

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-221-M-6

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2015 Fisheries Management Survey Report

Winters-Elm Creek Reservoir

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July 31, 2016

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Winters-Elm Creek Reservoir were surveyed in 2015 using electrofishing and trap netting and in 2016 using gill netting. Historical data are presented with the 2015-2016 data for comparison. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Winters-Elm Creek Reservoir is a 337-acre impoundment located east of Winters, Texas in Runnels County. It is situated on Elm Creek, directly downstream of Old Winters Reservoir. Boat access is good at the city-maintained boat ramp, and bank access is good at the city park. No disabled-access facilities are available.
- **Management History:** Important sport fish include Largemouth Bass, Catfish and White Crappie. Only one previous management report has been prepared for this reservoir; however, periodic fish stockings have occurred since 1981. Statewide harvest regulations have been used to manage this fishery.
- **Fish Community**
 - **Prey species:** Electrofishing catch of Gizzard Shad was very good with most available to sport fish as prey. Abundance of Bluegills was low and very few Bluegills were over 5-inches long.
 - **Catfishes:** Blue Catfish catch rates have increased over the past 3 surveys. Channel Catfish abundance was low and few fish were available to anglers. Flathead Catfish were present in the reservoir.
 - **Temperate basses:** White Bass were not collected in 2016. Historically, White Bass have been present at very low abundance.
 - **Largemouth Bass:** Largemouth Bass abundance was moderate, size structure was low, but were in adequate condition.
 - **White Crappie:** A strong year class was produced in 2015, but few fish were of legal size.

Management Strategies: Continue to manage the fishery with statewide regulations. Conduct additional electrofishing and gill netting surveys in 2017, and general monitoring surveys with gill nets and electrofishing surveys in 2019-2020. Conduct additional trap netting in 2017 and 2019. Conduct a spring quarter creel survey in 2017. Habitat and vegetation surveys will be conducted in 2019.

INTRODUCTION

This document is a summary of fisheries data collected from Winters-Elm Creek Reservoir in 2015-2016. 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 fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2015-2016 data for comparison.

Reservoir Description

Winters-Elm Creek Reservoir is a 337-acre impoundment completed in 1983 on Elm Creek. The reservoir is located in Runnels County, east of Winters, Texas and is operated and controlled by the City of Winters. Primary reservoir water uses include municipal water supply and recreation. Old Winters Reservoir, constructed in 1945, is situated directly upstream and feeds water to Winters-Elm Creek through a spillway. Conservation pool is 1,790 feet above MSL and water level was approximately 8ft low at time of sampling. Emergent vegetation (bulrush), dead trees, and rocky shoreline have been observed as dominant habitat features in the reservoir. Other descriptive characteristics for Winters-Elm Creek Reservoir are in Table 1.

Angler Access

Winters-Elm Creek Reservoir has one public boat ramp and no private boat ramps. Boat access was good at a city-maintained boat ramp. Bank fishing access was good at the city-maintained park, but no docks or piers for disabled access were available. Ramp characteristics are in table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Scott and Farooqi 2012) included:

1. Sample the potentially expanding Blue Catfish population.
Action: Blue Catfish were sampled with low-frequency electrofishing in 2013 and gill nets in 2016.
2. Collect otoliths from all White Crappie in 2013 to get a better perspective on growth and monitor body condition.
Action: Age and growth data were collected during trap netting in 2013 and body condition data was collected.
3. Conduct a vegetation survey in 2012, investigate the feasibility of transplanting native aquatic plants into Winters-Elm Creek to enhance fish habitat.
Action: A presence/absence vegetation survey was conducted in 2015. To date no vegetation enhancement projects have been initiated.
4. Work with controlling authorities to post signage, educate the public about invasive species issues through the media and presentations.
Action: Continued to work with controlling authorities to post signage and to educate the public on invasive species threats through media outlets.

Harvest regulation history: Sport fishes in Winters-Elm Creek Reservoir are currently managed with statewide regulations (Table 3).

Stocking history: Species stocked have included Bluegill, Channel Catfish, Blue Catfish, Florida Largemouth Bass, Smallmouth Bass, and Walleye. Smallmouth Bass and Walleye populations never established in the reservoir. The complete stocking history is in Table 4.

Vegetation/habitat management history: Winters-Elm Creek Reservoir has no significant vegetation/habitat management history.

Water transfer: Winters-Elm Creek Reservoir is primarily used for municipal water supply and recreation. A spillway on the south end of the Old Winters Reservoir deposits water directly into Winters-Elm Creek Reservoir. No interbasin water transfer occurs on these reservoirs.

METHODS

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

Electrofishing – Largemouth Bass, Sunfishes, and Gizzard Shad were collected by electrofishing (1.17 hour at 14, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Ages for Largemouth Bass were determined using otoliths from 13 randomly-selected fish (range 13.0 to 14.9 inches).

Trap netting – Crappie were collected using trap nets (14 net nights at 14 stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn).

Gill netting – Channel Catfish and Blue catfish were collected by gill netting (6 net nights at 6 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

Low-frequency electrofishing – Flathead Catfish were collected by low-frequency electrofishing at 10 stations. The minimum duration of electrofishing at each station was 3 minutes. CPUE for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Jug-lines – Blue Catfish were collected with 20 jug-lines fished with 2 hooks per float and fished for 2 nights. Hooks were baited with cut carp and were re-baited following the first night.

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

Habitat – A presence/absence only vegetation survey was conducted in 2015.

RESULTS AND DISCUSSION

Habitat: Two months prior to the vegetation survey, the reservoir received a 13-foot rise in water level, submerging all aquatic vegetation. No aquatic vegetation was observed and habitat consisted of submerged flooded terrestrial.

Prey species: Electrofishing catch rates of Gizzard Shad were 421.7/h, which was lower than 2011 (792.0/h) and 2003 (694.3/h), but still adequate. Index of vulnerability (IOV) for Gizzard Shad was excellent, indicating that 96% of Gizzard Shad were available to existing predators; this was similar to IOV estimates in previous years (Figure 1). Total CPUE of Bluegill in 2015 was 41.1/h which was similar to the previous survey in 2011 (34.0/h). Size structure continued to be dominated by small individuals with few Bluegill over 5 inches (Figure 2).

