Lake Raven

2024 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-5

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

Prepared by:

Brandon Murray, Fish and Wildlife Technician
and
Niki Ragan-Harbison, District Management Supervisor

Inland Fisheries Division
College Station – Houston District, Snook, Texas

David Yoskowitz, Ph.D.
Executive Director

Timothy Birdsong
Director, Inland Fisheries

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Survey and Management Summary

Fish populations in Lake Raven were surveyed in 2024 using electrofishing and in 2025 using tandem hoop netting. Anglers were surveyed from March through May in 2025 with a roving creel survey. Historical data are presented with the 2024-2025 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 Raven is a 203-acre reservoir located in Huntsville State Park. The reservoir was repaired and re-impounded in 1956 by the Texas Parks & Wildlife Department for recreational use. There is no active water level recording on the reservoir, on site reports indicate multiple high-water events in 2024. Habitat features primarily consist of native floating-leaved, emergent and submersed vegetation, as well as non-native emergent and submersed vegetation.

Management History: Lake Raven has a history of producing trophy Largemouth Bass. The population was managed with a catch-and-release regulation from September 1996 until September 2018 when the regulation changed to a 16-inch maximum with a 5 fish bag limit. The regulation allows the angler to retain Largemouth Bass measuring > 24 inches for immediate weighing and subsequent release, or if weighing 13 pounds or more during Legacy-class collection season (January 1st – March 31st), donation into the Toyota ShareLunker Program. Lake Raven was included in Operation World Record (OWR) from 2006-2016, a research project designed to compare growth of selectively bred ShareLunker Largemouth Bass fingerlings to resident bass fingerlings and received preferential stocking under the program for several years. Management efforts looking at catfish reproduction in spawning barrels has been conducted, with efforts to increase the catfish population in Lake Raven.

Alligator weed, hydrilla, giant salvinia, and water hyacinth have all impeded access and degraded habitat to varying degrees at different times and have been managed with an integrated pest management plan including use of herbicides, biological control (Grass Carp, hydrilla flies, and alligator weed flea beetles), and manual removal.

Fish Community

- **Prey species:** Threadfin Shad, Gizzard Shad, Bluegill and Redear Sunfish were the predominant prey species in the reservoir. Although abundance of the prey species was lower than previous years, most were available as forage for predators.
- **Catfishes:** Channel Catfish were present in the reservoir but in low abundance.
- **Largemouth Bass:** Largemouth Bass were abundant with many available to anglers for harvest. Largemouth Bass had slow growth and overall adequate body condition. They were one of the most targeted species.
- **Crappie:** Black Crappie and White Crappie were present in the reservoir and harvested, legal-size fish were available to anglers.

Management Strategies: The discontinuation of annual Lone Star Bass stockings will occur with the intention of increasing bass growth rates. A larger scale age & growth evaluation will be conducted on Largemouth Bass to further investigate the slow growth rates. Continue to control the non-native vegetation community using an integrated pest management plan, with a goal of keeping 20% total vegetative coverage in the reservoir. Channel Catfish will be managed as a put-grow-take fishery in the future.

Introduction

This document is a summary of fisheries data collected from Lake Raven from 2024 through 2025. 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 2024 and 2025 data for comparison.

Reservoir Description

Lake Raven is a 203-acre reservoir constructed in 1956 located within Huntsville State Park just North of the Houston metropolitan area, approximately 60 miles from downtown Houston, Texas. The drainage area for Lake Raven is approximately 1,556 square miles with rainfall in the watershed averaging 46.2 inches per year. The reservoir has a maximum depth of 24 feet, a mean depth of 6 feet, and has little bathymetric variation (Figure 1). Lake Raven has a shoreline length of 6.3 miles and a shoreline development ratio of 2.3. Lake Raven lies within the Piney Woods Land Resource Area. Land use around the reservoir is recreational. Habitat features primarily consist of a mixture of native and non-native aquatic vegetation. Other descriptive characteristics from Lake Raven are found in Table 1.

Angler Access

Lake Raven is located entirely within Huntsville State Park and has one public boat ramp. Boat and bank access are excellent. Additional boat ramp characteristics are presented in Table 2. Shoreline access is outstanding except for times when overabundant aquatic vegetation limits casting from some areas of the shore. Two fishing piers located within the campground are open to day use and are in good condition.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ragan-Harbison and Best 2021) included:

1. Support the Largemouth Bass fishery with annual Florida Largemouth Bass fingerling stockings, as well as promoting the fishery and angler participation in the ShareLunker program through available media resources.

   Action: Largemouth Bass have been stocked every year since 2019. This includes yearly Florida Largemouth Bass stockings from 2019-2021 and Lone Star Bass stockings from 2022-2025. Participation in the ShareLunker program has been promoted using media resources, as well as signage at the boat ramp.

2. Use an integrated pest management plan to control invasive plant species that impede fishing and recreational access at Lake Raven. The goal is to maintain 20-30% of vegetation coverage.

   Action: Aquatic vegetation surveys are conducted yearly to monitor the native and non-native vegetation coverage. ProcellaCOR, an herbicide that minimally affects most native species, has been used to control Hydrilla when it causes access or recreational use issues in the reservoir. Vegetation booms placed in the upper coves have been maintained to limit the spread of free-floating non-native vegetation, such as Water Hyacinth and Giant Salvinia.

3. Evaluate the effectiveness of the artificial spawning structures for Channel Catfish in Lake Raven.

   Action: Hoop netting was conducted in the spring and fall of 2021. The spring survey yielded low numbers of Channel Catfish, and the timing of this survey coincided with the annuli formation of the catfish, making age determination difficult to achieve with any degree of certainty. No Channel Catfish were collected from the fall hoop net survey.

4. Improve bank fishing success on Lake Raven through vegetation control, fish attracting structures and signage at the fishing piers with appropriate angling methods.

   Action: Aquatic vegetation on the state park shoreline is treated annually with multiple methods. While the vegetation on the inaccessible shoreline is left alone to create ideal fish habitat and maintain 20-30% of vegetation coverage across the lake. No additional fishing structures have been added since the artificial structures were placed under the fishing piers in 2017, and signage has not been developed at this time.

5. Invasive species continue to be an issue across the state, with Lake Raven containing multiple invasive aquatic vegetation species.

   Action: Signage is posted at the Lake Raven boat ramp informing the public about invasive species and ways to prevent the spread of them to other waterbodies. Available media resources are also used to educate the public about the risks invasive species can pose across the state.

Harvest regulation history: Since September 2018, Largemouth Bass at Lake Raven have been managed under a 16-inch maximum length limit and a 5 fish bag limit with the caveat that anglers may retain a bass 24 inches or greater for immediate weighing and release or donation to the ShareLunker Program (if caught during Legacy-class collection season). Between 1996 and 2018, Largemouth Bass were managed under a catch-and-release regulation with the same 24-inch and greater caveat. Prior to that, the fishery was under a 14–21-inch slot length limit. Other species have been managed under statewide regulations, except Blue and Channel Catfish which were previously managed under the Community Fishing Lake regulation and now are managed with a 14-inch minimum length limit for both species and a 15-fish combined bag limit. As a state park lake, no fishing license is required. Current regulations are found in Table 3.

Stocking history: Fish stockings began at Lake Raven in 1966 with the introduction of Channel Catfish. Periodic stockings of Channel Catfish continued over the next 40 years, but a self-sustaining population has never been established. Florida Largemouth Bass were first introduced in 1979 and have been stocked nine times since. In 2005, 2007, 2010, and 2013 ShareLunker advanced fingerling Largemouth Bass were stocked as part of Operation World Record, a research project designed to compare growth of selectively bred ShareLunker fingerlings to that of resident bass fingerlings. Starting in 2022 the transition was made statewide to stock Lone Star Bass in place of Florida Largemouth Bass. Lone Star Bass are the 2nd generation offspring of Legacy class ShareLunker's from years prior and have been stocked yearly in Lake Raven since 2022. Both hybrid and triploid Grass Carp have been periodically stocked to control excessive aquatic vegetation. A complete stocking history is provided in Table 4.

Vegetation/habitat management history: The primary habitat in Lake Raven is aquatic vegetation, both native and non-native. Hydrilla has caused access problems in past years and has been controlled by 400 Triploid Grass Carp, stocked in 2009 and by annual herbicide treatments since 2017. Water hyacinth, giant salvinia, and alligator weed have also caused access and biological issues requiring annual herbicide applications since. In addition, 6,000 alligator weed flea beetles were released in 2014 as part of an integrated pest management approach.

Water transfer: Lake Raven is a recreational reservoir contained completely within Huntsville State Park. No interbasin water transfers exist.

Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Lake Raven (Ragan-Harbison and Best 2021). 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 2022).

Common names of fishes and their hybrids in this report are used following Page et al. (2023) with an exception for Largemouth Bass. While we recognize recent changes to black bass names, Texas reservoirs contain a mix of Florida Bass, Largemouth Bass, and their intergrade offspring. Therefore, Largemouth Bass is used in this report for simplicity as well as consistency with previous reports.

Electrofishing – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Ages for Largemouth Bass were determined using otoliths from selected fish (range 15.0 to 16.9 inches; category 2 assessment, Fishery Assessment Procedures, unpublished revised 2022). Electrofishing in 2024 was conducted using a Smith-Root Apex electrofisher, while previous surveys used a GPP 7.5 electrofisher.

Tandem hoop nets – Channel Catfish were collected using 5 tandem hoop-net series at 5 stations. Nets were baited with 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 Neumann et al. (2012). 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 of boat and bank anglers was conducted in the spring of 2025. The creel period was March 1 through May 31. Angling pressure was estimated from progressive angler counts during each creel time period. Angler interviews were conducted on 5 weekend days and 4 weekdays to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Habitat – Structural habitat has not significantly changed since the last comprehensive survey was completed in 2016. Vegetation surveys were conducted in 2021-2024 to monitor the expansion of non-native vegetation. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

Results and Discussion

Habitat: Shoreline habitat consisted primarily of natural shoreline with minimal bulkhead based on the last structural habitat survey done in 2016 (Best and Webb 2017). Both native and invasive plant species have made a comeback since herbicide treatments in 2014 stripped the reservoir of most plant life. Hydrilla was the most abundant (48.8 acres; 24%) species observed in the 2024 vegetation survey while native emergent species covered 18.8 acres (9%; Table 6). Species present included: alligator weed, American lotus, hydrilla, elephant ear, water hyacinth, white water lily, and yellow cow lily. Controlling invasive species expansion has been maintained through annual herbicide treatments; hydrilla coverage has been variable with a range of approximately 30-70 acres of coverage since the last report. Alligator Weed has also been inconsistent, with a range of 0-12 acres. Giant salvinia and water hyacinth in the reservoir have been sufficiently controlled since the last report; neither species has exceeded 1 acre in total coverage.

Creel: The 2025 creel survey estimated 18,797 hours of angling effort during the spring quarter; bank anglers were more prevalent than boat anglers, accounting for 12,933 hours of the total effort (Table 7). Bank anglers primarily targeted any species (62%) while boat anglers primarily targeted Largemouth Bass (80%). Total directed fishing effort was also highest for anglers targeting any species (45.5%), likely driven by the high percentage of bank fishing effort observed during the creel period (Table 8). Total fishing effort and expenditures ($154,141) decreased slightly from the 2021 creel (25,760 hours and $178,630; Table 9).

