PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

Lake Tawakoni

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Tawakoni were surveyed in 2014 using electrofishing and in 2015 using gill netting. An access-point creel survey was conducted from June 2013 through May 2014. An angler opinion survey was conducted from July 2013 through June 2014 to gauge the support of catfish anglers for a regulation change to protect trophy Blue Catfish from harvest. This report summarizes the results of the surveys and contains a management plan for the reservoir.

- **Reservoir description:** Lake Tawakoni is a 37,325-acre reservoir located in Van Zandt, Rains, and Hunt Counties, Texas, on South Fork and Cowleech Fork of the Sabine River and Caddo Creek. The reservoir was constructed by the Sabine River Authority to provide water for municipal and industrial uses and for recreational purposes.

- **Management history:** Important sport fishes in Lake Tawakoni include Striped Bass, Hybrid Striped Bass (Palmetto Bass and Sunshine Bass), White Bass, Blue Catfish, Channel Catfish, Black Crappie, White Crappie, and Largemouth Bass. Annual requests are submitted to stock Striped Bass and Palmetto Bass and/or Sunshine Bass to maintain these fisheries.

- **Fish community**
  - **Prey species:** Lake Tawakoni contains populations of both Gizzard Shad and Threadfin Shad of appropriate size to provide prey for sport fish. Catches of sunfishes such as Bluegill, and Longear Sunfish were reduced because of poor aquatic habitat conditions resulting from reduced lake elevation at the time of sampling.

  - **Catfishes:** Lake Tawakoni continues to support quality fisheries for Blue Catfish and Channel Catfish which were responsible for the highest directed angling effort. Blue Catfish remain more abundant in population surveys than Channel Catfish although more Channel Catfish were harvested in creel surveys. Both species exhibited lower catch rates in 2015 than in previous surveys. Anglers were overwhelmingly in support of restricting harvest of large Blue Catfish.

  - **Temperate basses:** Lake Tawakoni contains a diverse mix of temperate bass species including White Bass, Striped Bass, Palmetto Bass and Sunshine Bass supported by an ample prey base and abundant open water habitat. This combined species group is second in popularity at Lake Tawakoni. Annual requests are submitted to stock Striped Bass and Palmetto Bass and/or Sunshine Bass.

  - **Largemouth bass:** Catches of Largemouth Bass in electrofishing were low because of poor aquatic habitat resulting from low lake elevation at the time of sampling. Directed effort for Largemouth Bass was the lowest of any species or species group and tournament fishing accounted for less than 5% of directed effort for Largemouth Bass.

  - **Crappie:** Directed angler effort for crappie was responsible for the third highest angler effort and fishing pressure was substantially higher in 2013-2014 as compared with 2008-2009. Although angler catch rate was lower, harvest was over three times higher than before. Almost twice as many White Crappie were harvested as compared with Black Crappie.

- **Management strategies:** Requests for stockings of Striped Bass and Palmetto and/or Sunshine Bass will continue annually. An optional gill net survey will be conducted in Spring 2017, general monitoring involving gill netting and electrofishing surveys will be repeated in 2018-2019, and an access creel survey will be conducted in 2017-2018. An aquatic vegetation survey will be conducted in 2018 and annual surveys will be performed to check for the presence of water hyacinth.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Tawakoni from June 2014 through May 2015. Its purpose 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 2014-2015 data for comparison.

Reservoir Description

Lake Tawakoni is 37,325-acre impoundment of the Sabine River in Van Zandt, Rains, and Hunt Counties, Texas. The reservoir was constructed by the Sabine River Authority (SRA) in 1960 as water supply for municipal, industrial, and recreational uses. At conservation pool elevation (CPE), Lake Tawakoni has a surface area of 37,325 ac, a shoreline length of 200 mi, and a mean depth of 12 ft. The elevation of Lake Tawakoni increased to within 0.5 feet of CPE in April 2012, followed by decline to the second lowest level (425.48 ft msl) in the past 14 yr in December 2014. By the end of May 2015 the lake elevation was above CPE and water was overflowing the spillway as a result of an unseasonably wet spring (Figure 1). The reservoir is hypereutrophic with a mean trophic state index chl-*a* of 64.38 µg/L (Texas Commission on Environmental Quality 2011). Other descriptive characteristics for Lake Tawakoni are shown in Table 1.

Angler Access

Boat access is available at numerous public and private boat ramps located around the lake. Bank fishing access is present near all public boat ramps, and in privately-owned facilities. Additional boat ramp characteristics are in Table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Storey 2011) included:

1. Monitor the Catfish fishery.
   Action: A supplemental gill netting survey was conducted in spring 2013 to monitor the Blue Catfish population and an access point creel was completed from June 2013 through May 2014. In addition, an age and growth sample of 262 Blue Catfish was collected using gill netting, low frequency electrofishing and angler-caught fish. Angler opinions were surveyed through the Lake Tawakoni Catfish Angler Survey.
2. Monitor Lake Tawakoni's temperate bass fisheries.
   Action: Annual requests for stockings of Striped Bass and Palmetto and/or Sunshine Bass were submitted. Data on angler effort, catch and harvest of temperate bass was collected in the access point creel conducted from June 2013 through May 2014. The Lake Tawakoni Sportsman's Association contact District personnel each year to inquire about the need to purchase Sunshine Bass fingerlings to supplement annual stockings.
3. Monitor the Largemouth Bass population
   Action: Fall electrofishing to assess the Largemouth Bass population every 2 yr was discontinued and sampling was extended to a 4-yr interval. Habitat conditions in fall 2014 during electrofishing sampling were poor because of low lake elevation resulting in low bass catch rates. Few fish were collected which precluded an assessment of age and growth or genetic analysis.
4. Promote Lake Tawakoni fisheries resources
   Action: Numerous contacts were made with outdoor writers requesting information for articles on the Blue Catfish fishery and temperate bass fisheries.
5. Invasive species awareness
   Action: The Sabine River Authority posted warnings using painted stencils on the surface of select boat ramps on Lake Tawakoni to increase angler awareness of invasive species. Kevin Storey gave a "Zebra mussel update" presentation to the Texas Clean Rivers Program Sabine

River Basin Steering Committee meeting in Emory in April 2014 and to the Tawakoni Bass Club in May 2014.

Harvest regulation history: Sport fishes in Lake Tawakoni are currently managed with TPWD statewide regulations (Table 3).

Stocking history: Annual requests for Striped Bass and Palmetto Bass stockings at a rate of 5/acre were submitted through 2012 although no Striped Bass were stocked in 2011 or 2012 and Palmetto Bass stockings in the same years were less than 50% of the requested amounts. In 2013, the requested stocking rate was increased to 10/ac in an attempt to compensate for irregular stockings in the previous two years. Since 2013 Striped Bass fingerlings have been stocked annually along with over 1 million fry. Palmetto Bass fingerlings were stocked in 2013 and 2014 and Sunshine Bass were substituted in 2015. In 2015, over 1 million Palmetto Bass and Sunshine Bass fry each were stocked in Lake Tawakoni. The Lake Tawakoni Sportsman's Association (LTSA) has purchased Sunshine Bass in 2004 (139,000), 2007 (60,900), and in 2011 (50,440) to supplement TPWD stockings and they contact the District office annually to assess the need to purchase additional fish. Florida Largemouth Bass were stocked in 2010 and 2011. Complete stocking history is listed in Table 4.

Vegetation/habitat management history: Aquatic vegetation coverage in Lake Tawakoni has historically consisted of small amounts of native emergent and submersed species. The dominant species were American lotus and waterwillow. In 2010, aquatic vegetation represented 1.1% of the reservoir surface area. In 2014, vegetation and habitat surveys were not conducted because the reservoir elevation was more than 10 ft below CPE. A small infestation, 1.5 ac, of water hyacinth was documented in Ash Cove in 2004. Texas Parks and Wildlife Department's Aquatic Habitat Enhancement staff treated an area of 5 ac in 2008. In August 2009 a small quantity of water hyacinth plants in Ash Cove were physically removed by the Tyler North District personnel during a vegetation survey. In November 2011, staff from TPWD's Wildlife Division treated a small infestation in Pawnee Inlet using herbicide supplied by the SRA. District staff will continue to monitor water hyacinth through vegetation surveys.

Water Transfer: Lake Tawakoni is primarily used for municipal water supply, recreation, and to a lesser extent, flood control. There are currently 15 entities which transfer water from the reservoir to other locations. These include Cash SUD, Combined Consumers, Lone Oak Land Development, MacBee, North Texas Municipal Water District, Nortex Nursery, South Tawakoni WSC, and the following cities: Dallas, Commerce, Edgewood, Emory, Greenville, Point, West Tawakoni, and Wills Point.

METHODS

Fishes were collected by electrofishing (2.0 hr at 24, 5-min stations) in fall 2014 and gill netting (15 net nights at 15 stations) in spring 2015. A supplemental gill netting survey was conducted in 2013 to sample Blue Catfish. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and for gill nets as the number of fish caught per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014). An access-point angler creel survey consisting of 9 survey days per quarter (4 weekdays, 5 weekend days) was conducted from June 2013 through May 2014 to estimate angler catch and harvest rates and angling effort in accordance with Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014). Aquatic vegetation and littoral habitat surveys were not conducted during the review period because reservoir elevation was over 10 feet below CPE at the time surveys were scheduled.

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], and relative weight (Wr) 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 and creel

statistics. A length weight table for Lake Tawakoni Blue Catfish was constructed through regression analysis using Microsoft Excel (Microsoft Office 365 Home) spreadsheet software from data extracted from gill netting surveys conducted in 2007, 2009, 2011, and 2013 in addition to additional fish collected in age and growth samples in 2013 and 2014.

Ages were determined using otoliths from Blue Catfish (N= 262, length range 8.3 to 49.3 in) collected in gill netting, low frequency electrofishing, and from the fish cleaning station at Lake Tawakoni State Park in 2013 and 2014. Otoliths from Hybrid Striped Bass (Palmetto Bass and Sunshine Bass) (N=15, length range 17.0 to 18.5 in), White Bass (N=15, length range 9.1 to 10.4 in) and Striped Bass (N=4, length range 17.5 to 18.9 in) were also collected in spring gill netting in 2015 to calculate mean age at legal-length. No Largemouth Bass were collected for age and growth assessment or genetic analysis because of poor habitat conditions at the time of sampling resulting in low catch rates. Source for water level data was the United States Geological Survey (USGS 2015) and the Sabine River Authority Iron Bridge Division at Lake Tawakoni.

The age structure of the Blue Catfish population was determined by creating an age-length key. The age and growth sample collected in 2013 and 2014 was applied to the length frequency distribution from gill netting sample of March 2013. These number-at-age data were used to fit a catch curve of the population. Fish in classes 3 through 19 were assumed to be fully vulnerable, or recruited, to the gear. Log-transformed numbers of fish were regressed against age class using the method of Robson and Chapman (1961). The number in each age class was increased by one to compensate for age classes under consideration that did not contain any observations since the natural log of zero cannot be computed. The slope of the regression is the instantaneous rate of natural mortality (Z). Survival (S) = e-Z and Total Annual Mortality (AM) = 1-S. A weighted regression technique was employed using Fishery Analysis and Simulation Tools (FAST) software (Slipke and Maceina 2000) in order to reduce the influence of rarer older fish and missing age class data when computing the slope of the regression.

The Lake Tawakoni Catfish Angler Survey was developed to collect opinions and preferences of Lake Tawakoni catfish anglers. The survey was offered in printed form or as an online survey developed using SelectSurvey to anglers who fished for catfish on Lake Tawakoni. Catfish anglers were invited to participate during the time period July 2013 to June 2014 in person during creel surveys, at fishing tournaments, through posters at Lake Tawakoni boat ramps and businesses, through Facebook, through the Texas Fishing Forum, and though TPWD news releases.

RESULTS AND DISCUSSION

Habitat: Aquatic habitat in Lake Tawakoni has been limited for the past three years because of declining reservoir elevation caused by drought. Neither vegetation nor habitat surveys were conducted in 2014 because the elevation was over 10 feet below CPE when the surveys were scheduled. The majority of the shoreline of Lake Tawakoni is unmodified. In 2010, when the last habitat survey was conducted, major modifications included piers and docks (14.0%), rocky shoreline (11.9%), and bulk heading (6.2%) (Storey 2011). Aquatic vegetation in Lake Tawakoni is generally limited. American lotus, waterwillow, and smartweed represented 1.1% of reservoir surface area in 2010 when the last vegetation survey was completed (Storey 2011). A trace amount of hydrilla was observed in 2010 but no water hyacinth was documented at that time.

Creel: Total fishing effort at Lake Tawakoni in 2013-2014 was 279,527 h. This was higher than in the previous creel survey in 2008-2009 (162,641 h), despite reduced access caused by low lake elevation (Table 6). Directed expenditures totaled $2.8 million. This was a 100% increase from 2008-2009 (Table 6). Directed angler effort for catfish (Blue Catfish, Channel Catfish, and Flathead Catfish combined) continues to be the highest of any species group at Lake Tawakoni, accounting for 42.9% of total angler effort (Table 5). The fishery for temperate basses (Striped Bass, Hybrid Striped Bass, and White Bass) remained second in importance, representing 33.9% of angler effort. Directed angler effort for crappie accounted for 10.3%, and Largemouth Bass anglers contributed 6.1% of total effort. The vast majority of anglers travel less than 100 mi to fish at Lake Tawakoni (Appendix F).

Prey species: Primary prey fish populations included Gizzard Shad, Threadfin Shad, and various sunfish species. Gizzard Shad were the most abundant prey fish species collected in 2014 and the electrofishing catch rate, 367.5/h, was the highest of any year in the review although all catch rates were comparatively high (Figure 2). The Gizzard Shad population is dominated by fish less than 5 inches in length resulting in a high (96) index of vulnerability (IOV). Total CPUE of Threadfin Shad was 25.5/h (Appendix A). Catch rates of sunfishes was reduced because of poor aquatic habitat conditions resulting from reduced lake elevation at the time of sampling. Bluegill catch rate in 2014 (14.5/h) was similar to 2006 (10.0/h) but lower than in 2010 (74.5/h) (Figure 3). Redear Sunfish were also available as prey, but they were much less abundant in 2014 fall electrofishing (14.5/h) than Bluegill (Figure 4).

