

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-4

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2013 Fisheries Management Survey Report

Coleta Creek Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Coletto Creek Reservoir were surveyed in 2013 using trap nets and electrofishing and in 2014 using electrofishing (bass-only) and gill nets. Creel surveys were conducted from 1 June 2012 through 31 May 2013. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Coletto Creek Reservoir is a 3,100-acre (averaged 2,570 acres in 2013-2014) reservoir located on Coletto Creek in the Guadalupe River Basin 13 miles southwest of Victoria. Regulated by the Guadalupe-Blanco River Authority, it receives water from Coletto and Perdido creeks as well as several smaller tributaries and is used for 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 within 4 feet of conservation pool. Substrate is composed primarily of clays, deep loams and small rock. Littoral habitat consisted of many native and exotic species of aquatic vegetation and flooded timber.
- **Management History:** Important sport fish species include Blue, Channel, and Flathead catfishes, White Bass, Largemouth Bass, and White and Black crappies. Palmetto Bass and Red Drum were previously stocked in the reservoir but these stockings have been discontinued due to low gill net catch rates and low directed angling effort. The 2010 management plan focused on nuisance aquatic vegetation control, collecting fishery dependent data through creel surveys to estimate angling effort, catch, and harvest, conduct additional Largemouth Bass sampling via spring bass-only electrofishing, and compile tournament data records to further assess Largemouth Bass population dynamics and abundance/catch of preferred-size (≥ 15 in) fish. Hydrilla, milfoil and water hyacinth have historically restricted access to some areas of the reservoir and these problematic areas have been treated with herbicides and bio-control organisms.
- **Fish Community**
 - **Prey species:** Gizzard and Threadfin shad abundance was low. Abundant sunfish (Bluegill and Redear) populations formed the reservoirs forage base.
 - **Catfishes:** Blue and Channel catfish were present in the reservoir in low abundance. All catfish collected in 2014 were > 12 inch minimum length limit.
 - **White Bass:** White Bass increased in abundance over the survey period. The majority of individuals collected were > 10 inch minimum length limit; however, directed angling effort was low.
 - **Largemouth Bass:** Largemouth Bass abundance remained high over the survey period. Largemouth Bass were the most sought species in the reservoir and the population continued to provide excellent angling opportunities. Mean age at legal length in 2013 was 3.1 years.
 - **Crappie:** Black and White crappies were present in the reservoir. Crappies were the third most sought species in the reservoir.
- **Management Strategies:** Continue to manage sport fish populations under existing harvest regulations. Conduct creel survey to collect quantitative data on angler use. Determine if poor catches and low relative abundance of catfishes and crappies are accurate. Monitor coverage and potential expansion of non-native vegetation and continue to work with GBRA on all vegetation control activities.

INTRODUCTION

This document is a summary of fisheries data collected from Coletto Creek Reservoir in 2013-2014. 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

Coletto Creek Reservoir is a 3,100-acre reservoir located in the Guadalupe River Basin on Coletto Creek. The reservoir was constructed in 1980 and is located 13 miles southwest of Victoria. Regulated by the Guadalupe-Blanco River Authority (GBRA), it receives water from Coletto Creek and several smaller tributaries and is used as a power plant cooling supply and for recreation. Approximately 600 acres are used for cooling ponds and are inaccessible to anglers. The reservoir typically experiences little water level fluctuation. However, during 2013 – 2014 water level fluctuated between 2 – 4 feet below conservation pool during all fisheries and vegetation surveys (Figure 1). Substrate is composed primarily of clays, deep loams and small rock. Littoral habitat consisted of timber stands, periodically flooded terrestrial vegetation, native aquatic vegetation, and seasonally abundant exotic vegetation. Exotic species present included hydrilla, Eurasian water milfoil, and water hyacinth. Historically, hydrilla 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) District 1E. Other descriptive characteristics for Coletto Creek Reservoir are in Table 1.

Angler Access

Coletto Creek Reservoir has one public boat ramp located at Coletto Creek Park and is maintained and operated by GBRA. Additional boat ramp characteristics are in Table 2. Shoreline access was adequate. All shoreline within Coletto 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 2010) included:

1. Assess apparent declines in relative abundance of Channel Catfish, White Bass, and White Crappie.
Action: Additional gill net and trap net surveys were conducted in 2012.
2. Exotic vegetation has potential to be problematic in this reservoir. Coverage of hydrilla and water milfoil increased substantially since the last report.
Action: District 1E monitored the expansion of nuisance vegetation through standard fisheries surveys and conducted an aquatic vegetation survey in 2013. District staff continued to serve as advisors to GBRA on all vegetation control activities. Nuisance species have been maintained at manageable levels; the GBRA annually treated day-use and swimming areas with herbicides.
3. A creel survey has not been conducted on the reservoir since 2005/2006. Angler effort, harvest, and catch data are needed to further assess angler dynamics and sport fish population dynamics.
Action: A creel survey was conducted in 2012/2013.
4. Few preferred-size (≥ 15 in) Largemouth Bass have been collected in the last several electrofishing surveys. The lack of larger fish in the samples may be caused by proportionately greater size-specific fishing mortality.

Action: Additional spring electrofishing surveys were conducted in 2012 and 2014. Further, district staff initiated a Largemouth Bass tournament records database and recorded Largemouth Bass catch and release by weight-class (<4 pound, 4 – 6.99, 7– 9.99, and ≥10) from anglers intercepted during creel surveys.

Harvest regulation history: Sport fishes in Coletto Creek Reservoir are currently managed with statewide regulations (Table 3). When Coletto Creek Reservoir was opened to anglers in 1981, the Largemouth Bass were managed with a 16-inch minimum length limit 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 with efforts to create another sport fish population. However, Red Drum were never collected during routine fisheries surveys; only anecdotal angler catches have been reported. Palmetto Bass were last stocked in 1999 but stockings have been 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: Historically, hydrilla and watermilfoil have been problematic in the reservoir by restricting access. Hydrilla and watermilfoil infestations at boat ramps have been treated with herbicides when needed. Additionally, bio-control organisms (hydrilla and watermilfoil 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 native species such as coontail. Isolated colonies of water hyacinth were found on the reservoir in 2005. However, through GBRA control efforts, coverage has been limited and has not negatively impacted access. Over the current survey period, hydrilla and milfoil have not negatively impacted boat and angler access. However, the GBRA has conducted annual herbicide treatment of watermilfoil at day-use and swimming areas.

Water transfer: Coletto Creek Reservoir is primarily used for hydropower generation and recreation. 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

Fishes were collected by electrofishing (1.0 hours at 12, 5-minute stations), dual-cod trap netting (16 net nights at 8 stations), and gill netting (5 net nights at 5 stations). Standard electrofishing surveys were conducted during night time and sample station selection was random for electrofishing and gill netting and biologist selected stations for trap netting as prescribed by the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011) (Appendix B). Additional spring bass-only daytime electrofishing was conducted at 5-minute randomly selected stations to further assess Largemouth Bass population dynamics. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour of actual electrofishing (fish/h) and for gill and trap nets as the number of fish caught in one net set overnight (fish/nn). Mean age at length was calculated for Largemouth Bass between 13–15 inches total length each year from 2009 – 2013. Largemouth Bass collected for age and growth analysis were aged using otoliths. Largemouth Bass tournament results data were collected from 2009 – 2014. These data were collected from various bass club websites that provided tournament weigh-in results. Data collected included; date, club, angler total bag, bag weights, and big bass weights. These data are summarized in Appendix E. An aquatic vegetation survey was conducted in 2013 by circumnavigating the reservoir. Vegetation type was recorded using a Trimble global positioning system.

Genetic analysis of Largemouth Bass was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Micro-satellite analysis was used to determine genotype of individual fish in 2005 through 2013 and by electrophoresis for previous years.

A roving creel survey was conducted from 1 June 2012 through 31 May 2013. Angler interviews were conducted on 5 weekend days and 4 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 2011). Additional information was obtained from interviewed anglers including Largemouth Bass angler type and the weights of Largemouth Bass that were caught and released.

Sampling statistics (CPUE for various length categories) and structural indices [Proportional Size Distribution (PSD) for various length categories, terminology modified by Guy et al.2007], and condition indices [relative weight indices (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. Source for water level data was the United States Geological Survey (USGS 2014).

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of natural shoreline, standing timber, native submersed and floating-leaved vegetation, and non-native submersed vegetation (Tables 5 and 6). Total native vegetation coverage was 211.2 acres (10.2%) in 2013, a substantial decrease from 411.2 acres (16.0%) in 2009 (Table 6). Coontail (119.3 acres, 5.8% coverage) was the most abundant native vegetation. Total non-native vegetation coverage was 672.3 acres (32.4%) in 2013, similar to 722.0 acres (29.0%) in 2009. The reservoir experienced substantial increases in Eurasian watermilfoil, covering 658.8 acres (31.8%). Eurasian watermilfoil expanded to the upper reservoir over the survey period where coverage was limited to the lower half during 2009. Hydrilla substantially decreased (94.4% reduction) in abundance over the study period.

Creel: Directed fishing effort by anglers in 2012-2013 was highest for Largemouth Bass (77.7%; combined tournament [33.0%] and non-tournament [44.7%] anglers), followed by catfish (7.7%), no species preference (7.7%) and White Crappie (3.7%), (Table 7). Total fishing effort for all species at Coletto Creek Reservoir was 50,948 h and anglers spent an estimated \$521,771 on direct expenditures in 2012-2013 (Table 8). This represents a 31.4% and 16.2% decrease in fishing effort (74,313 h) and direct expenditures (\$622,456), respectively, from 2005-2006 (Table 8).

Prey species: Gizzard Shad abundance and IOV, based on electrofishing, over the survey period was low (Figure 2). Minimal Gizzard Shad catches in electrofishing sample may be attributed to heavily vegetated electrofishing sample sites. Bluegill and Redear Sunfish were the most abundant prey species. Electrofishing catch rate of Bluegill in 2013 was 245.0/h, similar to 2011 (262.0/h), and higher than 2012 (125.0/h) (Figure 3). While CPUE for Redear Sunfish declined over the survey period; the 2013 catch rate (143.0/h) indicated ample numbers of Redear Sunfish available as forage (Figure 4). Size classes of Bluegill and Redear Sunfish were suitable for most predators as indicated by low PSD values. Some large sunfish were collected, potentially providing added recreational opportunity to anglers. Overall, sunfish abundance and size structure was sufficient to maintain predator abundance, growth, and body condition.

Blue Catfish: Blue Catfish abundance remained low (gill net CPUE range: 0.4 – 1.8/nn; Figure 5). While the 2014 Blue Catfish catch was low (N = 3), all fish collected were quality-sized (≥ 20 in). Directed effort for Blue Catfish increased, yet total harvest decreased in 2012/2013 compared to 2005/2006 (Table 9). Angler compliance was excellent and harvested fish ranged in length between 16 – 24 inches, all years combined (Figure 6).

Channel Catfish: The gill net catch rate for Channel Catfish in 2014 was 0.8/nn, considerably lower than 2010 (4.6/nn) and 2012 (3.0/nn) (Figure 7). All fish collected in 2014 were > 12 inch minimum length limit.

Anglers only spent 317 h targeting Channel Catfish and harvest was estimated at 967 fish in 2012-2013 (Table 10). Fish 13 – 19 in total length comprised the majority of harvest (Figure 8).

White Bass: Relative abundance of White Bass increased during the survey period. The 2014 gill net catch rate for White Bass was 5.2/nn, considerably higher than the catch rate in 2010 (0.4/nn), but consistent with catches in 2012 (3.6/nn) (Figure 9). The majority of fish collected in 2014 were available for angler harvest as evidenced by CPUE-10 of 4.8/nn. Relative weights were low and consistent across size classes (Figure 9). No angling effort was directed for White Bass in 2005/2006 and 2012/2013. Total harvest was substantially reduced in 2012/2013 compared to 2005/2006 (Table 11).

Largemouth Bass: Relative abundance of Largemouth Bass remained high. The electrofishing catch rate for Largemouth Bass was 131.0/h in 2013, higher than 2012 (101.0/h) and lower than 2011 (184.0/h) (Figure 11). Catch of legal-size fish was excellent in all years (CPUE-14 range: 13.0 – 28.0/h; Figures 11 and 12). Based on spring bass-only electrofishing, abundance of quality-sized (≥ 15 in) fish increased in 2014 (CPUE-15 = 17.0) compared to 2012 (CPUE-15 = 9.0) (Figure 12). Proportional size distribution was similar (range: 43 – 59) among years which indicated a stable and balanced population (Figure 11). Condition of fish greater than 8-in total length remained consistent across years for most size classes; however, no discernible trends were evident based on size. Mean age at legal length in 2013 was 3.1. Growth remained consistent from 2009 – 2012, but slowed in 2013 (Table 12). Introgression of Florida Largemouth Bass genetics into the population has remained high over the past decade (%FLMB allele; mean = 86, range: 81 – 92, N = 9). In 2013, 23% of the population was Florida Largemouth Bass genotype (Table 13).

