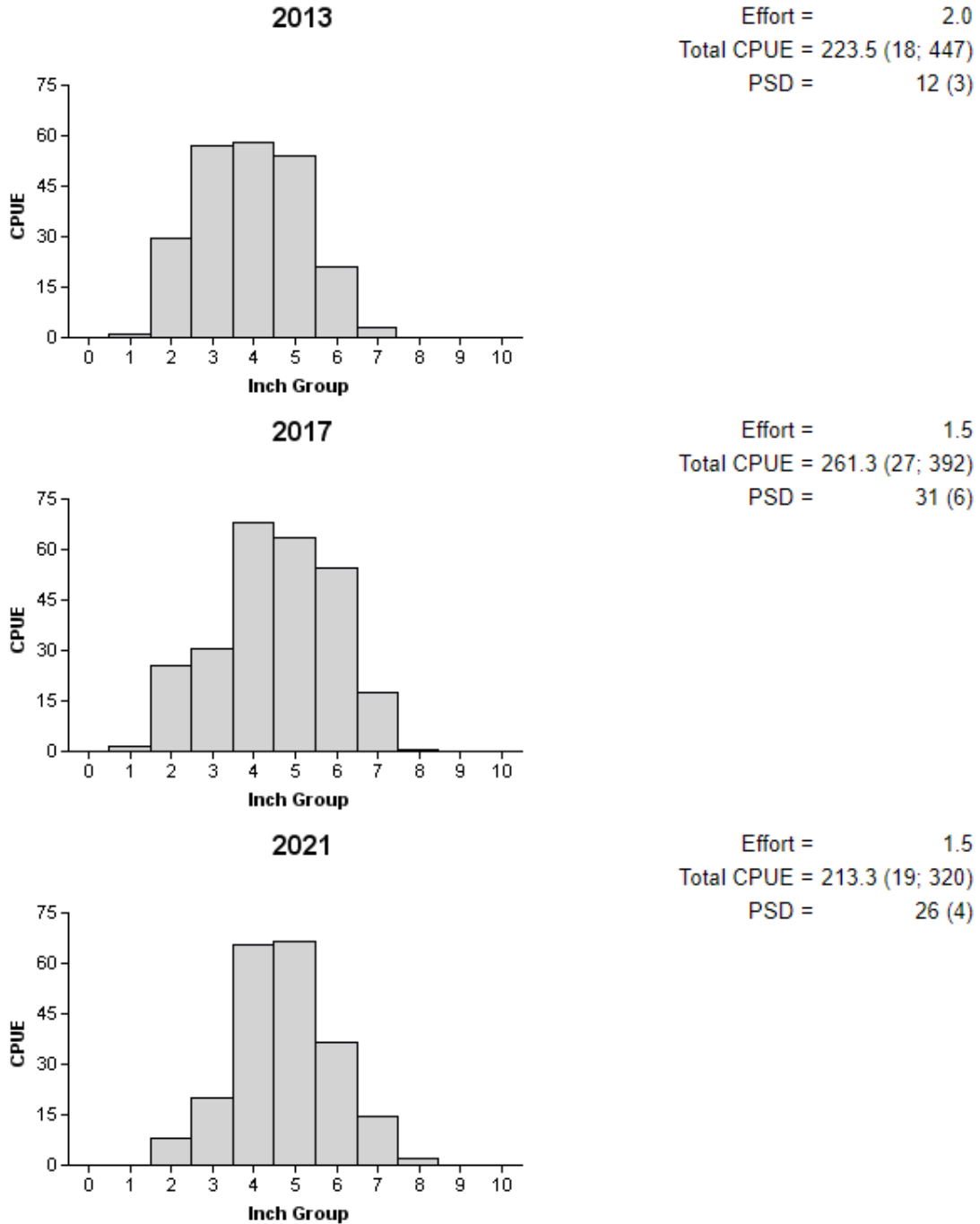


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Palestine, Texas, 2013, 2017, and 2021.

Blue Catfish

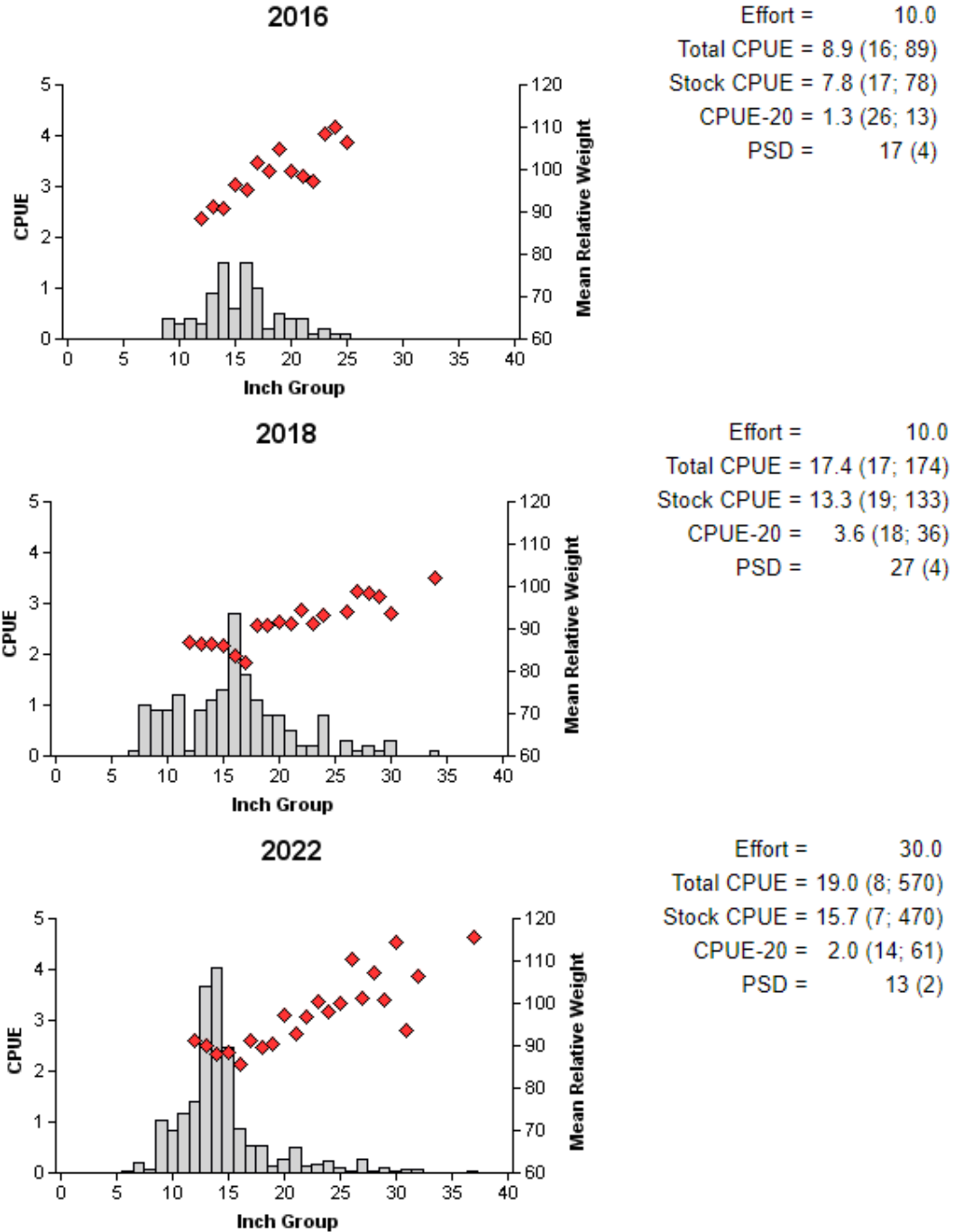


Figure 4. Number of Blue Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Palestine, Texas, Lake Palestine, 2016, 2018, and 2022.