Catfishes: Blue Catfish were by far the dominant catfish species collected in gill nets in Lake Tawakoni although catch rate in 2015 (6.2/nn) was considerably lower than in 2011 (14.9/nn) or 2013 (14.1/nn) (Figure 5). Channel catfish were considerably less abundant in gill net surveys than Blue Catfish and the catch rate in 2015 (0.7/nn) was also noticeably lower than in 2009 (4.9/nn) and in 2011 (5.5/nn) (Figure 6). Considering the identical trend in reduction of gill net catches for both Blue Catfish and Channel Catfish it seems feasible these differences are potentially linked to differences in catch efficiency related to reservoir elevation as opposed to real changes in abundance. Blue Catfish gill net catch rates remained in the range from 11.3/nn to 20.9/nn from 2003 through 2013 (Jubar and Storey 2007, Storey 2011).

Legally-harvestable fish ($\geq$12 in) represented 97% of all fish collected similar to the relative abundance in 2013 (96%). Fish body condition was good with all but one inch group having relative weights exceeding 80. A length weight table for Blue Catfish from Lake Tawakoni was developed using data from gillnetting surveys and age and growth samples (Appendix C). The function of this table is to facilitate calculation of fish weights when considering potential length limit options for Blue Catfish. Blue Catfish in Lake Tawakoni grow to legal length (12 in) in 2.9 yr (Appendix D). Blue Catfish grow to quality size (20 in) in an average of 10.1 yr and to preferred size (30 in) in 14.6 yr. In 2013 two fish from the original stocking of Blue Catfish in 1989 were collected and aged. The gap of five years between these fish and the next oldest fish is the time required for them to reach sexual maturity and produce the lake's first naturally-reproduced offspring. One additional fish from the 1989 stocking was recovered in 2014. Growth rates of the 1989 cohort varied widely with fish ranging in length from 35 in to 53 in and their weights ranged from 27 lb to 84.5 lb.

Directed effort for the catfish species group, 119,790 h, increased from an estimated 72,532 h in 2008-2009 and harvest rate increased to 4.04/ac, up from 3.33/ac (Table 7). Although Blue Catfish were more abundant in gill net sampling, more Channel Catfish were harvested (68,158) than Blue Catfish (51,131) in creel surveys. Catfish released by anglers included 64% legal-sized fish in 2013-2014 as compared with 68% in 2008-2009. There has been an increase in harvest of Blue Catfish since 2008-2009 (35,697) and the modal class of the size distribution has increased (Figure 7). At the same time Channel Catfish harvest (79,139) decreased and the modal class decreased also (Figure 8). Despite the increased harvest of Blue Catfish, there is popular support for catch and release fishing for larger fish. Anglers contacted during the creel survey between January and May 2014 were asked to estimate the numbers of released Blue Catfish in specific size categories (Appendix G) and 34% of these fish were 10 pounds or larger.

A weighted regression analysis performed on number-at-age data for Blue Catfish of age classes 3 through 19 (Appendix I) that were assumed to be fully vulnerable, or recruited, to the sampling gear, calculated an estimate of instantaneous total annual mortality (Z) of -0.14 (R^2=0.51) which equates to Survival (S) of 87% and total annual mortality (A) of 13%. Instead, if data from age classes 5 through 19 was analyzed in case fish were not fully recruited until age 5, the estimate of A increased to 16% (R^2=0.55). By comparison, Boxrucker and Kuklinski (2006) found A ranged from 21% to 30% with an average of 26% in seven water bodies sampled in Oklahoma.

The Lake Tawakoni Catfish Angler Survey was completed by 293 anglers (Appendix H) and 40% of the anglers who were contacted in person responded. Few respondents (9%) were licensed guides, 32% had fished in catfish tournaments in the previous two years, and 68% had fished on Lake Tawakoni in the

previous 12 months. The majority of anglers (84%) preferred to catch Blue Catfish on Lake Tawakoni in preference to other catfish species and most were satisfied with the quality of angling for Blue Catfish (45.7% extremely satisfied, 35.0% very satisfied). Harvest of Blue Catfish was related to trip satisfaction in 29.3% of respondents, and when anglers did harvest Blue Catfish, 45% preferred to limit harvest to fish under 5 lbs (24 inches) and 37% preferred to keep fish under 10 lbs (30 inches). Half of anglers (50%) were not satisfied with a fishing trip unless they caught a trophy Blue Catfish and 93.6% preferred to release larger Blue Catfish. Eighty four percent of respondents said they would not harvest Blue Catfish. Despite these preferences, 74.9% were satisfied with the minimum length limit of 12 inches on Blue Catfish and Channel Catfish at Lake Tawakoni and only 5.2% of anglers supported increasing the daily bag limit from 25 fish. Reduction in harvest of larger Blue Catfish (for example above 10 lb) in order to catch more large fish in future was supported by 85.5% of anglers and 73.3% said they supported keeping more smaller fish in exchange for reducing harvest of larger fish.

Temperate basses: The gill net catch of White Bass in 2015 (3.9/nn) was the highest of any survey in this review (Figure 9). White Bass grew to legal-length in one year (mean=9.9 in, range=9.1 – 10.7 in, N=15). The harvest of White Bass was estimated at 75,615. This was approximately four times the level estimated in 2008-2009 (17,001) (Figure 12) and was the highest of all temperate basses.

Catch rate of Striped Bass collected in gill net sampling in 2015 (2.7/nn) was similar to 2009 (3.2/nn) and much higher than in 2011 (0.1/nn) (Figure 10). The fish in the sample were from stockings in 2013 and 2014. Harvest of Striped Bass is low and declined from the previous creel survey (Figure 13). A small sample (N=4) of Striped Bass was aged which averaged two years of age at legal-length (average=18.1 in). Anecdotal reports from anglers in spring 2015 indicated higher catch rates of sub-legal Striped Bass than usual indicating good survival of fish stocked in 2013 and 2014.

Gill net catch rate of Hybrid Striped Bass (Palmetto Bass and Sunshine Bass combined) in 2015 (4.2/nn) was similar to 2009 (4.0/nn) but higher than in 2011 (0.9/nn) (Figure 11). Harvest of Hybrid Striped Bass, 22,633, increased considerably since the previous creel survey, 7,847 (Figure 14). Reports on social media have supported high harvest rates of Hybrid Striped Bass at Lake Tawakoni and guides have commented on the high quality of the Hybrid Striped Bass fishery for the past two to three years. Anglers continue to have difficulty in distinguishing between Hybrid Striped Bass and White Bass which resulted in illegal harvest of 7-8% of Hybrid Striped Bass retained by anglers (Figure 14) in creel surveys. Hybrid Striped Bass took an average of two years to grow to legal-length (average age=2.0, average length=17.6 in, length range=17.0 – 19.0 in, N=15).

Directed fishing effort for temperate basses (White Bass, Striped Bass, and Palmetto Bass/Sunshine Bass combined) from June 2013 through May 2014 was estimated at 94,724 h, a noticeable increase over the previous creel survey five years ago (56,863 h) (Table 8). The total angler catch rate of 2.34/h, and harvest of 3.48/ac also increased from the 2008-2009 levels of 1.14/h and 0.92/ac respectively.

Largemouth bass: Few Largemouth Bass were collected in electrofishing sampling on Lake Tawakoni in 2014 (5.5/h), as a result of loss of aquatic habitat from reduced lake elevation at the time of sampling (Figure 15). Consequently, it is impossible to reliably assess the quality of the Largemouth Bass population. Low catch rates also precluded collection of fish for age and growth assessment and genetic evaluation. The most recent genetic assessment was performed in 2008 (Storey 2011) when the FLMB allele frequency was 20.0% and 80% of the samples were second or higher generation hybrids between FLMB and Northern Largemouth Bass (NLMB). Since TPWD stocked FLMB fingerlings in 2010 and 2011, no samples were collected for the 2011 review because of the risk of collecting recently-stocked fish in the sample thereby biasing the results.

Directed angler effort for black bass was estimated at 17,023 h which represented 6.1% of total effort and was the lowest of any species group at Lake Tawakoni. The estimated angling effort of 0.58/ac, was similar to the 2008-2209 level of 0.57/ac. The total angler catch rate of 0.36/h, was also similar to the previous creel survey (0.32/h). Tournament effort for Largemouth Bass was low (4.8%) but similar to the estimate from the survey in 2008-2009 (5.5%) (Table 9). Non-tournament anglers were responsible for 78% of the harvest of Largemouth Bass but they released 81% of the legal-sized fish they caught.

Crappies: Crappie accounted for directed angler effort of 28,703 h (Table 10), which represented over 10% of total effort (Table 5) and showed a significant increase over the effort observed in 2008-2009 (4,246 h) (Table 10). Crappie harvest also increased from 0.22/ac to 0.86/ac, although the total angler catch rate declined from 1.93/h to 1.20/h. White Crappie represented approximately 66% of crappie harvested in 2013-2014 (Figure 17 and 18).

Fisheries management plan for Lake Tawakoni, Texas

Prepared – July 2015

ISSUE 1: Catfish are Lake Tawakoni's most targeted fisheries resource accounting for more than 40% of total fishing effort. In 2001, the Texas State Legislature designated Lake Tawakoni as the Catfish Capital of Texas. From June 2013 through May 2014 catfish angling accounted for 42.9% of total directed effort (119,790 h). As a result of overwhelming angler support, a regulation change to reduce harvest of trophy Blue Catfish will be submitted in summer 2015. Monitoring of this vital fisheries resource will continue.

MANAGEMENT STRATEGIES

1. Conduct supplemental gill netting in spring 2017 and routine gill netting in spring 2019 to monitor abundance and size distribution of Blue Catfish and Channel Catfish.
2. Conduct an access point creel survey from June 2018 through May 2019 to monitor angler effort, catch and harvest of catfish species.
3. Submit a regulation proposal in summer 2015 to reduce harvest of trophy Blue Catfish in order to enhance the fishery at Lake Tawakoni.

ISSUE 2: Lake Tawakoni contains high quality fisheries for a diversity of temperate basses and their hybrids. Anglers seeking Striped Bass, Hybrid Striped Bass (Palmetto Bass and Sunshine Bass) and White Bass contributed a combined effort of 94,724 h from June 2013 through May 2014 which accounted for 33.90% of total directed effort.

MANAGEMENT STRATEGIES

1. Continue submitting annual request for stocking of fingerling Striped Bass and Palmetto/Sunshine Bass each at a rate of 10 fish/acre or substitute fry at appropriate rates depending on availability.
2. Encourage efforts by the Lake Tawakoni Sportsman's Association's to purchase Sunshine Bass to supplement TPWD stockings in the event of reduced production from TPWD hatcheries and provide assistance with boat stockings of any purchased fish.
3. Conduct supplemental gill netting in spring 2017 to monitor abundance and size distribution of temperate basses and their hybrids.
4. Conduct an access point creel survey from June 2017 through May 2018 to monitor angler effort, catch and harvest of temperate basses and their hybrids.

ISSUE 3: The lake elevation of Lake Tawakoni is subject to significant fluctuations in response to periodic drought and demand for water. Increasing demands for water by the large number of entities that currently pump from Lake Tawakoni will likely make reduced water elevations more commonplace. Periods of low water levels result in limited aquatic habitat which reduces electrofishing catch rates of littoral species such as Largemouth Bass making it difficult to assess the status of these species. Directed effort for largemouth bass from June 2013 through May 2014 was 17,023 h, which accounted for 6.1% of total directed effort. This was the lowest effort of any species group. Efforts to monitor and enhance Lake Tawakoni's largemouth bass fishery will continue but at a reduced rate.

MANAGEMENT STRATEGIES

1. Conduct fall electrofishing survey in 2018 to monitor abundance and size distribution of Largemouth Bass and prey species.
2. Collect a 30-fish sample of Largemouth Bass for genetic analysis and age and growth samples using biologist-selected sites during periods of when lake elevation is close to conservation pool.

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 controlling authority 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.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes mandatory monitoring in 2018-2019 (Table 6). Gillnetting surveys will be conducted every two years to monitor the catfish, and temperate bass populations, and an access point creel survey will be conducted from June 2017 through May 2018 . Annual vegetation surveys will be conducted to monitor the status of waterhyacinth in Lake Tawakoni.

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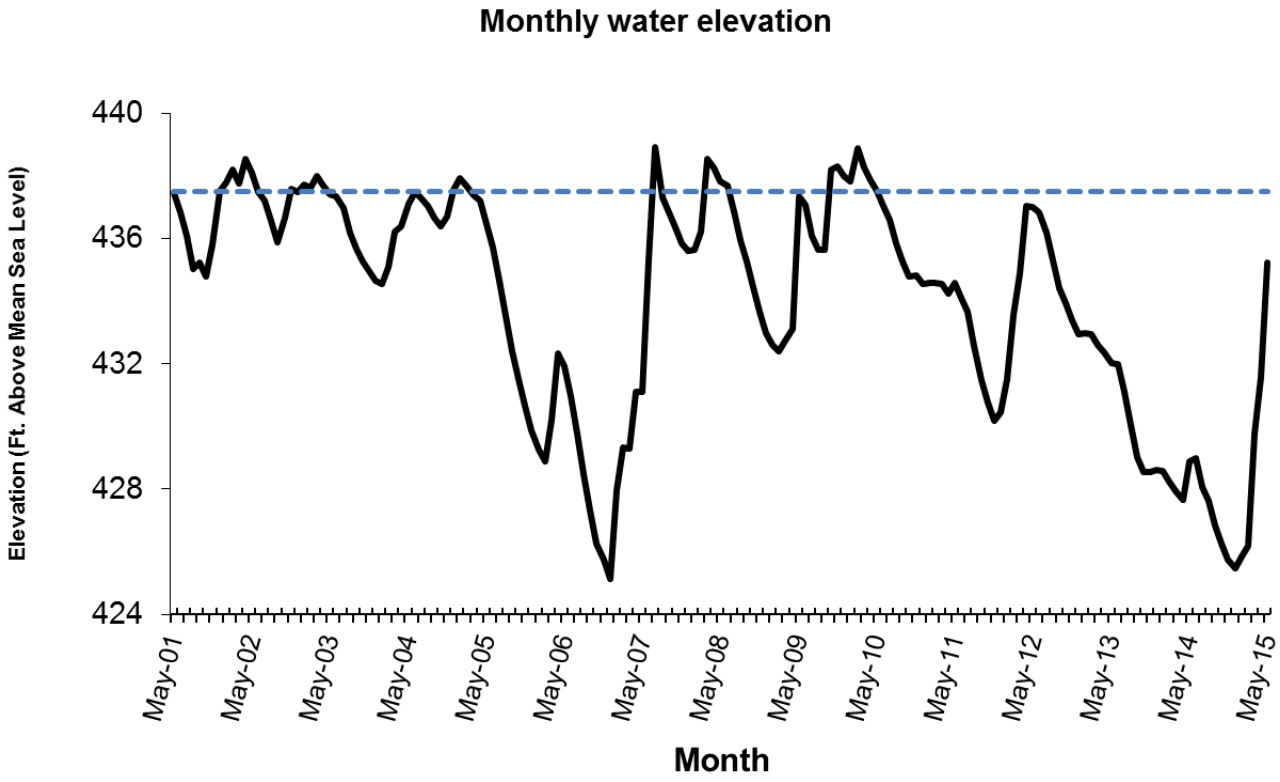


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lake Tawakoni from May 2001 – May 2015. Conservation pool elevation (CPE) for Lake Tawakoni is 437.5 ft msl.

