

# Palo Pinto Reservoir

## 2019 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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## Contents

Contents .....	i
Survey and Management Summary .....	1
Introduction.....	2
Reservoir Description .....	2
Angler Access.....	2
Management History .....	2
Methods.....	4
Results and Discussion.....	4
Fisheries Management Plan for Palo Pinto Reservoir, Texas .....	7
Objective-Based Sampling Plan and Schedule (2020–2024).....	8
Literature Cited.....	10
Tables and Figures .....	11
Water Level .....	11
Reservoir Characteristics .....	11
Boat Ramp Characteristics.....	12
Harvest Regulations .....	12
Stocking History.....	12
Objective-Based Sampling Plan 2019-2020.....	14
Structural Habitat Survey.....	15
Aquatic Vegetation Survey .....	15
Gizzard Shad .....	16
Bluegill .....	17
White Bass.....	20
Largemouth Bass .....	22
White Crappie.....	23
Proposed Sampling Schedule .....	24
APPENDIX A – Catch rates for all species from all gear types .....	25
APPENDIX B – Map of sampling locations.....	26
APPENDIX C – Historical catch rates of targeted species by gear type for Palo Pinto Reservoir, Texas ..	27
APPENDIX D – Proposed Turkey Peak Reservoir .....	29
APPENDIX E – Proposed Weighted Sampling Area in Blue .....	30

## Survey and Management Summary

Fish populations in Palo Pinto Reservoir were surveyed in 2019 using electrofishing, low-frequency electrofishing, trap netting, and in 2020 using gill netting. Historical data are presented with the 2019-2020 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:** Palo Pinto Reservoir is a 2,399-acre impoundment located in Palo Pinto County on Palo Pinto Creek in the Brazos River Basin approximately 80 miles southwest of Fort Worth. It was constructed in 1964 to provide municipal water for Mineral Wells, Texas and cooling water for the Brazos Electric power plant. It has a primarily rocky shoreline with boat docks. Rocky shoreline and standing timber were the dominant habitat features. Boat access was adequate at two of the three boat ramp sites of which only one is considered public. Periodic turbidity, fluctuating water levels, and rocky substrate inhibit the growth of most aquatic vegetation. Early in 2015, the reservoir nearly went dry because of a severe drought but quickly refilled after heavy precipitation. The drought had a negative impact on the fish populations.

**Management History:** Important sport fishes include White Bass, Palmetto Bass, Largemouth Bass, White Crappie, and catfishes. The management plan from the 2016 survey report included stocking Palmetto Bass at 15 fish/acre every year and were stocked in 2015, 2016, and 2017. Sunshine Bass fry were stocked in 2020 since Palmetto Bass fingerlings were not available. Florida Largemouth Bass were stocked in 2015 and 2016 in response to the reservoir filling up after a prolonged drought period.

### Fish Community

- **Prey species:** Threadfin Shad were present in the reservoir, though not in high abundance. Electrofishing catch rate of Gizzard Shad was the highest documented, and most Gizzard Shad were of a length making them available as prey to most sport fishes. Electrofishing catch rate of Bluegill was average, but very few Bluegill over 6-inches long were collected.
- **Catfishes:** The Blue Catfish population has recovered nicely since the reservoir refilled in 2015. Low-frequency electrofishing found an abundance of smaller fish that should recruit to the fishery in the coming years. There were also legal-sized fish available to anglers and what would qualify as a new waterbody record was sampled during the gill net surveys. No Channel Catfish were sampled but have in the past been present in low abundance. Flathead Catfish were present in the reservoir.
- **Temperate basses:** White Bass and Palmetto Bass were present in the reservoir. Catch rates of both species were among the highest we have seen during gill net surveys.
- **Largemouth Bass:** Largemouth Bass abundance has remained consistent since the reservoir refilled in 2015. The abundance of legal-length bass has increased steadily since the reservoir has recovered from the drought and is anticipated to continue to improve.
- **White Crappie:** White Crappie catch rate was the highest we have recorded with an abundance of legal-length fish available to anglers. Body condition was excellent.

**Management Strategies:** Continue annual stocking requests of Palmetto Bass at 15 fish/acre. Conduct additional gill net survey examining hybrid Striped Bass in 2022. Inform the public about the negative impacts of aquatic invasive species. Conduct general monitoring surveys including access and vegetation surveys as well as examine fish populations with trap nets, gill nets, and electrofishing surveys in 2023-2024. Monitor progress of the plans and construction of Turkey Peak Reservoir which will connect with Palo Pinto Reservoir.

## Introduction

This document is a summary of fisheries data collected from Palo Pinto Reservoir in 2019-2020. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2019-2020 data for comparison.

## Reservoir Description

Palo Pinto Reservoir is a 2,399-acre impoundment constructed in 1964 on Palo Pinto Creek in the Brazos River watershed. It is located in Palo Pinto County approximately 80 miles southwest of Fort Worth. Primary uses are municipal water supply for Mineral Wells, Texas and cooling water for the Brazos Electric power plant. Mean depth is 17 feet and conductivity was 490  $\mu\text{S}/\text{cm}$  in July 2019. Primary aquatic habitat in 2015 included natural and rocky shoreline, standing timber, and boat docks. Periodic turbidity, fluctuating water levels (Figure 1) and rocky substrate has historically inhibited the abundance of aquatic vegetation. Other descriptive characteristics are in Table 1. The reservoir nearly went dry in 2015 until heavy spring precipitation filled it to capacity.

## Angler Access

Palo Pinto Reservoir has one public boat ramp and two private boat ramps available to the public. A low water ramp, Love Ramp is in poor condition and would be hard to use, being unpaved and rutted. Additional boat ramp characteristics are in Table 2. Shoreline access is limited to the public boat ramp area and the causeway area by the power plant.

## Management History

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Mauk and Lang 2016) included:

1. The Palmetto Bass population was decimated by the drought which nearly dried up the entire waterbody. The reservoir refilled in 2015, but no Palmetto Bass were documented in the 2016 gill net survey.
 

**Action:** Requested annual stockings of Palmetto Bass and received stockings in 2015, 2016, and 2017. In 2020, fingerling Palmetto Bass were not available but Sunshine Bass fry were stocked instead. Completed gill net survey to monitor population in 2020.
2. Blue Catfish were highly sought during the 2012-2013 creel survey and the drought was detrimental to the Blue Catfish population.
 

**Action:** A low-frequency electrofishing survey was completed in 2019. A stocking request would be made if supplemental Blue Catfish were available, but they were not and no other stocking request was made.
3. The potential spread of zebra mussels and other invasive species exists. Informing the public and reservoir authorities of what to do to prevent the spread and what to do if they suddenly appear in the reservoir are prudent.
 

**Action:** Signage was posted at the boat ramps to make boaters aware of invasive species. Invasive species are a talking point while communicating with the public and discussed/published in various media outlets.

**Harvest regulation history:** Sport fishes in Palo Pinto Reservoir have always been managed using statewide regulations (Table 3).

**Stocking history:** Palmetto Bass are requested annually but were last stocked in 2017. Palmetto Bass fingerlings were not available in 2020 so Sunshine Bass fry were stocked instead. Florida Largemouth Bass were last stocked in 2016. The complete stocking history is in Table 4.

**Vegetation/habitat management history:** Palo Pinto Reservoir has no significant vegetation (Table 7) or habitat management history. Noxious vegetation has not been a problem at the reservoir.

**Water transfer:** There are no intra or inter basin transfers from Palo Pinto Reservoir. The city of Mineral Wells uses water released through the dam as a municipal water source via pumping from the creek about 15 miles downstream of the reservoir.

## Methods

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Palo Pinto Reservoir (Mauk and Lang 2016). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

**Electrofishing** – Largemouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (1 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

**Trap netting** – Crappie were collected using trap nets (5 net nights at 5 stations). Catch per unit effort for trap netting was recorded as the number of fish caught per net night (fish/nn).

**Gill netting** – Blue Catfish, Channel Catfish, White Bass, and Palmetto Bass were collected by gill netting (5 net nights at 5 stations). Catch per unit effort for gill netting was recorded as the number of fish caught per net night (fish/nn).

**Low-frequency electrofishing** – Blue Catfish were collected by low-frequency electrofishing at 10 stations. The minimum duration of electrofishing at each station was 3 minutes. Catch per unit effort for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

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

**Habitat** – A structural habitat survey was conducted in 2015. Vegetation surveys were conducted every four years from 2003 through 2019. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2017).

**Water level** – Source for water level data was the United States Geological Survey (USGS 2020).

## Results and Discussion

**Habitat:** A structural habitat survey was last conducted July 22, 2015 and was not replicated in 2019 since there were no major changes apparent at the reservoir. The 2015 survey indicated the littoral zone habitat consisted primarily of rocky and natural shoreline with 9.3% of the reservoir having had standing timber (Table 6). Just over an acre of emergent vegetation was observed during the aquatic vegetation survey in 2019 (Table 7).