Channel Catfish

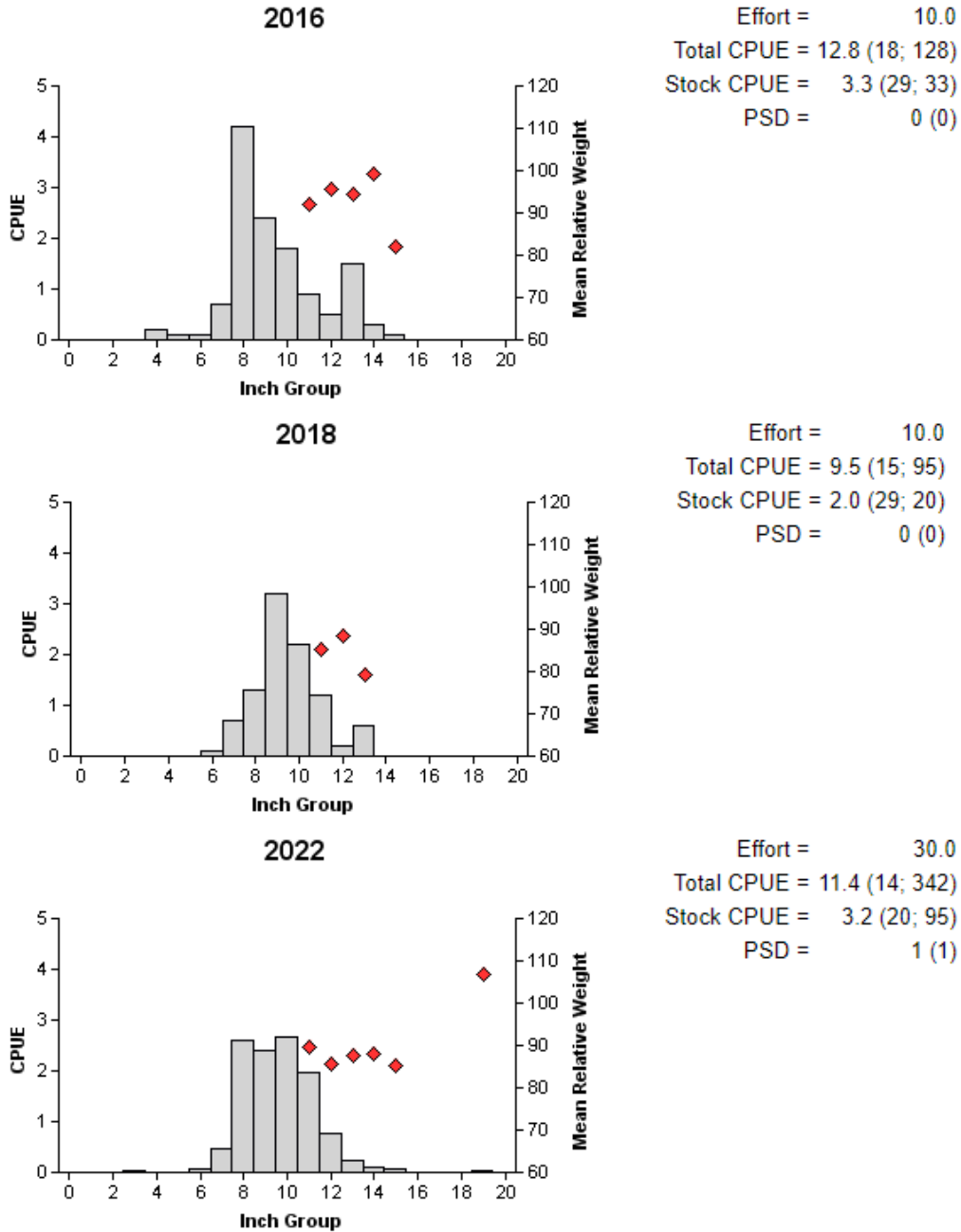


Figure 5. Number of Channel Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Palestine, Texas, 2016, 2018, and 2022.

Table 9. Creel survey statistics for catfish (Channel and Blue Catfish) at Lake Palestine, Texas, from June 2009 through May 2022. Total catch per hour is for anglers targeting catfish and total harvest is the estimated number of catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2009/2010	2013/2014	2021/2022
Surface area (acres)	23,434	23,434	25,560
Directed effort (h)	95,132 (18)	61,054 (15)	19,674 (25)
Directed effort/acre	4.1 (18)	2.6 (15)	0.8 (25)
Total catch per hour	2.3 (39)	3.4 (33)	1.6 (53)
Total harvest	121,174	158,985	22,954
Blue Catfish	32,246 (38)	25,070 (46)	6,667 (80)
Channel Catfish	88,927 (46)	133,915 (26)	16,287 (49)
Harvest/acre	5.2	6.8	0.9
Blue Catfish	1.4 (38)	1.7 (46)	0.3 (80)
Channel Catfish	3.8 (46)	5.7 (26)	0.6 (49)
Percent legal released	5	32	66

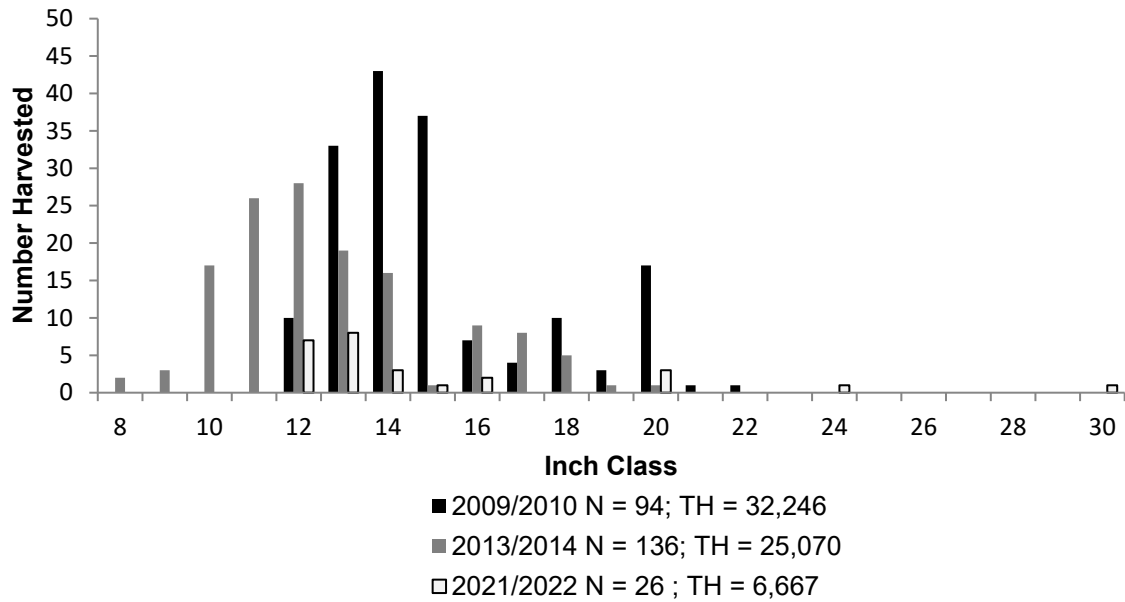


Figure 6. Length frequency of harvested Blue Catfish observed during creel surveys at Lake Palestine, Texas, June 2009 through May 2021, all anglers combined. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