Prey species: Electrofishing catch rates of Gizzard and Threadfin Shad were moderately low (119/h and 180/h, respectively, Appendix A). Although, catch rates for both the shad species were higher than previous surveys. Index of Vulnerability (IOV) for Gizzard Shad was moderate, indicating that 71% of Gizzard Shad were available as forage for predators; this was substantially higher than IOV estimates in previous years (Figure 2). Catch rate for Bluegill in 2024 (102/h) was considerably lower than in 2020 (963/h) or 2016 (197/h, Figure 3). Most individuals were 4 inches or shorter in length. Redear Sunfish catch rates in 2024 (38/h) were also lower than the 2020 & 2016 surveys (472/h and 449/h, respectively; Figure 4). The majority of individuals were 5 inches or shorter, similar to the previous survey.

In the 2024 electrofishing survey, the decline in overall catch rate of sunfish can likely be explained by multiple factors relating to the high-water event in May of 2024 occurring around the sunfish spawn. Angling pressure and harvest of sunfish species could also be a factor, as the total percentage of directed effort towards sunfishes nearly doubled from the 2021 creel survey to the 2025 creel survey (5.0% and 9.7%, respectively, Table 8).

In comparing the 2020 and 2024 electrofishing surveys there has been a notable change in the forage base in Lake Raven. The relative abundance of the shad species increased while the sunfish relative abundance decreased substantially. Multiple factors could have led to this switch, more than likely it is a combination of the sustained turbidity of the lake since the last survey, the high-water events in 2024 causing a weak sunfish spawn and the high abundance of predatory fish impacting the population dynamics of the prey species.

Channel Catfish: The 2025 hoop net survey yielded 12 Channel Catfish; similar to overall catch from the previous survey in 2021 where 7 individuals were caught (Table 5). Presence of individuals 9-11 inches in length does show evidence of Channel Catfish recruitment in the reservoir, since stockings have not been conducted since 2019. However, the amount of recruitment necessary to support a Channel Catfish fishery without the need for regular stockings is likely not attainable with the high abundance of predatory fish in the reservoir. The 2021 survey was conducted in March in an attempt to avoid sampling inefficiencies caused by vegetation, while the 2025 survey was conducted in June. In 2025, body condition metrics were only calculated on individuals suspected to be the result of natural recruitment.

The catfish fishery at Lake Raven decreased slightly in popularity from the 2021 creel (3.8% of total angling effort) to the 2025 creel (2.7% of total angling effort, Table 8). This can likely be attributed to the low catch rates observed during the previous creel surveys. Total catch rate for the last 3 creel surveys has been low (<0.1/h, Table 10). No Channel Catfish were harvested during the previous 2 creel surveys (Figure 6).

Catfish populations at Lake Raven are dependent on regular stockings and can be defined as a recruitment-limited population. Evidence of reproduction was found during the recruitment study in the form of egg masses and fry within the barrels, but there is little evidence of those fish recruiting into the population and becoming available for anglers in abundant quantities, even with the current regulation, designed to help poor-recruiting populations. This is likely due to the predation of juvenile catfish by the high abundance of predatory fish within the reservoir.

Largemouth Bass: Electrofishing catch rates had been steadily increasing over the past 2 surveys with 122/h in 2018 and 156/h in 2020, but the 2024 survey saw a decrease to 90/h (Figure 7). However, the stock-size catch rate has stayed consistent among the last three surveys (99/h in 2018, 90.5/h in 2020 and 90/h in 2024). The proportion of the population that is at or above the maximum length limit has also stayed consistent throughout the last three survey years (PSD-16). Thirteen Lunker Class (8+ lbs.) and one Elite Class (10+ lbs.) ShareLunkers have been submitted since the last report. Body condition was adequate in 2024 ($W_r \geq 85$), and growth was slow with fish reaching 16 inches in length at an average of 5.4 years (N = 17; range 2-7 years). Florida Largemouth Bass influence has been historically high with 81-85% Florida bass alleles observed in the last 2 genetic samples (Ragan-Harbison and Best 2021).

The increase in overall catch rate in 2020 can likely be attributed to a fall spawning event as evident by the high relative abundance of bass below 4 inches in the survey. A fall bass spawn can occur with a combination of lower-than-normal water temperatures in the early fall followed by a warming trend while the photo period is still conducive to mimic normal spawning conditions in the springtime. This makes the comparison of overall catch rate slightly misleading due to this abnormal event. The relative abundance of bass below the 10-inch mark substantially decreased in the 2024 survey as compared to previous years and can likely be attributed to the high-water event in May of 2024. It is likely the high turbid water caused by the flooding resulted in a weak year-class, due to the disruption of the normal progression of life stages after the eggs are hatched.

Growth rates of Largemouth Bass have decreased substantially since the last electrofishing survey, with the average age at 16 inches being 4.3 years in the 2020 survey and 5.4 years in the 2024 survey. Length at age data from bass ranging from 15.0 – 16.9 inches compiled from the 2020 and 2024 surveys shows an overall negative trend of growth rates within the population (Appendix B). The decrease in growth rates can likely be attributed to a foraging efficiency related issue caused by the high abundance of aquatic vegetation present in the reservoir.

Combined directed fishing effort among boat and bank anglers for Largemouth Bass was 39% of angler effort in 2025, which was a slight decrease from the 2021 creel survey (44% of total directed fishing effort, Table 8). In 2025, boat angling effort was heavily skewed towards Largemouth Bass with 80% of directed effort, while 21% of bank angler effort was directed at Largemouth Bass (Table 7). Overall angler catch rates for Largemouth Bass have stayed consistent among the past three creel surveys (0.4/h in 2018, 0.4/h in 2021, and 0.3/h in 2025, Table 11). With the 16-inch maximum harvest regulation being in place, 100% of legal fish (under 16 inches in length) were released. Harvest of Largemouth Bass remained negligible; no harvest was observed during the 2025 spring quarter creel survey and only 4 harvested bass have been observed in the previous 3 creel surveys combined (Figure 8).

Crappie: Black Crappie and White Crappie were both observed as bycatch in the 2024 electrofishing survey, confirming their presence (Appendix A). Crappie received 2.8% of total directed fishing effort during the 2025 spring quarter creel, which was a decrease from the previous creel in 2021 (9.9%, Table 8). A decrease in catch rate of the crappies was also observed compared to the previous creel survey (1.84/h in 2021 and 1/h in 2025, Table 12). Harvest of both species of crappie saw a noticeable decrease from 2021 and no Black Crappie were harvested during the 2025 creel survey period (Figures 10-11).

Fisheries Management Plan for Lake Raven, Texas

Prepared – July 2025

ISSUE 1: Largemouth Bass continue to be the most popular sport fish at Lake Raven, providing an outstanding fishery located within a heavily utilized state park. Growth rates showed a substantial decrease since the last report, likely due to a foraging efficiency related issue caused by the high abundance of aquatic vegetation. Relative abundance of juvenile bass and the sunfish species also decreased since the last report. Efforts to manage the fishery for big fish potential should continue.

MANAGEMENT STRATEGIES

1. Based on Largemouth Bass growth rates, Lone Star Bass stocking requests will be discontinued for the time being. Fall electrofishing surveys and a genetics sample in 2028 will aid in the determination if future Lone Star Bass stockings requests are reimplemented to embellish growth potential in the population.
2. In conjunction with the fall electrofishing survey in 2028, a large-scale age & growth evaluation will be conducted. This data will estimate mean length at age and age structure for the population to be used for possible future management actions involving the Largemouth Bass population in the reservoir.
3. Non-native aquatic vegetation treatments will be slightly increased in order to maintain closer to 20% total vegetation coverage, this aims to address the likely foraging efficiency issue causing the slow growth rates detected in the 2024 survey. Future electrofishing surveys and the large-scale age & growth evaluation will serve to assess the impact of the new vegetation treatment plan on the Largemouth Bass population.
4. An additional electrofishing survey will be conducted in the fall of 2025 to detect if Largemouth Bass did in fact have a weak year class in 2024 and whether the sunfish catch rates continue to be lower than the historical averages in the reservoir.
5. Promote the fishery through the use of available resources and promote participation in the ShareLunker Program.

ISSUE 2: Lake Raven is susceptible to an overabundance of hydrilla, giant salvinia, water hyacinth, and alligator weed, which have historically impeded bank fishing access and swimming areas. These non-native species have the tendency to outcompete native aquatic vegetation and can cause a chronic issue in the reservoir if left unchecked. The goal is to maintain 20% of vegetative coverage. This amount of coverage aids young-of-year fish survival without impeding fish performance or causing recreational issues in the reservoir. Lake Raven is also heavily utilized by boat and bank anglers, but fishing success is overall lower for bank anglers. 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. Use appropriate herbicide to control hydrilla for improved boating lanes, areas of open deep water, and shoreline access along the day use and camping shorelines. ProcellaCOR, which is not effective on many native species, will be used when appropriate to reduce impacts on native species.

2. Maintain vegetation booms in the upper coves to concentrate giant salvinia and water hyacinth, which will be treated with appropriate herbicide to reduce abundance and improve shoreline access as needed. Biocontrols and mechanical removal of exotic nuisance species as needed as part of the integrated pest management approach.
3. Control vegetation along the shorelines of the day use and camping areas to maintain open shorelines and fishing lanes to increase bank angler success.
4. Cooperate with Huntsville State Park to maintain appropriate signage at the reservoir regarding invasive species. Educate the public through the use of media resources about the threat invasive species can pose across the state.

ISSUE 3: Channel Catfish at Lake Raven receive a notable amount of angling pressure based on recent creel surveys. The population has limited natural recruitment and has previously been managed as a low-density population maintained by stocking. However, stocking was temporarily discontinued in 2019 to conduct a recruitment study with artificial spawning barrels. Results yielded evidence of reproduction in the form of egg masses in the spawning barrels, but minimal evidence of those fish recruiting into the population, even with the new more-restrictive harvest regulation option. Channel Catfish in Lake Raven should be managed as a put-grow-take fishery in the future due to lack of recruitment.

MANAGEMENT STRATEGY

1. Request fall stocking of 9” Channel Catfish and supplemental stocking of retired adult brood fish as the opportunities arise.

Objective-Based Sampling Plan and Schedule (2025–2029)

Largemouth Bass are the primary sport fish in Lake Raven. Blue Catfish, Channel Catfish, Black Crappie, and White Crappie are also present. Forage species include Gizzard Shad, Threadfin Shad, Redear Sunfish, and Bluegill. Many anglers report fishing for sunfishes as well. The proposed sampling schedule can be found in Table 13.

Low density or underutilized fisheries

Blue Catfish: Blue Catfish populations in Lake Raven are dependent on stockings and were last stocked in 2015. Only one Blue Catfish was observed in the hoop net survey, and none were observed during the electrofishing or creel survey in 2024-2025. The presence/absence of Blue Catfish will be monitored through hoop net and creel surveys every four years.

