# Ray Roberts Reservoir

## 2023 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:*

Dan Bennett, District Management Supervisor
and
Greg Cummings, Assistant District Management Supervisor

Inland Fisheries Division
Denison District, Pottsboro, Texas



David Yoskowitz, Ph.D.
Executive Director

Timothy Birdsong
Director, Inland Fisheries


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# Survey and Management Summary

Fish populations in Ray Roberts Reservoir were surveyed in 2023 using electrofishing and trap netting, and in 2024 using gill netting and spring electrofishing. Historical data are presented with the 2023-2024 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:** Ray Roberts Reservoir is a 28,646-acre impoundment on the Elm Fork Trinity River north of Dallas-Fort Worth in Denton, Grayson, and Cooke Counties. The conservation elevation of Ray Roberts Reservoir is 632.5 feet above mean sea level. Habitat features consisted mainly of flooded timber, rocky shoreline, native and non-native submerged vegetation, and riprap along the dam and railroad bridges.

**Management History**: Important sport fishes included Blue and Channel Catfish, White Bass, black basses, and crappie. A 14- to 24-inch slot length limit, 5 fish daily bag limit for Largemouth Bass was dropped in 2009, in favor of the statewide 14-inch minimum length limit, 5 fish daily bag limit. Statewide fish harvest regulations currently apply to all sport fishes in Ray Roberts Reservoir. The statewide minimum length for Blue and Channel Catfish was dropped in 2021. Florida Largemouth Bass fingerlings have been stocked periodically since 1985.

**Fish Community**

- **Prey species:** Threadfin Shad and Gizzard Shad are present along with sunfish species including predominately Bluegill, Longear, and Redear Sunfish.
- **Catfishes:** Channel Catfish and Blue Catfish are available to anglers. Flathead Catfish are also present.
- **White Bass:** White Bass provide a popular fishery in the main lake year-round and in the reservoir's tributaries during the spring.
- **Black basses:** Black bass present include Largemouth Bass, Spotted Bass, and Smallmouth Bass. Although not stocked by TPWD, Smallmouth Bass are occasionally caught by anglers, and a small number have been collected during fisheries surveys. Spotted Bass are also present in moderate abundance and Ray Roberts holds the current state record Smallmouth x Spotted Bass hybrid.
- **Crappie:** Crappie are abundant and support the most popular fishery at Ray Roberts Reservoir.

**Management Strategies**: Inform the public about the negative impacts of aquatic invasive species. Conduct general monitoring surveys with trap nets and electrofishing in fall 2027 and gill nets in spring 2028. Stock Lone Star Bass in 2024. Continue to pursue ideas and opportunities to improve fish habitat. Access and vegetation surveys will be conducted in 2027.

# Introduction

This document is a summary of fisheries data collected from Ray Roberts Reservoir in 2023-2024. 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 2023-2024 data for comparison.

## Reservoir Description

Ray Roberts Reservoir is a 28,646-acre impoundment on the Elm Fork Trinity River north of Dallas-Fort Worth in Denton, Grayson, and Cooke Counties. It was constructed in 1987 by the U.S. Army Corps of Engineers (USACOE) for flood control, water supply, hydropower, fish and wildlife, and recreation. Ray Roberts Reservoir was border-line mesotrophic-eutrophic with a mean TSI chl-*a* of 49.28 (Texas Commission on Environmental Quality 2022). Habitat at the time of sampling consisted of rocky shoreline, dead trees, and riprap along with emergent and submerged vegetation. The lake level remained near the conservation elevation of 632.5ft above MSL during the survey period (Figure 1). Other descriptive characteristics for Ray Roberts Reservoir are in Table 1.

## Angler Access

Public access consisted of seven public boat ramps (Table 2), and bank access at two state parks and eight bridge crossings. Boat access is generally excellent; however, high lake levels in recent years have resulted in temporary ramp closures. Two privately operated marinas at Sanger Park and at Lone Star Lodge are available. All other access to the reservoir is maintained by Texas Parks and Wildlife State Parks. Further information about Ray Roberts Reservoir and its facilities can be obtained by visiting the Texas Parks and Wildlife Department (TPWD) web site at www.tpwd.texas.gov. Maps indicating boat and shoreline access locations are available at:
https://tpwd.texas.gov/fishboat/fish/recreational/lakes/ray_roberts/access.phtml and
https://tpwd.texas.gov/huntwild/hunt/public/annual_public_hunting/resources/RayRoberts_501.pdf

## Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Bennett and Cummings 2020) included:

1. Monitor Black Bass population with spring electrofishing in 2021 and fall electrofishing in 2023. Stock Florida Largemouth Bass fingerlings at the rate of 1,000/shoreline km in 2021 and 2024 to improve the proportion of Florida Bass alleles in individual fish in Ray Roberts Reservoir.

   **Action:** Florida Largemouth Bass fingerlings were stocked in 2021 and Lone Star Bass were stocked in 2024. Spring electrofishing was postponed until 2024 due to flooding in 2021 and a fall electrofishing survey was completed in 2023.

2. Update improvements in catfish and White Bass populations on the TPWD website and promote the potentially underutilized fisheries.

   **Action:** Fishing opportunities for Blue Catfish and spring White Bass fisheries have been promoted through social media and popular articles.

3. Pursue opportunities to partner with stakeholders to conduct habitat improvement initiatives to increase aquatic vegetation in Ray Roberts.

   **Action:** The Fort Worth Fly Fishers obtained a small grant from Friends of Reservoirs to partner with TPWD to construct and deploy experimental floating plant nurseries containing native submerged aquatic vegetation.

4. Educate stakeholders regarding invasive species concerns and monitor for invasive species.

   **Action:** Monitoring for non-native vegetation was conducted. Zebra mussel boat ramp stencils and boat ramp signage were refreshed. Opportunities to inform and educate the public about invasive species were taken during annual local career fairs and outreach events at the state park.

**Harvest regulation history:** Sportfish in Ray Roberts Reservoir are now managed with statewide regulations. A 14- to 24-inch slot length limit, 5 fish daily bag limit for Largemouth Bass was changed in 2009, in favor of the statewide 14-inch minimum length limit, 5 fish daily bag limit. Current regulations are found in Table 3.

**Stocking history:** Ray Roberts Reservoir has been stocked with Florida Largemouth Bass since 1985, when stockings occurred in nursery ponds prior to impoundment. ShareLunker Florida Bass were stocked in in 2005 and 2012. Lone Star Bass were stocked in 2024. Smallmouth Bass are suspected to have been illegally introduced by anglers from Lake Texoma in the 2000's, and a low-density population persists. The complete stocking history is in Table 4.

**Vegetation/habitat history:** Nuisance aquatic vegetation treatments have never been conducted by TPWD Inland Fisheries at Ray Roberts.

**Water transfer:** There is no raw water transfer from Ray Roberts Reservoir; however, water flows downstream into the Elm Fork of the Trinity River and into Lake Lewisville.

# Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Ray Roberts Reservoir (Bennett and Cummings 2020). Primary components of the OBS plan are listed in Table 5. Spring bass-only electrofishing survey sites were subjectively selected. All other survey sites were randomly selected (Appendix D), 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 were collected by spring electrofishing (2 hours at 12, 10-min stations) in 2024. Black bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by fall electrofishing (1.5 hours at 24, 5-min stations) in 2023. 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).

**Trap netting** – Crappie were collected using trap nets (10 net nights at 10 stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn). Ages for White Crappie were determined using otoliths from 12 randomly selected fish (range 9.0 to 10.9 inches).

**Gill netting** – Blue Catfish, Channel Catfish, and White Bass were collected by gill netting (10 net nights at 10 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn). Ages for Blue Catfish were determined using otoliths collected from 13 randomly selected fish (range 19.0 to 20.9 inches).

**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 statistics.

**Habitat** – A structural habitat and vegetation survey was conducted in 2023. Vegetation abundance was assessed with a random point intercept survey (TPWD, Inland Fisheries Division, unpublished manual revised 2022).

**Water level** – Source for water level data was the United States Geological Survey (Figure 1; USGS 2024).

# Results and Discussion

**Habitat:** Structural habitat remains constant at Ray Roberts Reservoir since development is restricted by the USACOE. Shoreline habitat consists primarily of natural shoreline (94%), flooded timber (3,000 acres), with some riprap (6%) along the dam and railroad bridges (Table 6). Stable water levels since 2015 have allowed native aquatic vegetation to increase. Random point-intercept surveys conducted in 2019 and 2023 documented an increase in emergent vegetation (water-willow) from 2.5 percent to 13.6 percent of survey sites. Native submersed vegetation also increased from 8.2 to 17.1 percent of survey sites (Table 7). Native submersed vegetation consisted primarily of American pondweed (*Potamogeton nodosus*) and muskgrass (*chara* spp.). Non-native Eurasian watermilfoil was also present at 6.4 percent of survey sites. Non-native Hydrilla (*Hydrilla verticillata)* was not recorded during the random-point survey in 2023. Native aquatic plant species, Illinois pondweed (*Potamogeton illinoensis*), Eel grass (*Vallisneria americana)*, and Water stargrass (*Heteranthera dubia*), were introduced in experimental floating enclosures, sponsored by the Fort Worth Fly Fishers, were not collected during the 2023 random-point vegetation survey. The 3-year pilot study was initiated to maintain plants until spread by seed or fragmentation could occur to try and increase plant diversify and abundance throughout the reservoir. Plants persisted in the enclosures until failure in 2023, and the remaining floats and empty enclosures were removed. In 2024, an angler reported “Eelgrass” growing in an area near the planter containing Vallisneria that had not been confirmed at the time of this publication due to flood conditions and ramp closures.

