

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2013 Fisheries Management Survey Report

Joe Pool Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Joe Pool Reservoir were surveyed in 2010, 2011, 2012, and 2013 using electrofishing, in 2013 using trap nets and in 2014 using gill nets. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Joe Pool Reservoir, a 7,470-acre reservoir located on Mountain Creek (a tributary of the Trinity River), was constructed in 1986 by the U.S. Army Corps of Engineers for flood control, water supply, recreation, and fish and wildlife enhancement. It was opened to public fishing in August 1989. It is located in Tarrant, Ellis, and Dallas Counties four miles south of Grand Prairie, Texas. Habitat is composed mainly of shoreline emergent vegetation, submersed vegetation in the form of hydrilla (*Hydrilla verticillata*), and American pondweed (*Potamogeton nodosus*), and flooded timber.
- **Management History:** Important sport fish include White Bass, Largemouth Bass, White Crappie, and Channel Catfish. Largemouth Bass have been intensively managed through harvest regulations and opened with an 18-inch minimum length limit. This was changed to a 14-to 21- inch slot length limit in fall 1992
- **Aquatic Vegetation:** Hydrilla was first discovered in Joe Pool Reservoir in 1994. Coverage was less than 1 acre until it expanded to approximately 116 acres in 2003 and fluctuated between 100 and 120 acres from 2004-2006. Hydrilla began to decrease in 2007 and decreased to less than one acre from 2008-2010. In 2011 Hydrilla had expanded to 31 acres. Hydrilla totaled 63 acres in 2012 and 115 acres in 2013. Although Hydrilla can be problematic, the vegetation has had a positive impact on the Largemouth Bass population.
- **Fish Community**
 - **Prey species:** Gizzard and Threadfin Shad were present in the reservoir. However, catch rates of these species remain well below averages of other district reservoirs. This could be the result of the low productivity of the water.
 - **Catfishes:** Blue Catfish catch rates continued to increase. Several large fish (≥ 30 inches) were captured. The catch rate of Channel Catfish also increased compared to previous years. Flathead catfish are present but none were captured.
 - **Temperate Bass:** White Bass were caught at a high rate by gill netting with most fish captured being over the minimum length limit. For the first time in sampling history, Yellow Bass were also collected.
 - **Largemouth Bass:** The Largemouth Bass catch rates increased from previous sample. Most of the increase was in the 9-to -11 inch length groups. Average body condition continued to be below optimal.
 - **White Crappie:** The White Crappie catch rates doubled from the previous survey. Most of the fish captured were below 10 inches.
- **Management Strategies:**

An additional electrofishing survey will be conducted in 2015 and general monitoring with trapnetting, gillnetting, and electrofishing in 2017-2018. Annual aquatic vegetation surveys will be conducted to monitor hydrilla coverage. Planting of floating leaved plants will be conducted annually if plants are available.

INTRODUCTION

This document is a summary of fisheries data collected from Joe Pool Reservoir from fall 2010-spring 2014. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2010-2014 data for comparison.

Reservoir Description

Joe Pool Reservoir is a 7,470-acre impoundment constructed in 1986 on Mountain Creek (a tributary of the Trinity River) by the United States Army Corps of Engineers (USACE) for flood control, water supply, recreation, and fish and wildlife enhancement. It is located in Tarrant, Ellis, and Dallas Counties, four miles south of Grand Prairie, Texas. The watershed was primarily agricultural but is being developed for residential purposes. Land use on the northeast side of the reservoir is maintained by Cedar Hill State Park. Joe Pool Reservoir has low productivity. In 2006, the Texas Commission on Environmental Quality (TCEQ) had Joe Pool ranked second highest among major reservoirs sampled in Texas as having limited chlorophyll a production and low total phosphorus levels (Texas Commission on Environmental Quality 2007). This has probably had an impact on the limited forage available for sport fish populations and is probably the main obstacle to improving Largemouth Bass growth rates, body conditions, and size structure. Because Joe Pool is not a major water supply source, water levels are fairly stable (Figure 1). At the time of sampling the fishery habitat was composed mainly of rocky habitat, submersed vegetation in the form of hydrilla and American pondweed, shoreline emergent vegetation, and flooded timber. Other descriptive characteristics for Joe Pool Reservoir are in Table 1.

Angler Access

Joe Pool Reservoir has seven public boat ramps and no private boat ramps. Additional boat ramp characteristics are in Table 2. Shoreline access for bank anglers is good along the shoreline of numerous parks that are around the reservoir. There is also a fishing barge located in Cedar Hill State Park Marina.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Brock and Hungerford 2010) included:

1. A yearlong creel survey will be conducted on Joe Pool in 2013-2014 to obtain creel statistics and angler opinion information.

Action: A 36-day annual creel was conducted on Joe Pool Reservoir from June 2013-May 2014.

2. Monitor coverage of hydrilla by conducting annual aquatic vegetation surveys. Recommend herbicide treatments if hydrilla coverage causes access problems.

Action: Annual summer vegetation surveys were conducted from 2010-2013 to monitor hydrilla abundance.

3. Contact controlling authority to determine if native vegetation plantings can be conducted in Joe Pool Reservoir. If permission is granted, plant native submersed vegetation in suitable sites and monitor its growth.

Action: USACE was contacted and approval was granted as long as wire cages were not used. If we decide to use wire cages a MOU would need to be developed. It was decided to try planting without cages to determine success. In the summer of 2013, vegetation

plantings of White Water lily (*Nymphaea odorata*) and the emergent plants American Water-Willow (*Justicia americana*) and Cattail (*Typha spp.*) were planted.

No submersed plants were planted because of the presence of American pondweed and the increase of Hydrilla.

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.

Action: The lakeside marinas were contacted regarding the zebra mussel issue. Signs were erected at public ramps. Zebra mussel samplers were placed at various locations around the reservoir.

Harvest regulation history: Sport fish populations in Joe Pool Reservoir were managed with statewide regulations with the exception of Largemouth Bass (Table 2). From 1989 to 1991, Largemouth Bass were managed with an 18-inch minimum length limit. A 14- to 21-inch slot length limit was implemented in 1992 to improve growth rates, fish condition, and the population size structure.

Stocking history: Joe Pool Reservoir was stocked in 2005 and 2006 with Florida Largemouth Bass. The stockings were conducted to increase the Florida Largemouth Bass genetic influence. The complete stocking history is in Table 3.

Vegetation/habitat history: Joe Pool Reservoir aquatic vegetation is currently composed of sporadic stands of American pondweed and shoreline emergent stands of American Water-willow (*Justicia americana*), and common reed (*Phragmites australis*). Hydrilla was first observed in Joe Pool Reservoir in 1994. At that time it comprised less than 0.10 acres. No hydrilla was observed in vegetation surveys conducted in 1995, 1996, 1997, 1999 and 2000. Small stands (less than 1 acre in size) of hydrilla were observed in 1998 and again in 2001 near the Lynn Creek Park boat ramps. In 2002, Hydrilla was evident at numerous locations around the reservoir with a total coverage estimated to be 13 acres. In 2003 Hydrilla expanded to an estimated 116 acres. In 2004, 2005, and 2006, hydrilla coverage fluctuated between 120 and 106 acres. Large dense stands of hydrilla were primarily along the shores of Cedar Hill State Park and Lynn Creek Park. The boat ramps and swimming beaches were treated at both parks in summer of 2004 with aquatic herbicide. In summer of 2005, the City of Grand Prairie again conducted herbicide treatments to their swimming areas and boat ramps and also conducted a first time herbicide treatment at Britton Park. Hydrilla abundance decreased in 2007 to 7.5 acres. From 2008-2010 less than an acre was reported. Hydrilla reappeared in 2011 and covered an estimated 31.7 acres. In 2012 and 2013, hydrilla covered an estimated 63.1 and 115.0 acres respectively. Some mechanical harvest of hydrilla was conducted around the state park marina.

Zebra mussels: The exotic species zebra mussel has been found in several DFW area Reservoirs. Joe Pool Reservoir has tested positive for zebra mussel DNA as determined by PCR analysis conducted by the United States Geologic Survey (USGS). However no adults or larva have been found in the Reservoir.

Water transfer: Joe Pool Reservoir is primarily used as water supply for the City of Midlothian and an irrigation supply for the City of Grand Prairie. No interbasin transfers exist. In the future, the Cities of Duncanville and Cedar Hill will also be using water from the reservoir.

METHODS

Fishes were collected by electrofishing (1.5 hours at 18, 5-min stations), gill netting (10 net nights at 10 stations), and trap netting (10 net nights at 10 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/hr) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011).

An annual roving creel survey was conducted from June 2013 through May 2014. Angler interviews were conducted on 5 weekend days and 4 weekdays per quarter to assess angler use and fish catch/harvest statistics in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Anglers targeting Largemouth Bass were also asked additional questions regarding their opinion of the slot length limit regulation. These questions and results are in Appendix D.