Blue Catfish: The gill net catch rate of Blue Catfish was 10.3/nn which was an increase since the 2012 (6.4/nn) and 2008 (4.6/nn) surveys (Figure 3). Size structure was low with a PSD of 20 which was similar to previous surveys. Condition was excellent with relative weights (W_r) over 100 for most adult-sized inch groups. The Blue Catfish population appears to be thriving with three consecutive surveys revealing increasing abundance, and excellent condition. Blue Catfish CPUE from Low-frequency electrofishing

was 14.5/hr and fish from 4 to 18 inches were collected. Jug-lines fished during February in 2016 caught 3 Blue Catfish that ranged in size from 20 to 36 inches, the largest of which weighed 24lbs.

Channel Catfish: The gill net catch rate of Channel Catfish was 4.5/nn in 2016, which was higher than 2012 (1.8/nn) and 2008 (0.6/nn). The Channel Catfish population continued to have low relative abundance of harvestable size fish with the largest observed Channel Catfish at only 14 inches. Condition of stock-size Channel Catfish was excellent with W_r values over 100 for fish 9 to 14 inches.

Largemouth Bass: Electrofishing catch rates in 2015 were similar to 2011 and 2003 (range 46.3/h to 55.7/h) suggesting the presence of a stable and moderately dense population of Largemouth Bass (Figure 6). Size structure was lower in 2015 (PSD = 19) with very few fish over the minimum length limit. PSD has ranged from 19 to 71 over the past 3 surveys and may be due to inconsistent recruitment and fluctuating water levels. Body condition was excellent, with W_r values over 100 for most adult-sized inch-groups, indicative of a population with reduced competition for prey resources. Growth was fast with mean age at 14 inches (13.0 to 14.9) was 1.1 years (N = 18, range 1-3 years). Large fish up to 23 inches in length have been observed in the last two surveys.

White Crappie: The abundance of stock-size White Crappie declined from 41.0/nn in 2011 to 2.0/nn in 2015 (Figure 7). A strong year class was produced in 2011, which produced good numbers of stock-size fish in 2013, but moderate growth and possibly high mortality rates limited the number of fish above the minimum length limit. Another strong year-class was produced in 2015 and could provide quality angling opportunities if growth does not become a limiting factor. Condition was above average with relative weights over 90 for most stock-size inch groups. Growth was moderate in 2013 with average age at 10 inches (9.1 to 10.8 inches) was 2.2 years (N = 19; range 1 – 3 years). Growth could not be accurately evaluated in 2015 due to low sample size, but all 5 fish from 9.1 to 10.2 inches were 1 year old. Age and growth data from 2013 indicate growth leveling off around the minimum length limit (Appendix C). Moderate growth and/or high mortality may be limiting the number of crappie reaching the minimum length limit.

Fisheries management plan for Winters-Elm Creek Reservoir, Texas

Prepared – July 2016.

ISSUE 1: The Blue Catfish population continues to expand in the reservoir. Fish up to 36 inches have been collected and the potential exists for this population to develop into a quality fishery. The population should be monitored to maintain trend data on abundance and size structure. Angling opportunities for Blue Catfish in Winters-Elm Creek Reservoir should be shared with the public.

MANAGEMENT STRATEGY

1. Conduct standard monitoring of Blue Catfish with gill nets in spring 2018 and 2020.
2. Promote the development of the quality Blue Catfish population with local media outlets.

ISSUE 2: White Crappie are abundant in the reservoir; however, most fish in trap net samples have been shorter than the legal length limit (10-inches). Lack of crappie above the legal length limit could be due to sub-optimal growth and/or high mortality of crappie above 10 inches due to angler harvest. Continued monitoring is necessary to detect potential issues related to the crappie fishery.

MANAGEMENT STRATEGIES

1. Conduct standard trap netting in 2017 and 2019 to monitor the population abundance, size structure, condition, and growth.

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.

Objective-Based Sampling Plan and Schedule

FY 2017 – FY 2020

Sport fish, forage fish, and other important fishes

Important sport fish in Winters-Elm Creek Reservoir include Blue Catfish, Largemouth Bass, and White Crappie. Important prey species include Gizzard Shad and Bluegill.

Low-density fisheries

Channel Catfish: Channel Catfish are present in Winters-Elm Creek Reservoir, but population abundance is low. Gill net CPUE of stock-size fish have been ≤ 2.0 fish/nn over the past 3 surveys. No Channel Catfish over 15 inches have been collected over the past 3 surveys. Sampling Channel Catfish is not necessary in FY 2017-2020, however presence/absence data may be collected during Blue Catfish gill net sampling.

Flathead Catfish: Flathead Catfish are present in Winters-Elm Creek Reservoir, but population abundance is low. Gill net CPUE of stock-size fish have been ≤ 1.0 fish/nn over the past 4 surveys. Sampling Flathead Catfish is not necessary in FY 2017-2020, however presence/absence data may be collected during Blue Catfish gill net sampling.

White Bass: White Bass have been present in Winters-Elm Creek Reservoir, but population abundance is low. The latest gill net survey caught no White Bass and since no major creek arms are present on the reservoir, reproduction is likely limited. Sampling White Bass is not necessary in FY 2017-2020, however presence/absence data may be collected during Blue Catfish gill net sampling.

Survey objectives, fisheries metrics, and sampling objectives

Blue Catfish: Gill net catch rates have increased over the past 3 surveys and the number of fish above the minimum length limit has increased. Blue Catfish up to 36 inches have been collected and the potential exists for quality fishery. Our survey objective is to monitor abundance, size structure, and condition. Based on survey data from 2016, 100 stock-size fish could be collected with a CPUE-stock RSE ≤ 25 with 80% confidence with 14 net nights. Based on data from 2004-2012, it would require approximately 30 net nights to meet these objectives, but since the population is expanding we should expect to catch at least, if not more, Blue Catfish than were caught in 2016. A minimum of 10 randomly selected stations will be sampled in 2018 and 2020 (Table 6). Exclusive of the original 10 random stations, 5 additional random stations will be pre-determined in the event some extra sampling is necessary. A maximum of 15 gill net stations will be sampled.