**Prey species:** Catch rates of Gizzard Shad (110.0/h) and Threadfin Shad (73.3.0/h; Appendix A) were moderate, following a long-term trend (Appendix B). The IOV of Gizzard Shad exhibited a declining trend (IOV = 45; Figure 2) over the last three surveys (Figure 2) and the CPUE of threadfin shad also declined since a record high catch rate in 2015. Bluegill catch rate (153.3.0/h) remained consistent with the long-term average of 160.3/h (Appendix B). Most Bluegill were available as forage for sportfish (PSD = 7; Figure 3). Longear Sunfish (118.7/h), Redear Sunfish (10.0/h), Green Sunfish (4.0/h), and Warmouth (1.3/h) also contributed to the prey base (Appendix A).

**Catfish:** Gill net catch rate of Channel Catfish was low (1.9/nn), below the long-term average of 3.6/nn (Appendix B) and Channel Catfish over quality length (16-inches) have not been collected since 2016 (Figure 4). Gill net catch rate of Blue Catfish (4.6/nn) remains above the long-term average yet fell slightly from the record catch in 2020 (Appendix B). The catfish community continues to exhibit a shift from being dominated by Channel Catfish to a Blue Catfish dominated fishery. The population contains many harvestable sizes of Blue Catfish between 14- and 20-inches (Figure 5). Due to the change in the statewide harvest regulations for catfish (Table 3) following the previous objective-based sampling plan, we collected and aged Blue Catfish (N=13) between 19.0 and 20.6 inches in total length. Average age at 20-inches was 12.8 years, slower than in other Texas Reservoirs. Body condition was moderate (<85) for more abundant size classes suggesting some density dependent growth limitations. The catch rate of Blue Catfish over 20-inches increased slightly over the last three surveys (Figure 5). We collected 45 Blue Catfish, 5 stock-size fish below our target CPUE; however, additional sampling was not conducted since all other objectives were achieved and additional sampling was deemed unlikely to yield additional insight to the status of the Blue Catfish population.

**White Bass:** Gill net catch rate of White Bass (5.8/nn) was consistent with the CPUE in 2020 (5.9/nn), and near the long-term average (7.1; Appendix B) yet down from the record catch rate in 2016 (14.9/nn).

However, the number of larger fish increased in 2024 (PSD=71, Figure 6). White Bass provide a popular spring fishery in the Elm Fork and other tributaries of Ray Roberts during the spawning migration.

**Black Bass:** Spotted Bass electrofishing catch rate (26/h) was near the long-term average (25.3/h), yet down from record catch rates in 2011 and 2015 (Appendix B). Spotted Bass up to 15-inches were collected and exhibit good body condition for all size groups. Smallmouth Bass were not collected during the 2023 electrofishing survey, yet one suspected hybrid Smallmouth x Spotted Bass was observed during the spring gill net survey.

Catch rate of Largemouth Bass (113.3/h) was also near the long-term average catch-rate (120.1/h; Appendix B) and increased from the previous survey and record low catch rate (37.5/h). Largemouth PSD (45; Figure 8) was within the target range (40 to 60). The catch rate of legal length fish (11.3/h) improved from prior surveys. Body condition was variable between size classes but generally >80. Largemouth Bass reached the minimum length limit in 2.1 years (N = 13; range 1-3 years). A spring bass-only electrofishing survey was planned for 2021; yet was postponed to 2024 due to flooding and ramp closures in 2021. Largemouth Bass were collected up to 22-inches in spring 2024 and size metrics (PSD = 72; PSD-P = 58) appeared consistent with previous results (Figure 9), however our catch rate did not reach our goal of collecting 50-stock size Largemouth Bass. A recent water level rise was suspected to have reduced overall catch rates. Recent tournament results indicate winning weights at large tournaments ($\geq$50 participants) are consistently above a five-pound average fish weight mark for 5-fish bag limits, and big fish weights range from 6 to 9 pounds (Appendix E). Between 1 January and 31 March 2024, six ShareLunker entries had been submitted for Ray Roberts including two “Strike King Elite” bass up to 11.37 pounds.

**White Crappie:** Trap net catch rate of White Crappie (4.3/nn) was down from a high catch rate in 2019 of 26.4/nn; yet catch rate was highly variable between stations (RSE=40). Black Crappie (0.5/nn) catch rate was low and similar-to previous years; (Appendix B). All White Crappie aged (N=12) near the minimum length limit (9.0-10.9-inches) were age-1 suggesting excellent growth. Relative weights were above 90 for larger size classes of White Crappie yet lower for Black Crappie (Figure 10). Crappie sampling fell short of total 13-fish age and growth target and our 50 stock-sized fish target; however, sampling precision was also low and deemed unlikely to be improved with additional sampling.

# Fisheries Management Plan for Ray Roberts Reservoir, Texas

Prepared – July 2024

**ISSUE 1:** Largemouth Bass remain one of the most popular fisheries at Ray Roberts. Many tournaments target the reservoir.

MANAGEMENT STRATEGIES

1. Continue to monitor the Black Bass population with Fall electrofishing in 2027.
2. Continue monitoring trends in tournament catch statistics and ShareLunker reports.
3. Stock Lone Star Bass in 2024 at 1,000/shoreline km to maintain the trophy potential of the reservoir.

**ISSUE 2:** Habitat in the form of aquatic vegetation has increased in Ray Roberts Reservoir but is limited in distribution and abundance.

MANAGEMENT STRATEGIES

1. Continue to monitor efforts to increase aquatic plant diversity and overall coverage.
2. Pursue opportunities to partner with stakeholders to conduct habitat improvement initiatives.

**ISSUE 3:** Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant Salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEIES

1. Cooperate with the controlling authority to maintain appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, and other outreach materials so that they can in turn educate their customers.
3. Educate the public about invasive species using media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) future interbasin water transfers to facilitate potential invasive species responses.

# Objective-Based Sampling Plan and Schedule (2024–2028)

Sport fish, forage fish, and other important fishes

Important sport fish in Ray Roberts Reservoir include black bass, crappie, Blue and Channel Catfish, and White Bass. Important forage species include sunfishes, Gizzard Shad, and Threadfin Shad.

Survey objectives, fisheries metrics, and sampling objectives

**Largemouth Bass**: Largemouth Bass ranked second in popularity among anglers during the 2018 creel survey. Sampling once every four years in the fall to collect long-term monitoring trend data will allow for determination of any large-scale changes in the Largemouth Bass population that may spur further investigation.

A maximum of twenty-four randomly selected 5-min electrofishing sites will be sampled in fall 2027. Sampling will continue until a minimum of 50 stock-size fish are collected with a desired precision (RSE of CPUE-S $\leq$ 25) or two-hours of electrofishing has been conducted. Thirteen Largemouth between 13.0 and 14.9 inches will be collected to estimate age at the minimum length limit (14 inches). A genetic sample of 30 randomly selected Largemouth Bass will be collected in 2027 to access the contribution of Florida Largemouth Bass stockings last conducted in 2019. Relative weight of Largemouth Bass $\geq$ 8" TL will be determined from their length/weight data (maximum of 10 fish weighed and measured per inch class).

**Catfish:** Catch rates are typically low for Channel Catfish; however, sampling to achieve objectives for Blue Catfish should allow detection of large-scale changes in the Channel Catfish population.

Ten randomly selected gill net stations will be generated in spring 2028. The anticipated effort to meet an RSE of CPUE-S $\leq$ 25 and collect at least 50 Blue Catfish, and 13 fish between 11.0 and 12.9 inches (to estimate age at the MLL), is between 8 and 15 stations with 80% confidence. Additional net nights may be added if we determine objectives can be met with reasonable additional effort.

**Crappie**: Crappie ranked slightly higher in popularity than black bass in the 2018 creel survey. White Crappie are much more abundant than Black Crappie. Data on Black Crappie will be recorded along with White Crappie. Trend data on CPUE, size structure, age and growth, and body condition of White Crappie will be collected with trap nets in 2027 to monitor trends in the population. We estimate that the effort required to meet sampling objectives (RSE of CPUE-S $\leq$ 25 and collect at least 50 stock-size fish) for White Crappie to be between 10 and 15 net-nights. This level of sampling should provide enough (13) White Crappie between 9.0 and 10.9 inches to estimate average age at legal length (10 inches). We plan to generate 10 random shoreline trap net stations initially; however, an additional 5 net-nights may be sampled if objectives can be met with reasonable additional effort.

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

**Sunfish and Shad**: Bluegill and Longear Sunfish, along with Gizzard and Threadfin Shad are the primary forage species. We intend to collect trend data on abundance, size structure, and prey availability for forage species (along with sampling for Largemouth Bass) once every four years by electrofishing. Effort expended to achieve desired relative abundance estimates for Bluegill should be similar-to that required for Largemouth Bass. Additional effort will not be expended beyond that which is necessary to collect data for Largemouth Bass.