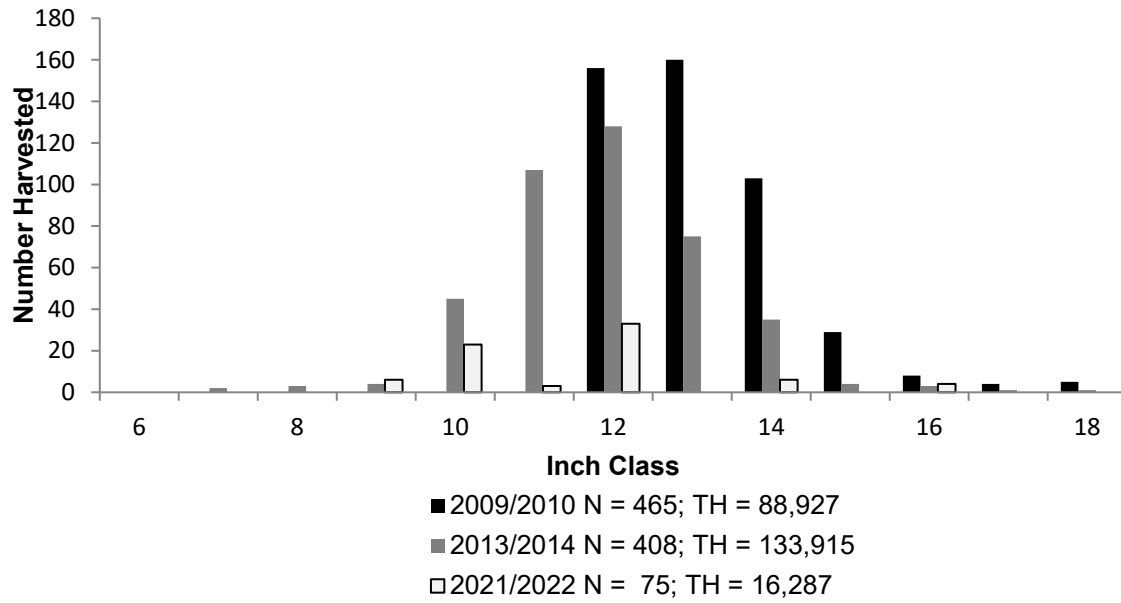


Figure 7. Length frequency of harvested Channel Catfish observed during creel surveys at Lake Palestine, Texas, June 2009 through May 2021, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

White Bass

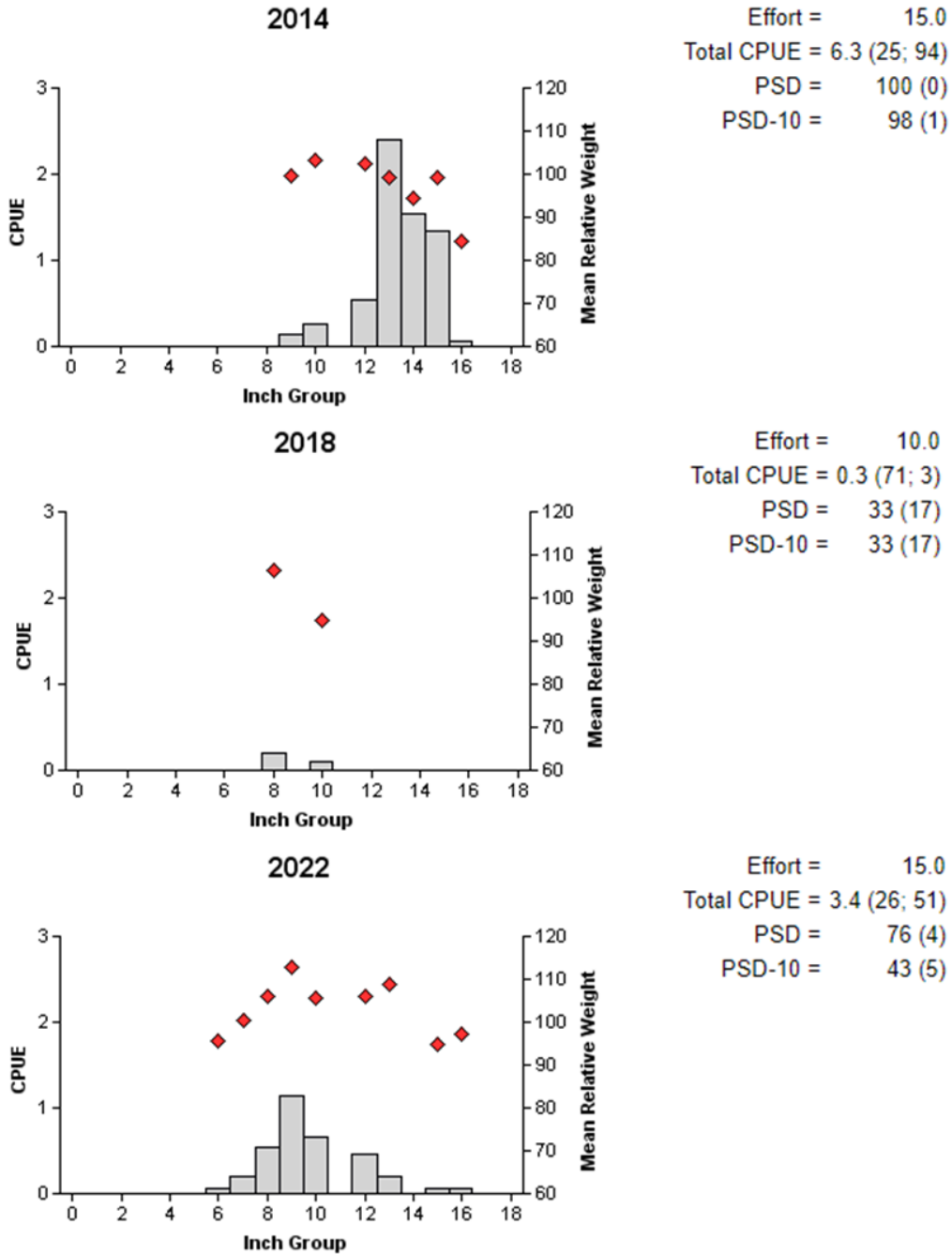


Figure 8. Number of White Bass caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Palestine, Texas, 2014, 2018, and 2022. No White Bass were collected during the 2016 survey.

