

PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2015 Fisheries Management Survey Report

J. B. Thomas Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in J.B. Thomas 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:** J.B. Thomas Reservoir is a 7,820-acre impoundment (constructed in 1952) on the Colorado River. The dam is located 16 miles southwest of Snyder and west of State Highway 208, in Scurry County, Texas. The reservoir is owned by the Colorado River Municipal Water District (CRMWD) and provides water to three member cities. The reservoir has a drainage area of 3,950 square miles; however, it experiences frequent water level fluctuations, and the reservoir was last full in 1962. The reservoir declined steadily from approximately 3,917 acres in 2005 to 320 acres in 2012 due to drought and municipal water pumping. In 2014 and 2015 the watershed experienced large rain events, and the reservoir increased in size to 6,233 acres and was 3 feet below Conservation Pool elevation (approximate 46 foot rise). Angler access is good as most of the shoreline is accessible, and currently two of four boat ramps are open and usable. At the time of sampling, habitat consisted primarily of sand/silt and rocky shore covered with flooded terrestrial vegetation and standing timber.
- **Management History:** Important sport fish include Largemouth Bass, White Crappie, and catfishes. Florida Largemouth Bass were introduced in 1980. Due to extended drought followed by a recent large rise in lake level, Blue and Channel Catfish were restocked in 2015. Florida Largemouth Bass were stocked in 2015 and 2016. The sport fish populations have only been managed with statewide regulations.
- **Fish Community**
 - **Prey species:** Gizzard Shad were highly abundant in the reservoir, and the majority of sampled shad were available as prey to most sport fish. Electrofishing catch of Bluegills was low, and no Bluegill over 4-inches in length were observed.
 - **Catfishes:** The 2015 stocking of Blue Catfish appears to have been successful with numerous juvenile fish sampled. Blue Catfish greater than 20 inches were also observed. The Channel Catfish population also appears to be recovering from the extended period of drought; both juvenile fish as well as legal sized fish were sampled. Flathead Catfish are present in the reservoir.
 - **Largemouth Bass:** The 2015 stocking of Largemouth Bass fingerlings occurred approximately 3 months prior to the 2015 electrofishing survey. As there was little time for the fish to grow and disperse throughout the lake, few bass were observed. All fish sampled were below the minimum length limit.
 - **White Crappie:** Few White Crappie were observed, and only one legal-sized fish was collected.
- **Management Strategies:** Conduct monitoring with trap nets, gill nets, and electrofishing in 2017-2018 to evaluate the continued recovery of sportfish populations following the extended drought and recent water level rise. Contact CRMWD about developing parking area at White Island boat ramp. Continue educating the public about the dangers of invasive species.

INTRODUCTION

This document is a summary of fisheries data collected from J.B. Thomas 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 species of 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

J.B. Thomas Reservoir is a 7,820-acre impoundment constructed in 1952 on the main stream of the Colorado River. The dam is located 16 miles southwest of Snyder and west of State Highway 208, in Scurry County, Texas. The reservoir is owned by the Colorado River Municipal Water District (CRMWD) and provides water to three member cities. The reservoir has a drainage area of 3,950 square miles; however, it experiences frequent water level fluctuations. At conservation pool the lake is approximately 2,253 feet above mean sea level (MSL) (Figure 1). The reservoir declined steadily from approximately 3,917 acres in 2005 to 320 acres in 2012 due to drought and municipal water pumping. In 2014 and 2015 the watershed experienced large rain events, and the reservoir increased to 6,233 acres and within 3 feet of Conservation Pool elevation (approximate 46 foot rise). Water has not gone over the spillway since 1962. At the time of sampling, habitat consisted primarily of sand/silt and rocky shore covered with flooded terrestrial vegetation and standing timber. Other descriptive characteristics for J.B. Thomas Reservoir are in Table 1.

Angler Access

Angler access is good, as much of the shoreline is accessible. J. B. Thomas Reservoir has four public boat ramps. Two public ramps, White Island Park and Bull Creek Park, were unavailable to anglers in 2016. White Island Park ramp was usable, but it was closed by the reservoir controlling authority due to lack of parking at the ramp. Bull Creek Park ramp was unavailable due to the end of the ramp being above the waterline. Extension of the ramp at Bull Creek Park is not feasible. Additional boat ramp characteristics are in Table 2.