Largemouth Bass: Largemouth Bass stock abundance has been moderate and fairly consistent, ranging from 30.9 to 45.0/h over the past 3 surveys. Size structure has been variable, with PSD ranging from 19 to 71 over the past 3 surveys, possibly owing to inconsistent recruitment and fluctuating water levels. However, large fish up to 23 inches have been observed in recent surveys and have the potential to provide a quality fishery. Our objectives are to monitor abundance, size structure, condition, and growth with biennial trend data. A minimum of 12 randomly selected 5-min electrofishing sites will be sampled in 2017 and 2019 (Table 6), but sampling will continue at random sites until 50 stock-size fish are collected and the CPUE-Stock RSE ≤ 25 (the anticipated effort to meet both sampling objectives is 12-24 stations

with 80% confidence). Twelve random stations will be determined. Exclusive of the original 12 random stations, 12 additional random stations will be pre-determined in the event some extra sampling is necessary. A maximum of 24 stations will be sampled. An access-point angler creel survey will be conducted from March 2017 through May 2017 to estimate Largemouth Bass directed angling effort, catch rates, number of fish harvested, and the distribution of released fish by weight category (i.e., <4 lb, 4-7 lb, 7-10,lb, and >10 lb).

White Crappie: White Crappie are very abundant in Winters-Elm Creek Reservoir with catch rates ranging from 13.4 to 69.8/n over the past 3 surveys. Growth was moderate in 2013, mean age at 10 inches was 2.2 years. Further monitoring is warranted for this fishery. In 2017 and 2019, our objective is to monitor abundance, size structure, condition, and growth. Sampling data from 2003-2015 indicates a sample of 200 stock-size crappie could be collected with 10-22 net nights with 80% confidence. Ten stations should be adequate to achieve sample objectives to estimate size structure (minimum 50 stock-size fish), condition (10 fish/inch-group max), abundance (RSE of CPUE-Stock is < 25) and growth (13 fish between 9.0 and 10.9 inches). A minimum of 10 randomly selected trap net sites will be sampled, but sampling will continue at random sites until sampling objectives are met. Ten random stations will be determined. Exclusive of the original 10 random stations, 10 additional random stations will be pre-determined in the event extra sampling is necessary. A maximum of 20 stations will be sampled.

Bluegill and Gizzard Shad: Gizzard Shad are the primary forage at Winters-Elm Creek Reservoir while Bluegill are lower in abundance and provide a secondary forage source. Continuation of sampling, as per Largemouth Bass above, will allow for monitoring of large-scale changes in Bluegill and Gizzard Shad relative abundance and size structure. Sampling effort based on achieving sampling objectives for Largemouth Bass will result in sufficient numbers of Bluegill and Gizzard shad for size structure and abundance estimation (PSD and IOV; 50 fish minimum and RSE < 25 of CPUE-Total). No additional effort will be expended to achieve sampling objectives of Bluegill and Gizzard Shad. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density. Relative weight of Largemouth Bass > 8" TL will be determined from their length/weight data (maximum of 10 fish weighed and measured per inch class).

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- 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.
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Table 1. Characteristics of Winters-Elm Creek Reservoir, Texas.

Characteristic	Description
Year constructed	1983
Controlling authority	City of Winters
County	Runnels
Reservoir type	Tributary
Shoreline Development Index (SDI)	1.9
Conductivity	467 μ S/cm
Conservation pool elevation	1,790.0 Ft. above MSL

Table 2. Boat ramp characteristics for Winters-Elm Creek Reservoir, Texas, June, 2016. Reservoir elevation at time of survey was 1790 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Lakeside Marina	31.94061 -99.86391	Y	15	1780	Excellent, no access issues

Table 3. Harvest regulations for Winters-Elm Creek Reservoir, Texas.

Species	Bag limit	Length limit
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, Largemouth	5	14-inch minimum
Crappie: White and Black crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Winters-Elm Creek Reservoir, Texas. FGL = fingerling; AFGL = advanced fingerling; ADL = adults.

Species	Year	Number	Size
Threadfin Shad	1982	2,000	UNK
	1984	1,050	UNK
	1985	1,200	UNK
	Total	4,250	
Blue Catfish	1984	8,640	FGL
	1986	4,420	FGL
	Total	13,060	
Channel Catfish	2003	25,199	FGL
	2004	7,897	FGL
	Total	33,096	
Bluegill	2002	169,930	FGL
Smallmouth Bass	1984	8,992	FGL
Florida Largemouth Bass	2002	16,845	FGL
	2003	32,206	FGL
	Total	49,051	
Walleye	1988	140,000	FRY
Coppernose Bluegill	1981	700	UNK
	1984	45,000	UNK
	Total	45,700	

Table 5. Objective-based sampling plan components for Winters-Elm Creek Reservoir, Texas 2015 – 2016.

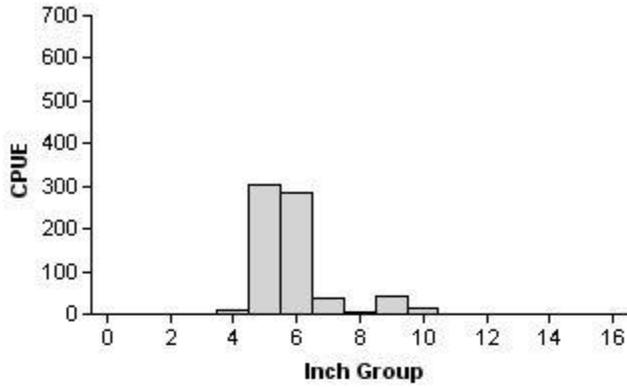
Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Abundance	CPUE – stock	RSE-Stock \leq 25
	Size structure	PSD, length frequency	N \geq 50 stock
	Age-and-growth	Age at 14 inches	N = 13, 13.0 – 14.9 inches
	Condition	W_r	10 fish/inch group (max)
Bluegill ^a	Abundance	CPUE – Total	RSE \leq 25
	Size structure	PSD, length frequency	N \geq 50
Gizzard Shad ^a	Abundance	CPUE – Total	RSE \leq 25
	Size structure	length frequency	N \geq 50
	Prey availability	IOV	N \geq 50
<i>Gill netting</i>			
Blue Catfish	Abundance	CPUE – Total	RSE-Stock \leq 25
	Condition	W_r	10 fish/inch group (max)
<i>Jug-lines</i>			
Blue Catfish	Abundance	Presence/Absence of trophy size fish (\geq 45 in)	20 jug-lines
<i>Trap netting</i>			
Crappie	Size structure	PSD, length frequency	N = 50
	Age-and-growth	Age at 10 inches	N = 13, 9.0 – 10.9 inches
	Abundance	CPUE – stock and total	RSE \leq 25
	Condition	W_r	10 fish/inch group (max)

^a No additional effort will be expended to achieve an RSE \leq 25 for CPUE-Total or to collect 50 stock size fish for size structure analysis of Bluegill and Gizzard Shad if not reached from designated Largemouth Bass sampling effort. Instead, Largemouth Bass body condition can provide information on forage abundance, vulnerability, or both relative to predator density.