**Prey species:** Objective based sampling goals were met for Gizzard Shad but not for Bluegill, and no extra sampling occurred for Bluegill since the sampling goal for Largemouth bass was attained. Electrofishing catch rates of Gizzard Shad and Bluegill were 307.0/h and 116.0/h, respectively. Index of Vulnerability (IOV) for Gizzard Shad was excellent, indicating that 97% of Gizzard Shad were available to existing predators; this was higher than IOV estimates in the previous survey and similar to the 2015 survey (Figure 2). Total CPUE of Gizzard Shad was higher in 2019 compared to the 2017 survey but similar to the 2015 survey (Figure 2). Total CPUE of Bluegill in 2019 was slightly lower than total CPUE for the 2017 survey but higher than the 2015 survey, and size structure continued to be dominated by small individuals (Figure 3). Threadfin Shad are abundant but were small and could not be enumerated since they went through the mesh of the nets.

**Channel Catfish:** No Channel Catfish were sampled in the 2016 and 2020 gill net surveys. Only one Channel Catfish was sampled in 2012 before the drought impacted the reservoir. Prior to 2012, periodic stockings maintained the population which was never very abundant. Palo Pinto Reservoir is a power plant reservoir and there was some evidence that the water temperatures were too high for Channel Catfish to thrive in. In the early 2000's, the decision was made to stop stocking Channel Catfish and to stock Blue Catfish instead to see if they would perform better in the reservoir. Since the results indicate they do indeed perform better, the maintenance stockings of Channel Catfish have ceased.

**Blue Catfish:** Blue Catfish were first introduced into the reservoir in 2007 with another stocking occurring a year later. Blue Catfish were first sampled in 2010 and have been present in all gill net surveys completed since. A 2012-2013 creel survey found them to be a popular addition to the reservoir, even though they had not really established themselves (Mauk and Lang 2016). The recent gill net survey resulted in the highest catch rate yet for the species (3.0/nn), up from the 2016 survey result of 0.8/nn after the reservoir had refilled from the drought (Figure 4). The 2020 survey found catfish from 9 to 37-inches in length with adequate body condition (range 83-106) as measured by relative weight. In addition to a gill net survey, the objective based sampling called for a low-frequency electrofishing survey with the goal of CPUE-Stock with RSE  $\leq 25$ . This goal was not met and would have required much more sampling to attain. Extra sampling was not called for since Blue Catfish data could be collected in a planned gill net survey targeting Palmetto Bass. The Blue Catfish low-frequency electrofishing survey resulted in a catch rate of 200/hr (Figure 5). It revealed an abundance of small catfish (2 to 4-inches) that are not recruited to the gill net gear that is standard for our survey work. The 2019 low-frequency electrofishing survey found catfish from 2 to 21-inches in length with adequate body condition (range 81-95) as measured by relative weight. The gill nets found some larger Blue Catfish as opposed to the low-frequency electrofishing and more stock length catfish. Data on legal length fish is important in managing this fishery and it seems we can get this information easier with gill nets than low-frequency electrofishing. The CPUE-Stock RSE was rather high for low-frequency electrofishing (47) compared to the 2020 gill net survey (31) which indicates that abundance estimates were better with gill netting, though not where it needs to be. It is recommended to continue to monitor the Blue Catfish population with gill nets unless a specific question arises about natural recruitment but increase the effort to seven net nights. In 2012, ten net nights was used, and we had an CPUE-Stock RSE of 60 so increasing the effort does not mean we will attain a stated objective of CPUE RSE-Stock of  $\leq 25$ .

**White Bass:** The gill net catch rate of White Bass was 7.2/nn in 2020, a great increase from 2016 when no White Bass were sampled and 2012 when the catch rate was 0.2/nn (Figure 6). The 2020 catch rate was by far the highest documented. Body condition as measured by  $W_r$  was excellent exceeding 100 for all inch groups.

**Palmetto Bass:** The objective based sampling goal for Palmetto Bass of CPUE-Stock  $\leq 25$  was not met and no extra sampling occurred to attain it, since historically the population abundance has been quite low. The gill net catch rate of Palmetto Bass was 0.6/nn in 2020, an increase over the two previous surveys (Figure 7). The historic low abundance can be traced to Palmetto Bass first being introduced in 2002 and being stocked at a reduced rate (5/acre) every two years. The drought negatively impacted the population abundance to where there were no Palmetto Bass found in 2016. Before the drought, Palmetto Bass proved to be popular among anglers according to the 2012-2013 creel survey (2.6% anglers targeted them) and seemed to have no impact on prey species, so a decision was made to request them annually at a rate of 15/acre. Palmetto Bass were stocked in 2016 and 2017 at this rate but no recent fingerling stockings have occurred. Still, the current catch rate is the highest we have documented. In 2020, Palmetto Bass fingerlings were unavailable, so Sunshine Bass fry were stocked instead. The stocking of Sunshine Bass fry gives the opportunity to monitor their progress over time in the reservoir. One researcher reported a difference between the two hybrids was that Palmetto Bass demonstrated a greater tendency than Sunshine Bass to emigrate from lake to river (Mesing et al. 1997). Palo Pinto Reservoir has often been documented going over the spillway in recent years and anecdotal reports of Palmetto Bass going over the spillway has been reported. This might account for the low catch rate in gill nets. Perhaps Sunshine Bass are better suited for Palo Pinto with reservoir elevations topping

the spillway occasionally. If they do well, future management strategies could include requesting fry instead of fingerling and requesting Sunshine Bass as opposed to Palmetto Bass.

**Largemouth Bass:** The objective based sampling goal was met for Largemouth Bass. The electrofishing catch rate of Largemouth Bass was 50.0/h in 2019, similar to the previous two surveys completed in 2015 and 2017 (48.0/nn and 49.0/nn, respectively). Size structure was considered adequate as PSD was 66 (Figure 8). Body condition in 2019 varied greatly (relative weight ranged from 82-119) with no discernable trends among inch groups (Figure 8).

**White Crappie:** The objective based sampling goal was just missed with CPUE-Stock being 26 and the goal being  $\leq 25$ . Historically five trap nets achieve this goal. No extra sampling was done since that would have meant another trip to the reservoir. The trap net catch rate of White Crappie was 30.8/nn in 2019, higher than in 2015 (6.6/nn) and higher than 2011 catch rate (21.4/nn). The PSD was 50 and was similar to the PSD in 2015 and higher than the PSD in 2011 indicating a balanced population between stock and quality size crappie but it doesn't mean there is an abundance of legal-length crappie (Figure 9). Mean relative weight was over 100 for all length classes up to 13-inches (Figure 9).

**Proposed Turkey Peak Reservoir:** Plans have been drawn up and permits acquired for construction of Turkey Peak Reservoir (Appendix D). This new reservoir will connect to Palo Pinto reservoir at the spillway which will be lowered four feet to form the connection. Purchasing the properties is currently underway with construction anticipated to begin 2023. Turkey Peak Reservoir will be 648 surface acres with an average depth of 35 feet and a capacity of 22,577 acre/feet. Currently Palo Pinto is 2,399 surface acres with an average depth of 12.5 feet and a capacity of 27,215acre/feet. The plans call for construction of a public boat ramp and for no removal of standing trees. Current plans call for a under water pipe to connect the two sections and control water flow from Palo Pinto Reservoir into Turkey Peak Reservoir. The city of Mineral Wells will draw municipal water from Turkey Peak Reservoir while keeping Palo Pinto as near to full pool as possible by closing the pipe between the two reservoirs. This is being done to ensure that the Brazos Electric's R. W. Miller Power Plant situated on Palo Pinto Reservoir will have plenty of water available for cooling and that property owners will have adequate water for recreation. The result of these operation plans will be that often the two waterbodies will be at different elevations and watercraft movement between the two will be limited. It is anticipated that both reservoirs will be near full pool around 20% of the time, usually in the spring.



# Fisheries Management Plan for Palo Pinto Reservoir, Texas

Prepared – July 2020

**ISSUE 1:** Palmetto Bass have been a part of the fishery at Palo Pinto Reservoir since 2002. Annual stocking of Palmetto Bass is required to sustain the population and maintain a fishery. In 2020, Palmetto Bass fingerlings were unavailable and Sunshine Bass fry were stocked instead.

## MANAGEMENT STRATEGIES

1. Request an annual stocking of Palmetto Bass annually at 15 fish/acre.
2. Monitor the Sunshine Bass stocking by completing an additional gill net survey in 2022 with an additional two gill nets using weighted sampling in order to increase sampling numbers.
3. Perform age and growth on all Palmetto and Sunshine Bass caught and run genetic analysis in order to identify hybrid cross type.

**ISSUE 2:** Survey work on the portion of the reservoir from the R. W. Miller power plant to Palo Pinto Creek that feeds the reservoir usually yields few targeted species during survey work. The fish assemblage is made up of mostly less desirable species that are not targeted in our surveys. Besides a few anglers targeting catfish, this portion of the reservoir has little value to anglers and to surveyed fish populations. The section also includes unsamplable waters that lack adequate sampling depth.

## MANAGEMENT STRATEGY

1. When choosing random sampling sites for this reservoir, weigh the selections more from the boat ramp to power plant and dam area as opposed to the rest of the reservoir (Appendix E). This will be done for electrofishing, gill and trap net surveys.