Directed effort, catch per hour, and total harvest for Largemouth Bass was 39,460 h, 0.77 fish/h, and 2,390 fish, respectively, from 1 June 2012 through 31 May 2013. In 2012/2013, total fishing effort and angler catch rate declined considerably (23.9% and 45.4%, respectively), while harvest increased (106.4%) when compared to the 2005/2006 survey period (Table 14). Largemouth Bass tournaments were an important component to the fishery at the reservoir. In 2005/2006 and 2012/2013, tournament anglers represented 38.1 and 33.0% of total fishing effort (Table 7). Catch and release of legal-size fish was frequent and consistent among years indicated by percent legal largemouth bass released (2005/2006 = 72.8%, 2012/2013 = 70.6%; Table 14). Angler compliance to the minimum length limit was poor, 9% of observed harvested fish were below legal size. Harvested fish ranged from 12 – 21 inches total length. The majority of observed harvest occurred in the 14 – 18 in size range (Figure 13). In 2012/2013, 274 Largemouth Bass weighing between 7 and 10 lbs and 2,206 fish weighing between 4 and 6.99 lbs were caught and released by anglers. Tournament records indicated the average tournament angler weighed-in 3.12 fish and the average weight of tournament-weighted Largemouth Bass was 2.32 pounds (Appendix E).

White Crappie: Trap net catch rates of White Crappie over the survey period were low (CPUE range: 0.0 – 1.1/nn) despite considerable sampling effort (Figures 14 and 15). Directed effort for White Crappie was 1,859 h in 2012/2013, a 69.4% decrease in angler effort compared to 2005/2006 (6,076 h). Further, angler CPUE and total harvest decreased substantially in 2012/2013 (Table 15). Harvested fish ranged in length between 10 – 13 inches in 2012/2013 (Figure 16). Although angler effort and harvest were reduced in 2012/2013, White Crappie continued to be an important component of the sport fishery.

Black Crappie: Catch rates indicated that Black Crappie continued to be present in the reservoir. The dual cod trap net catch rate of Black Crappie was 0.8/nn in 2013, lower than the catch rate in 2012 (2.6/nn) (Figure 17). In 2013, relative weights averaged 90 for most inch groups. Total harvest of Black Crappie increased in 2012/2013 (Table 16) and harvested fish ranged from 10 – 11 inches (Figure 18).

Fisheries management plan for Coletto Creek Reservoir, Texas

Prepared - July 2014.

ISSUE 1 Sampling catch rates of some important sport fish (i.e., Blue and Channel Catfish, Black and White Crappie) were poor.

MANAGEMENT STRATEGIES

1. Refine catfish sampling and explore use of alternative sampling gears (low-frequency EF and hoop net) to collect abundance and population data for Blue and Channel Catfish.
2. Continue to refine trap net sampling procedures and conduct additional trap net survey to monitor abundance of White and Black Crappie.
3. Conduct creel survey in 2016/2017 and evaluate creel statistics to gain further insight into catfish and crappie fishery dynamics (specifically, angler effort, catch, and harvest).

ISSUE 2 Non-native vegetation has the potential to be problematic in this reservoir. Abundance of Eurasian watermilfoil has increased substantially since last vegetation survey conducted in 2009 and has expanded into the upper half of the reservoir.

MANAGEMENT STRATEGIES

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

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

MANAGEMENT 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 annual electrofishing, additional trap net and gill net surveys in 2015 and 2016, respectively, creel survey in 2016/2017, and mandatory monitoring in 2017/2018 (Table 17). Additional electrofishing surveys are necessary to maintain consistent data for trend information on this heavily utilized Largemouth Bass fishery. The use of alternative sampling gears will be explored to further assess population status of catfishes (low-frequency EF, hoop net), White Bass, and crappies (dual-cod). The creel survey is necessary to evaluate trends in angler effort, catch, and harvest).

LITERATURE CITED

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.
- DiCenzo, V.J., M.J. Maceina, and M.R. Stimpert. 1996. Relationships between reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.
- Binion, G. B. and J. A. Findeisen. 2009. Statewide freshwater fisheries monitoring and management program survey report for Coletto Creek Reservoir, 2005. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Guy, C. S., R. M. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution: A further refinement of population size structure index terminology. Fisheries 32: 348.
- United States Geological Society (USGS). 2014. National water information system: Web interface. Available: <http://waterdata.usgs.gov/tx/> (July 2014).

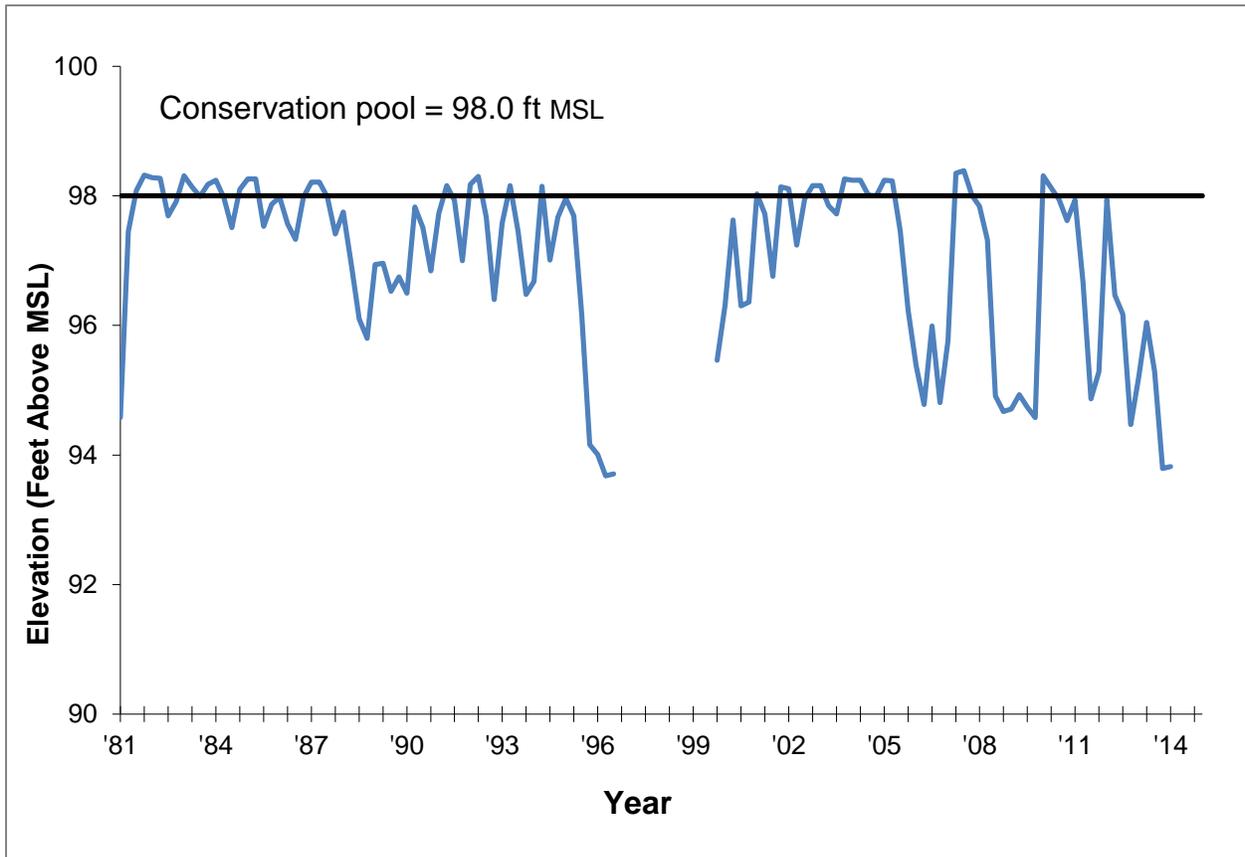


Figure 1. Quarterly water level elevations in feet above mean sea level recorded for Coletto Creek Reservoir, Texas. Water level data was not available from mid-1996 through 1999.

Table 1. Characteristics of Coletto 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 Coletto 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
Coletto Creek Park	28.72039° -97.17385°	Y	40+	91.0	Excellent, no access issues

Table 3. Harvest regulations for Coletto 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, Palmetto	5	18-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 Coletto Creek Reservoir, Texas. Size categories are: FGL = fingerling and ADL = adults.

Year	Number	Size
<u>Threadfin Shad</u>		
1980	17,900	ADL
<u>Nile perch</u>		
1981	68,119	FGL
<u>Peacock Bass</u>		
1980	4,147	FGL
<u>Coppernose Bluegill</u>		
1982	249,992	FGL
<u>Blue Catfish</u>		
1990	31,496	FGL
<u>Channel Catfish</u>		
1980	100,583	FGL
<u>Palmetto Bass</u>		
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	
<u>Northern Largemouth Bass</u>		
2003	38,613	FGL
2004	31,872	FGL
2005	31,249	FGL
Species total	101,734	
<u>Florida Largemouth Bass</u>		
1980	356	ADL
1981	92,092	FGL
1982	160,294	FGL
1983	161,800	FGL
Species total	414,542	
<u>Red drum</u>		
2001	25,445	FGL

Table 5. Survey of structural habitat types, Coletto 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 6. Survey of aquatic vegetation, Coletto Creek Reservoir, Texas, 2009 and 2013. Surface area (acres) is listed with percent of total reservoir surface area in parentheses. In 2009, percent surface area was calculated based on reservoir surface acreage at full pool (98.0 ft). Percent surface area in 2013 was calculated based on surface acreage at the 95.0 ft contour line.

Vegetation	2009	2013
Native submersed	406.7 (16.0)	127.2 (6.1)
Water stargrass	329.0 (13.2)	
Coontail	70.0 (2.8)	119.3 (5.8)
Chara	7.7 (< 1.0)	
American pondweed		7.9 (< 1.0)
Native floating-leaved	4.2 (< 1.0)	84.0 (4.1)
Native emergent	0.3 (< 1.0)	
Non-native	722.0 (29.0)	672.3 (32.4)
Hydrilla (Tier II)	240.8 (9.6)	13.5 (< 1.0)
Eurasian watermilfoil (Tier II)	481.2 (19.4)	658.8 (31.8)

Table 7. Percent directed angler effort by species for Coletto Creek Reservoir, Texas, 2005/2006 and 2012/2013. Survey periods were from 1 June through 31 May.

Species	2005/2006	2012/2013
Blue Catfish	<1.0	2.1
Channel Catfish	<1.0	<1.0
Catfishes	11.6	7.7
Largemouth Bass (Non-Tournament)	31.7	44.7
Largemouth Bass (Tournament)	38.1	33.0
White Crappie	8.8	3.7
Anything	8.2	7.7

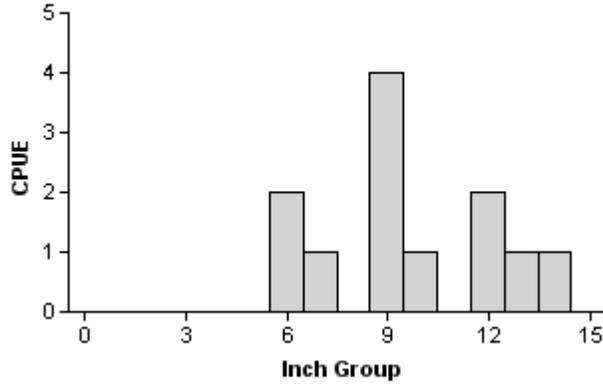
Table 8. Total fishing effort (h) for all species and total directed expenditures at Coletto Creek Reservoir, Texas, 2005/2006 and 2012/2013. Survey periods were from 1 June through 31 May. Relative standard error is in parentheses.

Creel statistic	2005/2006	2012/2013
Total fishing effort	74,313 (10)	50,948 (13)
Total directed expenditures	\$622,456 (31)	\$521,771 (25)

Gizzard Shad

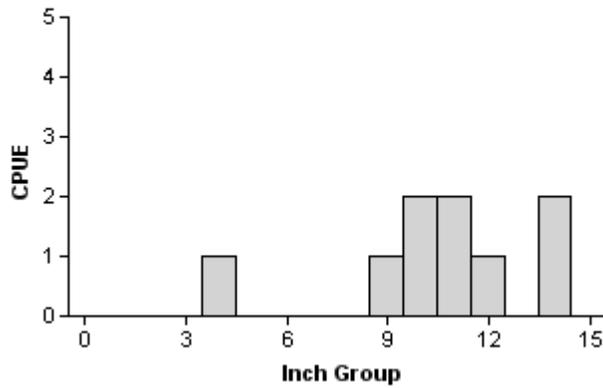
2011

Effort = 1.0
 Total CPUE = 12.0 (44; 12)
 IOV = 25 (20)



2012

Effort = 1.0
 Total CPUE = 9.0 (33; 9)
 IOV = 11 (10)



2013

Effort = 1.0
 Total CPUE = 1.0 (100; 1)
 IOV = 0 (0)

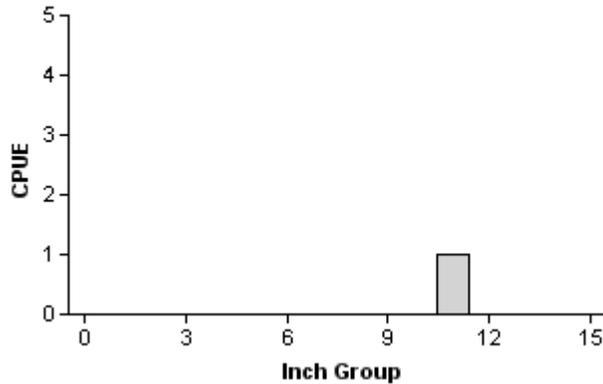
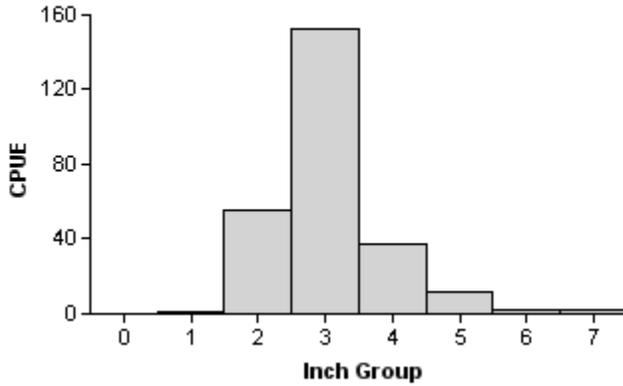


Figure 2. Number of Gizzard Shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Coletto Creek Reservoir, Texas, 2011, 2012, and 2013.