Hybrid Striped Bass

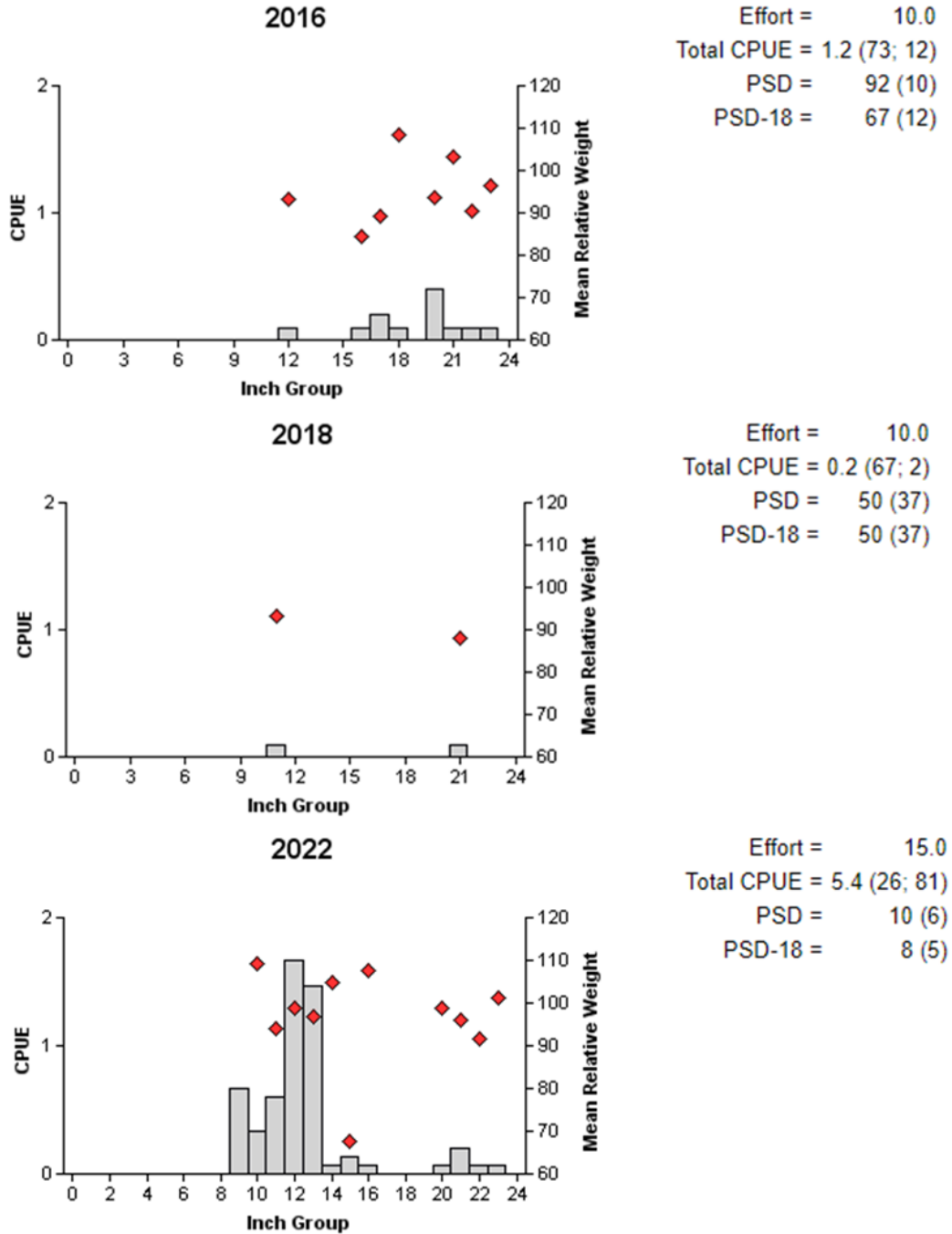


Figure 9. Number of Hybrid Striped Bass caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Palestine, Texas, 2016, 2018, and 2022.

Table 10. Creel survey statistics for temperate basses (White Bass and Hybrid Striped Bass) at Lake Palestine, Texas, from June 2009 through May 2022. Total catch per hour is for anglers targeting temperate basses and total harvest is the estimated number of temperate basses harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2009/2010	2013/2014	2021/2022
Surface area (acres)	23,434	23,434	25,560
Directed effort (h)	6,107 (40)	4,592 (38)	6,841 (43)
Directed effort/acre	0.3 (40)	0.2 (38)	0.3 (43)
Total catch per hour	1.0 (47)	0.9 (70)	0.5 (78)
Total harvest	1,574 (315)	4,161	552 (223)
White Bass	1,574 (315)	3,824 (102)	0.0
Hybrid Striped Bass	0.0	337 (839)	552 (223)
Harvest/acre	<0.1 (315)	0.2	<0.1 (223)
White Bass	<0.1 (315)	0.2 (102)	0.0
Hybrid Striped Bass	0.0	<0.1 (839)	<0.1 (223)
Percent legal released	54	58	92

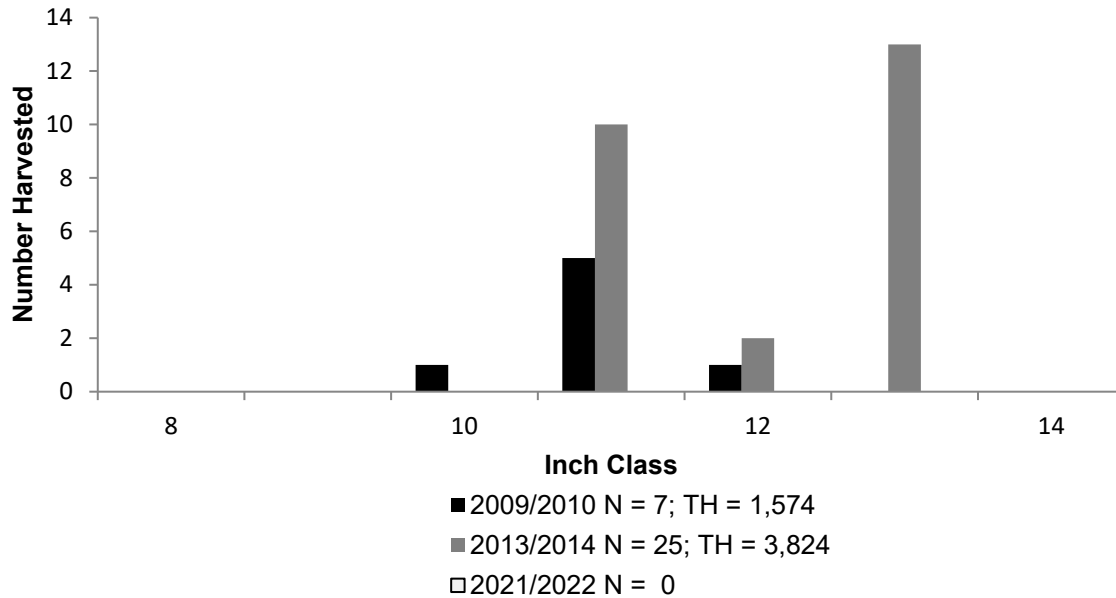


Figure 10. Length frequency of harvested White Bass observed during creel surveys at Lake Palestine, Texas, June 2009 through May 2021, all anglers combined. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