**ISSUE 3:** It is anticipated that construction of the Turkey Peak Reservoir that will be connected to Palo Pinto Reservoir at the spillway will begin sometime in 2023 if plans progress as expected. This will increase the acreage of water the reservoir and will create new habitat in the reservoir.

## MANAGEMENT STRATEGIES

1. Continue to stay informed on the project. Current plans are for no removal of standing timber and construction of a boat ramp on new portion of reservoir.
2. Stocking and sampling plans will be adjusted whenever the new reservoir is filled.
3. Turkey Peak and Palo Pinto Reservoirs will only be connected for watercraft passage between the two reservoirs when both reservoirs are near full. This will need to be monitored since it might involve trailering a boat from one section to another.

**ISSUE 4:** 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 STRATEGIES

1. Cooperate with the city of Mineral Wells to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc... so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

## Objective-Based Sampling Plan and Schedule (2020–2024)

### Sport fish, forage fish, and other important fishes

Sport fishes in Palo Pinto Reservoir have historically included Blue Catfish, Palmetto Bass, Largemouth Bass, and White Crappie. The primary forage species have been Bluegill and Gizzard Shad.

### Negligible fisheries

The most recent creel survey completed in 2012/2013 found low percentages of anglers targeting Channel Catfish and no anglers targeting White Bass. In addition, Channel Catfish have historically been present but in low abundance in gill net surveys. Flathead Catfish are also present in the reservoir.

### Survey objectives, fisheries metrics, and sampling objectives

**Largemouth Bass:** Abundance was considered average in the 2019 electrofishing survey. The objective of the 2023 electrofishing survey will be general monitoring of this fishery, sampling 12 random sites to collect CPUE-S with a RSE  $\leq 25$  with no additional sampling if RSE is not achieved. This amount of sampling was sufficient in 2019 to achieve sampling objective. In 2015 and 2017, we would not have achieved the goal; however, those surveys were influenced by the previous drought. Another objective is to collect 50 stock-length bass for meaningful size structure analysis and all stock-length crappie will be weighed for relative weight estimates. Historically, an hour of electrofishing does not come close to achieving this goal. No extra sampling is planned if not attained. Weighted random sampling will occur, from the boat ramp to the power plant and dam area (Appendix E). This should increase sampling numbers of stock-length bass and reduce CPUE-Stock RSE.

**Bluegill and Gizzard Shad:** These species will be collected while electrofishing for Largemouth Bass and the objective is general monitoring. Survey objectives are general monitoring of abundance with a goal of a meaningful CPUE estimate with CPUE-S RSE  $\leq 25$ . Collection of 50 fish for size structure estimate and Gizzard Shad IOV will also be completed. If objectives are not met, no additional electrofishing will occur except that expended for Largemouth Bass.

**White Crappie:** White Crappie will be surveyed using 5 random trap net sites in 2023. General monitoring will suffice with a sampling objective of a meaningful abundance estimate with CPUE-S RSE  $\leq 25$ . This effort in the past has been adequate to attain the stated RSE objective. Fifty stock-length crappie will be sampled for size structure and all stock-length crappie will be weighed for relative weight estimates. Weighted random sampling will occur, concentrating the sampling from the boat ramp to the power plant and to dam area.

**Blue Catfish:** Since low-frequency electrofishing did not seem to capture larger Blue Catfish we will only use it if we have questions regarding recruitment to the fishery. Otherwise, we plan to monitor this population through standardized gill net surveys using weighted random stations. Survey objective will be general monitoring with no stock CPUE RSE goals set since historically we do not come close to an RSE  $\leq 25$ . An increase in effort to 7 net nights from 5 net nights will occur to increase sample size. No size structure or body condition objectives will be set since historically we have not approached the needed 50 stock-length or 10 fish per inch group required. The species was first introduced in 2007 and the population never became fully established because of the drought years. Perhaps when the population has had an opportunity to become stable and mature, then objectives can be set and attained.

**Palmetto and Sunshine Bass:** We plan to monitor these populations through weighted, standardized gill net surveys. Survey objective will be general monitoring with no CPUE-Stock RSE goals set since historically we do not come close to an RSE  $\leq 25$  for Morone species at this reservoir. To improve catch rates and associated RSEs, random sample stations will be weighted for the eastern portion of the reservoir from the power plant cove to the dam. Since historical catch rates have been low, sampling effort will be increased from five to seven gill nets to increase sample sizes for more meaningful analysis. Palmetto Bass have proven to be popular with anglers, but the abundance is currently low. Palmetto Bass fingerlings were not available in 2020 but Sunshine Bass fry were stocked in 2020. Since it was stocked with Sunshine Bass fry, a gill net survey will be completed in 2022 to monitor the stocking to determine the feasibility of fry stockings in the future. Age and growth as well as genetic analysis will be completed on sampled Palmetto and Sunshine Bass.

## Literature Cited

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.
- 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.
- Dumont, S. C., and B. C. Neely. 2011. A proposed change to Palmetto Bass proportional size distribution length categories. *North American Journal of Fisheries Management* 31: 722-725.
- 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.
- Mauk, R., and T. Lang. 2016. Palo Pinto Reservoir, 2015 fisheries management survey report. Texas Parks and Wildlife Department, Federal Aid Report F-221-M-6, Austin.
- Mesing, C.L., E.A. Long, I.I. Wirgin, and L. Maceda. 1997. Age, growth, and movement of 2 *Morone* species in the Apalachicola river system, Florida. *Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies* 51:123-134.
- United States Geological Society (USGS). 2020. National water information system: Web interface. Available: <http://waterdata.usgs.gov/tx/nwis> (July 2020).

## Tables and Figures

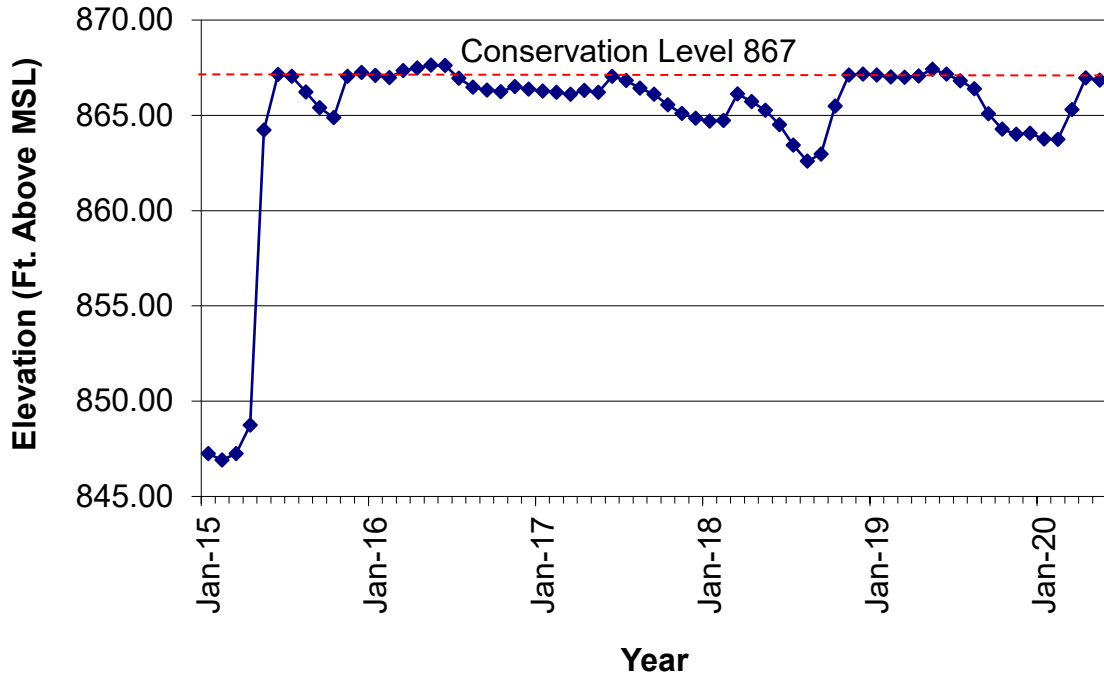


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Palo Pinto Reservoir, Texas.

Table 1. Characteristics of Palo Pinto Reservoir, Texas.

Characteristic	Description
Year constructed	1964
Controlling authority	City of Mineral Wells
County	Palo Pinto
Reservoir type	Tributary
Shoreline Development Index	2.62
Conductivity	490 $\mu$ S/cm

Table 4. Stocking history for Palo Pinto Reservoir, Texas. FGL = fingerlings and AFGL = advanced fingerlings.