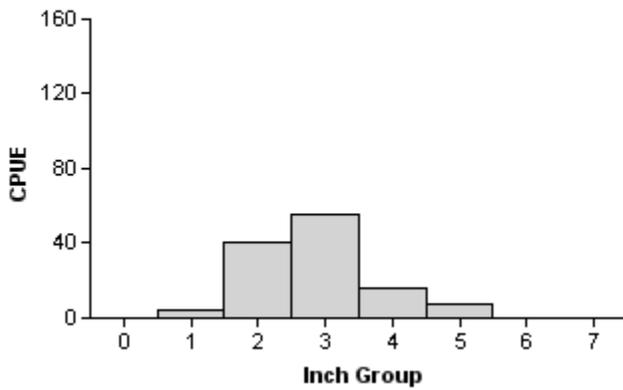
Bluegill

2011



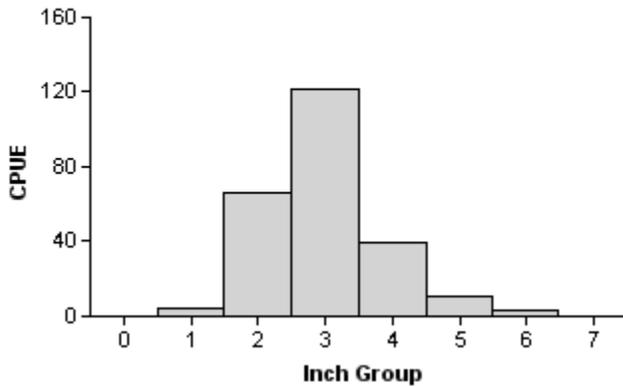
Effort = 1.0
 Total CPUE = 262.0 (31; 262)
 Stock CPUE = 206.0 (29; 206)
 PSD = 2 (1)

2012



Effort = 1.0
 Total CPUE = 125.0 (21; 125)
 Stock CPUE = 80.0 (20; 80)
 PSD = 0 (57)

2013



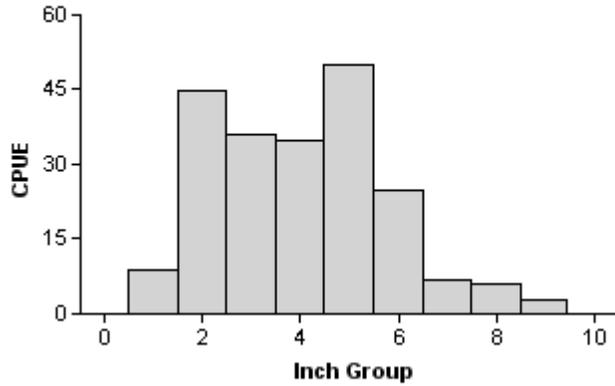
Effort = 1.0
 Total CPUE = 245.0 (25; 245)
 Stock CPUE = 175.0 (28; 175)
 PSD = 2 (1)

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, Coletto Creek Reservoir, Texas, 2011, 2012, and 2013.

Redear Sunfish

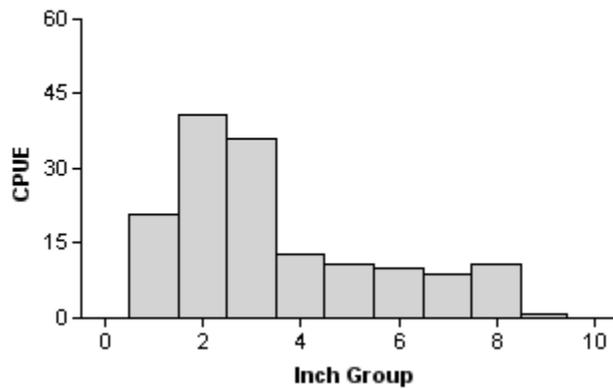
2011

Effort = 1.0
 Total CPUE = 216.0 (22; 216)
 Stock CPUE = 126.0 (24; 126)
 PSD = 13 (4)



2012

Effort = 1.0
 Total CPUE = 153.0 (23; 153)
 Stock CPUE = 55.0 (22; 55)
 PSD = 38 (6)



2013

Effort = 1.0
 Total CPUE = 143.0 (20; 143)
 Stock CPUE = 67.0 (16; 67)
 PSD = 16 (5)

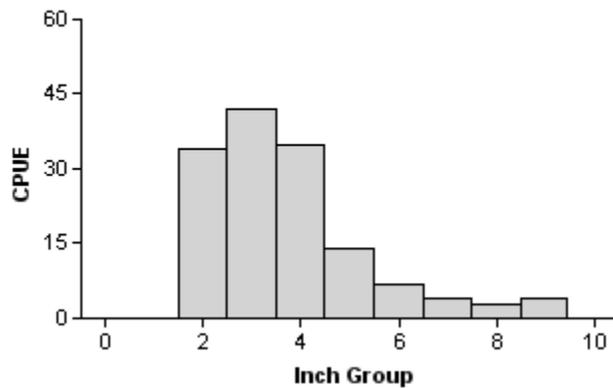


Figure 4. Number of Redear Sunfish caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Coletto Creek Reservoir, Texas, 2011, 2012, and 2013.

Blue Catfish

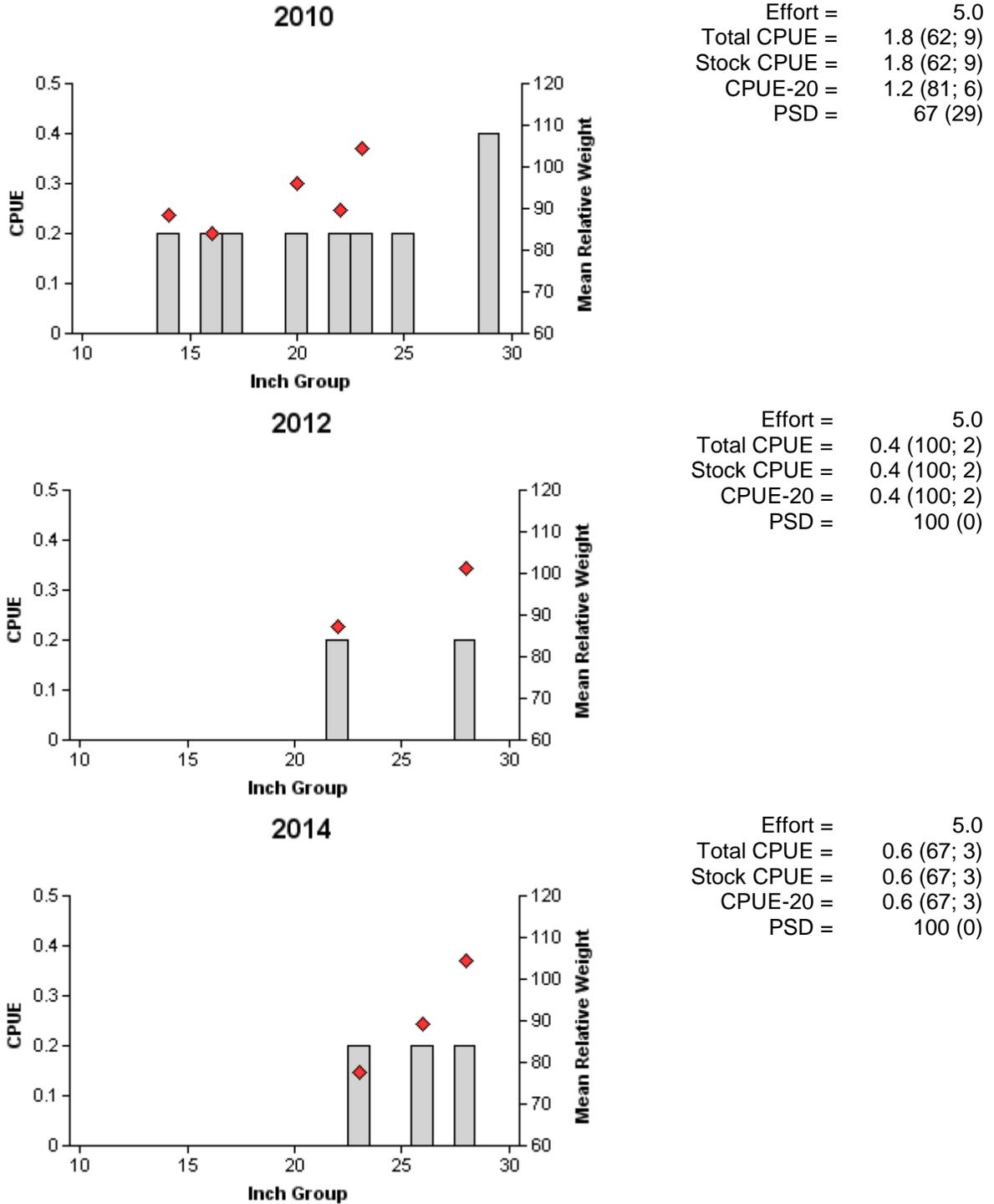


Figure 5. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill surveys, Coletto Creek Reservoir, Texas, 2010, 2012, and 2014.

Blue Catfish

Table 9. Creel survey statistics for Blue Catfish at Coletto Creek Reservoir from June 2005 through May 2006, and June 2012 through May 2013. Total catch per hour is for anglers targeting Blue Catfish and total harvest is the estimated number of Blue Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2005/2006	2012/2013
Directed effort (h)	102.00 (151)	1,078.00 (52)
Directed effort/acre	0.03 (151)	0.35 (52)
Total catch per hour	0.00 (0)	0.11 (100)
Total harvest	533.00 (163)	214.00 (229)
Harvest/acre	0.17 (163)	0.07 (229)

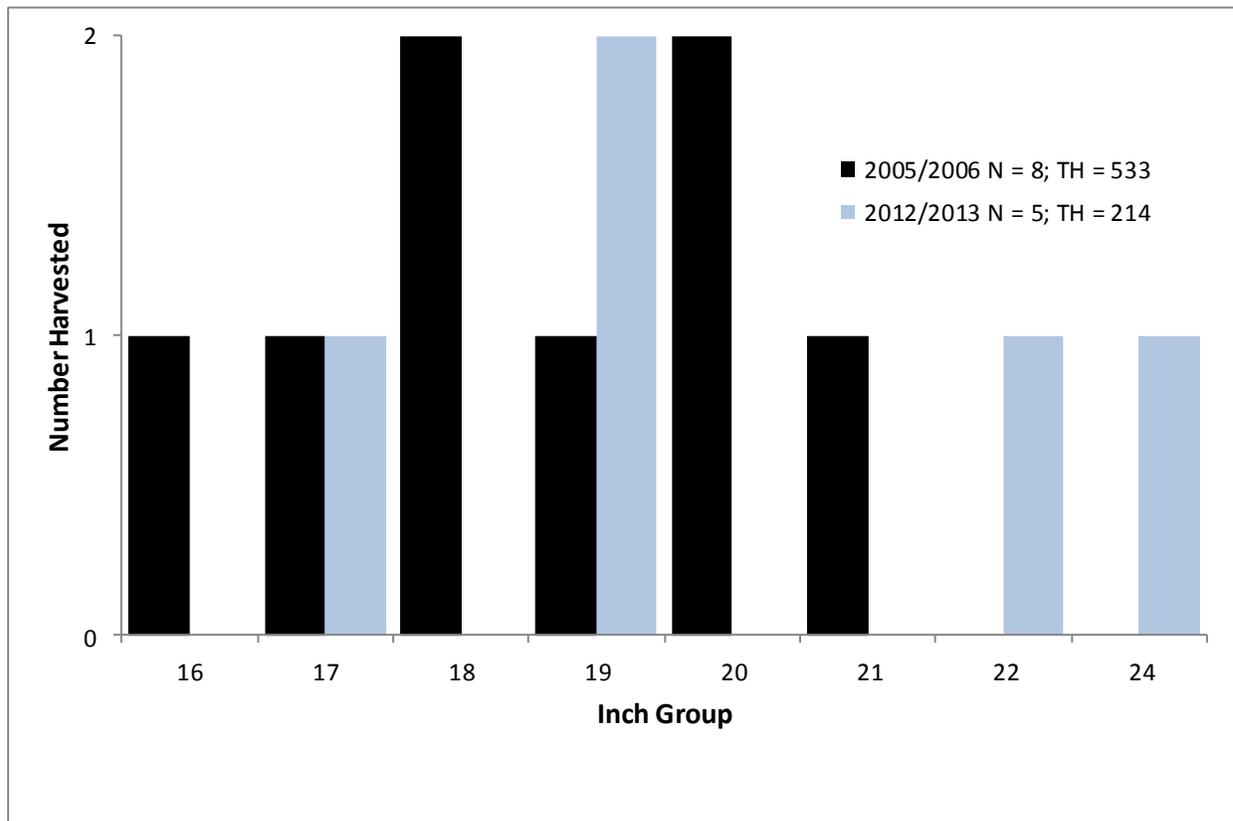


Figure 6. Length frequency of harvested Blue Catfish observed during creel surveys at Coletto Creek Reservoir, Texas, June 2005 through May 2006 and June 2012 through May 2013, all anglers combined. N is the number of harvested Blue Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Channel Catfish