Crappie: Black Crappie and White Crappie are present in the reservoir; however, the 2025 creel survey observed a low-directed effort and few harvested fish. Historically, trap net surveys produced variable results and were discontinued in 2013. Therefore, crappie populations will be monitored for presence/absence through fall electrofishing surveys. Targeted fishing pressure for crappies as well as catches will be monitored during a spring quarter creel in 2029.

Survey objectives, fisheries metrics, and sampling objectives

Channel Catfish: Channel Catfish in Lake Raven have historically been dependent on stockings. Efforts to establish a self-sustaining Channel Catfish population through the addition of artificial spawning structures produced minimal success. With the recruitment study being discontinued, long-term trend data for the Channel Catfish population will be collected through regular survey monitoring every 4 years in order to track stocking rate suitability and overall population health. Data for size structure (PSD and length frequency), relative abundance (CPUE-total and CPUE-stock), condition (W_r) and fisheries-dependent metrics (angler preference, angling pressure, and angler catch) will be collected through summer hoop netting in 2028 and a spring quarter creel starting in 2029. Five sets of baited tandem hoop nets will be used. Overall trends tracking angler usage of the catfish population will be monitored using the spring quarter creel survey in 2029.

Largemouth Bass: Largemouth Bass are the most popular sport fish in Lake Raven with 39% of all fishing effort dedicated to the fishery by both boat and bank anglers (7,386 hours combined). The popularity and reputation for quality Largemouth Bass fishing and alternative management regulation at Lake Raven warrant sampling time and effort. One hour of fall electrofishing over 12 randomly selected, 5-minute stations has historically provided sufficient data (CPUE RSEs < 25) and will be used to survey the Largemouth Bass population in 2025, 2026 and 2028. Sampling objectives will include size structure (PSD and length frequency), growth (aside from the higher category assessment in 2028; will include 13 fish between 15.0 and 16.9 inches to determine mean age at 16 inches), relative abundance (CPUE-total and CPUE-stock) and condition (W_r). A larger scale age & growth evaluation will be conducted in conjunction with the fall 2028 electrofishing survey. A random sample of 200 bass between 150mm and 500mm will be subsampled at 5 fish per 10mm size-class and collected for ageing purposes. This data will be used to estimate Mean Age at Length and age structure for the population. Angler effort, catch rate, and harvest will be estimated through a spring quarter creel in 2029. Genetic samples will be obtained from 30 randomly selected fish during the 2028 electrofishing sampling to track the persistence of Florida Largemouth Bass alleles in the population in light of the discontinuation of Lone Star Bass stockings.

Prey Species: Gizzard Shad, Threadfin Shad, Bluegill, and Redear Sunfish are the primary forage species at Lake Raven. Sampling the shad species, Bluegill and Redear Sunfish at the same intensity as is proposed for Largemouth Bass as mentioned above, will provide trend information to detect large-scale changes in general population characteristics (size structure, relative abundance and IOV for Gizzard Shad) of sunfish and shad species. Relative weight calculations for Largemouth Bass will be used for supplemental qualitative assessment of prey suitability. No additional effort will be expended beyond the effort required to sample Largemouth Bass.

Creel Survey: A roving angler creel survey will be conducted March 1, 2029 – May 31, 2029, to estimate directed angling effort, catch, harvest, and expenditures. This is a general monitoring creel survey that intends to capture information about all species sought by anglers, economic expenditures, travel distances for anglers and angling pressure on Lake Raven fisheries. Creel data will also be utilized to track usage trends of the Channel Catfish put-grow-take fishery in order to ensure support for the stockings is warranted.

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Tables and Figures

Table 1. Characteristics of Lake Raven, Texas.

Characteristic	Description
Year constructed	1956
Controlling authority	Texas Parks and Wildlife Department
County	Walker (location of dam)
Reservoir type	Tributary: State Park
Shoreline Development Index	2.3
Conductivity	162 µS/cm

Figure 1. Bathymetric map of Lake Raven, Texas 2021. Data was collected using side scan and rendered using BioBase© software.

Table 2. Boat ramp characteristics for Lake Raven, Texas, September 2024. Reservoir elevation at time of survey was 284 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Huntsville State Park	30.614394 -99.535277	Y	30	272	Excellent, no access issues

Table 3. Harvest regulations for Lake Raven, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	15 (in any combination)	14-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, Largemouth	5	16-inch maximum*
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

*16-inch maximum for Largemouth Bass with the exception that any bass 24 inches or greater caught may be weighed on personal scales and then immediately released, or if the fish is over 13lbs., donated to the ShareLunker program during Legacy-class collection season (Jan 1 – Mar 31).

Table 4. Stocking history of Lake Raven, Texas. FGL = fingerling; AFGL = advanced fingerling; ADL = adults; UNK = Unknown.

Species	Year	Number	Size
Black Crappie	1968	30	UNK
	1970	4,120	UNK
	Total	4,150	
Blue Catfish	2000	1,591	AFGL
	2003	5,157	AFGL
	2015	25,020	FGL
	Total	31,768	
Channel Catfish	1966	9,900	AFGL
	1971	52,000	AFGL
	1972	57,400	AFGL
	1980	80	UNK
	1982	2,016	AFGL
	1987	21,087	AFGL
	1992	5,252	AFGL
	1996	5,250	AFGL
	1998	5,256	AFGL
	1999	5,251	AFGL
	2000	3,672	AFGL
	2001	5,253	AFGL
	2002	5,237	AFGL
	2004	2,034	AFGL
	2005	12,084	AFGL
	2006	2,930	AFGL
	2010	5,196	AFGL
	2010	20,280	FGL
	2012	1,860	AFGL
	2015	859	AFGL
	2017	3,500	ADL
	2017	25,325	AFGL
	2018	426	ADL
	2018	5,332	AFGL
	2019	40	ADL
	Total	257,520	
Florida Largemouth Bass	1979	10,800	FGL
	1980	338	ADL
	1987	16,850	FGL
	1991	22,487	FGL
	1996	142	ADL
	1998	952	AFGL
	2013	12,451	FGL
	2019	20,613	FGL
	2020	23,590	FGL
	2021	22	ADL

	Total	108,223	
Grass Carp x Bighead Carp	1989	3,038	UNK
	1990	400	UNK
	Total	3,438	
Green Sunfish x Redear Sunfish	1968	13	UNK
	1972	300	UNK
	Total	313	
Lone Star Bass[b]	2022	20,357	FGL
	2023	21,384	FGL
	2024	20,855	FGL
	2025	20,351	FGL
	Total	82,947	
Northern Pike	1974	1,160	UNK
	Total	1,160	
Northern Pike x Muskellunge	1976	2,100	UNK
	Total	2,100	
ShareLunker Largemouth Bass[a]	2005	5,901	AFGL
	2007	5,088	AFGL
	2010	2,375	AFGL
	2013	12,375	FGL
	Total	25,739	
Triploid Grass Carp	2009	400	UNK
	Total	400	

[a] ShareLunker Largemouth Bass are 1st generation offspring from angler-donated Largemouth Bass ≥ 13 pounds from the Toyota ShareLunker program.

[b] Lone Star Bass are 2nd generation offspring of pure Florida strain ShareLunker Largemouth Bass that have proven to be able to grow to ≥ 13 pounds.

Table 5. Objective-based sampling plan components for Lake Raven, Texas 2024–2025.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Age-and-growth	Age at 16 inches	N = 17, 15.0 – 16.9 inches
	Condition	W_r	10 fish/inch group (max)
Bluegill [a]	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Redear Sunfish [a]	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad [a]	Abundance	CPUE–Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Prey availability	IOV	N ≥ 50
Crappies	Presence / Absence		
Tandem hoop netting			
Channel Catfish	Abundance	CPUE–stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	W_r	10 fish/inch group (max)
Creel survey			
Blue Catfish	Presence / Absence		
Crappies	Fishing pressure and catches	Angling effort, Catch and Harvest	

[a] No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill, Redear Sunfish 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 Raven, Texas, 2021–2024. Surface area (acres) is listed with percent of total reservoir surface area in parentheses. Vegetation surveys in 2021-2023 only included exotics, while the 2024 survey documented all plant species present.

Vegetation	2021	2022	2023	2024
Native submersed		2.25 (1.11)		0
Native floating-leaved		0		0.4 (0.2)
Native emergent		10.27 (5.06)		18.77 (9.25)
Non-native				
Alligator Weed (Tier II)*	12.00 (5.9)	0.0 (0.0)	4.19 (2.1)	0.23 (< 0.1)
Giant salvinia (Tier II)*	< 0.1 (< 0.1)	0.0 (0.0)	< 0.1 (< 0.1)	0.0 (0.0)
Hydrilla (Tier II)*	52.35 (25.8)	31.05 (15.3)	69.42 (34.2)	48.76 (24.0)
Water hyacinth (Tier II)*	0.16 (<0.1)	0.16 (<0.1)	1.0 (0.5)	< 0.1 (<0.1)
Total native coverage	--**	12.52 (6.17)	--**	19.17 (9.44)
Total non-native coverage	64.58 (31.81)	31.21 (15.37)	74.67 (36.78)	48.99 (24.13)
Total coverage	64.58 (31.81)	43.73 (21.54)	74.67 (36.78)	68.16 (33.58)

*Tier II is maintenance control status

**Not surveyed

Table 7. Total fishing effort (h) for all species, total direct expenditures, and percent directed effort, catch per hour of directed effort, and harvest by species for anglers fishing from boat and bank for Lake Raven, Texas 2025. Bank anglers includes those on natural shoreline, bulkhead, or fishing pier. Relative standard error is in parentheses where applicable. Survey periods were from March 1 to May 31.

Creel statistic	Bank anglers	Boat anglers
Total fishing effort	12,993 (22)	5,804 (24)
Percent fishing effort	69%	31%
Total directed expenditures	$116,049 (72)	$38,092 (56)
Percent directed expenditures	75%	25%
Percent directed effort		
Catfish	3.9	0
Sunfishes	10.3	8.4
Largemouth Bass	21.1	80.0
Crappie	3.2	1.9
Anything	61.5	9.7
Catch per hour		
Catfish	0	N/A
Sunfishes	0.92 (74)	2.94 (-)*
Largemouth Bass	0.07 (55)	0.43 (27)
Crappie	1.0 (100)	0
Anything	0.94 (39)	0.13 (100)
Total Harvest		
Catfish	0	N/A
Sunfishes	1,244 (105)	0
Largemouth Bass	0	0
Crappie	0	0

*Sample size too small to calculate RSE.

Table 8. Percent directed angler effort by species for Lake Raven, Texas, 2018–2025. Survey periods were from March 1 through May 31.

Species	2018	2021	2025
Catfish	42.0	3.8	2.7
Sunfishes	3.5	5.0	9.7
Largemouth Bass	30.7	44.2	39.3
Crappie	1.0	9.9	2.8
Anything	22.8	37.1	45.5

Table 9. Total fishing effort (h) for all species and total directed expenditures at Lake Raven, Texas, 2018-2025. Survey periods were from March 1 through May 31. Relative standard error is in parentheses.