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. All procedures were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011). Micro-satellite DNA analysis was used to determine genetic composition of individual fish from 2005 through 2013 and by electrophoresis for previous years.

Source for water level data was the United States Geological Survey (USGS 2014).

RESULTS AND DISCUSSION

Vegetation Survey: Vegetation surveys were conducted from 2010-2013 to monitor the abundance of Hydrilla. The abundance of American pondweed was also estimated during these surveys (Table 5).

Creel: Directed fishing effort by anglers was highest for Largemouth Bass (47%), followed by anglers fishing for Crappies (28%) and Catfishes 12% (Table 7). Total trip expenditures for anglers fishing Joe Pool during the survey were \$359,352.

Prey species: From 2010 to 2013 electrofishing catch rates of Gizzard Shad averaged 87.8/hr and ranged from 49.3/hr in 2011 to 144.7/hr in 2010 (Figure 2). Index of vulnerability for Gizzard Shad was poor with values averaging only 21.8 from 2010-2014 (Figure 2). This average was below IOV estimates in previous years. The electrofishing catch rates of Threadfin Shad varied from a low in 2011 of 44.7/hr to a high of 312.0/hr in 2010. The average threadfin catch rate from 2010-2014 was 118.7/hr. This is below the district average of 302.7/hr. Electrofishing catch rates of bluegill ranged from 103.3/hr in 2010 to 178.0/hr in 2012 (Figure 3). Electrofishing rates did increase as vegetation abundance increased. The number of Bluegill of quality-size (≥ 6 inches) did increase to 22.7/h in 2013. Longear Sunfish catch rates averaged 25.7/hr and ranging from 8.7/hr in 2012 to 46.0/hr in 2011 (Appendix C).

Catfishes: Blue Catfish were first captured by gill netting in 2006. The catch rates have been low but have gradually increased in subsequent samples (Figure 4). The gill netting catch rate of Blue Catfish in 2014 was 1.4/nn with fish >30 inches being captured. The gill net catch rate of Channel Catfish was 4.3/nn in 2014 which was higher than previous samples (Figure 5). This catch rate is well below the

district average of 5.6/n and the size structure decreased when compared to previous sample. Catfishes were the third most sought after species by anglers (Table 8).

Temperate Basses: White Bass were first collected by gill netting in Joe Pool in 1994. The gill netting catch rates of White Bass have historically been well below the district average of 7.8/n. However, the catch rate in 2014 was 13.4/n which is a large increase from the previous samples (Figure 7). Most fish caught were ≥ 10 inches. Size structure of the population was skewed towards larger individuals as indicated by the PSD value of 98. Yellow Bass were also collected for the first time at a low rate (Appendix A). It is not known how they were introduced in the reservoir.

The percent directed angling effort for White Bass on Joe Pool was low (Table 9).

Largemouth Bass: The total electrofishing catch rates of Largemouth Bass averaged 110.9/hr from 2010-2013 and were fairly consistent with the exception of 2010 (Figure 9). The catch rate of Largemouth Bass ≥ 14 inches averaged 7.3/hr from 2010-2013. Size structure of the population remained stable from 2010-2012 with PSD values averaging 31. However a decrease in size structure was observed in 2013.

Body condition in 2014 were below optimal (relative weights under 91) for most size classes of fish. Florida Largemouth Bass allele frequency was 57% and the FLMB genotype was 3.3% (Table 11). Historically growth of largemouth bass has been slow. Based on age and growth analysis from 2006, on average largemouth bass reached 14 inches in length (the lower slot limit) by age three (Brock and Hungerford 2006).

Largemouth Bass were by far the most sought after species in Joe Pool Reservoir. Forty seven percent of anglers surveyed were targeting Largemouth Bass (Table 10). Anglers targeting Largemouth Bass caught them at a rate of 0.71/hr. Most of the Largemouth Bass observed as harvested during the creel surveys were from tournament anglers. No fish observed during the creel survey were above slot length limit.

An estimated 70% of Largemouth Bass anglers surveyed believed the current slot length limit was helpful to the population and 73% of the Largemouth Bass anglers surveyed supported leaving the slot length limit in place (Appendix D).

White Crappie: The trap net catch rate of White Crappie was 10.5/n in 2013, which was double the two previous samples (Figure 11). PSD value was lower than previous samples due to the increase in the number of fish captured between 7 and 9 inches.

Crappies were the second most sought after species in Joe Pool with 28% of anglers surveyed targeting crappies (Table 12). Catch rate by anglers targeting Crappies was high (2 fish/hr) and any legal white crappie caught was harvested.

Fisheries management plan for Joe Pool Reservoir, Texas

Prepared – July 2014.

ISSUE 1: Joe Pool Reservoir had 115 acres of hydrilla in 2013. High coverage of hydrilla can cause negative impacts to boating access.

MANAGEMENT STRATEGY

1. Conduct annual vegetation surveys to monitor hydrilla coverage.

ISSUE 2: Joe Pool Reservoir fish populations benefit from the presence of aquatic vegetation. Joe Pool had 115 acres of hydrilla and 37 acres of pondweed in 2013.

MANAGEMENT STRATEGY

1. Request floating leaf vegetation from TPWD aquatic nursery in Athens and plant vegetation in suitable areas of Joe Pool Reservoir.

ISSUE 3: Joe Pool Reservoir has produced trophy-sized Largemouth Bass. Anecdotal information suggest fish over 10 lbs are caught frequently during the spring. The increase in the abundance of aquatic vegetation mainly in the form of hydrilla will result in better survival of stocked fingerlings.

MANAGEMENT STRATEGY

1. Request FLMB for stocking into Joe Pool Reservoir for 2014 and 2015.

ISSUE 4: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

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

SAMPLING SCHEDULE JUSTIFICATION

Electrofishing surveys will be conducted every other year to monitor the Largemouth Bass population and prey. Standard monitoring of other sport fish species with gill netting and trap netting will be conducted in 2017-2018 (Table 13). Vegetation surveys will be conducted annually to monitor hydrilla coverage.

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.
- Brock, R. and T. Hungerford 2006. Statewide freshwater fisheries monitoring and management program survey report for Joe Pool Reservoir, 2009. Texas Parks and Wildlife Department, Federal Aid Report F-30, Austin.
- Brock, R. and T. Hungerford 2010. Statewide freshwater fisheries monitoring and management program survey report for Joe Pool Reservoir, 2009. Texas Parks and Wildlife Department, Federal Aid Report F-30, Austin.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between Reservoir trophic state and Gizzard Shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16: 888-895.
- Guy, C. S., R. M. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional Size Distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7):348.
- Texas Commission on Environmental Quality. 2007. Trophic classification of Texas reservoirs. 2006. Texas Water Quality Inventory and 303 (d) List, Austin. 15 pp.
- United States Geological Society (USGS). 2013. National water information system: Web interface. Available: <http://waterdata.usgs.gov/tx/nwis> (July 2014).

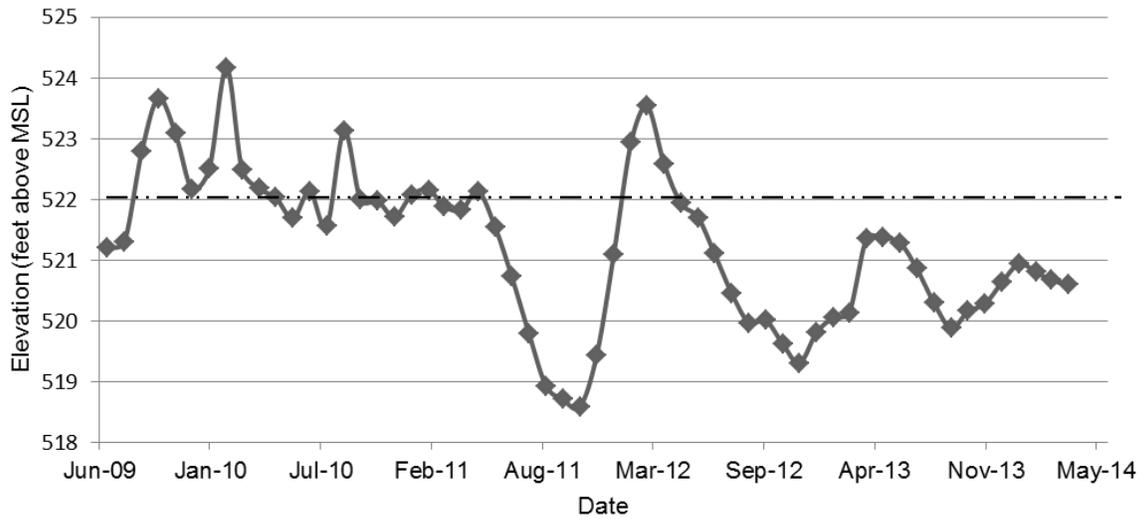


Figure 1. Mean monthly water level elevations in feet above mean sea level (MSL) recorded for Joe Pool Reservoir, Texas from Sept 2010-April 2014. Conservation pool is 522 feet above MSL and represented by the dashed line.