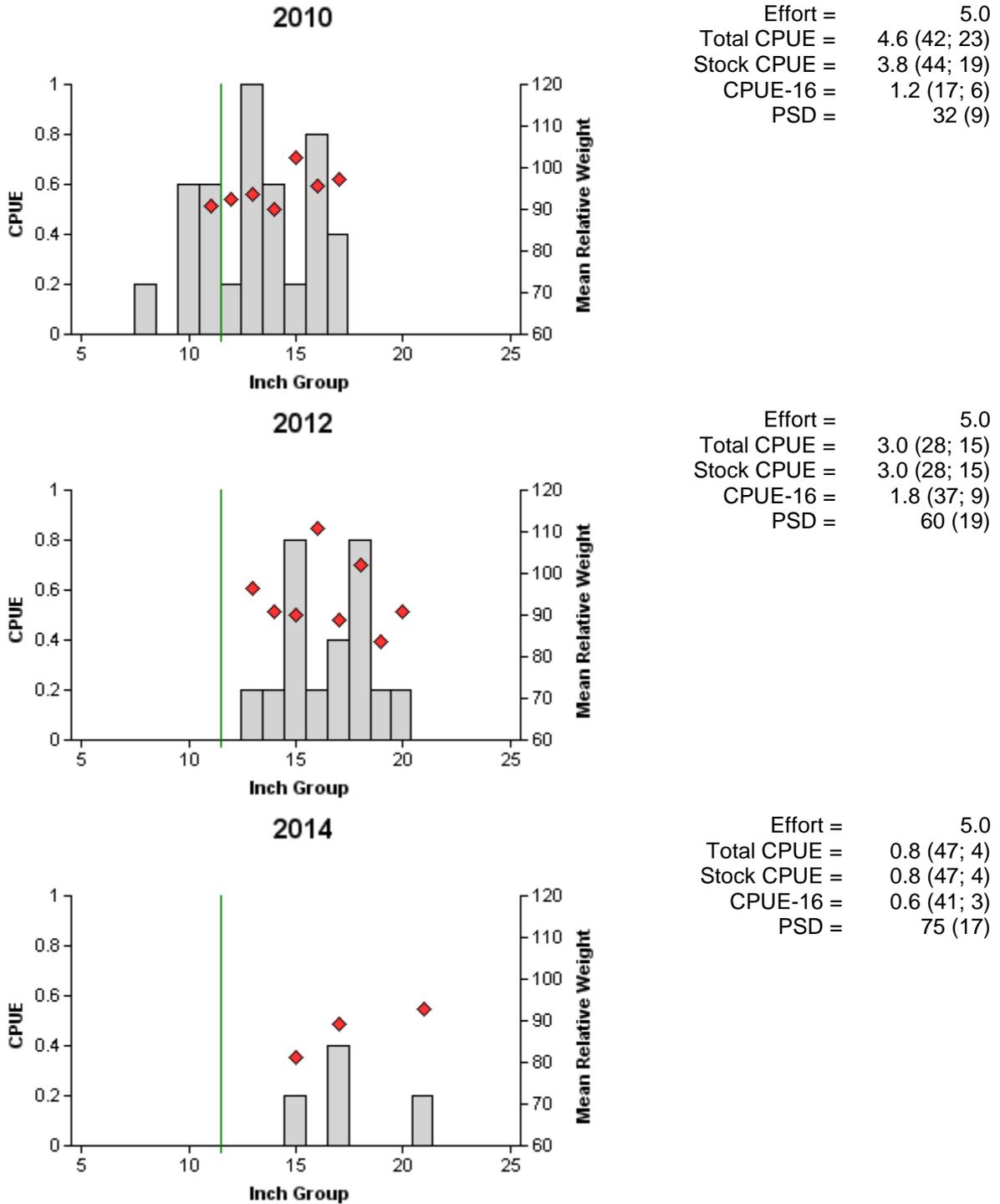


Figure 7. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill surveys, Coletto Creek Reservoir, Texas, 2010, 2012, and 2014. Vertical lines denote 12-inch minimum length limit.

Channel Catfish

Table 10. Creel survey statistics for Channel Catfish at Coletto Creek Reservoir from June 2005 through May 2006, and June 2012 through May 2013. Total catch per hour is for anglers targeting Channel Catfish and total harvest is the estimated number of Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2005/2006	2012/2013
Directed effort (h)	438.00 (81)	317.00 (76)
Directed effort/acre	0.14 (81)	0.10 (76)
Total catch per hour	2.14 (.)	0.00 (0)
Total harvest	3,838.00 (59)	967.00(128)
Harvest/acre	1.24 (59)	0.31 (128)

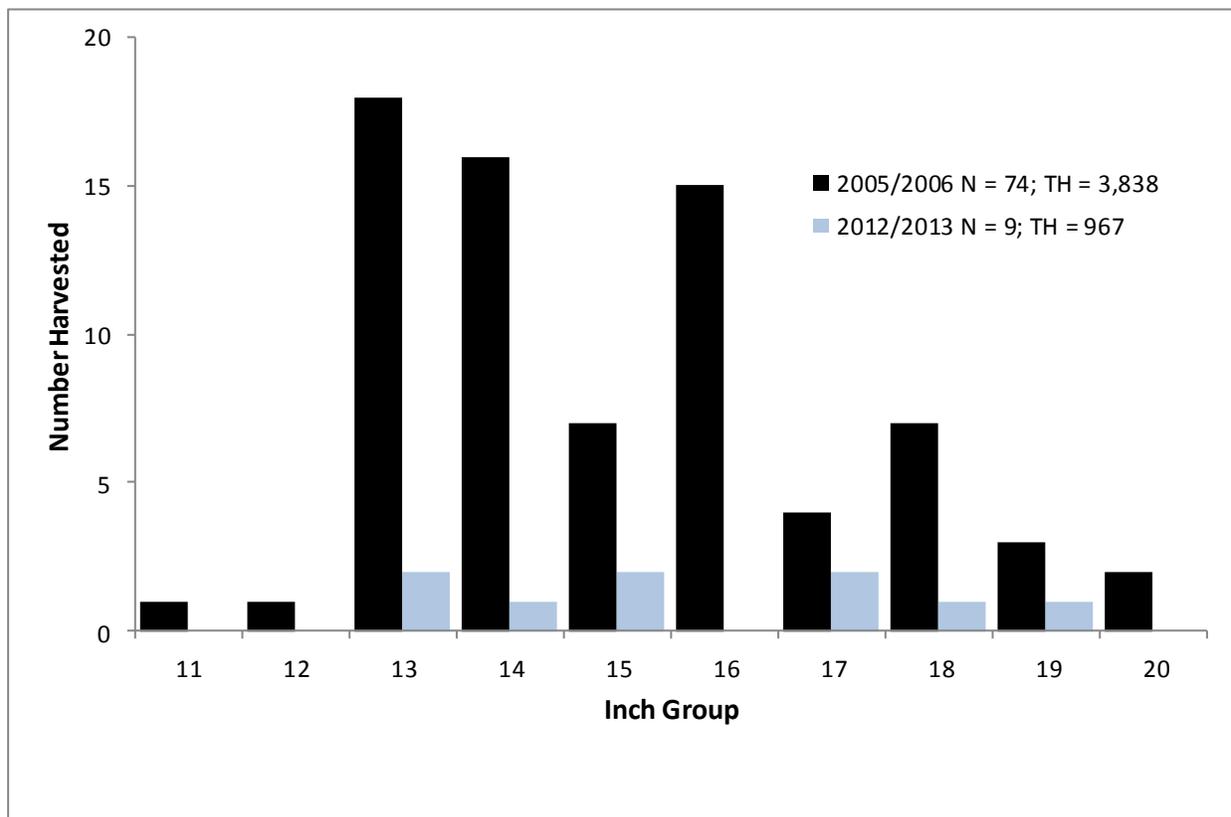


Figure 8. Length frequency of harvested Channel Catfish observed during creel surveys at Coletto Creek Reservoir, Texas, June 2005 through May 2006 and June 2012 through May 2013, all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

White Bass

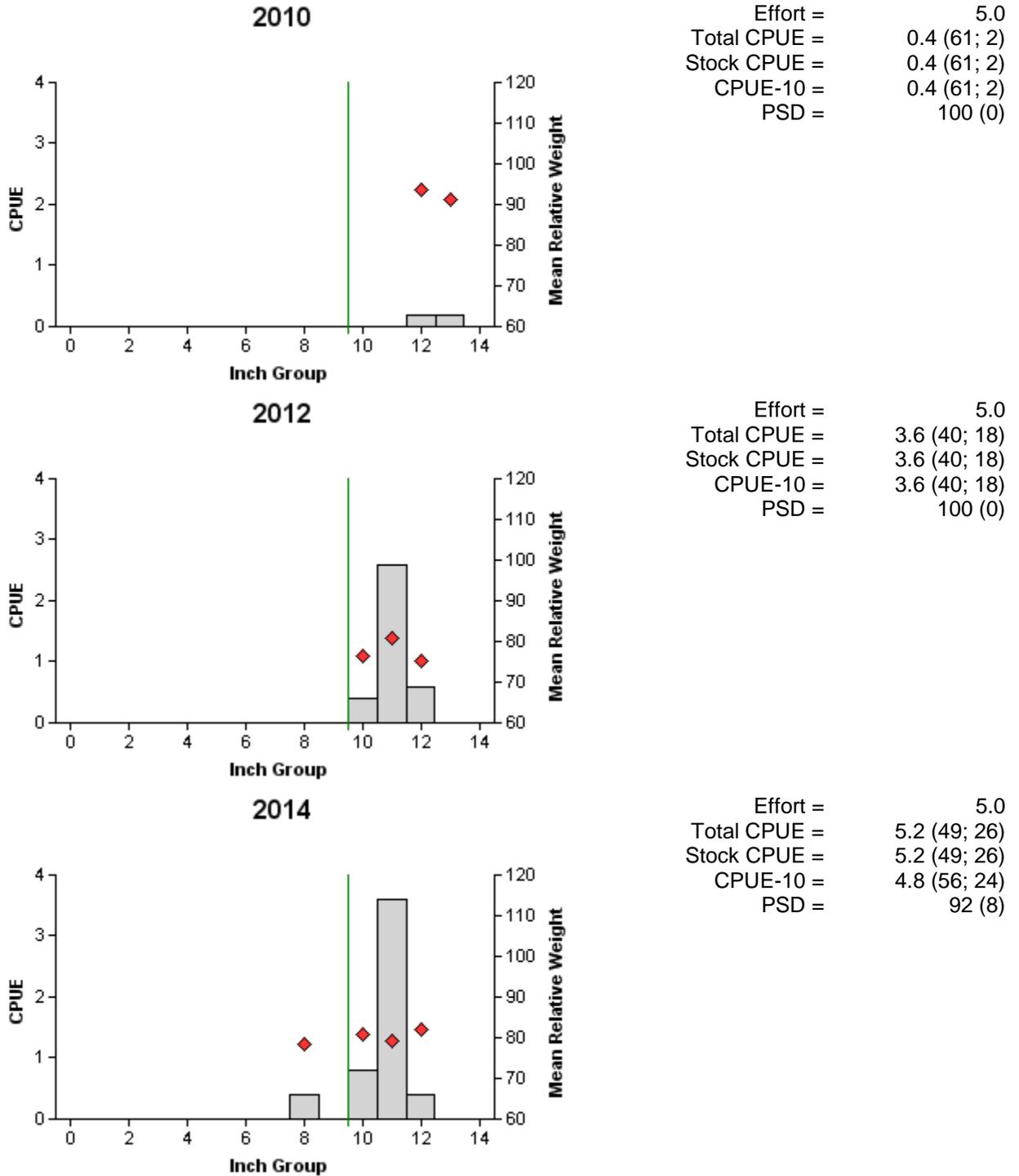


Figure 9. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill surveys, Coletto Creek Reservoir, Texas, 2010, 2012, and 2014. Vertical lines denote 10-inch minimum length limit.