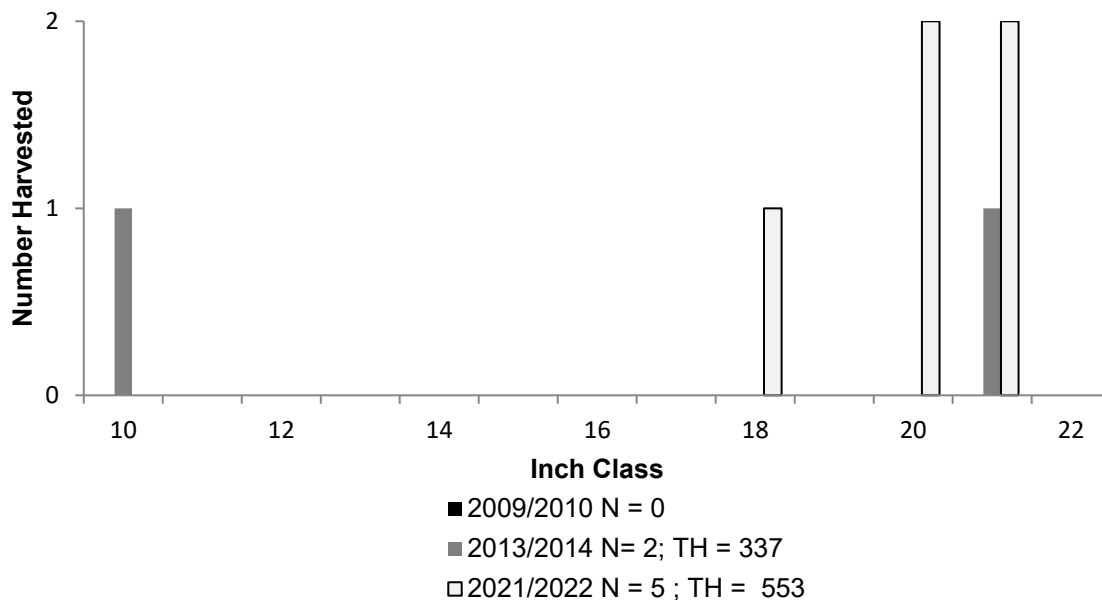


Figure 11. Length frequency of harvested Hybrid Striped Bass observed during creel surveys at Lake Palestine, Texas, June 2013 through May 2022, all anglers combined. N is the number of harvested Hybrid Striped Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth Bass

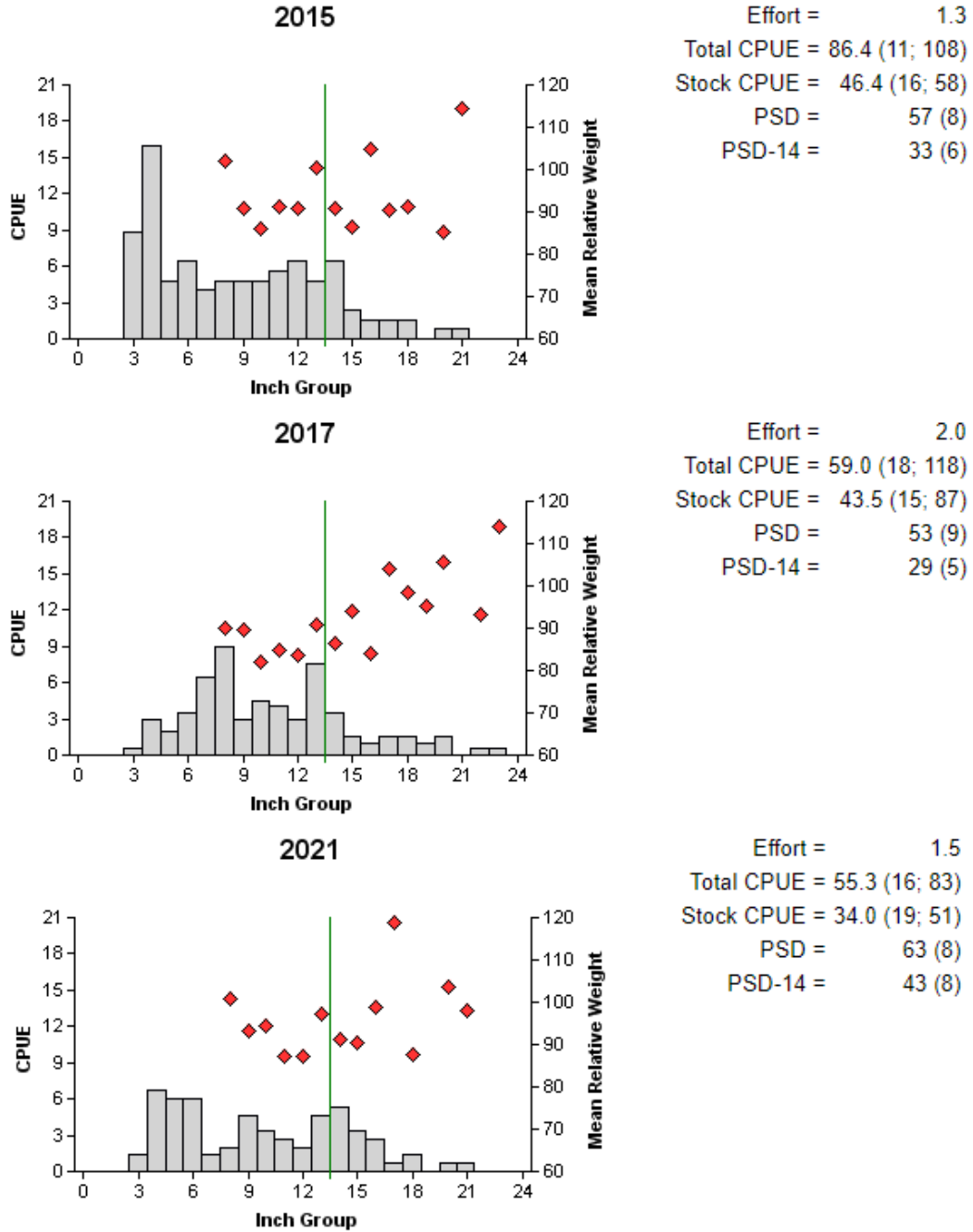


Figure 12. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Palestine, Texas, 2015, 2017, and 2021. Vertical line represents legal-length (14 inches).