Table 1. Characteristics of Joe Pool Reservoir, Texas.

Characteristic	Description
Year constructed	1986
Year opened to public	1989
Controlling authority	United States Army Corps of Engineers
Counties	Tarrant, Dallas, Ellis
Reservoir type	Tributary Trinity River
Conductivity	415 $\mu\text{S}/\text{cm}$

Table 2. Boat ramp characteristics for Joe Pool Reservoir, Texas, April, 2013. Reservoir elevation at time of survey was 520.5 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
State Park South Ramps	32.6142 -96.9950	Y	80	516.5	Good
State Park Main Ramps	32.6271 -96.9823	Y	90	510.5	Good
Lynn Creek Park North	32.6323 -97.0228	Y	50	513.0	Good
Lynn Creek Park South	32.6313 -97.0250	Y	50	515.0	Good. No courtesy dock
Lynn Creek Marina	32.6310 -97.0395	Y	100	510.0	Good
Britton Park	32.5479 -97.0535	Y	90	513.5	Good
Loyd Park	32.6189 -97.0625	Y	50	510.0	Good. No courtesy dock

Table 3. Harvest regulations for Joe Pool Reservoir, Texas.

Species	Bag Limit	Length Limit (inches)
Catfish: Channel and Blue Catfish, their hybrids and subspecies	25 (in any combination)	12-inch minimum
Catfish, Flathead	5	18-inch minimum
Bass, White	25	10-inch minimum
Bass: I Largemouth	5 (only 1 > 21 inches)	14-to 21-inch slot
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Joe Pool Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Channel Catfish	1986	750,000	FRY	0.8
	Total	750,000		
Coppernose Bluegill	1981	19,950	UNK	UNK
	1985	125,000	AFGL	2.0
	1986	5,290	AFGL	2.0
	Total	150,240		
Florida Largemouth Bass	1981	2,970	FRY	0.7
	1984	2,700	FRY	1.0
	1986	665,810	FRY	1.0
	1987	203,315	FRY	1.0
	2001	182,049	FGL	1.5
	2005	317,036	FGL	1.6
	2006	325,681	FGL	1.6
Total	1,699,561			
Threadfin Shad	1981	1,080	AFGL	2.9
	Total	1,080		

Table 5. Survey of Hydrilla and American pondweed, Joe Pool Reservoir, Texas, 2010 – 2013. Surface area (acres) is listed with percent of total reservoir surface area in parentheses.

Vegetation	2010	2011	2012	2013
Native submersed				
Native floating-leaved (American pondweed)	<1 (0)	<1 (0)	14.1 (0.19)	37.2 (0.49)
Native emergent				
Non-native				
Hydrilla (Tier 3)	<1 (0)	31.7 (0.42)	63.1 (0.84)	115.0 (1.50)

Table 6. Percent directed angler effort by species for Joe Pool Reservoir, Texas, 2013 – 2014. Survey periods were from 1 June 2013 through 31 May 2014.

Species	2013/2014
Catfishes	12
White Bass	1.9
Sunfishes	0.3
Largemouth Bass	37
Crappies	28
Anything	11

Table 7. Total fishing effort (h) for all species and total directed expenditures at Joe Pool Reservoir, Texas, 2013- 2014. Survey periods were from 1 June 2013 through 31 May 2014. Relative standard error is in parentheses.

Creel statistic	2013/2014
Total fishing effort	118,816 (14)
Total directed expenditures	\$359,352 (23)

Gizzard Shad

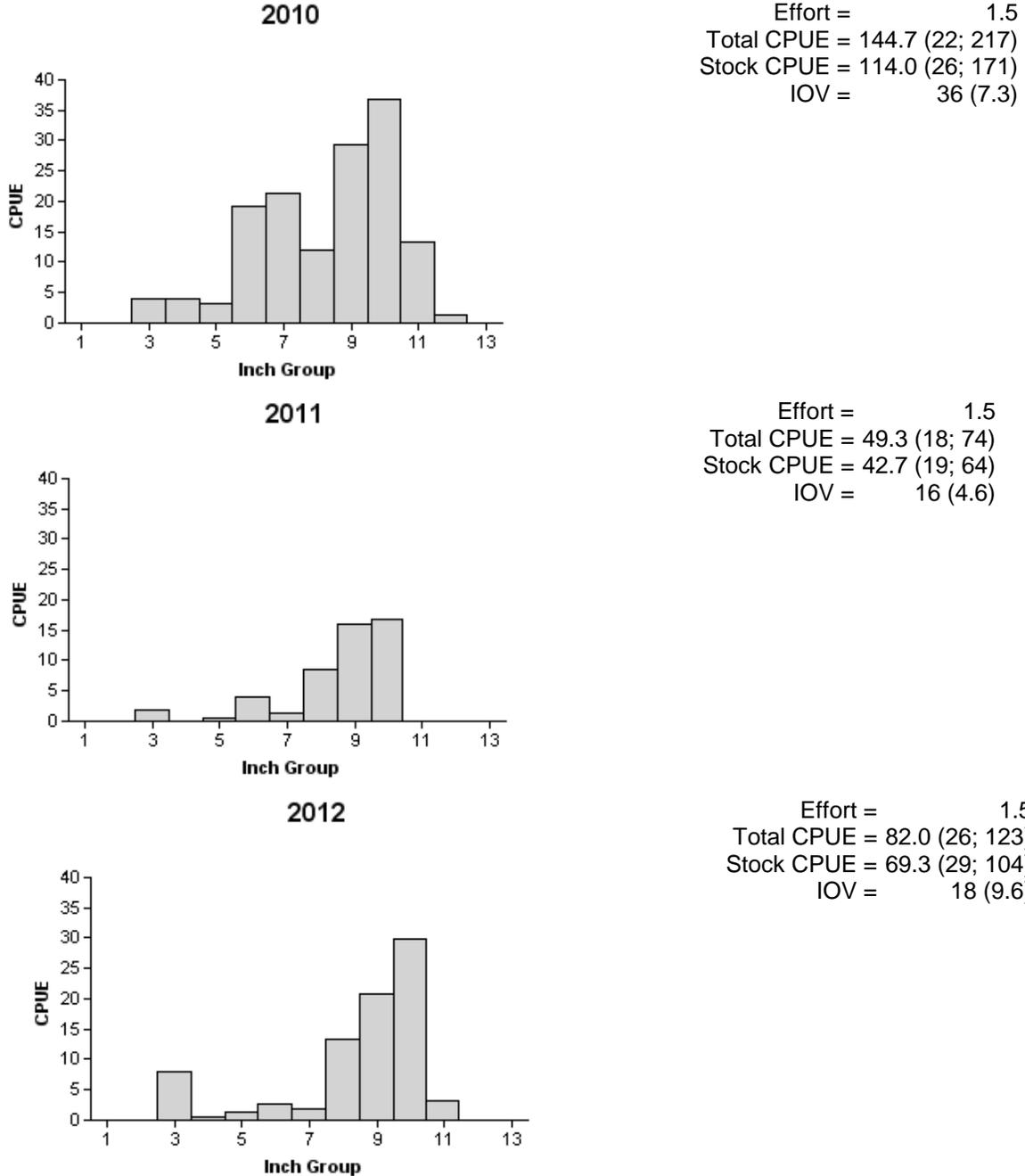
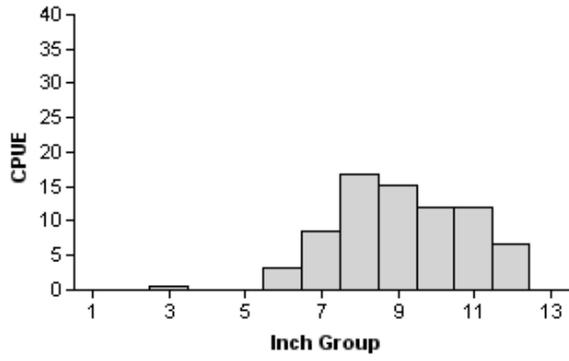


Figure 2. Number of Gizzard Shad caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Joe Pool Reservoir, Texas, 2010, 2011, 2012, and 2013.