White Bass

Table 11. Creel survey statistics for White Bass at Coletto Creek Reservoir from June 2005 through May 2006, and June 2012 through May 2013. 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	Year	
	2005/2006	2012/2013
Directed effort (h)	0.00 (0)	0.00 (0)
Directed effort/acre	0.00 (0)	0.00 (0)
Total catch per hour	0.00 (0)	0.00 (0)
Total harvest	1,630.00 (90)	46.00 (888)
Harvest/acre	0.53 (90)	0.01 (888)

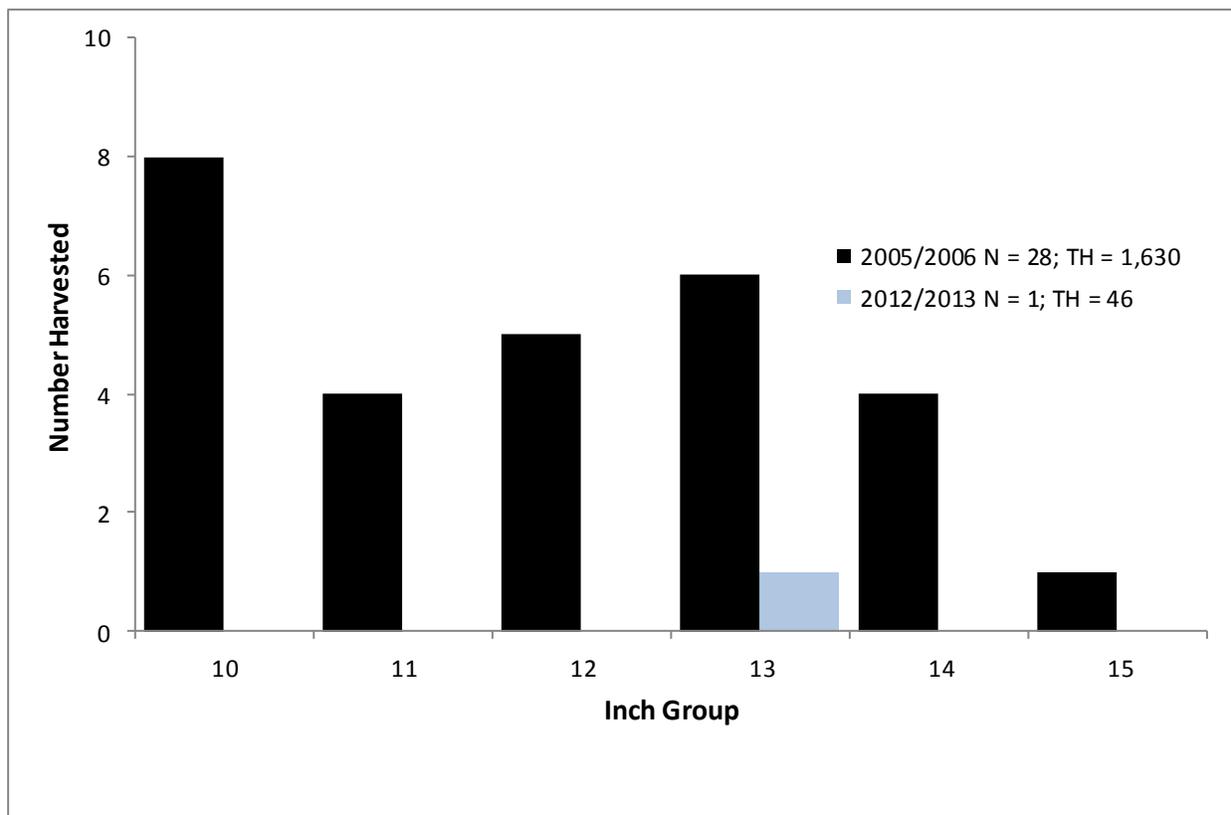
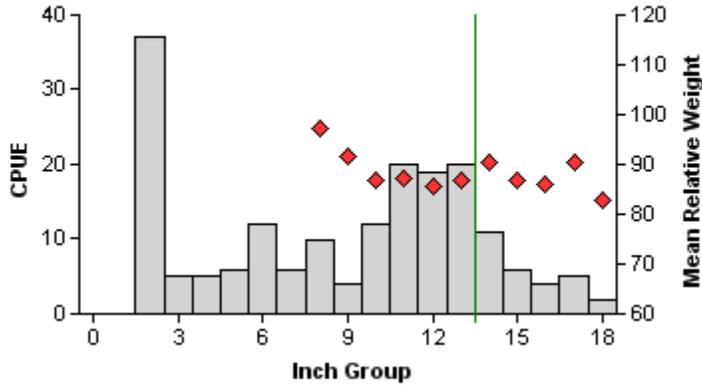


Figure 10. Length frequency of harvested White Bass observed during creel surveys at Coletto Creek Reservoir, Texas, June 2005 through May 2006 and June 2012 through May 2013, all anglers combined. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

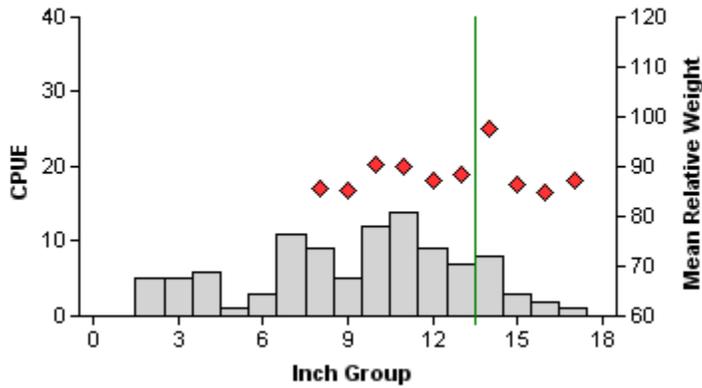
Largemouth Bass

2011



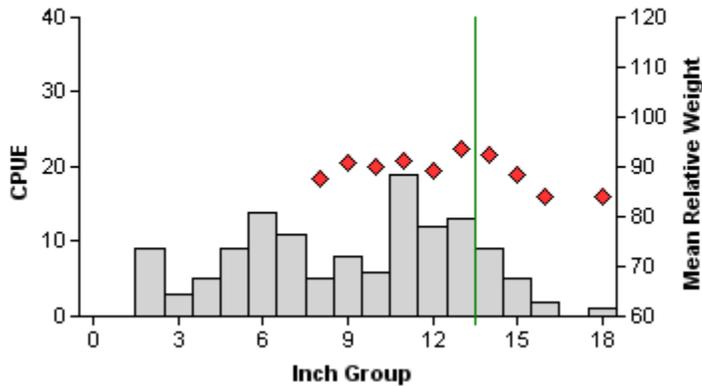
Effort =	1.0
Total CPUE =	184.0 (11; 184)
Stock CPUE =	113.0 (15; 113)
CPUE-14 =	28.0 (18; 28)
CPUE-15 =	17.0 (22; 17)
CPUE-18 =	2.0 (67; 2)
PSD =	59 (5)

2012



Effort =	1.0
Total CPUE =	101.0 (18; 101)
Stock CPUE =	70.0 (20; 70)
CPUE-14 =	14.0 (33; 14)
CPUE-15 =	6.0 (46; 6)
CPUE-18 =	0.0 (0; 0)
PSD =	43 (7)

2013



Effort =	1.0
Total CPUE =	131.0 (10; 131)
Stock CPUE =	80.0 (15; 80)
CPUE-14 =	17.0 (34; 17)
CPUE-15 =	8.0 (46; 8)
CPUE-18 =	1.0 (100; 1)
PSD =	52 (7)

Figure 11. 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, Coletto Creek Reservoir, Texas, 2011, 2012, and 2013. Vertical lines denote 14-inch minimum length limit.

Largemouth Bass

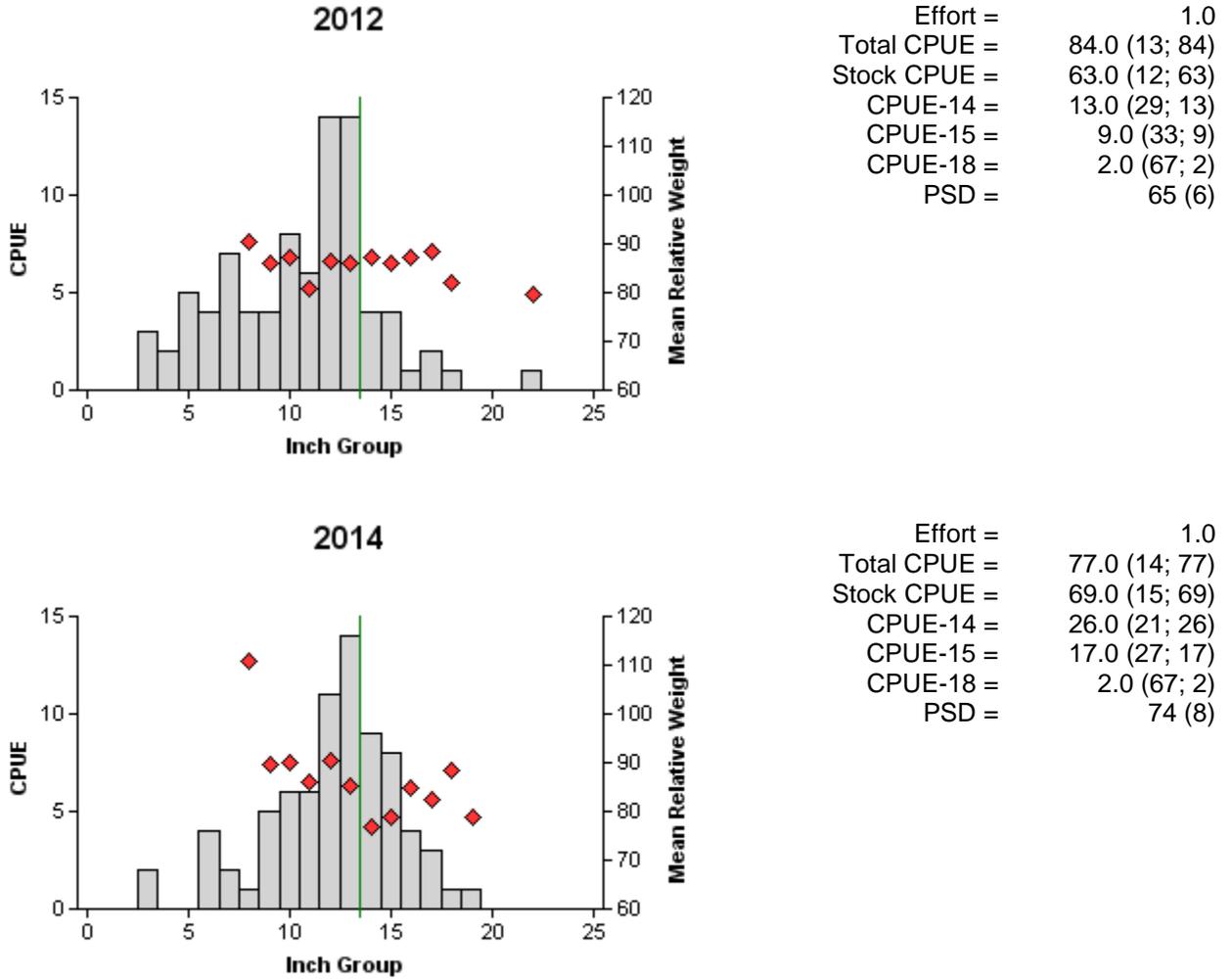


Figure 12. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring, daytime, Bass-only electrofishing surveys, Coletto Creek Reservoir, Texas, 2012 and 2014. Vertical lines denote 14-inch minimum length limit.