Table 11. Creel survey statistics for black bass (Largemouth Bass and Spotted Bass) at Lake Palestine, Texas, from June 2009 through May 2022. Catch rate is for all anglers targeting black bass. Harvest is partitioned by the estimated number of fish harvested by non-tournament anglers and the number of fish retained by tournament anglers for weigh-in and release. The estimated number of fish released by weight category is for all released Largemouth Bass. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2009/2010	2013/2014	2021/2022
Surface area (acres)	23,434	23,434	25,560
Black bass directed angling effort (h)			
Tournament	17,654 (28)	20,102 (24)	34,684 (26)
Non-tournament	19,738 (24)	25,817 (22)	56,970 (17)
Black bass effort	41,901 (21)	45,919 (19)	91,654 (17)
Angling effort/acre	1.8 (21)	2.0 (19)	3.6 (17)
Black bass catch rate (number/h)	1.1 (44)	0.6 (29)	0.6 (38)
Harvest (Largemouth Bass)			
Non-tournament harvest	1,078 (228)	2,967 (286)	1,709 (186)
Harvest/acre	0.3 (228)	0.1 (286)	<0.1 (186)
Tournament weigh-in and release	5,125 (110)	5,176 (89)	3,823 (82)
Release by weight			
<4.0 lbs	NA	6,367 (102)	44,660 (50)
4.0-6.9 lbs	NA	316 (121)	967 (85)
7.0-9.9 lbs	NA	0	335 (111)
≥10.0 lbs	NA	0	198 (71)
Percent legal released (non-tournament)	70	64	91

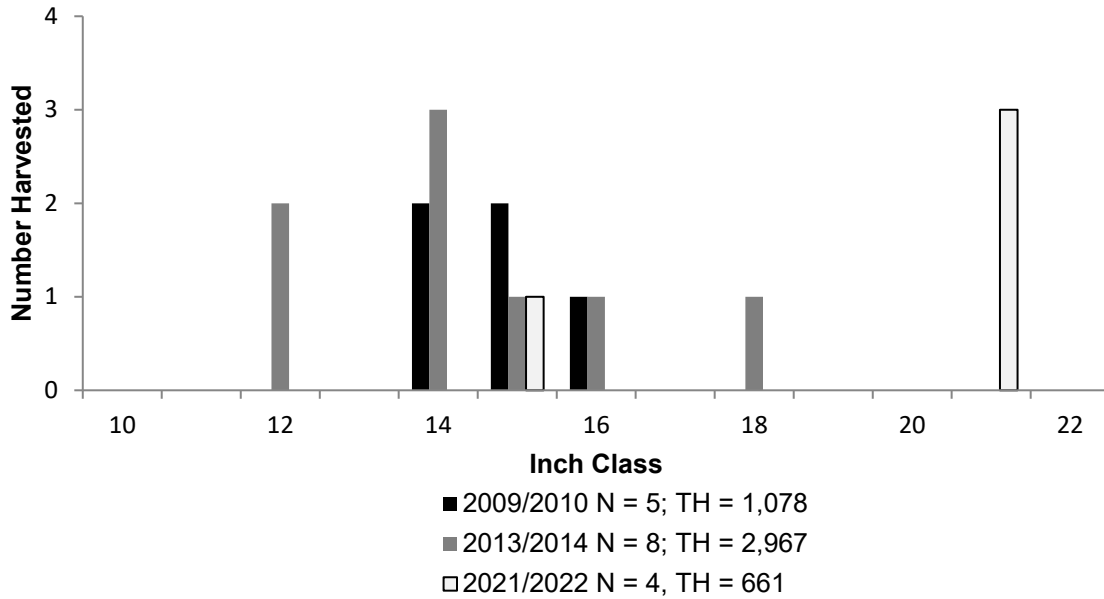


Figure 13. Length frequency of non-tournament harvested Largemouth Bass observed during creel surveys at Lake Palestine, Texas, June 2009 through May 2022, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the estimated harvest for the creel period.

Table 12. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Lake Palestine, Texas, 1994 through 2021. 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	FLMB	Intergrades (N)	NLMB	% FLMB alleles	% FLMB
1994	59	4	42	13	42	6.8
1995	30	2	32	6	42	6.9
1996	30	1	17	12	31	3.3
1997	32	0	26	6	32	0.0
2001	24	1	21	2	38	4.1
2003	30	5	19	5	42	14.3
2007	30	0	30	0	50	0.0
2011	30	0	29	1	50	0.0
2013	30	0	30	0	41	0.0
2021	30	1	29	0	63	4.5