Gizzard Shad

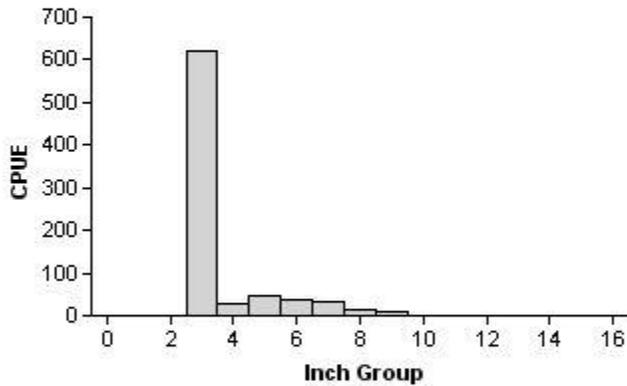
2003

Effort = 0.6
 Total CPUE = 694.3 (19; 405)
 IOV = 91 (4)



2011

Effort = 1.0
 Total CPUE = 792.0 (43; 792)
 IOV = 97 (1)



2015

Effort = 1.2
 Total CPUE = 421.7 (20; 492)
 IOV = 96 (2)

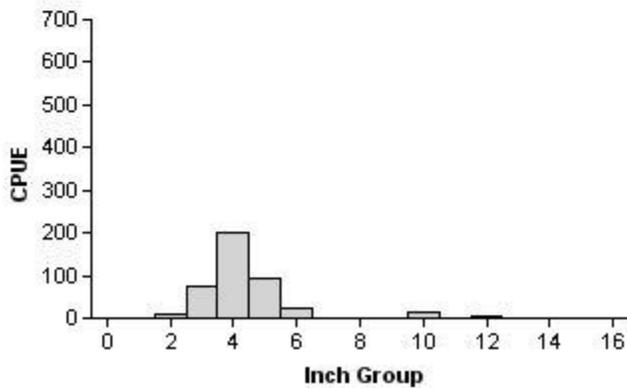


Figure 1. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Winters-Elm Creek Reservoir, Texas, 2003, 2011, and 2015.

Bluegill

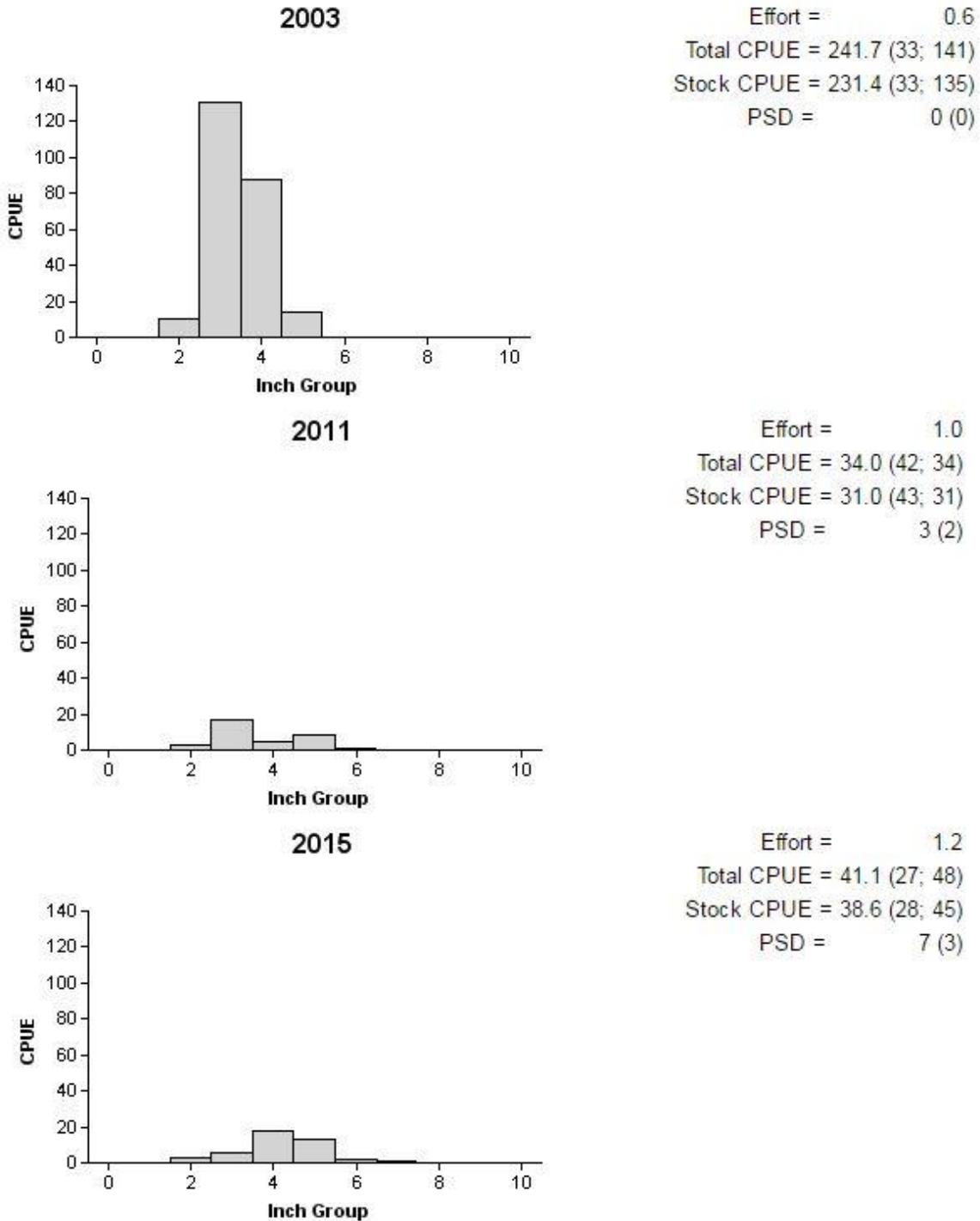


Figure 2. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Winters-Elm Creek Reservoir, Texas, 2003, 2011, and 2015.