Largemouth Bass

Table 12. Mean age at legal length (14 in) for Largemouth Bass collected by fall electrofishing, Coletto Creek Reservoir, Texas, 2009-2013. 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)

Table 13. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Coletto 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.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB genotype
		FLMB	Intergrade	NLMB		
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 Coletto Creek Reservoir, TX from June 2005 through May 2006 and June 2012 through May 2013. 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	2005/2006	2012/2013
Directed angling effort (h)		
Tournament	28,288 (15)	16,752 (17)
Non-tournament	23,563 (15)	22,708 (14)
All Largemouth Bass anglers combined	51,851 (15)	39,460 (17)
Angling effort/acre	16.73 (15)	12.73 (17)
Catch rate (number/h)	1.41 (15)	0.77 (17)
Harvest		
Non-tournament harvest	1,123 (62)	2,390 (43)
Harvest/acre	0.36 (62)	0.77 (43)
Tournament weigh-in and release	4,832 (44)	4,192 (38)
Release by weight		
<4.0 lbs		46,181 (43)
4.0-6.9 lbs		2,206 (60)
7.0-9.9 lbs		274 (122)
≥10.0 lbs		
Percent legal released (non-tournament)	72.8	70.6

Largemouth Bass

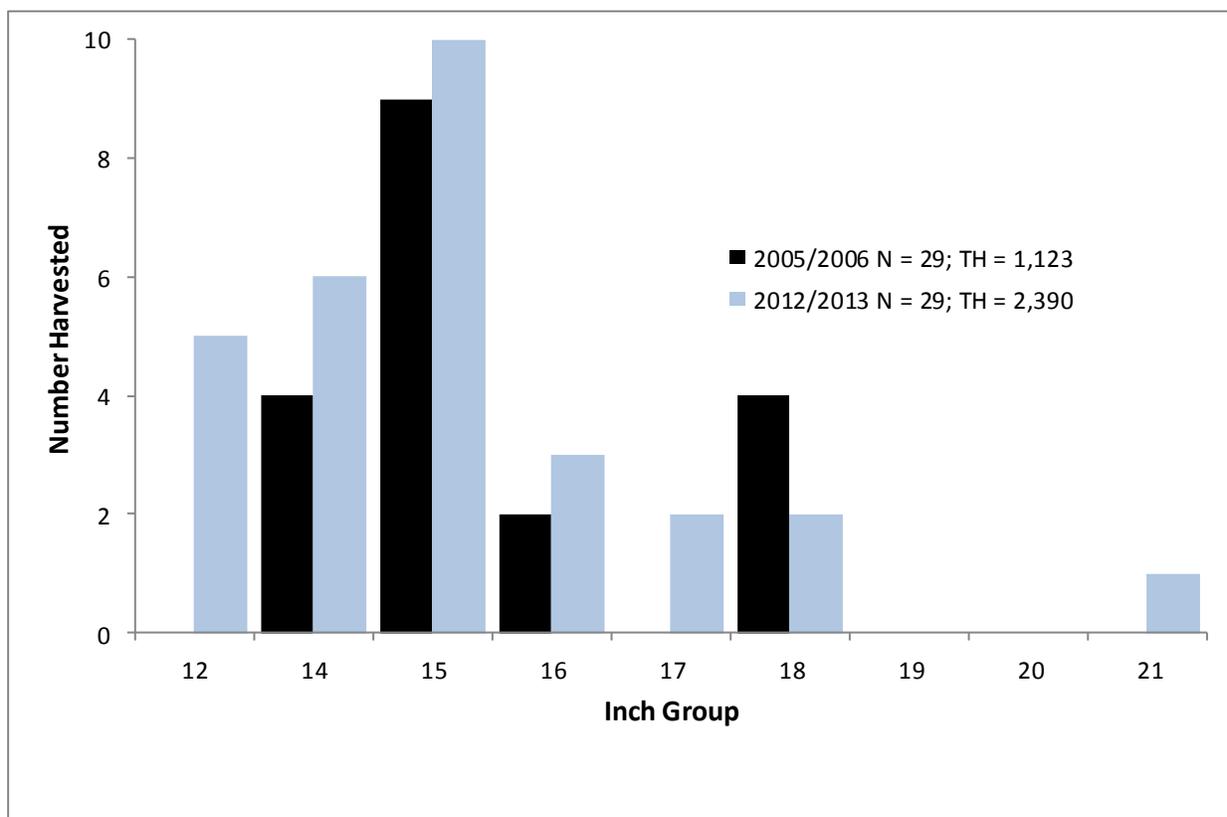
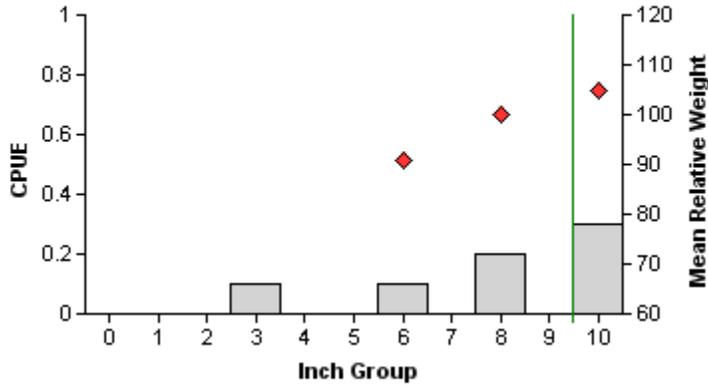


Figure 13. Length frequency of harvested Largemouth Bass observed during creel surveys at Coletto Creek Reservoir, Texas, June 2005 through May 2006 and June 2012 through May 2013, non-tournament anglers only. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated non-tournament harvest for the creel period.

White Crappie

2011



Effort = 5.0
 Total CPUE = 0.7 (60; 7)
 Stock CPUE = 0.6 (71; 6)
 CPUE-10 = 0.3 (100; 3)
 PSD = 83 (17)

Effort = 7.0
 Total CPUE = 0.0
 Stock CPUE = 0.0
 CPUE-10 = 0.0
 PSD = 0

No White Crappie were collected in the fall 2012 trap net survey.

Figure 14. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for standard, fall trap net surveys using biologist-selected stations, Coletto Creek Reservoir, Texas, 2011 and 2012. Vertical lines denote 10-inch minimum length limit.

White Crappie

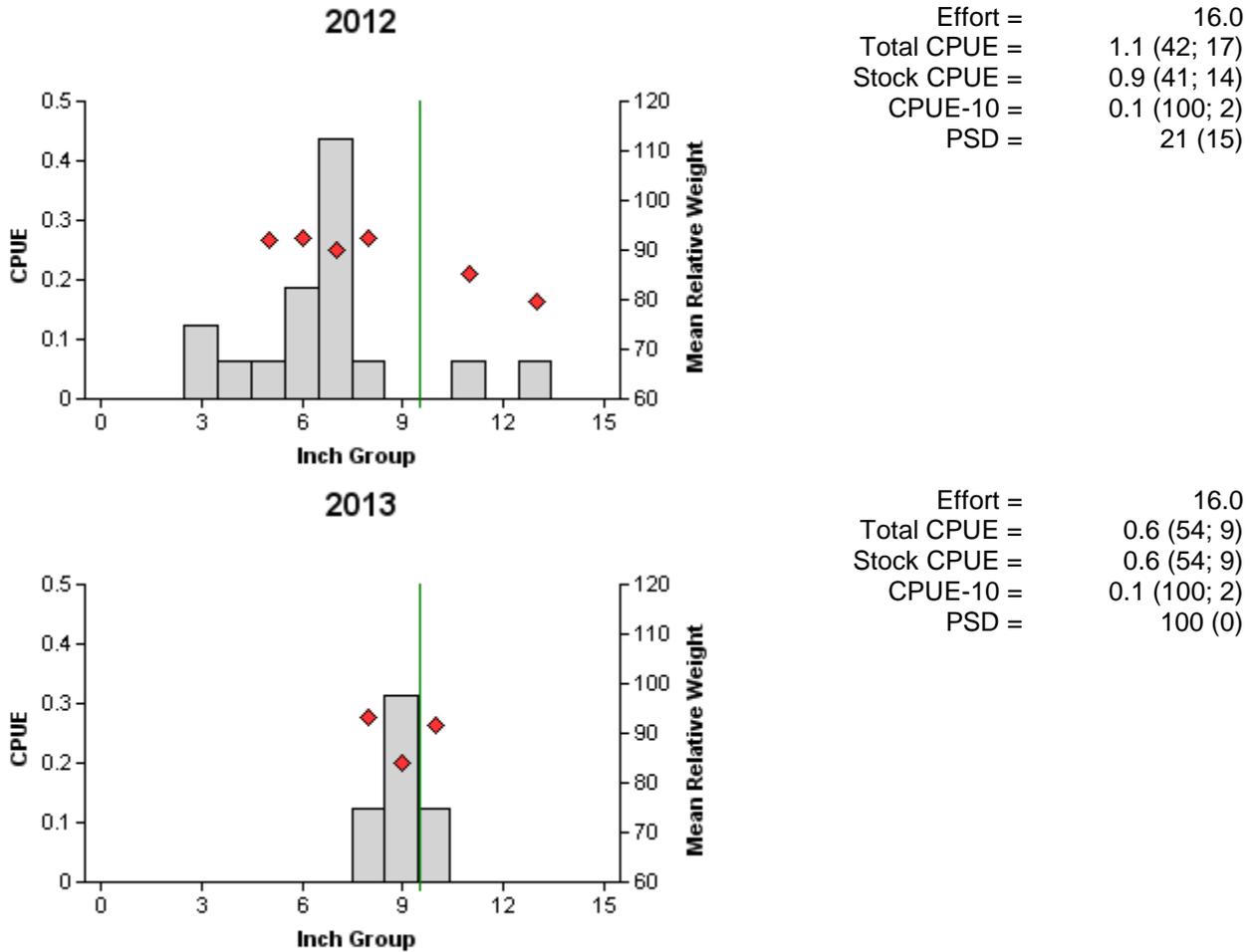


Figure 15. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for dual-cod, fall trap net surveys using biologist selected stations, Coletto Creek Reservoir, Texas, 2012 and 2013. Vertical lines denote 10-inch minimum length limit.

White Crappie

Table 15. Creel survey statistics for White Crappie at Coletto Creek Reservoir from June 2005 through May 2006, and June 2012 through May 2013. Total catch per hour is for anglers targeting White Crappie and total harvest is the estimated number of White Crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2005/2006	2012/2013
Directed effort (h)	6,076 (23)	1,859 (37)
Directed effort/acre	2.12 (23)	0.60 (37)
Total catch per hour	3.69 (40)	1.96 (72)
Total harvest	10,723 (36)	2,185 (51)
Harvest/acre	3.46 (36)	0.70 (51)

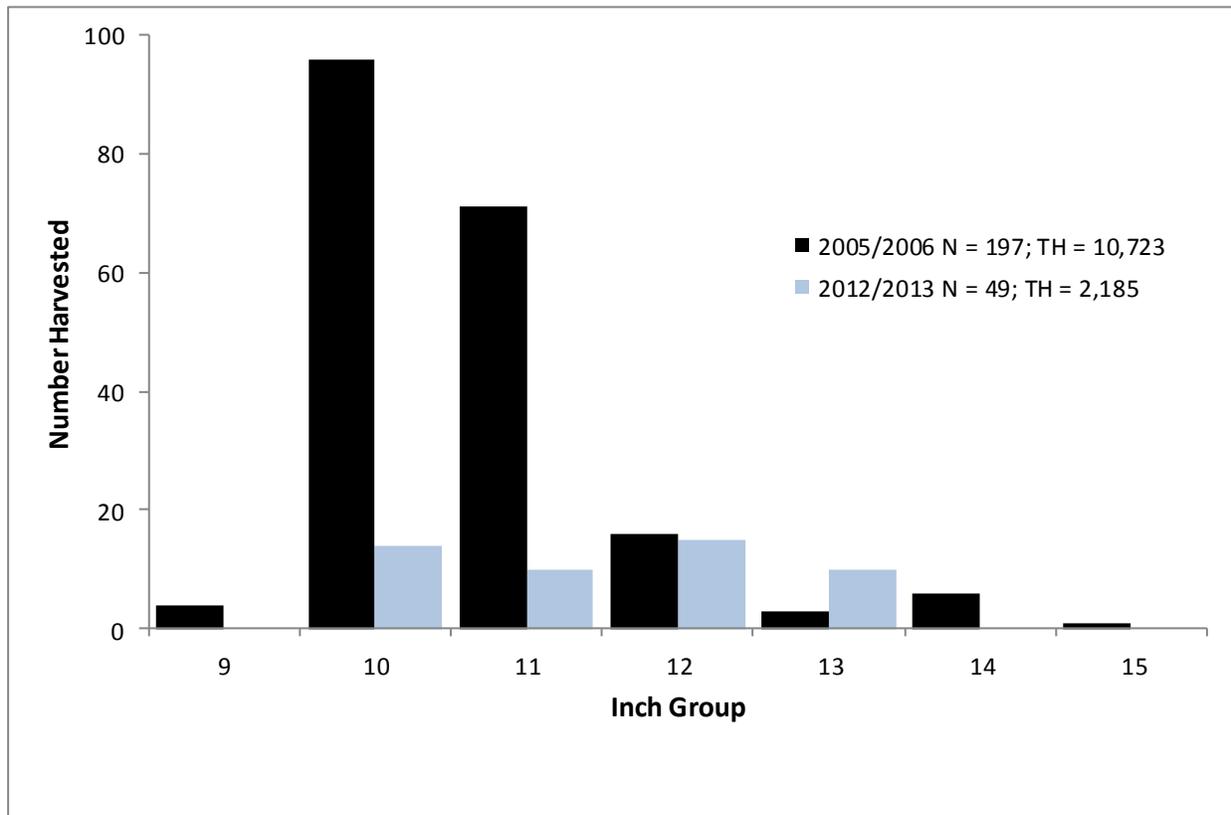


Figure 16. Length frequency of harvested White Crappie observed during creel surveys at Coletto Creek Reservoir, Texas, June 2005 through May 2006 and June 2012 through May 2013, all anglers combined. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Black Crappie

