PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2016 Fisheries Management Survey Report

Coleto Creek Reservoir

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TABLE OF CONTENTS

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Coleto Creek Reservoir were surveyed in 2016 using electrofishing and in 2017 using gill nets and baited tandem hoop nets. Creel surveys were conducted from 1 January 2017 through 30 June 2017. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Coleto Creek Reservoir is a 3,100-acre (averaged 2,923 acres in 2016-2017) reservoir located on Coleto Creek in the Guadalupe River Basin, 13 miles southwest of Victoria, Texas. Regulated by the Guadalupe-Blanco River Authority (GBRA), the reservoir receives water from Coleto and Perdido creeks as well as several smaller tributaries. Primary uses include power plant cooling and recreation. Approximately 600 acres are used for cooling ponds and inaccessible to anglers. Water level is typically stable; however, over the survey period water levels fluctuated 2.5 feet from conservation pool. Substrate is composed primarily of clays, deep loams and small rock. Littoral habitat consisted primarily of flooded terrestrial vegetation, floating-leaved native vegetation, water hyacinth, and flooded timber.

- **Management History:** Important sport fish species include Blue and Channel catfishes, White Bass, Largemouth Bass, and White and Black crappies. Angler harvest of all sport fishes has been regulated according to statewide size and bag limits. Palmetto Bass and Red Drum were previously stocked in the reservoir but these stockings were discontinued due to low directed angling effort. Recent management efforts focused on control of nuisance aquatic vegetation, compiling catch and harvest statistics on important sport fish populations, and exploratory use of low-frequency electrofishing to collect population data on catfishes. District staff also conducted additional Largemouth Bass sampling to estimate total annual mortality and compiled tournament data records to document catches of larger fish. Historically, invasive aquatic vegetation (hydrilla, water milfoil, and water hyacinth) has restricted access. District staff worked with GBRA and herbicides were utilized as needed.

- **Fish Community**
  - **Prey species:** Gizzard and Threadfin Shad abundance was low. Abundant sunfish (Bluegill and Redear Sunfish) populations formed the forage base.

  - **Catfishes:** Blue and Channel Catfish were present in the reservoir in high abundance. Good numbers of legal-size catfish were available for angler harvest. Catfishes ranked 2nd in angler preference, yet harvest was relatively low.

  - **White Bass:** White Bass decreased in abundance over the survey period. All White Bass collected in 2017 exceeded the 10 inch minimum length limit. Directed angling effort and harvest was low.

  - **Largemouth Bass:** Largemouth Bass abundance remained high over the survey period. Mean age at legal length in 2017 was 2.6 years. Largemouth Bass were the most sought species in the reservoir and supported numerous live-release tournaments.

  - **Crappies:** Black and White Crappies were present in the reservoir. Crappies were the 3rd most sought sport fish in the reservoir and provided excellent angling opportunity.

- **Management Strategies:** Continue to manage sport fish populations under existing harvest regulations. Conduct creel survey to collect quantitative data on angler use. Monitor coverage and potential expansion of non-native vegetation and continue to work with GBRA on all vegetation control activities. Promote and disseminate information on current angling opportunities.

INTRODUCTION

This document is a summary of fisheries data collected from Coleto Creek Reservoir in 2016-2017. The purpose of the document is to provide fisheries information and provide management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Management recommendations address existing problems and/or opportunities. Historical data are presented for comparison.

Reservoir Description

Coleto Creek Reservoir is a 3,100-acre reservoir located in the Guadalupe River Basin on Coleto Creek. The reservoir was constructed in 1980 and is located 13 miles southwest of Victoria. The reservoir receives water from Coleto and Perdido creeks and several smaller tributaries. The reservoir is controlled and operated by the Guadalupe-Blanco River Authority. Its main purposes are use as power plant cooling supply and recreation. Roughly 600 acres are used for cooling ponds and thus inaccessible to anglers. The reservoir typically experiences little water level fluctuation. Water level was within 2.5 feet of conservation pool during all fisheries and vegetation surveys conducted in 2016 – 2017 (Figure 1). Substrate is composed primarily of clays, deep loams and small rock. Littoral habitat consisted of timber stands, periodically flooded terrestrial vegetation, and seasonally abundant exotic vegetation. Non-native species present included water hyacinth. Historically, hydrilla, water milfoil, and water hyacinth have been problematic in the reservoir and subsequently treated with herbicides and bio-control organisms under the guidance of Texas Parks and Wildlife (TPWD) Corpus Christi District. Other descriptive characteristics for Coleto Creek Reservoir are in Table 1.

Angler Access

Coleto Creek Reservoir has one public boat ramp located at Coleto Creek Park and is maintained and operated by GBRA. Additional boat ramp characteristics are in Table 2. Shoreline access was adequate. All shoreline within Coleto Creek Park grounds were available to bank fishermen, including one fishing pier.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Binion and Findeisen 2014) included:

1. Address low sampling catch rates and apparent declines in relative abundance of important sport fish (Blue and Channel Catfish and White and Black Crappie).
   Action: In addition to gill netting, exploratory sampling for catfishes with low frequency electrofishing (LFE) and baited tandem hoop nets were conducted in summer 2015 (LFE) and 2017 (hoop netting). A creel survey was conducted in accordance with the objective-based sampling plan to assess angling effort, catch, and harvest of important sport fishes.

2. Invasive species has potential to be problematic in the reservoir.
   Action: Invasive vegetation was monitored through standard fisheries surveys and an aquatic vegetation survey in 2016. District staff continued to serve as advisors to GBRA on all vegetation control activities. Invasive vegetative species have been maintained at manageable levels. The GBRA treated day-use and swimming areas with herbicides annually. TPWD's aquatic habitat enhancement (AHE) team treated water hyacinth with herbicide in 2017 (16.5 acres).

3. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir. Contact and educate marina owners about invasive species, and provide them with

posters, literature, etcetera so that they can in turn educate their customers. Educate the public about invasive species through the use of media and the internet. Make a speaking point about invasive species when presenting to constituent and user groups. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses. Monitor water hyacinth and other exotic invasive vegetation through vegetation surveys. Revisit the water hyacinth control program and continue to cooperate with the city of Corpus Christi on all vegetation control activities.

Action: Invasive vegetation was monitored through several vegetation surveys and routine fisheries surveys. Staff maintained working relationship with GBRA and advised on all vegetation control activities. TPWD AHE staff conducted water hyacinth herbicide treatment in 2017 (16.5 acres). Signage was provided to GBRA and posted at the reservoirs only access point.

Harvest regulation history: Sport fishes in Coleto Creek Reservoir are currently managed with statewide regulations (Table 3). When Coleto Creek Reservoir was opened to anglers in 1981, the Largemouth Bass were managed with a 16-inch minimum length limit (MLL) and three fish daily bag. In the late 1980's the regulation was changed to the statewide 14-inch minimum length limit, five fish daily bag.

Stocking history: Northern Largemouth Bass (NLMB) fingerlings were stocked over a three year period from 2003-2005 as part of a research project aimed to evaluate the contribution of NLMB in reservoirs that were composed primarily of Florida Largemouth Bass (FLMB). Red Drum were stocked in 2001 as a management action to create another sport fish population. However, Red Drum were never collected during routine fisheries surveys; only anecdotal angler catches were reported. Palmetto Bass were last stocked in 1999; stockings were discontinued due to low gill net catch rates and minimal angling effort directed toward this species. A complete stocking history can be found in Table 4.

Vegetation/habitat management history: Hydrilla and water milfoil have historically been problematic in the reservoir restricting recreational access. Hydrilla and water milfoil infestations at boat ramps have been treated with herbicides as needed. Additionally, bio-control organisms (hydrilla and water milfoil flies) have been introduced to assist with control. Hydrilla abundance in the reservoir has decreased substantially since 1998. This is likely attributed to high water temperatures, herbivores such as tilapia, weevil introductions, and competition with other submersed species. Isolated colonies of water hyacinth were found on the reservoir in 2005. However, through GBRA control efforts, coverage has been limited and has yet to negatively impact access. Over the current survey period, hydrilla and milfoil have not negatively impacted boat and angler access. However, water hyacinth coverage expanded in 2016 – 2017 and was treated with herbicides by TPWD in 2017 (16.5 acres).

Water transfer: Coleto Creek Reservoir is primarily used for recreation and as a cooling pond for the Coleto Creek Power coal-fired power plant. There is one pumping station on the reservoir with the capacity to pump water in from the Guadalupe River. There are no pending proposals to install additional pump stations. No inter-basin transfers are known to exist.

METHODS

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

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

was conducted at randomly selected stations to collect a 200-fish sample for a comprehensive age and growth analysis in 2015. Ages for Largemouth Bass were determined using otoliths from 13 – 34 randomly selected fish (range 13.0 – 14.9 inches) for all surveys excluding 2015 where 5-fish per 10 mm group were collected and aged.

Gill netting – Channel Catfish, Blue Catfish, and White Bass were collected by gill netting (10 net nights at 10 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

Low-frequency electrofishing – Blue Catfish and Flathead Catfish were collected by low-frequency electrofishing (1 hour at 20, 3-minute stations). CPUE for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Tandem hoop nets – Channel Catfish were collected using 6 tandem hoop-net series at 6 stations. Nets were baited with soap and deployed for 2-night soak durations. CPUE for tandem hoop netting was recorded as the number of fish caught per tandem hoop net series (fish/series).

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 from 2005 through 2013 and by electrophoresis for previous years.

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 and creel statistics.

Growth parameters were estimated using the von Bertalanffy growth equation utilizing non-linear least squares methodology (Haddon 2001). Mean length-at-age was described by: $L_a = L\infty\ (1\text{-}e^{-K(t-to)})$; where L_a = length-at-age, $L\infty$ = average asymptotic length, K = metabolic growth coefficient, and t_o = hypothetical age where the fish has a length of zero. Mortality estimates were obtained by regressing *ln*(catch at age) against each age class and the slope of the line was used as an estimate of instantaneous mortality (*Z*). Survival (*S*) was calculated as $e^{(-Z)}$ and total annual mortality (*A*) was calculated as 1-*S*. Residuals from the catch curve were plotted by year class allowing inference into year class strength and recruitment dynamics (Maceina 1997; 2004).

Creel survey – A roving creel survey was conducted from 1 January 2017 through 30 June 2017. Angler interviews were conducted on 7 weekend days and 5 weekdays per quarter to assess angler effort, catch, and harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2015). Additional information was obtained from interviewed anglers including Largemouth Bass angler type and weight class data of Largemouth Bass that were caught and released.

Habitat –Vegetation surveys were conducted 2015 – 2017 to monitor expansion of water hyacinth. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

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, standing timber, flooded terrestrial vegetation, and native and non-native floating vegetation (Tables 6 and 7). Total native vegetation coverage was 5.5 acres (< 1.0%) in 2016, a substantial decrease from 211.2 acres (10.2%) in 2013 (Table 7). Most notably, the reservoir experienced large reservoir-wide decreases in submersed aquatic vegetation. Spatterdock (3.2 acres) was the most abundant native vegetation in 2016. Total non-native vegetation coverage decreased in 2016 (5.3 acres; < 1.0%) relative to 2013 (672.3 acres; 32.4%); primarily attributed to reduction in Eurasian watermilfoil. Water hyacinth expanded to the upper reservoir over the survey period and was treated with herbicides in spring of 2017.

Creel: The reservoir continues to be a popular South Texas destination for anglers. Directed fishing effort by anglers in 2017 was highest for Largemouth Bass (74.7%; combined tournament [35.4%] and non-tournament [39.3%] anglers), followed by no species preference (10.8%), catfishes (8.1%), and crappies (6.0%), (Table 8). Total fishing effort for all species at Coleto Creek Reservoir was 64,489 h and anglers spent an estimated $708,225 on direct expenditures in 2017 (Table 9). While some anglers traveled great distances (> 1250 miles) to fish at the reservoir, the majority (> 90%) resided within 250 miles (Appendix F).

Prey species: Gizzard Shad catch rates were 67.0/h in 2016, considerably lower than 2015 (184.0/h). Index of vulnerability values were high across years (range: 87 – 95), indicating the majority of Gizzard Shad collected were available as prey (Figure 2). Bluegill and Redear Sunfish comprised the majority of the prey base in the reservoir. While electrofishing catch rates of Bluegill tapered over the study period, catch rates in 2016 remained high (241.0/h; Figure 3). A similar trend in declining relative abundance was observed for Redear Sunfish, yet the 2016 catch rate (148.0/h) indicated ample numbers of fish (Figure 4). The majority of Bluegill and Redear Sunfish collected were < 6 inches; a suitable size as prey for most predators. Several large Redear Sunfish were collected (CPUE-6 = 69.0/h; Figure 4), providing added recreational opportunity to anglers. Overall, sunfish abundance and size structure was sufficient to maintain predator abundance, growth, and body condition.

Catfishes: Blue Catfish abundance increased substantially from previous surveys (2017 gill net CPUE = 15.0/nn; Figure 5). In addition to gill netting, LFE was utilized as a potential alternative sampling method and yielded a catch rate of 149.0/h (Figure 6). Several (N = 6) quality-sized (≥ 20 in) fish were collected with low-frequency electrofishing. However, LFE standard errors were high because a majority of fish were collected from a few sampling stations. Furthermore, the majority (93%) of fish collected were ≤ 4 inches total length (Figure 6). Relative weight values were low (< 86) for smaller size classes.