Gizzard Shad

2013

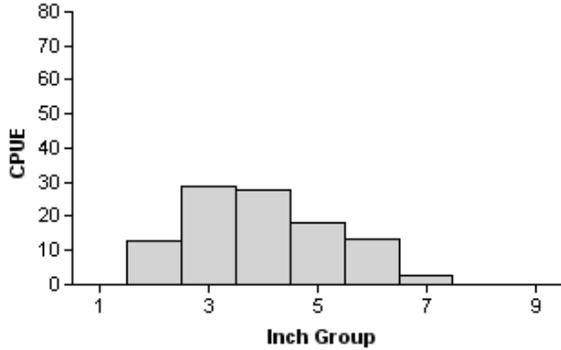


Effort = 1.5
Total CPUE = 75.3 (15; 113)
Stock CPUE = 71.3 (16; 107)
IOV = 17 (6)

Figure 2 continued.

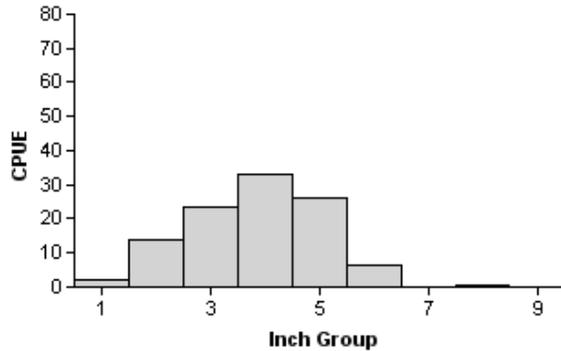
Bluegill

2010



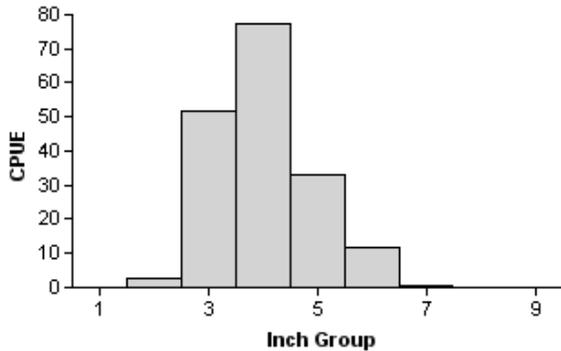
Effort = 1.5
 Total CPUE = 103.3 (21; 155)
 Stock CPUE = 90.7 (20; 136)
 CPUE-6 = 16.0 (29; 24)
 PSD = 18 (4.6)

2011



Effort = 1.5
 Total CPUE = 106.0 (25; 159)
 Stock CPUE = 90.0 (27; 135)
 CPUE-6 = 7.3 (53; 11)
 PSD = 8 (3.6)

2012



Effort = 1.5
 Total CPUE = 178.0 (29; 267)
 Stock CPUE = 175.3 (29; 263)
 CPUE-6 = 12.7 (33; 19)
 PSD = 7 (1.5)

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, Joe Pool Reservoir, Texas, 2010, 2011, 2012, and 2013.

Bluegill

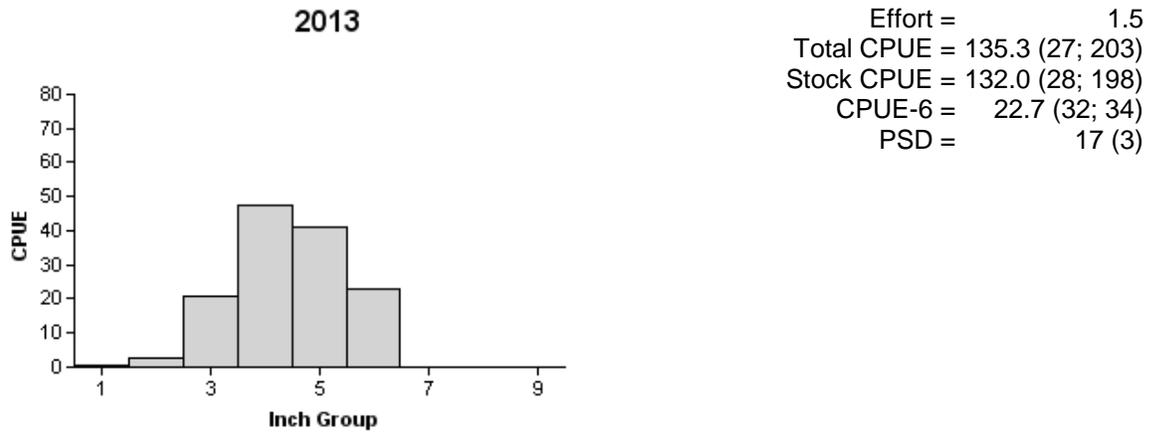
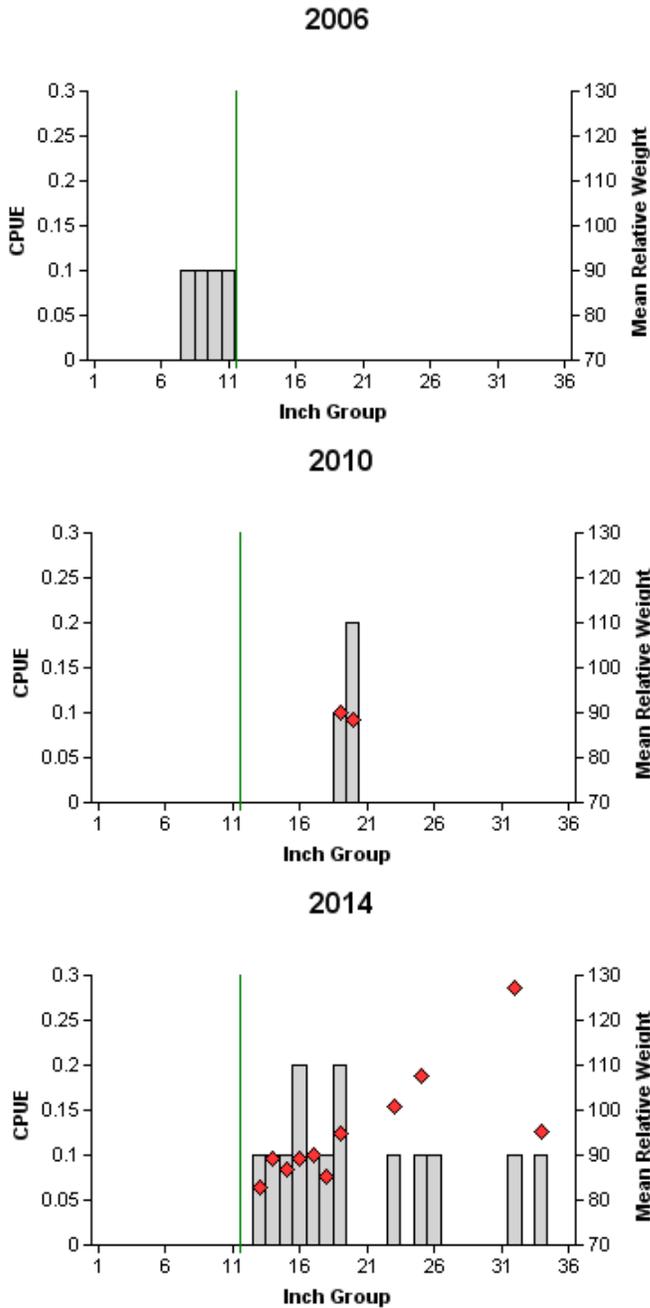


Figure 3 continued.

Blue Catfish



Effort = 10.0
 Total CPUE = 0.4 (76; 4)
 Stock CPUE = 0.0 (0; 0)

Effort = 10.0
 Total CPUE = 0.3 (71; 3)
 Stock CPUE = 0.3 (71; 3)

Effort = 10.0
 Total CPUE = 1.4 (40; 14)
 Stock CPUE = 1.4 (40; 14)

Figure 4. Number of Blue Catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Joe Pool Reservoir, Texas, 2006, 2010, 2014. Vertical line represents length limit at time of sampling.