Table 2. Boat ramp characteristics for Palo Pinto Reservoir, Texas, July, 2019. Reservoir elevation at time of survey was 867.0 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
FM 3137 (Public)	32.66504 -98.30230	Y	20	861	Good
Love Ramp (Private)	32.65195 -98.29687	Y	5	852	Poor
Deer Haven Road (Private)	32.64604 -98.30193	Y	5	863	Good

Table 3. Harvest regulations for Palo Pinto Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Palmetto	5	18-inch minimum
Bass, Largemouth	5	14-inch minimum
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Species	Year	Number	Size
Black Crappie x White Crappie	1993	125,480	FRY
	1994	134,000	FRY
	1995	26,774	FGL
	Total	<u>286,254</u>	
Blue Catfish	2007	120,555	FGL
	2008	120,666	FGL
	Total	<u>241,221</u>	
Channel Catfish	1986	79,831	AFGL
	1997	13,325	AFGL
	2000	27,016	FGL
	Total	<u>120,172</u>	
Florida Largemouth Bass	1975	53,000	FRY
	1982	53,823	FGL
	1983	64,960	FGL
	1983	116,984	FRY
	1985	119,150	FRY
	1997	133,648	FGL
	2008	120,900	FGL
	2015	45,720	FGL
	2016	44,975	FGL
Total	<u>753,160</u>		
Largemouth Bass	1970	100,000	UNK
	1982	17,681	UNK
	Total	<u>117,681</u>	
Palmetto Bass (Striped Bass X White Bass)	2002	13,342	FGL
	2004	12,107	FGL
	2006	12,084	FGL
	2008	12,469	FGL
	2011	18,169	FGL
	2013	12,016	FGL
	2015	7,724	FGL
	2016	34,179	FGL
	2017	40,000	FGL
Total	<u>162,090</u>		
Sunshine Bass (White Bass X Striped Bass)	2020	124,520	FRY
		<u>124,520</u>	

Table 5. Objective-based sampling plan components for Palo Pinto Reservoir, Texas 2019–2020.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE–Stock	RSE-Stock $\leq$ 25
Bluegill <sup>a</sup>	Abundance	CPUE–Total	RSE $\leq$ 25
Gizzard Shad <sup>a</sup>	Abundance	CPUE–Total	RSE $\leq$ 25
<i>Low-frequency electrofishing</i>			
Blue Catfish	Abundance	CPUE–Stock	RSE-Stock $\leq$ 25
<i>Trap netting</i>			
Crappie	Abundance	CPUE–Stock	RSE-Stock $\leq$ 25
<i>Gill netting</i>			
Palmetto Bass	Abundance	CPUE–stock	RSE-Stock $\leq$ 25

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



Table 6. Survey of structural habitat types, Palo Pinto Reservoir, Texas, 2015. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Bulkhead	0.4 miles	1.6
Natural shoreline with boat docks	2.6 miles	10.3
Natural	8.0 miles	31.7
Rocky	6.5 miles	25.8
Rocky with boat docks	7.7 miles	30.6
Standing timber	223.3 acres	9.3

Table 7. Survey of aquatic vegetation, Palo Pinto Reservoir, Texas, 2003–2019. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2003	2007	2011	2015	2019
Native submersed	1.4 (<0.1)	3.7 (<0.1)			
Native floating-leaved	0.2 (<0.1)				
Native emergent	<0.1 (<0.1)	0.4 (<0.1)		<0.1 (<0.1)	1.2 (<0.1)

### Gizzard Shad

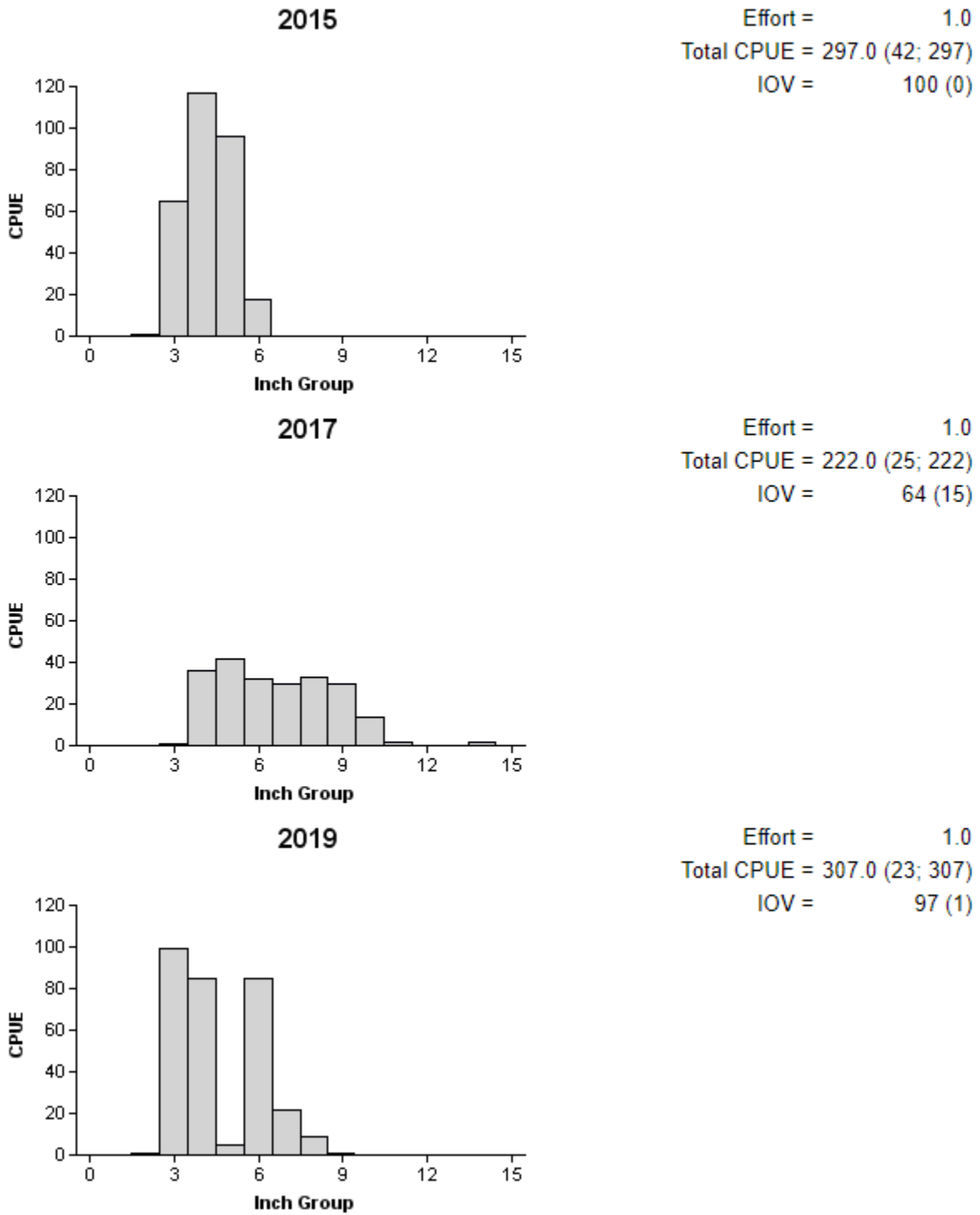


Figure 2. Number of Gizzard Shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Palo Pinto Reservoir, Texas, 2015, 2017, and 2019.