Blue Catfish

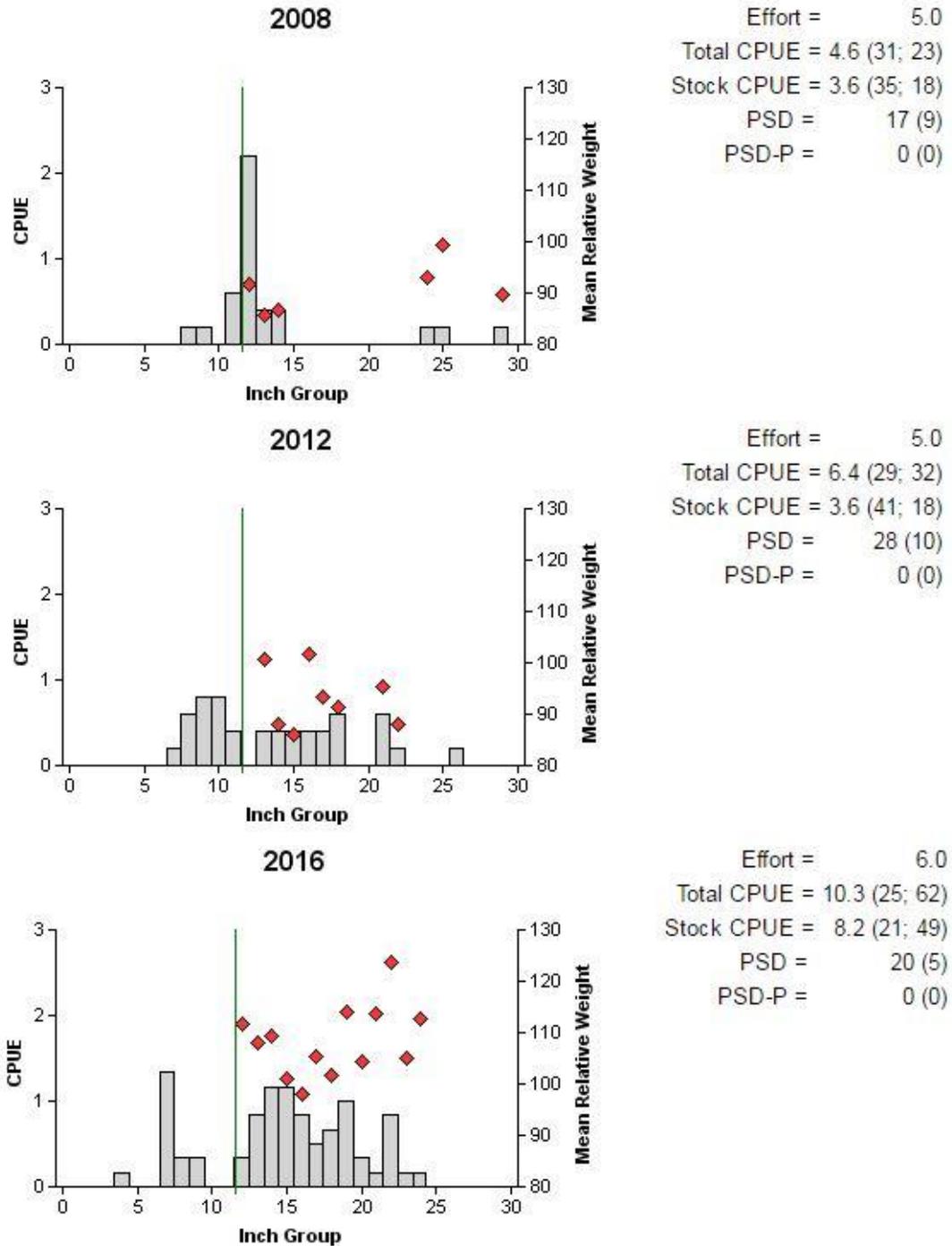


Figure 3. Number of Blue Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Winters-Elm Creek Reservoir, Texas, 2008, 2012, and 2016. Vertical line indicates minimum length limit.

Blue Catfish

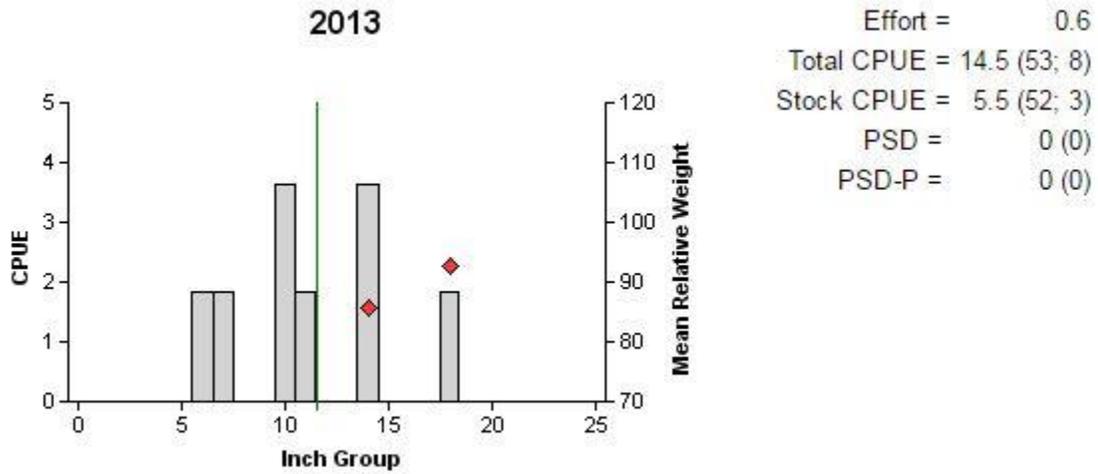


Figure 4. Number of Blue Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall low-frequency electrofishing survey, Winters-Elm Creek Reservoir, Texas, 2013. Vertical line indicates minimum length limit.

