PERFORMANCE REPORT

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TEXAS

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2016 Fisheries Management Survey Report

Texoma Reservoir

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TABLE OF CONTENTS

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Texoma Reservoir were surveyed in 2012 and 2014 using low-frequency electrofishing, in 2013, 2014, and 2016 using electrofishing and trap netting, and annually using gill netting. Vegetation was surveyed in 2016. Historical data are presented with the 2013-2017 data for comparison. This report summarizes the results of these surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Texoma Reservoir is a 74,686-acre impoundment on the Red and Washita Rivers on the Texas and Oklahoma border with a conservation elevation of 617 feet above mean sea level (msl). Since the previous report, Texoma Reservoir reached its lowest water level since 1972 in 2014 of 608 feet above msl, followed by a record breaking high water level of 645 feet above msl in May of 2015. Texoma Reservoir exhibits moderate trophic productivity. Habitat features consisted mainly of natural features, rocky and gravel shoreline, and boat docks. Aquatic vegetation is typically limited, and none was observed in a 2016 vegetation survey. Approximately 80 acres of emergent vegetation was last measured in 2008; however, abundant buttonbush (*Cepthalanthus occidentalis*) provides fish cover during periods of high water.

- **Management History:** Important sport fish included Blue and Channel Catfish, White Bass, Striped Bass, Smallmouth Bass, Spotted Bass, Largemouth Bass, and Black and White Crappie. Striped Bass were stocked between 1965 and 1985. In 2009, a special regulation was implemented for catfish. Blue Catfish and Channel Catfish are managed with a 12-inch minimum length limit, 15 fish daily bag of which only one fish can be $\geq$30 inches. Smallmouth Bass were introduced between 1981 and 1987. Zebra mussels were first identified in the reservoir in 2009, and are monitored in cooperation with other resource agencies, the U.S. Army Corps of Engineers (USACE), and North Texas Municipal Water District (NTMWD).

- **Fish Community**
  - **Prey species:** Threadfin Shad and Gizzard Shad abundance remains elevated due to mild winters. Bluegill and other sunfish species exhibit an abundant and diverse prey population.

  - **Catfishes:** Blue Catfish and Channel Catfish are abundant. Many large Blue Catfish support a trophy fishery.

  - **Temperate basses:** White Bass and Striped Bass are abundant and thriving after successful recruitment and above average growth following flooding in 2015.

  - **Black basses:** Smallmouth Bass, Spotted Bass, and Largemouth Bass are present in Texoma Reservoir and support popular recreational and tournament fisheries.

  - **Crappie:** White Crappie support a popular fishery in Texoma Reservoir. Black Crappie are also present, but lower in abundance.

Management Strategies: Based on current information, Texoma Reservoir should continue to be managed with existing harvest regulations. Sampling will include annual gill netting at set locations to monitor Striped Bass in cooperation with ODWC (Oklahoma Department of Wildlife Conservation), and low-pulse electrofishing for Blue Catfish will be conducted every 3rd August. A creel survey and economic study is planned for 2018. General monitoring surveys in 2020 – 2021 require electrofishing and trap netting, at randomly selected sites and biologist selected sites.

INTRODUCTION

This document is a summary of fisheries data collected from Texoma Reservoir from 2013-2017. 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 species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2013-2017 data for comparison.

Reservoir Description

Texoma Reservoir is a 74,686-acre impoundment constructed in 1944 on the Red and Washita Rivers along the Texas and Oklahoma state-line. Denison Dam impounds waters of the upper Red River basin and the entire Washita River basin for a total watershed of 40,000 square miles in west Texas and central and western Oklahoma. The shoreline is 580 miles long and approximately 40% of the reservoir is $\leq$ 15 feet deep. Texoma Reservoir is operated and controlled by the USACE. Reservoir purposes include flood control, hydropower, municipal, industrial, and agricultural water supply, and recreation. Water level fluctuation was significant during the study period (Figure 1). In 1992 the USACE implemented a seasonal pool elevation management plan that bore the consensus of the USACE and other members of the Texoma Reservoir Advisory Committee. This committee is comprised of, in addition to USACE personnel, various conservation/recreation agency personnel, area businesses, and chambers of commerce. The plan varies from the conventional reservoir conservation elevation (617 ft-MSL; Figure 2) in that water level is allowed to drop to a level below conservation elevation during the spring and early fall. Reservoir level is then maintained above the conservation elevation during summer, late fall, and early winter. This unique plan attempts to minimize negative impacts of extreme high and low water conditions. Fish habitat consists primarily of natural features, rocky and gravel shoreline, and boat docks. Aquatic vegetation is seldom present. Texoma Reservoir was mesotrophic with a mean trophic state index (TSI) of 40.0 based on Secchi disc readings (Texas Commission on Environmental Quality 2012). Other descriptive characteristics for Texoma Reservoir are listed in Table 1.

Angler Access

Boat access is adequate with 39 public boat ramps at 21 sites on the Texas side of the Reservoir, which also have bank access available (Table 2). However, some public facilities are leased to private operations which charge a fee for access. Access to facilities for the physically challenged are provided. Two fishing piers (one lighted) are located at Eisenhower State Park.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Hysmith and Moczygemba 2013) included:

1. Recommended conducting creel survey in 2015/2016 and updating a 1995 economic analysis of the Striped Bass fishery.
   Action: Due to flooding in 2015 and a subsequent decline in fishing activity, the creel survey was postponed until the fishery and fishing pressure stabilized.
2. Recommended continuing annual gill net surveys of the premier Striped Bass fishery in Texoma Reservoir. Fisheries managers in Texas and Oklahoma need to monitor this important fishery annually.
   Action: Annual gill net surveys were conducted during February by Texas Parks and Wildlife Department (TPWD) and ODWC. Age and growth analysis was conducted in 2016 and 2017.

3. Recommended conducting electrofishing in known Smallmouth Bass habitat during the fall of 2013 and spring of 2014 to improve catch rates.
   Action: Electrofishing of known Smallmouth Bass habitat was conducted according to the previous management plan. The targeted approach in fall 2013 achieved a higher catch rate and greater precision.
4. Recommended conducting low-frequency electrofishing in the upper Red and Washita River arms during August 2014 in coordination with the ODWC.
   Action: Fisheries personnel from TPWD and ODWC conducted low-frequency electrofishing in August of 2012 and 2014.
5. Recommended continuing our inter-agency role along with personnel from ODWC, USACE, U.S. Fish and Wildlife Service (USFWS), and Dr. Robert McMahon (retired UT Arlington) in monitoring zebra mussels in Texoma Reservoir.
   Action: Fisheries personnel from TPWD and ODWC, USACE, and USFWS conducted observations of zebra mussels while in the field conducting other sampling. The zebra mussel population continues to persist, and staff has continued to disseminate information and signage to stakeholders and the public.

Harvest regulation history: Only Smallmouth Bass, Spotted Bass, and Largemouth Bass in Texoma Reservoir are currently managed with statewide regulations. All other sport fishes are managed with exceptions to statewide regulations (Table 3).

Stocking history: Texoma's first stocking occurred in 1944 with 67,000 Channel Catfish fingerlings; 2,400 Coppernose Bluegill fingerlings; 225,000 Largemouth Bass fingerlings; and 18,000 Redear Sunfish fingerlings (Table 4). The reservoir was last stocked in 2010 with Threadfin Shad following a large winter die-off, and with 200 adult Channel Catfish each year between 2012 and 2015 following an annual youth fishing event at Eisenhower State Park. Striped Bass were first introduced in 1965, and Smallmouth Bass were introduced between 1981 and 1987.

Vegetation/habitat management history: Texoma Reservoir supports limited aquatic vegetation due to extreme water level fluctuations; vegetation was not observed in a 2016 survey. Structural habitat consisted mostly of natural shoreline features, rock, and gravel. Piers, boat docks, and boat ramps augmented structural habitat. Abundant buttonbush provides some littoral habitat during high water periods.

Water transfer: With the discovery of zebra mussels in Texoma Reservoir in 2009, NTMWD ceased water transfer activity to Lavon Reservoir via a tributary (Sister Grove Creek). A direct pipeline to the NTMWD water treatment facility was constructed and became operational in 2014. Raw water is also directly transferred into Randell Lake, a water supply reservoir for the City of Denison, which drains into the Red River below Denison Dam.

METHODS

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for Texoma Reservoir (TPWD unpublished). Primary components of the OBS plan are listed in Table 5. All survey sites were randomly selected, unless otherwise specified, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

Electrofishing – Largemouth Bass, Spotted Bass, Smallmouth Bass, sunfishes, Gizzard Shad, and Threadfin Shad were collected by electrofishing (2 hours at 24, 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 13 randomly-selected fish (range 13.0 to 14.4 inches).

Smallmouth Bass were also collected by electrofishing at biologist-selected stations in fall 2013 (2 hours at 24, 5-min stations) and spring 2014 (1 hour at 12, 5-min stations).

Trap netting – Crappie were collected using trap nets (15 net nights at 15 stations). Trap net stations were selected based on a stratified sampling regime. Five stations were randomly selected from stratified upper, middle, and lower reservoir sections. 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 13 randomly-selected fish (range 9.3 to 10.7 inches).

Gill netting – Blue Catfish, Channel Catfish, White Bass, and Striped Bass were collected by gill netting (30 net nights at 30 stations; 15 stations by ODWC). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn). Ages for Striped Bass (10 per inch group) were determined by ODWC using otoliths from 105 fish in 2016 and 189 fish in 2017.

Low-frequency electrofishing – Blue Catfish and Flathead Catfish were collected by low-frequency electrofishing at 20 stations in 2012 and 18 stations in 2014. Procedures were based on ODWC protocols. CPUE for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Genetics – Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015). Micro-satellite DNA analysis was used to determine genetic composition of individual fish.

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

Habitat – A vegetation survey was conducted in 2016.

Water level – Source for water level data was the United States Geological Survey (USGS 2017).

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of natural shoreline features along with rocky and gravel substrate, stumps and laydowns, floating boat docks, boat ramps, and some standing timber in upper

reservoir reaches (Hysmith and Moczygemba 2013). Aquatic vegetation was absent following extreme flooding in 2015.

Prey species: Electrofishing CPUE of Gizzard Shad (219.0/h) and Bluegill (263.5/h) were both above the average historical catch rate (Figures 3 and 4; Appendix C). The IOV for Gizzard Shad indicated 92% of Gizzard Shad were available as forage (i.e. 7 inches or less) to existing predators. Electrofishing CPUE for Threadfin Shad was just 21.0/h (Appendix C); although CPUE is not believed to accurately represent abundance at the time of survey. Threadfin Shad were not present in shallow water during electrofishing surveys for black basses and sunfishes. Above average rainfall and water levels in 2015 and 2016 are believed to have increased the abundance of all forage populations, and subsequently improved the condition of sportfish populations.

Catfishes: Gill net CPUE of Blue Catfish is not typically representative of population abundance in Texoma Reservoir. However, the gill net CPUE (3.3/nn) of Blue Catfish was well above the historical average in 2016 (Figure 5; Appendix C), and provided adequate precision for estimating size structure of the population. Combined results from gill nets and low-frequency electrofishing (Figure 6) indicate an abundance of Blue Catfish available for harvest by Texoma anglers and a number of larger individuals (>30 inches) also present in the population. Body condition of Blue Catfish collected in gill nets was adequate and increased with size. Low-frequency electrofishing in 2012 and 2014 produced a stock CPUE of 173.4/h and 164.0/h, respectively. This was adequate for evaluating size structure of the population. Blue Catfish PSD was 30 in 2012 and 16 in 2014. Low water levels during the 2014 survey may have resulted in a reduced catch rate of larger Blue Catfish.

Channel Catfish and Flathead Catfish are present in the reservoir, but are infrequently collected during gill-netting or targeted low-frequency electrofishing for Blue Catfish (Appendix C). Gill net CPUE of Channel Catfish (1.4/nn; Figure 7) remains consistent, and indicates the population is dominated by harvestable fish above the minimum length limit (Figure 7). Like Blue Catfish, body condition of Channel Catfish was adequate and increased with size; recruitment was also evident.

Temperate basses: Gill net catches of White Bass in 2017 (13.2/nn) mirrored catch rates in 2016 (11.8/nn), and reflected strong (post-2015 flood) recruitment. High water levels in 2015 and 2016, abundant forage populations, and poor Striped Bass recruitment in 2014 may have allowed the White Bass population to expand with limited competition. Body condition of White Bass was well above average (Figure 8), resulting in a number of lake weight records being challenged or broken for Texas and Oklahoma in 2017.

The gill net catch rate of Striped Bass in 2016 (6.4/nn) was the lowest catch on record. The low CPUE was heavily influenced by a largely missing 2014 year class, resulting from limited inflows and connectivity to the Red and Washita Rivers during spring 2014. Seining conducted by ODWC also confirmed poor recruitment in 2014 (Appendix D). Age and growth analysis of these fish revealed only one fish from this year class was collected in gill nets. However, similar to White Bass, gill net CPUE of Striped Bass in 2017 (16.3/nn) was dominated by strong cohorts produced during above average inflows in 2015 and 2016 (Figure 9). Striped Bass exhibited excellent condition and growth in a 2017 age and growth analysis (Figures 10 & 11). Typically Striped Bass in Texoma Reservoir require more than three years to grow to 20 inches; however, fish reached 20 inches in two years due to abundant forage and a lack of competition from older fish. Age-1 Striped Bass also exhibited above average growth. The mean length of age-1 Striped Bass in 2016 was 8.7 inches, and was 10.5 inches in 2017.