The gill net catch rate for Channel Catfish in 2017 was 9.0/nn, considerably higher than 2012 (3.0/nn) and 2014 (0.8/nn) (Figure 7). Numerous harvestable-sized (≥ 12 in) fish were available to anglers indicated by CPUE-12 (6.5/nn). Size composition in 2017 was balanced (PSD = 38) and comprised a wide size range of individuals. Relative weight values were variable and tended to increase with increased length. Baited tandem hoop nets were deployed in the summer of 2017 to explore its use as an alternative sampling gear but no Channel Catfish were collected.

Catfishes were the second most popular sport fish and directed effort comprised 5,246 angler hours (8.1% total directed effort; Table 10) in 2017. Angler catch rate was 1.11/h and total estimated harvest was 3,044 fish (Table 10). Channel Catfish comprised the majority (91%) of the catch composition. Harvested catfish ranged in length between 12 – 27 inches (Figures 8 and 9).

White Bass: Relative abundance of White Bass varied over the survey period. The gill net catch rate for White Bass in 2017 (0.7/nn) was considerably lower than the catch rate in 2012 (3.6/nn) and 2014 (5.2/nn; Figure 10). While catches were low, all fish collected in 2017 were available for angler harvest. Relative weights were low (< 80) across years and size classes (Figure 10). Little angling effort was directed for White Bass in 2017 and total harvest was low (Table 11).

Largemouth Bass: Relative abundance of Largemouth Bass remained high. The electrofishing catch rate for Largemouth Bass was 160.0/h in 2017, higher than 2015 (114.0/h) but lower than 2014 (234.0/h) (Figure 12). Catch of legal-size fish was adequate in all years (CPUE-14 range: 10.0 – 40.0/h; Figures 12 and 13), while CPUE-18 declined over the survey period. Population size structure was poor (PSD = 34) in 2017 and indicated a population dominated by smaller size classes (Figure 12). This was attributed to a strong 2015 year class likely resulting from coincident water level rise (Figures 1 and 12). Relative weight values ranged from 81 – 92 in 2017, were reduced relative to 2014 and 2015, and tended to decrease with increased length. Growth was adequate and improved over the survey period. Mean age at legal length (14 inches) in 2016 was 2.6 years (Table 12; Figure 14). Total annual mortality (*A*) for the population was considered low to moderate, estimated at 0.30 (95% CI: 0.05 – 0.48) in 2015 (Figure 15); a value considerably lower than reported in 2008 (Binion and Findeisen 2009). The contribution of a strong 2011 year class (Figure 16) was evident in the 2014 length frequency histogram with several fish in the population above the 14 inch MLL (CPUE-14 = 40.0/h; Figure 12). Introgression of Florida Largemouth Bass genetics into the population was consistent and has remained high over the past decade (%FLMB allele; mean = 86, range: 81 – 92, N = 9) (Table 13).

Directed effort, catch per hour, and total harvest for Largemouth Bass was 48,180 h, 1.8 fish/h, and 2,062 fish, respectively, from 1 January 2017 through 30 June 2017 (Table 14). Largemouth Bass tournaments comprised an important component to the fishery at the reservoir. In 2017, tournament anglers represented 35.4% of total fishing effort (Table 8). Catch and release of legal-size fish was frequent indicated by percent legal largemouth bass released (71.5%; Table 14). Angler compliance to the minimum length limit was poor; 5% of observed harvested fish were below legal size. Harvested fish ranged from 12 – 23 inches total length. The majority of observed harvest occurred in the 14 – 20 in size range (Figure 17). From 1 January 2017 thru 30 June 2017, 154 Largemouth Bass weighing between 7 and 10 lbs and 1,044 fish weighing between 4 and 6.99 lbs were caught and released by anglers. Tournament records indicated the average tournament angler weighed-in 3.31 fish and the average weight of tournament-weighed Largemouth Bass was 2.32 pounds (Appendix E).

Crappies: Trap netting for crappies was discontinued in 2014 due inconsistent catches and poor data resolution. Directed effort for crappies was 3,860 h (6.0%) in 2017 and angler success was high (angler CPUE = 1.67; Table 15). Total harvest for crappies was 3,671 fish and harvested fish ranged in length between 10 – 14 inches (Figure 18). Crappies provided excellent angling and continued to be an important component of the overall sport fishery.

Fisheries management plan for Coleto Creek Reservoir, Texas

Prepared - July 2017

ISSUE 1: The reservoir continues to be a popular destination for anglers. Collection of quantitative data such as angler effort, catch, and harvest is necessary to evaluate trends in fishery statistics.

MANAGEMENT STRATEGIES

1. Conduct a roving creel survey spanning 1 January 2020 through 30 June 2020.
2. Maintain and continue to collect data for Largemouth Bass trophy database.

ISSUE 2: Non-native vegetation has the potential to be problematic in this reservoir. Abundance of water hyacinth has increased since last vegetation survey conducted in 2016 and has expanded into the upper half of the reservoir.

MANAGEMENT STRATEGIES

1. Monitor the spread of nuisance vegetation through annual vegetation surveys.
2. Continue to serve as advisors to GBRA on all vegetation control activities.

ISSUE 3: Channel and Blue Catfish abundance has increased and size composition is excellent. Several quality sized fish were collected. These populations can sustain additional angling effort and harvest.

MANAGEMENT STRATEGIES

1. Promote catfish fisheries and catfish angling opportunities by distributing press releases.

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.

Objective-Based Sampling Plan and Schedule for Coleto Creek Reservoir

2017 – 2021

Sportfish and forage species at Coleto Creek Reservoir

Sport fishes in Coleto Creek Reservoir include Blue, Channel, and Flathead Catfish, White Bass Largemouth Bass, and White and Black Crappie. Important forage species include bluegill, redear sunfish, redbreast sunfish, and both gizzard and threadfin shad.

Low-density fisheries

Flathead Catfish: Flathead Catfish are present in the reservoir in low abundance. No Flathead Catfish were collected in gill nets from 1998 to 2014 and only one was collected in the 2017 gill net survey. Creel survey data shows there is no directed effort towards this species and no Flathead Catfish have been encountered during angler interviews. Exploratory use of low-frequency electrofishing was conducted in 2015 to determine if the Flathead Catfish population is negligible and also for utility for use as alternative gear for collecting trend data for this species. Twenty, randomly selected 3-minute LF electrofishing stations were sampled in summer 2015. No Flathead Catfish were collected during this survey. Presence/absence will be noted in standard gill net samples (Table 16). No additional effort beyond standard sampling for Blue and Channel Catfish will be expended to evaluate this population.

White Bass: White Bass are present in the reservoir in low abundance. Gill net CPUEs from 1998-2017 ranged from 0.4 to 10.6 fish/nn with RSE's ranging from 29 – 73. Minimal conclusions regarding the trend data on CPUE, size structure, and body condition of White Bass can be made due to high variability in the gill net catch data. Due to the inconsistent catches and associated high sampling variability and low directed fishing effort (< 1.0%); directed effort, angler catch, and angler harvest will be monitored with a creel survey conducted in 2020/2021 to detect any large-scale shifts in White Bass metrics; lending important insight into overall population status and dynamics that may justify more intensive investigation. Additionally, presence/absence will be noted in standard gill net samples (Table 16).

Survey objectives, fisheries metrics, and sampling objectives

Blue Catfish: Blue Catfish are present in Coleto Creek Reservoir but historically abundance has been low. Gill net CPUEs from 1998-2014 ranged from 0.4 fish/nn to 1.8 fish/nn. The 2017 gill net survey yielded a record catch rate of 15.0/nn with an acceptable RSE (21). Additionally, a LFE survey conducted in 2015 netted 149.0/h, albeit size composition and RSE values were poor. Exploratory use of low-frequency electrofishing will be continued to determine its utility for use as alternative gear for collecting trend data for this species. A minimum of 20, randomly selected 3-minute LF electrofishing stations (effort will continue until fish no longer surface or all fish submerge) will be sampled in summer 2020 and gill net sampling (minimum of 10 net nights) will be conducted in spring 2021 (Table 16). Evaluation of angler catch, effort, and harvest will provide further support in determining if this fishery is utilized.

Channel Catfish: Channel Catfish are the predominant *ictalurid* species in Coleto Creek Reservoir. Gill net CPUEs from 1998-2017 have ranged from 0.8 to 9.0 fish/nn (RSE range: 19 – 47). Gill net sampling has produced highly variable catch rates and less than desirable RSE values for monitoring trends in relative abundance. However, the 2017 gill net survey yielded a record catch rate of 9.0/nn with an acceptable RSE (19). A baited tandem hoop net survey was conducted in 2017 but no Channel Catfish were collected. Exploratory use of baited tandem hoop netting will be continued to determine its utility for use as alternative gear (providing larger sample and more precise measurements of CPUE) for collecting trend data for this species. A minimum of 6, randomly selected 2-night tandem hoop net sets will be sampled in summer 2020 and gill net sampling (minimum of 10 net nights) will be conducted in spring

2021 (Table 16). Evaluation of angler catch, effort, and harvest will provide further support in determining if this fishery is utilized.

Largemouth bass: Largemouth bass are abundant in Coleto Creek Reservoir and are the most popular sport fish (> 70% total directed effort). Results from 2017 creel surveys showed directed angling effort for largemouth bass to be 20 hours/acre, and 154 largemouth bass over 7 pounds were estimated to be caught and released by anglers. Trend data on CPUE, size structure, and body condition has been collected intensively since 1986 with electrofishing. The collection of biennial trend data with fall electrofishing will allow for determination of large-scale changes in basic population dynamics (abundance, size structure indices, body condition, age-at-length) that may warrant further investigation with more intensive sampling and/or management action. A minimum of 12 randomly selected electrofishing sites will be sampled to collect 50 stock-size fish for PSD indices and relative weight. The desired level of precision is RSE ≤ 25 for CPUE-S. Further, category 2 age and growth analysis [mean age at legal length (14 in), N = minimum of 13 fish between 13.0 – 14.9 in] will be conducted for each sample year to assess any changes in growth to the minimum length limit. Sampling will continue up to an additional 12 stations until all objectives are attained. Directed effort, angler catch, and angler harvest will be monitored with a creel survey conducted in 2020/2021 to monitor for any large-scale changes in angling effort, catch, and harvest to gain further insight into overall population status (Table 16). Largemouth Bass catch data recorded from creel surveys will be categorized by weight (<4, 4 – 6.9, 7 – 9.9, >10) to document catches of trophy-sized fish and to maintain the trophy LMB database at the reservoir.

White and Black crappie: Considerable trap net sampling efforts (random and biologist-selected, standard and dual-cod, fall and spring) have yielded very little population data on crappies and data quality was poor. Historic (1998 – 2014) catch rates for white crappie have ranged from 0.0 – 12.4/nn with RSE values ranging from 32 – 72. Staff once thought crappie as a negligible fishery due to low trap net catches. The fishery was realized after implementation of a creel survey in 2005/06. Crappies are an important component of the overall sport fishery at the reservoir; representing up to 9% of the total angling effort. Due to inconsistent trap net catch data and inability to assess trends in population metrics, creel survey data will be used to monitor large-scale changes in crappie angler catch, effort, and harvest.

Shad and Bluegill: Gizzard Shad and Bluegill are the primary forage at Coleto Creek Reservoir. Like Largemouth Bass, trend data on CPUE and size structure of Gizzard Shad and Bluegill have been collected annually since 2007 with fall electrofishing. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in Gizzard Shad and Bluegill relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers for size structure estimation (Gizzard Shad IOV; 50 fish minimum, Bluegill PSD; 50 fish minimum at 12 randomly selected 5-minute stations with 90% confidence) and relative abundance estimates (Gizzard Shad and Bluegill CPUE-Total; RSE ≤ 25). Threadfin Shad and other sunfish presence/absence will be noted in electrofishing collections. No additional effort will be expended beyond sampling effort conducted for Largemouth Bass data collection.