Channel Catfish

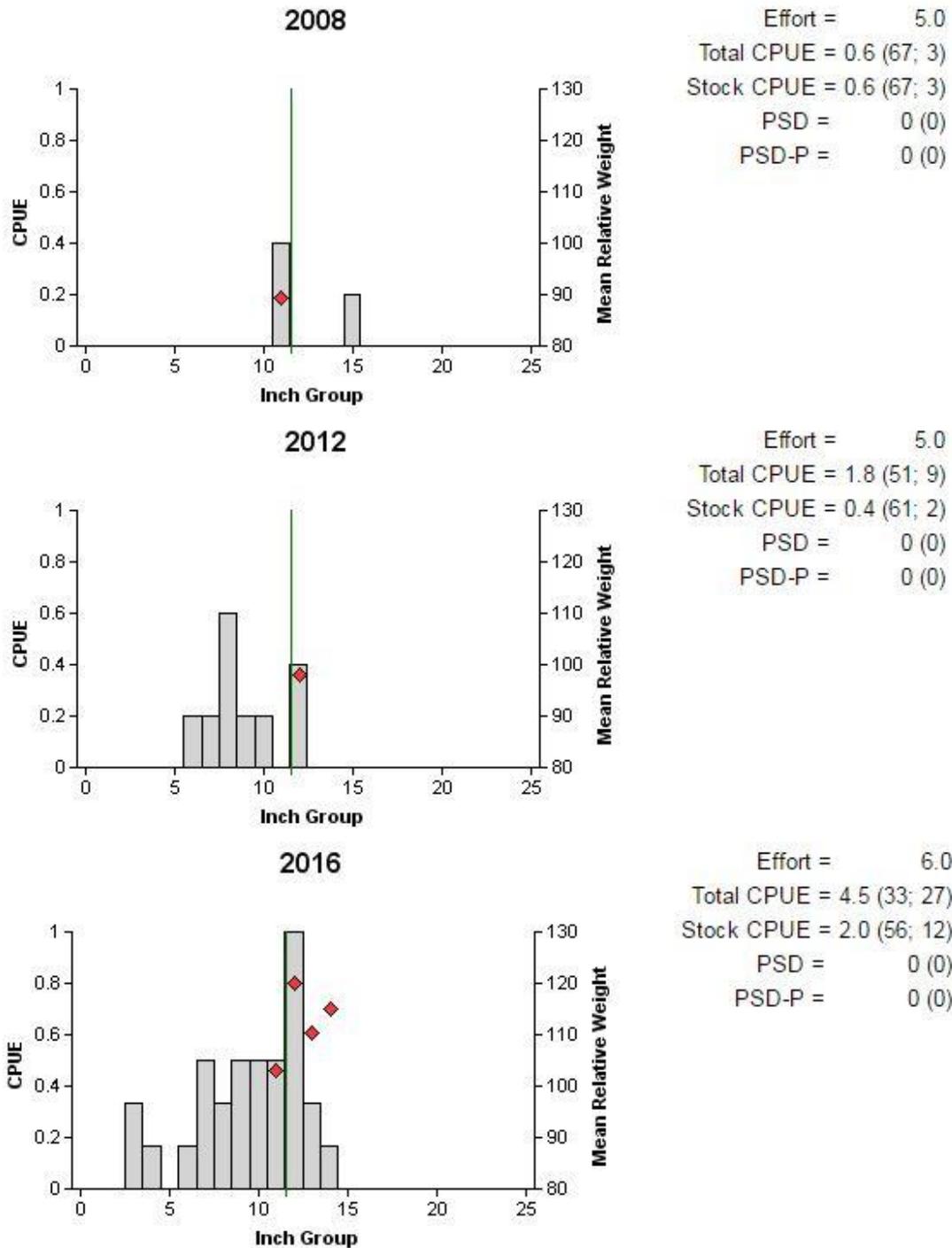


Figure 5. Number of Channel Catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Winters-Elm Creek Reservoir, Texas, 2008, 2012, and 2016. Vertical line indicates minimum length limit.