Creel statistic	2018	2021	2025
Total fishing effort	19,157 (26)	25,760 (36)	18,797 (20)
Total directed expenditures	$88,288 (275)	$178,630 (72)	$154,141 (56)

Gizzard Shad

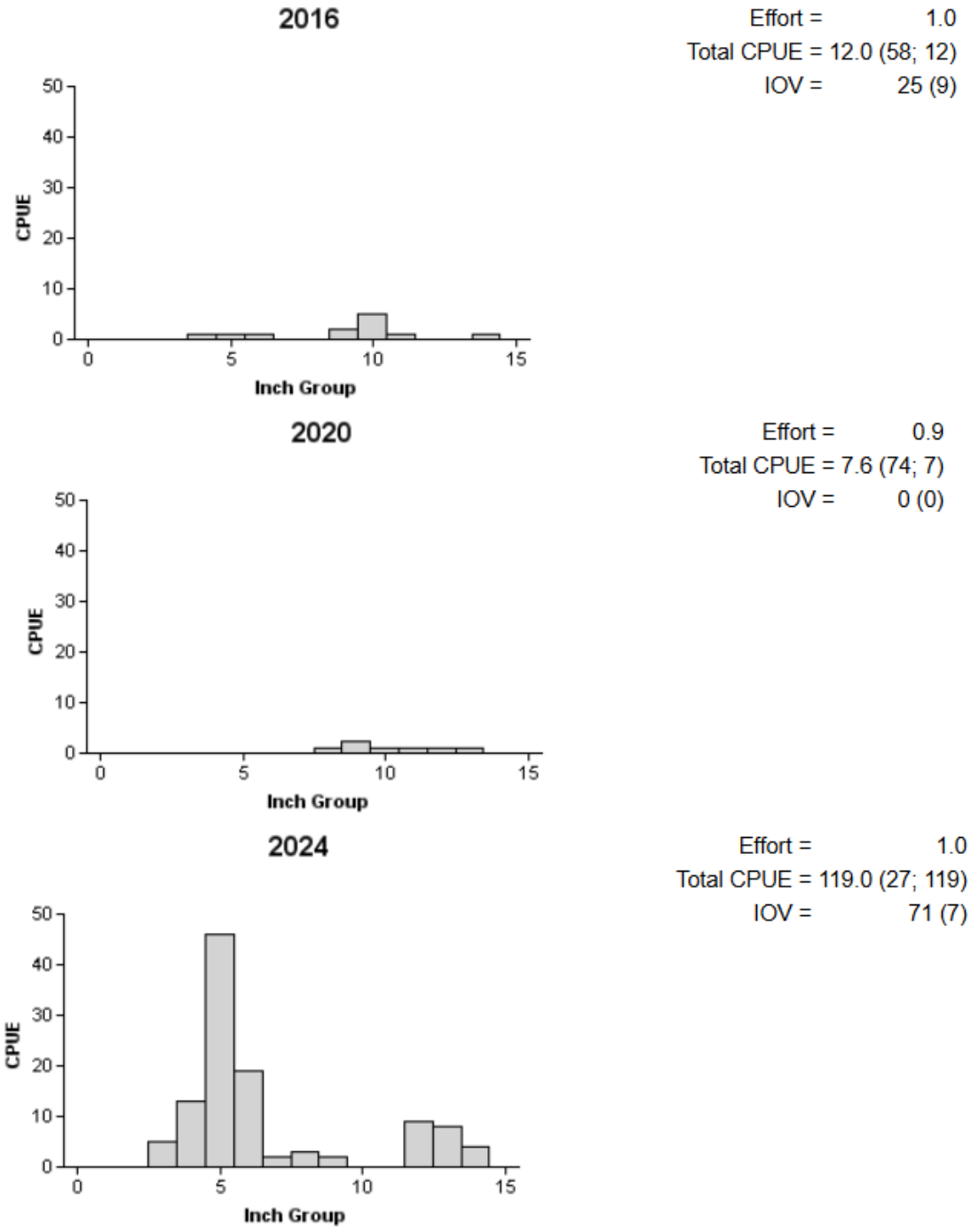


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Raven, Texas, 2016, 2020, and 2024.

Bluegill

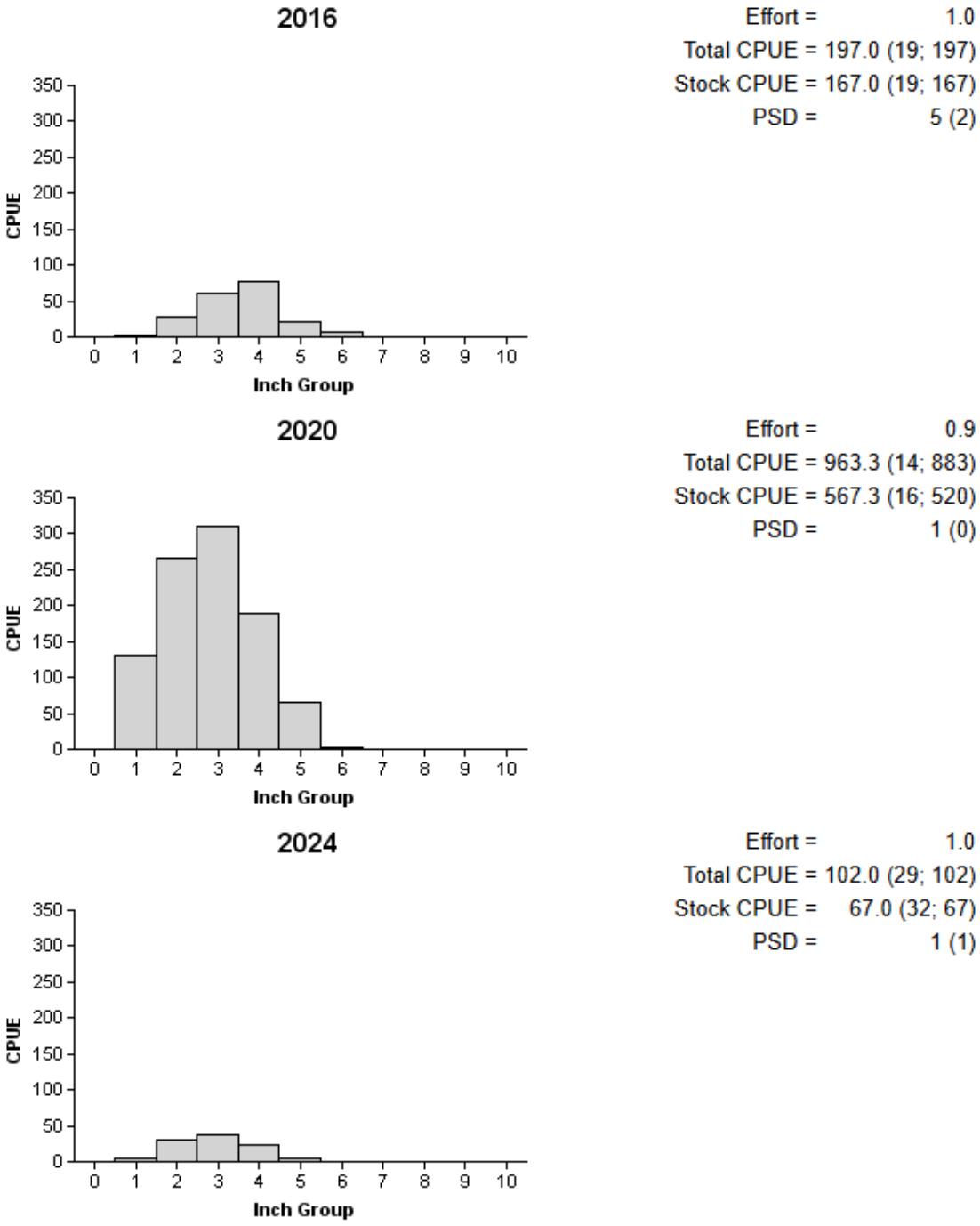


Figure 3. Number of Bluegill caught per hour (CPUE), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Raven, Texas, 2016, 2020, and 2024.

Redear Sunfish

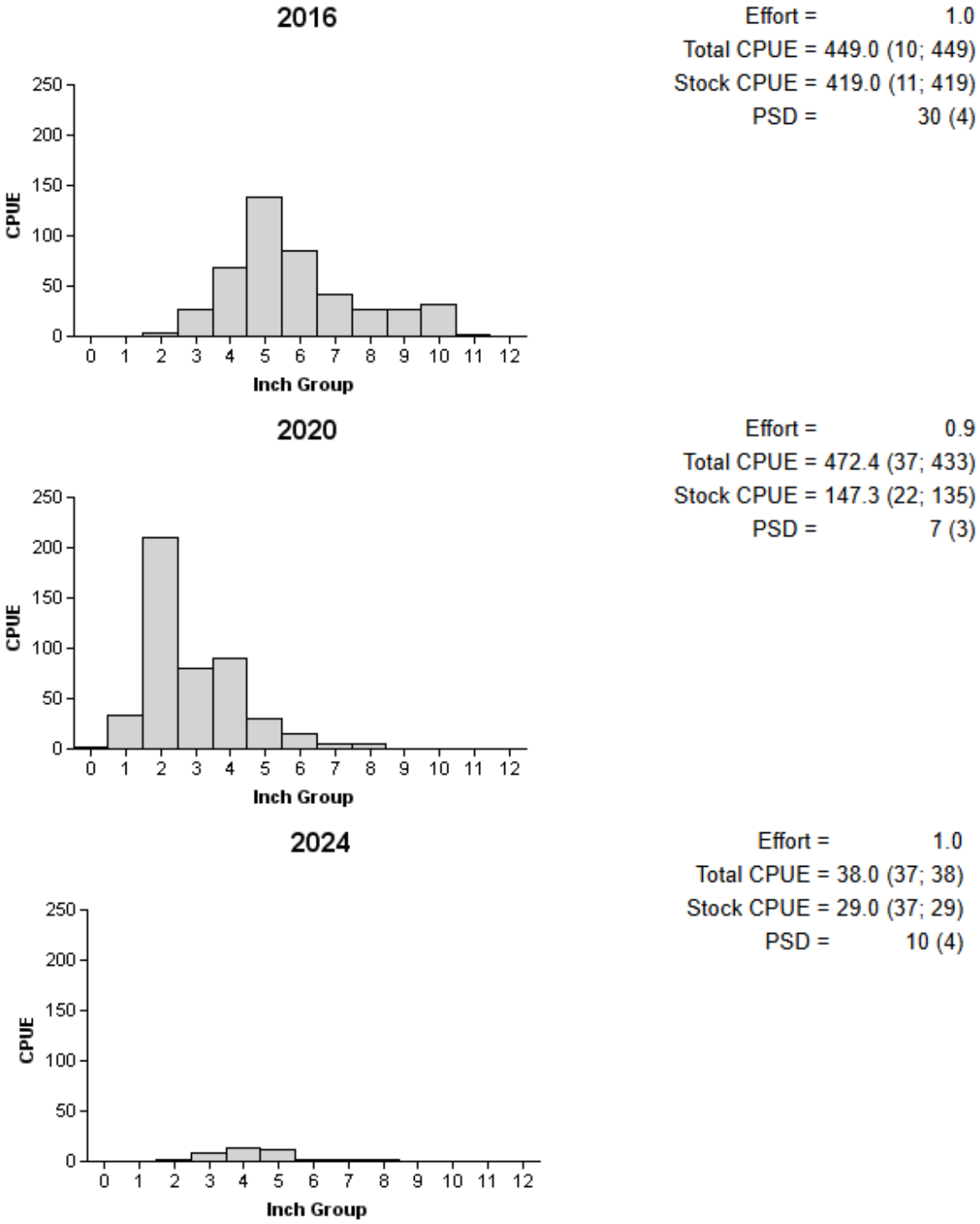


Figure 4. Number of Redear Sunfish caught per hour (CPUE), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Raven, Texas, 2016, 2020, and 2024.