Channel Catfish

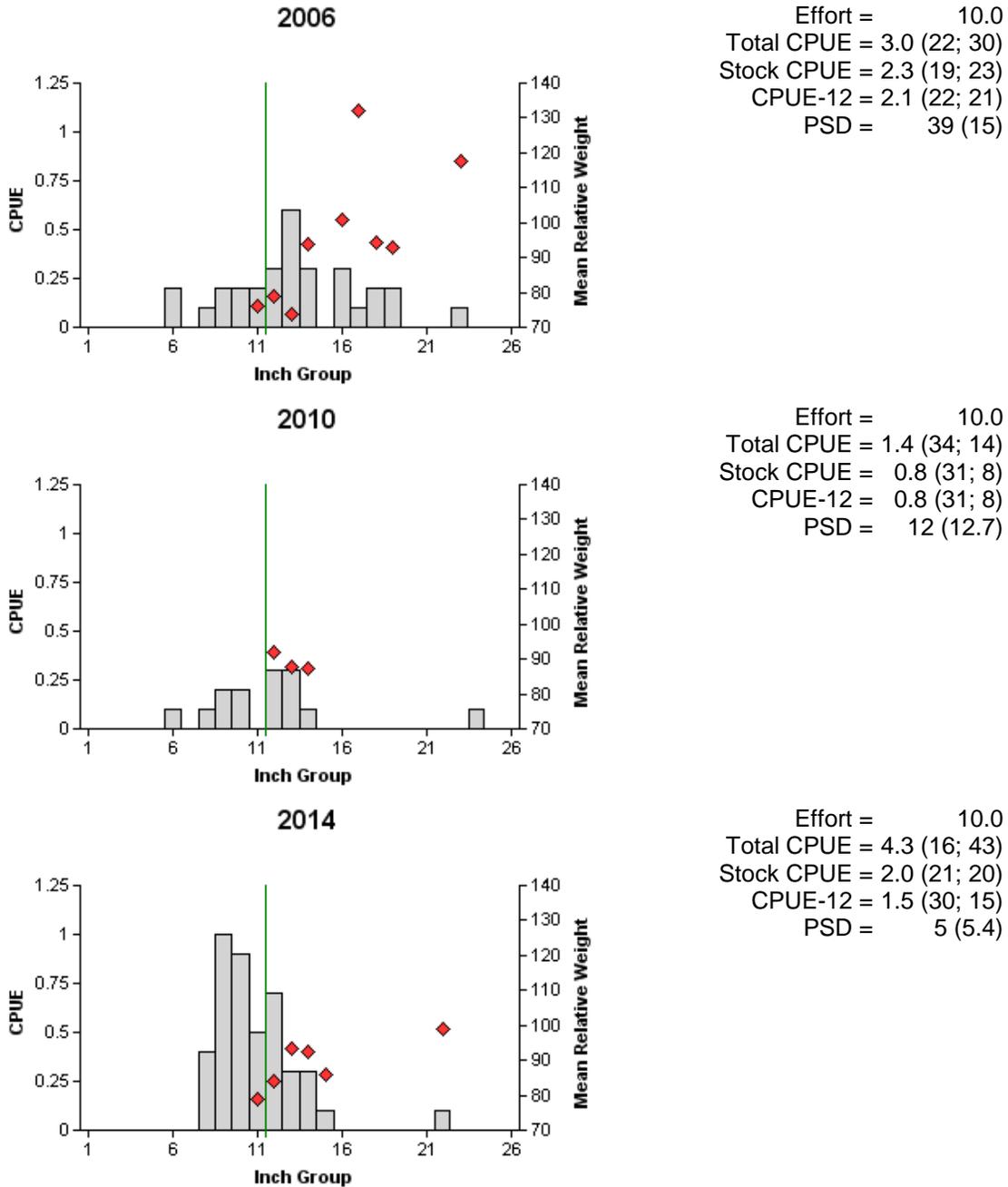


Figure 5. Number of Channel Catfish caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Joe Pool Reservoir, Texas, 2006, 2010, and 2014. Vertical line represents length limit at time of sampling.

Table 8. Creel survey statistics for Catfish at Joe Pool Reservoir from June 2013 through May 2014, where effort statistics are for anglers targeting Catfish and harvest statistics and percent legal released is the estimated number of Channel Catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year
	June 2013-May 2014
Percent directed effort	11.7
Directed effort (h)	12,256 (55.5)
Directed effort/acre	1.89
Total catch per hour	0.28 (126.7)
Total harvest	1058 (73.6)
Harvest/acre	0.16
Percent legal released	21

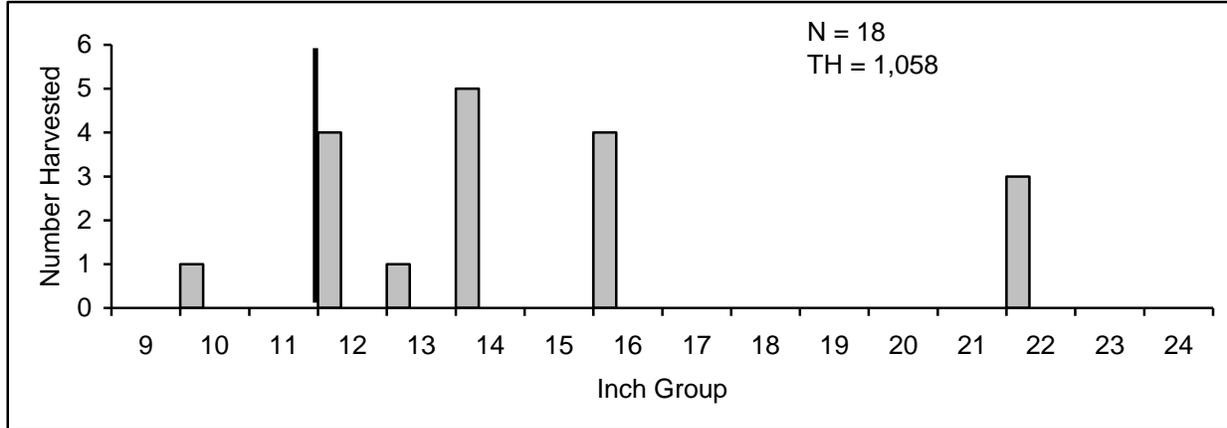


Figure 6. Length frequency of harvested Channel Catfish observed during creel surveys at Joe Pool Reservoir from June 2013 through May 2014 all anglers combined. N is the number of harvested Channel Catfish observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents minimum length limit.

White Bass

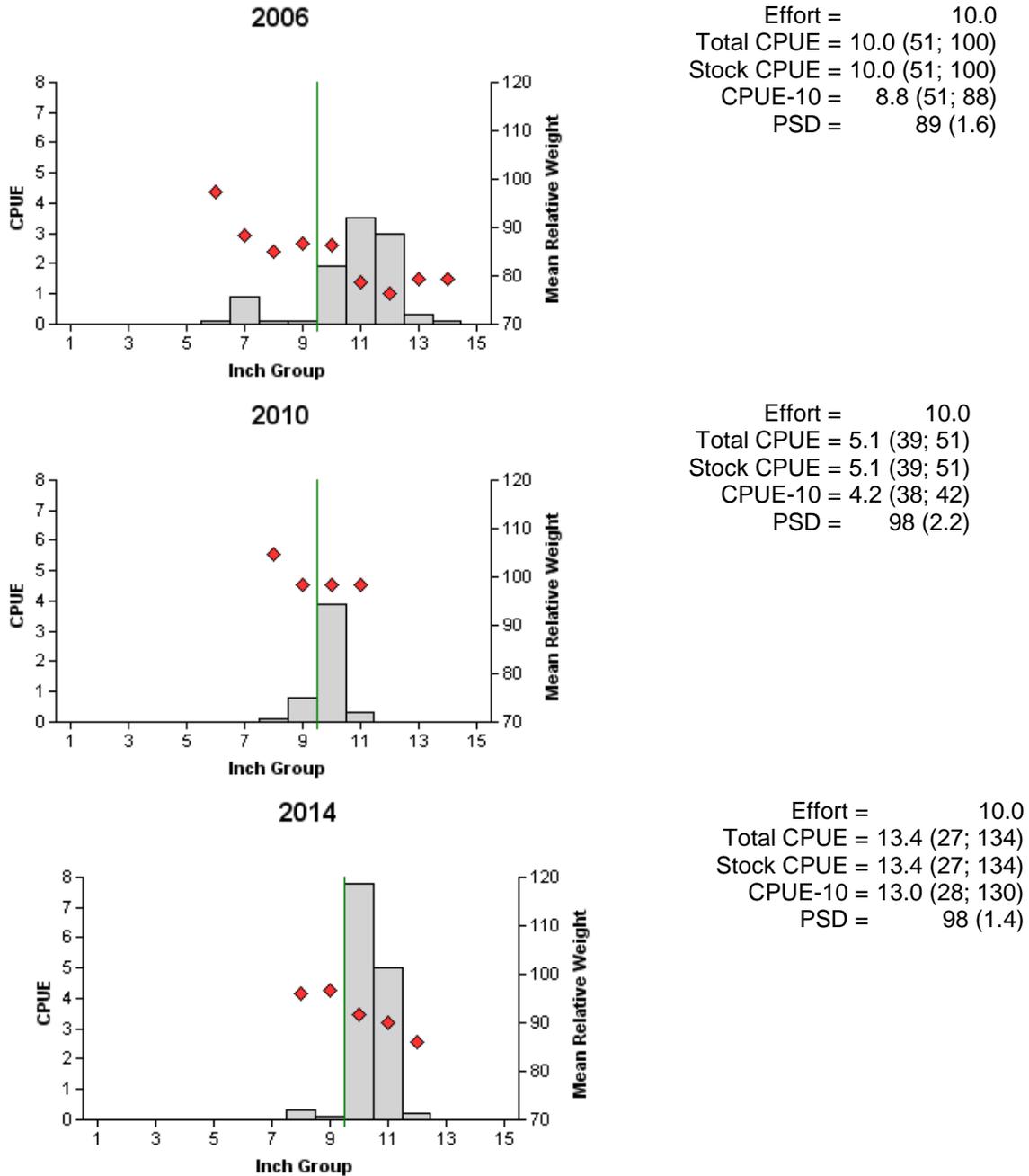


Figure 7. Number of White Bass caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Joe Pool Reservoir, Texas, 2006, 2010, and 2014. Vertical line represents length limit at time of sampling.