Largemouth Bass

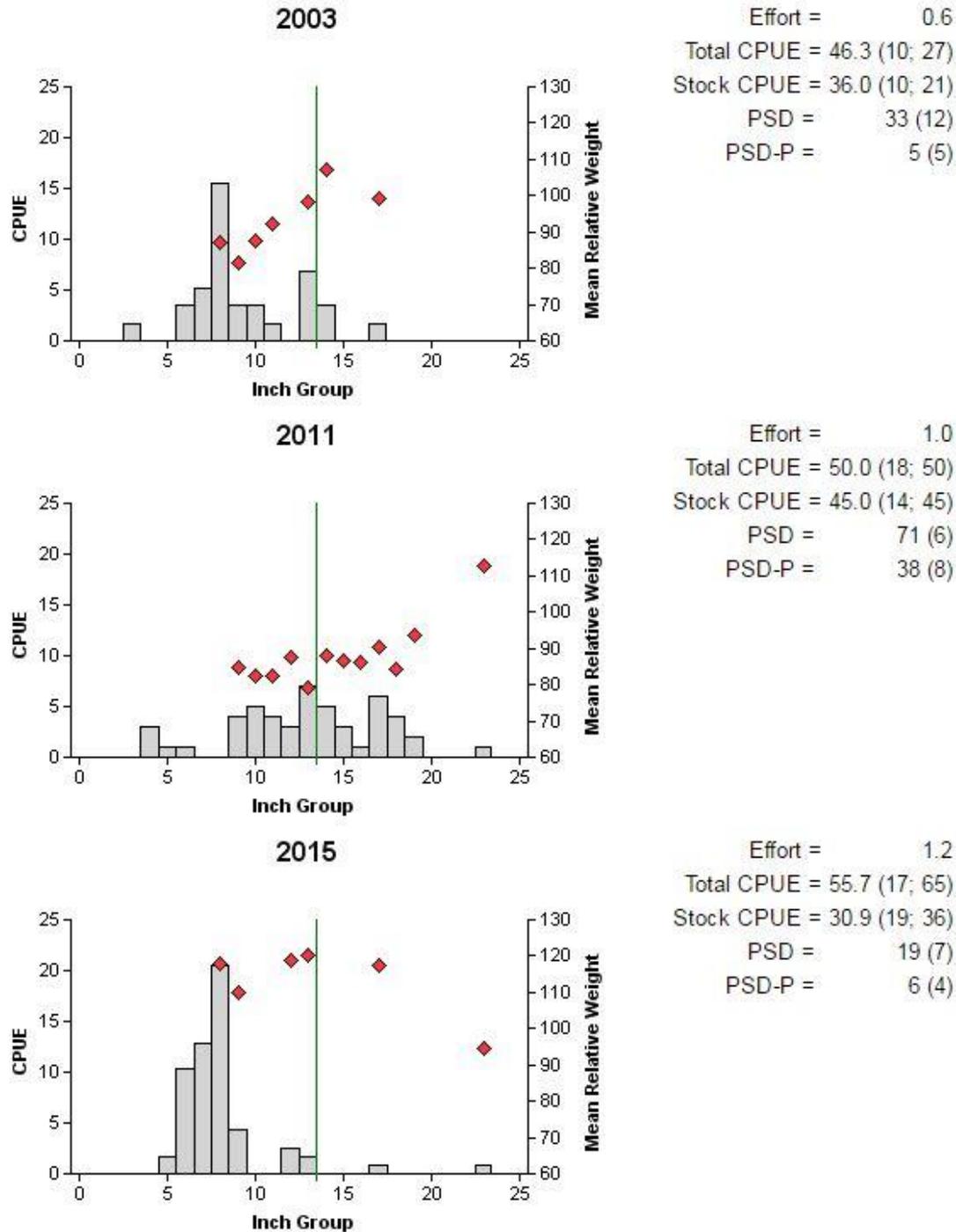


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Winters-Elm Creek Reservoir, Texas, 2003, 2011, and 2015. Vertical line indicates minimum length limit.

White Crappie

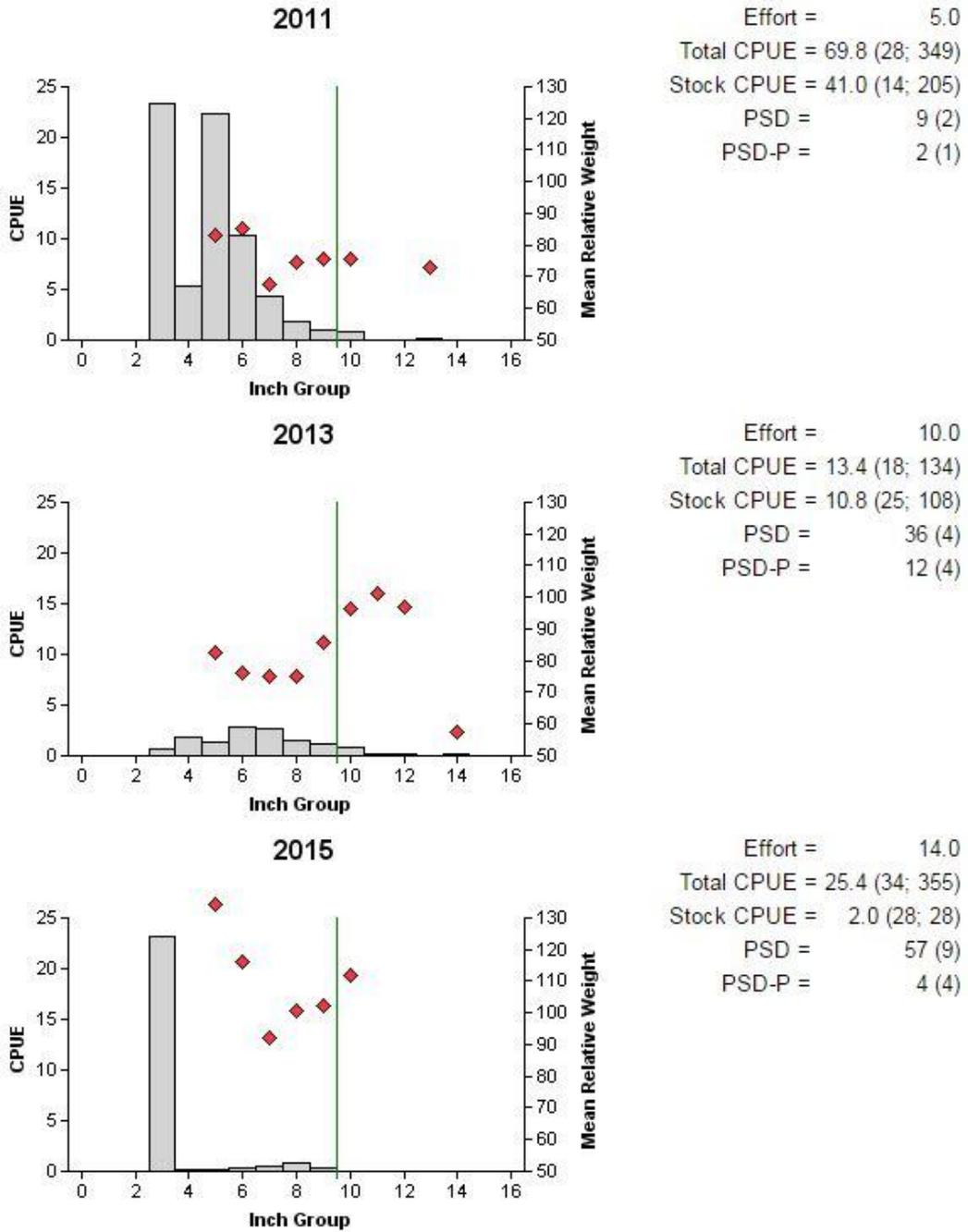


Figure 7. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Winters-Elm Creek Reservoir, Texas, 2011,2013, and 2015. Vertical line indicates minimum length limit.

Table 6. Proposed sampling schedule for Winters-Elm 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(Spring)	Trap net	Gill net	Habitat			Creel survey	Report
				Structural	Vegetation	Access		
2016-2017							A	
2017-2018	A	A	A					
2018-2019								
2019-2020	S	S	S	S	S	S		S