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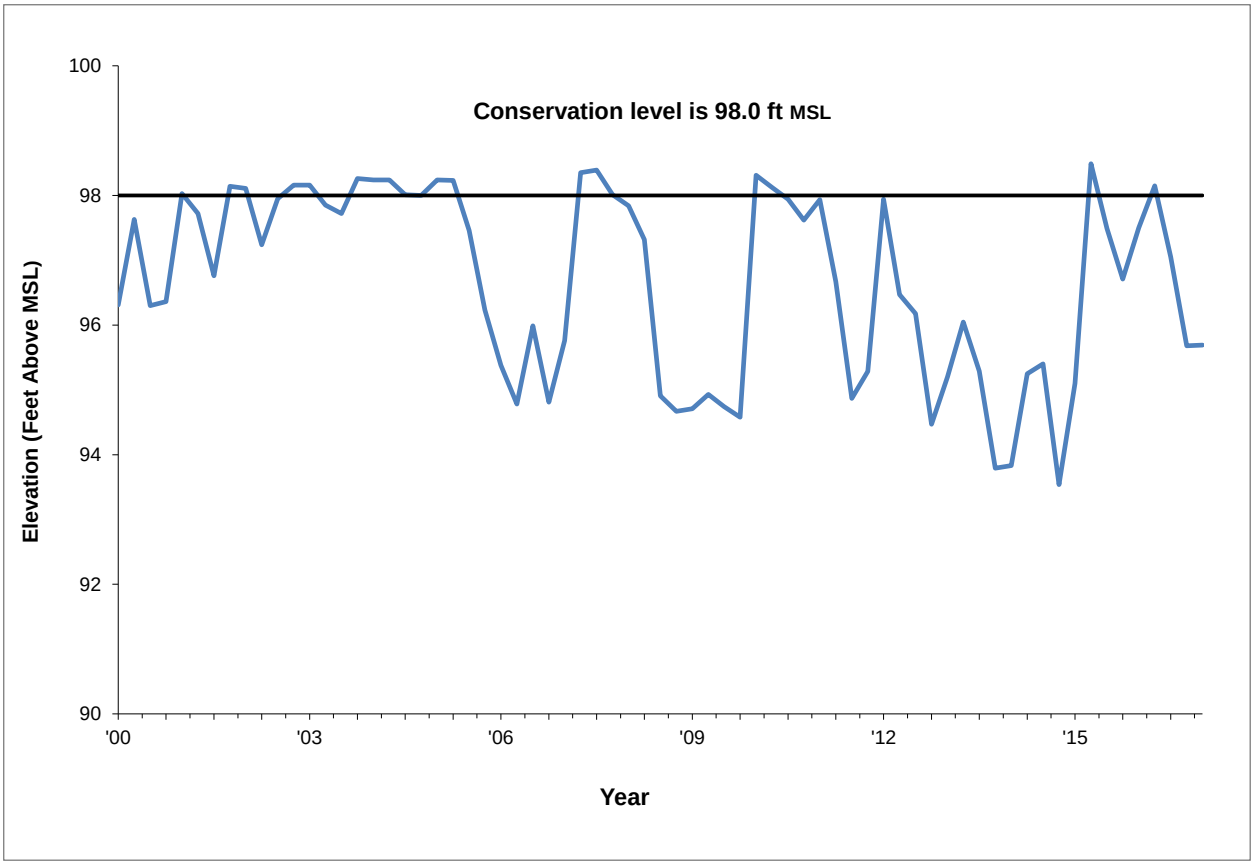


Figure 1. Quarterly water level elevations in feet above mean sea level recorded for Coleto Creek Reservoir, Texas.

Table 1. Characteristics of Coleto Creek Reservoir, Texas.

Characteristic	Description
Year constructed	1980
Controlling authority	Guadalupe-Blanco River Authority
Counties	Goliad, Victoria
Reservoir type	Mainstem
Shoreline Development Index	7.8
Conductivity	500-700 umhos/cm
Access: Boat	Adequate, 1 ramp
Bank	Adequate, park area with pier
Handicapped	Adequate, park area with pier

Table 2. Boat ramp characteristics for Coleto Creek Reservoir, Texas, March, 2013. Reservoir elevation at time of survey was 94.0 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Coleto Creek Park	28.72039° -97.17385°	Y	40+	91.0	Excellent, no access issues

Table 3. Harvest regulations for Coleto Creek Reservoir, Texas.

Species	Bag Limit	Length Limit
Gar, Alligator	1	none
Catfish: Channel and Blue, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass, Largemouth	5	14-inch minimum
Crappie: White and Black, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Coleto Creek Reservoir, Texas. Size categories are: FGL = fingerling and ADL = adults.

Year	Number	Size
Threadfin Shad		
1980	17,900	ADL
Nile perch		
1981	68,119	FGL
Peacock Bass		
1980	4,147	FGL
Coppernose Bluegill		
1982	249,992	FGL
Blue Catfish		
1990	31,496	FGL
Channel Catfish		
1980	100,583	FGL
Palmetto Bass		
1981	34,461	FGL
1982	30,980	FGL
1986	30,500	FGL
1987	10,021	FGL
1988	64,567	FGL
1989	68,584	FGL
1991	46,000	FGL
1992	31,300	FGL
1995	30,470	FGL
1996	46,500	FGL
1997	41,021	FGL
1998	49,642	FGL
1999	46,747	FGL
Species total	484,293	
Northern Largemouth Bass		
2003	38,613	FGL
2004	31,872	FGL
2005	31,249	FGL
Species total	101,734	
Florida Largemouth Bass		
1980	356	ADL
1981	92,092	FGL
1982	160,294	FGL
1983	161,800	FGL
Species total	414,542	
Red drum		
2001	25,445	FGL

Table 5. Objective-based sampling plan components for Coleto Creek Reservoir, Texas 2014 – 2017.

Gear/target species	Survey objective	Metrics	Sampling objective
	For all target species monitor for large-scale changes in:		
Electrofishing			
Largemouth Bass	Abundance	CPUE – stock	RSE-Stock ≤ 25
	Size structure	PSD, length frequency	N ≥ 50 stock
	Condition	W_r	10 fish/inch group (max)
	Age-and-growth	Length-at-age & age at 14 inches	N = 200, all size classes; N = 13, 13.0 – 14.9 inches
	Mortality	Total annual mortality (*A*)	N = 200, all size/age classes
Bluegill [a]	Abundance	CPUE – Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
Gizzard Shad [a]	Abundance	CPUE – Total	RSE ≤ 25
	Size structure	PSD, length frequency	N ≥ 50
	Prey availability	IOV	N ≥ 50
Gill netting			
Blue Catfish	Abundance	CPUE – stock	
	Size structure	PSD, Length frequency	N ≥ 50 stock
	Condition	W_r	10 fish/inch group (max)
Channel Catfish	Abundance	CPUE – stock	
	Size structure	PSD, Length frequency	N ≥ 50 stock
	Condition	W_r	10 fish/inch group (max)
Low-frequency electrofishing	Exploratory use of alternative gear to monitor for large-scale changes in:		
Flathead Catfish	Abundance	CPUE – stock	
	Size structure	Length frequency	N ≥ 50 stock
Blue Catfish	Abundance	CPUE – stock	
	Size structure	Length frequency	N ≥ 50 stock

Table 5 Continued. Objective-based sampling plan components for Coleto Creek Reservoir, Texas 2014 – 2017.

Gear/target species	Survey objective	Metrics	Sampling objective
Tandem hoop netting	Exploratory use of alternative gear to monitor for large-scale changes in:		
Channel Catfish	Abundance	CPUE– stock	
	Size Structure	Length frequency	N ≥ 50 stock
Creel Survey [b]			
White Bass	Trend information on angler effort, catch, and harvest	Angler CPUE, total harvest, and size composition of harvest	
Crappies	Trend information on angler effort, catch, and harvest	Angler CPUE, total harvest, and size composition of harvest	

[a] No additional effort will be expended to achieve an RSE ≤ 25 for CPUE of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.
[b] Angler utilization data and associated statistics will be calculated for all sport fish and non-game species.

Table 6. Survey of structural habitat types, Coleto Creek Reservoir, Texas, 2005, Shoreline habitat type units are in miles.

Habitat type	Estimate	% of total
Boat dock	0.3	0.4
Bulkhead	0.3	0.4
Concrete	0.7	1.0
Natural	66.4	97.0
Rip rap	0.2	0.3
Rocky	0.9	1.2
Standing timber	30.9	45.1

Table 7. Survey of aquatic vegetation, Coleto Creek Reservoir, Texas, 2013 and 2016. Surface area (acres) is listed with percent of total reservoir surface area in parentheses. Percent surface area in 2013 and 2016 was calculated based on surface acreage at the 95.0 and 98.0 ft. contour lines, respectively.

Vegetation	2013	2016
Native submersed	127.2 (6.1)	0.58 (< 1.0)
Water stargrass		0.33 (< 1.0)
Coontail	119.3 (5.8)	0.25 (< 1.0)
American pondweed	7.9 (< 1.0)	
Native floating-leaved	84.0 (4.1)	3.61 (< 1.0)
Native emergent		1.33 (< 1.0)
Non-native	672.3 (32.4)	5.27 (< 1.0)
Hydrilla (Tier III)	13.5 (< 1.0)	
Eurasian watermilfoil (Tier III)	658.8 (31.8)	0.36 (< 1.0)
Alligatorweed (Tier III)		0.39 (< 1.0)
Water hyacinth (Tier II)		4.52 (< 1.0)

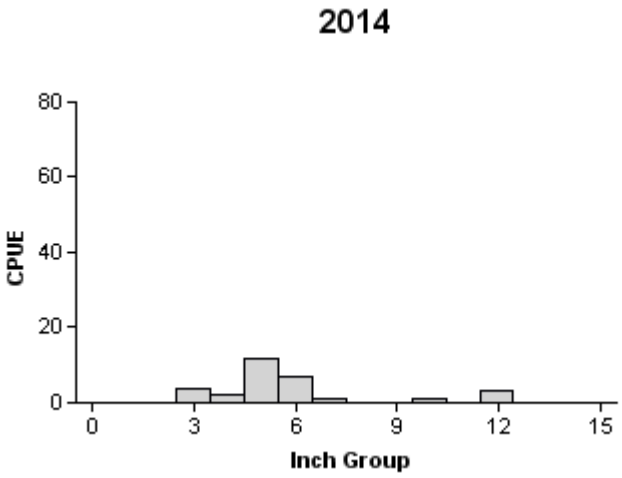
Table 8. Percent directed angler effort by species for Coleto Creek Reservoir, Texas, 2017. Survey periods were from 1 January through 30 June.

Species	2017
Catfishes	8.1
White Bass	0.4
Largemouth Bass (Non-Tournament)	39.3
Largemouth Bass (Tournament)	35.4
Crappies	6.0
Anything	10.8

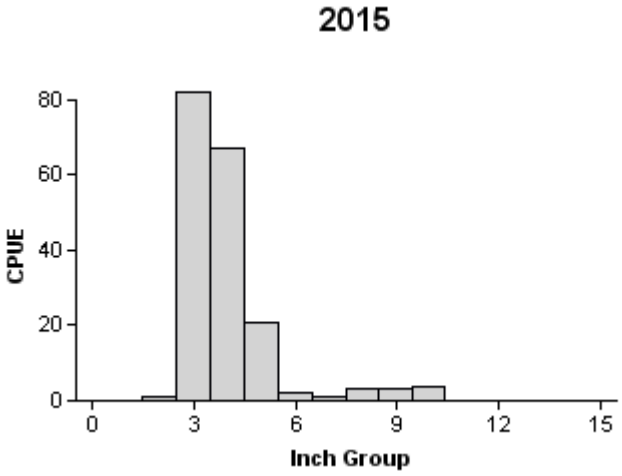
Table 9. Total fishing effort (h) for all species and total directed expenditures at Coleto Creek Reservoir, Texas, 2017. Survey periods were from 1 January through 30 June. Relative standard error is in parentheses.

Creel statistic	2017
Total fishing effort	64,489 (14)
Total directed expenditures	$708,225 (25)

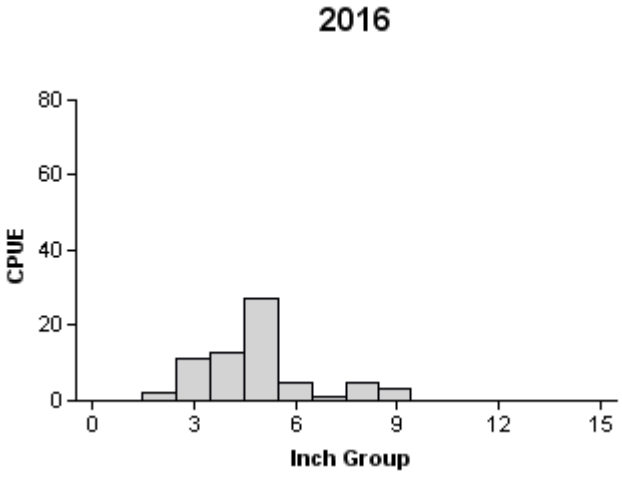
Gizzard Shad



Effort = 1.0
Total CPUE = 30.0 (69; 30)
IOV = 87 (9)



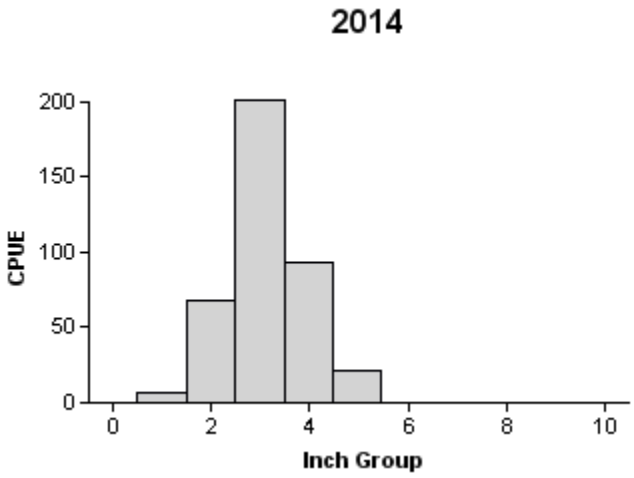
Effort = 1.0
Total CPUE = 184.0 (25; 184)
IOV = 95 (2)



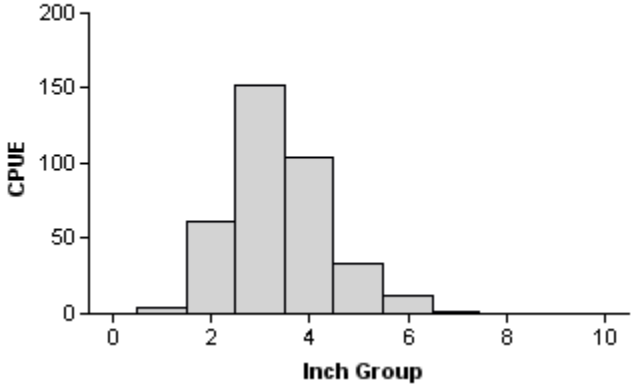
Effort = 1.0
Total CPUE = 67.0 (31; 67)
IOV = 88 (3)

Figure 2. Number of Gizzard Shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Coleto Creek Reservoir, Texas, 2014, 2015, and 2016.