# Literature Cited

Bennett, D. L., and G.A. Cummings. 2020. Statewide freshwater fisheries monitoring and management program survey report for Ray Roberts Reservoir, 2019. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-4, Austin.

DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

Guy, C. S., R. M. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7): 348.

Neumann, R. M., C. S. Guy, and D. W. Willis. 2012. Length, weight, and associated indices. Pages 637-676 in A. V. Zale, D. L. Parrish, and T. M. Sutton, editors. Fisheries techniques, 3rd edition. American Fisheries Society, Bethesda, Maryland.

Page, L. M., K. E. Bemis, T. E. Dowling, H. S. Espinosa-Perez, L. T. Findley, C. R. Gilbert, K. E. Hartel, R. N. Lea, N. E. Mandrak, M. A. Neighbors, J. J. Schmitter-Soto, and H. J. Walker, Jr. 2023. Common and scientific names of fishes from the United States, Canada, and Mexico. American Fisheries Society, Special Publication 37, Bethesda, Maryland.

Texas Commission on Environmental Quality. 2022. Trophic classification of Texas reservoirs. 2022 Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d), Austin. 21 pp.

United States Geological Survey (USGS). 2024. National water information system: Web interface. Available: http://waterdata.usgs.gov/tx/nwis (July 2024).

# Tables and Figures

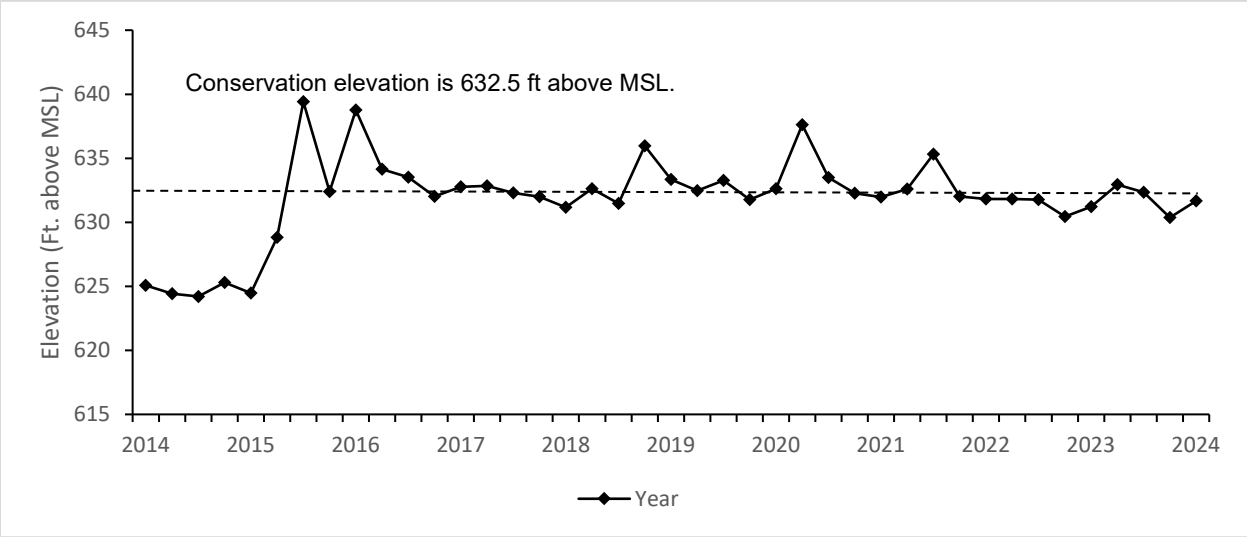



Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Ray Roberts Reservoir, Texas, 2014 to 2024.

Table 1. Characteristics of Ray Roberts Reservoir, Texas.

| Characteristic | Description |
|---|---|
| Year constructed | 1987 |
| Controlling authority | U.S. Army Corps of Engineers |
| Counties | Cooke, Denton, and Grayson |
| Reservoir type | Mainstream: Elm Fork Trinity River |
| Shoreline Development Index | 8.63 |
| Conductivity | 316 µS/cm |

Table 2. Boat ramp characteristics for Ray Roberts Reservoir, Texas, August 2024. Reservoir elevation at time of survey was 630.4 feet above mean sea level.

| Boat ramp | Latitude Longitude (dd) | Public | Parking capacity (N) | Elevation at end of boat ramp (ft) | Condition |
|---|---|---|---|---|---|
| Johnson Branch | 33.40926 -97.05071 | Y | 100 | 618 | Excellent, no access issues. |
| Isle de Bois | 33.37946 -97.03163 | Y | 100 | 601 | Excellent, no access issues. |
| Jordan Park | 33.40180 -97.00460 | Y | 70 | 624 | Excellent, no access issues. |
| Buck Creek | 33.44536 -97.92559 | Y | 60 | 621 | Excellent, no access issues. |
| Sanger Park | 33.37915 -97.10577 | Y | 60 | 625 | Excellent, no access issues. |
| Pond Creek | 33.38722 -97.10722 | Y | 60 | 625 | Excellent, no access issues. |
| Pecan Creek | 33.43004 -97.10471 | Y | 50 | 627 | Excellent, no access issues. |

Table 3. Harvest regulations for Ray Roberts Reservoir, Texas.

| Species | Bag limit | Length limit |
|---|---|---|
| Catfish: Channel and Blue Catfish, their hybrids and subspecies | 25 (in any combination; only 10 ≥ 20 inches) | None |
| Catfish, Flathead | 5 | 18-inch minimum |
| Bass, White | 25 | 10-inch minimum |
| Bass, Spotted | 5 | No limit |
| Bass, Largemouth and Smallmouth | (in any combination) | 14-inch minimum |
| Crappie: White and Black Crappie, their hybrids, and subspecies | 25 (in any combination) | 10-inch minimum |

Table 4. Stocking history of Ray Roberts Reservoir, Texas. FRY = fry; FGL = fingerling; AFGL = advanced fingerling; ADL = adults.

| Year | Number | Size |
|---|---|---|
| | Threadfin Shad | |
| 1985 | 1,200 | ADL |
| Total | 1,200 | |
| | Coppernose Bluegill | |
| 1987 | 234,506 | AFGL |
| 1987 | 110,002 | FRY |
| Total | 344,508 | |
| | Florida Largemouth Bass | |
| 1985 | 59,900 | FRY |
| 1987 | 78 | ADL |
| 1987 | 100,262 | FRY |
| 1989 | 733,750 | FRY |
| 1993 | 133,630 | FGL |
| 1994 | 600,809 | FGL |
| 2000 | 502,121 | FGL |
| 2001 | 522,791 | FGL |
| 2011 | 500,719 | FGL |
| 2013 | 521,526 | FGL |
| 2017 | 247,741 | FGL |
| 2019 | 170,169 | FGL |
| 2021 | 122,720 | FGL |
| Total | 4,216,216 | |
| | Channel Catfish | |
| 1986 | 50,004 | AFGL |
| Total | 50,004 | |
| | ShareLunker Largemouth Bass[a] | |
| 2005 | 14,839 | FGL |
| 2012 | 15,285 | FGL |
| Total | 30,124 | |
| | Lone Star Bass[b] | |
| 2024 | 255,065 | FGL |

[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 Ray Roberts Reservoir, Texas 2020–2024.

| Gear/target species | Survey objective | Metrics | Sampling objective |
|---|---|---|---|
| *Electrofishing (Fall)* | | | |
| Largemouth Bass | Abundance | CPUE–Stock | RSE-Stock ≤ 25 |
| | Size structure | PSD, length frequency | N ≥ 50 stock |
| | Age-and-growth | Age | N = 13, 13.0-14.9 in. |
| | Condition | $W_r$ | 10 fish/inch group (max) |
| Bluegill [a] | Abundance | CPUE–Total | RSE ≤ 25 |
| | Size structure | PSD, length frequency | N ≥ 50 |
| Gizzard Shad [a] | Abundance | CPUE–Total | RSE ≤ 25 |
| | Prey availability | IOV | N ≥ 50 |
| *Electrofishing (Spring)* | Abundance | CPUE-Stock | RSE-Stock $\leq$ 25 |
| Largemouth Bass | Size structure | PSD, length frequency | N ≥ 50 stock |
| *Trap netting* | Abundance | CPUE-stock | RSE-Stock $\leq$ 25 |
| White Crappie | Size structure | PSD, length frequency | N = 50 |
| | Condition | $W_r$ | 10 fish/inch group (max) |
| | Age-and-growth | Age at 10 inches | N = 13, 9.0 – 10.9 inches |
| *Gill Netting* | Abundance | CPUE–stock | RSE-Stock ≤ 25 |
| Blue Catfish | Size structure | PSD, length frequency | N ≥ 50 stock |
| | Age-and-growth | Age at 12 inches | N = 13, 11.0 – 12.9 inches |
| | Condition | $W_r$ | 10 fish/inch group (max) |
| | Abundance | CPUE – stock | No objective |
| White Bass | Size structure | PSD, length frequency | No objective |
| | Condition | $W_r$ | 10 fish/inch group (max) |

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

Table 6. Survey of structural habitat types, Ray Roberts Reservoir, Texas, 2023. Shoreline habitat type units are in miles and standing timber and piers, boat docks, and marinas are in acres.