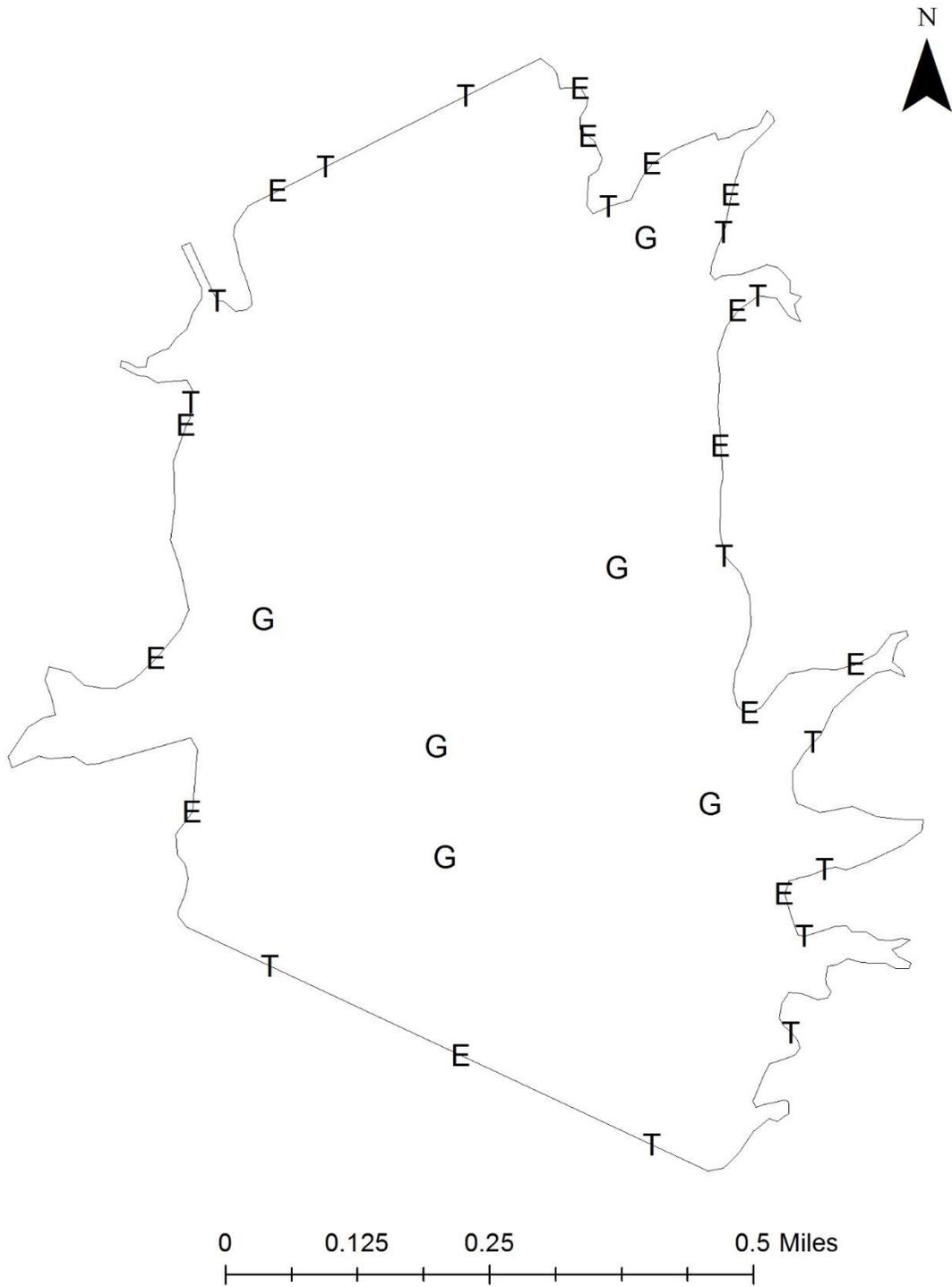
Creel survey in 2016-2017 is spring quarter only

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Winters-Elm Creek Reservoir, Texas, 2015-2016. Sampling effort was 6 net nights for gill netting, 14 net nights for trap netting, and 1.17 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad	19	3.2			492	421.7
Common Carp	8	1.3				
Smallmouth Buffalo	25	4.2				
Blue Catfish	62	10.3				
Channel Catfish	27	4.5				
Flathead Catfish	6	1.0				
White Bass	3	0.5				
Green Sunfish			1	0.1	3	2.6
Warmouth			12	0.9		
Orangespotted Sunfish			1	0.1		
Bluegill			456	32.6	48	41.1
Longear Sunfish			41	2.9	1	0.9
Largemouth Bass					65	55.7
White Crappie	11	1.8	355	25.4		
Freshwater Drum	5	0.8				

APPENDIX B



Location of sampling sites, Winters-Elm Creek Reservoir, Texas, 2015-2016. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was approximately 8ft below full pool at time of sampling.

APPENDIX C

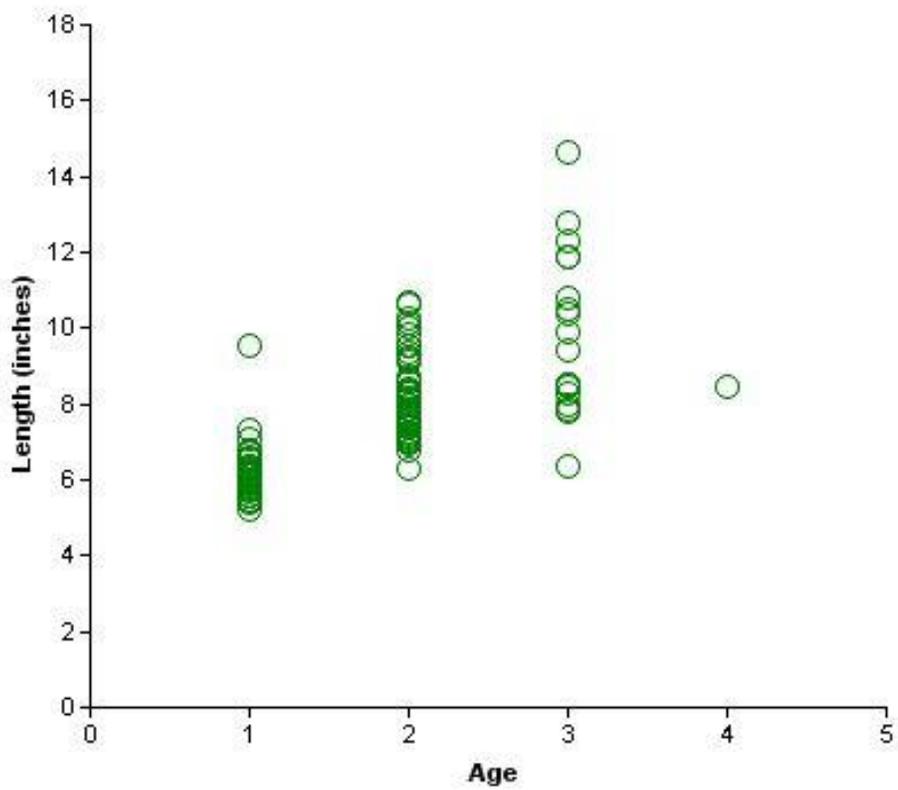


Figure 8. Length at age for White Crappie collected from trap nets at Winters-Elm Creek Reservoir, Texas, December 2013.