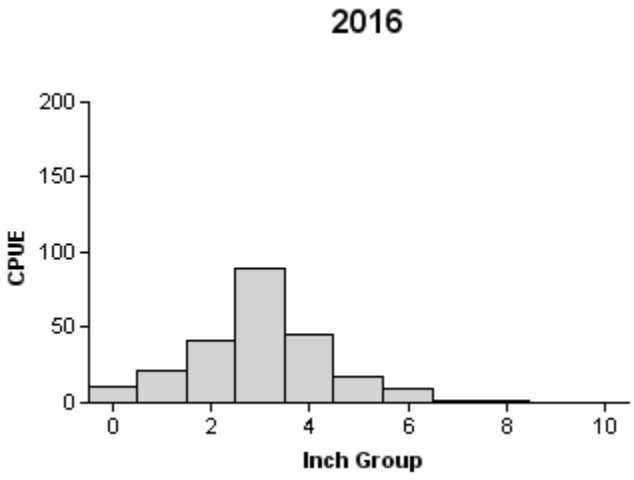
Bluegill



Effort = 1.0
Total CPUE = 393.0 (25; 393)
Stock CPUE = 318.0 (26; 318)
CPUE-6 = 0.0 (0; 0)
PSD = 0 (0)



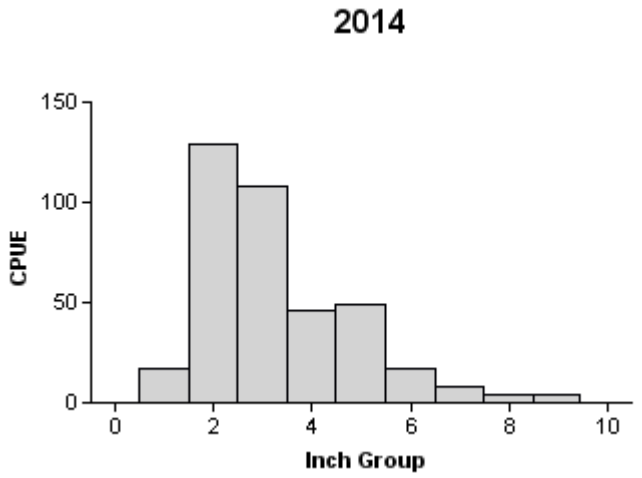
Effort = 1.0
Total CPUE = 370.0 (14; 370)
Stock CPUE = 304.0 (15; 304)
CPUE-6 = 14.0 (33; 14)
PSD = 5 (1)



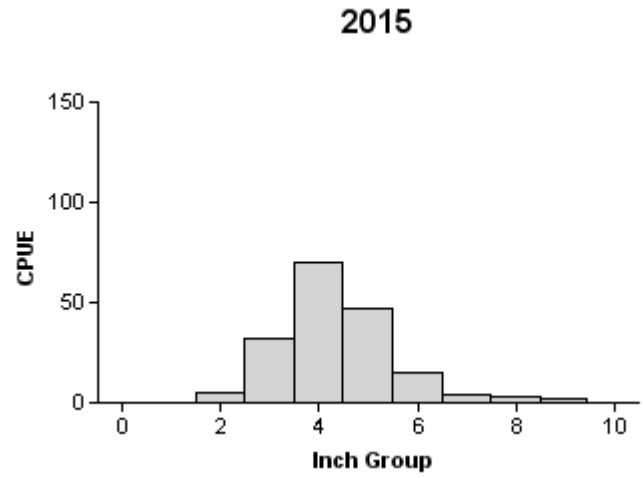
Effort = 1.0
Total CPUE = 241.0 (29; 241)
Stock CPUE = 167.0 (29; 167)
CPUE-6 = 14.0 (28; 14)
PSD = 8 (3)

Figure 3. Number of Bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Coleto Creek Reservoir, Texas, 2014, 2015, and 2016.

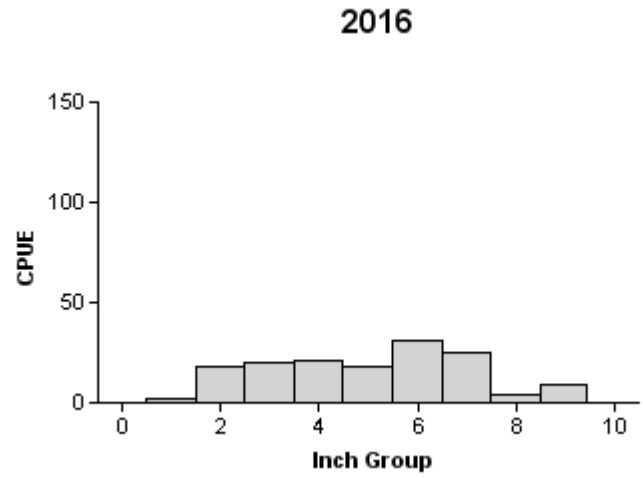
Redear Sunfish



Effort =	1.0
Total CPUE =	382.0 (17; 382)
Stock CPUE =	128.0 (16; 128)
CPUE-6 =	33.0 (15; 33)
PSD =	12 (3)



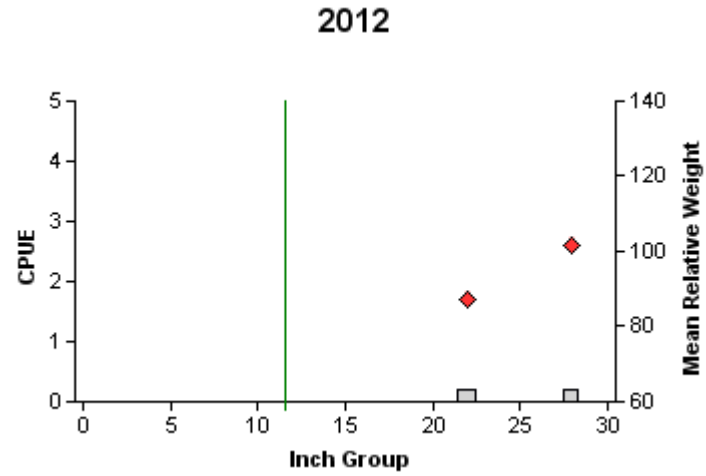
Effort =	1.0
Total CPUE =	178.0 (14; 178)
Stock CPUE =	141.0 (15; 141)
CPUE-6 =	24.0 (18; 24)
PSD =	6 (2)



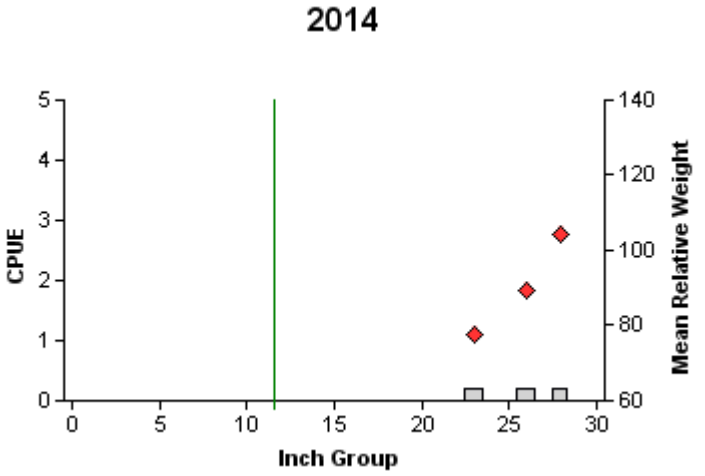
Effort =	1.0
Total CPUE =	148.0 (26; 148)
Stock CPUE =	108.0 (20; 108)
CPUE-6 =	69.0 (20; 69)
PSD =	35 (7)

Figure 4. Number of Redear Sunfish caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Coleto Creek Reservoir, Texas, 2014, 2015, and 2016.

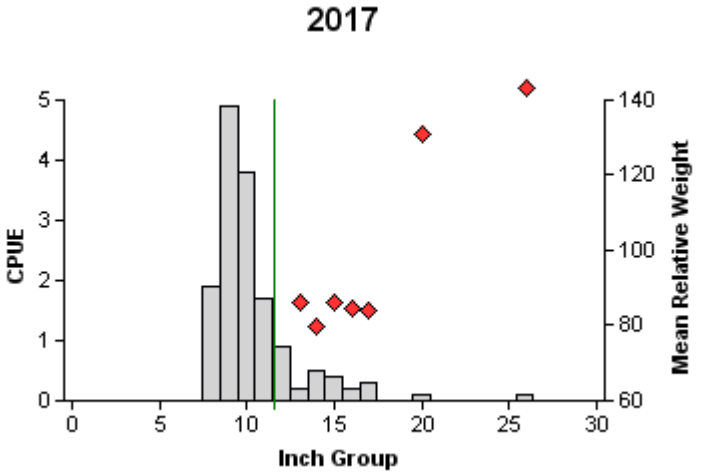
Blue Catfish



Effort =	5.0
Total CPUE =	0.4 (100; 2)
Stock CPUE =	0.4 (100; 2)
CPUE-12 =	0.4 (100; 2)
PSD =	100 (0)



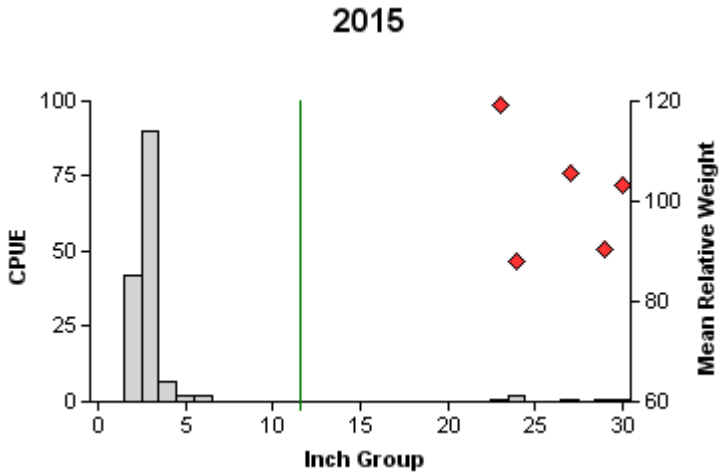
Effort =	5.0
Total CPUE =	0.6 (67; 3)
Stock CPUE =	0.6 (67; 3)
CPUE-12 =	0.6 (67; 3)
PSD =	100 (0)



Effort =	10.0
Total CPUE =	15.0 (21; 150)
Stock CPUE =	2.7 (34; 27)
CPUE-12 =	2.7 (34; 27)
PSD =	7 (5)

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 surveys, Coleto Creek Reservoir, Texas, 2012, 2014, and 2017. Vertical line denotes 12-inch MLL.

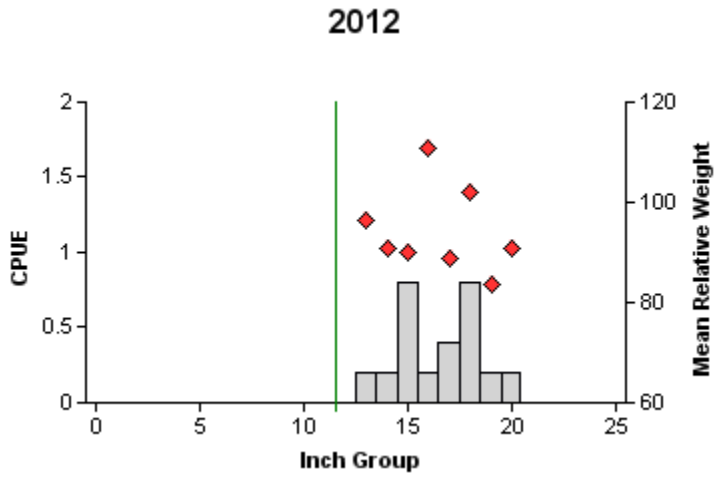
.Blue Catfish



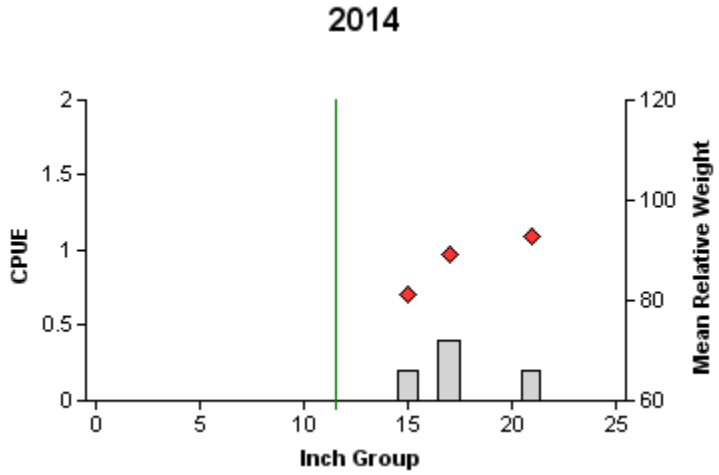
Effort =	1.0
Total CPUE =	149.0 (50; 149)
Stock CPUE =	6.0 (45; 6)
CPUE-12 =	6.0 (45; 6)
PSD =	100 (0)

Figure 6. Number of Blue Catfish caught per hour (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for summer low-frequency electrofishing survey, Coleto Creek Reservoir, Texas, 2015. Vertical line denotes 12-inch MLL.