| Habitat type | Estimate | % of total |
|---|---|---|
| Standing timber | 3000 acres | 11 |
| Piers, boat docks, marinas | 6 acres | <0.1 |
| Rocky | 12 miles | 6 |
| Natural | 195 miles | 94 |

Table 7. Percent (%) occurrence and associated 95% confidence limits (CL) for vegetation types throughout the reservoir (280 points) encountered during a summer vegetation survey, Ray Roberts Reservoir, Texas, 2019 and 2023. Water level at time of survey was approximately 0.5 ft. and 2 ft. below conservation pool level in 2019 and 2023, respectively.

| Vegetation type | Percent occurrence | Lower CL | Upper CL |
|---|---|---|---|
| Native emergent[a] | | | |
| 2019 | 2.5 | 0.7 | 4.3 |
| 2023 | 13.6 | 9.8 | 18.2 |
| Native submersed[b] | | | |
| 2019 | 8.2 | 5.0 | 11.4 |
| 2023 | 17.1 | 12.9 | 22.0 |
| Non-native | | | |
| Hydrilla and Eurasian watermilfoil (Tier III) | | | |
| 2019 | 0.4 | 0.3 | 0.5 |
| 2023 | 6.4 | 3.8 | 9.9 |

[a] Water-willow
[b] American pondweed, Bushy pondweed, Chara

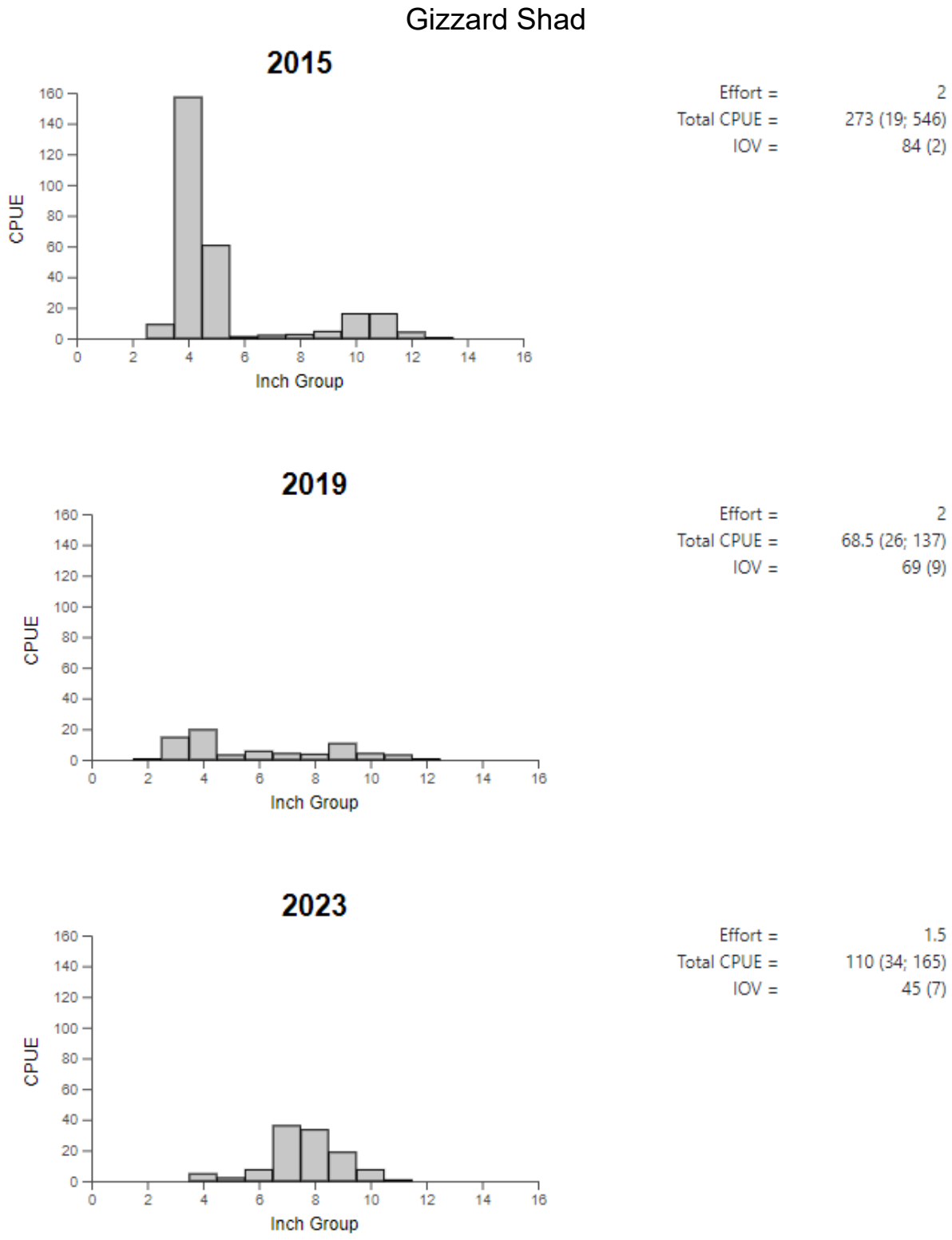



Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Ray Roberts Reservoir, Texas, 2015, 2019, and 2023.

Bluegill

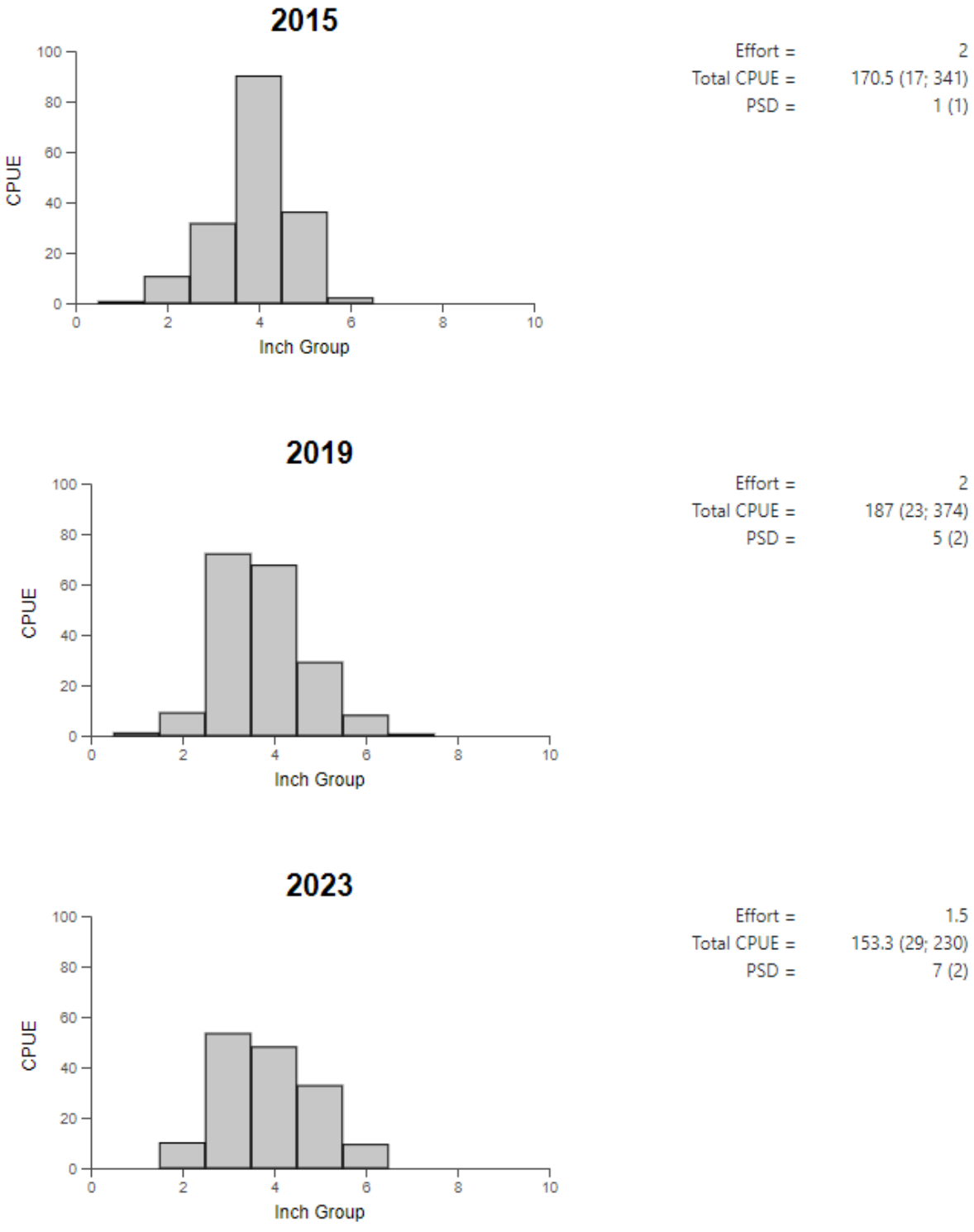



Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Ray Roberts Reservoir, Texas, 2015, 2019, and 2023.