Black basses: Random site selection of electrofishing stations used to collect Largemouth Bass seldom produces adequate CPUE of stock-size Smallmouth Bass sufficient to assess the population. Total CPUE of Smallmouth Bass was just 13.0/h in 2016, down from 25.5/h in 2012 (Figure 12). A fall, 2013 survey utilizing biologist-selected stations resulted in an electrofishing CPUE of 32.0 stock-sized fish/h (67 total; Figure 13), and was adequate for estimating size structure (PSD = 38) of the population.

Relative weights of Smallmouth Bass were moderate. Smallmouth Bass over five pounds are routinely weighed-in by Texoma Reservoir tournament anglers; and, winning five-fish tournament bag limits, comprised of all Smallmouth Bass, have exceeded 20 pounds. A junior angler record Smallmouth Bass (5.16lbs) was set at a Texas High School Bass Association tournament in 2017 (Appendix E).

Electrofishing total CPUE of Spotted Bass in 2016 (22.0/h) was down from a record catch rate (35.5/h) in 2012; although, was closer the average CPUE of 25.9/h (Figure 15 and Appendix C). Relative weight was above average for most length classes and recruitment was evident.

Electrofishing CPUE of Largemouth Bass has remained consistent, ranging from 44.5/h to 50.0/h in the past three survey years (Figure 16), and near the historical average (Appendix C). Relative weights were adequate and similar to previous years. Growth of Largemouth Bass was excellent; all Largemouth Bass aged (N = 13; 13.0 – 14.9 inches) were age-1. The contribution of Florida Largemouth Bass genetics remains low to moderate with 23% Florida alleles in individual hybrid bass (Table 6). In spite of frequent stockings prior to 2000, the proportion of FLMB alleles has never exceeded 30.3 percent (Hysmith and Moczygemba 2009). In spite of a relatively low contribution of Florida alleles, tournament anglers occasionally catch Largemouth Bass over eight-pounds. In 2017, 19% of teams fishing black bass tournaments with 50 or more participants weighed-in at least 15 pounds of fish (Appendix E).

Crappie: Trap net CPUE of White Crappie (18.3/nn) was the 3rd highest catch on record, and was similar to catch rates in 2008 (21.5/nn; Figure 17 and Appendix C). Both surveys followed years with above-average rainfall and high reservoir levels which likely contributed to strong year classes observed in nets. Relative weight generally increased with size, and all fish aged (N= 13, 9.3 to 10.7 inches) were from the 2015 year class. Black Crappie were also collected in typically low abundance (0.9/nn; Figure 18).

Fisheries management plan for Texoma Reservoir, Texas

Prepared – July 2017.

ISSUE 1: Texoma Reservoir supports a popular and valuable Striped Bass fishery that contributed approximately $26 million to the local economy in a 1990 study (Schoor et al. 1995). Economic data is approximately 27 years old and needs updating. It is also important for fisheries managers in Texas and Oklahoma to annually monitor the population especially since extreme water level fluctuations can significantly impact fish populations.

MANAGEMENT STRATEGIES

1. Coordinate with ODWC to conduct an annual creel survey in conjunction with an economic analysis if funding is available.
2. Conduct annual gill netting surveys at 30 established stations. ODWC personnel will set 15 stations, and TPWD personnel will conduct 15 stations.
3. Resulting data will be shared, analyzed, and presented at a scheduled Texoma Reservoir management meeting.

ISSUE 2: Smallmouth Bass fishing has gained in popularity since they were introduced in the 1980's. Random electrofishing for Smallmouth Bass has not produced a representative sample of the population.

MANAGEMENT STRATEGIES

1. Conduct a fall electrofishing survey at biologist selected sites in 2017, and explore strategies to improve precision of Smallmouth Bass sampling efforts in conjunction with ODWC.
2. Monitor tournament catches of Smallmouth Bass to assess trends and their overall contribution to the black bass fishery.

ISSUE 3: Gill net sampling historically produces low Blue Catfish CPUE's, and is not an accurate representation of Blue Catfish populations in Texoma Reservoir.

MANAGEMENT STRATEGY

1. Conduct low-frequency electrofishing in the upper Red River and Washita River arms with ODWC in August 2017.

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 USACE to post appropriate signage at access points around the reservoir.
2. Provide USACE with up-to-date information on invasive species. Provide them with posters, literature, etc… so that they can in turn educate their reservoir visitors.
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.
6. Continue to implement clean, drain, and dry protocols for office equipment.

Objective-based Sampling Plan and Schedule 2017-2021

Sport fish, forage fish, and other important fishes

Sport fishes in Texoma Reservoir include Striped Bass, White Bass, Blue Catfish, Channel Catfish, crappies, Largemouth Bass, and Smallmouth Bass. Important forage species include Bluegill, Gizzard Shad, and Threadfin Shad.

Survey objectives, fisheries metrics, and sampling objectives

Temperate Basses: Striped Bass are the most sought-after sport fish in Texoma Reservoir. General monitoring trend data has been collected annually since 1993 through cooperative sampling efforts with the ODWC Fisheries team. Routine monitoring will be conducted via winter gill netting at 30 fixed sampling stations. Data collected are sufficient for evaluating relative abundance, size structure, and body condition. Age-and-growth data will be periodically collected to estimate growth, mortality, and recruitment.

White Bass are abundant in Texoma Reservoir and provide a popular fishery. White Bass are frequently targeted and harvested by anglers also targeting Striped Bass. Long term monitoring trend data for White Bass will be collected along with gill netting to monitor the Striped Bass fishery. Gill netting conducted at 30 fixed sampling stations typically yields high precision data for evaluating White Bass relative abundance, size structure, body condition, and growth. No additional effort will be expended to collect White Bass beyond that needed to reach sampling objectives for Striped Bass.

Catfishes: Blue Catfish and Channel Catfish are both present in Texoma Reservoir, and data for both species will be collected annually using gill nets while sampling for Striped Bass. Mean CPUE for Channel Catfish (1.7/nn) is generally higher than mean CPUE of Blue Catfish (0.6/nn); however catch rates of both species are often variable. Data collected on Channel Catfish through annual gill netting frequently yields high precision data which will allow trend monitoring of relative abundance, size structure, and growth to the minimum length limit. Additional sampling effort, using gill nets, beyond that which is necessary to complete sampling objectives for Striped Bass will not be conducted for Channel or Blue Catfish.

Low-frequency electrofishing (LFE) will be conducted every third summer in cooperation with ODWC to collect additional, high-precision trend data for Blue Catfish to monitor relative abundance, size structure, and body condition. LFE will be conducted in August 2017.

Black Basses: Largemouth Bass, Spotted Bass, and Smallmouth Bass are present in Texoma Reservoir, and these species provide a popular fishery. General monitoring trend data has been collected once every four years with fall, nighttime electrofishing, and we will continue to follow this sampling schedule to monitor for large-scale changes. A minimum of 24 randomly selected 5-min electrofishing sites (on the Texas-side of the reservoir) will be sampled once every four years, but sampling will continue at random sites until 50 stock-size Largemouth Bass are collected with an RSE of CPUE-S $\leq$ 25. Trend data on CPUE and body condition for stock-size and larger Largemouth Bass and Smallmouth Bass will be collected once every four years. Body condition of Spotted Bass will also be determined. Thirteen Largemouth Bass between 13.0 and 14.9 inches will be collected to estimate age at the minimum length limit (14 inches). Relative weight of Largemouth Bass $\geq$ 8" TL, and Smallmouth Bass and Spotted Bass $\geq$ 7" TL, will be determined from their length/weight data (maximum of 10 fish weighed and measured per inch class for each species). For Largemouth Bass, effort required to meet sampling objectives is estimated to be between 24 to 27 sampling sites. For Spotted Bass, effort beyond that necessary to meet objectives for Largemouth Bass will not be conducted. Due to sampling inefficiencies for Smallmouth Bass, it is probable that objectives for Smallmouth Bass (collect 50 stock-size fish with an RSE of CPUE-S $\leq$ 25) will not be met during random electrofishing for Largemouth Bass. A fall survey, utilizing biologist selected stations, will be conducted in 2017 to monitor trends on Smallmouth Bass CPUE and size structure (Table 7).

Crappie: Both White and Black Crappie are present in Texoma Reservoir; however, Black Crappie are lower in abundance. Crappie in Texoma Reservoir are managed with a 37 fish/day bag limit and a 10" MLL. To monitor for any large scale changes in the White Crappie population, we will collect trend data to evaluate size structure, growth to the MLL, and body condition with fall, single-cod shoreline trap nets every four years. We estimate that we can collect a minimum of 50 stock-size White Crappie, with an RSE of CPUE-S $\leq$ 25, with 15 to 19 net nights. A minimum of 15 stratified, random sample sites will be determined along the upper, middle, and lower Texas shoreline of Texoma Reservoir; however, additional sample sites will be prepared if it is determined our objectives can be met with reasonable additional effort. This level of sampling should provide a sufficient number of White Crappie between 9.0 and 10.9 inches to estimate mean age at legal length (10 inches). Data on Black Crappie will be collected along with White Crappie; however, no additional effort will be expended beyond that which is necessary to achieve sampling objectives for White Crappie.

Bluegill and shad: Bluegill, Gizzard Shad, and Threadfin Shad are the primary forage at Texoma Reservoir. Sampling, as per black basses above, will allow for monitoring of large-scale changes in Bluegill and shad relative abundance and size structure. Sampling effort based on achieving sampling objectives for bass will likely result in sufficient numbers of shad for size structure estimation (PSD and IOV; 50 fish minimum at 5 stations with 80% confidence) and for relative abundance estimates (RSE $\leq$ 25 of CPUE-Total; anticipated effort is 5-17 stations). However, no additional effort will be expended to achieve an RSE $\leq$ 25 for CPUE-T of Bluegill and shad. Instead, predator body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

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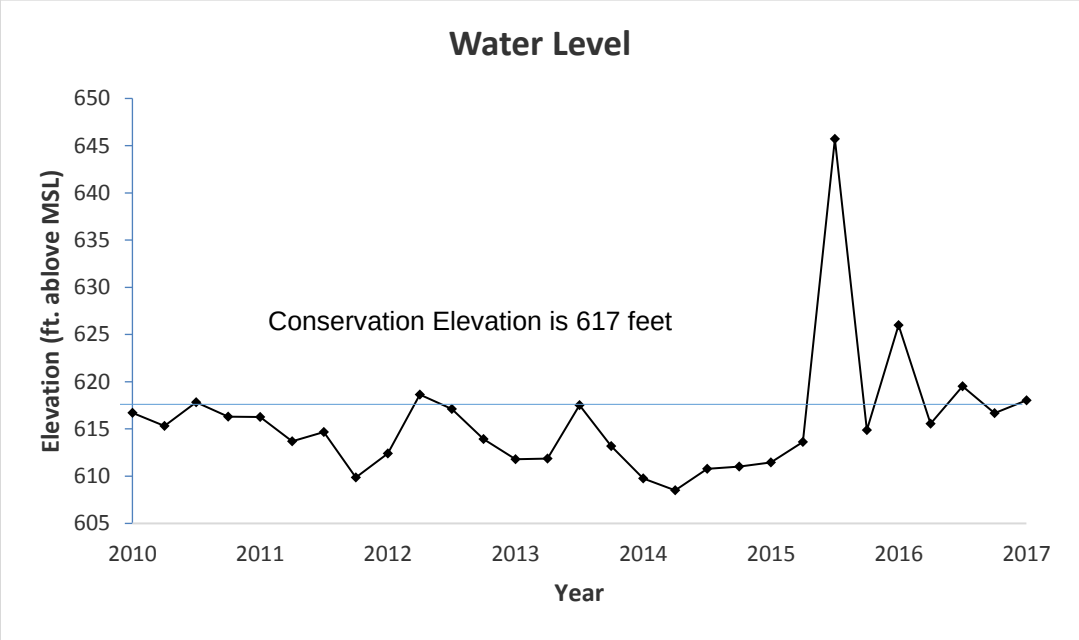


Figure 1. Quarterly water level elevations in feet above mean sea level (msl) recorded for Texoma Reservoir January 2010 to April 2017 (USGS 2017).