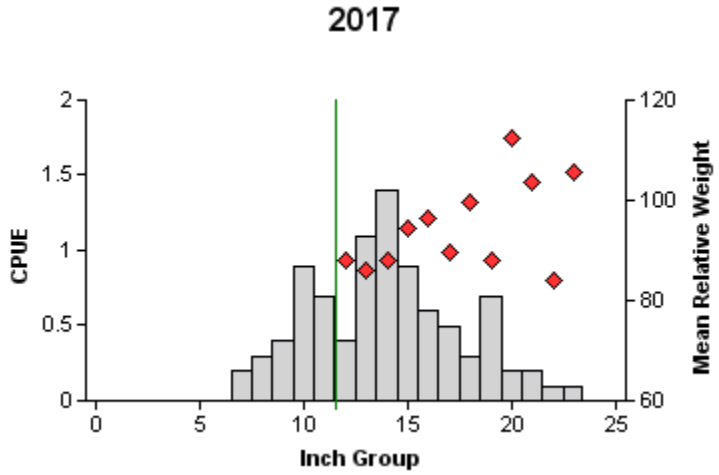
Channel Catfish



Effort = 5.0
Total CPUE = 3.0 (28; 15)
Stock CPUE = 3.0 (28; 15)
CPUE-12 = 3.0 (28; 15)
PSD = 60 (19



Effort = 5.0
Total CPUE = 0.8 (47; 4)
Stock CPUE = 0.8 (47; 4)
CPUE-12 = 0.8 (47; 4)
PSD = 75 (17)



Effort = 10.0
Total CPUE = 9.0 (19; 90)
Stock CPUE = 7.2 (24; 72)
CPUE-12 = 6.5 (26; 65)
PSD = 38 (7)

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 surveys, Coleto Creek Reservoir, Texas, 2012, 2014, and 2017. Vertical line denotes 12-inch MLL.

Catfishes

Table 10. Creel survey statistics for catfishes at Coleto Creek Reservoir from January 2017 through June 2017. Total catch per hour is for anglers targeting Blue Catfish and total harvest is the estimated number of catfishes harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	2017
Surface area (acres)	2,323
Directed effort (h)	5,246 (23)
Directed effort/acre	2.26 (23)
Total catch per hour	1.11 (69)
Total harvest	3,044 (82)
Harvest/acre	1.31 (82)
Percent legal released	10.6

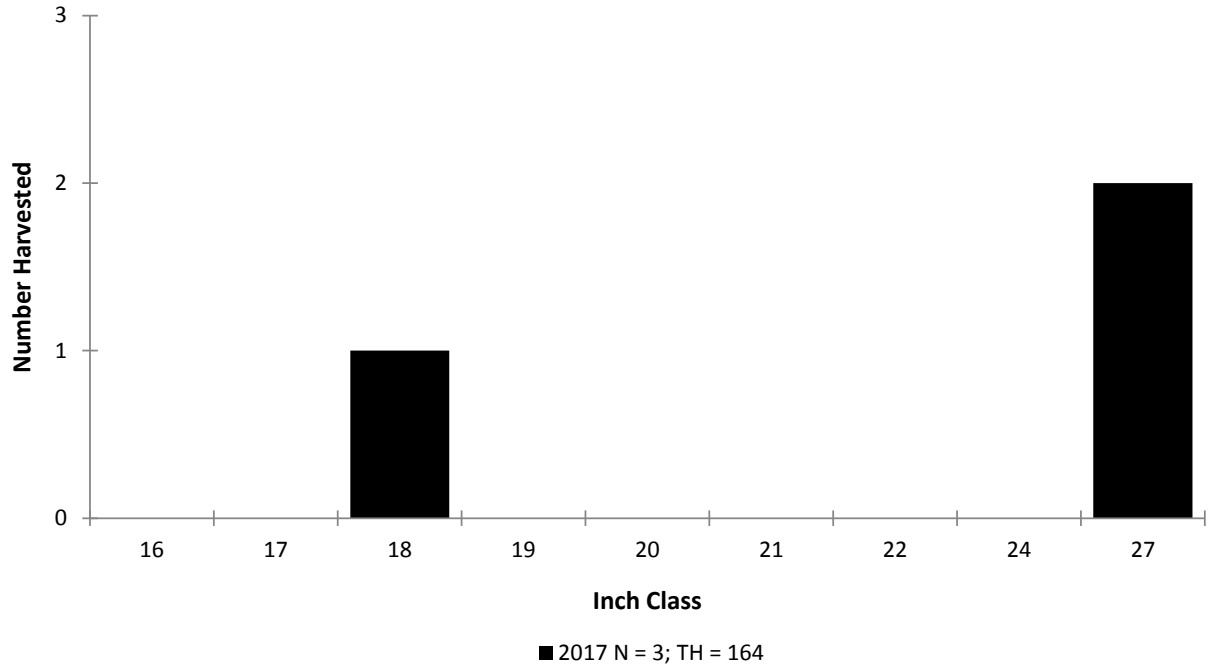


Figure 8. Length frequency of harvested Blue Catfish observed during creel surveys at Coleto Creek Reservoir, Texas, January 2017 through June 2017, all anglers combined. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Catfishes

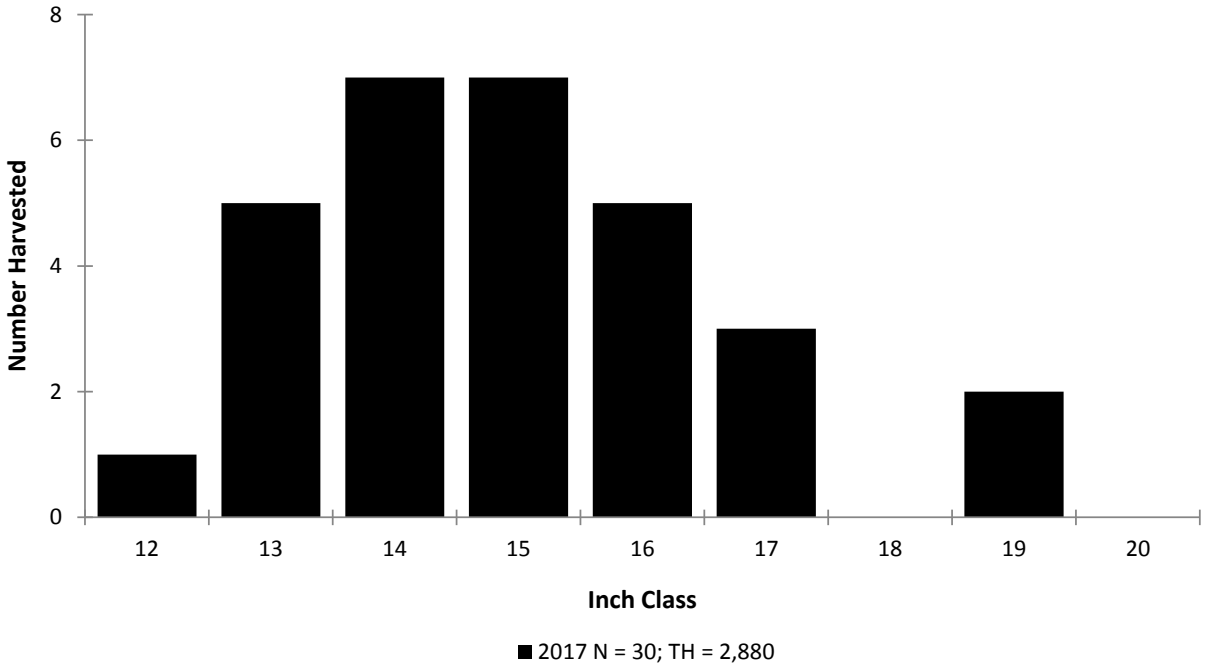
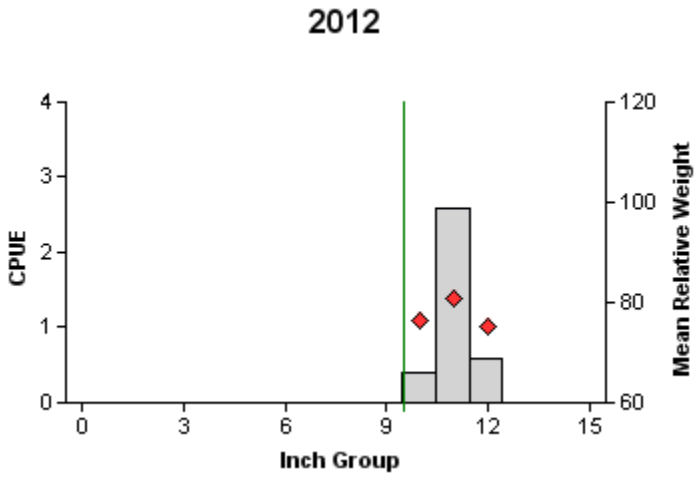
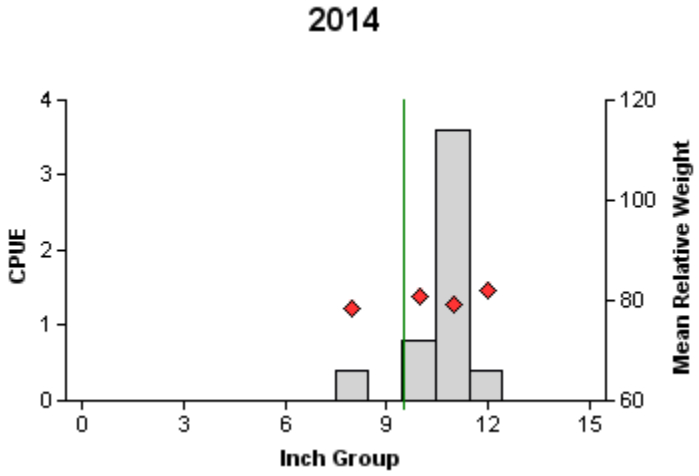


Figure 9. Length frequency of harvested Channel Catfish observed during creel surveys at Coleto Creek Reservoir, Texas, January 2017 through June 2017, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

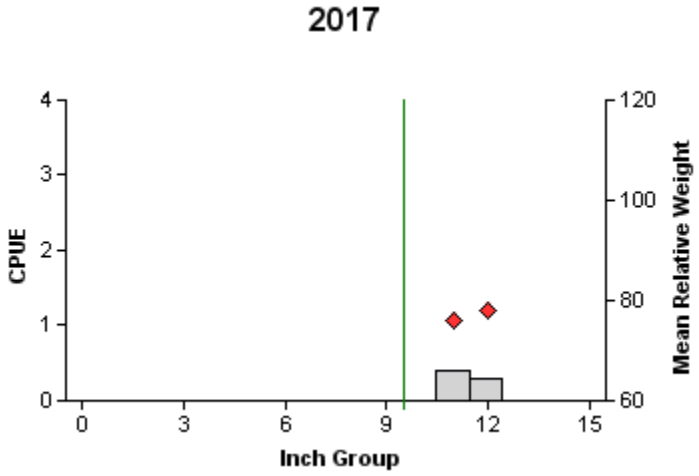
White Bass



Effort =	5.0
Total CPUE =	3.6 (40; 18)
Stock CPUE =	3.6 (40; 18)
CPUE-10 =	3.6 (40; 18)
PSD =	100 (0)



Effort =	5.0
Total CPUE =	5.2 (49; 26)
Stock CPUE =	5.2 (49; 26)
CPUE-10 =	4.8 (56; 24)
PSD =	92 (8)



Effort =	10.0
Total CPUE =	0.7 (52; 7)
Stock CPUE =	0.7 (52; 7)
CPUE-10 =	0.7 (52; 7)
PSD =	100 (0)

Figure 10. 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 surveys, Coleto Creek Reservoir, Texas, 2012, 2014, and 2017. Vertical lines denote 10-inch MLL.