Management History

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

1. If reservoir levels increase enough to allow boat access, conduct additional surveys to evaluate the effects of extended drought and loss of habitat on the fish populations in the reservoir.
Action: The reservoir did not regain boat access until September 2014 when a heavy rain event resulted in a rapid 35 foot rise. The rapid rise resulted in hazardous boating conditions due to floating debris and muddy water, so surveys were not conducted.
2. Evaluate the exposed reservoir basin for potential habitat enhancement projects.
Action: District staff discussed habitat enhancement possibilities until heavy rains in 2014 and 2015 re-flooded the majority of the reservoir basin providing abundant natural habitat with flooded and standing timber.
3. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir; contact and educate marina owners about invasive species, and provide them with posters, literature, etc... so that they can in turn educate their customers; educate the

public about invasive species through the use of media and the internet; and make a speaking point about invasive species when presenting to constituents and user groups. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

Action: Presentations have been given to the Region O water planning group and various area civic groups and school groups. Interviews and new releases concerning invasive species have been done for area newspapers. Stories and posts have been added to the district Facebook page. Signage has been sent to the controlling authority.

Harvest regulation history: Sport fishes in J.B. Thomas Reservoir are managed with statewide regulations (Table 3).

Stocking history: Following a large rise in water level, J.B. Thomas Reservoir was stocked with Blue Catfish, Channel Catfish, and Florida Largemouth Bass in 2015 and with Bluegill in 2016. The complete stocking history is in Table 4.

Vegetation/habitat management history: This reservoir has no vegetation/habitat management history.

Water Transfers: J. B. Thomas Reservoir is used for municipal water supply and recreation. One permanent pumping station operated by CRMWD transfers water for municipal water supply. Through the use of this pumping station and current pipeline connections, CRMWD is capable of transferring water to their other water supply reservoirs within the Colorado River basin (O. H. Ivie Reservoir, and E. V. Spence Reservoir). No interbasin transfers are known to exist.

METHODS

Surveys were conducted to achieve survey and sampling objectives in accordance with the objective-based sampling (OBS) plan for JB Thomas Reservoir (TPWD unpublished). Primary components of the 2015-2016 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 hour at 12, 5-min stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing.

Trap netting – Crappie were collected using trap nets (8 net nights at 8 stations). CPUE for trap netting was recorded as the number of fish caught per net night (fish/nn).

Gill netting – Blue Catfish and Channel Catfish were collected by gill netting (5 net nights at 5 stations). CPUE for gill netting was recorded as the number of fish caught per net night (fish/nn).

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 statistics.

Habitat – A structural habitat survey was conducted in September, 2015. Vegetation survey was also conducted in September, 2015. Habitat was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2015).

Water Level – Source for water level data was the United States Geological Survey (USGS 2015).

RESULTS AND DISCUSSION

Habitat: Littoral zone structural habitat consisted primarily of sand/silt and rocky shore. Vegetation consisted of flooded terrestrial vegetation and 563.8 acres of standing timber (Table 6). No aquatic vegetation was observed in the reservoir.

Prey species: Electrofishing CPUEs of Gizzard Shad and Bluegill in 2015 were 1551.0/h and 12.0/h, respectively (Figures 2 and 3). Index of vulnerability for Gizzard Shad was high, indicating 96% were available to predators. Total CPUE of Gizzard Shad in 2015 was much higher than catch rates in 2011 and 2007. Total CPUE of Bluegill in 2015 was lower than total CPUE in 2007 and 2011, and size structure consisted of small individuals.

Blue Catfish: Gill net CPUE of Blue Catfish was 14.6/nn in 2016 which is consistent with CPUE's in previous years (Figure 4). The presence of larger individuals indicates that several Blue Catfish appear to have survived the extended drought. While the spike in sub-stock fish in 2016 could be due to the stocking that occurred in 2015, it is also possible that the spike is a result of natural reproduction due to thousands of acres of potential spawning habitat being inundated by the 35 foot water level rise in October 2014. Body condition was good as all size classes had a W_r near 100 or greater.