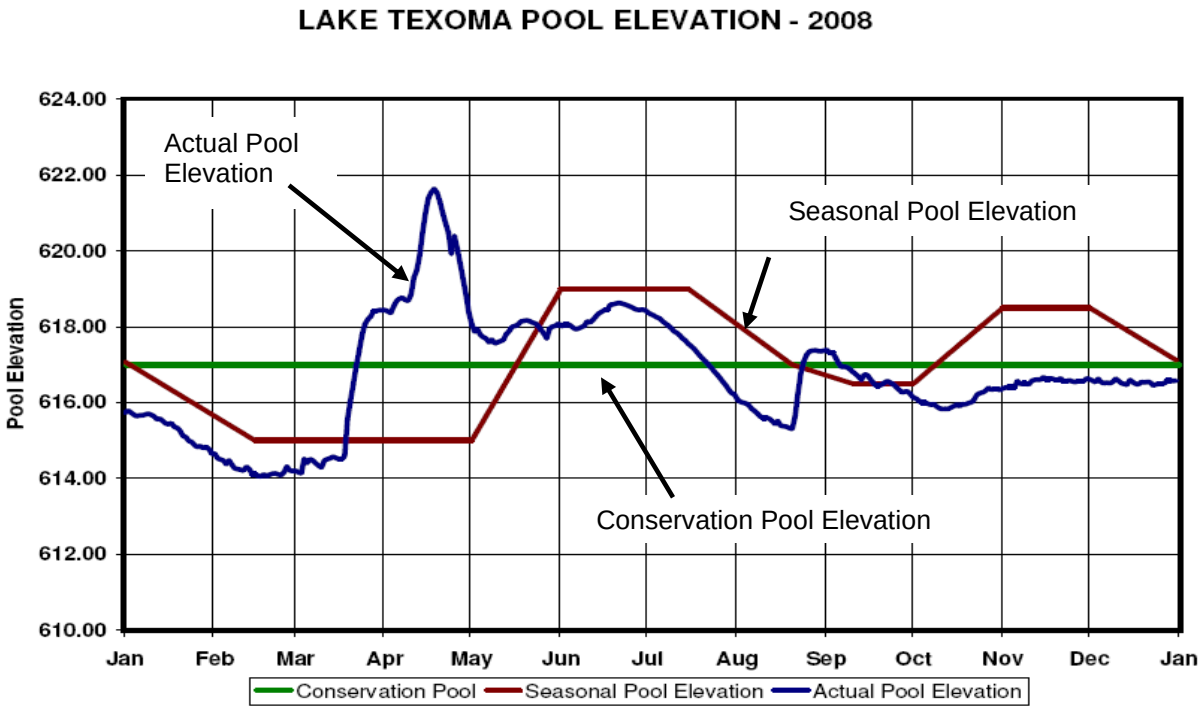


Figure 2. Example of the seasonal pool elevation management plan for Texoma Reservoir 2008.

Table 1. Characteristics of Texoma Reservoir.

Characteristic	Description
Year constructed	1944
Controlling authority	U.S. Army Corps of Engineers
Counties	Grayson and Cooke, Texas; Bryan, Marshall, and Love, Oklahoma
Reservoir type	Mainstream
Shoreline development index	13.9
Conductivity	1,456-1,940 µS/cm

Table 2. Texas public boat ramp characteristics for Texoma Reservoir, April 2017. Reservoir elevation at time of survey was 614.4 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Dam site	33.8165 -96.5764	90	606.95	Excellent
Eisenhower State Park West	33.8141 -96.6080	30	611.12	Adequate
Eisenhower State Park East	33.8141 -96.6079	30	603.95	Excellent
Grandpappy Point	33.8580 -96.6446	5	605.95	Excellent
Preston Bend Recreation Area	33.8745 -96.6440	10	612.45	Adequate
Little Mineral Marina	33.8716 -96.6474	10	604.95	Excellent
Lighthouse Marina North	33.8608 -96.6607	10	605.45	Adequate
Lighthouse Marina South	33.8598 -96.6601	10	608.45	Adequate
Preston Shores	33.8438 -96.6691	5	607.45	Excellent
Simmons Shores	33.8242 -96.6680	20	609.45	Excellent
Walnut Creek	33.8107 -96.8340	20	607.76	Excellent
Big Mineral Camp	33.7865 -96.8061	20	609.76	Adequate
Cedar Mills Marina	33.8294 -96.8115	10	604.26	Adequate
Flowing Wells Resort	33.7773 -96.7712	15	610.26	Excellent
Highport Marina	33.8263 -96.7050	84	604.26	Excellent
Mill Creek Marina	33.8201 -96.7712	10	612.76	Adequate
Juniper Point East	33.8614 -96.8294	25	613.01	Adequate
Juniper Point West	33.8619 -96.8351	16	607.01	Excellent

Table 2. Texas public boat ramp characteristics continued.

Boat ramp	Latitude Longitude (dd)	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Texoma Marina and Resort	33.8683 -96.8914	15	606.26	Excellent
Cedar Bayou Marina	33.8440 -96.8527	10	607.26	Excellent
Paradise Cove	33.7871 -96.7841	20	610.26	Adequate

Table 3. Harvest regulations for Texoma Reservoir.

Species	Bag Limit	Length Limit
Catfish: Channel and Blue Catfish, their hybrids and subspecies	15 (in any combination)	12-inch minimum (Blue Catfish only 1 > 30 inches)
Catfish, Flathead	5	20–inch minimum
Bass, White	25	None
Bass, Striped: its hybrids and subspecies	10 (in any combination)	(Only 2 >20 inches)
Bass, Largemouth, Spotted, and Smallmouth	5 (in any combination)	14-inch minimum
Crappie: White and Black Crappie, their hybrids and subspecies	37 (in any combination)	10-inch minimum

Table 4. Stocking history of Texoma Reservoir, Texas (TPWD-only). Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), sub-adults (SADL), and adults (ADL).

Year	Number	Size
Threadfin Shad		
1979	31,181	AFGL
1982	1,500	AFGL
1984	19,176	AFGL
1985	271,959	AFGL
2010	2,000	ADL
Total	325,816	
Bluegill		
1945	22,400	AFGL
1948	15,500	AFGL
1949	18,000	AFGL
1951	4000	AFGL
1979	20,400	AFGL
Species Total	80,300	
Coppernose Bluegill		
1944	2,400	AFGL
Redear Sunfish		
1944	18,000	FGL
1945	220,500	FGL
1946	116,000	FGL
1947	16,000	FGL
1948	82,500	FGL
1949	87,000	FGL
1951	4,000	FGL
Species Total	544,000	
Warmouth		
1947	4,000	FGL
Other sunfishes		
1945	14,000	FGL

Year	Number	Size
Channel Catfish		
1944	67,000	FGL
1945	104,500	FGL
1946	43,000	FGL
1947	18,000	FGL
1948	6,000	FGL
1949	9,000	FGL
1974	30,000	FGL
1979	12,200	FGL
2002	67,000	FGL
2012	200	ADL
2013	200	ADL
2014	200	ADL
2015	200	ADL
Species Total	357,500	
Kemp's Largemouth Bass		
1975	80,000	FGL
Largemouth Bass		
1944	225,000	FGL
1945	61,000	FGL
1946	7,000	FGL
1947	14,500	FGL
1948	28,000	FGL
1949	34,000	FGL
1949	425,000	FRY
1951	34,000	FGL
1953	142,000	FGL
1954	8,000	FGL
1980	30,976	FGL
Species Total	1,009,476	

Table 4. Stocking history continued.

Year	Number	Size
Florida Largemouth Bass		
1975	200,000	FGL
1975	112,000	FRY
1976	25,000	FGL
1977	23,748	FGL
1977	200,000	FRY
1986	231,850	FGL
1997	109,950	FGL
1998	110,500	FGL
1999	327,191	FGL
2000	324,444	FGL
Species Total	1,664,683	
Smallmouth Bass		
1981	576,655	FGL
1982	452,372	FGL
1983	48,104	FGL
1987	6,800	FGL
Species Total	1,083,931	
Paddlefish		
1999	5,757	SADL
2000	20,846	SADL
2001	770	SADL
2002	16,792	SADL
2003	4,421	SADL
2004	26,330	SADL
2005	30,478	SADL
2006	10,920	SADL
2007	2,029	SADL
Species Total	118,343	
Rock Bass		
1945	21,000	FGL
1947	4,000	FGL
Species Total	25,000	
Walleye		
1968	50,400	FGL
1968	400	FRY
1969	500,000	FGL
1970	3,219,891	FRY
1975	8,398,000	FRY
1976	98,000	FGL
1976	180,000	FRY
1977	2,261,000	FRY
Species Total	14,707,691	
Striped Bass		
1965	138	FGL
1967	200,000	FRY
1968	5,000	FGL
1969	284,614	FGL
1970	77,640	FGL
1971	96,839	FGL
1972	208,340	FGL
1973	141,612	FGL
1974	548,898	FGL
1977	1,600	FGL
1984	490	FGL
1985	500	FGL
Species Total	1,565,671	
White Crappie		
1945	3,000	FGL
1946	28,000	FGL
1948	11,100	FGL
1953	12,000	FGL
Species Total	54,100	

Table 5. Objective-based sampling plan components for Texoma Reservoir, Texas-Oklahoma 2016 – 2017.

Gear/target species	Survey objective	Metrics	Sampling objective
Electrofishing			
Smallmouth Bass	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	W_r	10 fish/inch group (max)
Spotted Bass[a]	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	W_r	10 fish/inch group (max)
Largemouth Bass	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
	Condition	W_r	10 fish/inch group (max)
	Genetics	% FLMB	N = 30, any age
Bluegill [b]	Abundance	CPUE – Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad [b]	Abundance	CPUE – total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Prey availability	IOV	N ≥ 50
Low-frequency electrofishing			
Blue Catfish	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	Length frequency	N ≥ 50 stock
Trap netting			
White Crappie	Abundance	CPUE – Total	RSE ≤ 25
	Size structure	PSD, length frequency	N = 50
	Age-and-growth	Age at 10 inches	N = 13, 9.0 – 10.9 inches
Gill netting			
Striped Bass	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Age-and-growth	Mean length at age	10 fish/inch group (ODWC)
	Condition	W_r	10 fish/inch group (max)

Table 5. Objective-based sampling plan components continued.

White Bass	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	W_r	10 fish/inch group (max)
Channel Catfish	Abundance	CPUE– stock	RSE-Stock ≤ 25
	Size structure		N ≥ 50 stock

[a] No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Spotted Bass if not reached from designated Largemouth Bass sampling effort.

[b] 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.

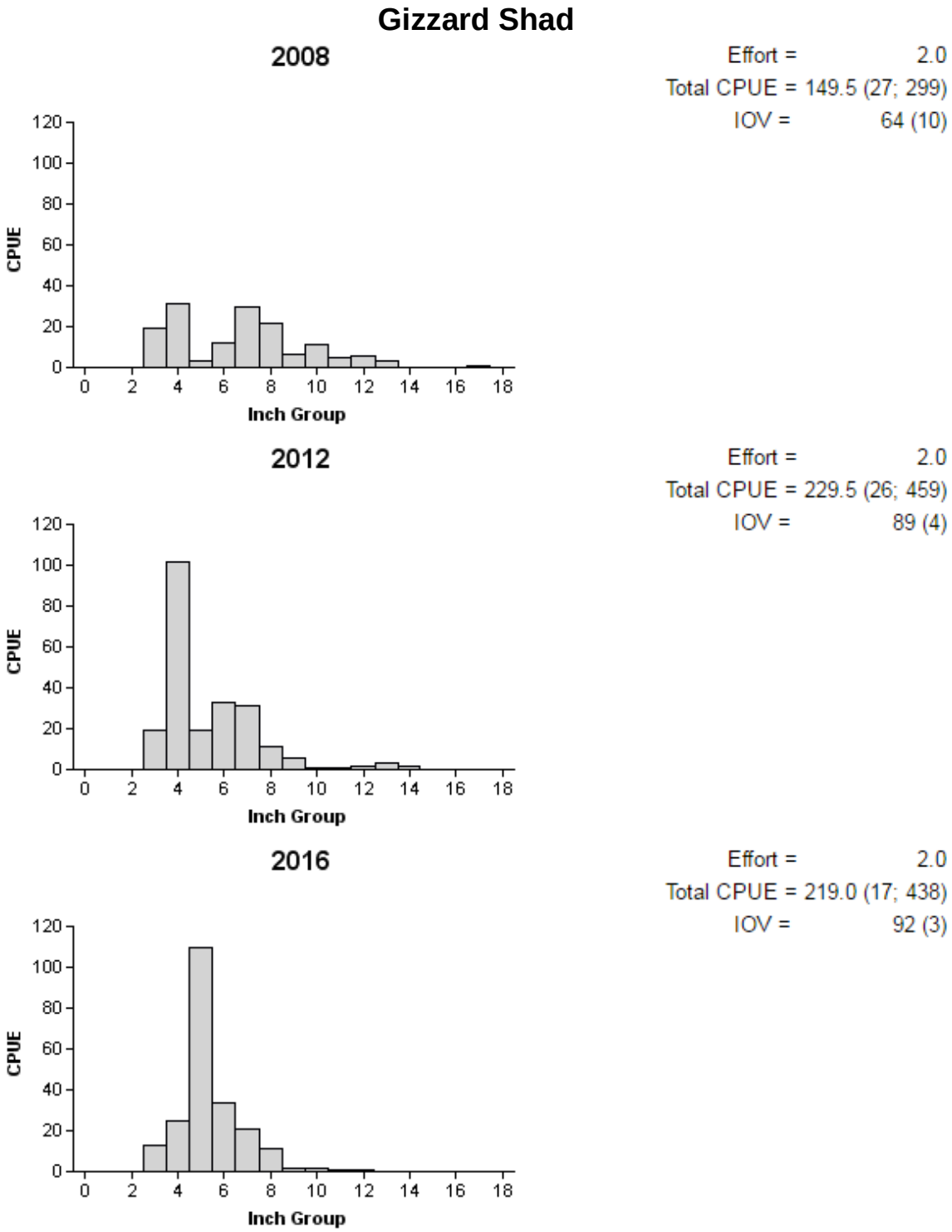


Figure 3. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Texoma Reservoir (Texas-side), 2008, 2012, and 2016.