White Bass

Table 11. Creel survey statistics for White Bass at Coleto Creek Reservoir from January 2017 through June 2017. Total catch per hour is for anglers targeting White Bass and total harvest is the estimated number of White Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	2017
Surface area (acres)	2,323
Directed effort (h)	252 (96)
Directed effort/acre	0.11 (96)
Total catch per hour	1.36 (410)
Total harvest	223 (444)
Harvest/acre	0.10 (444)
Percent legal released	12.5

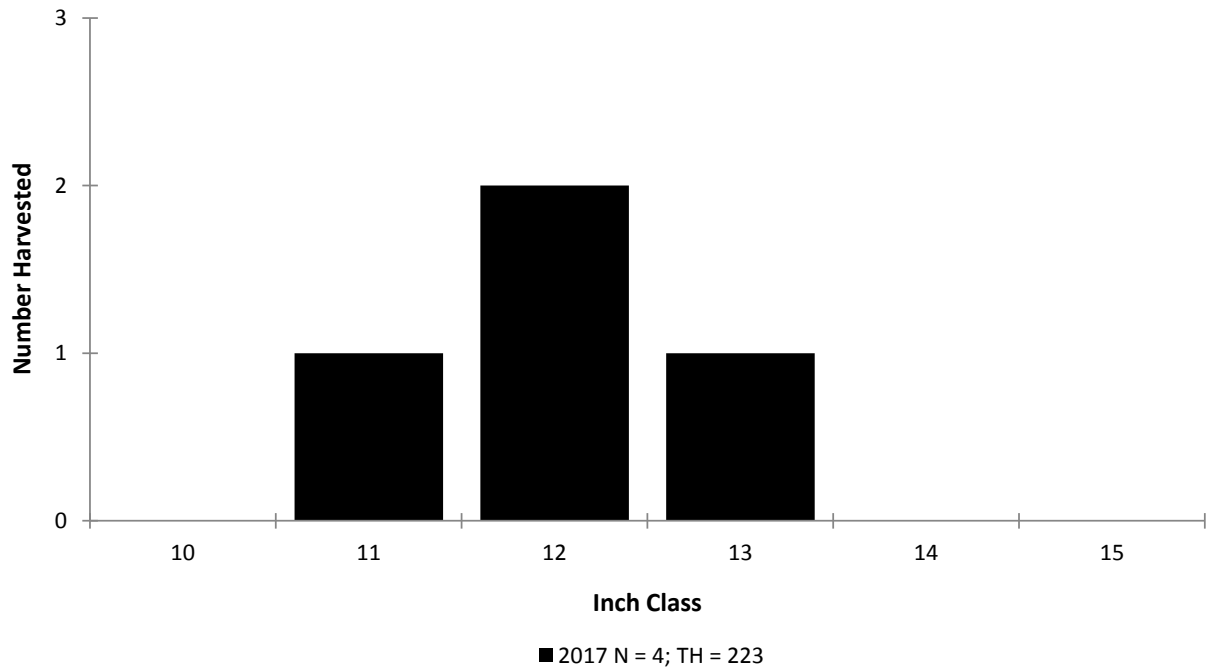
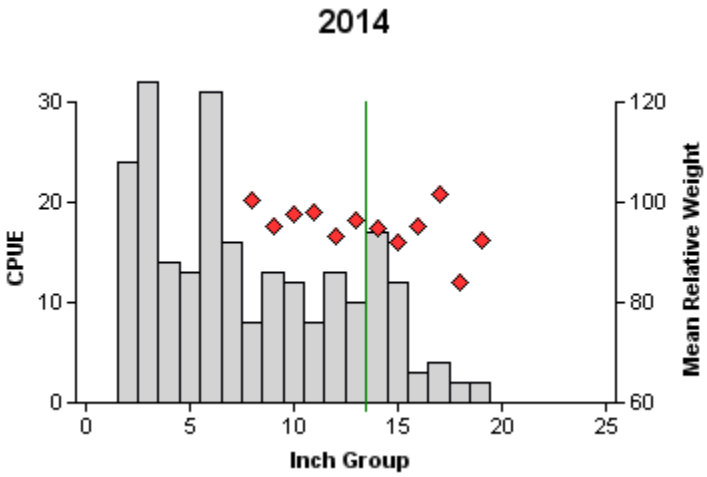
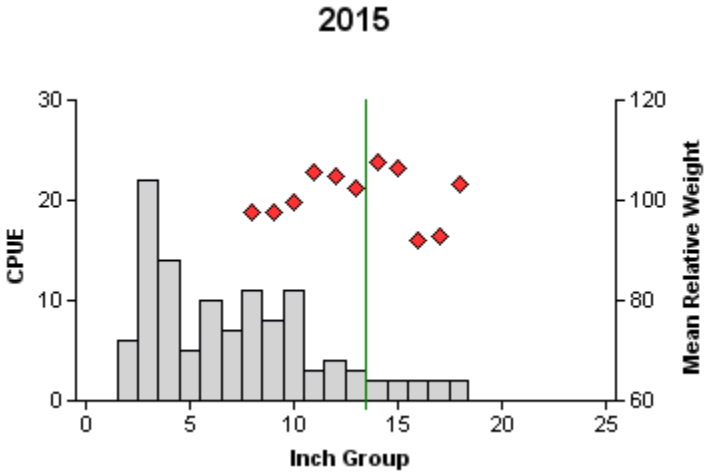


Figure 11. Length frequency of harvested White Bass observed during creel surveys at Coleto Creek Reservoir, Texas, January 2017 through June 2017, all anglers combined. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

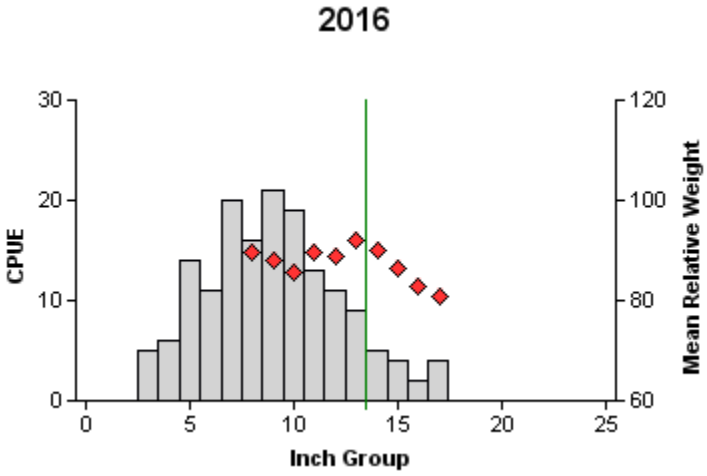
Largemouth Bass



Effort =	1.0
Total CPUE =	234.0 (22; 234)
Stock CPUE =	104.0 (12; 104)
CPUE-14 =	40.0 (21; 40)
CPUE-18 =	4.0 (100; 4)
PSD =	61 (7)



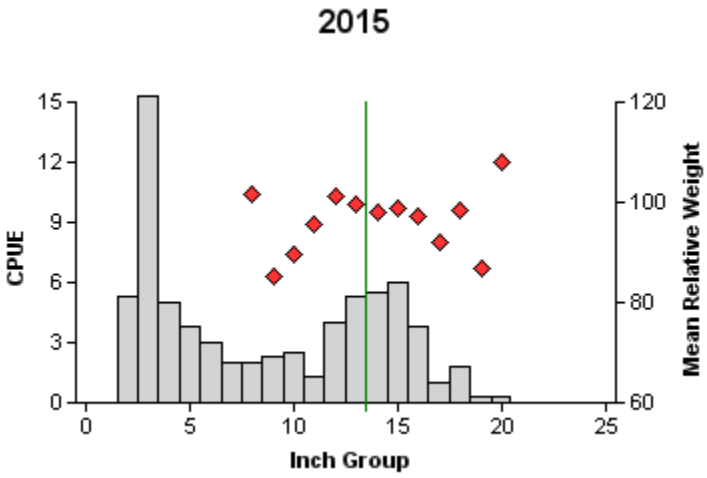
Effort =	1.0
Total CPUE =	114.0 (13; 114)
Stock CPUE =	50.0 (16; 50)
CPUE-14 =	10.0 (36; 10)
CPUE-18 =	2.0 (100; 2)
PSD =	34 (8)



Effort =	1.0
Total CPUE =	160.0 (17; 160)
Stock CPUE =	104.0 (25; 104)
CPUE-14 =	15.0 (30; 15)
CPUE-18 =	0.0 (0; 0)
PSD =	34 (4)

Figure 12. 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, Coleto Creek Reservoir, Texas, 2014, 2015, and 2016. Vertical lines denote 14-inch minimum length limit.

Largemouth Bass



Effort =	4.0
Total CPUE =	70.0 (8; 280)
Stock CPUE =	35.8 (10; 143)
CPUE-14 =	18.5 (14; 74)
CPUE-18 =	2.3 (37; 9)
PSD =	78 (4)

Figure 13. 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, daytime, Bass-only electrofishing survey, Coleto Creek Reservoir, Texas, 2015. Vertical lines denote 14-inch minimum length limit.

Largemouth Bass

Table 12. Mean age at legal length (14 in; 13.0 – 14.9 in) for Largemouth Bass collected by fall electrofishing, Coleto Creek Reservoir, Texas, 2009-2017. Standard deviations are in parenthesis.

Year	N	Age Range	Age-at-Length
2009	34	1 – 3	2.3 (0.51)
2010	15	2 – 4	2.5 (0.74)
2011	21	2 – 4	2.5 (0.68)
2012	14	2 – 4	2.4 (0.65)
2013	15	1 – 4	3.1 (1.03)
2014	13	2 – 4	2.9 (0.64)
2015	24	2 – 4	2.6 (0.71)
2016	14	2 – 4	2.6 (0.65)

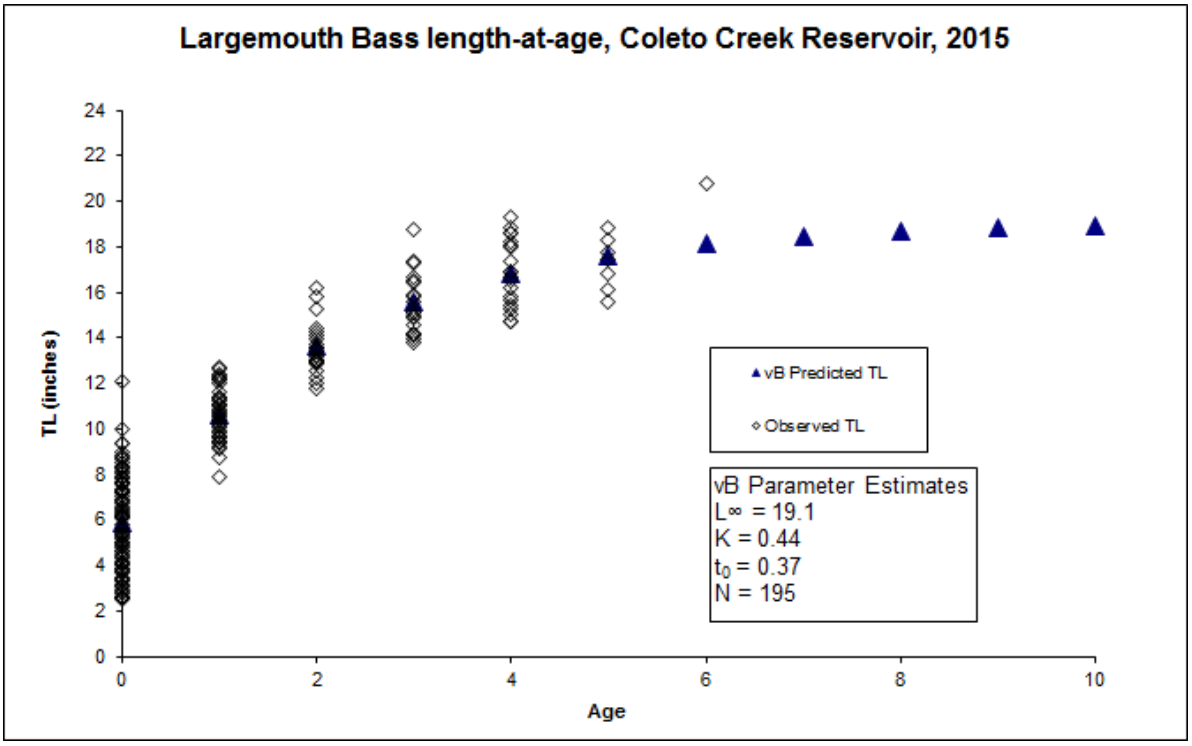


Figure 14. Observed and model predicted length-at-age from von Bertalanffy growth model, Coleto Creek Reservoir, Texas, 2015.