Table 1. Characteristics of Lake Tawakoni.

Characteristic	Description
Year constructed	1960
Controlling authority	Sabine River Authority
Counties	Van Zandt & Rains (location of dam), Hunt
Reservoir type	Mainstream
Conservation Pool Elevation (CPE)	437.5 ft. msl
Reservoir area at CPE	37,325 ac
Shoreline development index (SDI)	7.45
Conductivity	175 umhos/cm

Table 2. Boat ramp characteristics for Lake Tawakoni, Texas, September, 2014. Reservoir elevation at time of the survey was 427.2 ft msl.

Boat ramp	Public	Latitude	Longitude	Elevation at end of boat ramp (ft msl)	Parking capacity (N)	Condition
429 Marina and Resort	N	32.852700	-96.071015	436.15	20	Adequate
Anchor Inn North	N	32.896975	-96.001746	436.7	20	Adequate
Anchor Inn South	N	32.887567	-96.004002	424.2	30	Adequate
Caddo Creek Road	Y	32.925170	-96.056740	436.14	15	Adequate
Cedar Cove Landing	N	32.891868	-95.902660	437.27	15	Adequate
Duck Cove Marina	N	32.854053	-96.059529	435.1	20	Adequate
Duck Cove Public	Y	32.849946	-96.056414	436.98	40	Adequate
Holiday Marina	N	32.813208	-95.943435	424.19	80	Adequate
Lake Tawakoni S.P.	N	32.847828	-95.996166	422.7	47	Excellent
Sky Point RV Park	N	32.895367	-95.946697	422.2	50	Excellent
Walnut Cove	N	32.887629	-96.045843	436.22	20	Adequate
West Tawakoni Park	Y	32.909164	-96.017403	430.0	30	Excellent
White Point Causeaway	Y	32.860698	-96.066449	425.2	34	Adequate

Table 3. Harvest regulations for Lake Tawakoni, Texas.

Species	Bag Limit	Length Limit (inches)
Catfish, Channel and Blue Catfish	25 (in any combination)	12 - No Limit
Catfish, Flathead	5	18 - No Limit
Bass, White	25	10 – No Limit
Bass, Striped and Hybrid Striped Bass	5 (in any combination)	18 – No Limit
Bass, Largemouth	5	14 - No Limit
Crappie, White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 4. Stocking history of Lake Tawakoni. Size Categories are: FRY =<1 inch; FGL = 1-3 inches; AFGL = 8 inches; and ADL = adults.

Year	Number	Size
	Blue Catfish	
1989	366,675	
Total	366,675	
	Striped Bass	
1979	755,800	
1982	195,694	
1991	352,558	FGL
1992	203,462	FGL
1993	184,300	FGL
1994	722,640	FGL
1995	382,333	FGL
1996	183,700	FGL
1997	257,080	FGL
1998	135,256	FGL
1999	262,678	FGL
2000	189,410	FGL
2002	288,856	FGL
2003	369,005	FGL
2004	78,739	FGL
2005	100,211	FGL
2006	156,865	FGL
2007	916,724	FRY
2007	320,619	FGL
2008	283,198	FGL
2009	1,719,115	FRY
2009	348,921	FGL
2010	8,000	FRY
2010	150,970	FGL
2013	1,000,978	FRY
2013	244,494	FGL
2014	499,784	FGL
2015	349,634	FGL
Total	10,661,024	

Year	Number	Size
	Palmetto Bass	
1975	100,466	FGL
1979	181,500	FGL
1980	110,400	FGL
1983	179,302	FGL
1995	218,946	FGL
1996	166,295	FGL
1997	119,000	FGL
1998	267,842	FGL
1999	128,619	FGL
2002	92,910	FGL
2004	189,319	FGL
2005	189,557	FGL
2006	188,206	FGL
2007	172,704	FGL
2008	190,027	FGL
2009	97,968	FGL
2010	182,650	FGL
2011	152,443	FGL
2013	297,543	FGL
2014	143,020	FGL
2015	1,024,683	FRY
Total	4,393,400	
	Sunshine Bass	
2004	139,000	FGL
2007	60,900	FGL
2011	50,440	FGL
2015	500,000	FRY
2015	155,853	FGL
Total	906,193	

Year	Number	Size
	Florida Largemouth Bass	
1984	507,714	FGL
1992	469,904	FGL
1993	917,785	FGL
1998	367,500	FGL
1999	364,995	FGL
2010	508,133	FGL
2011	501,454	FGL
Total	3,637,485	
	Green x Redear Sunfish	
1973	5,300	FGL
Total	5,300	
	Walleye	
1979	450,000	FGL
Total	450,000	

Table 5. Percent directed angler effort by species for Lake Tawakoni, Texas, June 2008 - May 2009 and June 2013 - May 2014.

Species or Species Group	2008-2009	2013-1014
Catfish spp.	44.6	42.9
Temperate basses	35.0	33.9
Crappie spp.	2.6	10.3
Anything	5.7	6.9
Black bass	12.1	6.1

Table 6. Total fishing effort (h) for all species and total directed expenditures at Lake Tawakoni, Texas, June 2008 - May 2009 and June 2013 - May 2014.

Creel Statistic	2008-2009	2013-2014
Total fishing effort (hours)	162,641 (17)	279,527 (29)
Total directed expenditures	$1,433,605 (33)	$2,821,033 (46)

Gizzard Shad

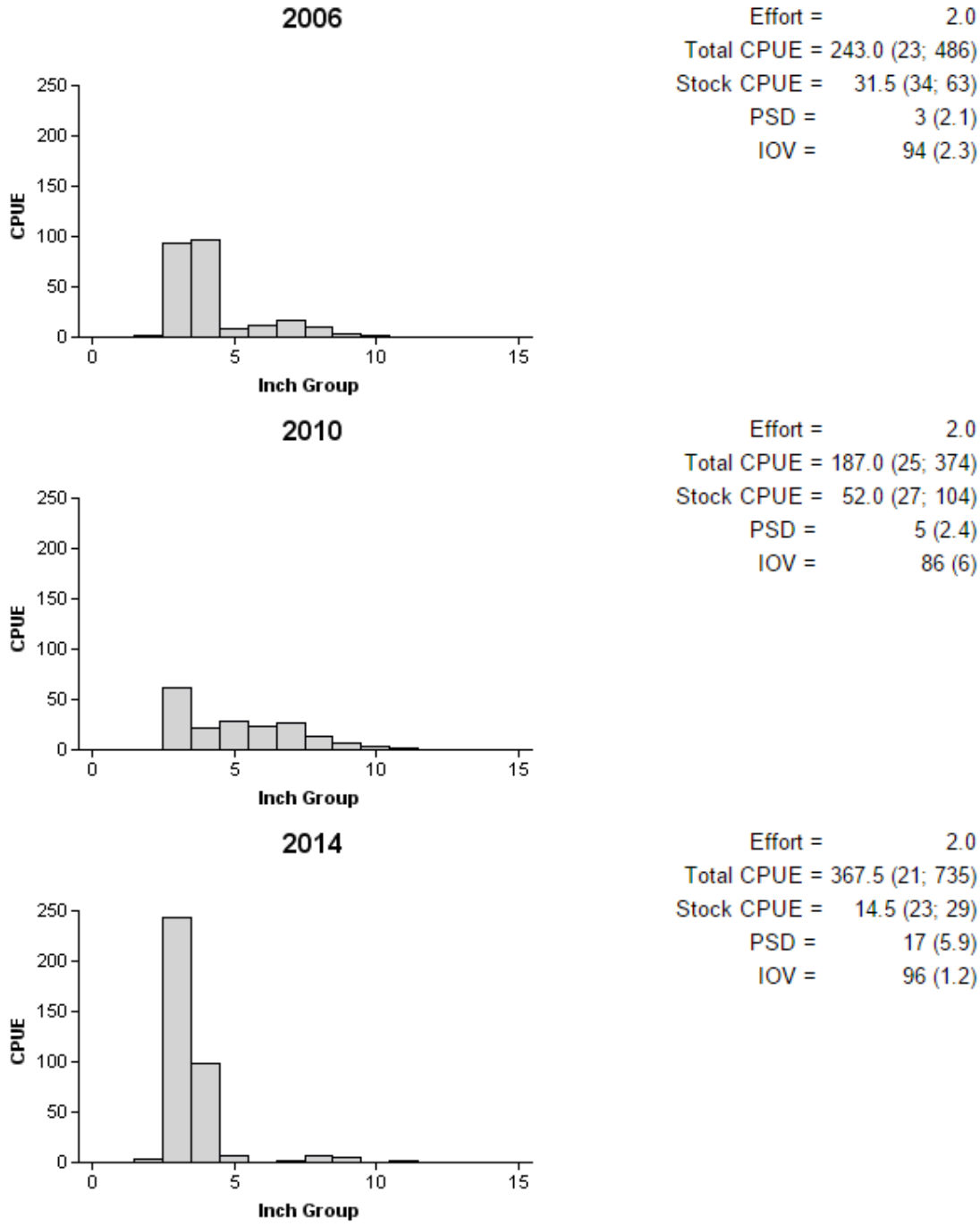


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure and IOV are in parentheses) for fall electrofishing surveys, Lake Tawakoni, Texas, 2006, 2010, and 2014.

Bluegill

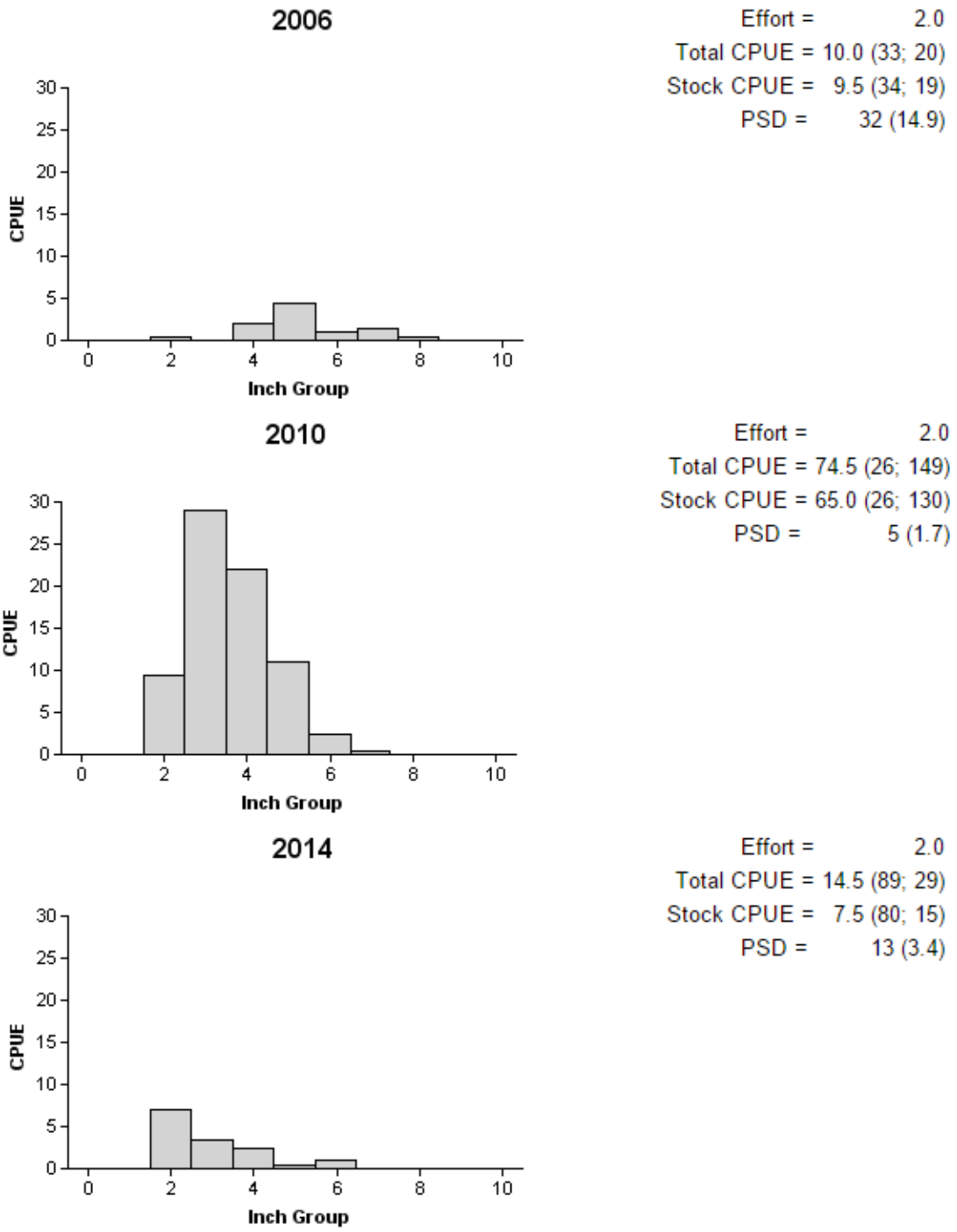


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Tawakoni, Texas, 2006, 2010 and 2014.