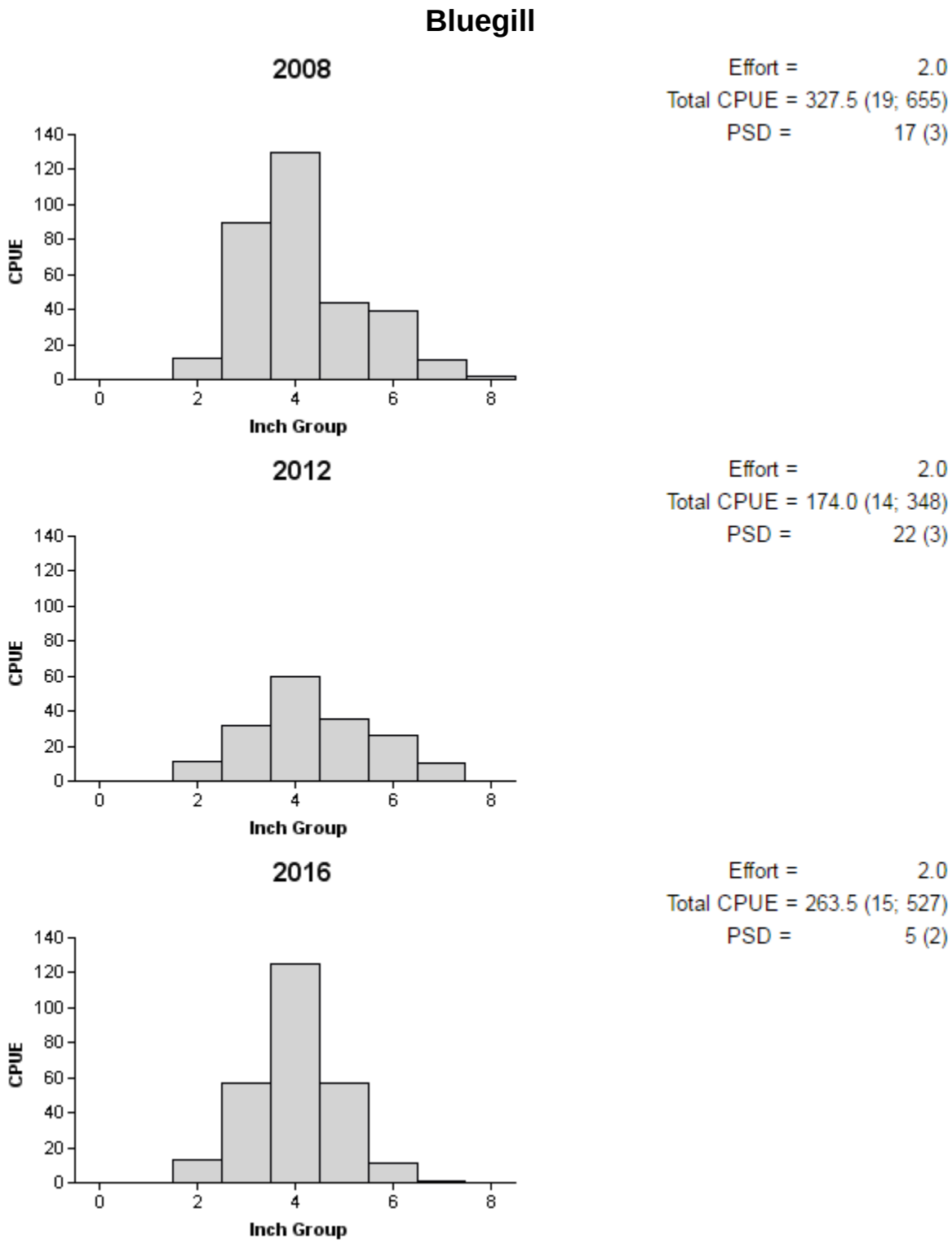


Figure 4. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Texoma Reservoir (Texas-side), 2008, 2012, and 2016.

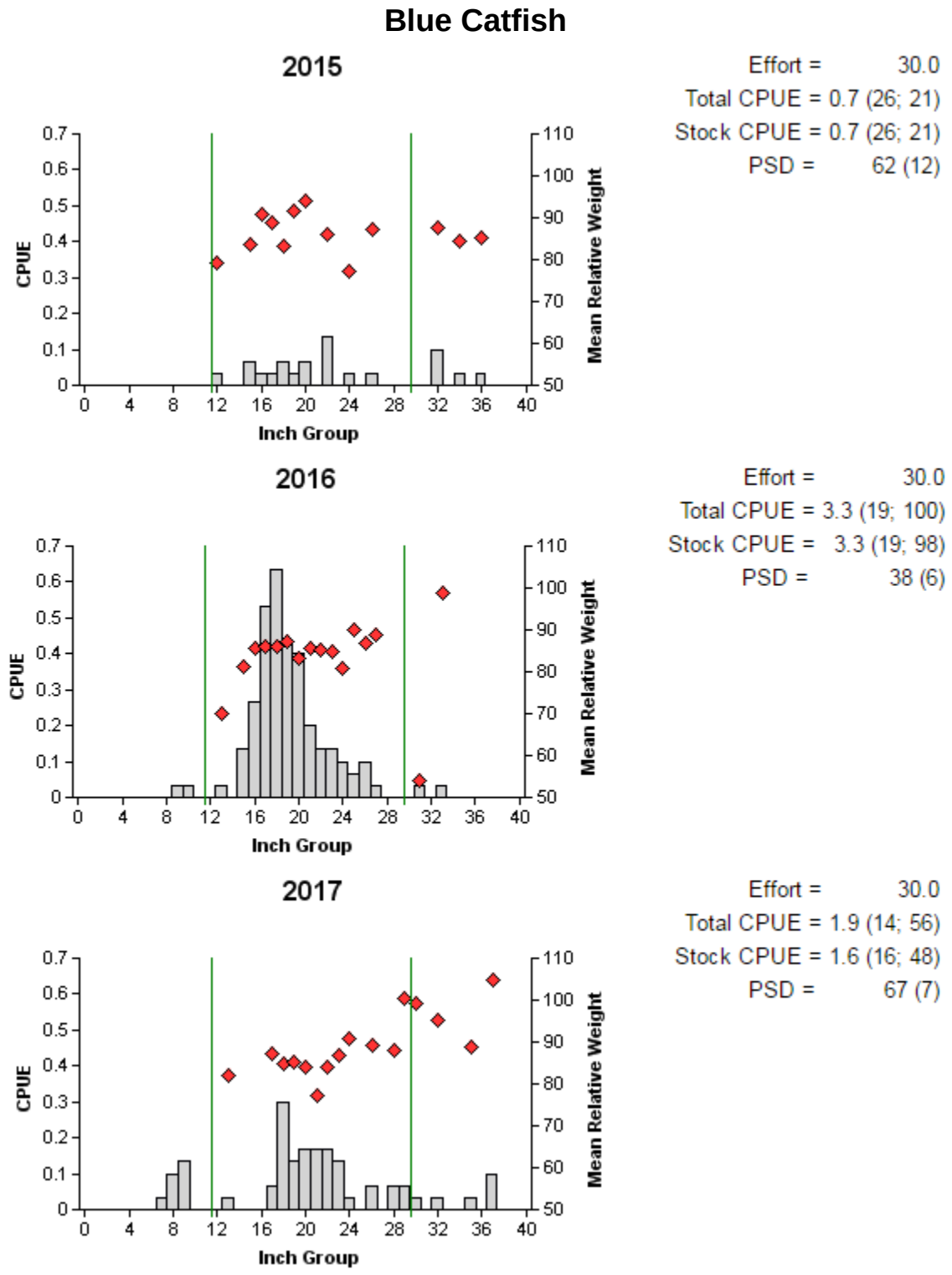


Figure 5. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Texoma Reservoir (entire reservoir), 2015, 2016, and 2017. Vertical lines represent length limits at time of collection.

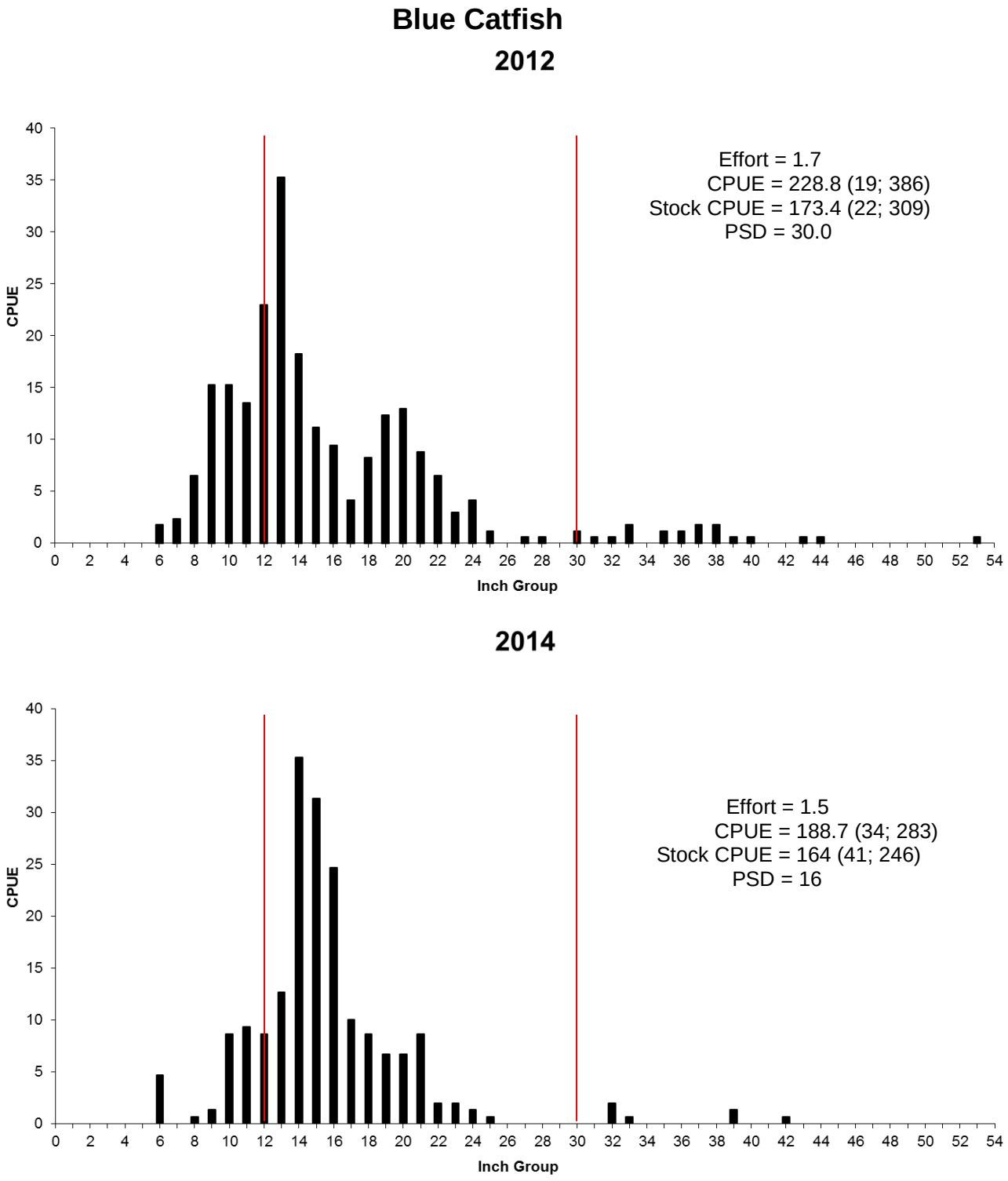


Figure 6. Number of Blue Catfish (CPUE, bars) caught with summer low pulse electrofishing survey, Texoma Reservoir (entire reservoir) 2012 and 2014. Survey conducted by Oklahoma Department of Wildlife Conservation and Texas Parks and Wildlife Department. Vertical lines represent length limits at time of collection.