## Bluegill

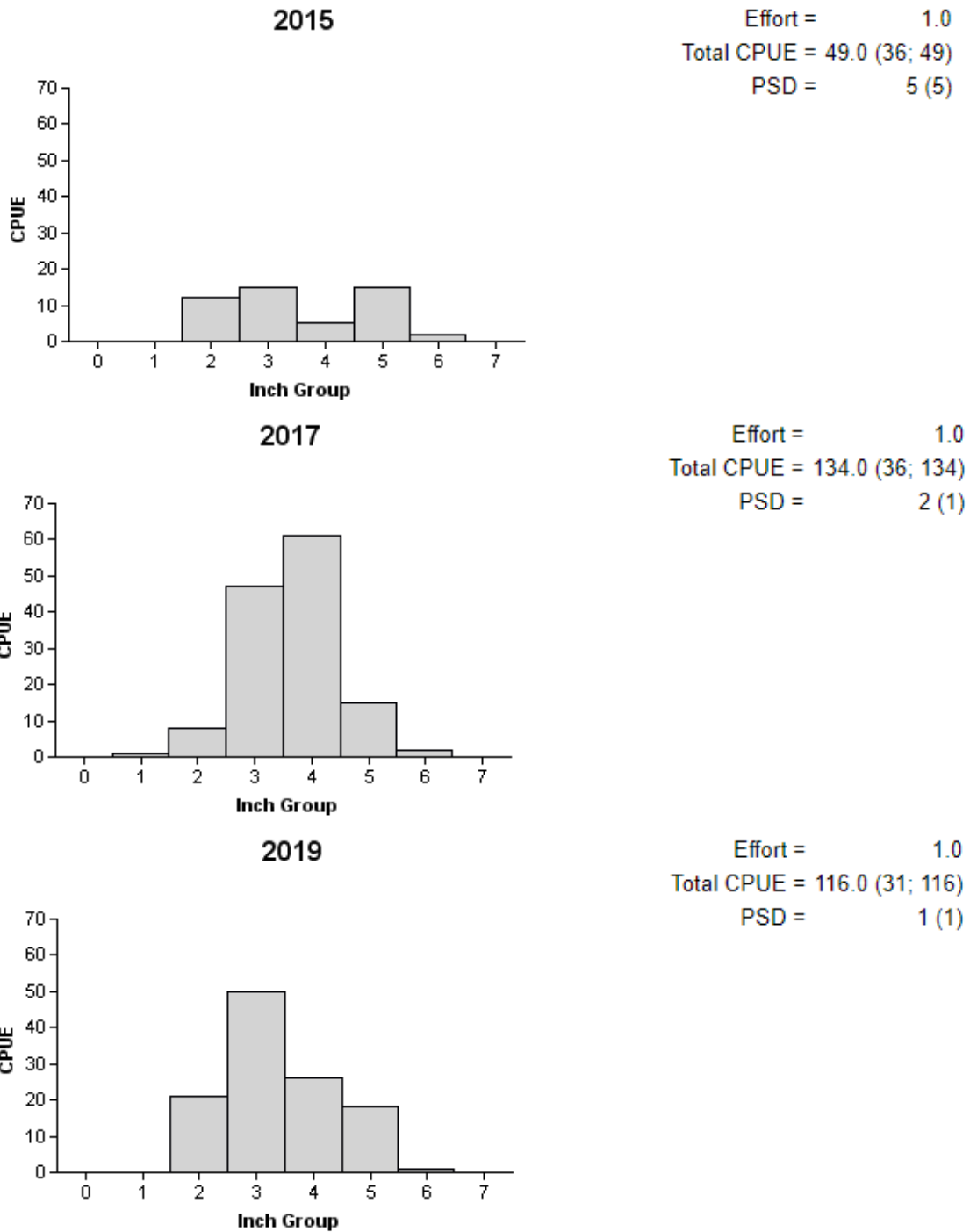


Figure 3. Number of Bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Palo Pinto Reservoir, Texas, 2015, 2017, and 2019.

## Blue Catfish

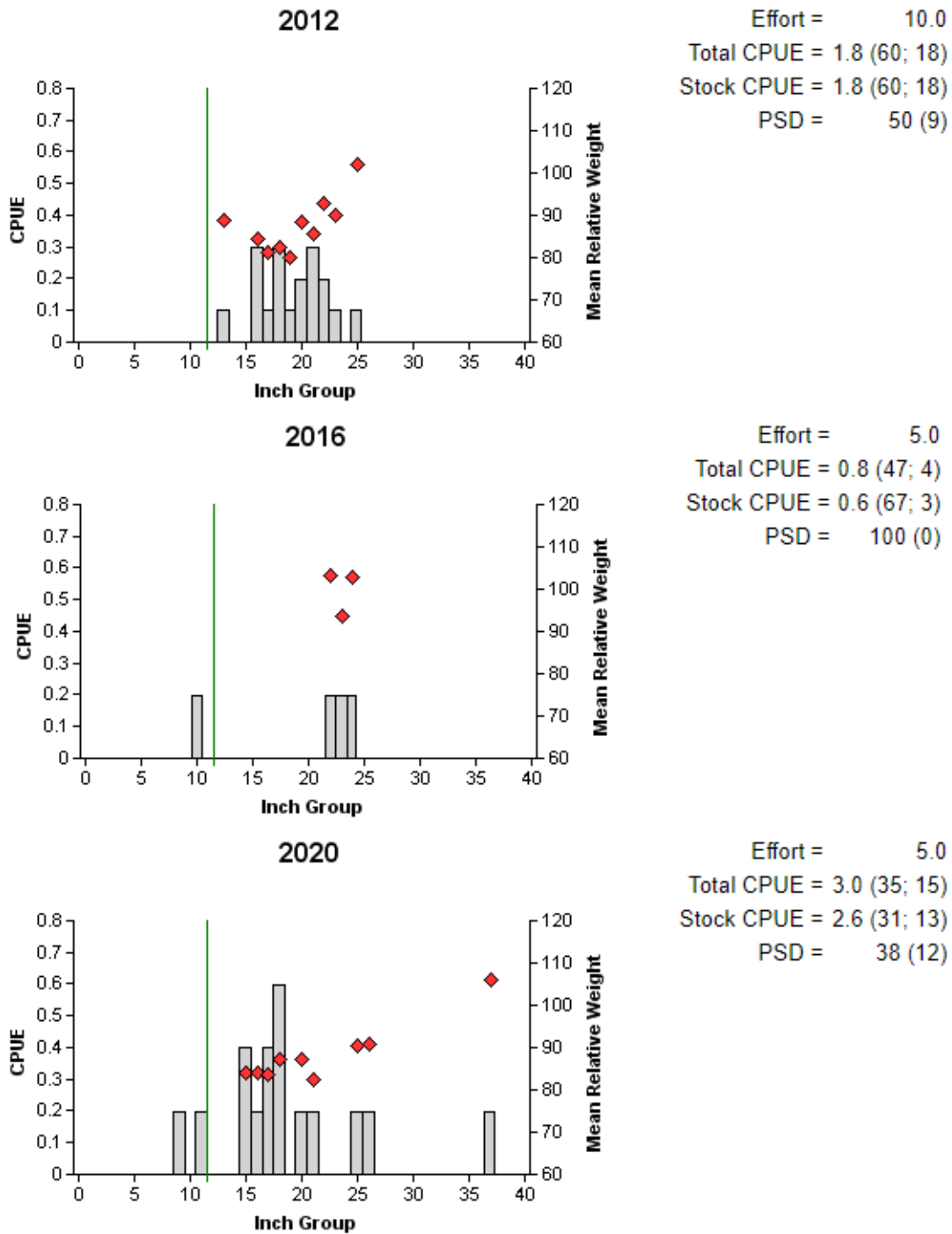


Figure 4. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Palo Pinto Reservoir, Texas, 2012, 2016, and 2020. Vertical line indicates minimum length limit.

## Blue Catfish

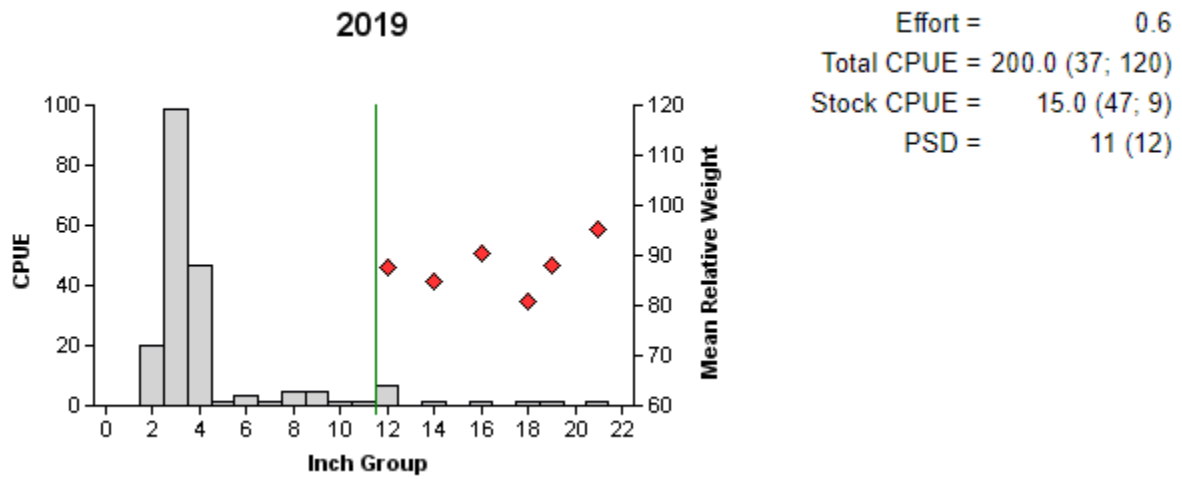


Figure 5. Number of Blue Catfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall low-frequency electrofishing surveys, Palo Pinto Reservoir, Texas, 2019. Vertical line indicates minimum length limit.