Largemouth Bass

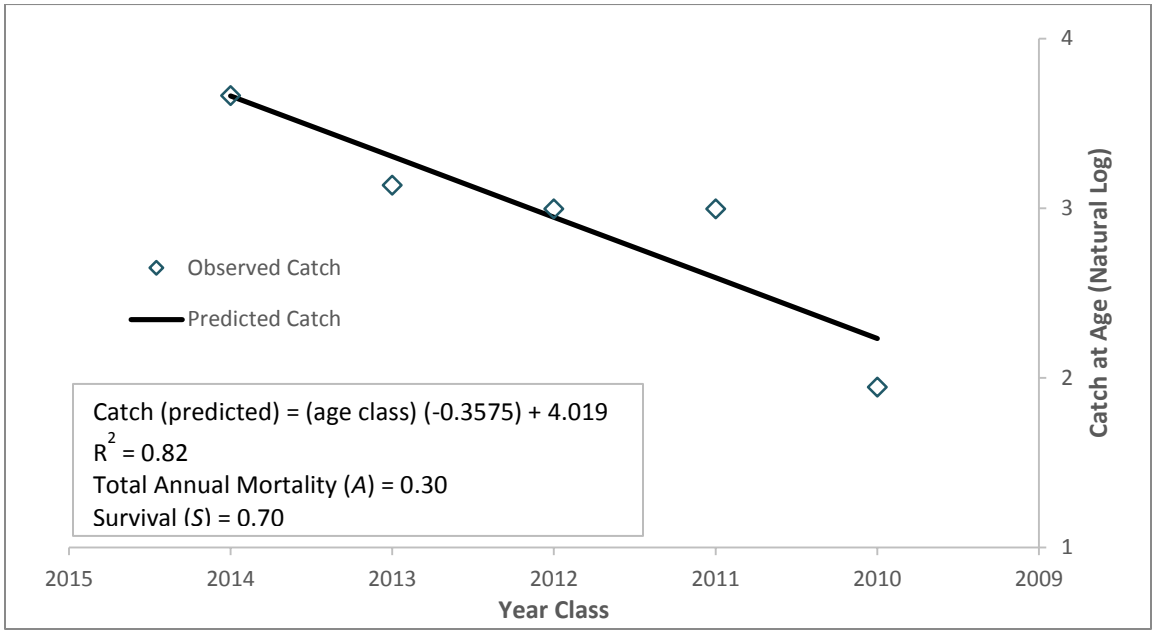


Figure 15. Plot of Largemouth Bass catch curve to illustrate total annual mortality (*A*), Coleto Creek Reservoir, Texas, 2015.

Figure 16. Plot of residuals from Largemouth Bass catch curve shown in Figure 15 to illustrate varying year class strength. Point below the line represent relatively weak year classes and points above the line represent relatively strong year classes.

Largemouth Bass

Table 13. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Coleto Creek Reservoir, Texas 2001, 2003, 2005 and 2008 – 2013. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

		Number of fish				
Year	Sample size	FLMB	Intergrade	NLMB	% FLMB alleles	% FLMB genotype
2001	30	22	6	0	91.7	Unknown
2003	30	18	11	0	89.2	Unknown
2005	31	13	17	0	80.7	43.0
2008	31	6	25	0	87.0	20.0
2009	30	6	24	0	87.0	19.0
2010	30	4	26	0	83.0	13.0
2011	30	6	24	0	85.0	20.0
2012	30	4	26	0	84.0	13.0
2013	30	7	23	0	89.0	23.0

Largemouth Bass

Table 14. Creel survey statistics for Largemouth Bass at Coleto Creek Reservoir, TX from January 2017 through June 2017. Catch rate is for all anglers targeting Largemouth Bass. Harvest is partitioned by the estimated number of fish harvested by non-tournament anglers and the number of fish retained by tournament anglers for weigh-in and release. The estimated number of fish released by weight category is for anglers targeting Largemouth Bass. Relative standard errors (RSE) are in parentheses.

Statistic	2017
Surface area (acres)	2,323
Directed angling effort (h)	
Tournament	22,852 (15)
Non-tournament	25,328 (18)
All Largemouth Bass anglers combined	48,180 (17)
Angling effort/acre	20.7 (17)
Catch rate (number/h)	1.8 (21)
Harvest	
Non-tournament harvest	2,062 (47)
Harvest/acre	0.89 (47)
Tournament weigh-in and release	19,205 (47)
Release by weight	
<4.0 lbs	63,508 (26)
4.0-6.9 lbs	1,044 (69)
7.0-9.9 lbs	154 (163)
≥10.0 lbs	
Percent legal released (non-tournament)	71.5

Largemouth Bass

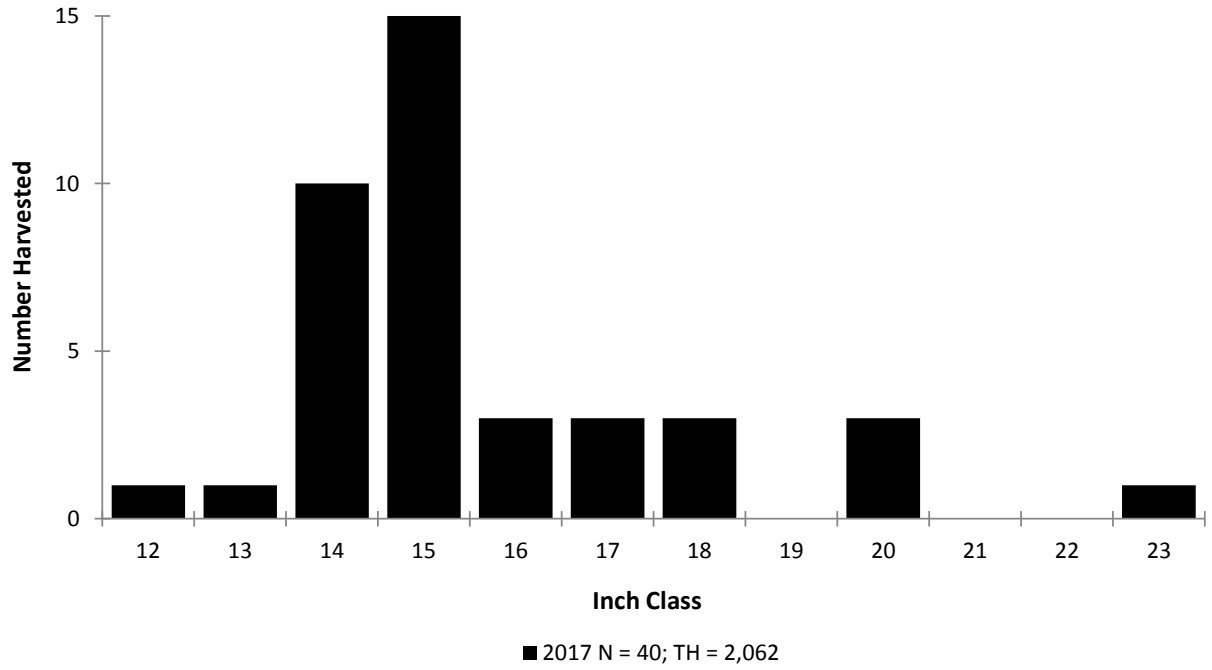


Figure 17. Length frequency of harvested Largemouth Bass observed during creel surveys at Coleto Creek Reservoir, Texas, January 2017 through June 2017, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Crappies

Table 15. Creel survey statistics for Crappies at Coleto Creek Reservoir from January 2017 through June 2017. Total catch per hour is for anglers targeting Crappies and total harvest is the estimated number of Crappies harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	2017
Surface area (acres)	2,323
Directed effort (h)	3,860 (27)
Directed effort/acre	1.66 (27)
Total catch per hour	1.67 (46)
Total harvest	3,671 (48)
Harvest/acre	1.58 (48)
Percent legal released	0.0

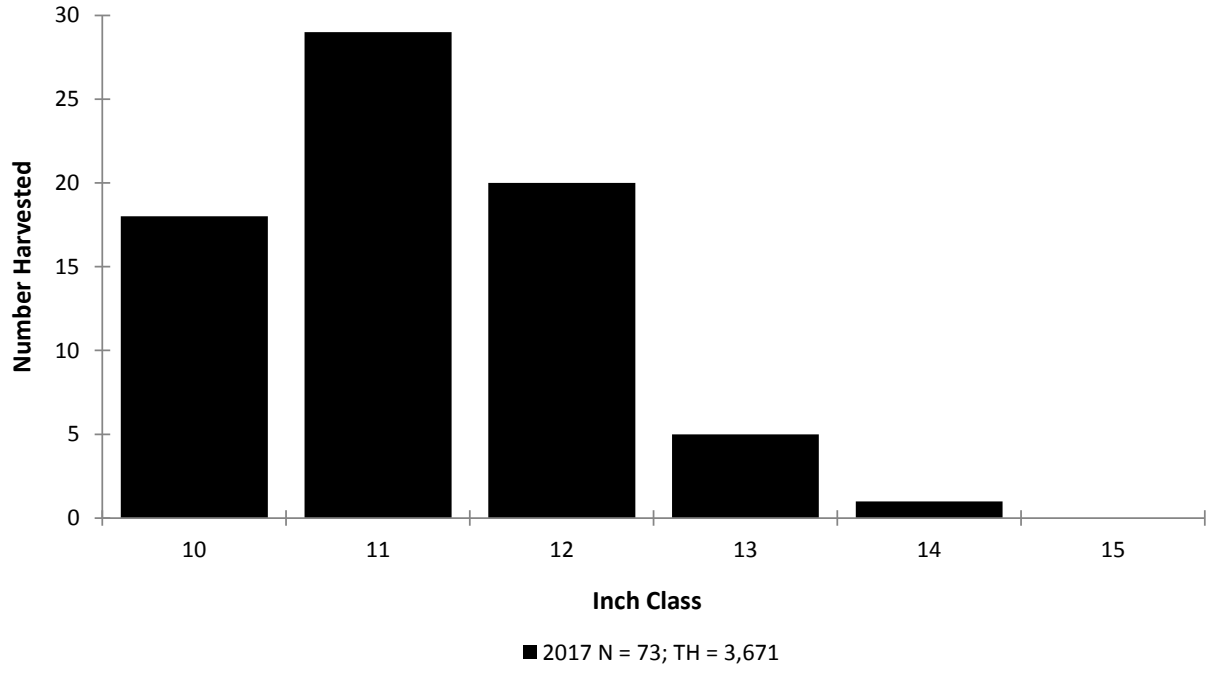


Figure 18. Length frequency of harvested crappies observed during creel surveys at Coleto Creek Reservoir, Texas, January 2017 through June 2017, all anglers combined. N is the number of harvested crappies observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 16. Proposed sampling schedule for Coleto Creek Reservoir, Texas. Survey period is June through May. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

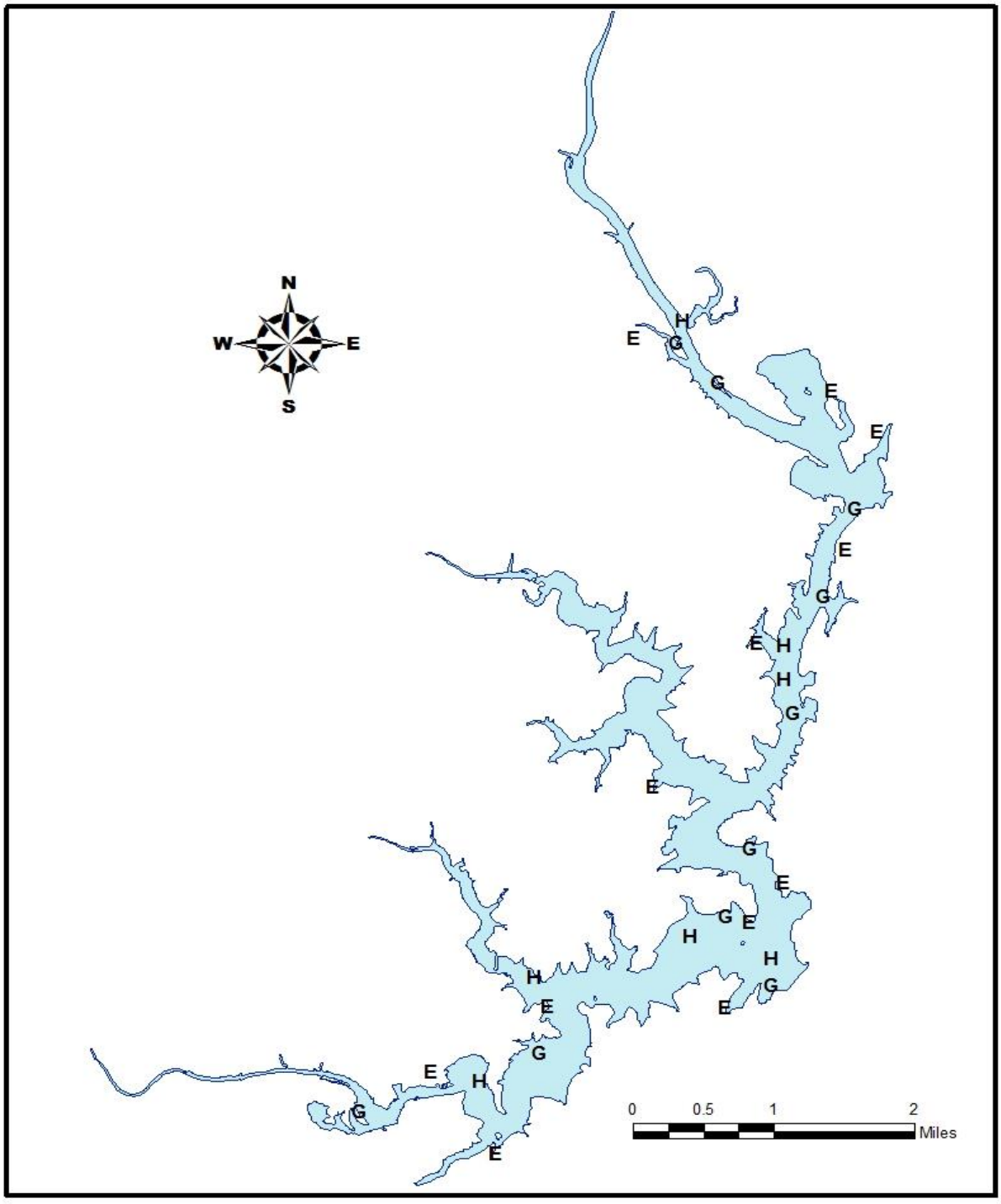
				Habitat				
Survey year	Electrofish Fall	LF Electrofish	Gill net	Hoop Net	Vegetation	Access	Creel survey	Report
2017-2018								
2018-2019	A							
2019-2020		A		A				
2020-2021	S		S		S	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from all gear types from Coleto Creek Reservoir, Texas, 2016-2017. Sampling effort was 10 net nights for gill netting, 6 net series for baited tandem hoop netting, and 1 hour for electrofishing.