Redear Sunfish

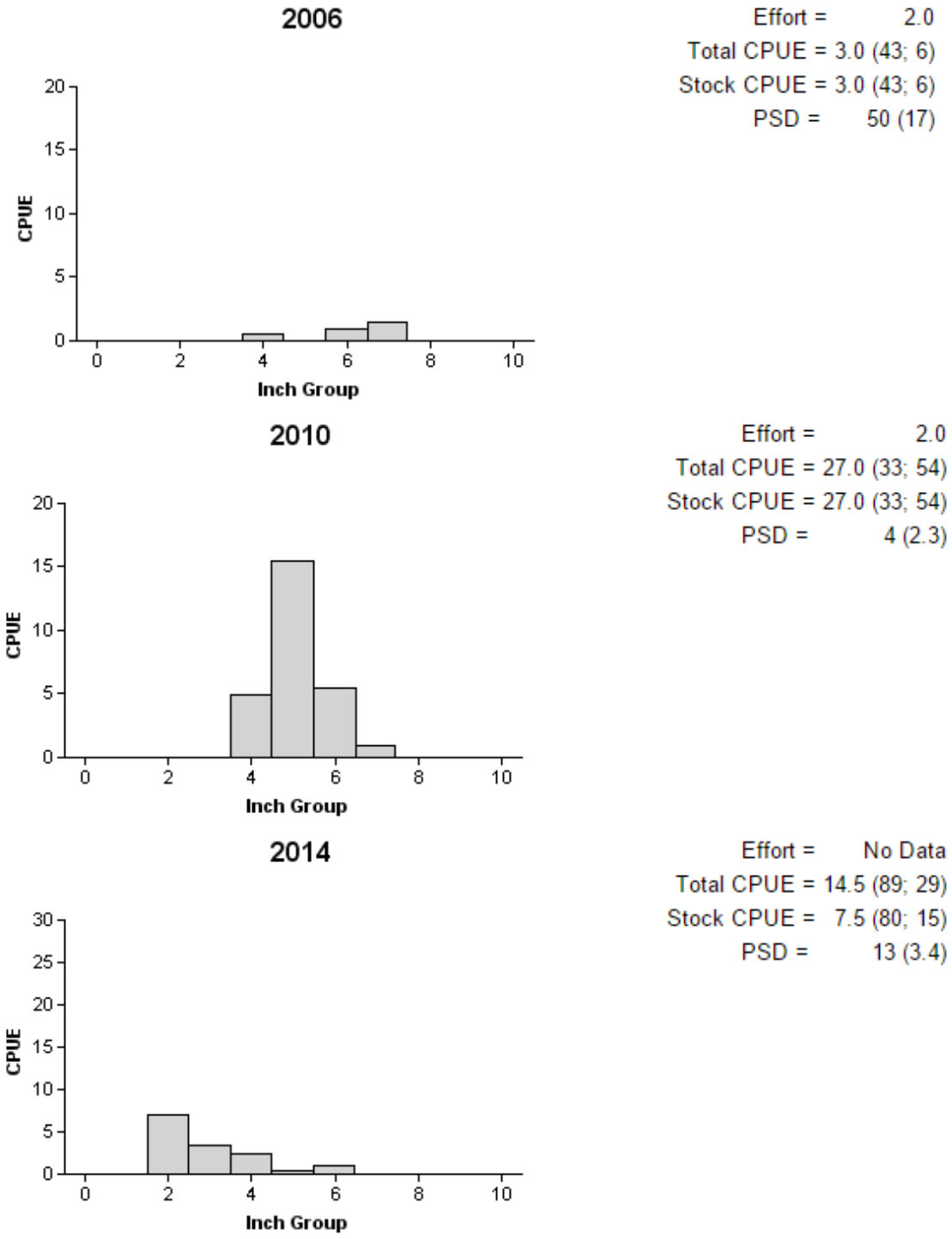


Figure 4. Number of Redear Sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Tawakoni, Texas, 2006, 2010 and 2014.

Blue Catfish

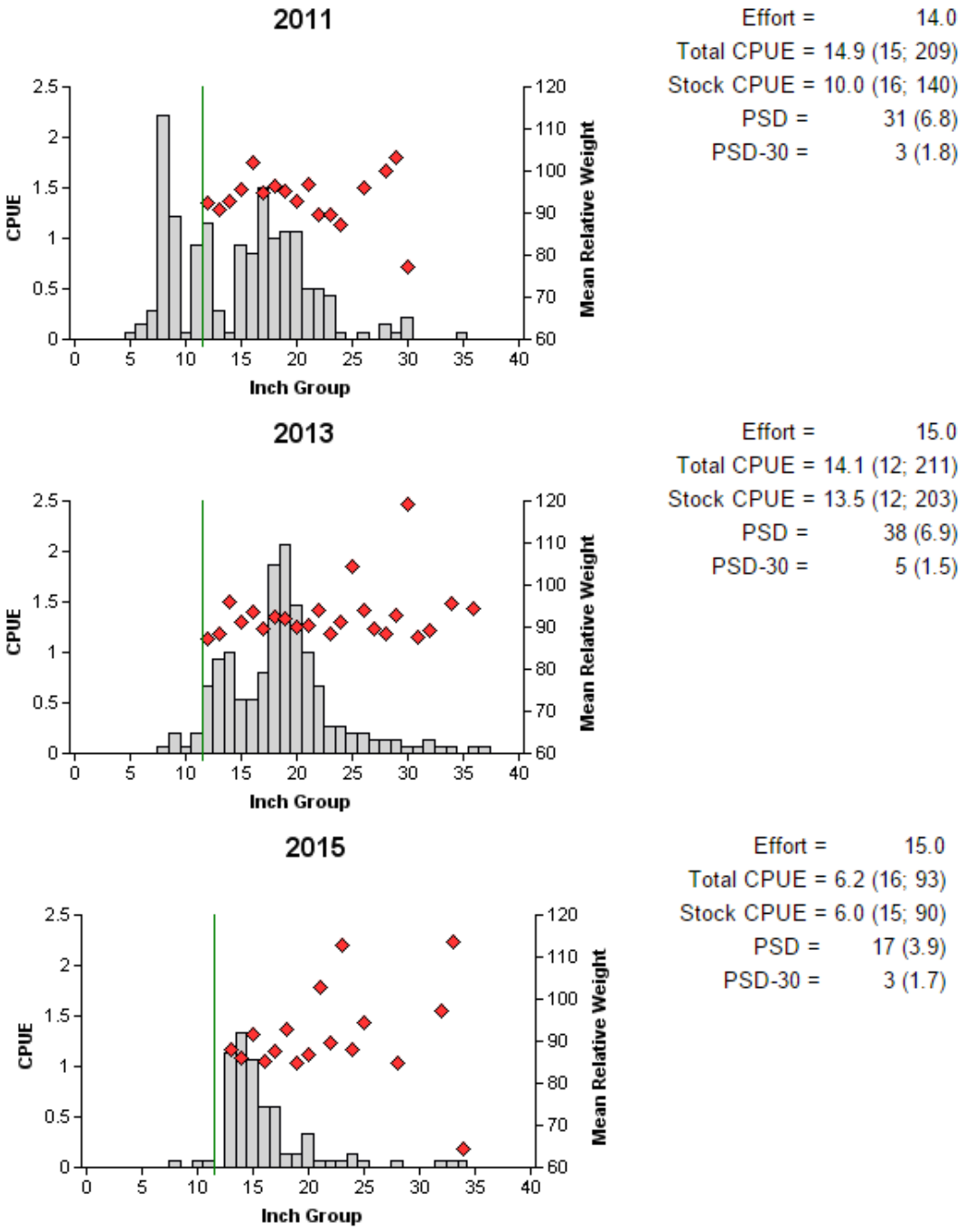


Figure 5. Number of Blue Catfish caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill netting surveys, Lake Tawakoni, Texas, 2011, 2013, and 2015. Vertical lines represent minimum length limit at time of survey.

Channel Catfish

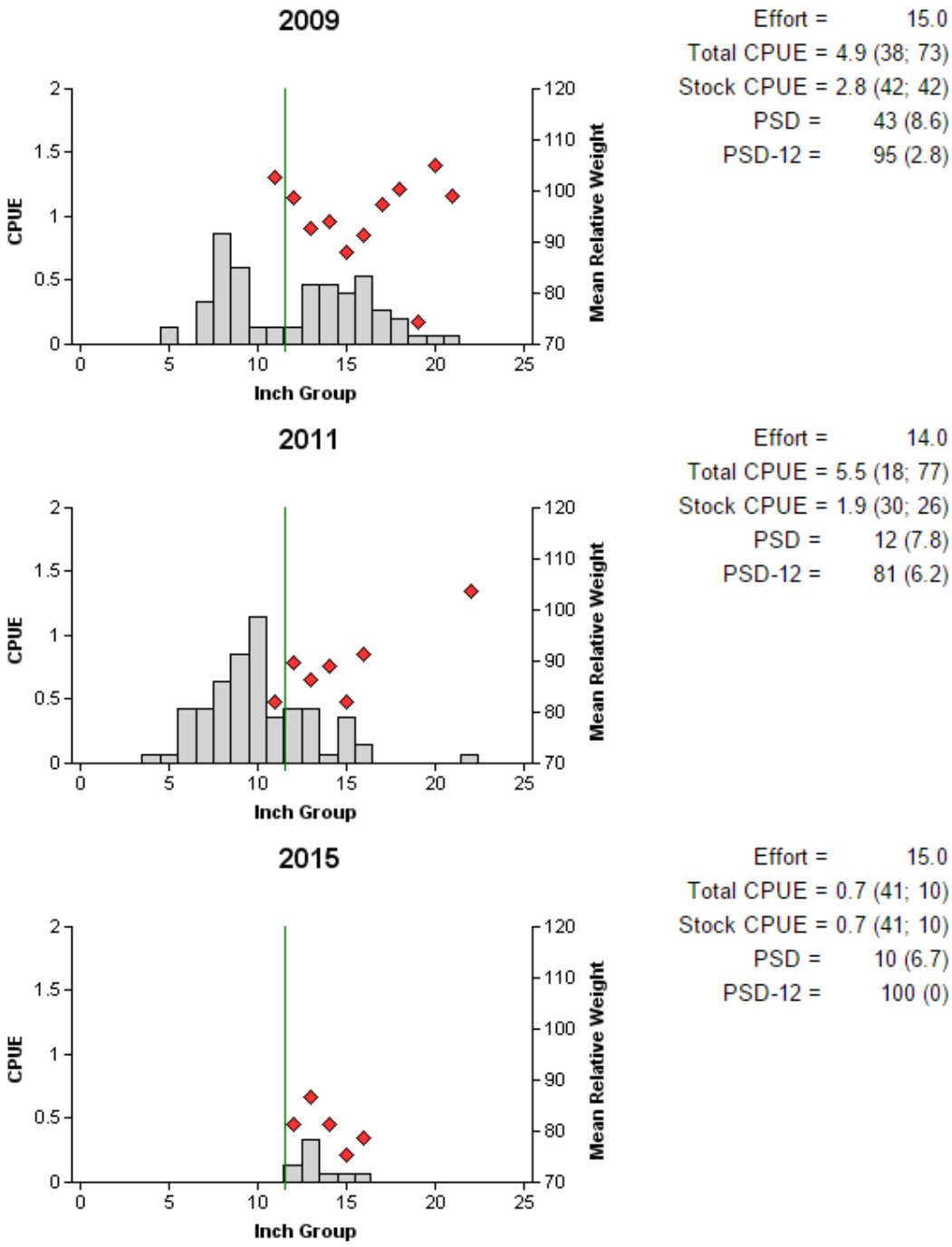


Figure 6. Number of Channel Catfish caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill netting surveys, Lake Tawakoni, Texas, 2009, 2011, and 2015. Vertical lines represent minimum length limit at time of survey.

Table 7. Creel survey statistics for catfish (Blue Catfish, Channel Catfish, and Flathead Catfish combined) at Lake Tawakoni from June 2008-May 2009 and June 2013–May 2014. Total catch/h is for anglers targeting catfish species and total harvest is the estimated number of catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses. (RSE for directed effort and total harvest is the same as directed effort/acre and total harvest/acre, respectively.)

Creel survey statistic	Year	
	2008-2009	2013-2014
Surface area (ac)	34,476	29,504
Directed effort (h)	72,532 (19)	119,790 (28)
Directed effort/ac	2.10 (19)	4.06 (28)
Total catch/h	1.20 (40)	1.34 (23)
Total harvest	114,939 (40)	119,289 (43)
Harvest/ac	3.33 (40)	4.04 (43)
Percent legal released	68%	64%

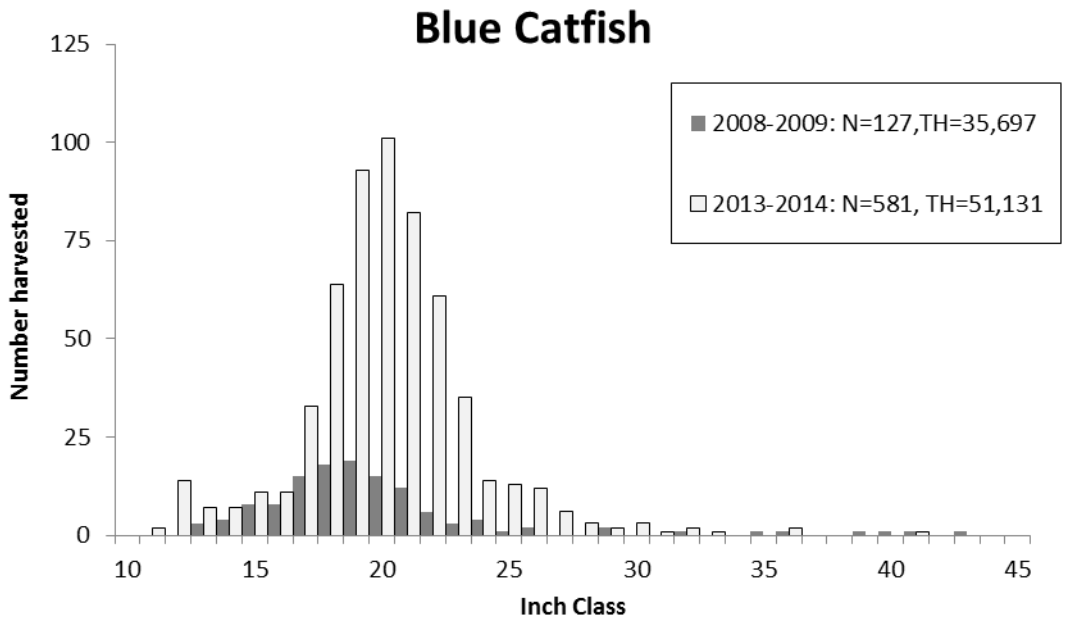


Figure 7. Length frequency of harvested Blue Catfish observed during creel surveys at Lake Tawakoni, Texas, June 2008-May 2009 and June 2013–May 2014, all anglers combined. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