Channel Catfish

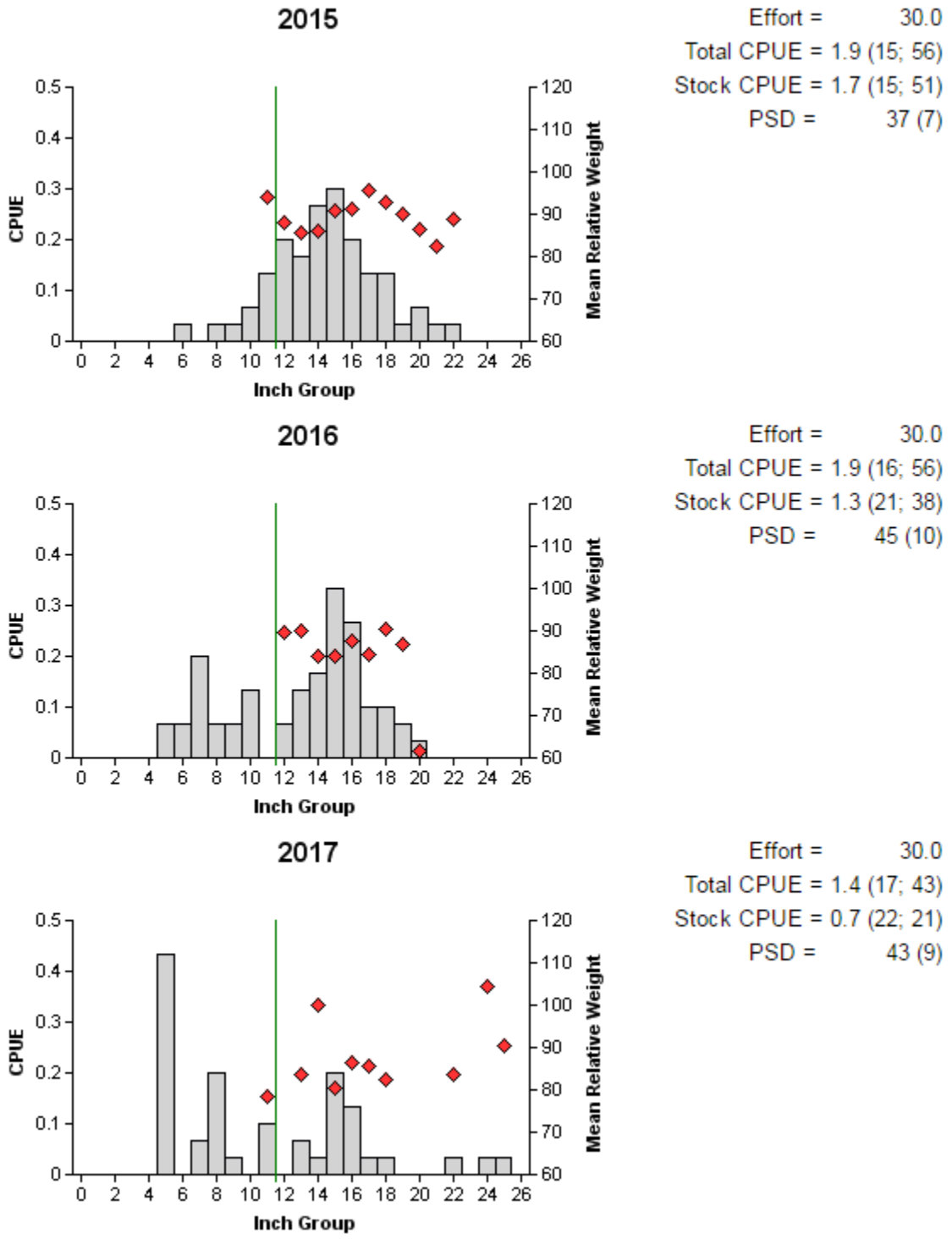


Figure 7. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys (entire reservoir) 2015, 2016, and 2017. Vertical line represents length limit at time of collection.

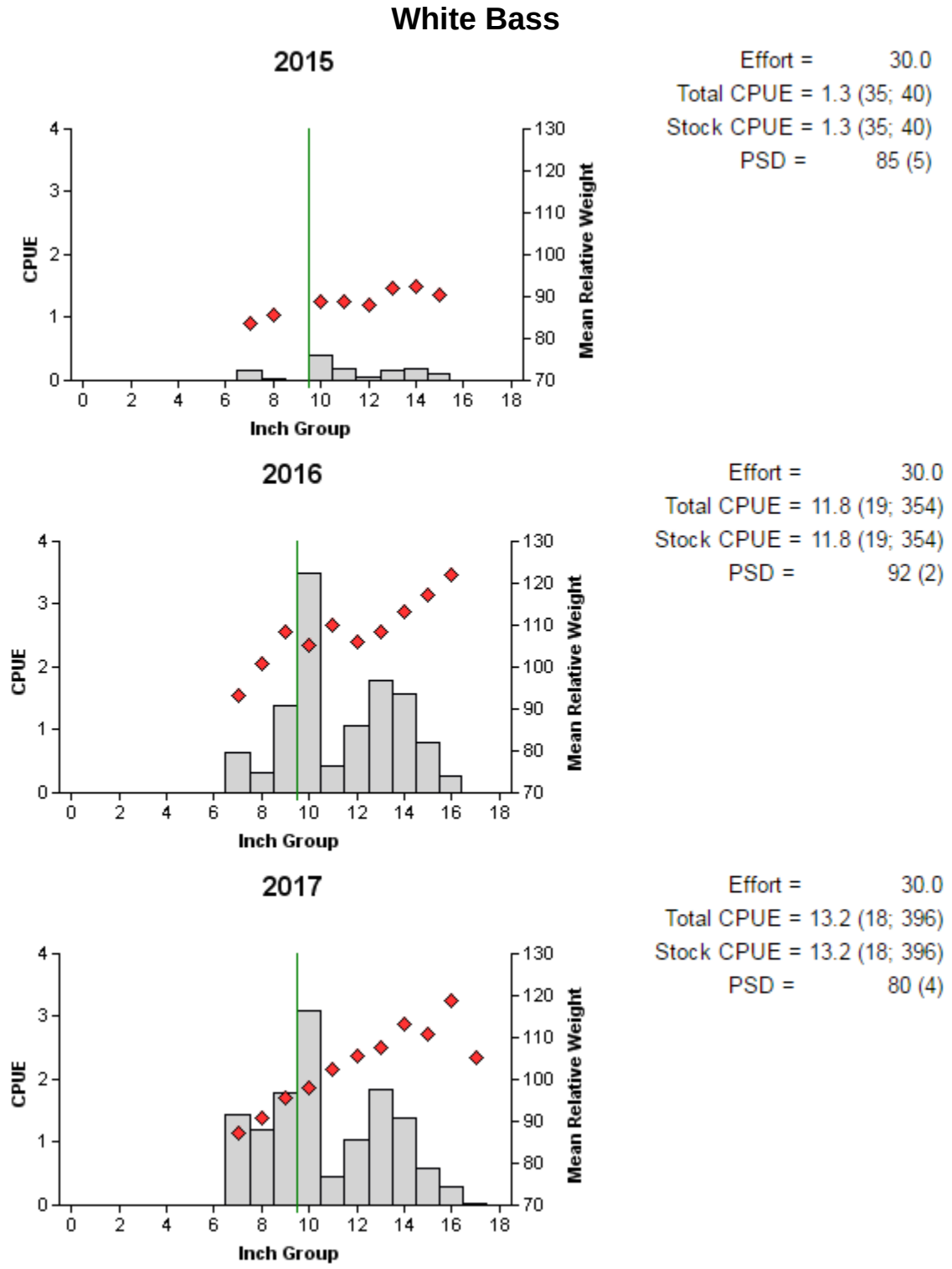


Figure 8. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Texoma Reservoir (entire reservoir) 2015, 2016, and 2017. Vertical line represents length limit at time of collection.

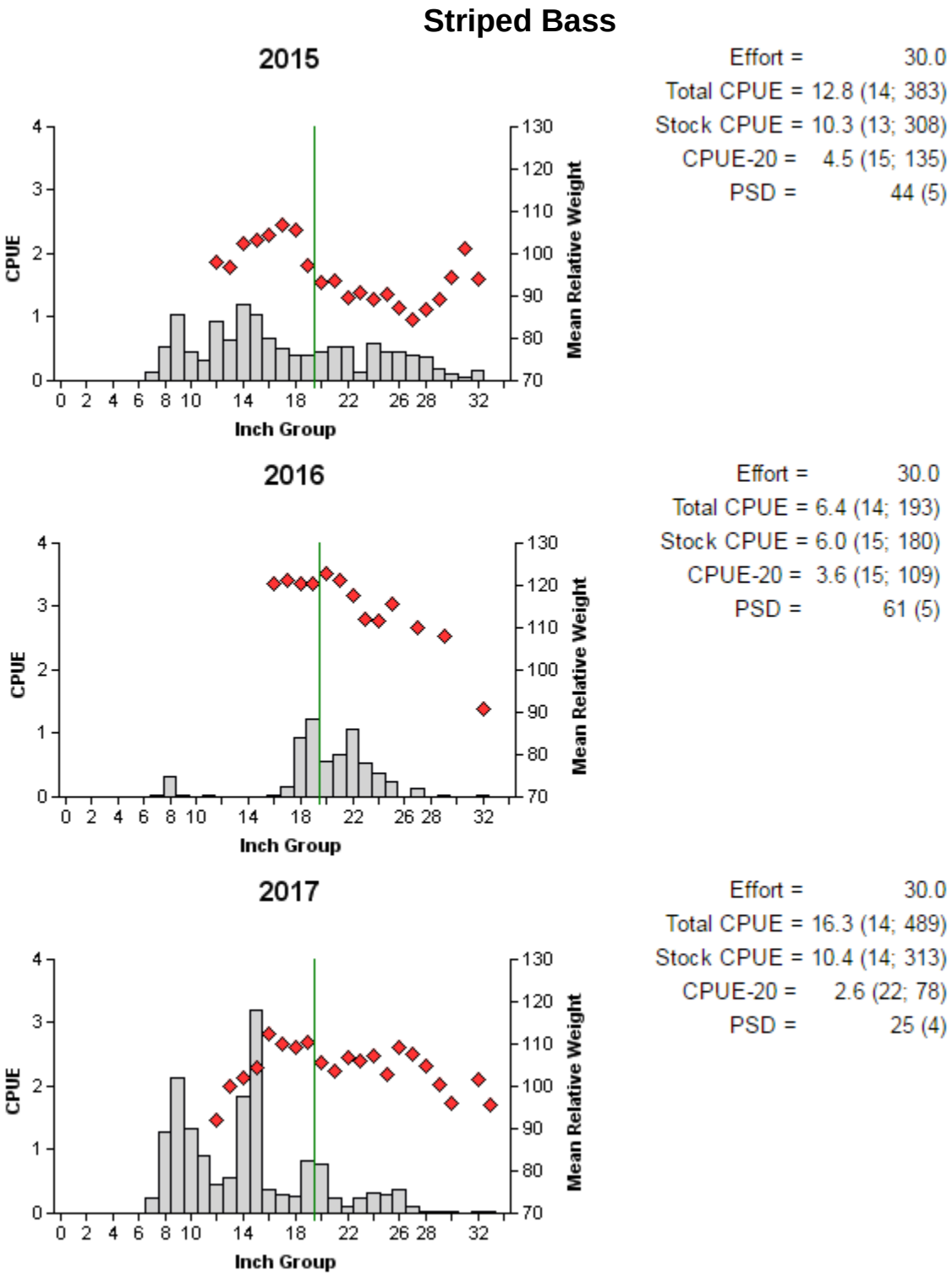


Figure 9. Number of Striped Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Texoma Reservoir (entire reservoir) 2015, 2016, and 2017. Vertical line represents length above which only 2 fish can be retained in the daily bag of 10 fish.

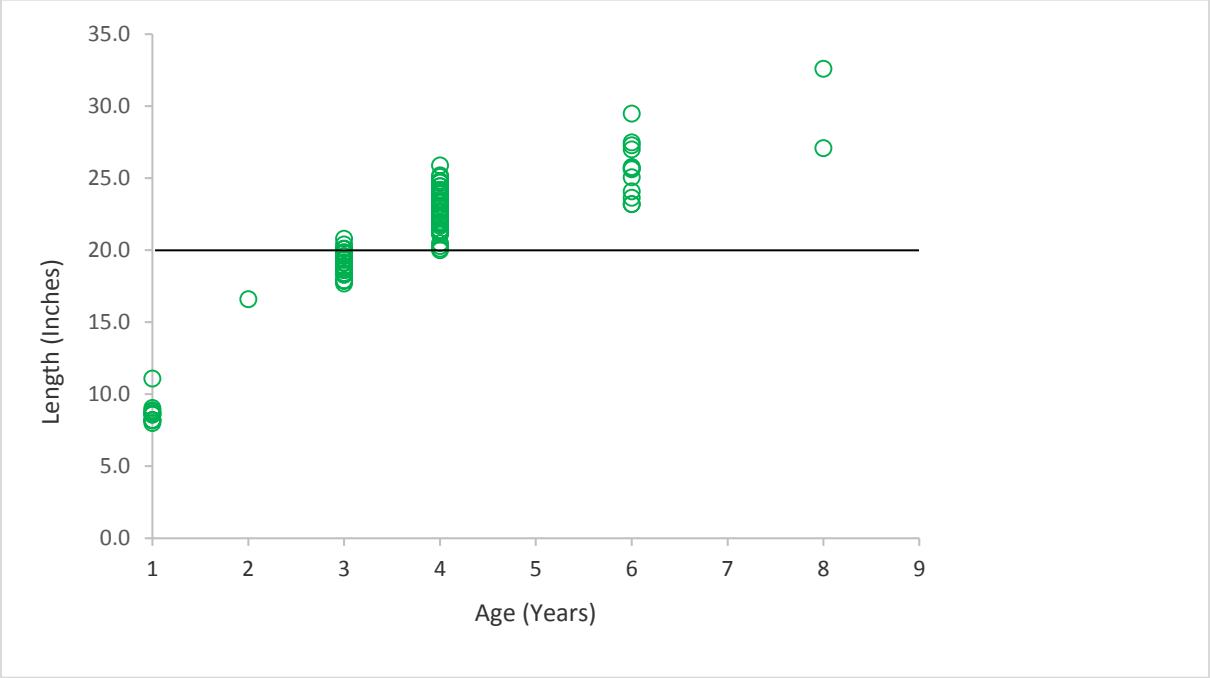


Figure 10. Length at age for Striped Bass (N = 105) collected from gill nets at Texoma Reservoir (entire reservoir) February 2016. Horizontal line represents length above which only 2 fish can be retained in the daily bag of 10 fish.