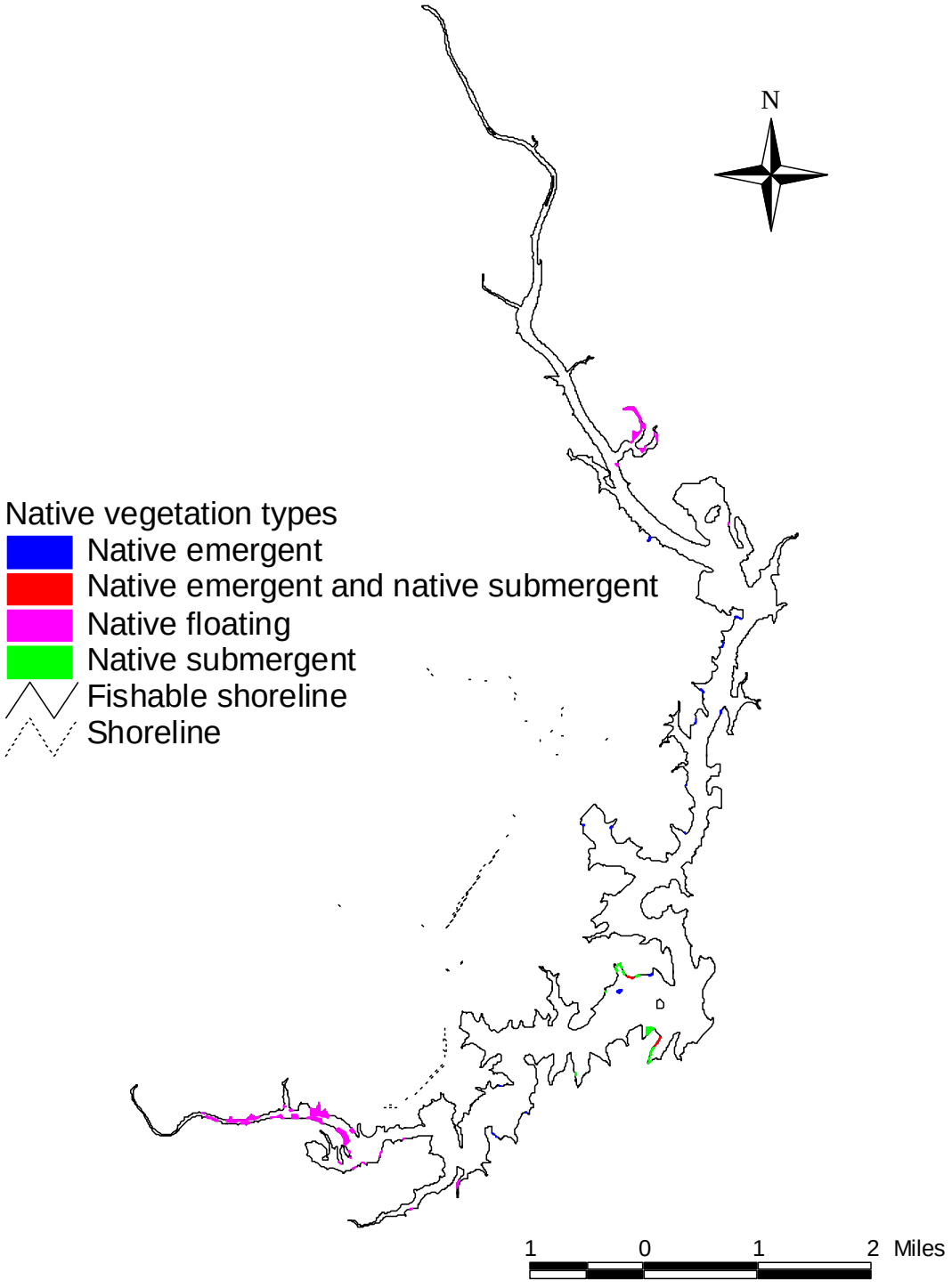
Species	Electrofishing		Hoop netting		Gill netting	
	N	CPUE	N	CPUE	N	CPUE
Spotted Gar			1	0.17	18	1.8
Gizzard Shad	67	67.0			114	11.4
Threadfin Shad	11	11.0			6	1.2
Common Carp					13	1.3
Smallmouth Buffalo					274	27.4
Blue Catfish					150	15.0
Channel Catfish					90	9.0
White Bass					7	0.7
Redbreast Sunfish	16	16.0				
Warmouth	1	1.0				
Bluegill	241	241.0	7	1.17	1	0.1
Redear Sunfish	14	148.0	4	0.67	7	0.7
Largemouth Bass	160	160.0			15	1.5
White Crappie	6	6.0	12	2.00	34	3.4
Black Crappie	6	6.0			17	1.7

APPENDIX B



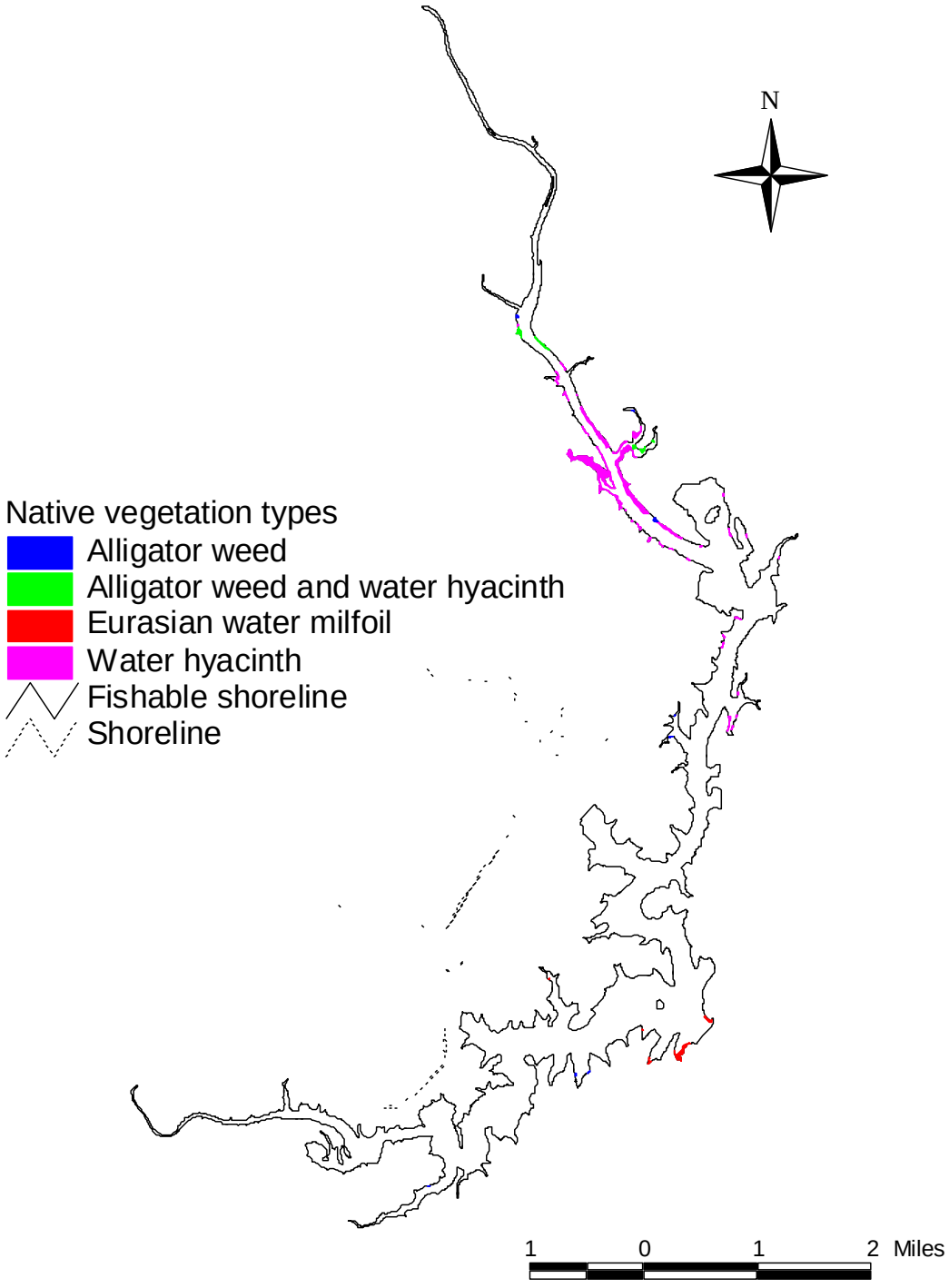
Location of sampling sites, Coleto Creek Reservoir, Texas, 2016-2017. Gill net, baited tandem hoop net, and electrofishing stations are indicated by G, H, and E respectively. Water level was 1 – 2 feet below conservation pool at time of surveys.

APPENDIX C



Native aquatic vegetation map for Coleto Creek Reservoir, Texas, 2016.

APPENDIX D



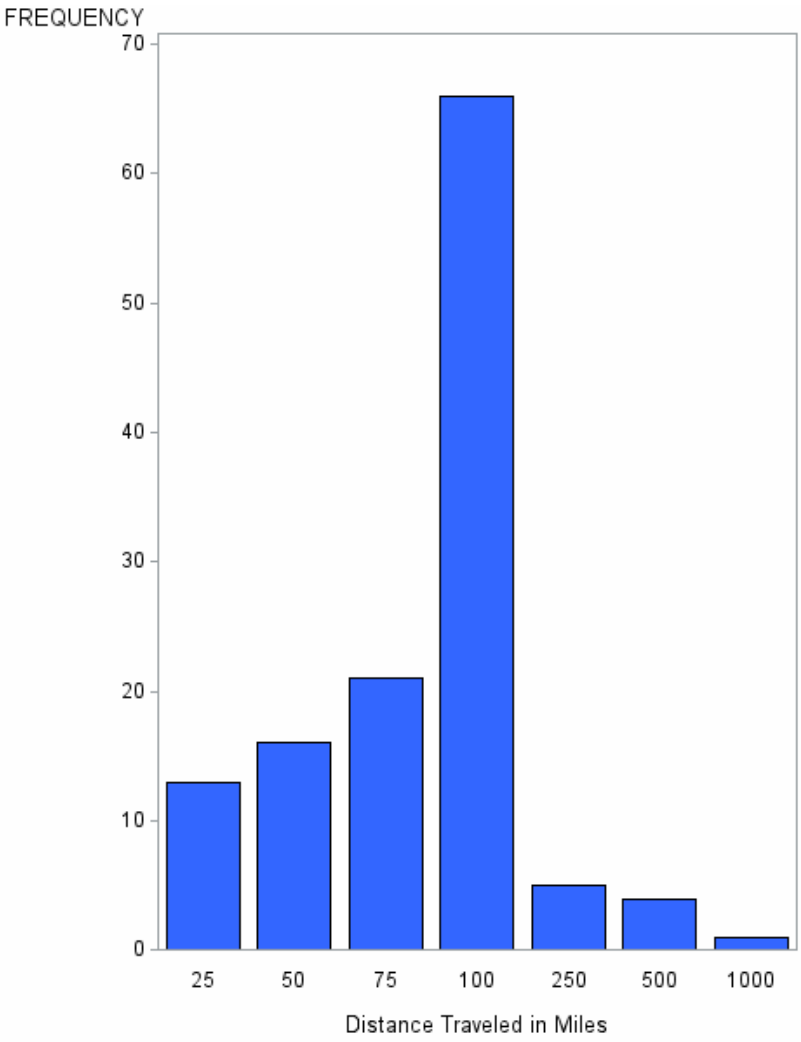
Non-native aquatic vegetation map for Coleto Creek Reservoir, Texas, 2016.

APPENDIX E

Summary of Largemouth Bass tournament data, Coleto Creek Reservoir, 2009-2017. N is total number of tournaments, anglers, and fish, respectively. Catch per angler is the average number of Largemouth Bass weighed-in per tournament fisherman. Catch 4 – 6.9 and 7 – 10 is total number of fish caught per weight category. Percent catch 5- and 4-fish bag is the percentage of total anglers that caught at least a 5- or 4-fish bag. Total weight is the combined total weight (pounds) of Largemouth Bass across all tournaments. Weight per fish is the average weight (pounds) per tournament fish.

N Tournament	N Angler	N Fish	Catch per Angler	Catch 4 - 6.9	Catch 7 - 10	% Catch 5-fish Bag	% Catch 4-fish Bag	Total Weight	Weight per Fish
38	1,036	3,428	3.31	97	11	43.2	54.9	7,942	2.32

APPENDIX F



Distance traveled (miles) by frequency to Coleto Creek Reservoir, Texas, as determined from 1 January 2017 through 30 June 2017 creel survey.