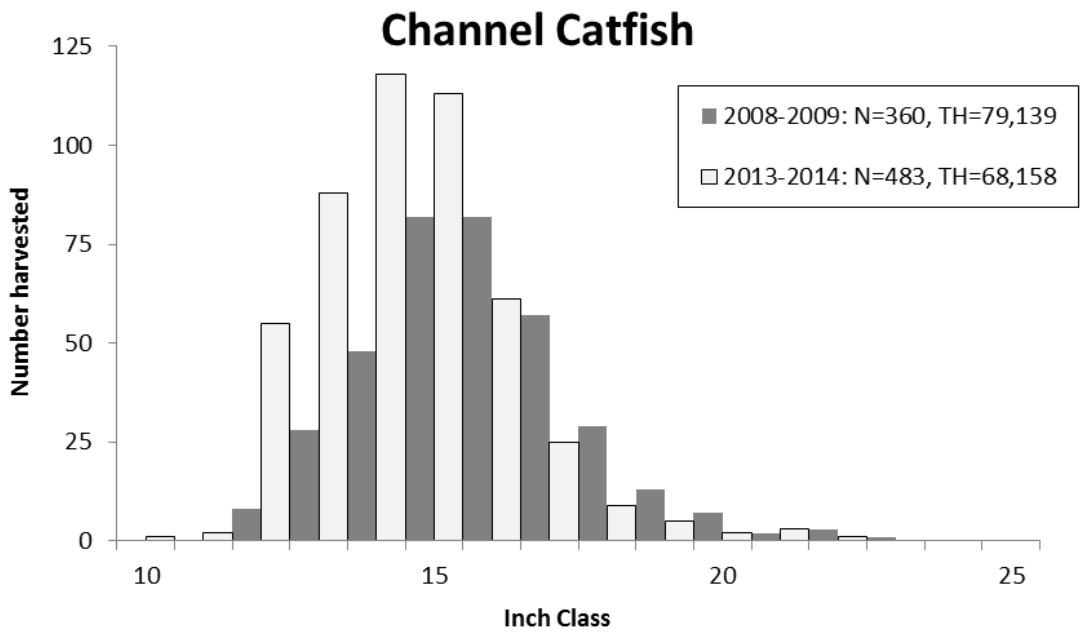


Figure 8. Length frequency of harvested Channel Catfish observed during creel surveys at Lake Tawakoni, Texas, June 2008-May 2009 and June 2013–May 2014, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

White Bass

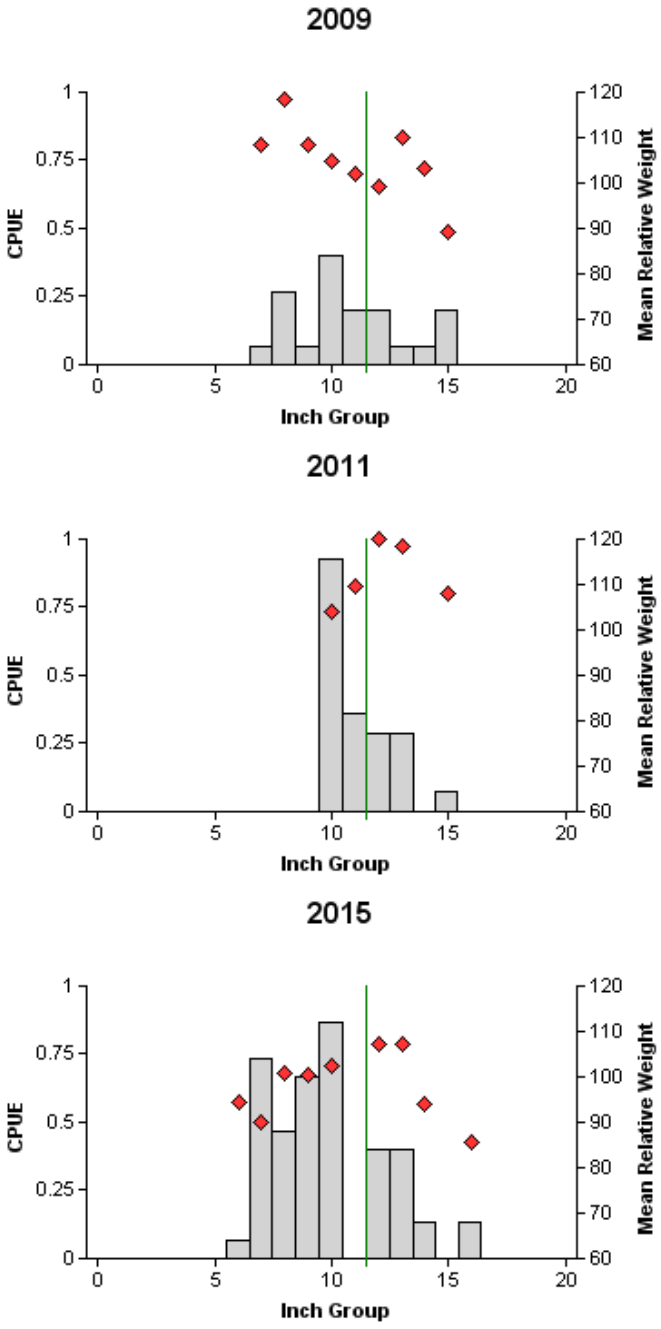


Figure 9. Number of White Bass caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill netting surveys, Lake Tawakoni, Texas, 2009, 20011, and 2015. Vertical lines represent minimum length limit at time of survey.

Striped Bass

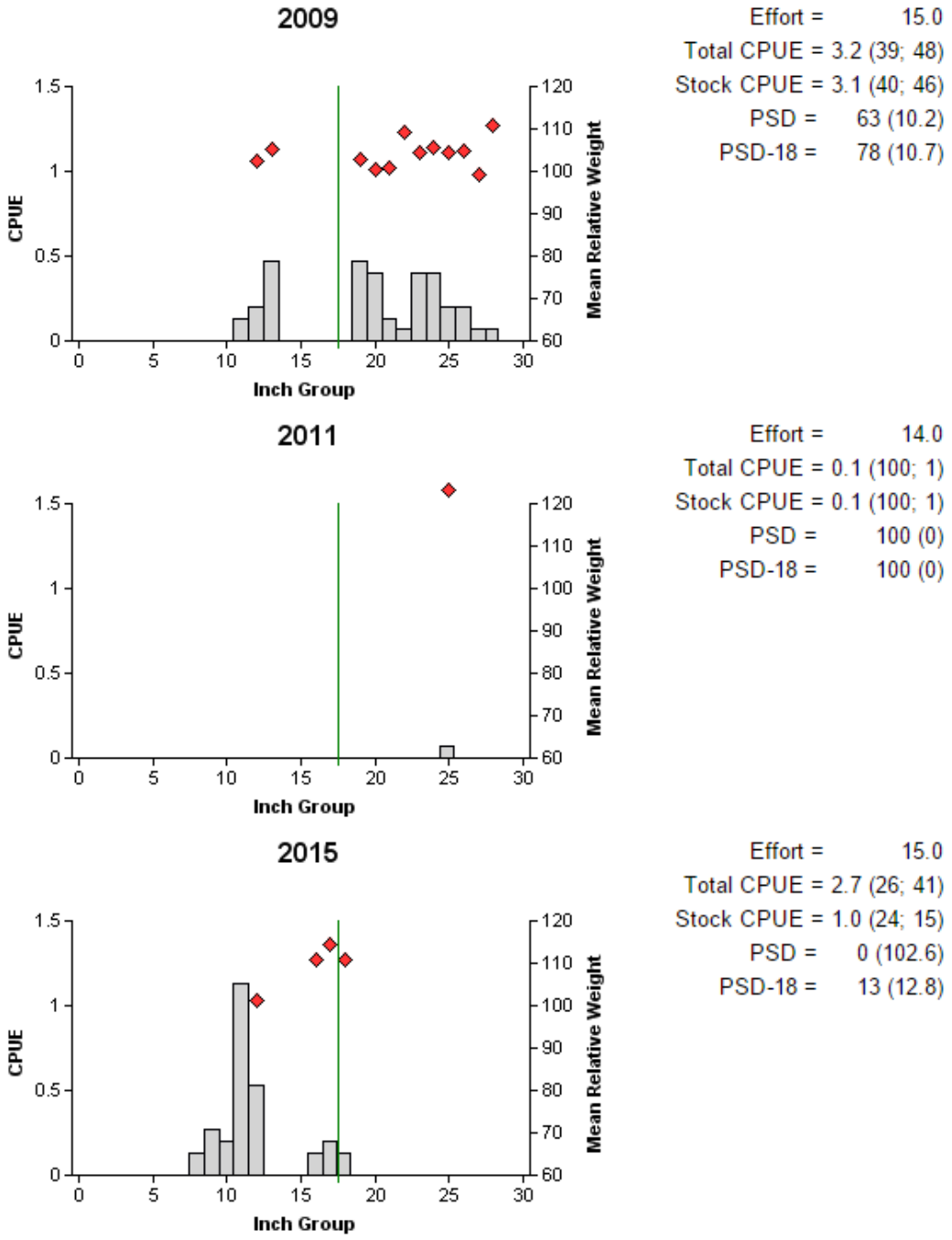


Figure 10. Number of Striped Bass caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill netting surveys, Lake Tawakoni, Texas, 2009, 2011, and 2015. Vertical lines represent minimum length limit at time of survey.

Hybrid Striped Bass

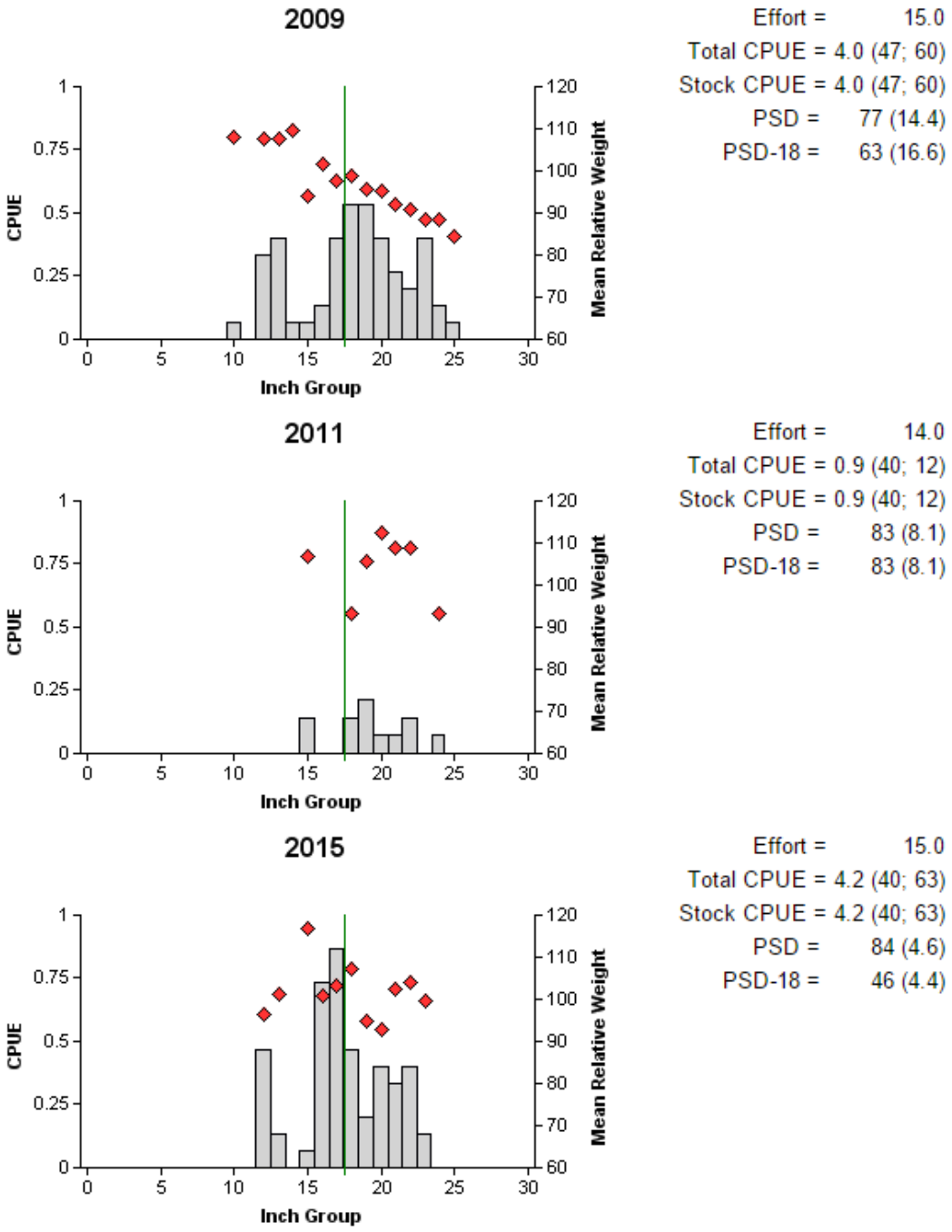


Figure 11. Number of Hybrid Striped Bass (Palmetto Bass and Sunshine Bass combined) caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill netting surveys, Lake Tawakoni, Texas, 2009, 2011, and 2015. Vertical lines represent minimum length limit at time of survey.