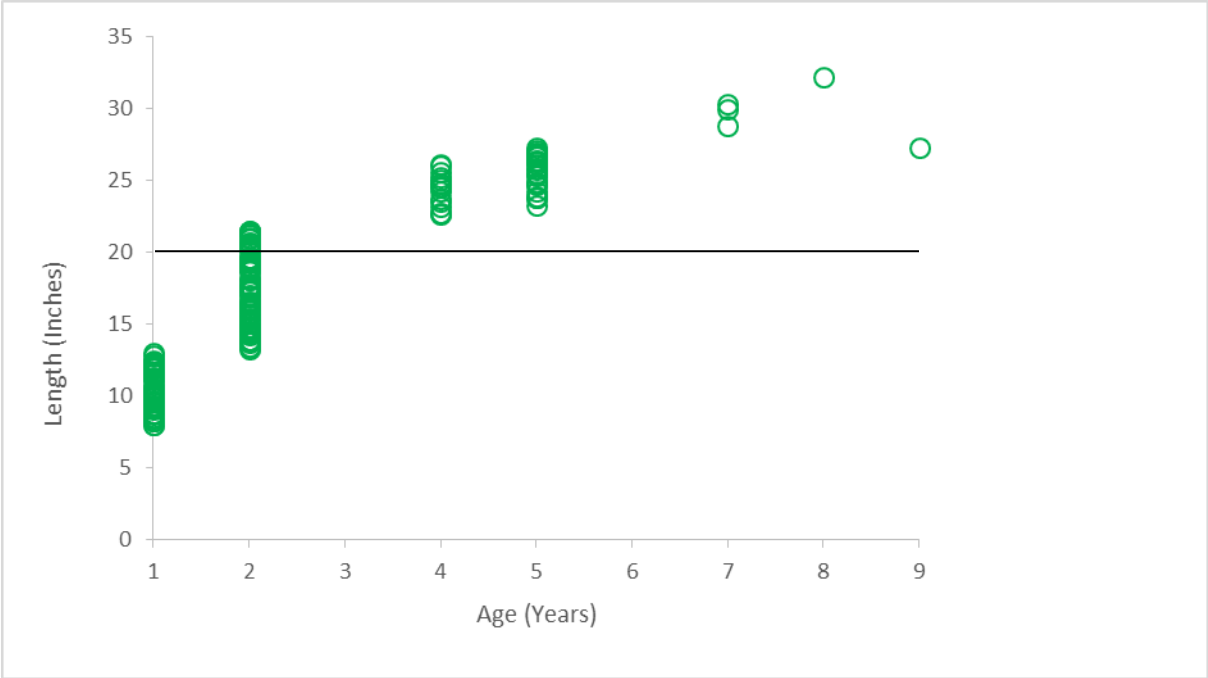


Figure 11. Length at age for Striped Bass (N = 189) collected from gill nets at Texoma Reservoir (entire reservoir) February 2017. Horizontal line represents length above which only 2 fish can be retained in the daily bag of 10 fish.

Smallmouth Bass

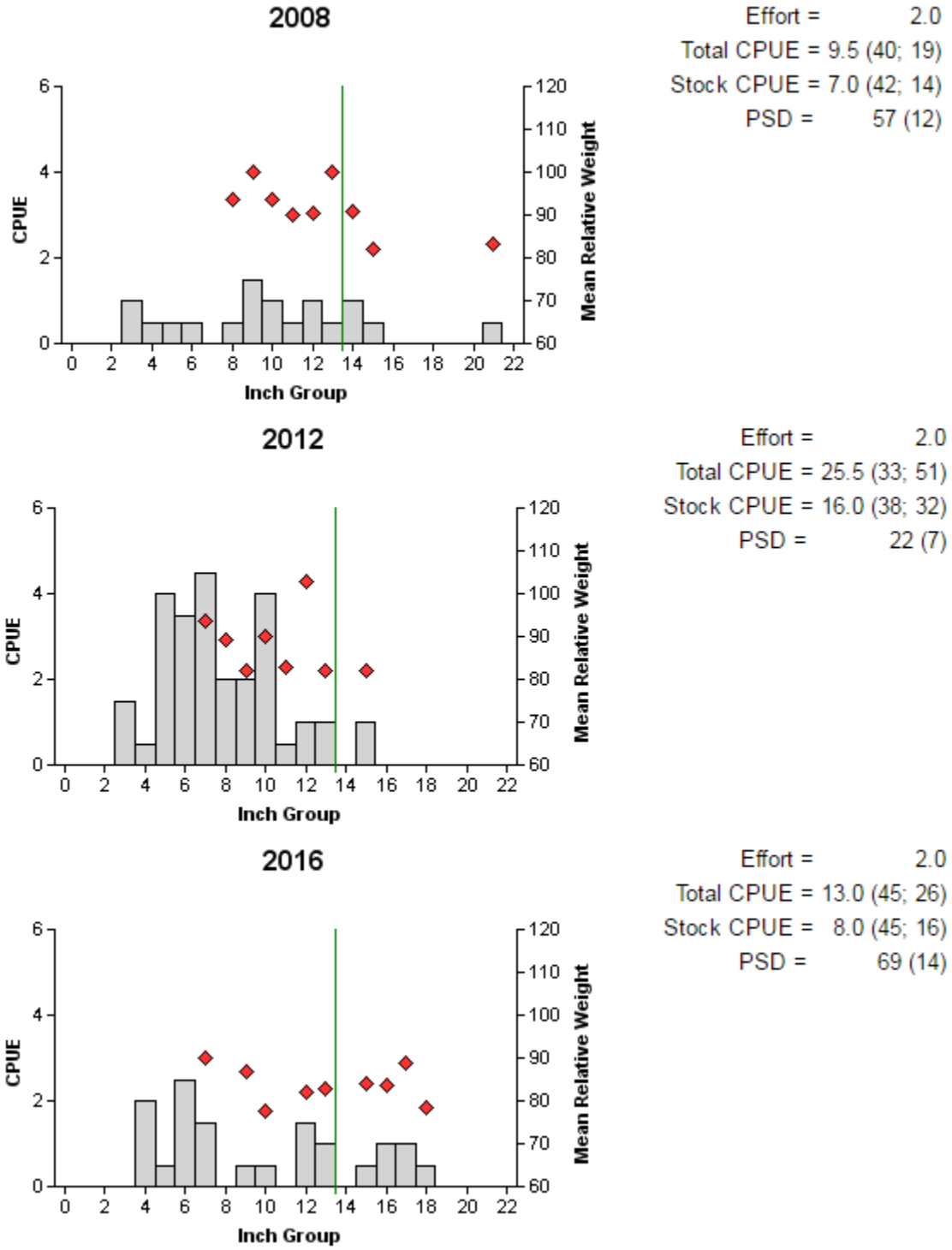


Figure 12. Number of Smallmouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys at randomly-selected stations, Texoma Reservoir (Texas-side) 2008, 2012, and 2016. Vertical line represents length limit at time of collection.

Smallmouth Bass

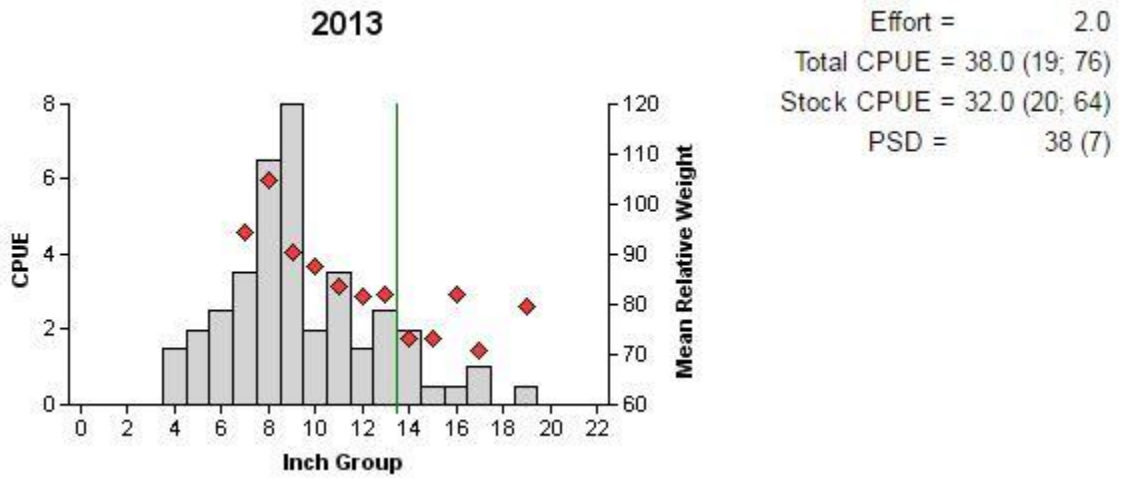


Figure 13. Number of Smallmouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for an electrofishing survey at biologist-selected stations, Texoma Reservoir (Texas-side), fall 2013. Vertical line represents length limit at time of collection.

Spotted Bass

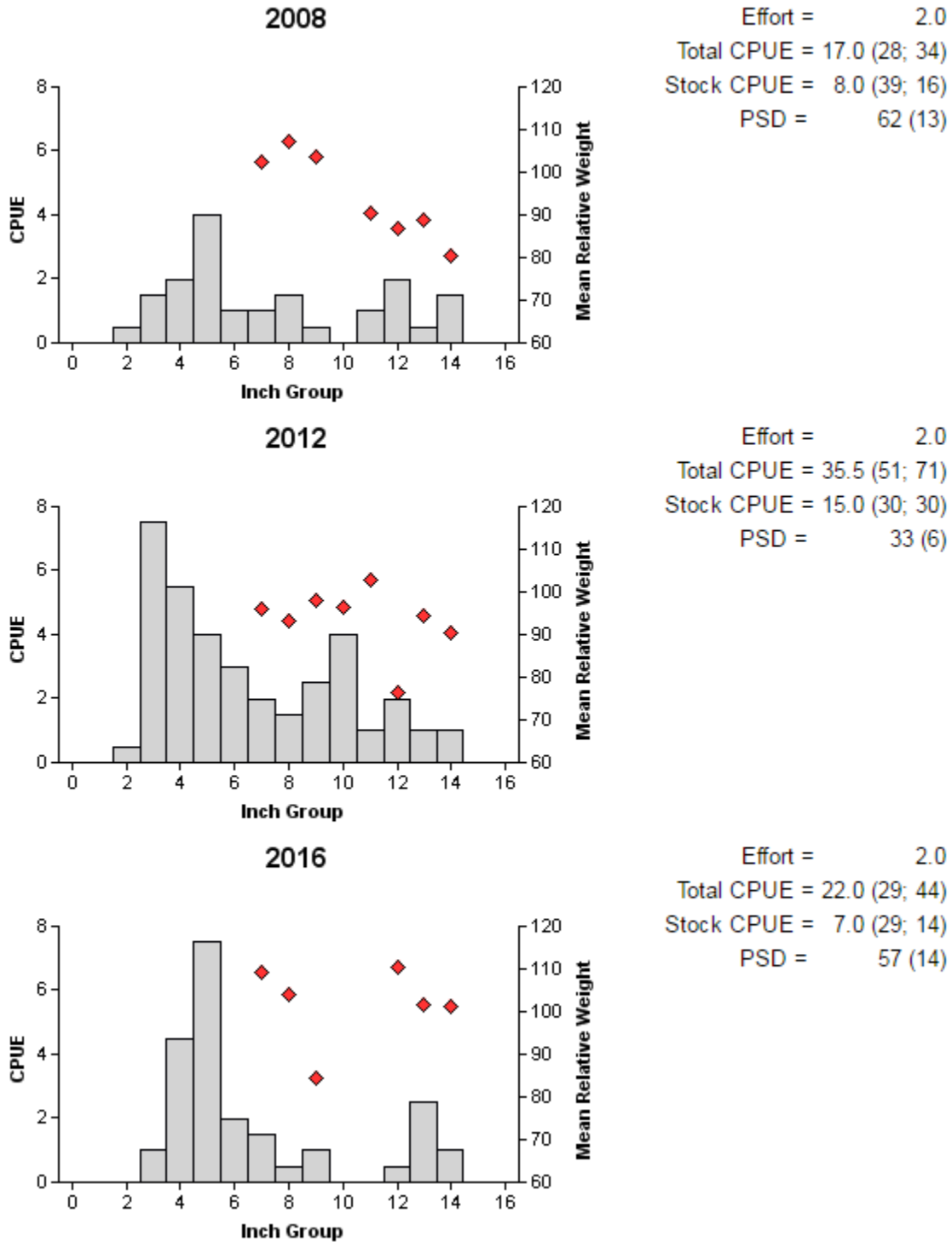


Figure 14. Number of Spotted Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Texoma Reservoir (Texas-side), 2008, 2012, and 2016.