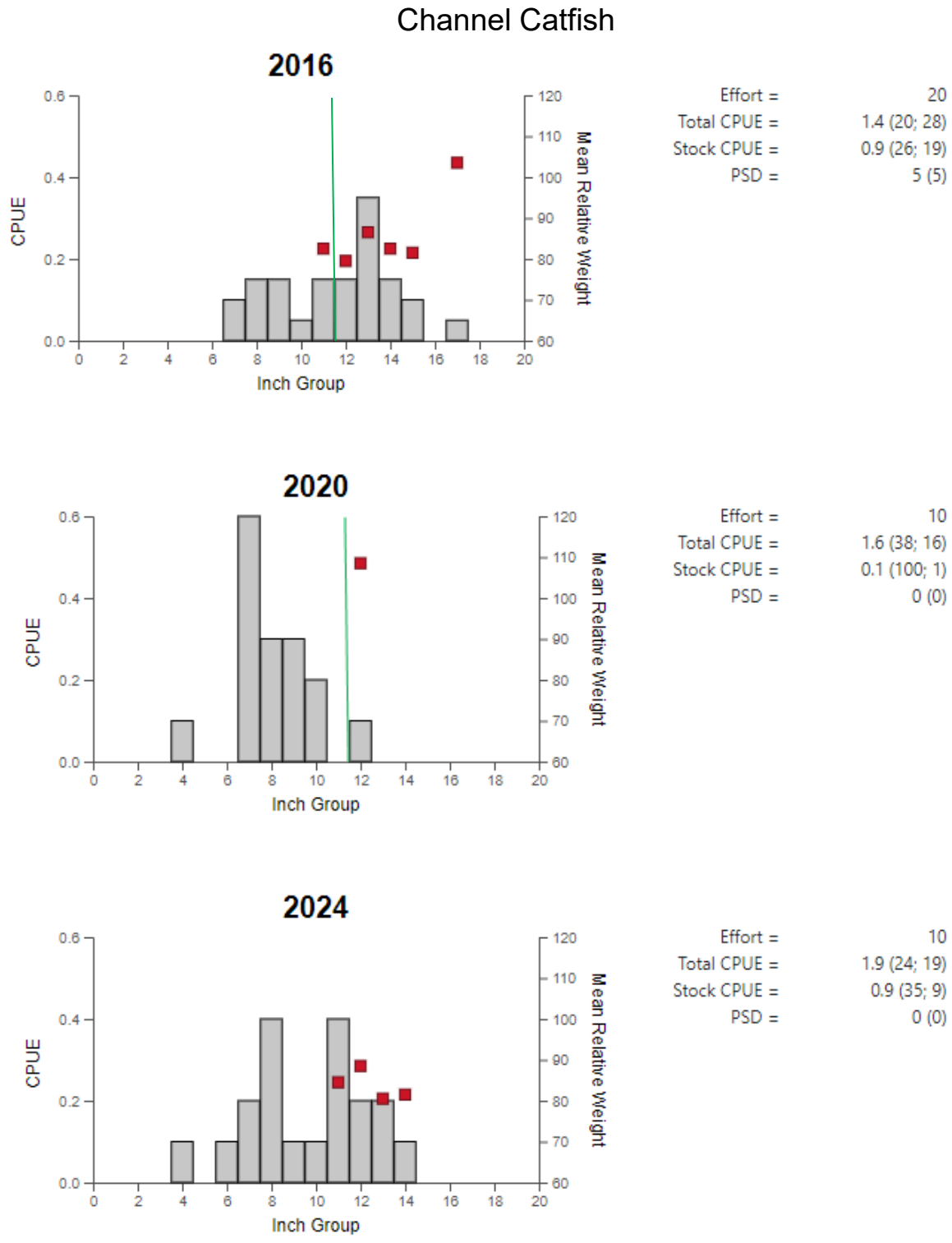



Figure 4. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Ray Roberts Reservoir, Texas, 2016, 2020, and 2024. Vertical line indicates minimum length limit at time of survey.

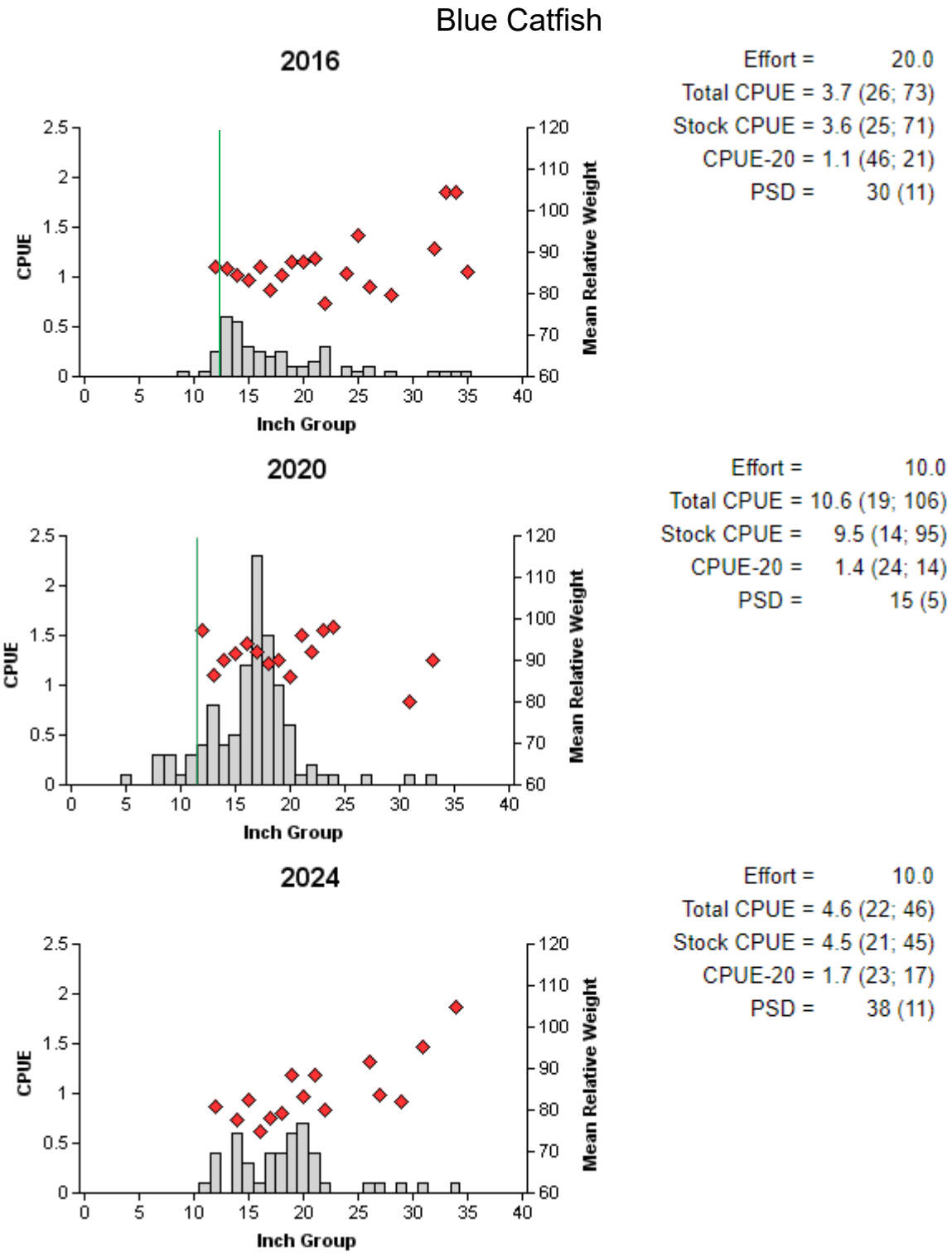



Figure 5. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Ray Roberts Reservoir, Texas, 2016, 2020, and 2024. Vertical line indicates minimum length limit at time of survey.