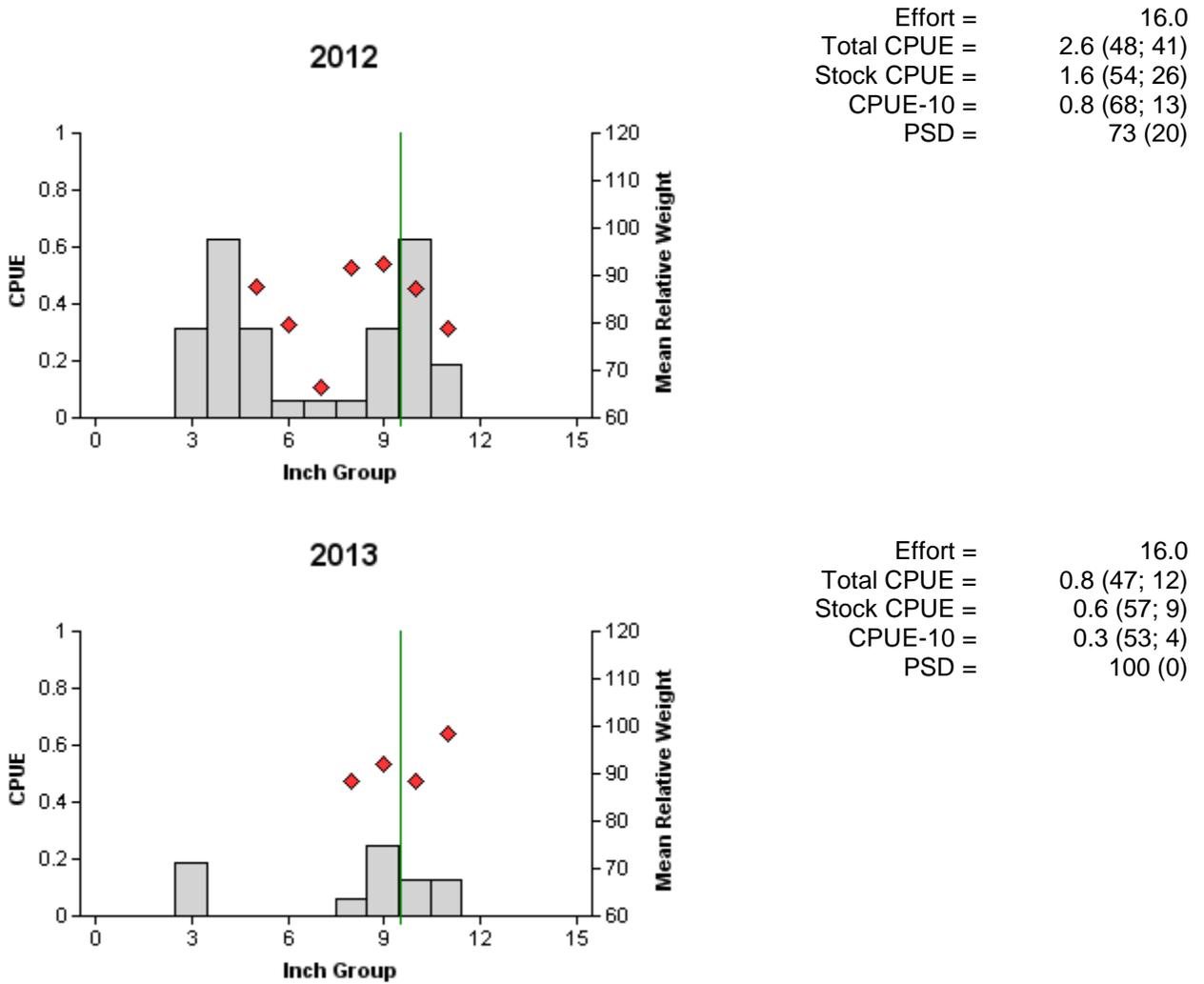


Figure 17. Number of Black Crappie caught per net night (CPUE, bars), mean relative weight (diamonds) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for dual-cod, fall trap net surveys using biologist selected stations, Coletto Creek Reservoir, Texas, 2012 and 2013. Vertical lines denote 10-inch minimum length limit.

Black Crappie

Table 16. Creel survey statistics for Black Crappie at Coletto Creek Reservoir from June 2005 through May 2006, and June 2012 through May 2013. Total catch per hour is for anglers targeting Black Crappie and total harvest is the estimated number of Black Crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel survey statistic	Year	
	2005/2006	2012/2013
Directed effort (h)	0 (0)	0 (0)
Directed effort/acre	0 (0)	0 (0)
Total catch per hour	0 (0)	0 (0)
Total harvest	0 (0)	311 (191)
Harvest/acre	0 (0)	0.10 (191)

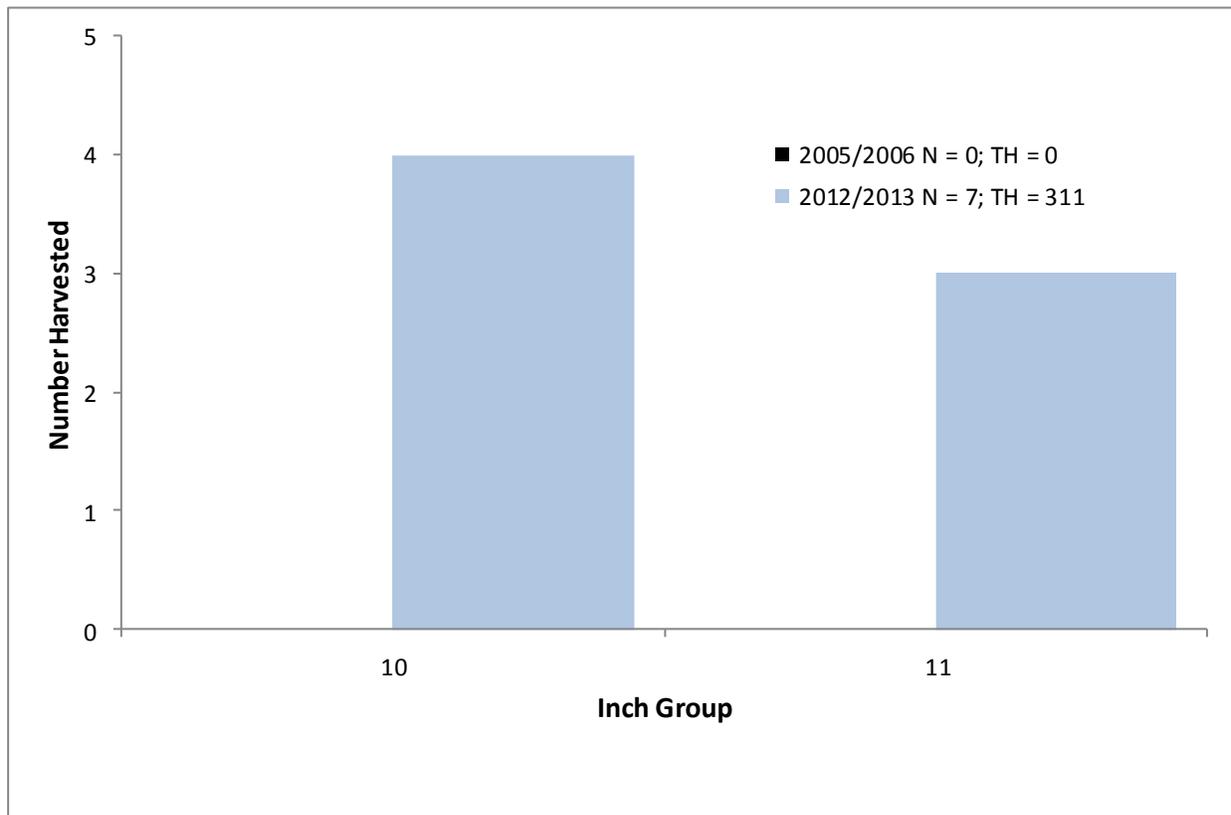


Figure 18. Length frequency of harvested Black Crappie observed during creel surveys at Coletto Creek Reservoir, Texas, June 2005 through May 2006 and June 2012 through May 2013, all anglers combined. N is the number of harvested Black Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 17. Proposed sampling schedule for Coletto 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.

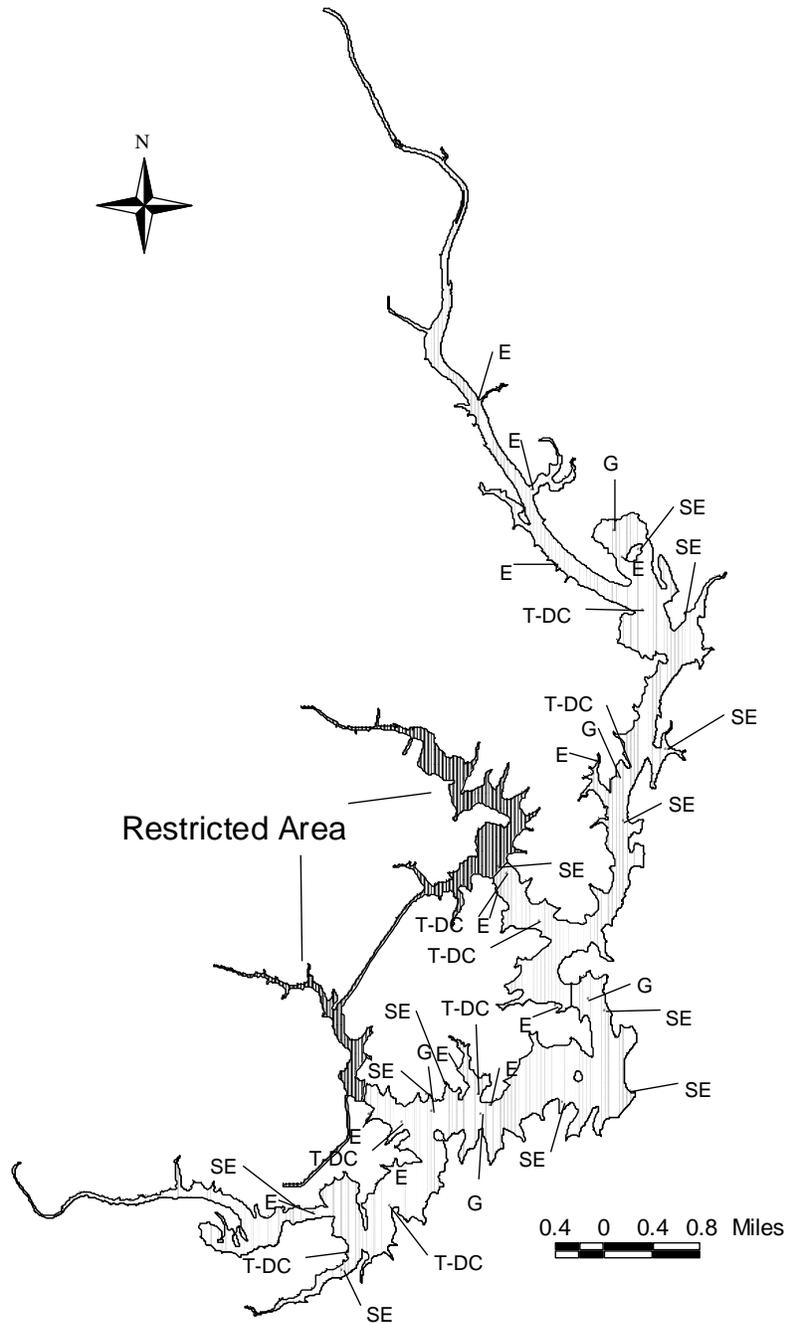
Survey year	Electrofishing Fall	Dual-cod trap net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2014-2015	A							
2015-2016	A	A	A					
2016-2017	A						S	
2017-2018	S	S	S		S	S		

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from all gear types from Coletto Creek Reservoir, Texas, 2013-2014. Sampling effort was 5 net nights for gill netting, 16 net nights for dual-cod trap netting and 1 hour for electrofishing.