Largemouth Bass

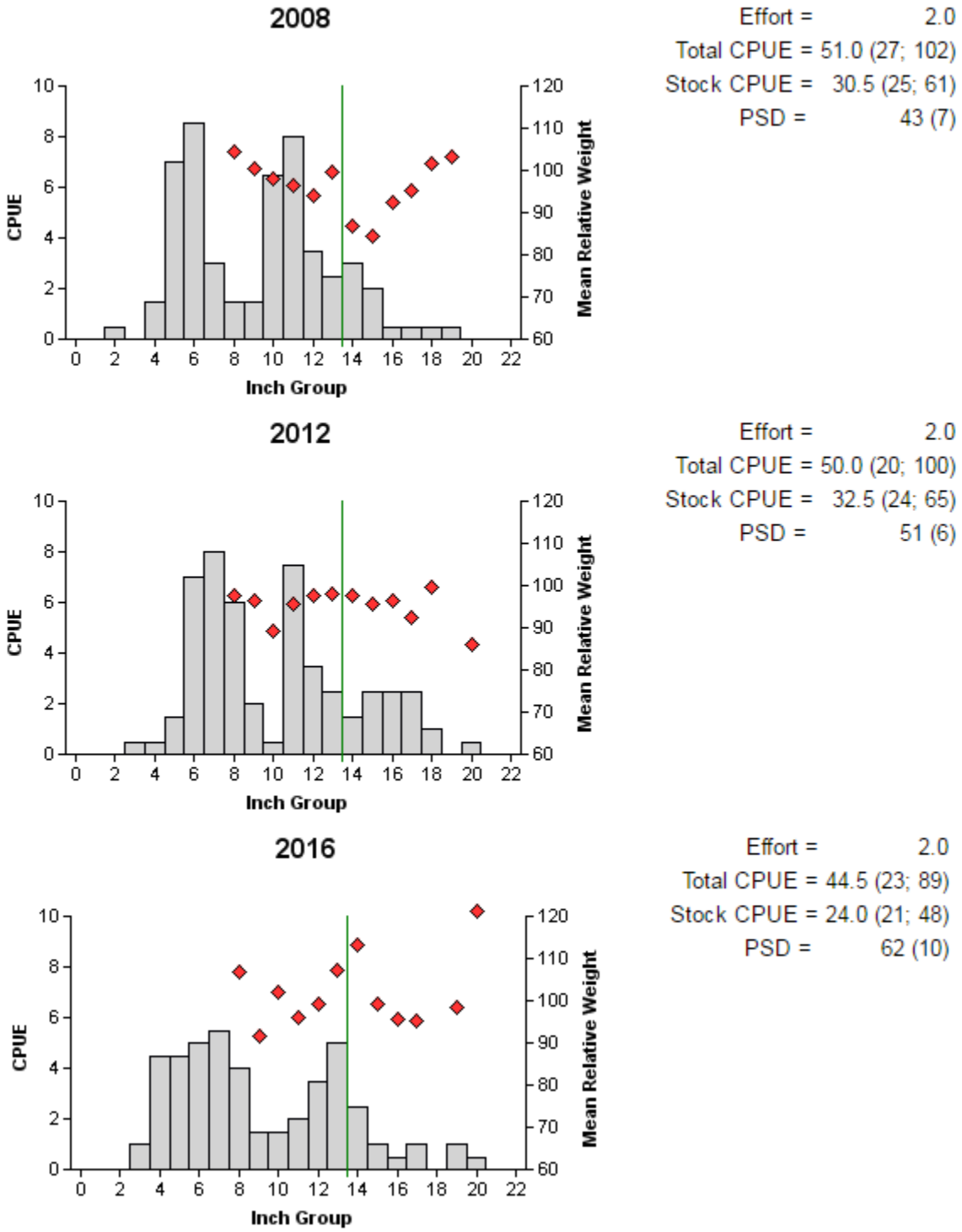


Figure 15. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Texoma Reservoir (Texas-side), 2008, 2012, and 2016. Vertical line represents length limit at time of collection.

Table 6. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Texoma Reservoir (Texas-side). FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB. Genetic composition was determined with micro-satellite DNA analysis.

		Number of fish					
Year	Sample size	FLMB	F1	Fx	NLMB	% FLMB alleles	% pure FLMB
2008	30	0	NA	26	4	20	0
2016	30	0	0	22	8	23	0

White Crappie

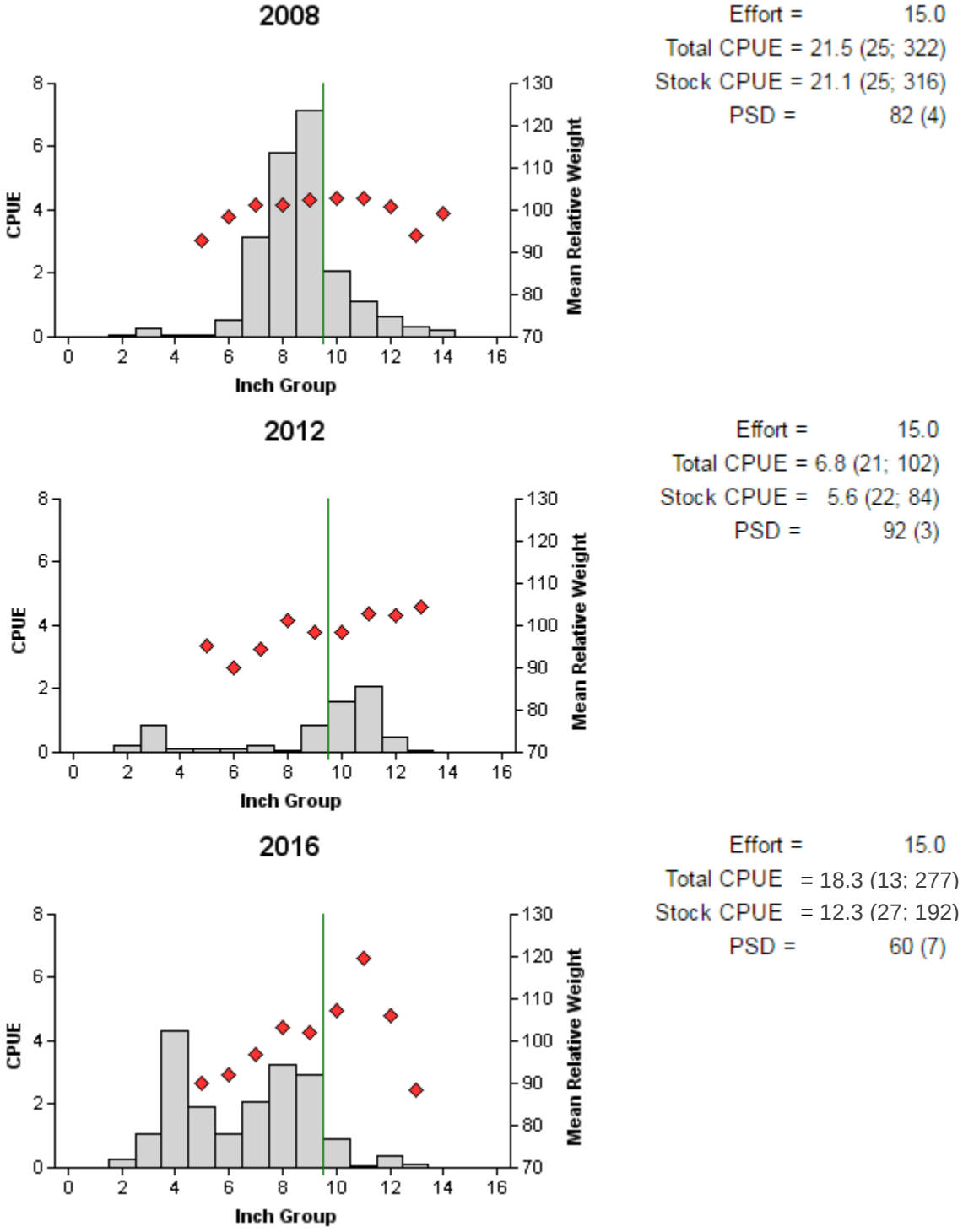


Figure 16. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Texoma Reservoir (Texas-side) 2008, 2012, and 2016. Vertical line represents length limit at time of collection.

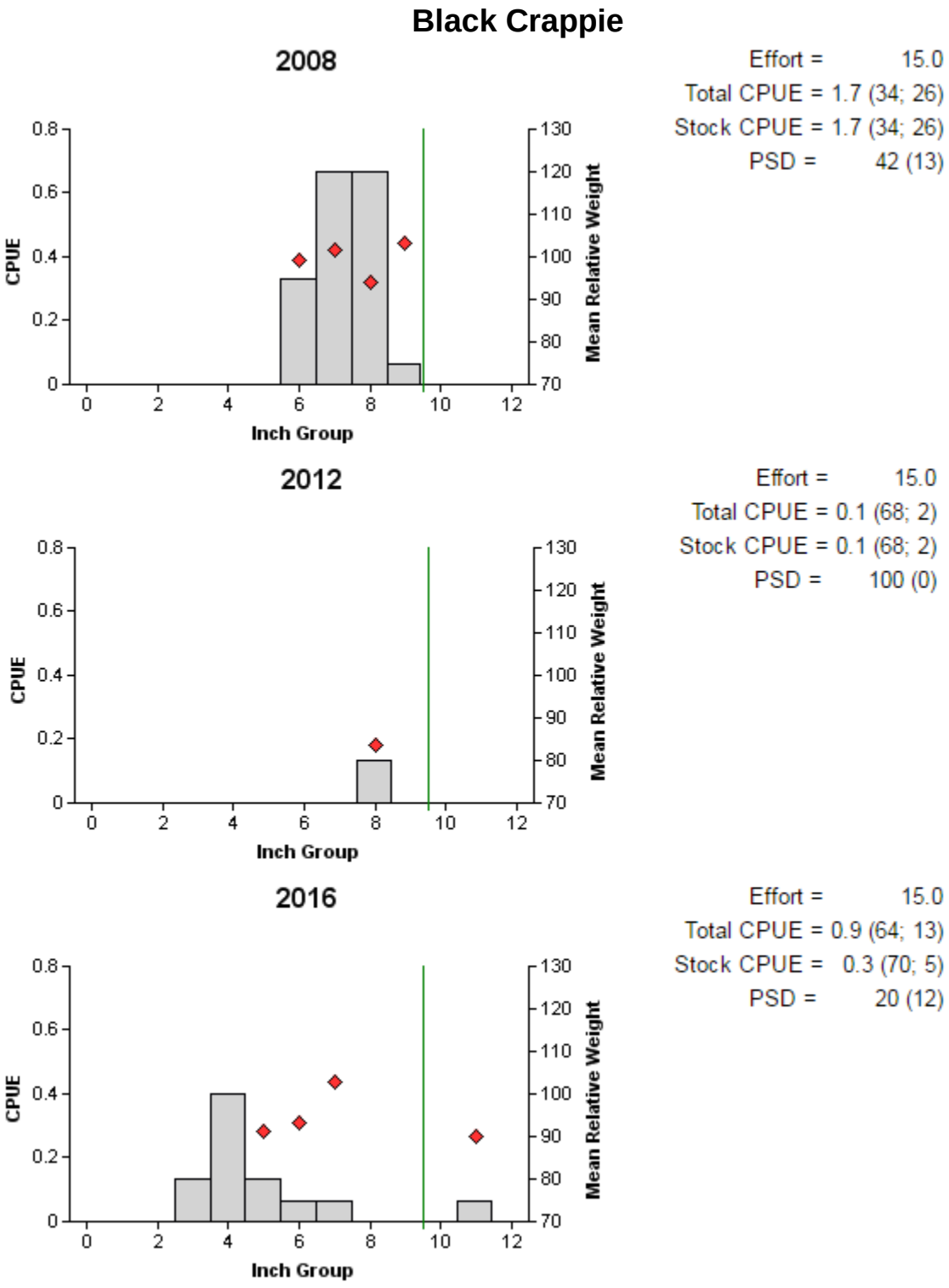


Figure 17. Number of Black Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Texoma Reservoir (Texas-side) 2008, 2012, and 2016. Vertical lines represent length limit at time of collection.