## White Bass

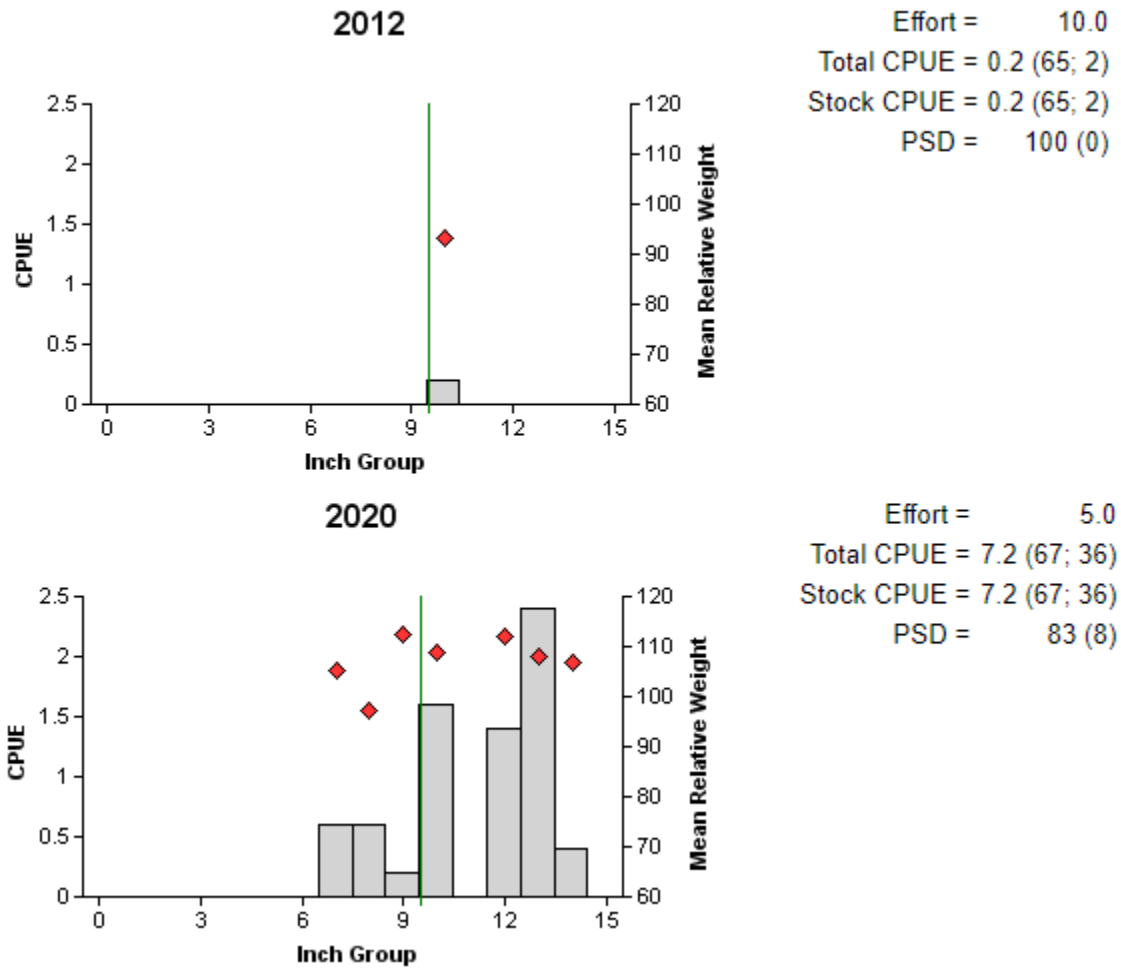


Figure 4. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Palo Pinto Reservoir, Texas, 2012 and 2020. No White Bass were collected during the 2016 gill net survey. Vertical line indicates minimum length limit.

## Palmetto Bass

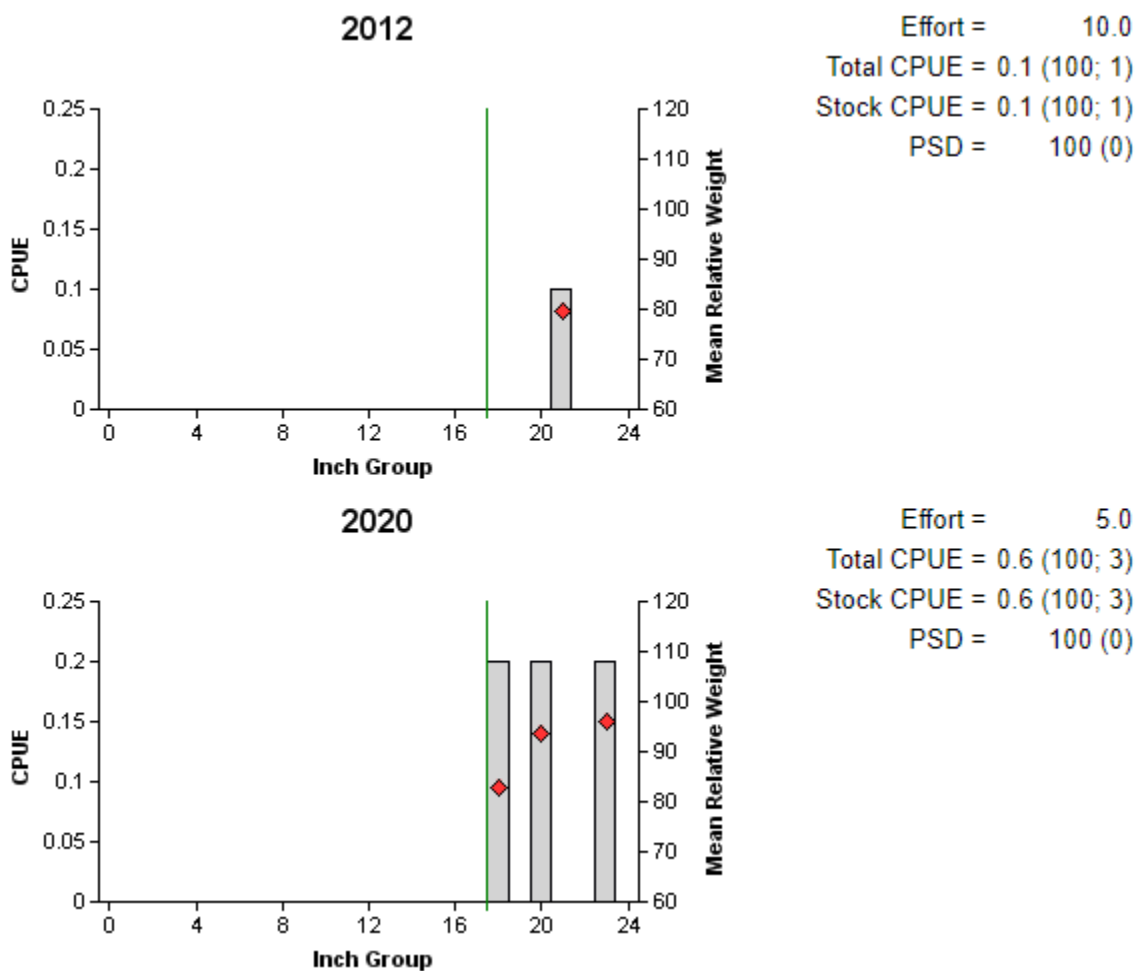


Figure 5. Number of Palmetto Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Palo Pinto Reservoir, Texas, 2012 and 2020. No Palmetto Bass were collected during the 2016 gill net survey. Vertical line indicates minimum length limit.

## Largemouth Bass

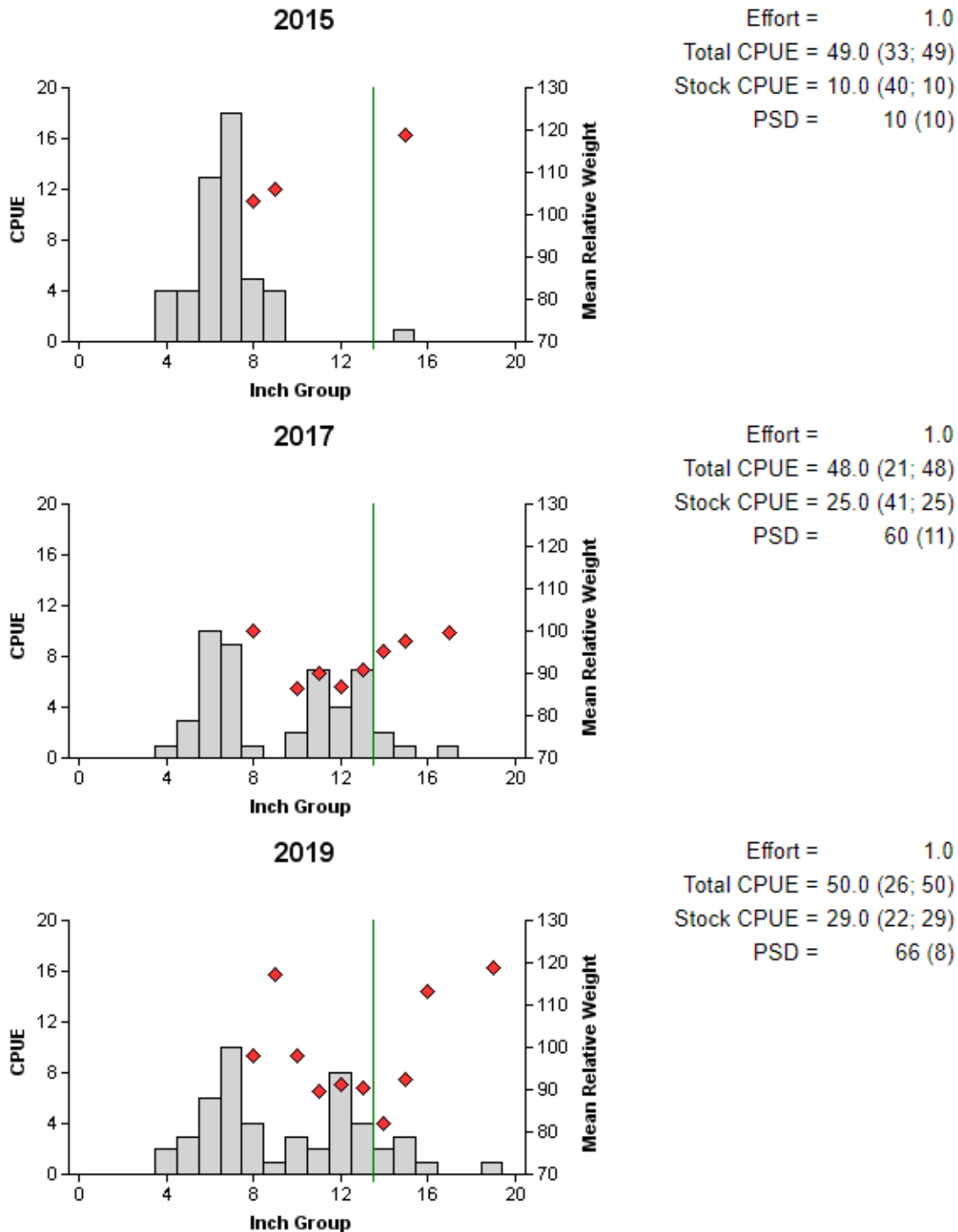


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Palo Pinto Reservoir, Texas, 2015, 2017, and 2019. Vertical line indicates minimum length limit.