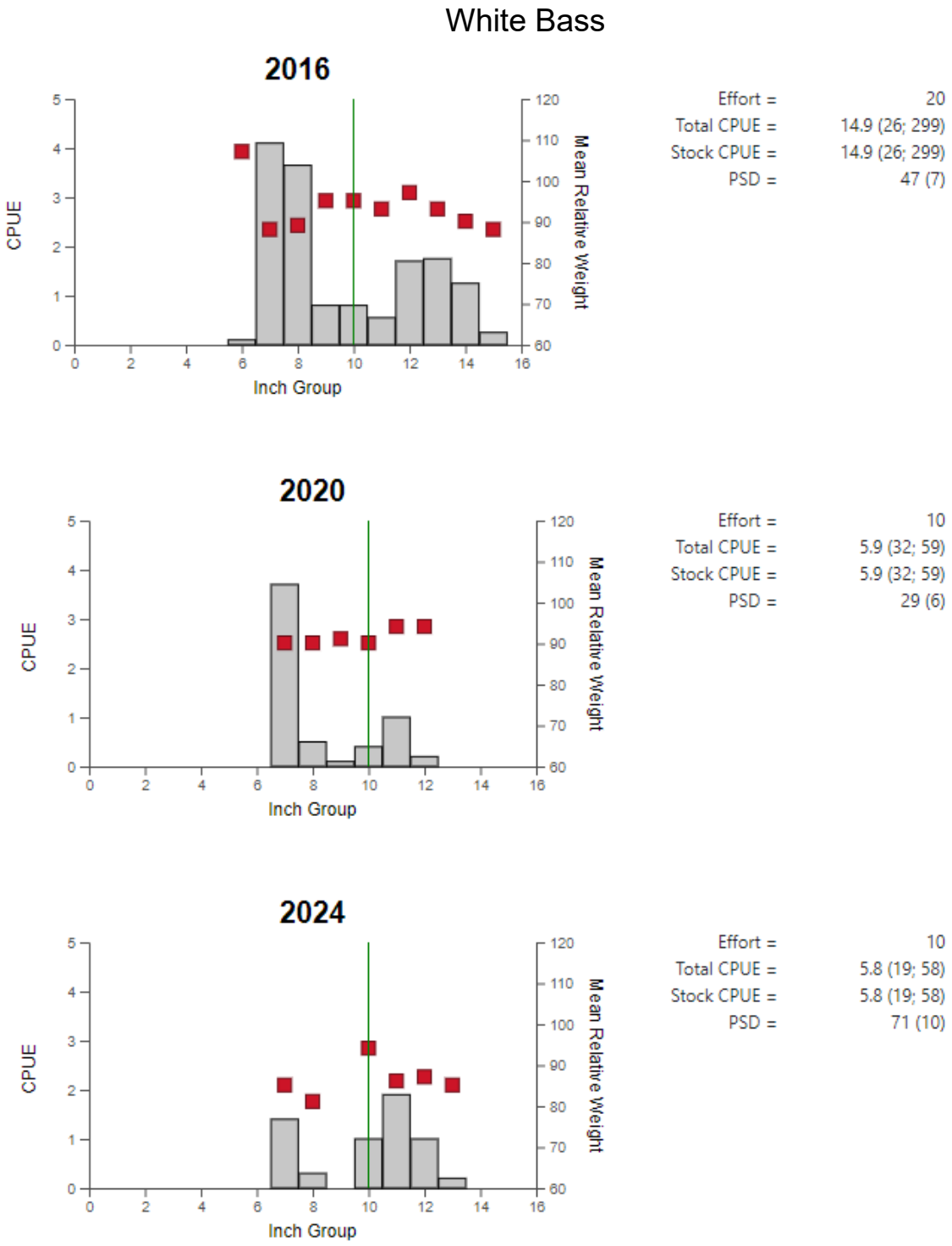



Figure 6. Number of White Bass caught per net night (CPUE, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Ray Roberts Reservoir, Texas, 2016, 2020, and 2024. Vertical line indicates minimum length limit.

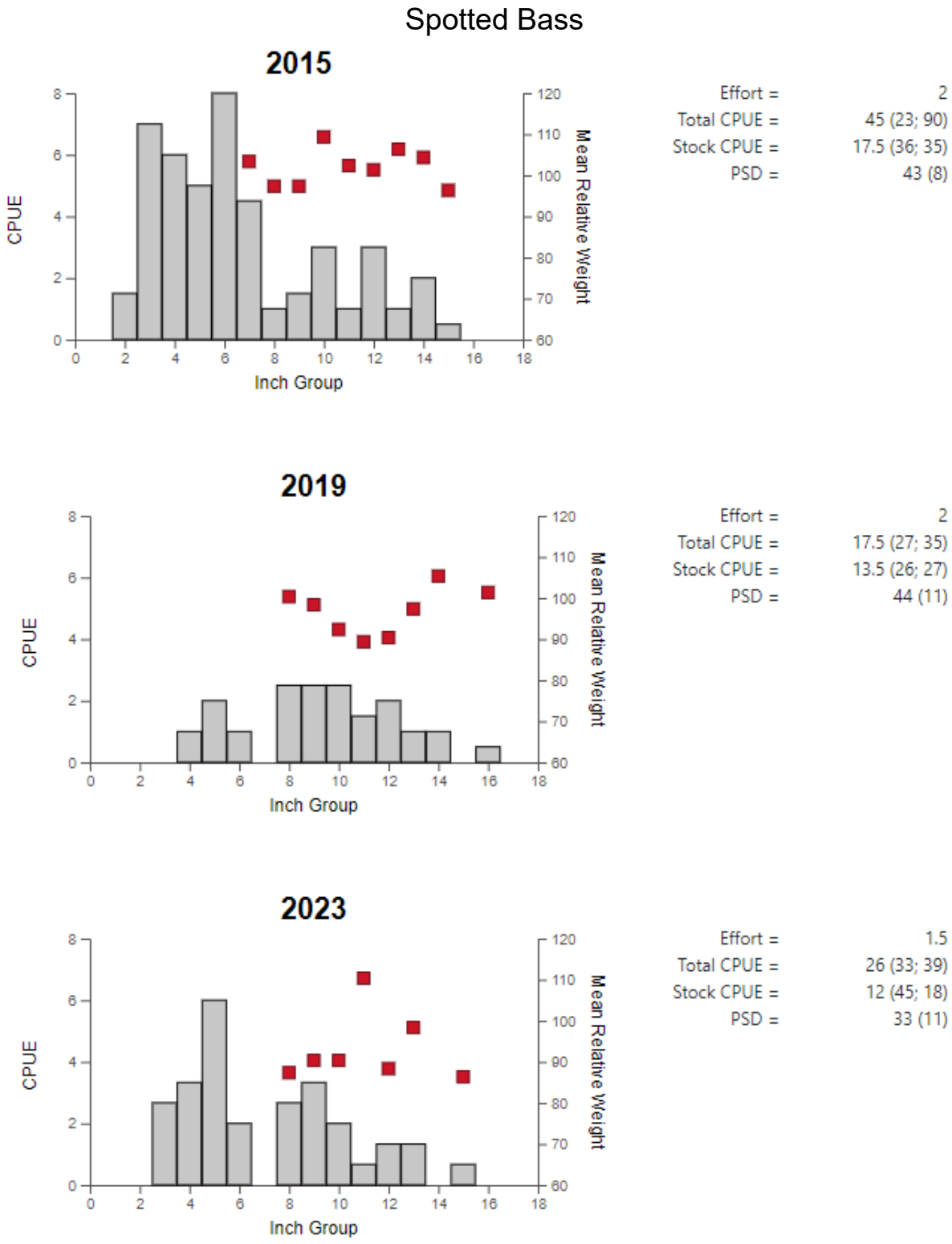



Figure 7. Number of Spotted Bass caught per hour (CPUE, bars), mean relative weight (squares), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Ray Roberts Reservoir, Texas, 2015, 2019, and 2023.

# Largemouth Bass

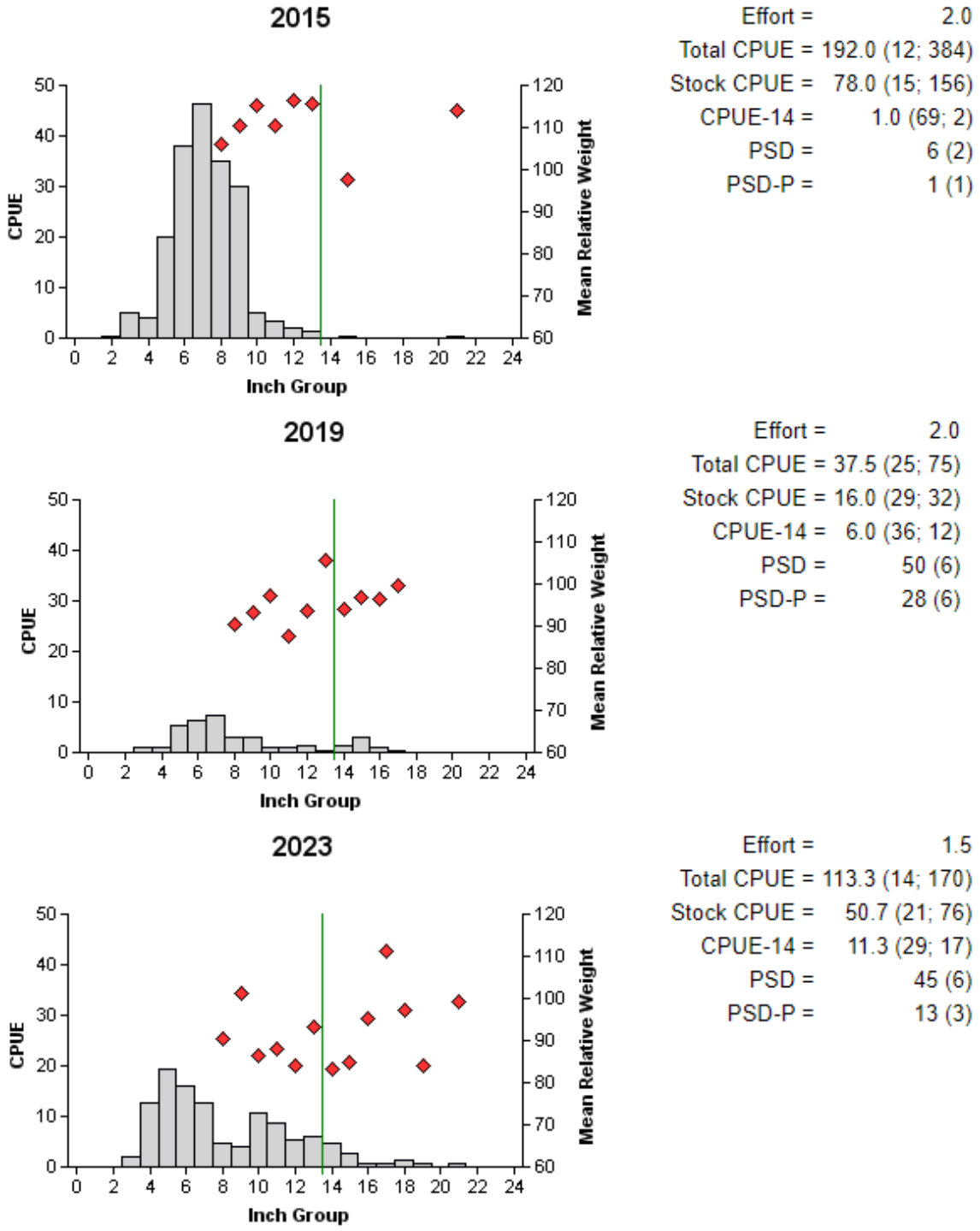



Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Ray Roberts Reservoir, Texas, 2015, 2019, and 2023. Vertical line indicates minimum length limit.