Spotted Bass

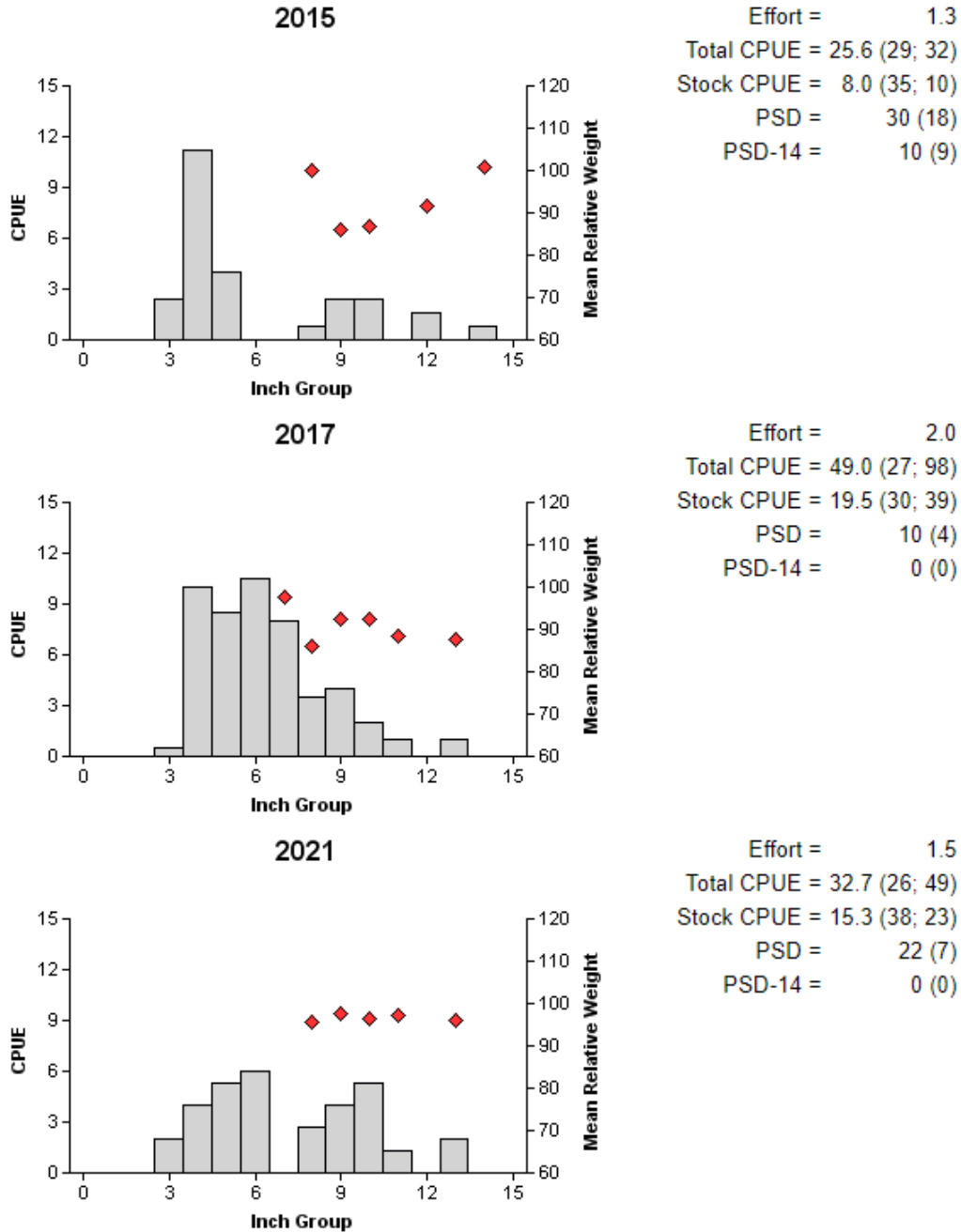


Figure 14. Number of Spotted Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Palestine, Texas, 2015, 2017, and 2021.

Crappie

Table 13. Creel survey statistics for crappie (White and Black Crappie) at Lake Palestine, Texas, from June 2009 through May 2022. Total catch per hour is for anglers targeting crappie and total harvest is the estimated number of crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2009/2010	2013/2014	2021/2022
Surface area (acres)	23,434	23,434	25,560
Directed effort (h)	42,009 (18)	20,296 (24)	69,504 (17)
Directed effort/acre	1.8 (18)	0.9 (24)	2.7 (17)
Total catch per hour	2.2 (33)	1.5 (49)	1.7 (28)
Total harvest	45,273	13,204	69,490
White Crappie	30,627 (33)	8,193 (4)	47,500 (22)
Black Crappie	14,646 (59)	5,011 (2)	21,989 (32)
Harvest/acre	1.9	0.6	2.7
White Crappie	1.3 (33)	0.4 (4)	1.9 (22)
Black Crappie	0.6 (59)	0.2 (2)	0.9 (32)
Percent legal released	4	22	6

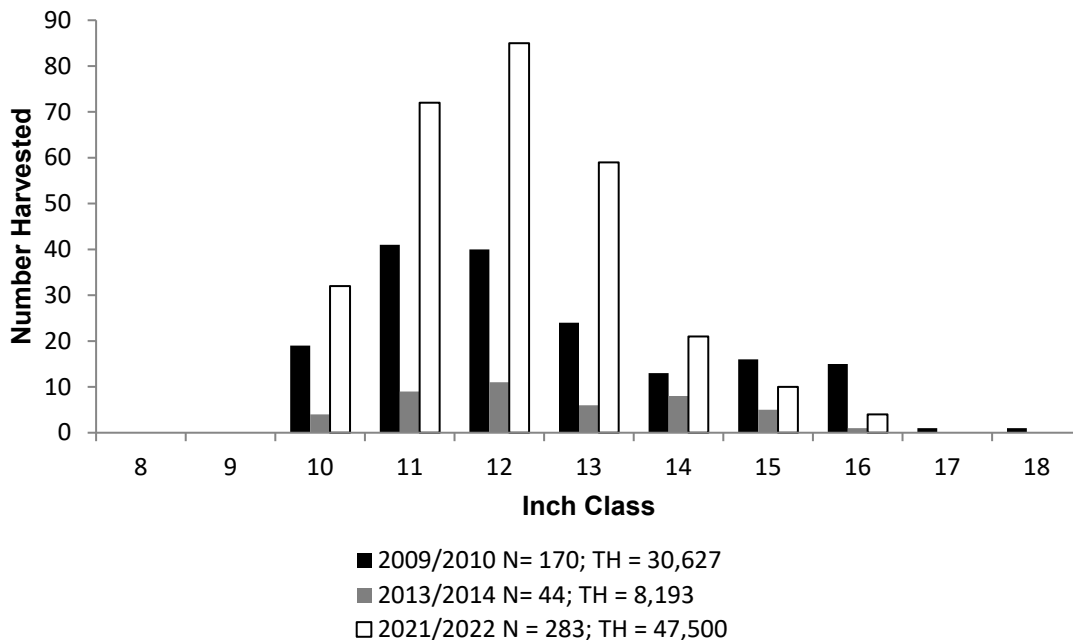


Figure 15. Length frequency of harvested White Crappie observed during creel surveys at Lake Palestine, Texas, June 2009 through May 2022, all anglers combined. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

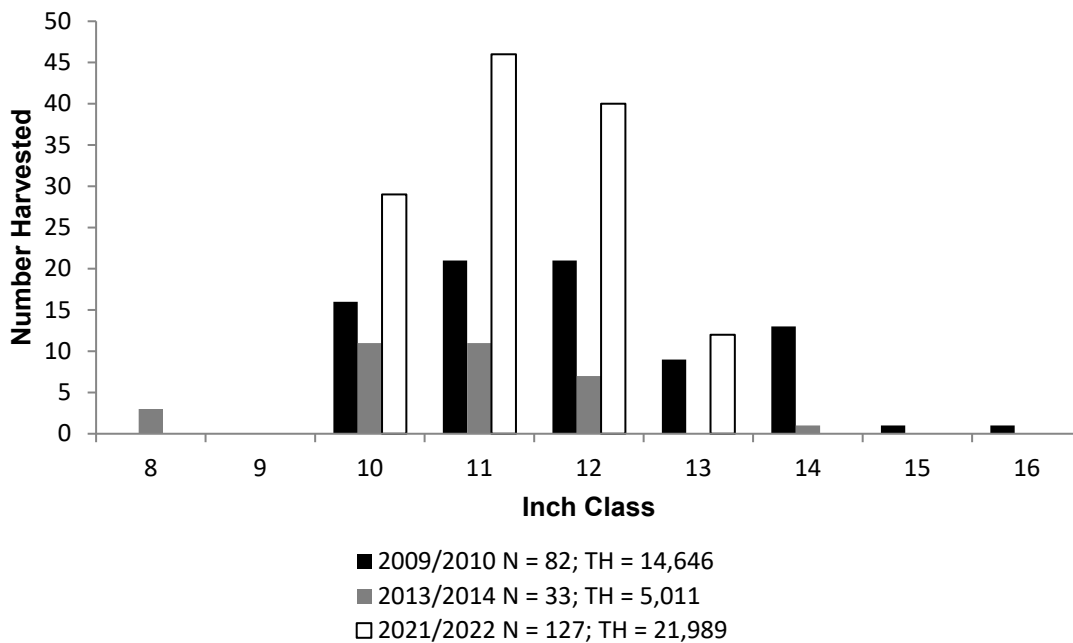


Figure 16. Length frequency of harvested Black Crappie observed during creel surveys at Lake Palestine, Texas, June 2009 through May 2022, all anglers combined. N is the number of harvested Black Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Proposed Sampling Schedule

Table 14. Proposed sampling schedule for Lake Palestine, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing surveys are conducted in the spring and fall. ANS = Aquatic Nuisance Species.