## White Crappie

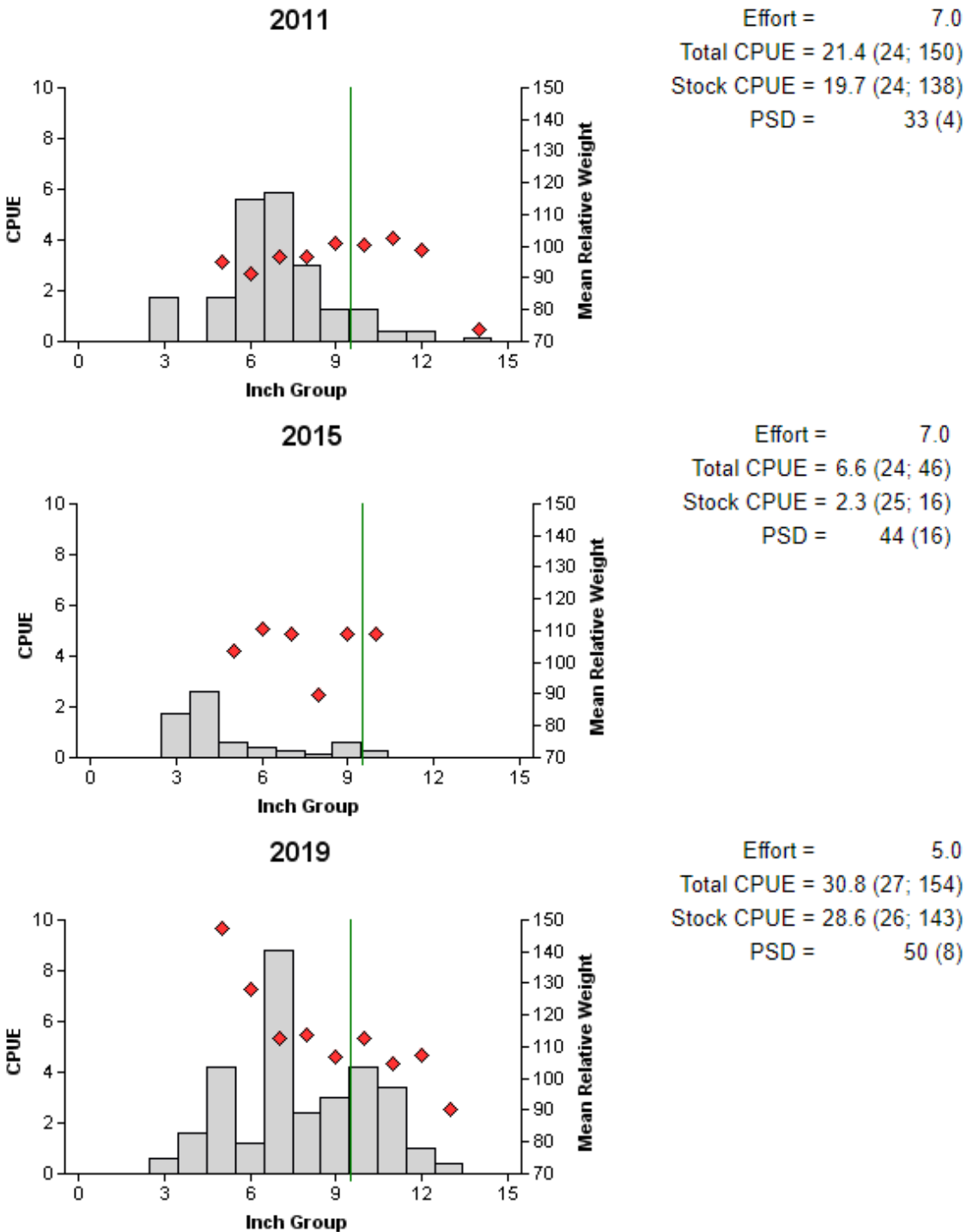


Figure 7. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Palo Pinto Reservoir, Texas, 2011, 2015, and 2019. Vertical line indicates minimum length limit.

## Proposed Sampling Schedule

Table 8. Proposed sampling schedule for Palo Pinto 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. Standard survey denoted by S and additional survey denoted by A

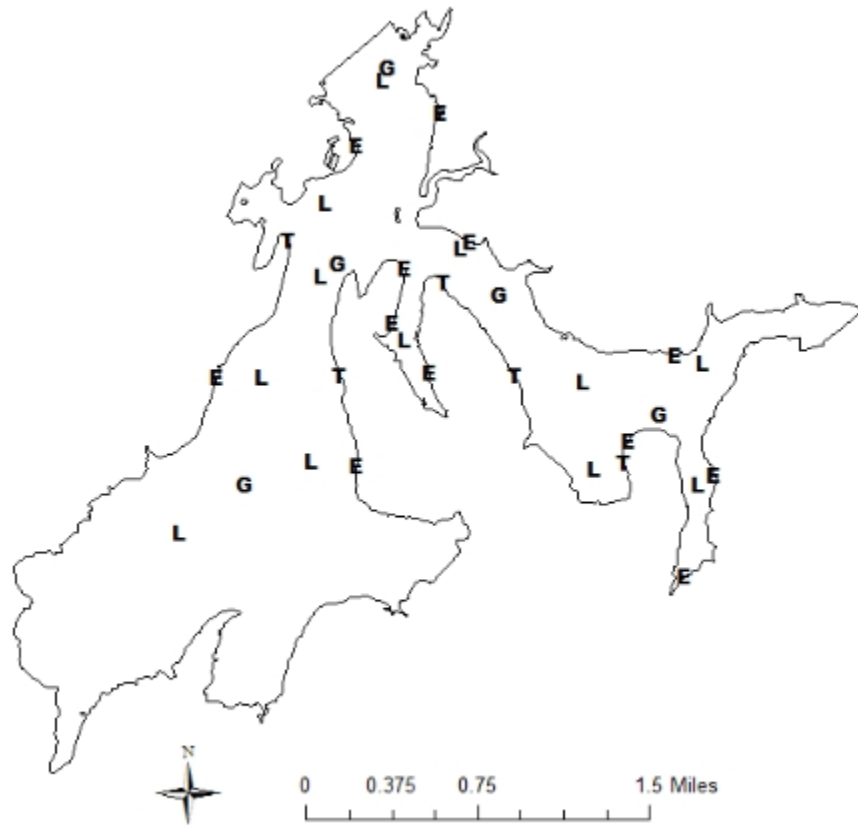
	Survey year			
	2020-2021	2021-2022	2022-2023	2023-2024
Angler Access				S
Structural Habitat				
Vegetation				S
Electrofishing – Fall				S
Electrofishing – Spring				
Electrofishing – Low frequency				
Trap netting				S
Gill netting		A		S
Baited tandem hoop netting				
Creel survey				
Report				S

## 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 Palo Pinto Reservoir, Texas, 2019-2020. Sampling effort was 5 net nights for gill netting, 5 net nights for trap netting, and 1 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Longnose Gar	14	2.8 (26)				
Gizzard Shad	30	6.0 (32)			307	307.0 (23)
Threadfin Shad					21	21.0 (54)
River Carpsucker	3	0.6 (67)				
Smallmouth Buffalo	62	12.4 (43)				
Blue Catfish	15	3.0 (35)				
Flathead Catfish	1	0.2 (100)				
White Bass	36	7.2 (67)				
Palmetto Bass	3	0.6 (100)				
Green Sunfish					3	3.0 (52)
Warmouth					1	1.0 (100)
Bluegill			18	3.6 (57)	116	116.0 (31)
Longear Sunfish			4	8 (73)	48	48.0 (38)
Redear Sunfish					8	8.0 (43)
Largemouth Bass			1	0.2 (100)	50	50.0 (26)
White Crappie	5	1.0 (63)	154	30.8 (27)		
Black Crappie			1	0.2 (100)		
Freshwater Drum	4	0.8 (47)				

## APPENDIX B – Map of sampling locations



Location of sampling sites, Palo Pinto Reservoir, Texas, 2019-2020. Trap net, gill net, electrofishing, and low-frequency electrofishing stations are indicated by T, G, E, and L, respectively. Water level was near full pool at time of sampling.