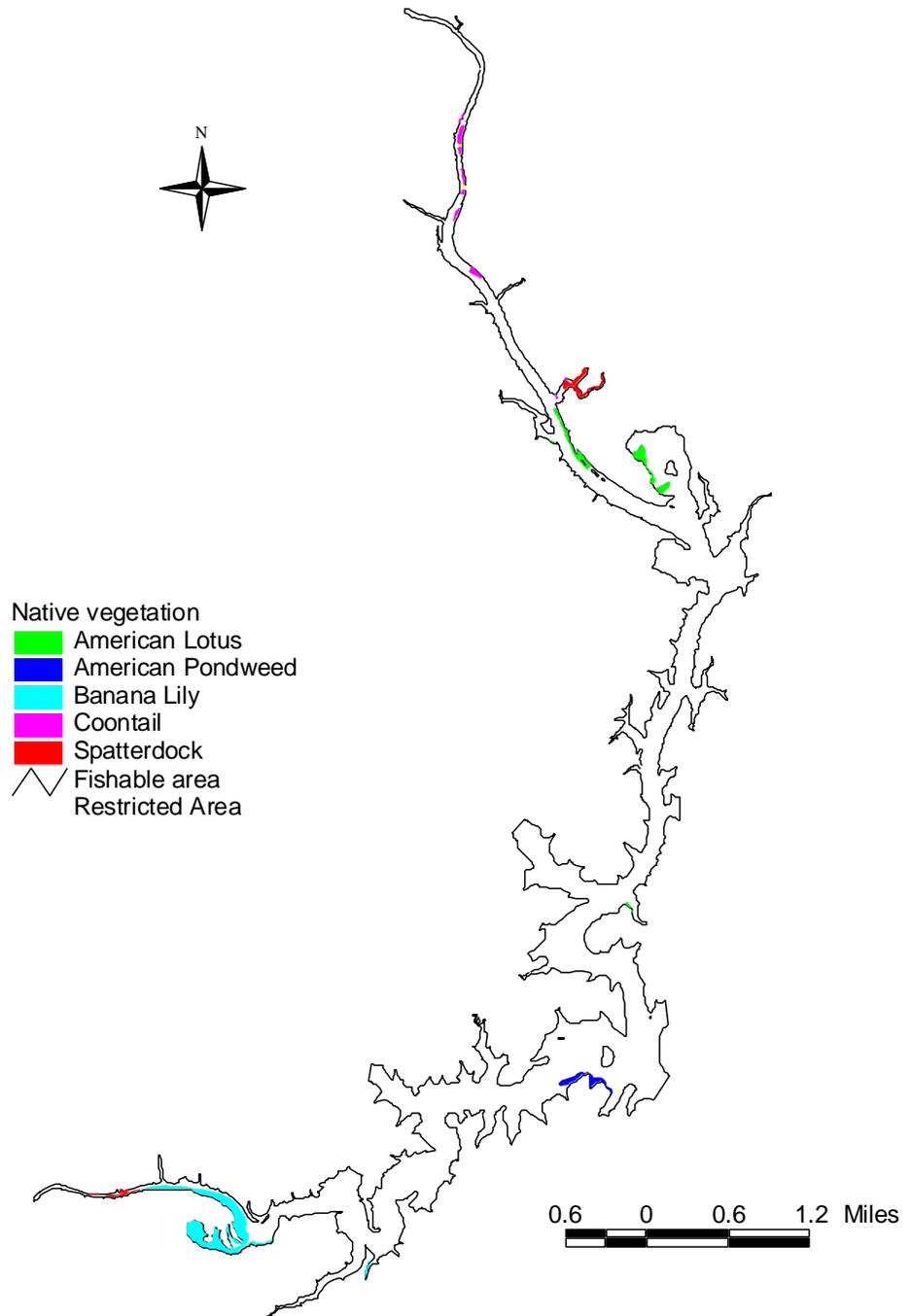
Species	Electrofishing		Trap netting		Gill netting	
	N	CPUE	N	CPUE	N	CPUE
Spotted Gar					9	1.8
Longnose Gar					5	1.0
Gizzard Shad	1	1.0			114	22.8
Threadfin Shad					6	1.2
Common Carp					8	1.6
Smallmouth Buffalo					35	7.0
Inland Silverside	1	1.0				
Blue Catfish					3	0.6
Channel Catfish					4	0.8
White Bass	2	2.0			26	5.2
Warmouth	13	13.0	3	0.2		
Bluegill	245	245.0	250	15.6		
Longear Sunfish	10	10.0	7	0.4	1	0.2
Redear Sunfish	143	143.0	124	7.8		
Largemouth Bass	131	131.0			3	0.6
White Crappie			9	0.6		
Black Crappie			12	0.8		
Logperch	1	1.0				
Blue Tilapia	3	3.0				

34
APPENDIX B



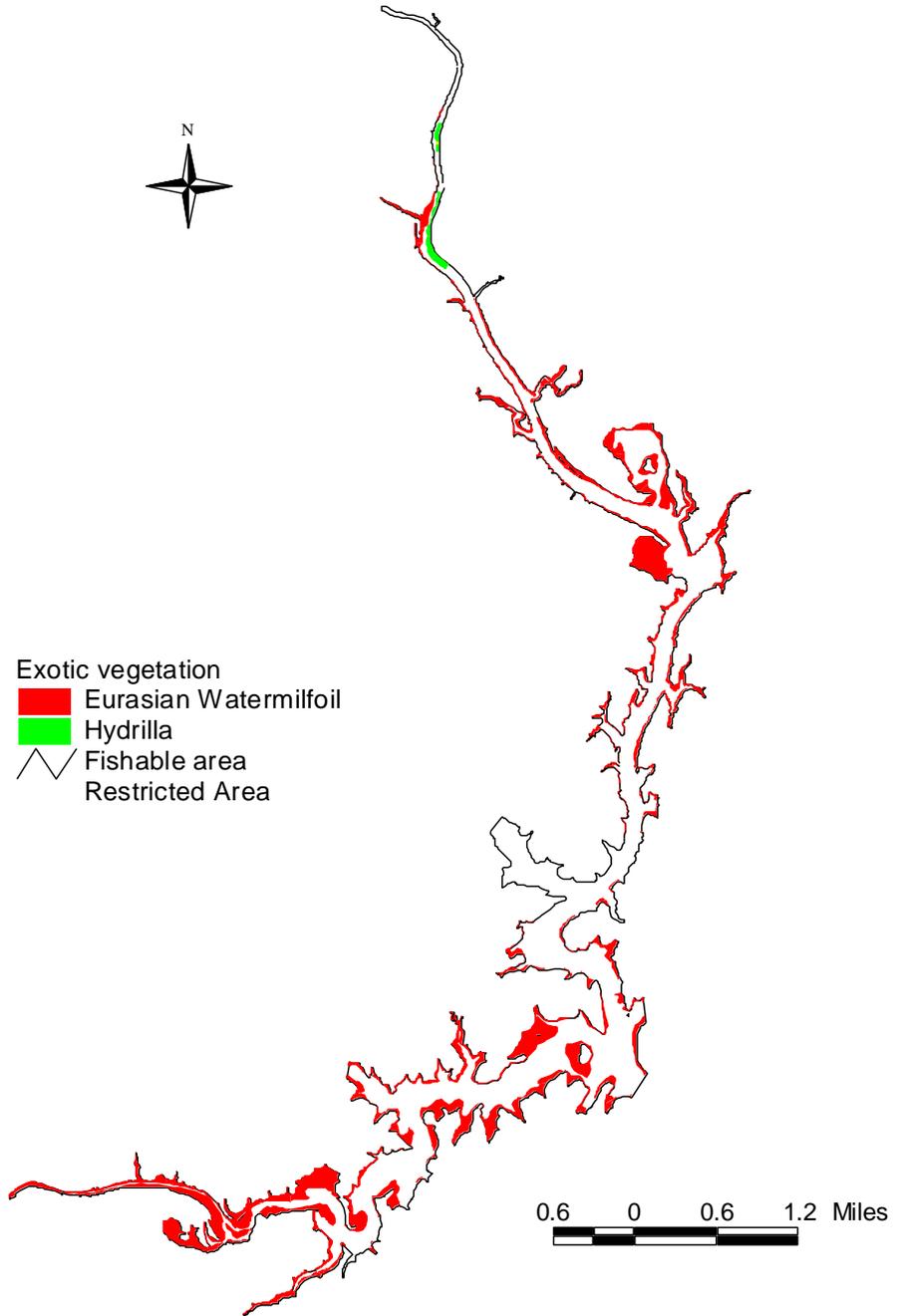
Location of sampling sites, Coletto Creek Reservoir, Texas, 2013-2014. Dual cod trap net, gill net, and electrofishing stations are indicated by T-DC, G and E, respectively. SE denotes supplemental daytime electrofishing. Dashed lake outline indicates area inaccessible to anglers. Water level was 2 – 4 feet below conservation pool at time of surveys.

35
APPENDIX C



Native aquatic vegetation map for Coletto Creek Reservoir, Texas, 2013.

APPENDIX D



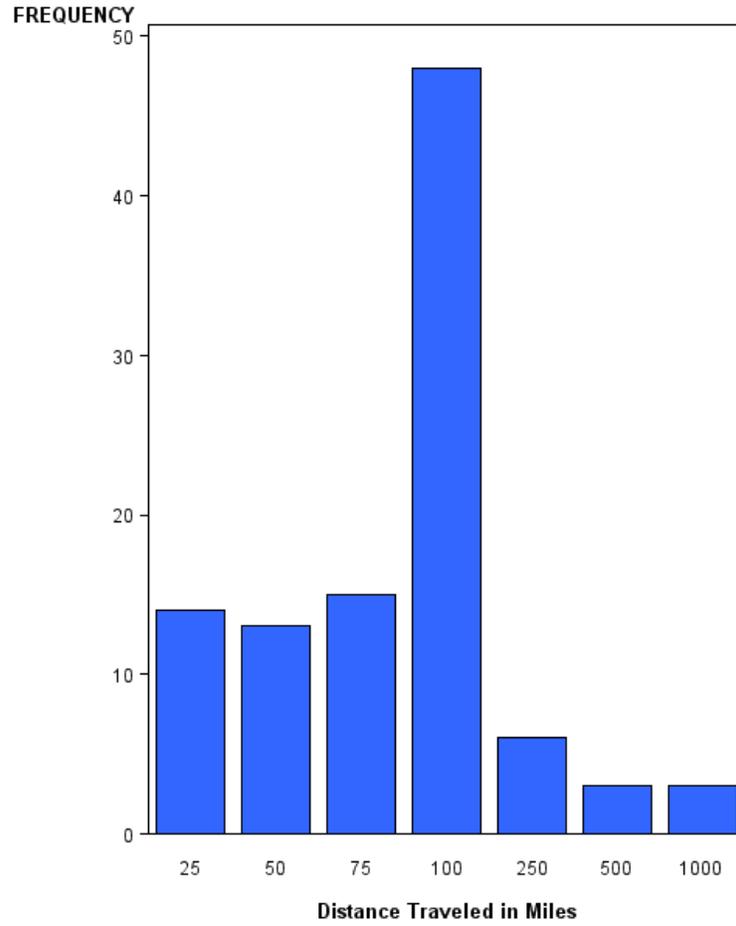
Non-native aquatic vegetation map for Coletto Creek Reservoir, Texas, 2013.

APPENDIX E

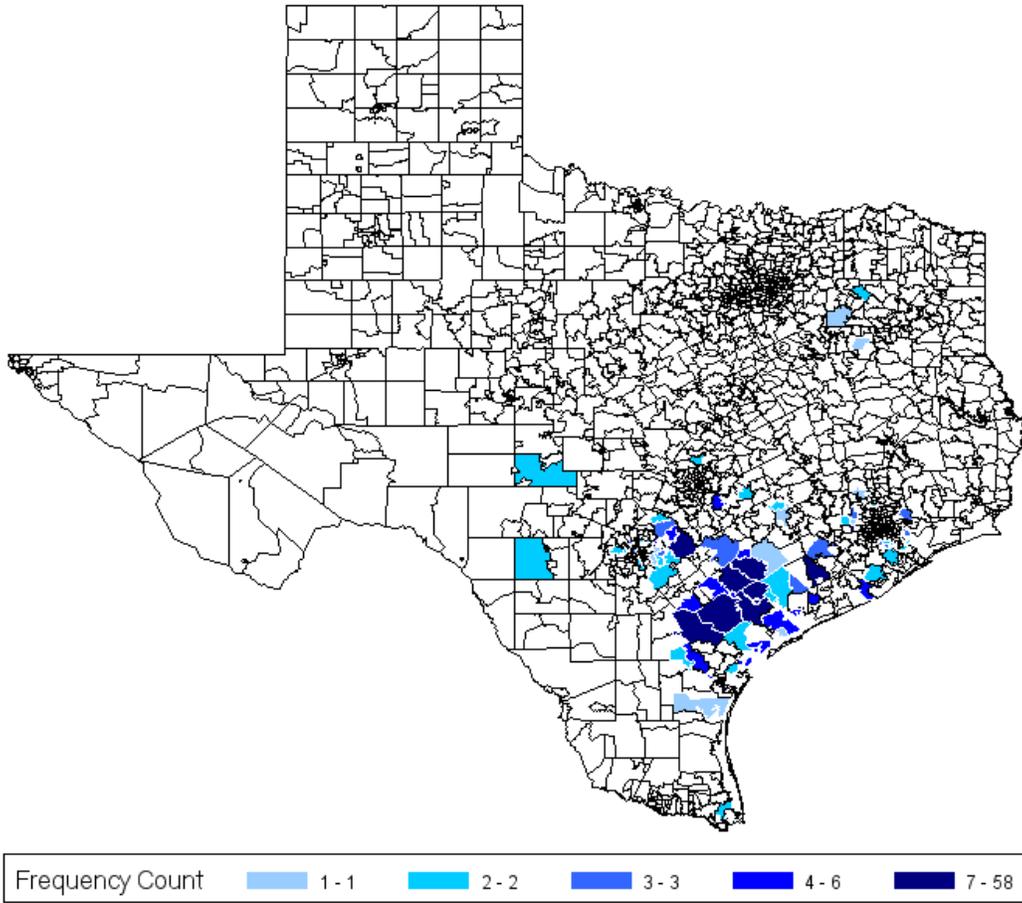
Summary of Largemouth Bass tournament data, Coletto Creek Reservoir, 2009-2014. N is total number of tournaments, anglers, and fish, respectively. Catch per angler is the average number of Largemouth Bass weighed-in per tournament fisherman. Catch 4 – 6.9 and 7 – 10 is total number of fish caught per 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
28	687	2,144	3.12	67	7	36.6	49.9	4,967	2.32

APPENDIX F



Distance traveled (miles) by frequency to Coletto Creek Reservoir, Texas, as determined from June 2012 through May 2013 creel survey.



Location, by ZIP code, and frequency of anglers that were interviewed at Coletto Creek Reservoir, Texas, during June 2012 through May 2013 creel survey.