Table 9. Creel survey statistics for White Bass at Joe Pool Reservoir from June 2013 through May 2014, where 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
	June 2013-May 2014
Percent directed effort	1.9
Directed effort (h)	1,962.6 (16.1)
Directed effort/acre	0.3
Total catch per hour	0.9 (42.4)
Total harvest	2000 (69.5)
Harvest/acre	0.3
Percent legal released	44

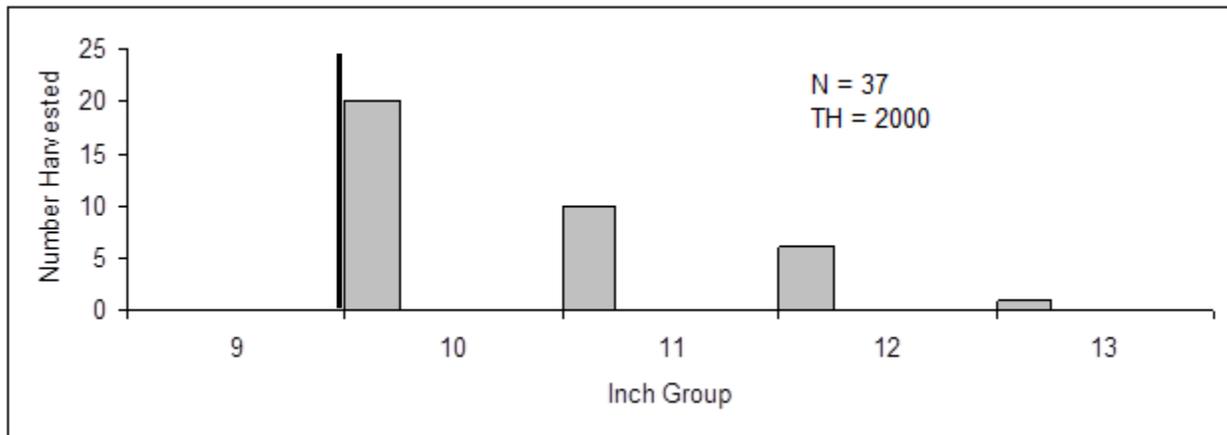


Figure 8. Length frequency of harvested White Bass observed during creel surveys at Joe Pool Reservoir from June 2013 through May 2014, all anglers combined. N is the number of harvested White Bass observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents minimum length limit.

Largemouth Bass

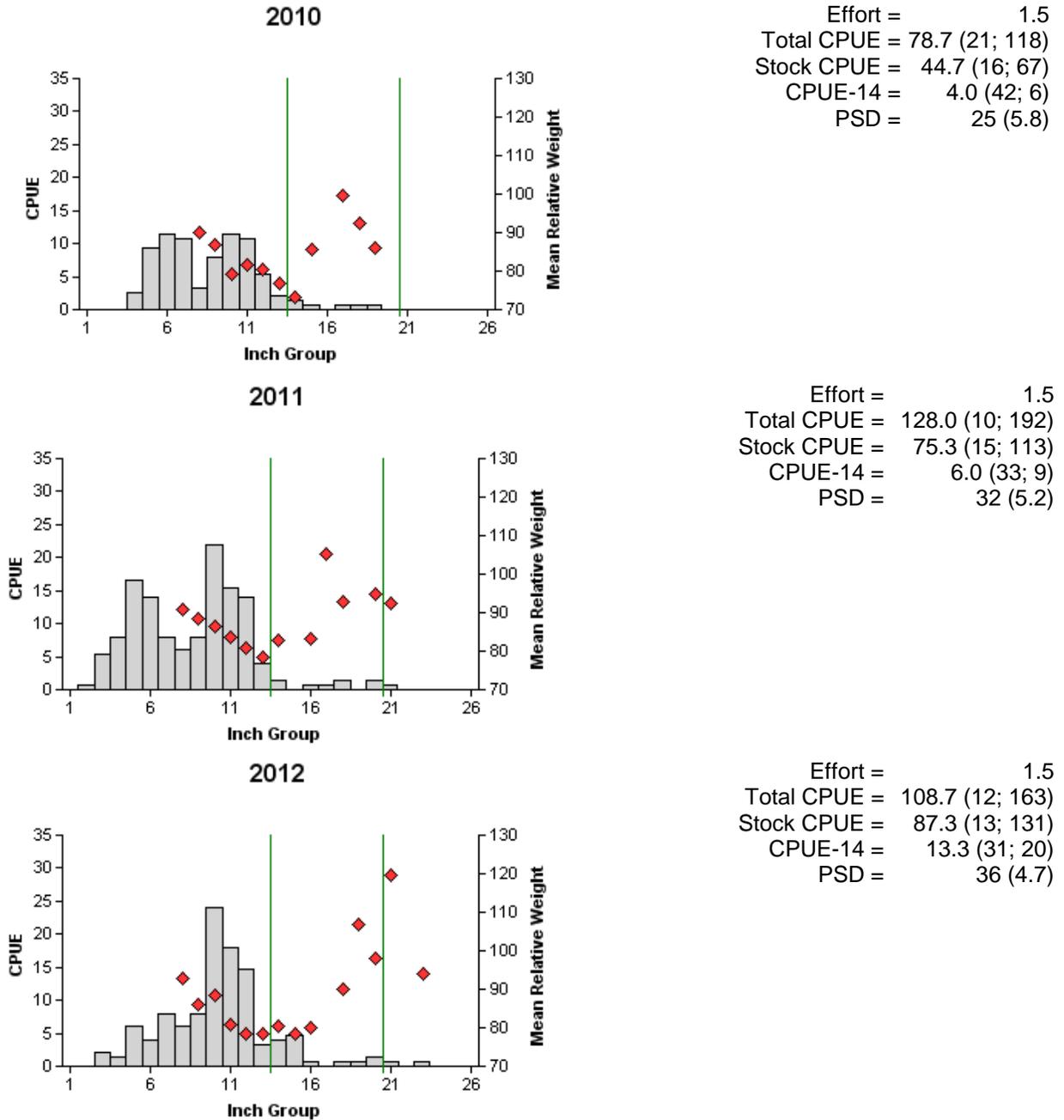
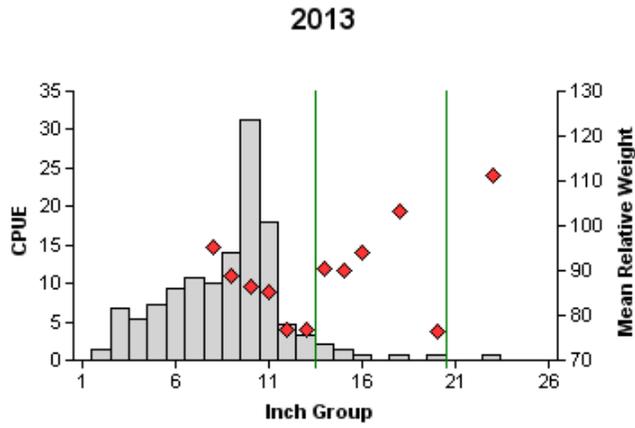


Figure 9. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Joe Pool Reservoir, Texas, 2010, 2011, 2012 and 2013. Vertical lines represent length limit at time of sampling.

Largemouth Bass



Effort = 1.5
 Total CPUE = 128.0 (13; 192)
 Stock CPUE = 87.3 (16; 131)
 CPUE-14 = 6.0 (44; 9)
 PSD = 16 (3)

Figure 9 continued.