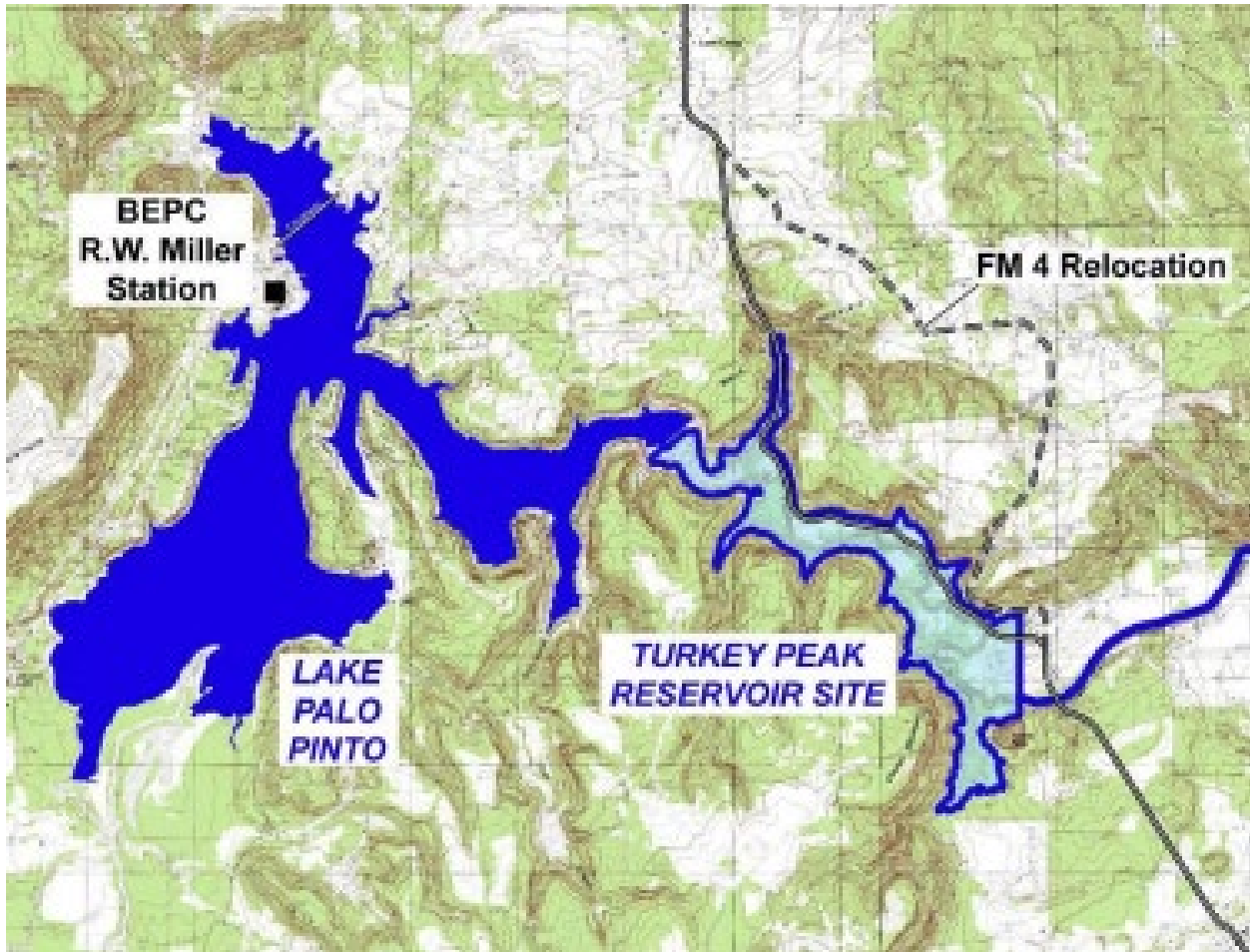


**APPENDIX C – Continued**

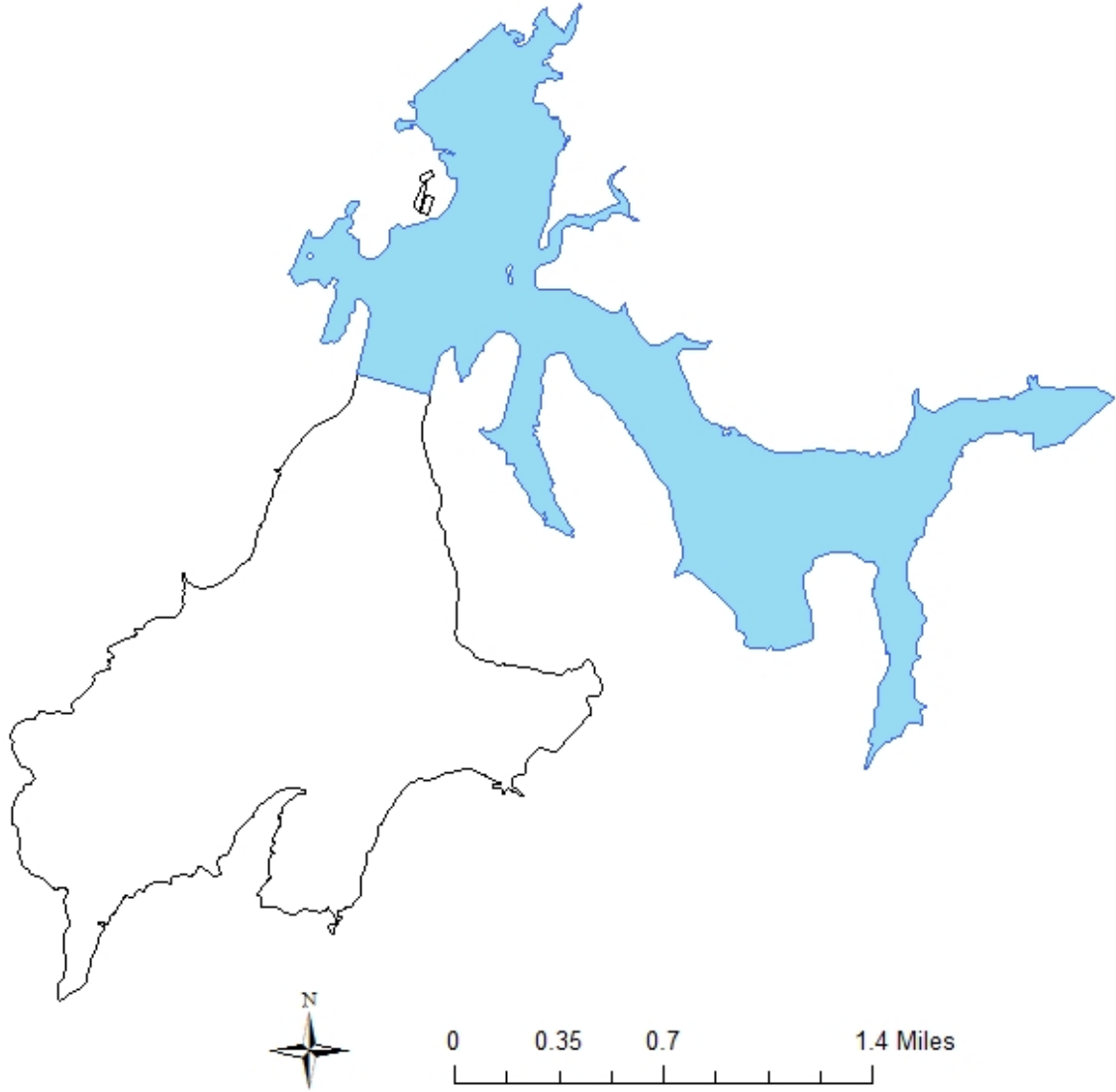
Historical catch rates for targeted species by gear type for Palo Pinto Reservoir, Texas.

Gear	Species	Year					Mean	
		2012	2015	2016	2017	2019		2020
Gill Netting (fish/net night)	Blue Catfish	1.8		0.8			3.0	1.8
	Channel Catfish	0.2		0			0	0.7
	White Bass	0.2		0			7.2	2.1
	Palmetto Bass	0.1		0			0.6	0.5
Electrofishing (fish/hour)	Gizzard Shad		297.0		222.0	307.0		204.3
	Threadfin Shad		199.0		30.0	21.0		62.6
	Green Sunfish		0		6.0	3.0		9.9
	Warmouth		1.0		4.0	1.0		9.4
	Bluegill		49.0		134.0	116.0		126.3
	Longear Sunfish		9.0		56.0	48.0		48.3
	Redear Sunfish		1.0		2.0	8.0		4.1
	Largemouth Bass		49.0		48.0	50.0		73.3
Trap Netting (fish/net night)	White Crappie		6.6			30.8		18.6
	Black Crappie		0.7			0.2		0.4
LFE (fish/hour)	Blue Catfish					200.0		200.0

## APPENDIX D – Proposed Turkey Peak Reservoir



### APPENDIX E – Proposed Weighted Sampling Area in Blue







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