# Largemouth Bass

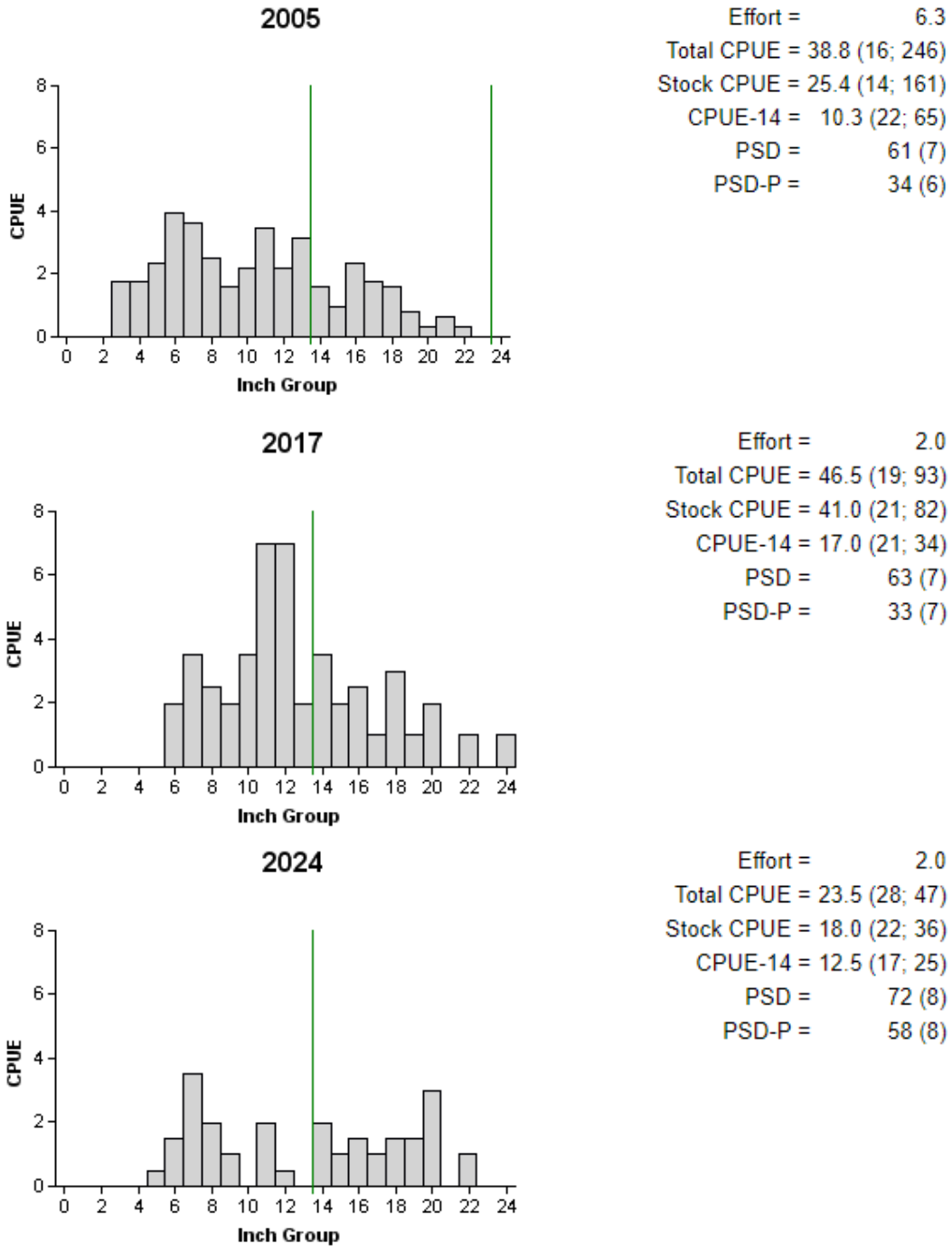
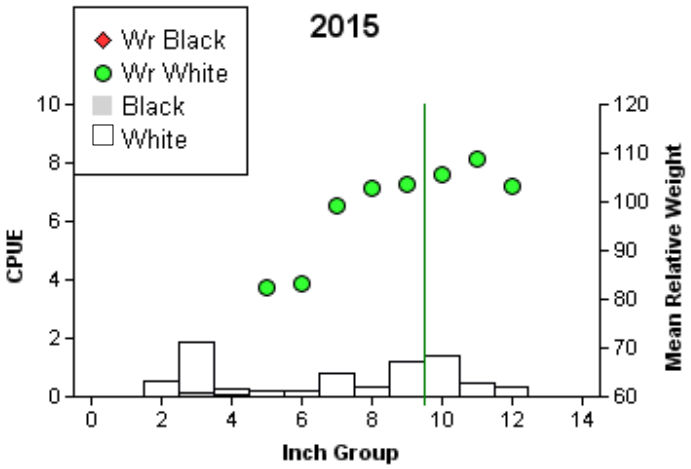
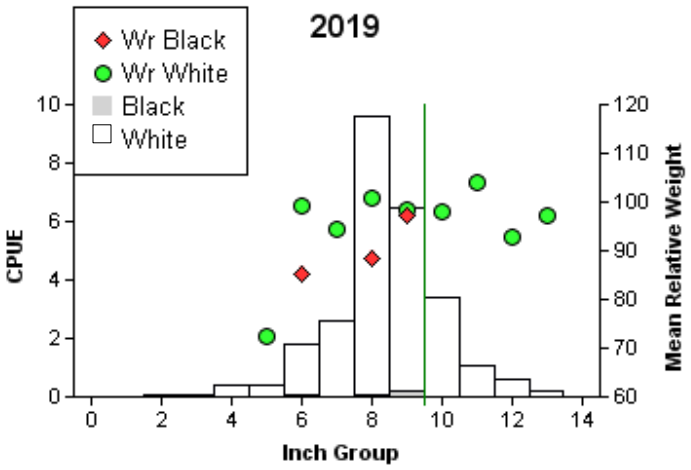



Figure 9. Number of Largemouth Bass caught per hour (CPUE, bars), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring electrofishing surveys, Ray Roberts Reservoir, Texas, 2005, 2017, and 2024. Vertical lines indicate slot length limit in 2005 and minimum length limit in 2017 and 2024.

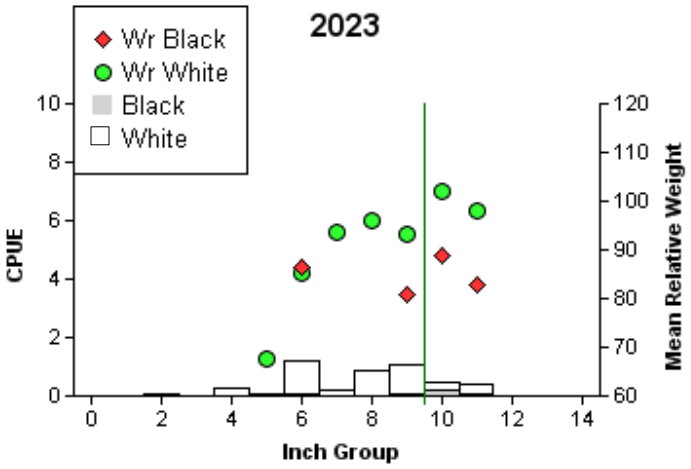
# Crappie




| | |
|---|---|
| Effort = | 15.0 |
| Total CPUE = | 7.6 (28; 114) |
| Stock CPUE = | 4.9 (25; 74) |
| CPUE-10 = | 2.2 (26; 33) |
| PSD = | 76 (5) |




| | |
|---|---|
| Effort = | 10.0 |
| Total CPUE = | 26.8 (51; 268) |
| Stock CPUE = | 26.2 (51; 262) |
| CPUE-10 = | 5.3 (44; 53) |
| PSD = | 82 (2) |




| | |
|---|---|
| Effort = | 10.0 |
| Total CPUE = | 4.8 (40; 48) |
| Stock CPUE = | 4.4 (40; 44) |
| CPUE-10 = | 0.9 (48; 9) |
| PSD = | 66 (7) |

Figure 10. Number of Crappie caught per net night (CPUE, bars), mean relative weight (diamonds and circles), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Ray Roberts Reservoir, Texas, 2015, 2019, and 2023. Vertical line indicates minimum length limit.