Table 8. Creel survey statistics for temperate basses (White Bass, Striped Bass, and Palmetto Bass/Sunshine Bass) at Lake Tawakoni from June 2008-May 2009 and June 2013–May 2014. Total catch/h is for anglers targeting temperate bass and total harvest is the estimated number of temperate bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2008-2009	2013-2014
Surface area (ac)	34,476	29,504
Directed effort (h)	56,863 (22)	94,724 (33)
Directed effort/ac	1.65 (22)	3.21 (33)
Total catch/h	1.14 (39)	2.34 (17)
Total harvest	31,735 (80)	102,533 (54)
Harvest/ac	0.92 (80)	3.48 (54)
Percent legal released	64%	35%

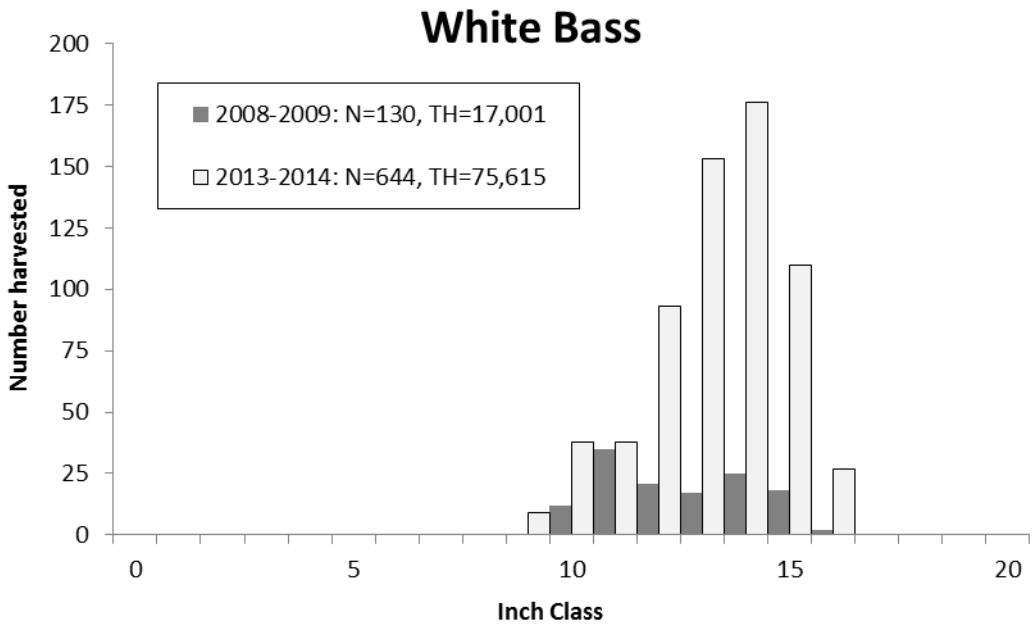


Figure 12. Length frequency of harvested White Bass observed during creel surveys at Lake Tawakoni, Texas, June 2008-May 2009 and June 2013–May 2014, all anglers combined. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

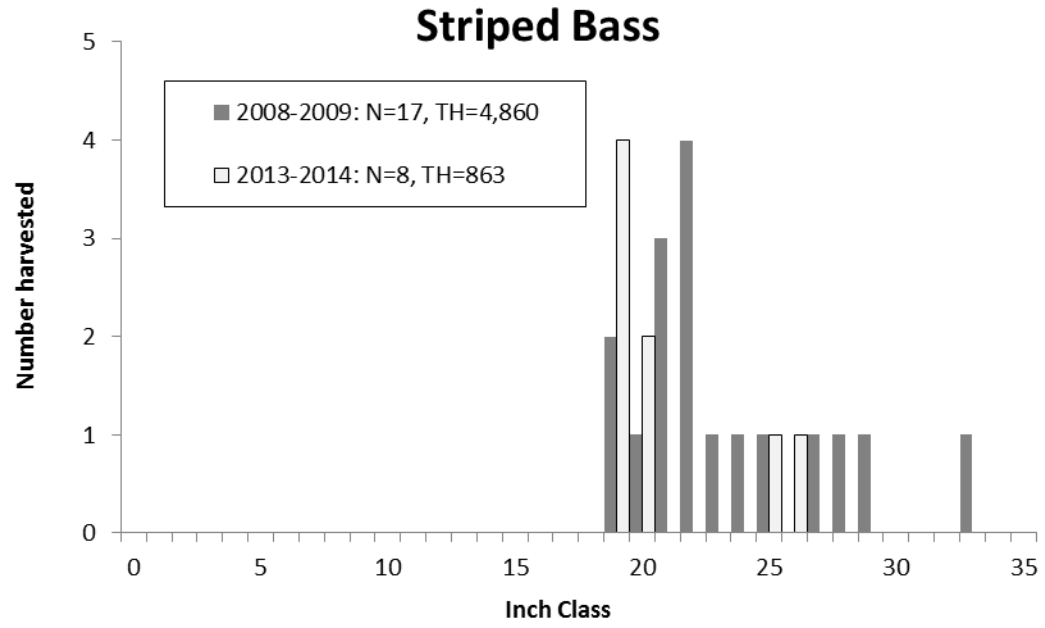


Figure 13. Length frequency of harvested Striped Bass observed during creel surveys at Lake Tawakoni, Texas, , June 2008-May 2009 and June 2013–May 2014, all anglers combined. N is the number of harvested Striped Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

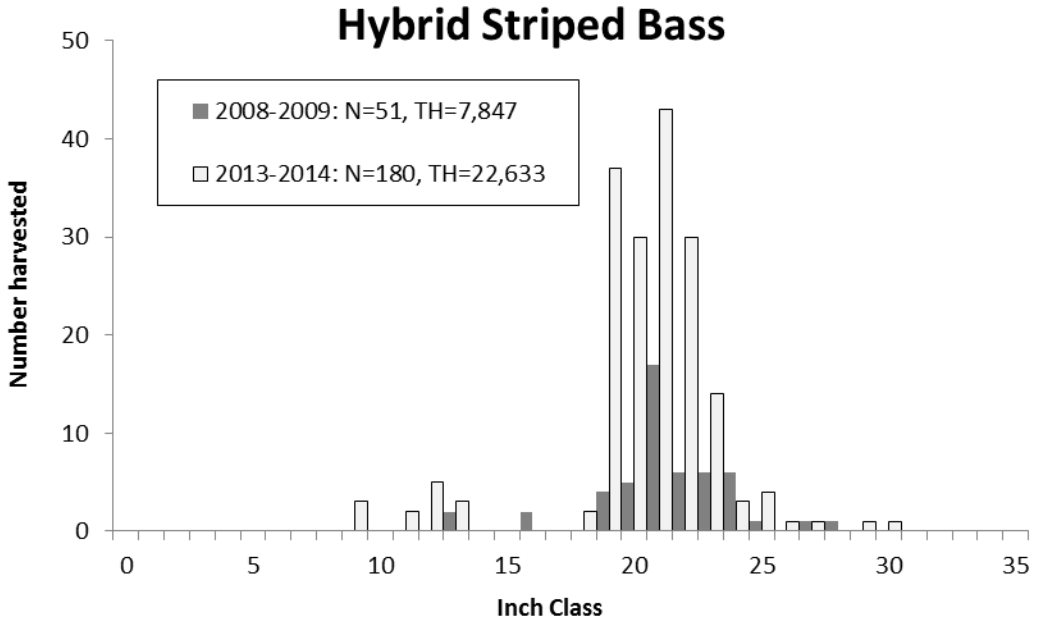


Figure 14. Length frequency of harvested Hybrid Striped Bass (Palmetto and Sunshine Bass combined) observed during creel surveys at Lake Tawakoni, Texas, June 2008-May 2009 and June 2013–May 2014, all anglers combined. N is the number of harvested Hybrid Striped Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth Bass

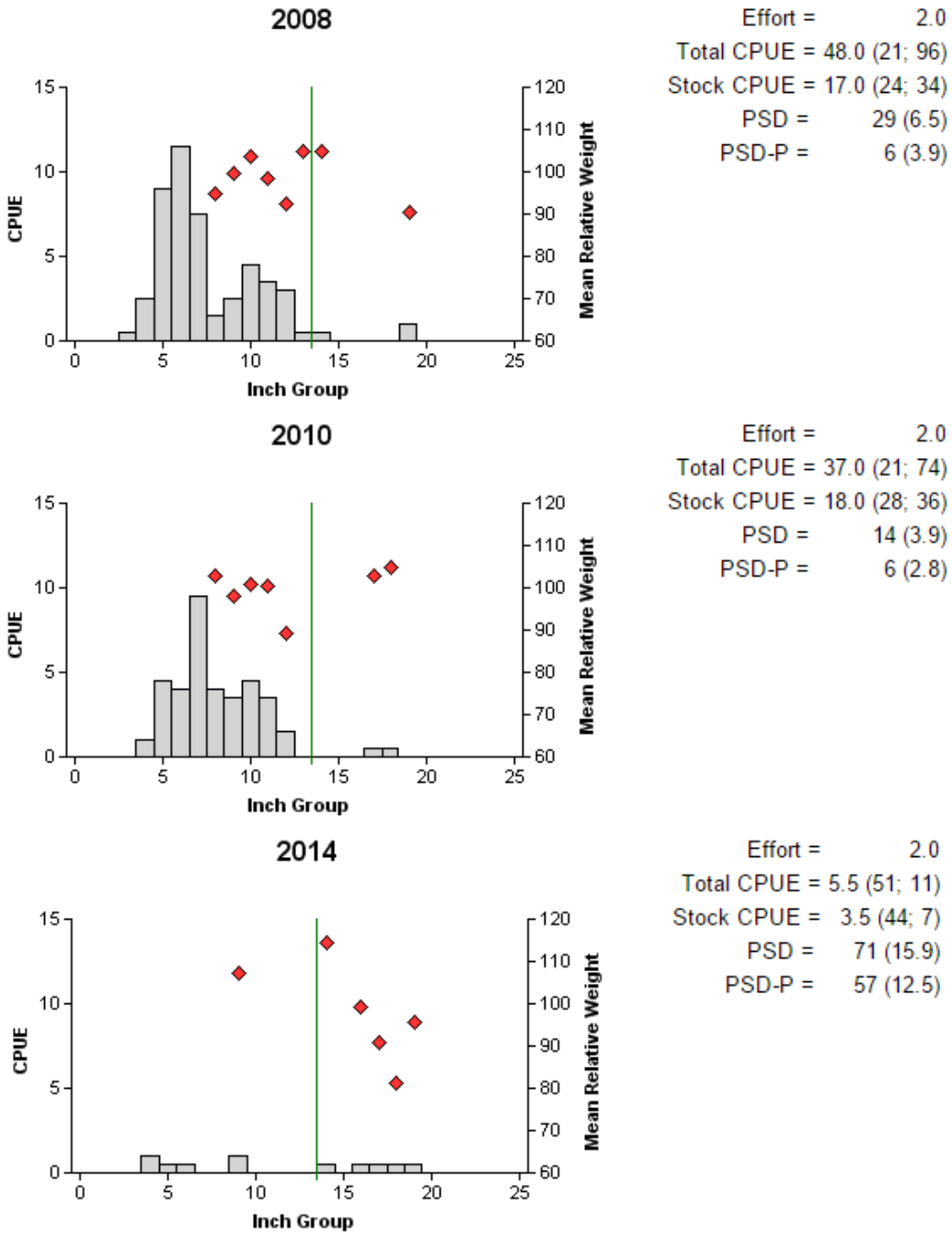


Figure 15. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Tawakoni, Texas, 2008, 2010, and 2014. Vertical lines represent minimum length limit at time of survey.

Table 9. Creel survey statistics for Largemouth Bass at Lake Tawakoni from June 2008 - May 2009 and June 2013 – May 2014. Catch rate is for all anglers targeting Largemouth Bass. Harvest is partitioned by the estimated number of fish harvested by non-tournament anglers and the number of fish retained by tournament anglers for weigh-in and release. The estimated number of fish released by weight category is for anglers targeting Largemouth Bass. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2008-2009	2013-2014
Surface area (ac)	34,476	29,504
Directed angling effort (h)		
Tournament	1,082 (106)	775 (114)
% of total bass effort	5.5%	4.8%
Non-tournament	18,649 (31)	16,248 (36)
All black bass anglers combined	19,731 (31)	17,023 (38)
Angling effort/acre	0.57 (31)	0.58 (38)
Catch rate (number/h)	0.32 (35)	0.36 (22)
Harvest		
Non-tournament harvest	16 (0)	1,970 (218)
Harvest/ac	>0.01 (0)	0.07 (128)
Tournament weigh-in and release	167 (1016)	551 (320)
Release by weight		
<4.0 lbs		1,955 (122)
4.0-6.9 lbs		406 (243)
7.0-9.9 lbs		130 (552)
≥10.0 lbs		-
Percent legal released (non-tournament)	47%	81%

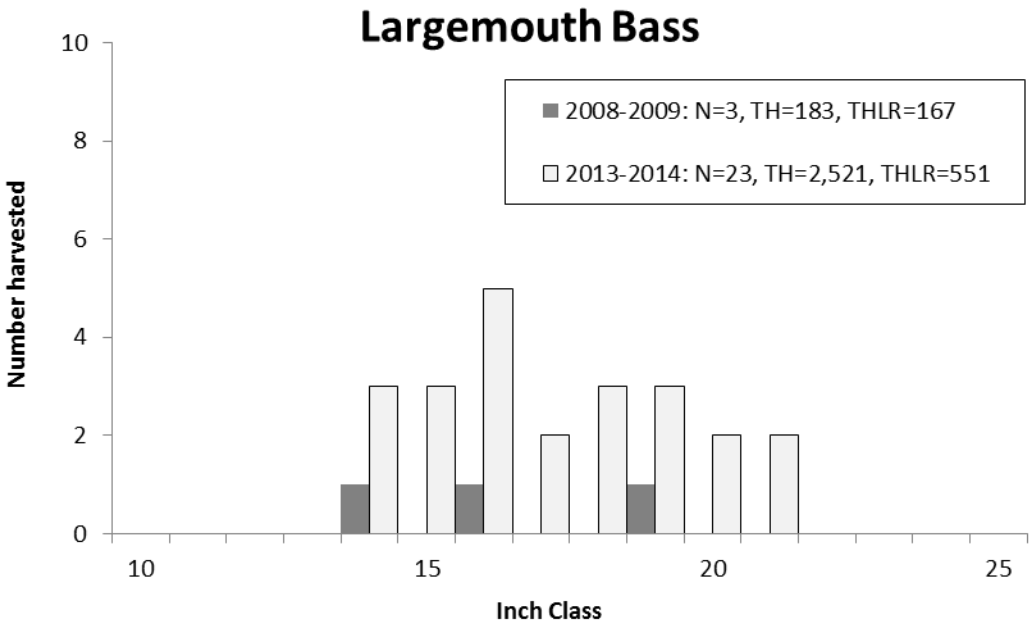


Figure 16. Length frequency of harvested Largemouth Bass observed during creel surveys at Lake Tawakoni, Texas, June 2008-May 2009 and June 2013–May 2014, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, TH is the total estimated harvest for the creel period, and TH_{LR} is the total estimated number of fish retained by anglers participating in live-release tournaments.