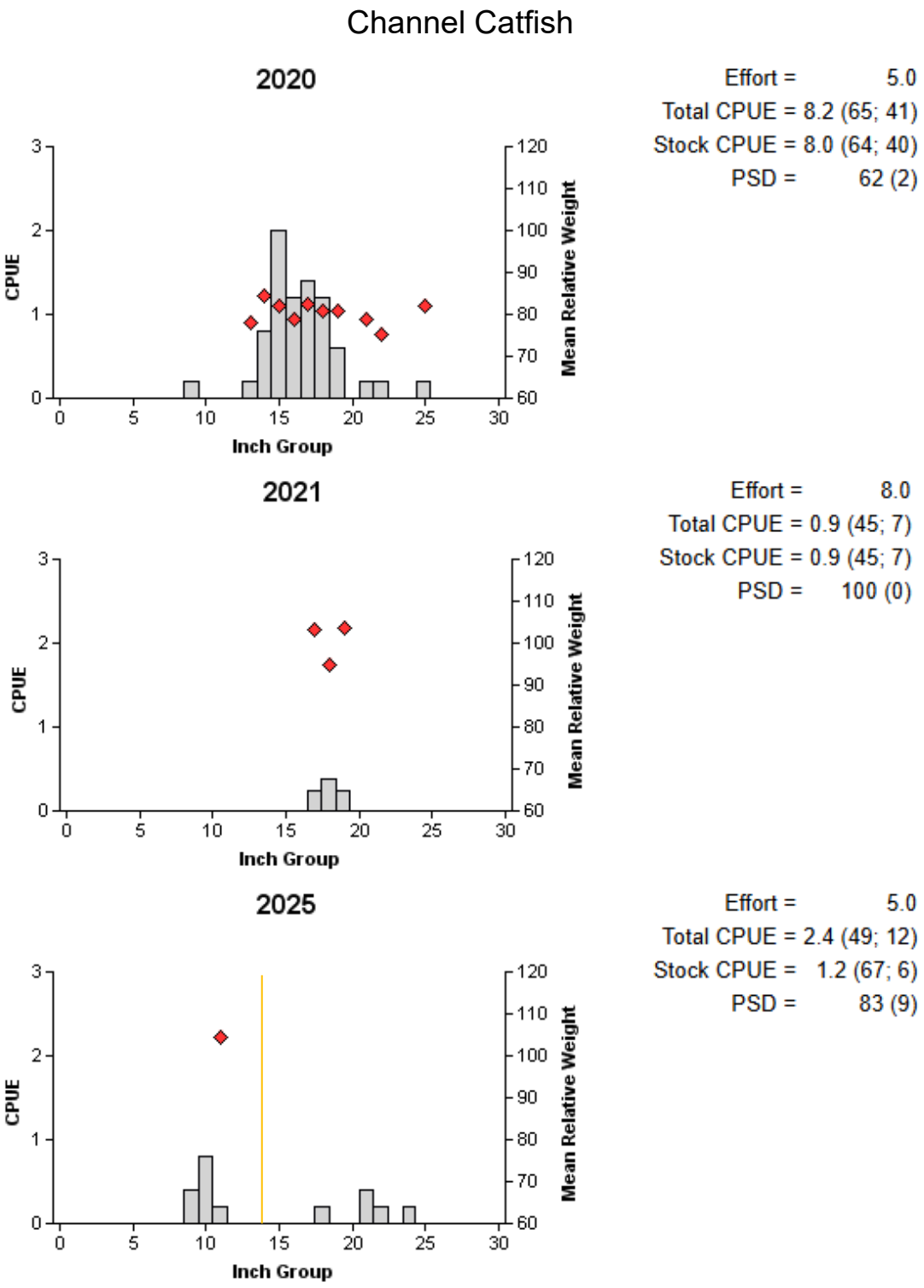


Figure 5. Number of Channel Catfish caught per series (CPUE), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring and summer hoop net surveys, Lake Raven, Texas, 2020, 2021, and 2025. Vertical line represents current 14-inch minimum length limit.

Table 10. Creel survey statistics for Channel Catfish at Lake Raven, Texas, from March 2018 through May 2018, March 2021 through May 2021, and March 2025 through May 2025. Total catch per hour is for anglers targeting Channel Catfish and total harvest is the estimated number of Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year		
	2018	2021	2025
Surface area (acres)	203	203	203
Directed effort (h)	8,054.71 (33)	971.17 (70)	506.40 (84)
Directed effort/acre	39.68 (33)	4.78 (70)	2.49 (84)
Total catch per hour	0.02 (-)*	0.10 (-)*	0.0
Total harvest	44.23 (130)	0	0
Harvest/acre	0.22 (130)	0	0
Percent legal released	0	100	0**

*Sample size too small to calculate RSE.

**No legal-sized fish were observed.

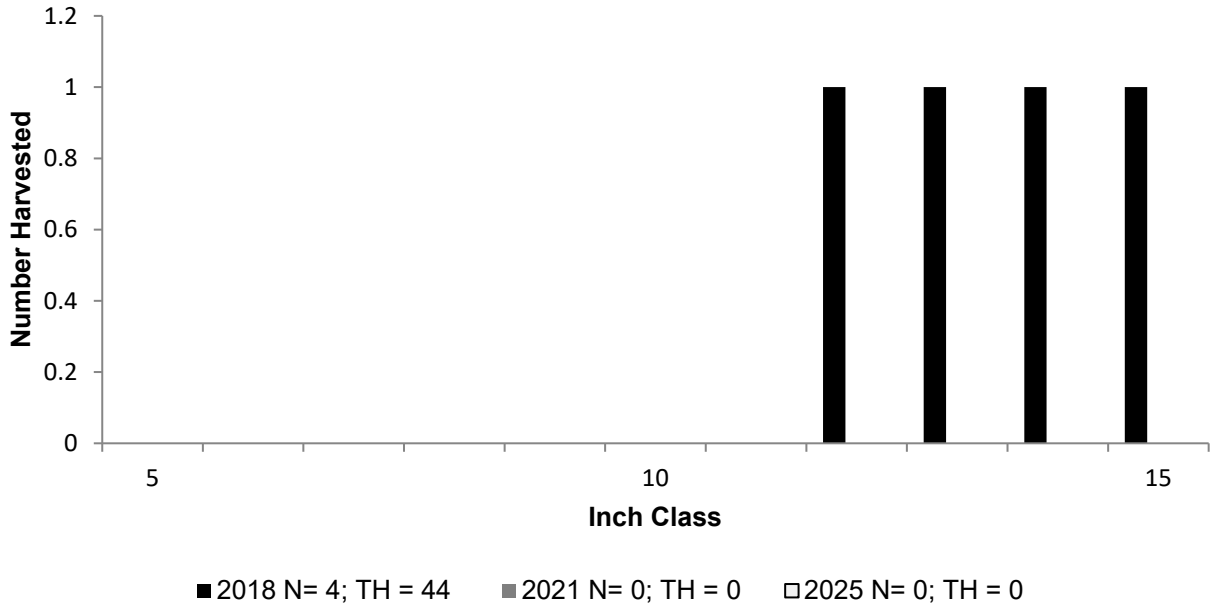


Figure 6. Length frequency of harvested Channel Catfish observed during creel surveys at Lake Raven, Texas, March 2018 through May 2018, March 2021 through May 2021 and March 2025 through May 2025, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth Bass

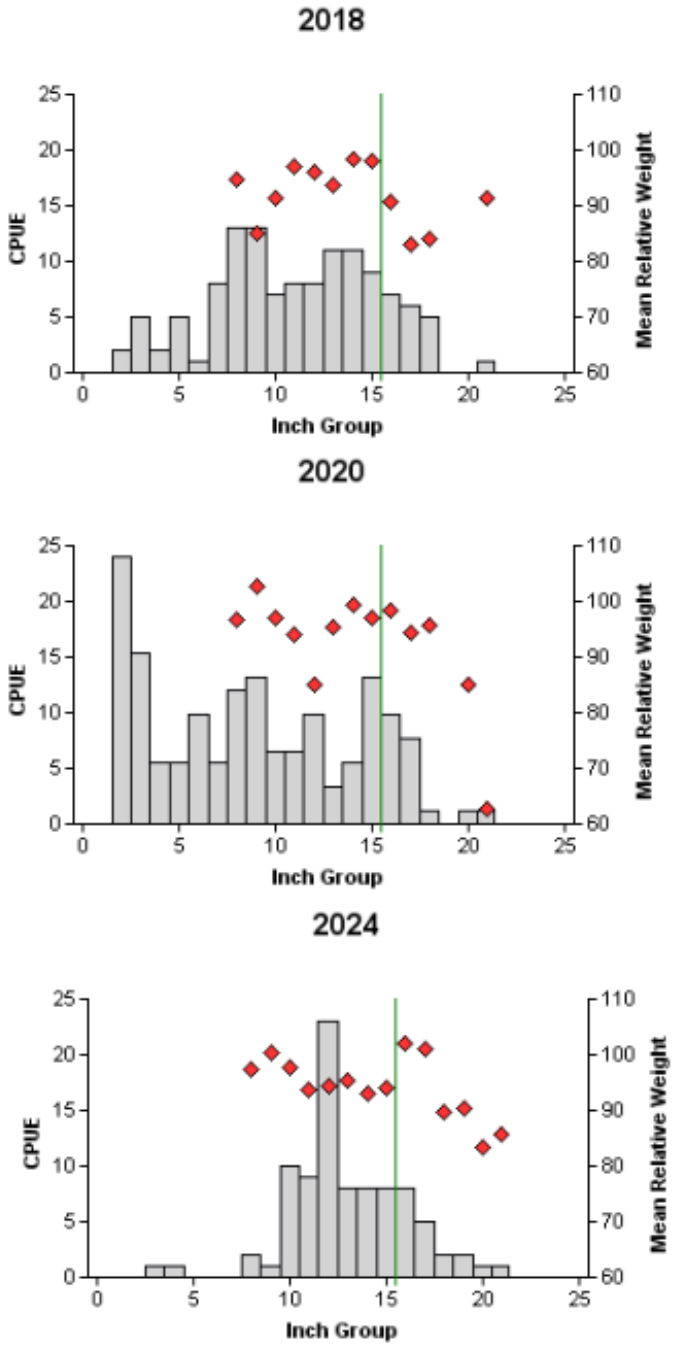


Figure 7. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Raven, Texas, 2018, 2020, 2024. Vertical line represents current 16-inch maximum length limit.