# Proposed Sampling Schedule

Table 8. Proposed sampling schedule for Ray Roberts Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall.

| | Survey year | | | |
|---|---|---|---|---|
| | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 |
| Angler Access | | | | X |
| Vegetation | | | | X |
| Fall Electrofishing | | | | X |
| Trap netting | | | | X |
| Gill netting | | | | X |
| Report | | | | X |

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

Number (N) and catch rate (CPUE) (RSE in parentheses) of all target species collected from all gear types from Ray Roberts Reservoir, Texas, 2023-2024. Sampling effort was 10 net nights for gill netting, 10 net nights for trap netting, two hours for fall electrofishing, and 2 hours for spring electrofishing.

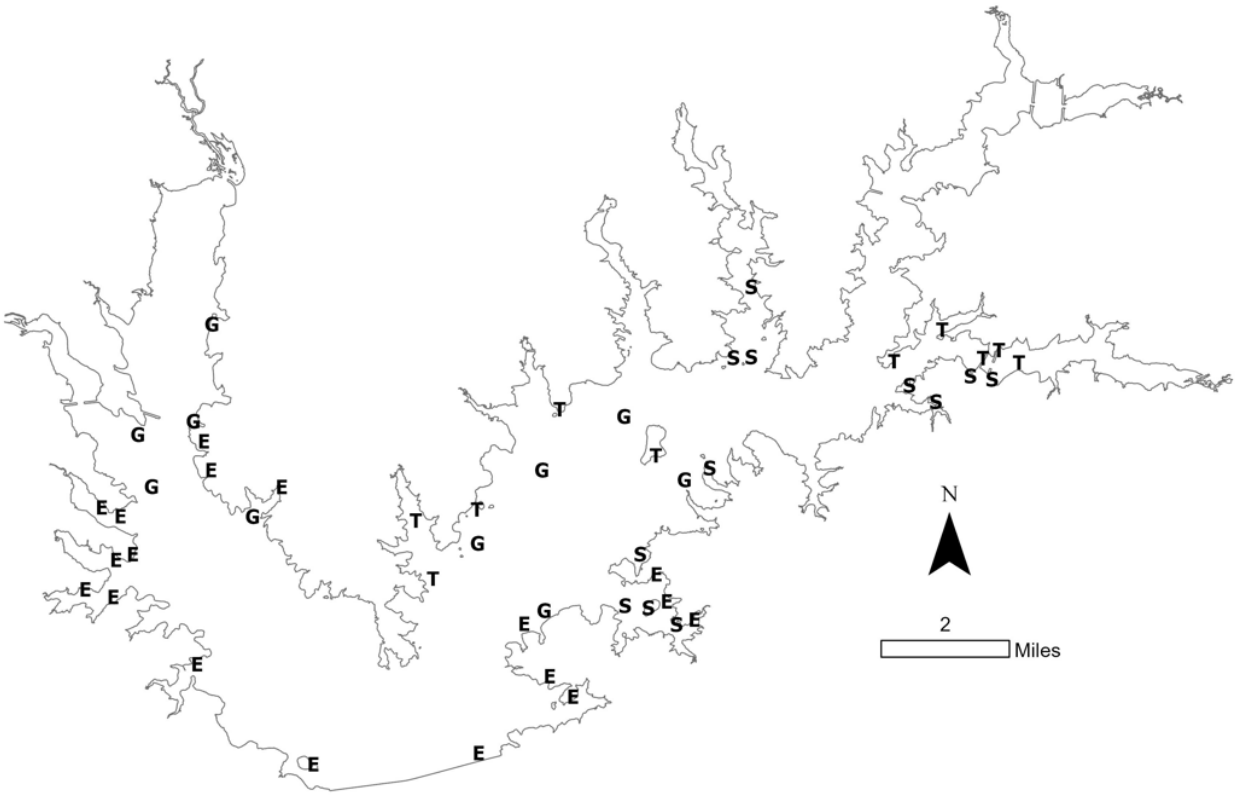
| Species | Gill Netting | | Trap Netting | | Fall Electrofishing | | Spring Electrofishing | |
|---|---|---|---|---|---|---|---|---|
| | N | CPUE | N | CPUE | N | CPUE | N | CPUE |
| Gizzard Shad | | | | | 165 | 110.0 (34) | | |
| Threadfin Shad | | | | | 110 | 73.3 (43) | | |
| Blue Catfish | 46 | 4.6 (22) | | | | | | |
| Channel Catfish | 19 | 1.9 (24) | | | | | | |
| White Bass | 58 | 5.8 (19) | | | | | | |
| Green Sunfish | | | | | 6 | 4.0 (73) | | |
| Warmouth | | | | | 2 | 1.3 (69) | | |
| Bluegill | | | | | 230 | 153.3 (29) | | |
| Longear Sunfish | | | | | 178 | 118.7 (30) | | |
| Redear Sunfish | | | | | 15 | 10.0 (48) | | |
| Largemouth Bass | | | | | 170 | 113.3 (14) | 47 | 23.5 (28) |
| Spotted Bass | | | | | 39 | 26.0 (33) | 6 | 3.0 (39) |
| White Crappie | | | 43 | 4.3 (45) | | | | |
| Black Crappie | | | 5 | 0.5 (33) | | | | |

# APPENDIX B – Historical Catch Rates

Catch rates (CPUE) of targeted species by gear type for Ray Roberts Reservoir, Texas, 1998 through 2024.

| | | Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Gear | Species | 1998 | 2003-2005 | 2007-2008 | 2011-2012 | 2015-2016 | 2019-2020 | 2023-2024 | **Avg** |
| Gill Net | Blue Catfish | 0.3 | 1.7 | 2.8 | 3.7 | 3.7 | 10.6 | 4.6 | **3.9** |
| (fish/net night) | Channel Catfish | 4.5 | 8.2 | 5.5 | 2.3 | 1.4 | 1.6 | 1.9 | **3.6** |
| | Flathead Catfish | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | **0.1** |
| | White Bass | 3.3 | 4.5 | 5.1 | 10.4 | 15.0 | 5.9 | 5.8 | **7.1** |
| Electrofishing | Gizzard Shad | 156.5 | 127.0 | 145.0 | 180.0 | 273.0 | 68.5 | 110.0 | **151.4** |
| (fish/hour) | Threadfin Shad | 61.0 | 189.5 | 339.0 | 65.0 | 1123.0 | 140 | 73.3 | **284.4** |
| | Green Sunfish | 2.5 | 2.5 | 48.0 | 146.5 | 76.0 | 19 | 4.0 | **42.6** |
| | Warmouth | 12.0 | 5.5 | 33.0 | 7.0 | 13.5 | 2.5 | 1.3 | **10.7** |
| | Orangespotted Sunfish | 0.0 | 1.0 | 3.0 | 0.0 | 3.5 | 0.5 | 0.0 | **1.1** |
| | Bluegill | 160.5 | 123.0 | 208.0 | 119.5 | 170.5 | 187.0 | 153.3 | **160.3** |
| | Longear Sunfish | 42.0 | 77.5 | 254.5 | 187.5 | 194.5 | 88.0 | 118.7 | **137.5** |
| | Redear Sunfish | 6.0 | 3.5 | 18.0 | 1.0 | 9.0 | 4.0 | 10.0 | **7.4** |
| | Smallmouth Bass | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | **0.1** |
| | Spotted Bass | 0.0 | 15.0 | 20.0 | 53.5 | 45.0 | 17.5 | 26.0 | **25.3** |
| | Largemouth Bass | 77.5 | 85.0 | 227.0 | 108.5 | 192.0 | 37.5 | 113.3 | **120.1** |
| Trap Net | White Crappie | 2.7 | 8.6 | 7.9 | 30.7 | 7.4 | 26.4 | 4.3 | **12.6** |
| (fish/net night) | Black Crappie | 0.1 | 0.3 | 0.3 | 1.1 | 0.2 | 0.4 | 0.5 | **0.4** |

# APPENDIX C – Map of sampling locations




Location of sampling sites, Ray Roberts Reservoir, Texas, 2023-2024. Trap net, gill net, fall electrofishing, and spring electrofishing stations are indicated by T, G, E, and S respectively. Water level was near conservation elevation at time of sampling.

# APPENDIX E – Tournament Results (Black Bass)

Results from individual and team format black bass tournaments at Ray Roberts Reservoir 2022 - 2023. Only tournaments with 5-fish bag limits and ≥ 50 participants or teams were included.

| Year | 1st place weight | 2nd place weight | 3rd place weight | Big Bass weight |
|---|---|---|---|---|
| | | Team | | |
| 2022 | 30.4 | 29.1 | 28.1 | 9.34 |
| 2022 | 29.3 | 23.8 | 23.3 | 8.07 |
| 2023 | 30.8 | 23.9 | 21.2 | 9.48 |
| 2023 | 27.1 | 23.7 | 23.1 | 8.88 |
| 2023 | 23.9 | 20.7 | 20.6 | 9.29 |
| 2024 | 23.9 | 20.2 | 20.2 | 8.60 |
| | | Individual | | |
| 2023 | 19.9 | 18.3 | 16.7 | 6.60 |
| 2023 | 17.4 | 15.1 | 14.2 | 7.12 |
| 2024 | 26.9 | 22.8 | 22.2 | 8.39 |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