Table 10. Creel survey statistics for crappie (White Crappie and Black Crappie combined) at Lake Tawakoni from June 2008-May 2009 and June 2013–May 2014. Total catch/h is for anglers targeting crappie and total harvest is the estimated number of crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2008-2009	2013-2014
Surface area (ac)	34,476	29,504
Directed effort (h)	4,246 (58)	28,703 (37)
Directed effort/ac	0.12 (58)	0.97 (37)
Total catch/h	1.93 (28)	1.20 (40)
Total harvest	7,503 (88)	25,236 (82)
Harvest/ac	0.22 (88)	0.86 (82)
Percent legal released	0%	45%

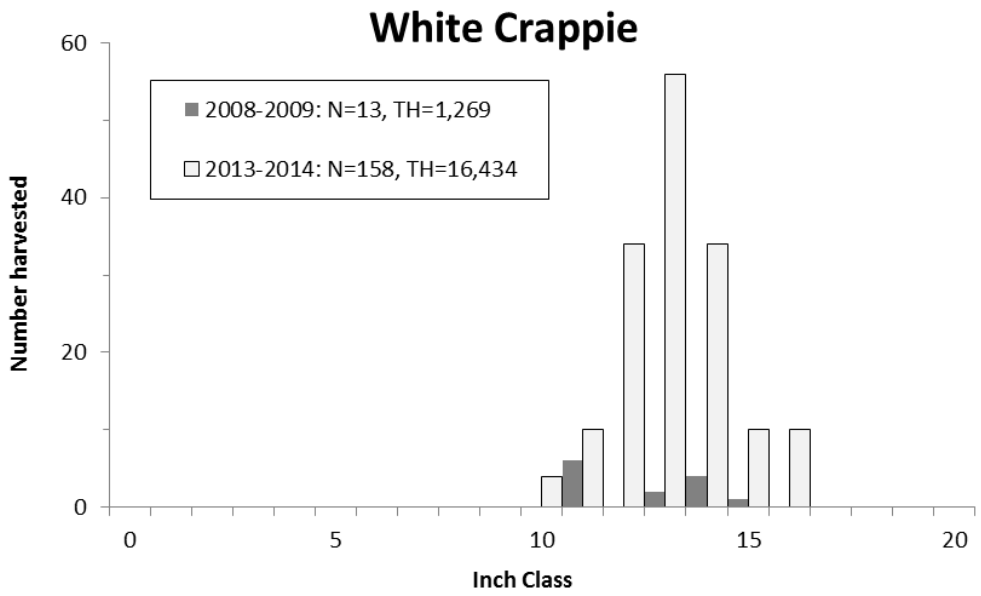


Figure 17. Length frequency of harvested White Crappie observed during creel surveys at Lake Tawakoni, Texas, June 2008-May 2009 and June 2013–May 2014, all anglers combined. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period

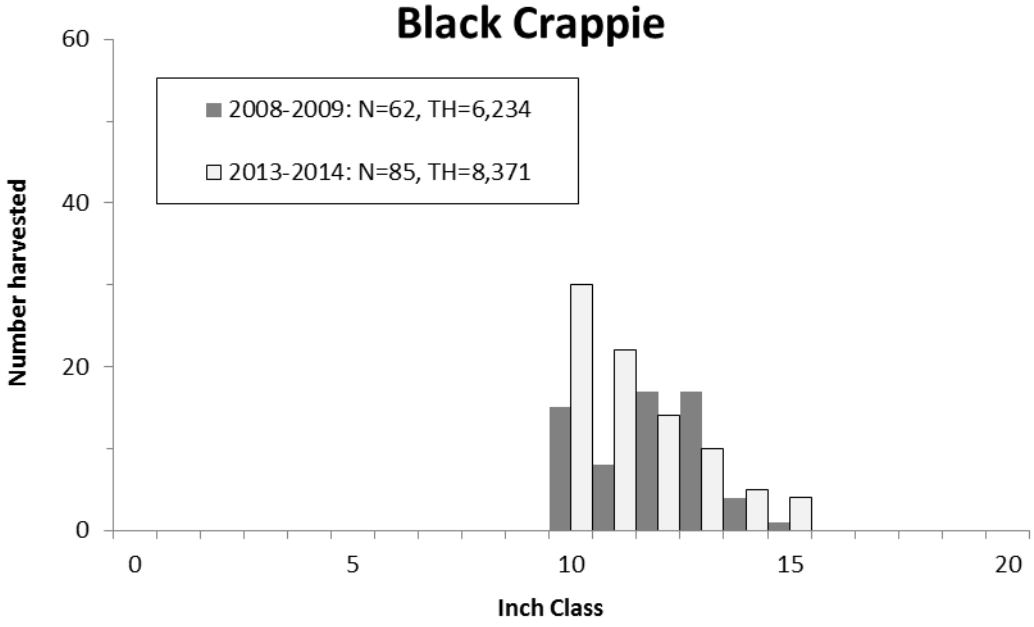


Figure 18. Length frequency of harvested Black Crappie observed during creel surveys at Lake Tawakoni, Texas, June 2008-May 2009 and June 2013–May 2014, all anglers combined. N is the number of harvested Black Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 11. Proposed sampling schedule for Lake Tawakoni, Texas. Gill netting surveys are conducted in the spring, and electrofishing surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey Year	Electrofishing	Gill netting	Vegetation survey	Habitat survey	Access survey	Creel survey	Report
2015-2016			A				
2016-2017		A	A				
2017-2018			A			A	
2018-2019	S	S	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from gill netting and electrofishing, Lake Tawakoni, Texas, 2014-2015.

Species	Electrofishing		Gill Netting	
	N	CPUE	N	CPUE
Gizzard Shad	735	367.5		
Threadfin Shad	51	25.5		
Blue Catfish			93	6.2
Channel Catfish			10	0.67
Flathead Catfish			1	0.07
White Bass			58	3.87
Striped Bass			41	2.73
Hybrid Striped Bass			63	4.2
Bluegill	29	14.5		
Longear Sunfish	7	3.5		
Largemouth Bass	11	5.5		

APPENDIX B

Water body records, all tackle category, for Lake Tawakoni as of 6/5/2015.

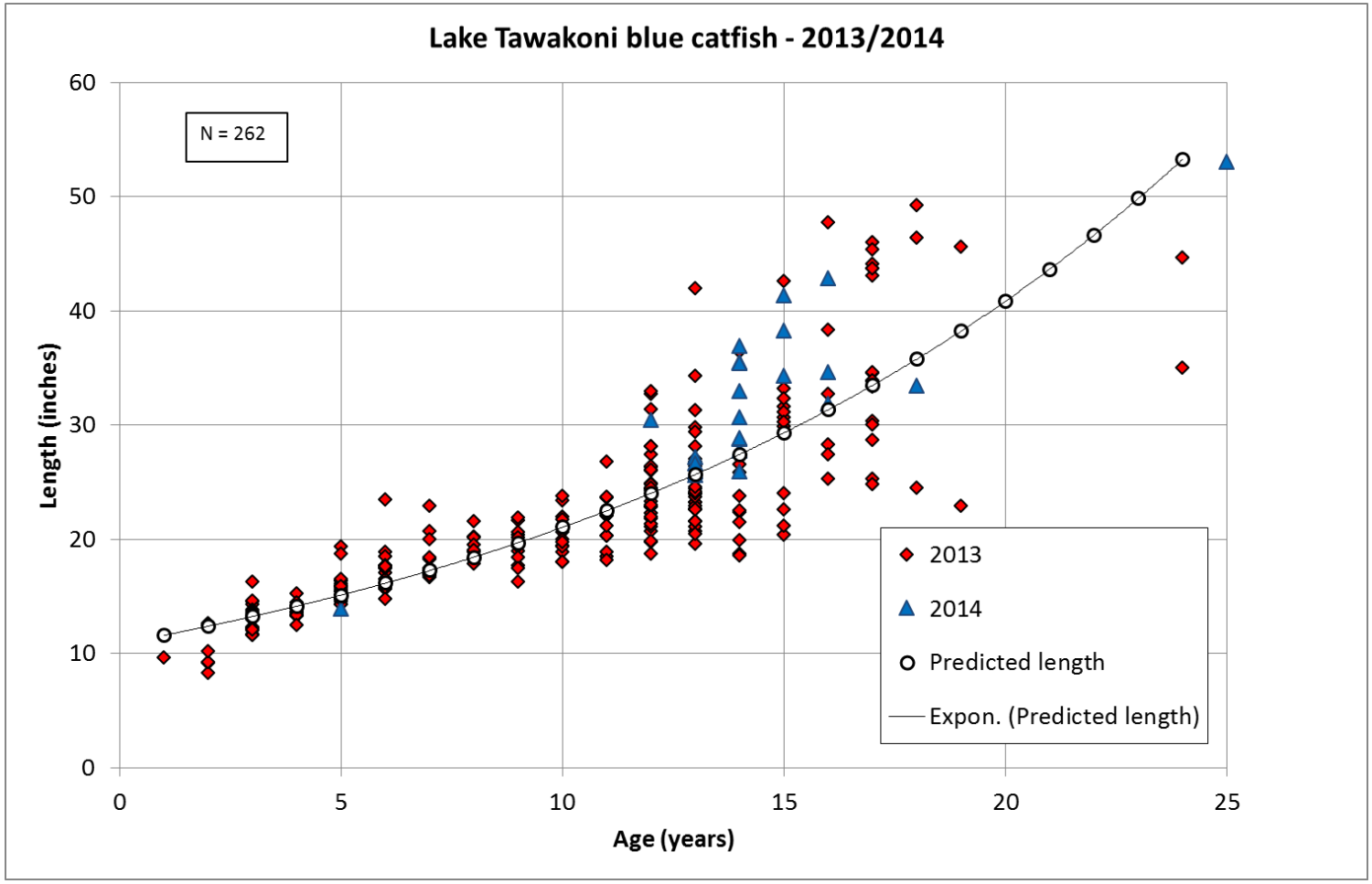
Species	Weight (lbs)	Length (inches)	Date certified	Gear
Bass, Largemouth	13.33	26.00	02/14/2000	Rod & reel
Bass, Hybrid Striped	15.25	28.00	5/16/1988	Rod & reel
Bass, Striped	22.50	35.75	6/7/2004	Rod & reel
Bass, White	4.84	23.00	9/12/2009	Rod & reel
Bass, White x Yellow	3.50	18.00	7/15/1989	Rod & reel
Bass, Yellow	1.97	14.25	2/15/2015	Rod & reel
Bluegill	0.75	9.00	4/5/2013	Rod & reel
Bowfin	7.56	28.25	4/6/2014	Rod & reel
Buffalo, Smallmouth	53.50	39.00	7/13/2012	Jug Line
Carp, Common	27.36	39.00	5/12/2012	Bow & arrow
Catfish, Blue	87.50	52.50	4/15/2014	Rod & reel
Catfish, Channel	31.00	42.00	10/02/2001	Trotline
Catfish, Flathead	110.50	60.50	6/5//1998	Trotline
Crappie, Black	2.82	16.00	3/6/2009	Rod & reel
Crappie, White	3.33	17.75	4/6/1998	Rod & reel
Drum, Freshwater	6.05	21.00	3/22/2014	Rod & reel
Gar, Longnose	8.38	38.00	8/2/2008	Bow & arrow
Gar, Spotted	4.13	28.75	6/20/2009	Rod & reel
Goldfish	9.22	24.50	8/4/2004	Bow & arrow
Sunfish, Green	0.63	8.50	5/20/2012	Fly rod

APPENDIX C

Length-weight table for Blue Catfish (N=687, R^2=0.97) derived from regression analysis of data collected from gill netting (2007, 2009, 2011, and 2013) and age and growth samples in 2013 and 2014 at Lake Tawakoni, Texas. Equation: lbs = 10^(-3.798060261+(3.261479403*LOG10(inches)))

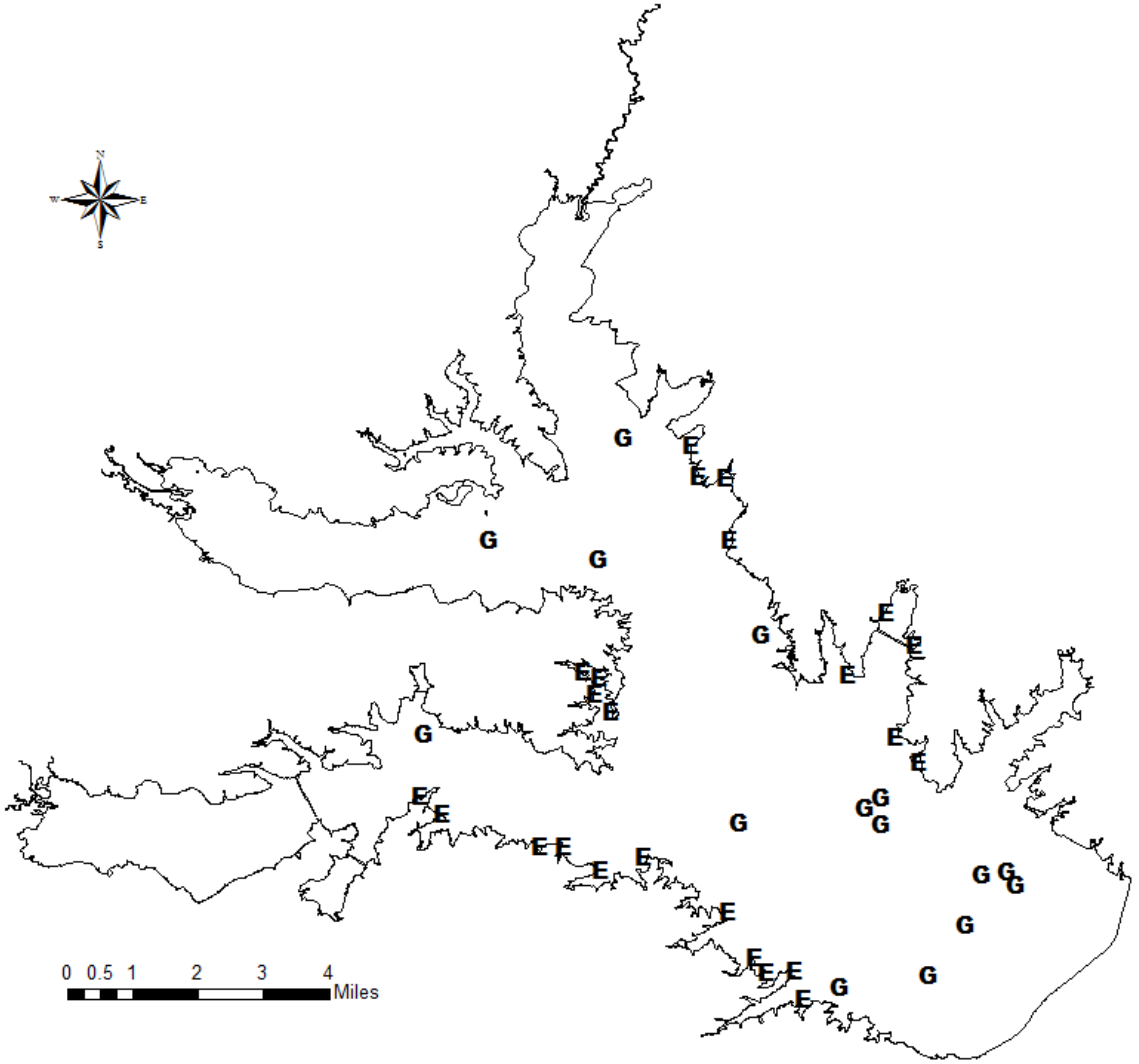
Inches	Lbs	mm	Kg
8	0.14	203	0.06
9	0.21	229	0.09
10	0.29	254	0.13
11	0.40	279	0.18
12	0.53	305	0.24
13	0.68	330	0.31
14	0.87	356	0.40
15	1.09	381	0.49
16	1.35	406	0.61
17	1.64	432	0.74
18	1.98	457	0.90
19	2.36	483	1.07
20	2.79	508	1.26
21	3.27	533	1.48
22	3.80	559	1.73
23	4.40	584	1.99
24	5.05	610	2.29
25	5.77	635	2.62
26	6.56	660	2.98
27	7.42	686	3.36
28	8.35	711	3.79
29	9.37	737	4.25
30	10.46	762	4.74
31	11.64	787	5.28
32	12.91	813	5.86
33	14.27	838	6.47
34	15.73	864	7.14
35	17.29	889	7.84
36	18.96	914	8.60
37	20.73	940	9.40
38	22.61	965	10.26
39	24.61	991	11.16
40	26.73	1,016	12.13
41	28.97	1,041	13.14
42	31.34	1,067	14.22
43	33.84	1,092	15.35
44	36.48	1,118	16.55
45	39.25	1,143	17.80
46	42.17	1,168	19.13
47	45.23	1,194	20.52
48	48.45	1,219	21.98
49	51.82	1,245	23.50
50	55.35	1,270	25.10