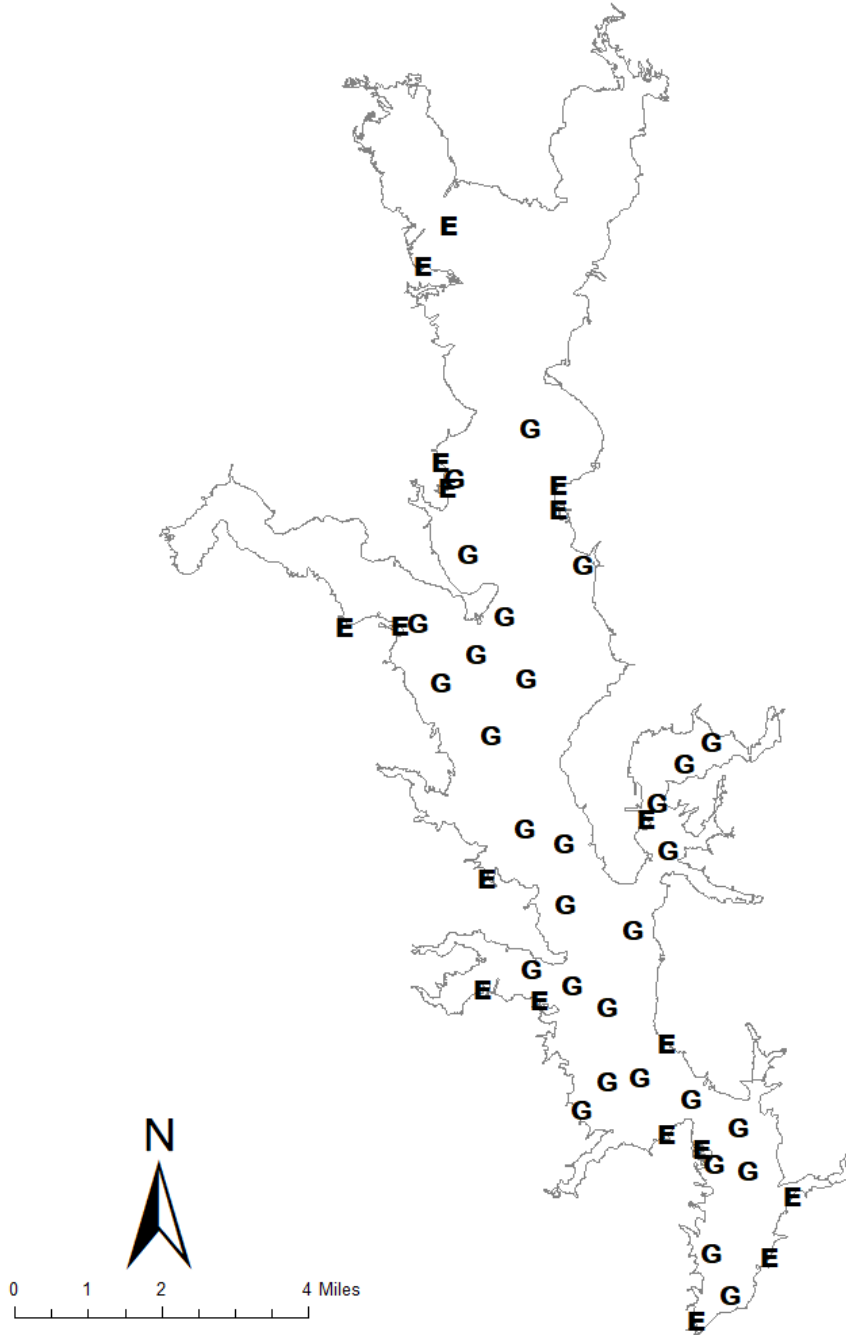
	Survey year			
	2022–2023	2023–2024	2024–2025	2025–2026
Angler Access				X
Vegetation - ANS	X	X	X	X
Vegetation - Comprehensive				X
Electrofishing – Fall				X
Electrofishing – Spring (Bass-only)	X			
Gill netting				X
Creel survey				X
Report				X

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 Palestine, Texas, 2021-2022. Sampling effort was 30 net nights for gill netting (15 net nights for temperate basses and 30 net nights for catfish) and 1.5 hours for electrofishing.

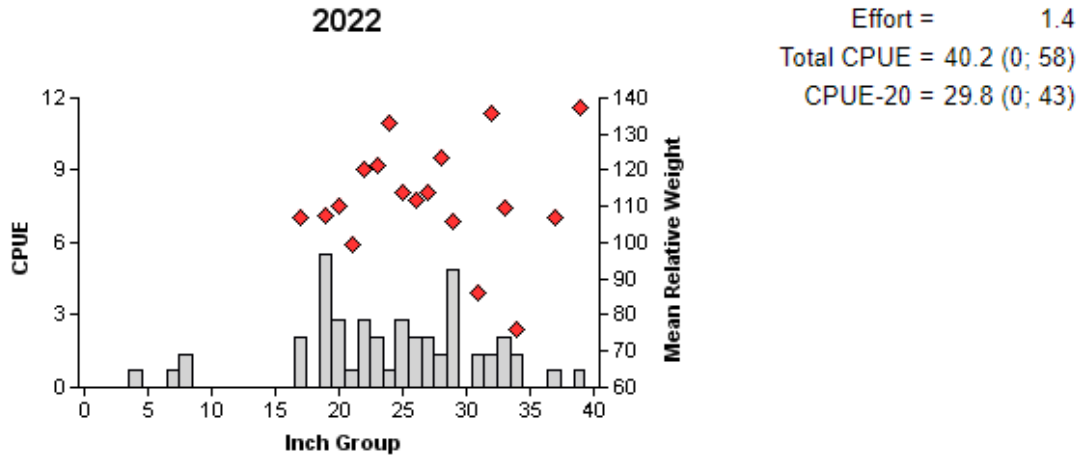
Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			171	114.0 (22)
Threadfin Shad			7,915	5,277.0 (23)
Blue Catfish	570	19.0 (8)		
Channel Catfish	342	11.4 (14)		
White Bass	51	3.4 (51)		
Hybrid Striped Bass	81	5.4 (26)		
Redbreast Sunfish			42	28.0 (33)
Bluegill			320	213.3 (19)
Longear Sunfish			86	57.3 (36)
Redear Sunfish			16	10.7 (35)
Redspotted Sunfish			7	4.7 (86)
Spotted Bass			49	32.7 (26)
Largemouth Bass			83	55.3 (16)

APPENDIX B – Map of sampling locations



Location of sampling sites, Lake Palestine, Texas, 2021-2022. Gill net and fall electrofishing stations are indicated by G and E, respectively. Water level was near full pool at time of sampling.

APPENDIX C – Special Project: Blue Catfish



Low frequency electrofishing (LFE) survey for Blue Catfish, Lake Palestine, Texas, 2022. Results above were part of a statewide project assessing statewide reservoir catfish fisheries. Number of Blue Catfish caught per hour (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring-time low frequency electrofishing survey, Lake Palestine, Texas, Lake Palestine, 2022.



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