Table 10. Creel survey statistics for Largemouth Bass at Joe Pool Reservoir from June 2013 through May 2014, where total catch per hour is for anglers targeting Largemouth Bass and total harvest is the estimated number of Largemouth Bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year
	June 2013-May 2014
Percent directed effort	47.3
Directed effort (h)	49,545 (16.2)
Directed effort/acre	7.7
Total catch per hour	0.71 (23.1)
Total harvest	4569 (41.9)
Harvest/acre	0.71
Percent legal released	83

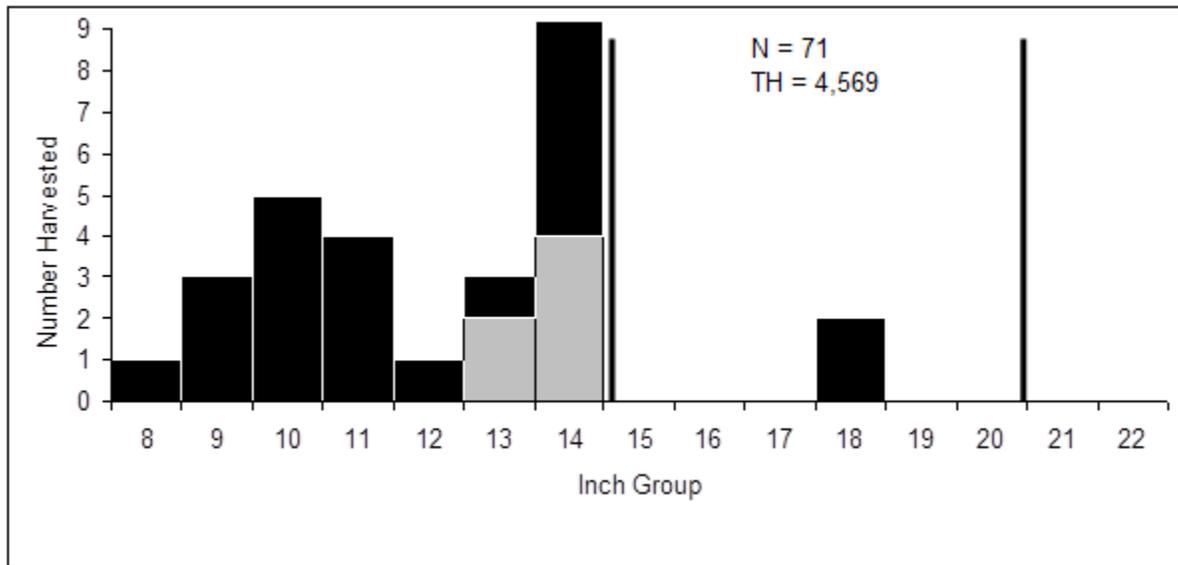
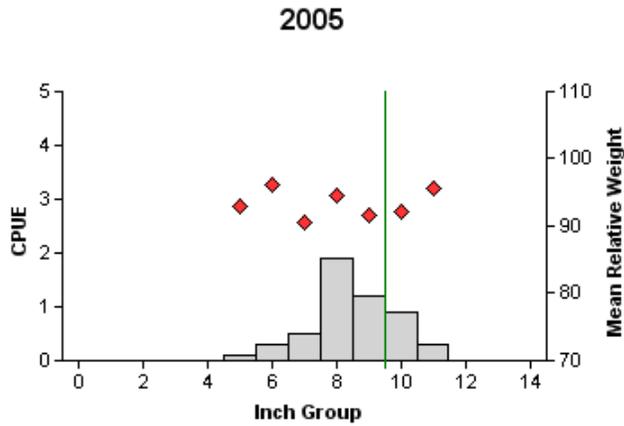


Figure 10. Length frequency of harvested Largemouth Bass observed during creel surveys Joe Pool Reservoir from June 2013 through May 2014, all anglers combined. N is the number of harvested Largemouth Bass observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents slot length limit at time of sampling. Tournament held Largemouth Bass are identified by the darker columns.

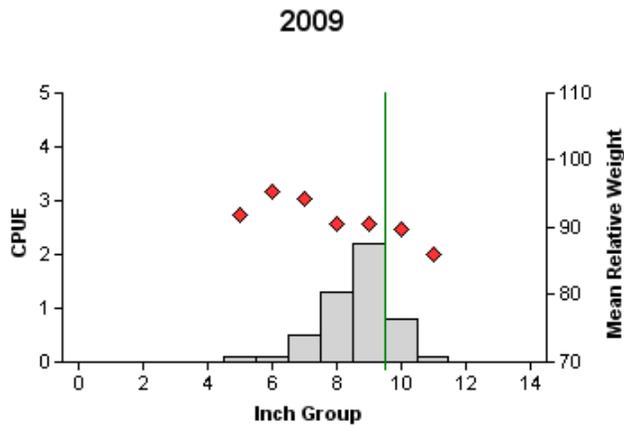
Table 11. Results of genetic analysis of Largemouth Bass collected by fall electrofishing, Joe Pool Reservoir, Texas, 2004, 2009, and 2013. FLMB = Florida Largemouth Bass, NLMB = Northern Largemouth Bass, Intergrade = hybrid between a FLMB and a NLMB. Genetic composition was determined by electrophoresis prior to 2005 and with micro-satellite DNA analysis since 2005.

Year	Sample size	Number of fish			% FLMB alleles	% FLMB
		FLMB	Intergrade	NLMB		
2004	30	0	16	14	25	0
2009	30	0	28	2	52	0
2013	30	1	29	0	57	3.3

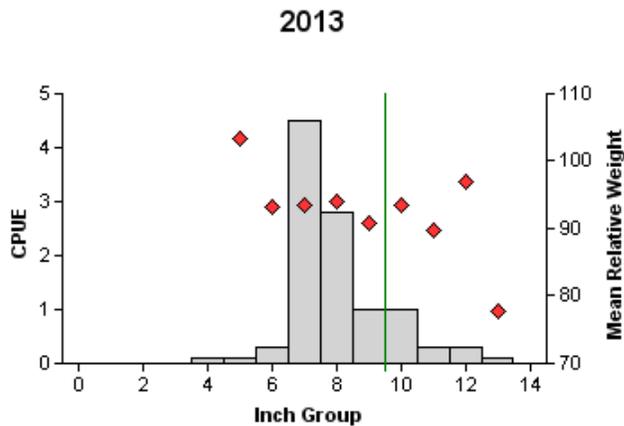
White Crappie



Effort = 10.0
 Total CPUE = 5.2 (34; 52)
 Stock CPUE = 5.2 (34; 52)
 PSD = 83 (5.9)



Effort = 10.0
 Total CPUE = 5.1 (24; 51)
 Stock CPUE = 5.1 (24; 51)
 PSD = 86 (7.3)



Effort = 10.0
 Total CPUE = 10.5 (28; 105)
 Stock CPUE = 10.4 (28; 104)
 PSD = 53 (7.7)

Figure 11. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Joe Pool Reservoir, Texas, 2005, 2009, and 2013. Vertical line represents minimum length limit at time of sampling.

Table 12. Creel survey statistics for Crappie at Joe Pool Reservoir from June 2013 through May 2014, where effort statistics is for anglers targeting Crappie and harvest statistics and percent legal released is the estimated number for White Crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year
	June 2013-May 2014
Percent directed effort	27.9
Directed effort (h)	29,234 (29.2)
Directed effort/acre	4.5
Total catch per hour	2.0 (27.6)
Total harvest	9,742 (54.3)
Harvest/acre	1.5
Percent legal released	0

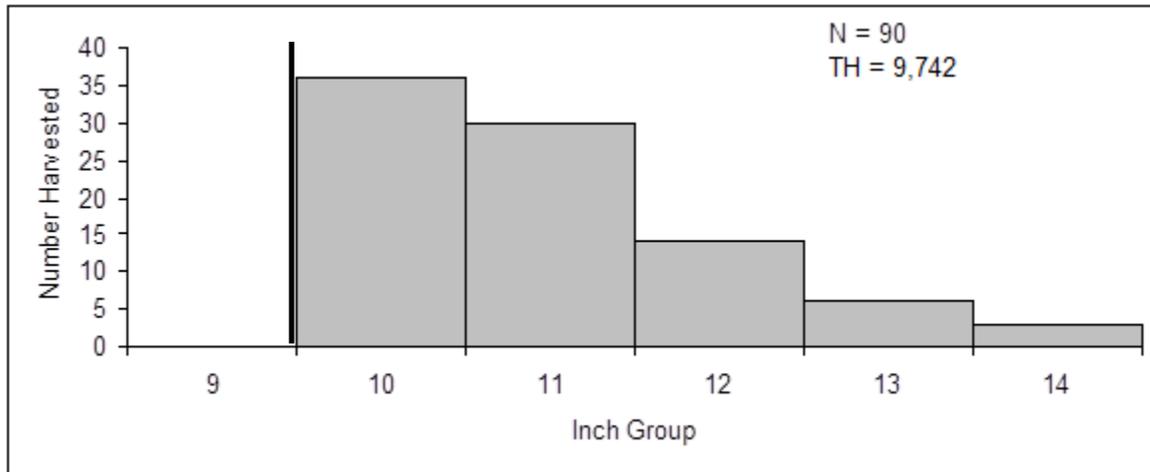


Figure 12. Length frequency of harvested White Crappie observed during creel surveys at Joe Pool Reservoir from June 2013 through May 2014, all anglers combined. N is the number of harvested White Crappie observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents minimum length limit.