APPENDIX D



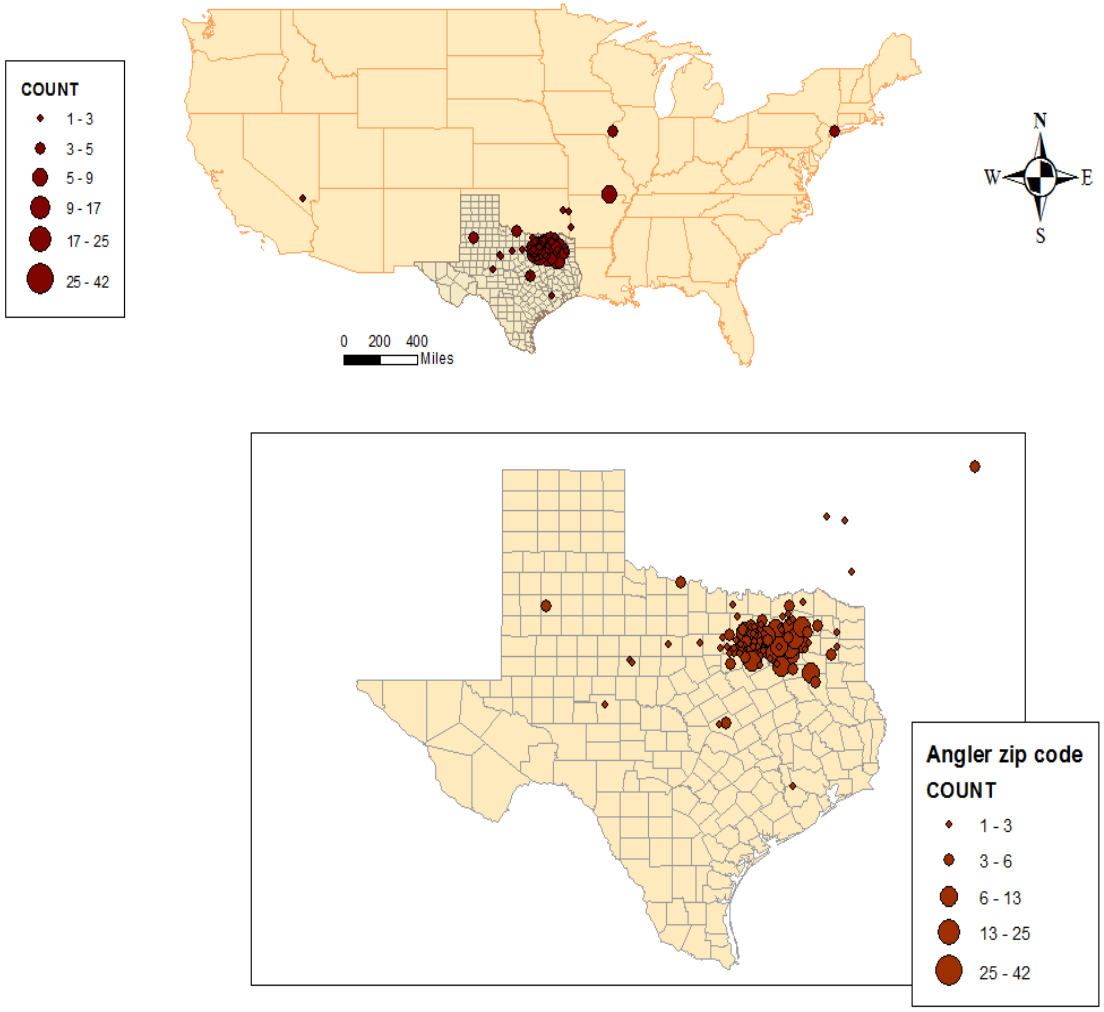
Length-at-age for Blue Catfish collected from various methods at Lake Tawakoni, Texas, 2013 and 2014.

APPENDIX E



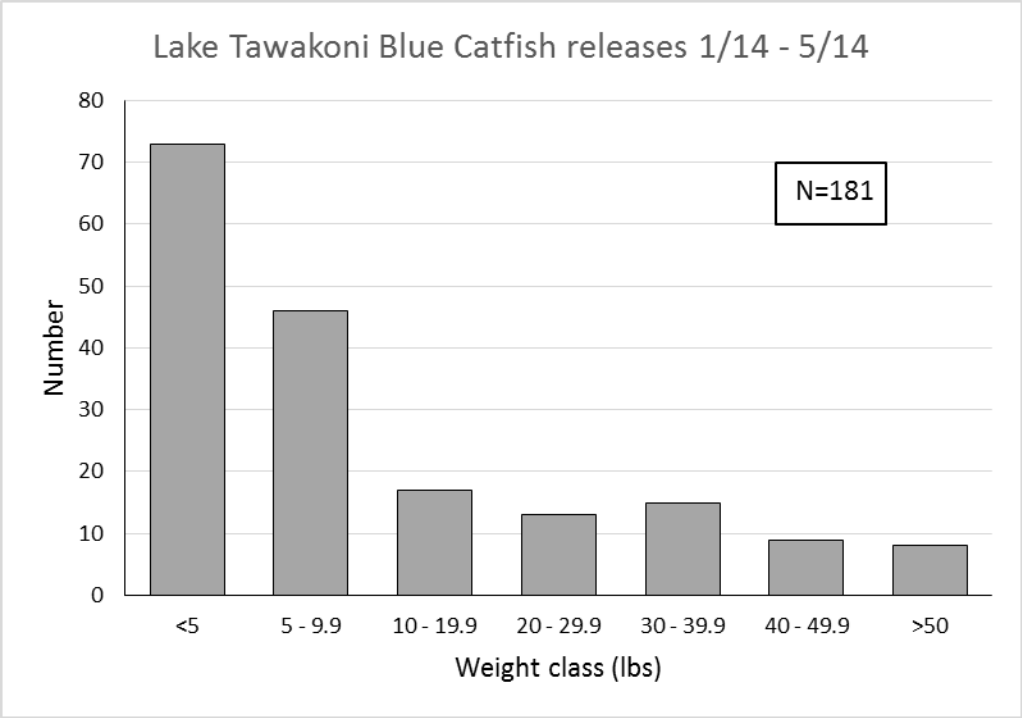
Location of fall electrofishing (E) and spring gill netting sites (G), Lake Tawakoni, Texas, 2014 - 2015.

Appendix F



Location, by ZIP code, and frequency of anglers that were interviewed at Lake Tawakoni, Texas, during access point creel survey, June 2013 through May 2014.

Appendix G



Weight distribution of released Blue Catfish in creel surveys at Lake Tawakoni, January through May 2014.

Appendix H

Angler responses to selected questions in the Lake Tawakoni Catfish Angler Survey, July 2013 to June 2014. Number participants = 293.

7) Are you a licensed fishing guide? (N=291)

Yes	9%
No	91%

20) Which method did you use MOST OFTEN to catch catfish in Texas in the last 12 months? (N=280)

Rod & Reel	92%
Jugline	5%
Trotline	2%
Handfishing	1%

21) Have you fished in any catfish tournaments in the past 2 years? (N=280)

Yes	32%
No	68%

22) Have you fish Lake Tawakoni in the past 12 months? (N=280)

Yes	32%
No	68%

23) Please rate your current satisfaction with angling for the following catfish species on Lake Tawakoni?

Blue catfish (N=243)

Not at all satisfied	3.3%
Slightly satisfied	2.5%
Moderately satisfied	13.6%
Very satisfied	35.0%
Extremely satisfied	45.7%

24) Which of the species of catfish listed below do you MOST prefer to catch at Lake Tawakoni? (N=245)

Blue catfish	84%
Channel catfish	13%
Flathead catfish	2%

25) What is your preferred size of blue catfish that you keep for eating at Lake Tawakoni? (N=243)

I don't keep blue catfish	6%
Fish under 5 lbs (24 inches)	46%
Fish under 10 lbs (30 inches)	37%
Fish under 15 lbs (34 inches)	6%
No size preference	2%
Other size preference	3%

29) b) I am not satisfied unless I can take home at least some blue catfish (N=246)

Strongly Agree	13.0%
Agree	16.3%
Neutral	17.1%
Disagree	30.9%
Strongly Disagree	22.8%

29) f) I am not satisfied unless I think I can catch a trophy blue catfish (N=246)

Strongly Agree	26.4%
Agree	23.6%
Neutral	17.1%
Disagree	22.0%
Strongly Disagree	11.0%

29) g) I am just as happy if I release most of the blue catfish I catch (N=247)

Strongly Agree	55.9%
Agree	22.7%
Neutral	11.3%
Disagree	6.1%
Strongly Disagree	4.1%

30) a) I am satisfied with the 12 inch minimum length limit for channel and blue catfish (N=255)

Strongly Agree	34.9%
Agree	40.0%
Neutral	9.4%
Disagree	8.6%
Strongly Disagree	7.1%

30) b) I think the current 25-fish bag limit on blue and channel catfish should be increased (N=254)

Strongly Agree	2.0%
Agree	3.2%
Neutral	9.8%
Disagree	35.8%
Strongly Disagree	49.2%

30) c) When I catch larger blue catfish, I prefer to release them back into the lake (N=254)

Strongly Agree	78.0%
Agree	15.6%
Neutral	2.4%
Disagree	2.8%
Strongly Disagree	1.2%

30) d) I favor reducing the harvest of larger blue catfish (for example fish above 10 lbs) so I can catch more large fish in future. (Note: 10 lbs is just used as an example, not a recommendation.) (N=255)

Strongly Agree	71.4%
Agree	14.1%
Neutral	6.7%
Disagree	3.1%
Strongly Disagree	4.7%

30) e) I seldom keep a 25-fish daily bag limit of blue and channel catfish (N=255)

Strongly Agree	51.0%
Agree	29.4%
Neutral	7.5%
Disagree	8.6%
Strongly Disagree	3.5%

30) f) I will harvest large blue catfish when I catch them (N=251)

Strongly Agree	2.8%
Agree	4.4%
Neutral	9.2%
Disagree	20.3%
Strongly Disagree	63.4%

30) g) I support keeping more smaller fish in exchange for reducing the harvest of larger blue catfish (for example fish above 10 lbs). (Note: 10 lbs is just used as an example, not a recommendation.) (N=255)

Strongly Agree	44.7%
Agree	28.6%
Neutral	13.3%
Disagree	7.1%
Strongly Disagree	6.3%

Appendix I

Blue Catfish Age-Length key – March 2013

Inch group / Age group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Population sample
8		1.00																		1
9	1.00	2.00																		3
10		1.00																		1
11			3.00																	3
12		2.22	6.67	1.11																10
13			6.46	7.54																14
14			3.46	3.46	6.92	1.15														15
15				1.00	6.00	1.00														8
16			1.00		3.00	1.00	2.00		1.00											8
17						5.00	5.00		2.00											12
18					1.65	3.29	3.29	3.29	3.29	4.94	4.94	1.65		1.65						28
19					3.88			7.75	3.88	3.88		3.88	3.88	3.88						31
20							3.38	3.38	5.08	1.69	3.38	1.69	1.69		1.69					22
21								1.67	3.33		1.67	1.67	3.33	1.67	1.67					15
22							1.43					4.29	1.43	1.43					1.43	10
23						1.00					2.00		1.00							4
24												2.00	2.00							4
25													1.00	1.00			1.00			3
26											1.00	1.00	1.00							3
27												1.00	1.00							2
28												1.00	1.00							2
29													2.00							2
30																	1.00			1
31												1.00								1
32												2.00								2
33															1.00					1
34													1.00							1
35																				0
36														1.00						1
37																				
38																				
39																				
40																				
41													1.00							1
42																				
43																				
44																				
45																			1	1
Total fish / age group	1.00	6.22	20.59	13.11	21.45	12.45	15.11	16.10	18.58	10.51	12.99	21.17	21.33	10.62	4.36	0.00	2.00	0.00	2.43	210