Table 11. Creel survey statistics for Largemouth Bass at Lake Raven, Texas, from March 2018 through May 2025. Catch rate is for all anglers targeting Largemouth 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 anglers targeting Largemouth Bass. Relative standard errors (RSE) are in parentheses.

Statistic	2018	2021	2025
Surface area (acres)	203	203	203
Directed angling effort (h)			
Tournament	N/A	1,030 (65)	N/A
Non-tournament	5,877 (33)	10,343 (37)	7,386 (21)
All black bass anglers combined	5,877 (33)	11,373 (37)	7,386 (21)
Angling effort/acre	29.0 (33)	56.0 (37)	36.4 (21)
Catch rate (number/h)	0.4 (49)	0.4 (32)	0.3 (35)
Harvest			
Non-tournament harvest	0	153 (81)	0
Harvest/acre	0	0.8 (81)	0
Tournament weigh-in and release	N/A	0	N/A
Release by weight			
<4.0 lbs	N/A	4,445 (50)	2,710 (51)
4.0-6.9 lbs	N/A	567 (58)	226 (63)
7.0-9.9 lbs	N/A	0	0
≥10.0 lbs	N/A	0	0
Percent legal released (non-tournament)	N/A	86	100

*Sample size too small to calculate RSE.

**Largemouth Bass were managed under a catch and release only regulation during the 2018 creel and thus do not have a percent release. During the 2021 and 2025 creels, percent release was calculated using Largemouth Bass released under 16 inches.

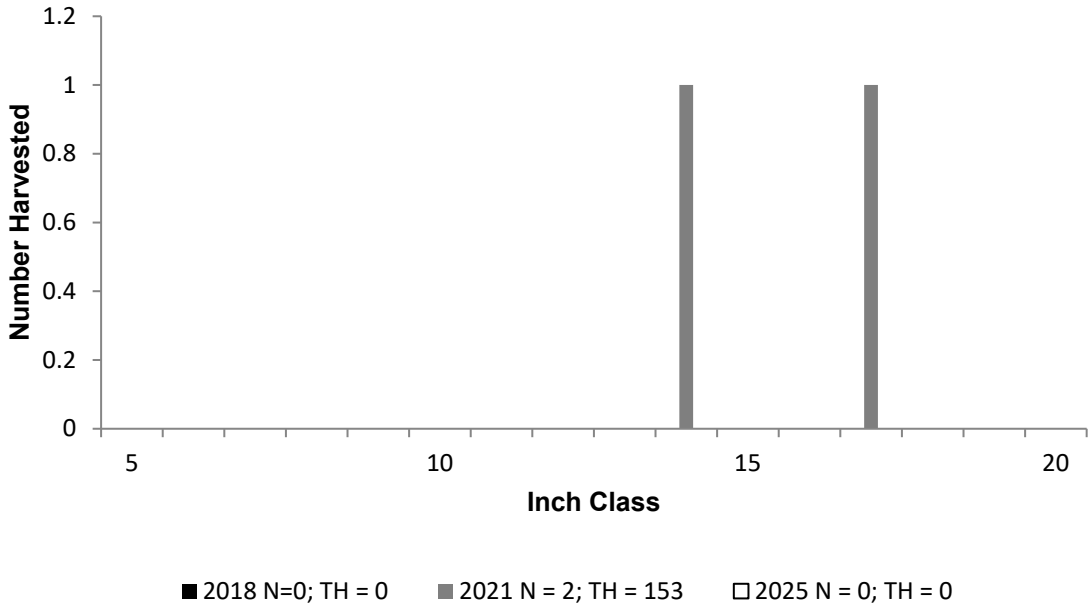
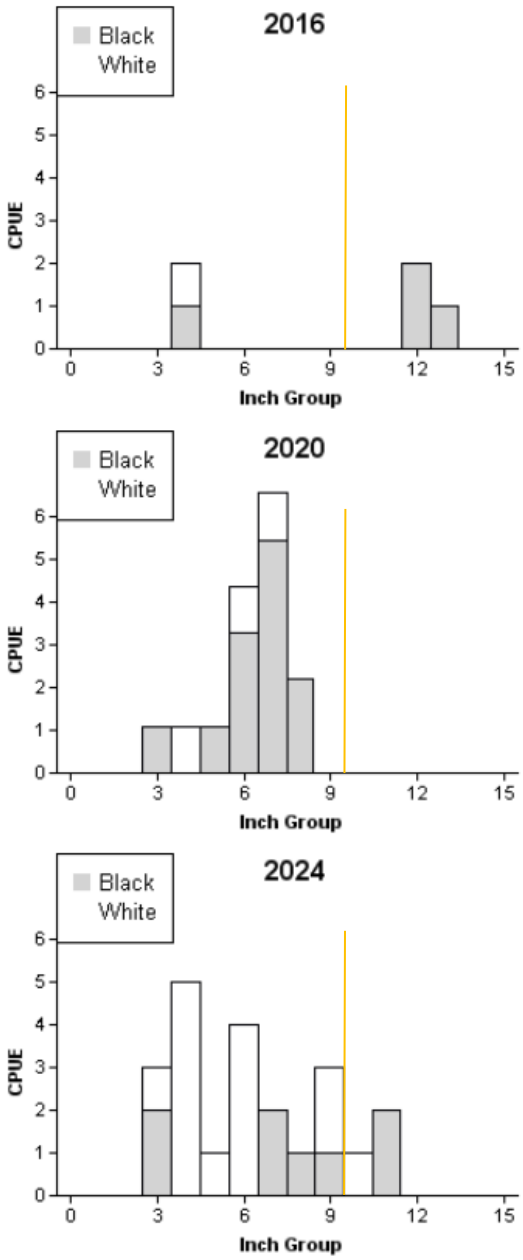


Figure 8. Length frequency of non-tournament harvested Largemouth Bass observed during creel surveys at Lake Raven, Texas, March 2018 through May 2018, March 2021 through May 2021, and March 2025 through May 2025, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and NTH is the estimated non-tournament harvest for the creel period.

Crappie



Effort = 1.0
Total CPUE = 5.0 (55; 5)

Effort = 0.9
Total CPUE = 16.4 (32; 15)

Effort = 1.0
Total CPUE = 22.0 (42; 22)

Figure 9. Number of Black Crappie and White Crappie 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 Raven, Texas, 2016, 2020, and 2024. Vertical bar represents the 10-inch minimum length limit.

Table 12. Creel survey statistics for Black and White Crappie at Lake Raven, Texas, from March 2018 through May 2018, March 2021 through May 2021, and March 2025 through May 2025. Total catch per hour is for anglers targeting crappies and the total harvest is the estimated number of Black Crappie and White Crappie harvested by all anglers. Percent released is the percentage of all legal-sized fish that were released. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2018	2021	2025
Surface area (acres)	203	203	203
Directed effort (h)	194 (223)	2,559 (45)	530 (78)
Directed effort/acre	0.96 (223)	12.61 (45)	2.61 (78)
Total catch per hour			
All Crappie	0.67 (-)*	1.84 (106)	1.00 (100)
Total harvest			
White Crappie	199 (80)	1,029 (91)	65 (185)
Black Crappie	133 (97)	382 (78)	0
Harvest/acre			
White Crappie	0.98 (80)	5.07 (91)	0.32 (185)
Black Crappie	0.66 (97)	1.88 (78)	N/A
Percent legal released			
White Crappie	40.7	0	49
Black Crappie	0	0	-**

* Sample size too small to calculate RSE.

**No legal-sized fish were observed.

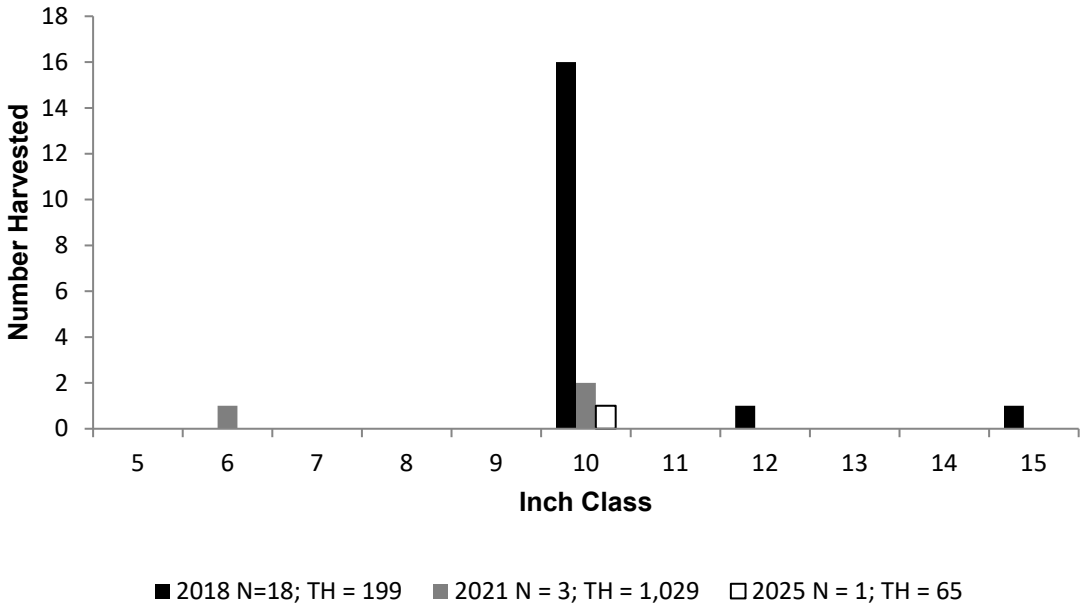


Figure 10. Length frequency of harvested White Crappie observed during creel surveys at Lake Raven, Texas, March 2018 through May 2018, March 2021 through May 2021 and March 2025 through May 2025, all anglers combined. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

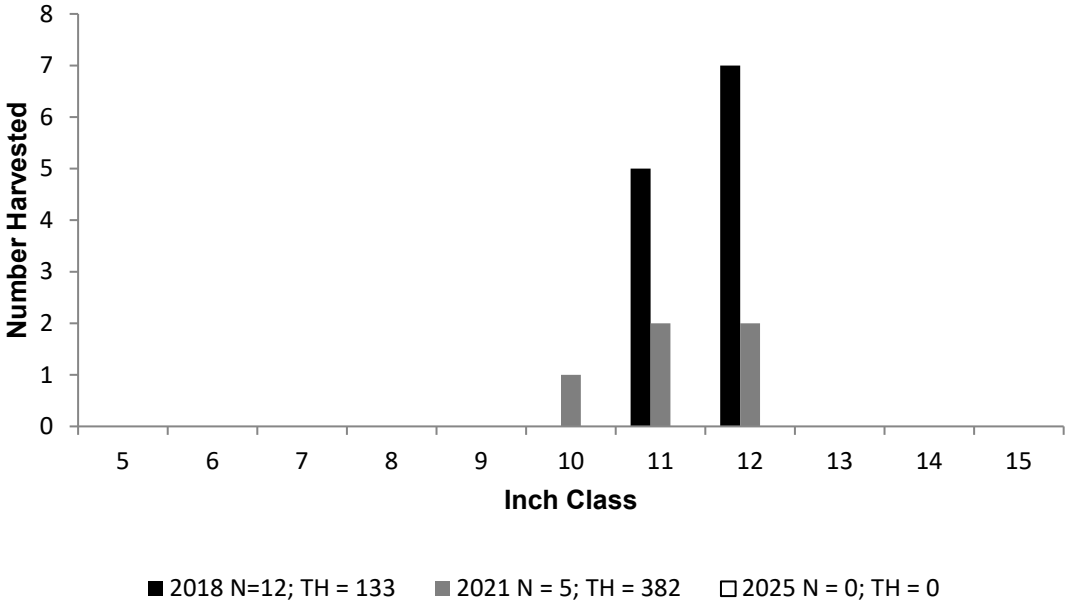


Figure 11. Length frequency of harvested Black Crappie observed during creel surveys at Lake Raven, Texas, March 2018 through May 2018, March 2021 through May 2021 and March 2025 through May 2025, all anglers combined. N is the number of harvested Black Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Proposed Sampling Schedule

Table 13. Proposed sampling schedule for Lake Raven, Texas. Survey period is June through May. Hoop netting surveys are conducted in the summer, while electrofishing surveys are conducted in the fall.