Table 13. Proposed sampling schedule for Joe Pool 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.

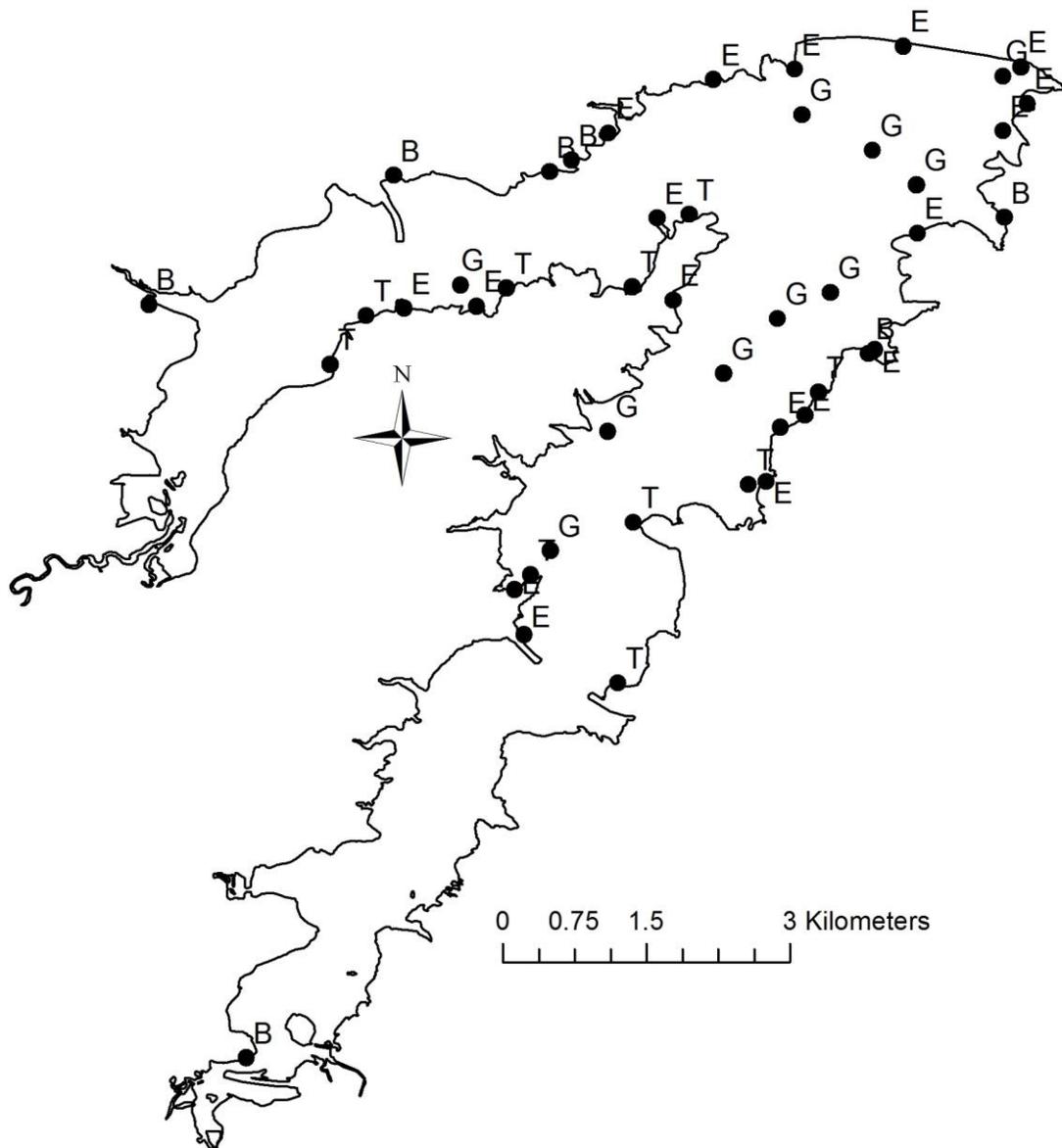
Survey year	Electrofishing Fall(Spring)	Trap net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2014-2015					A			
2015-2016	A				A			
2016-2017					A			
2017-2018	S	S	S		S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Joe Pool Reservoir, Texas, 2013-2014. Sampling effort was 10 net nights for gill netting and for trap netting, and 1.5 hours for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					113	75.3
Threadfin Shad					71	47.3
Common Carp	18	1.8				
Smallmouth Buffalo	29	2.9				
Blue Catfish	14	1.4				
Channel Catfish	43	4.3				
White Bass	134	13.4				
Yellow Bass	7	0.7				
Bluegill					203	135.3
Longear sunfish					14	9.3
Largemouth Bass	2	0.2			192	128
White Crappie	26	2.6	105	10.5		
Freshwater Drum	21	2.1				

APPENDIX B



Location of sampling sites, Joe Pool Reservoir, Texas, 2013-2014. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Boat ramps are indicated with a B. Water level was near full pool at time of sampling.

APPENDIX C

Historical catch rates of targeted species by gear type for Joe Pool Reservoir, Texas.

Gear	Species	Year													
		1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	2000	2001	2002
Gill Netting (fish/net night)	Blue Catfish		0.0		0.0				0.0			0.0			0.0
	Channel Catfish		3.0		1.0				2.1			3.1			2.5
	White Bass		0.0		0.0				2.1			0.8			0.9
	Yellow Bass		0.0		0.0				0.0			0.0			0.0
Electrofishing (fish/hour)	Gizzard Shad		110.0		187.0		153.0	71.0	120.0	112.0		110.7	132.7	90	152
	Threadfin Shad		36.0		12.0		13.0	0.0	22.0	26.0		11.3	84	45.3	149.3
	Bluegill		115.0		208.0		151.0		64.0	106.0		73.0	34.7	106.0	65.3
	Longear sunfish		50.0		101.0				36.0	44.0		45.0	26.0	61.0	28.7
	Largemouth Bass	92.0	120.7	144.0	151.3	144.4	143.5	106.5	113.3	119.0	133.3	91.3	104.0	90.0	78.0
Trap Netting (fish/net night)	White Crappie		15.0		7.0	7.3	4.9		1.5			2.3		18.5	17.9

APPENDIX C continued.

Gear	Species	Year											
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Gill Netting (fish/net night)	Blue Catfish				0.4				0.3				1.4
	Channel Catfish				3.0				1.4				4.3
	White Bass				10.0				5.1				13.4
	Yellow Bass				0.0				0.0				0.7
Electrofishing (fish/hour)	Gizzard Shad	76.0	58.7	106	77.3	93.3	122.7	54.7	144.7	49.3	82.0	75.3	
	Threadfin Shad	56.0	21.3	77.3	274.7	126	276.0	201.3	312	70.7	44.7	47.3	
	Bluegill	94.0	346.7	228	235.3	385.3	78.0	98.0	103.3	106.0	178.0	135.3	
	Longear Sunfish	32.7	33.3	14.0	4.7	54.0	6.0	34.7	38.7	46.0	8.67	9.3	
	Largemouth Bass	55.3	82.7	141.3	88.0	121.3	101.8	81.3	78.7	128.0	108.7	128.0	
Trap Netting (fish/net night)	White Crappie			5.2				5.1				10.5	

APPENDIX D

Angler opinion questions and results of anglers fishing for Largemouth Bass on Joe Pool Reservoir from June 2013 – May 2014.

____1. How often do you bass fish on Joe Pool?

- a) a couple of times a year.
- b) a couple of times a month.
- c) every week.

____2. Based on your fishing experiences at Joe Pool Lake, the Largemouth Bass slot length limit in your opinion has:

- a) helped the fishery.
- b) hurt the fishery.
- c) made no difference in the fishery.
- d) not applicable (does not know enough about it to make a choice).

____3. Which of the following regulations on Largemouth Bass would you support for Joe Pool?

- a) maintain the current 14-21" slot length limit.
- b) change to statewide 14" inch minimum length limit.
- c) change to 14-18" slot length limit.

Number and Percent of Total Responses from Anglers to Slot Length Limit Opinion Survey (N=76, Question 1 was added after several creels had been conducted resulting in N=69 for question 1).

Question		# of Responses	% of Total Responses
1	a	17	24
	b	28	41
	c	24	35
2	a	53	70
	b	2	3
	c	11	14
	d	10	13
3	a	56	74
	b	11	14
	c	9	12