Table 7. Proposed sampling schedule for Texoma Reservoir. Survey period is June through May. Gill netting surveys are conducted in February, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

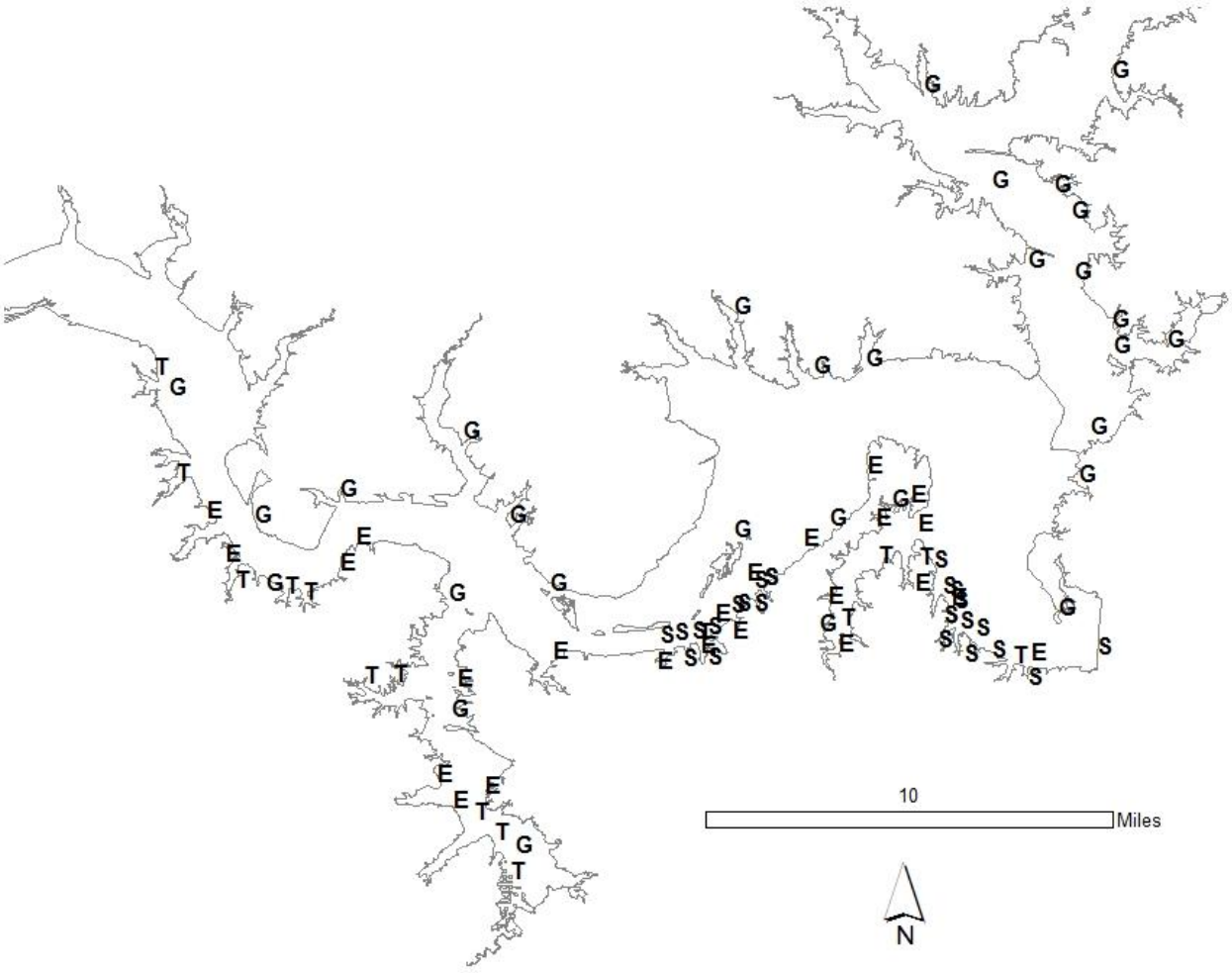
					Habitat				
Survey year	Electrofish	Electrofish (Low-pulse)	Trap net	Gill net	Structural	Vegetation	Access	Creel survey	Report
2017-2018	A	A		A					
2018-2019				A				A	
2019-2020				A					
2020-2021	S		S	S	S	S	S		S

Appendix A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Texoma Reservoir, Texas, 2016-2017. Sampling effort was 30 net nights for gill netting, 15 net nights for trap netting, and 2 hours for electrofishing.

	Gill Netting		Trap Netting		Electrofishing	
Species	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					438	219
Threadfin Shad					42	21
Blue Catfish	57	1.9				
Channel Catfish	42	1.4				
White Bass	396	13.2				
Striped Bass	489	16.3				
Green Sunfish					31	15.5
Warmouth					1	0.5
Bluegill Sunfish					527	263.5
Longear Sunfish					60	30
Redear Sunfish					4	2
Smallmouth Bass					26	13
Spotted Bass					44	22
Largemouth Bass					89	44.5
White Crappie			277	18.5		
Black Crappie			13	0.9		

Appendix B



Location of sampling sites, Texoma Reservoir 2013-2017. Electrofishing, gill netting, and trap netting stations are indicated by E, G, and T, respectively. Smallmouth Bass specific electrofishing stations are indicated by S. Electrofishing and trap netting stations are limited to the Texas-side of the reservoir, while gill netting stations are reservoir-wide. Water level was near conservation level for all sampling.

Appendix C

Catch rates (CPUE) of targeted species by gear type and year for Texoma Reservoir.

		Year						
Gear	Species	1993[a]	1994[a]	1995[b]	1996[b]	1997[b]	1998[b]	1999[b]
Gill Netting[c]	Blue Catfish	1.3	0.3	1.0	1.3	0.1	0.3; 1.1	0.6; 1.6
Winter; Spring	Channel Catfish	1.6	1.2	2.1	1.1	0.7	1.1; 1.3	1.8; 3.5
	Flathead Catfish	<0.1	0.3	<0.1	0.0	<0.1	0.2; 0.3	<0.1; 0.1
	White Bass	8.7	6.1	3.2	11.1	2.6	10.3; 1.3	2.2; 0.9
	Striped Bass	16.1	19.0	11.0	12.5	17.7	19.3; 3.3	18.2; 3.1
	Palmetto Bass	0.0	<0.1	0.0	0.0	0.0	0.0; 0.0	0.0; 0.0
Electrofishing[d]	Gizzard Shad	215.5; 193.5	211.5; 152.0	134.0	161.5	191.0	204.0	228.0
Spring; Fall	Threadfin Shad	103.0; 20.5	22.5; 6.0	121.0	3.5	5.5	11.0	28.0
	Green Sunfish	10.0; 11.5	48.5; 21.5	13.5	4.0	0.0	17.5	23.0
	Warmouth	1.5; 10.5	10.5; 6.0	3.0	1.0	0.5	1.0	2.5
	Bluegill Sunfish	181.5; 259.0	261.0; 295.5	315.0	110.0	127.5	92.5	209.0
	Longear Sunfish	17.0; 38.5	26.5; 44.0	28.5	24.5	35.5	8.5	57.0
	Redear Sunfish	7.5; 12.5	4.0; 8.0	5.5	7.5	9.0	0.5	1.0
	Smallmouth Bass	22.0; 31.5	27.0; 33.5	27.0	9.0	2.5	9.5	8.0
	Spotted Bass	21.0; 41.0	25.5; 53.0	42.5	21.5	19.5	21.0	23.0
	Largemouth Bass	72.5; 116.0	76.5; 96.5	155.5	40.5	65.0	37.5	65.5
Trap Netting	White Crappie	7.3	5.8	10.1	1.6	1.0	1.3	2.7
	Black Crappie	0.2	0.0	0.2	0.0	0.3	0.0	0.1

[a]Electrofishing, gill netting, and trap netting sampling sites were subjectively selected.
[b]Electrofishing and trap netting sampling sites were randomly selected, and gill netting sampling sites were subjectively selected.
[c]Gill netting in 1998 and 1999 was conducted in winter and spring. Gill netting in all other years was conducted in winter.
[d]Electrofishing in 1993 and 1994 was conducted in spring and fall. Electrofishing in all other years was conducted in fall.

Appendix C (continued)

Catch rates (CPUE) of targeted species by gear type and year for Texoma Reservoir.

		Year									
Gear	Species	2000	2001	2002	2003	2004	2005[f]	2006	2007	2008	2009
Gill Netting[e]	Blue Catfish	0.3	0.8; 0.1	0.4	0.2	0.3	0.2; 0.8	0.5	0.3	0.7	0.9
Winter; Spring	Channel Catfish	0.8	2.2;1.7	1.6	2.0	1.8	1.6; 1.1	1.9	1.3	2.2	2.4
	Flathead Catfish		0.2		0.1	0.1	0.0; 0.2			0.1	0.1
	White Bass	6.7	2.4;0.9	1.9	5.0	0.9	4.5; 0.1	2.6	4.1	6.4	5.3
	Striped Bass	18.9	24.9;10.7	19.3	21.7	24.4	22.3; 9.3	25.2	22.5	19.9	23.4
	Palmetto Bass		0.1								
Electrofishing	Gizzard Shad	245.5				221.5				149.5	
	Threadfin Shad	57.5				37.0				56.0	
	Green Sunfish	25.0				17.5				24.5	
	Warmouth	5.0				2.5				5.5	
	Bluegill Sunfish	166.5				151.5				327.5	
	Longear Sunfish	57.5				41.5				57.0	
	Redear Sunfish	2.0				7.5				12.0	
	Smallmouth Bass	4.5				3.0	17.3			9.5	
	Spotted Bass	36.5				42.0	29.4			17.0	
	Largemouth Bass	38.5				46.0	24.2			51.0	
Trap Netting	White Crappie	1.8	3.9	5.5	5.5	27.1			14.7	21.5	
	Black Crappie	0.2	0.0	0.0	0.2	0.2			1.3	1.7	

[e]Gill netting in 2001 and 2005 was conducted in winter and spring. Gill netting in all other years was conducted in winter.
[f]Combined daytime and nighttime electrofishing at subjectively selected sites.

Appendix C (continued)

Catch rates (CPUE) of targeted species by gear type and year for Texoma Reservoir.

Gear	Species	Year								
		2010	2011	2012	2013	2014	2015	2016	2017	**Avg (1993-2017)**
Gill Netting	Blue Catfish	0.3	1.5	0.8	0.6	0.2	0.7	3.3	1.9	**0.8**
	Channel Catfish	1.3	3.4	2.3	2.3	1.9	1.9	1.9	1.4	**1.7**
	Flathead Catfish		<0.1		<0.1			0.2		**0.1**
	White Bass	4.0	5.7	5.7	4.8	5.27	1.3	11.8	13.2	**5.4**
	Striped Bass	19.1	11.6	22.6	15.9	21.83	12.77	6.4	16.3	**18.5**
	Palmetto Bass									**0.0**
Electrofishing	Gizzard Shad			229.5				219.0		**200.9**
	Threadfin Shad			972.5				21.0		**119.9**
	Green Sunfish			23.5				15.5		**18.5**
	Warmouth			4.5				0.5		**3.2**
	Bluegill Sunfish			174.0				263.5		**198.3**
	Longear Sunfish			16.5				30.0		**33.3**
	Redear Sunfish			5.0				2.0		**5.3**
	Smallmouth Bass			25.5	38.0	31.7;19.0		13.0		**15.0**
	Spotted Bass			35.5		6.0		22.0		**25.9**
	Largemouth Bass			50.0		11.3		44.5		**55.6**
Low-frequency Electrofishing	Blue Catfish			228.8		188.7				**323.2**
	Channel Catfish					14				**14**
	Flathead Catfish					5				**5**
Trap Netting	White Crappie			6.8				18.47		**8.4**
	Black Crappie			0.1				0.87		**0.3**

Appendix D

Catch statistics for juvenile Striped Bass in June seine hauls (ODWC).

Year	Hauls	Min	Max	Mean
2000	30	0	110	27.7
2001	80	0	306	45.0
2002	40	1.5	210	54.7
2003	40	0	271	27.5
2004	40	0	665	127.5
2005	60	0	4	0.4
2006	40	0	238	49.8
2011	40	0	5	0.4
2012	20	4	160	43.4
2014	19	0	5	0.3
2016	19	1	311	78.3
2017	10	17	113	64.0

Appendix E

Results from individual and team format black bass tournaments at Texoma Reservoir 2016 - 2017. Only tournaments with 5-fish bag limits and ≥ 50 participants or teams were included. Weights are averages expressed in pounds.

Year	N	1st place weight	2nd place weight	3rd place weight	% total daily weights >15lbs.	Big Bass weight
			Team			
2016	6	19.6	18.6	17.4	15.3	7.2
2017	5	22.5	19.5	18.5	19.0	7.3*
			Individual			
2016	2	16.3	14.5	13.9	14	5.3

*average weight includes 5.4 pound Smallmouth Bass.