	Survey year			
	2025-2026	2026-2027	2027-2028	2028-2029
Angler Access				X
Structural Habitat				X*
Vegetation	X	X	X	X
Electrofishing – Fall	X	X		X
Baited tandem hoop netting				X
Spring Quarter Creel survey				X
Report				X

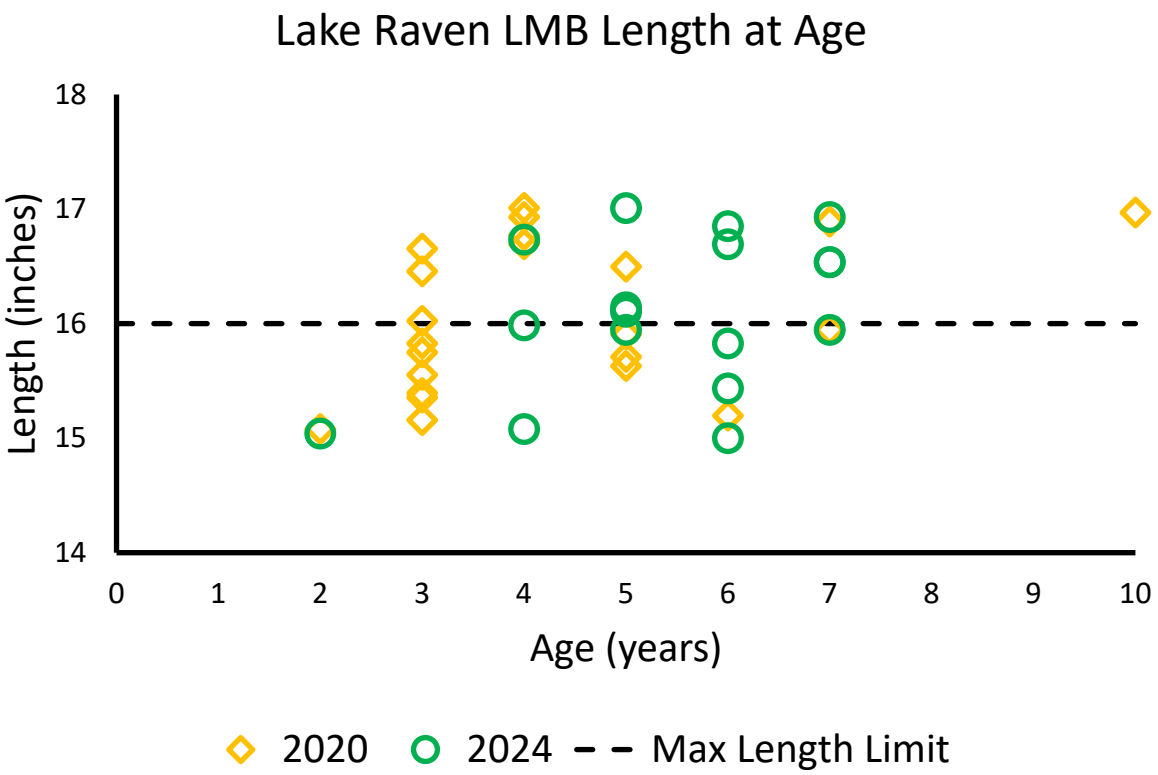
* A structural habitat survey will only be conducted if large changes in structural habitat are suspected.

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 Raven, Texas, 2024-2025. Sampling effort was 5 series for hoop netting, and 1 hour for electrofishing.

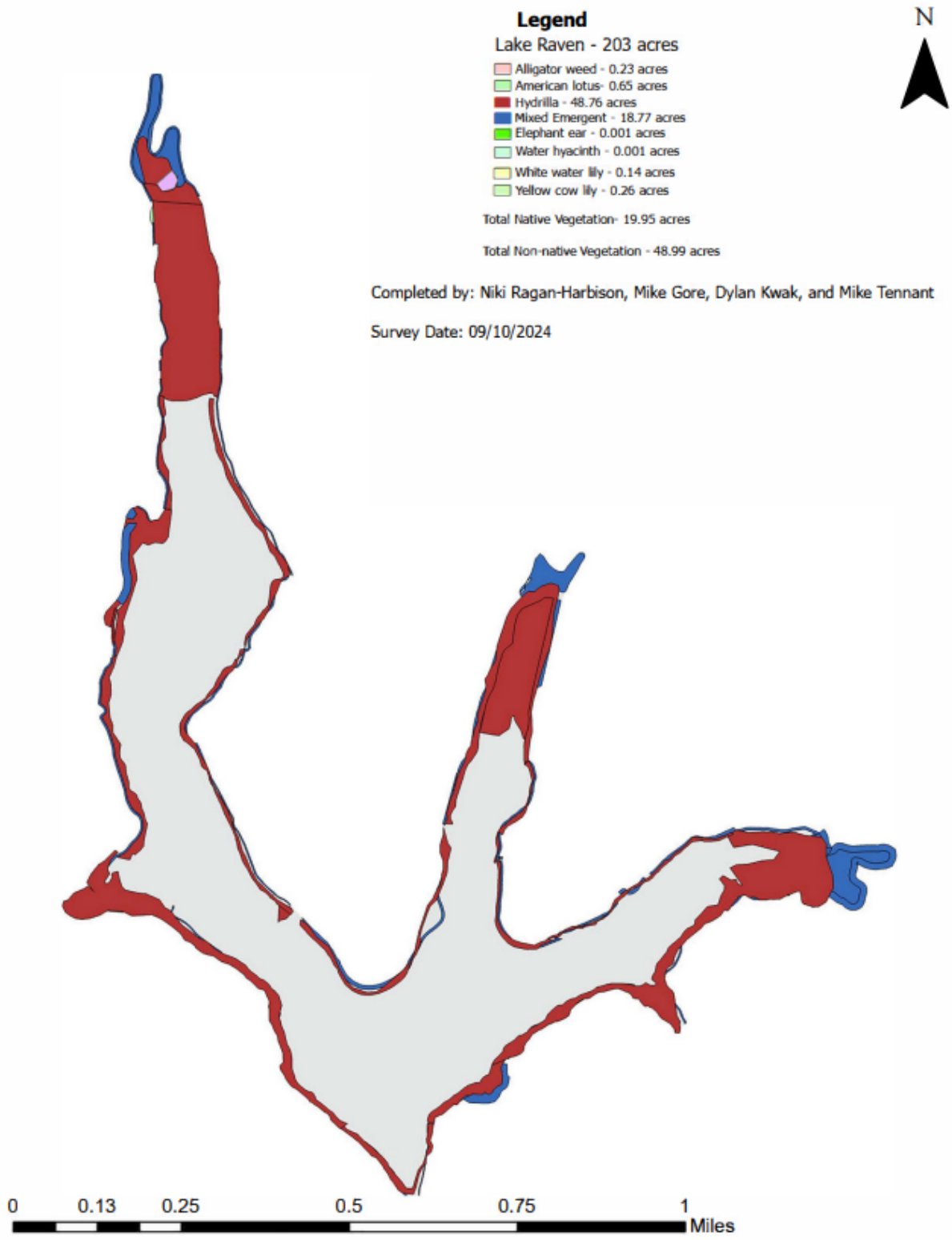
Species	Hoop Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard Shad			119	119 (25)
Threadfin Shad			180	180 (26)
Redfin Pickerel			2	2 (67)
Golden Shiner			16	16 (42)
Inland Silverside			15	15 (50)
Black Bullhead	17	3.40 (32)		
Yellow Bullhead	14	2.80 (44)		
Blue Catfish	1	0.20 (100)		
Channel Catfish	12	2.40 (49)		
Pirate Perch			6	6 (72)
Redbreast Sunfish			1	1 (100)
Warmouth			10	10 (44)
Bluegill	5	1.00 (100)	102	102 (29)
Longear Sunfish			4	4 (56)
Redear Sunfish	5	1.00 (45)	38	38 (37)
Redspotted Sunfish			13	13 (49)
Largemouth Bass			90	90 (17)
White Crappie	1	0.20 (100)	14	14 (54)
Black Crappie	1	0.20 (100)	8	8 (34)
Hybrid Sunfish			1	1 (100)

APPENDIX B – Largemouth Bass Length-at-Age Data

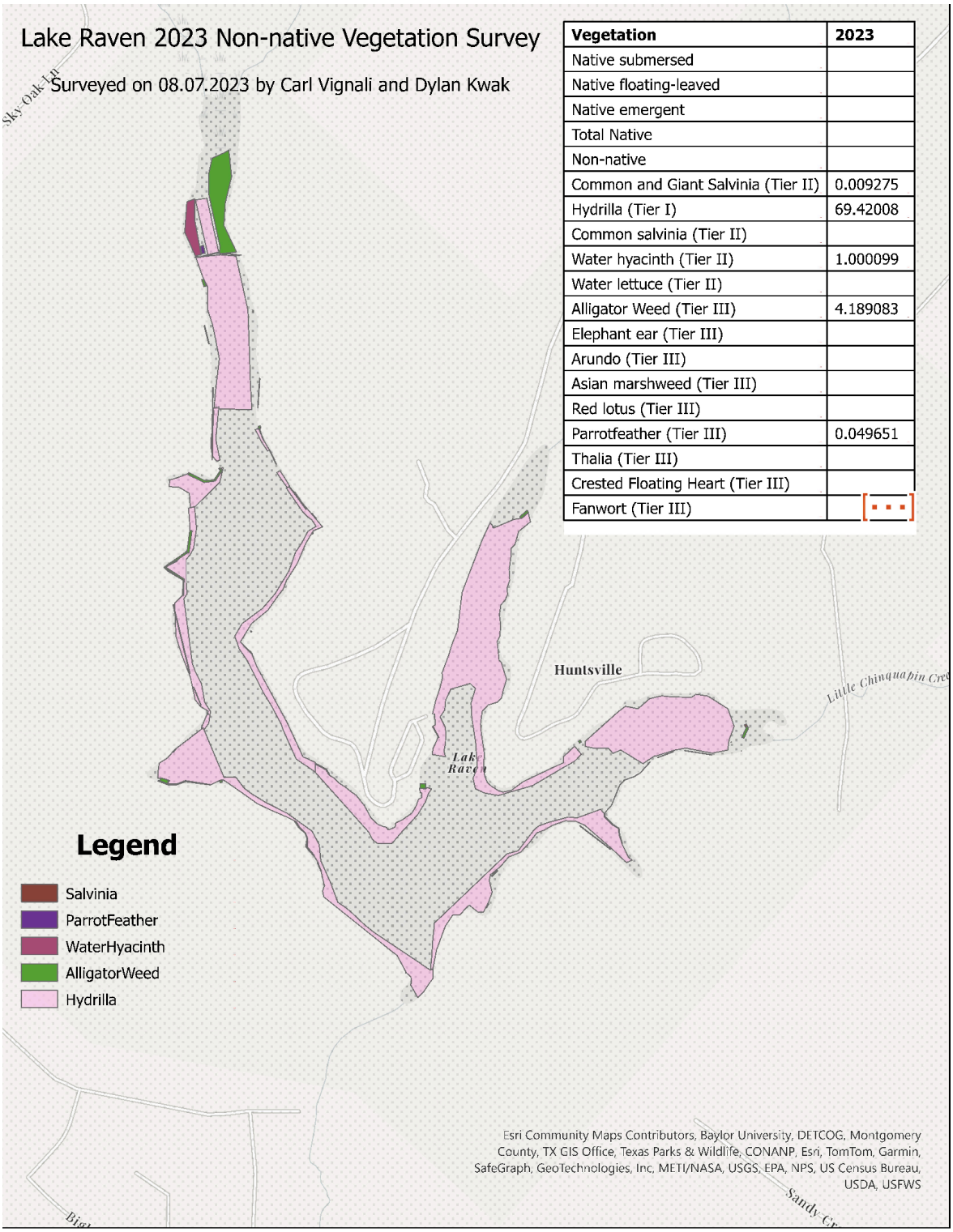


Length-at-age data for Largemouth Bass ranging from 15.0 – 16.9 inches collected during the 2020 and 2024 fall electrofishing surveys. The dashed black horizontal line represents the 16-inch maximum length limit.

APPENDIX C – Map of 2024 Vegetation Coverage

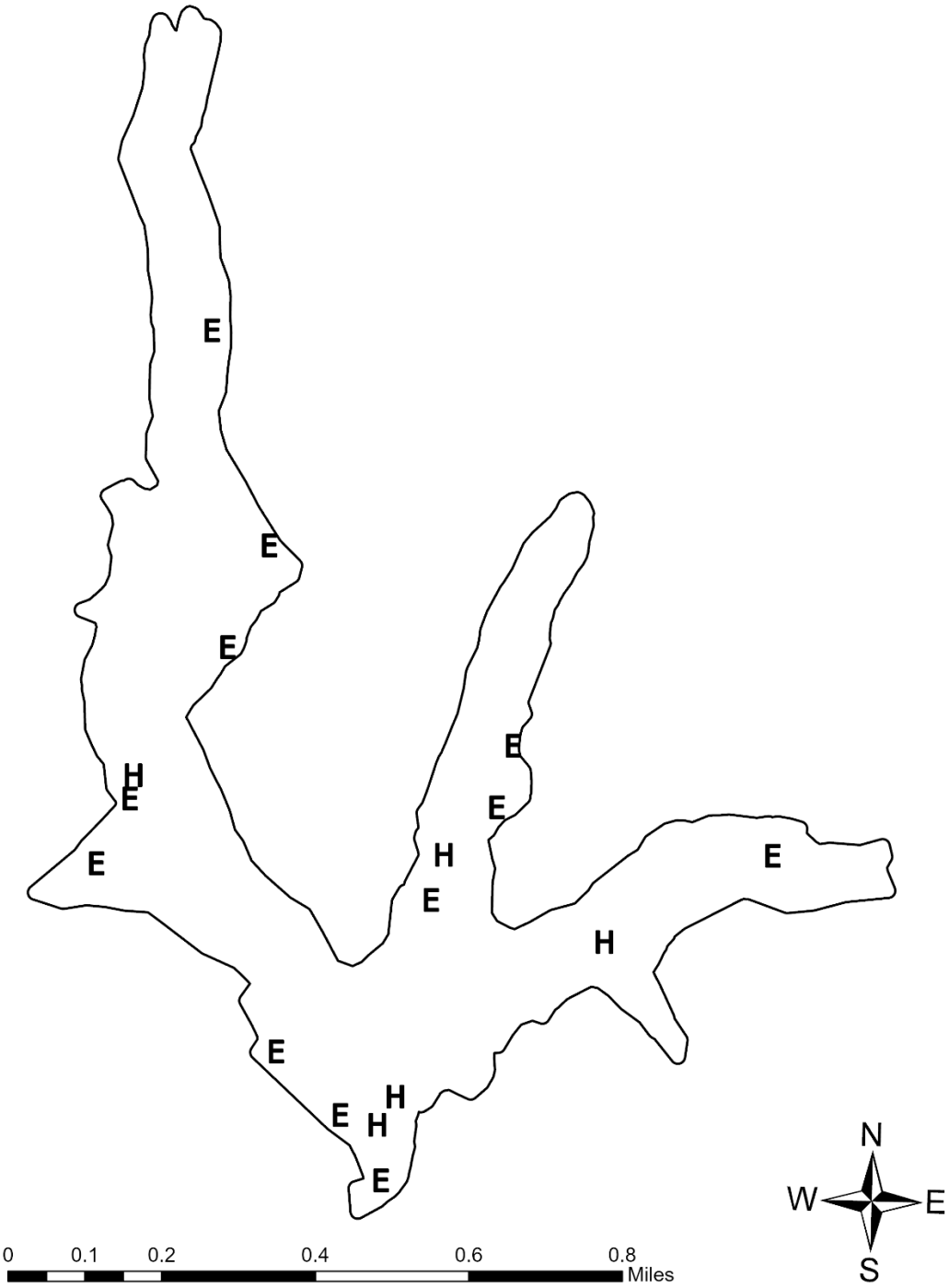


APPENDIX D – Map of 2023 Non-native Vegetation Coverage



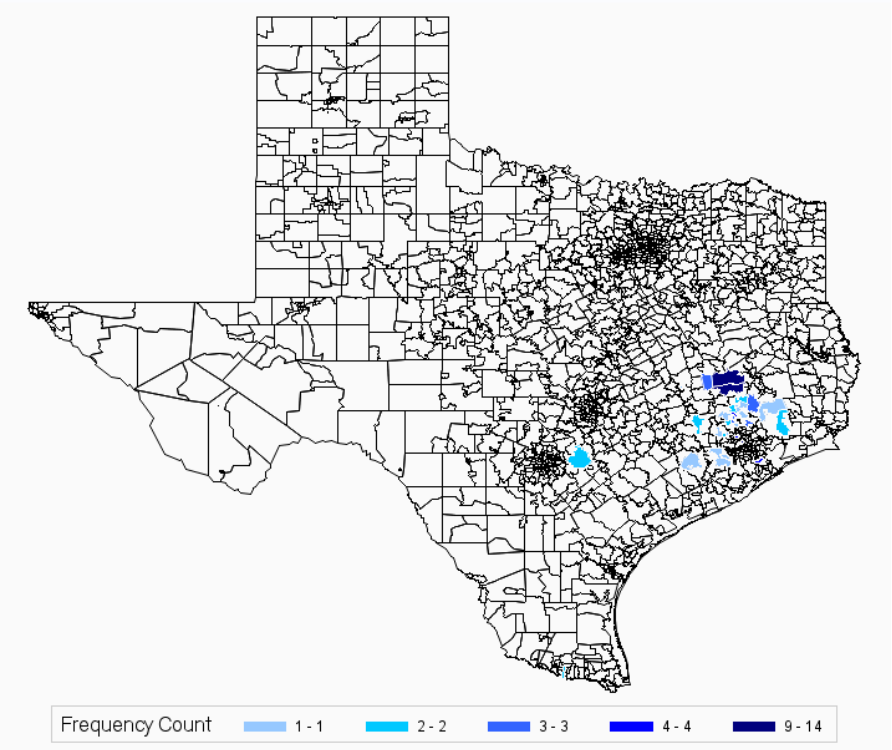
Vegetation	2023
Native submersed	
Native floating-leaved	
Native emergent	
Total Native	
Non-native	
Common and Giant Salvinia (Tier II)	0.009275
Hydrilla (Tier I)	69.42008
Common salvinia (Tier II)	
Water hyacinth (Tier II)	1.000099
Water lettuce (Tier II)	
Alligator Weed (Tier III)	4.189083
Elephant ear (Tier III)	
Arundo (Tier III)	
Asian marshweed (Tier III)	
Red lotus (Tier III)	
Parrotfeather (Tier III)	0.049651
Thalia (Tier III)	
Crested Floating Heart (Tier III)	
Fanwort (Tier III)	

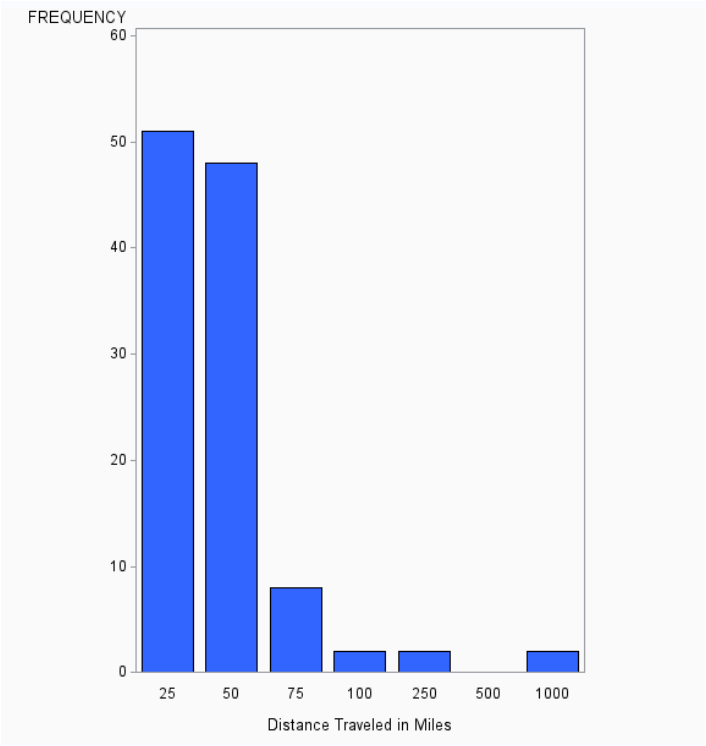
APPENDIX E – Map of sampling locations



Locations of sampling sites, Lake Raven, Texas, 2024-2025. Hoop net and electrofishing stations are indicated by H and E, respectively. Water level was near full pool at time of sampling.

APPENDIX F – reporting of creel ZIP code data





Location, by ZIP code, distance traveled and frequency of anglers that were interviewed at Lake Raven, Texas, during the March 2025 through May 2025 creel survey.

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