Channel Catfish: The gill net catch rate of Channel Catfish was 5.0/nn, which is greater than in previous years (Figure 5). Channel Catfish were stocked in 2015; however, few sub-stock fish were collected in 2016. The majority of fish sampled were stock size or larger, indicating that Channel Catfish appear to have survived the effects of the extended drought quite well. Body condition appeared good with W_r 's of 90 and greater.

Largemouth Bass: The electrofishing catch rate of Largemouth Bass was 11.0/h in 2015 which was lower than in 2011 (63.0/h) and 2007 (27.0/h) (Figure 6). As stocking of Largemouth Bass fingerlings occurred approximately 3 months prior to the electrofishing survey, low CPUE is not unexpected in this recovering reservoir. No fish greater than 10 inches in length were sampled. These fish are most likely representative of the stocking that occurred 2015. Body condition in 2015 was excellent as all size classes had W_r above 100.

White Crappie: White Crappie catch rates declined from 29.5/nn in 2003 to 4.4/nn in 2015. The majority of fish sampled were below the minimum length limit (Figure 7).

Fisheries management plan for J.B. Thomas Reservoir, Texas

Prepared – July 2016.

ISSUE 1: Heavy rain events in 2014 and 2015 increased the lake level by approximately 45 feet. Surface area increased from 320 acres to 6,233 acres. The reservoir also experienced low oxygen related fish kills prior to the water level increase. As of 2016, Largemouth Bass, Blue Catfish, and Channel Catfish have been stocked to boost existing sportfish populations, and Bluegill were stocked to provide additional forage. Largemouth Bass population appears to be recovering slowly as CPUE was low, and no fish larger than 10 inches were sampled in 2015.

MANAGEMENT STRATEGY

1. Conduct additional sampling in 2017-2018 to assess continued recovery of sportfish and forage populations, and determine success of 2016 Florida Largemouth Bass stocking. Based on results from 2017-2018 surveys, create new OBS objectives for the 2019-2020 surveys and determine which species may require stocking.

Issue 2: Currently the White Island boat ramp is usable; however, it has been closed by the CRMWD due to lack of parking.

MANAGEMENT STRATEGY

1. Contact CRMWD about possible development of parking at White Island ramp through TPWD grants.
2. Contact CRMWD about potential of adding a new ramp at north side location using TPWD grant money.

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. 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. Current low water conditions and high chlorides have reduced the risk of infestation, but inflows could return the reservoir to high risk.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to maintain 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 for JB Thomas Reservoir

Sampling Years 2016-2020

Sport fish, forage fish, and other important fishes

Sport fishes in JB Thomas Reservoir have historically included Blue Catfish, Channel Catfish, Flathead Catfish, White Bass, Largemouth Bass, and White Crappie. The primary forage species has been Gizzard Shad. Survey results from 2015 and 2016 indicate that Blue Catfish and Channel Catfish best survived the recent period of drought. Survey results also indicate that Flathead Catfish, Largemouth Bass and White Crappie are still present in the reservoir but in low relative abundance.

Negligible fisheries

Past surveys have indicated low relative abundance of Channel Catfish (0.4/nn in 2004 and 2.4/nn in 2008), Flathead Catfish (1.8/nn in 2004), and White Bass (1.2/nn in 2004 and 0.6/nn in 2008); however, the reservoir has been known to support a jug line and trotline fishery for catfishes. As no White Bass were sampled in 2015 or 2016, it is possible that this fish species is no longer present in the reservoir.

Survey objectives, fisheries metrics, and sampling objectives

Due to the extreme changes that have occurred at the reservoir, the current statuses of some fish populations are still unknown. The surveys in 2017 and 2018 will be exploratory to determine presence/absence of White Bass. Blue Catfish, Channel Catfish, Flathead Catfish, Largemouth Bass, and White Crappie will be monitored for continued recovery by assessing CPUE, population size structure, and body condition (W_t). Standard sampling effort will be used in 2017 and 2018 to evaluate recovery of most game fish species; presence/absence will be used to evaluate the White Bass population. Sampling will consist of 12 random electrofishing stations, 8 random trap net stations, and 5 random gill nets stations. Once fish populations are evaluated following the 2017 and 2018 survey period, survey objectives, fisheries metrics, and sampling effort will be reevaluated. An updated objective based sampling plan will be prepared in 2018. See Table 7 for proposed sampling schedule.

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- 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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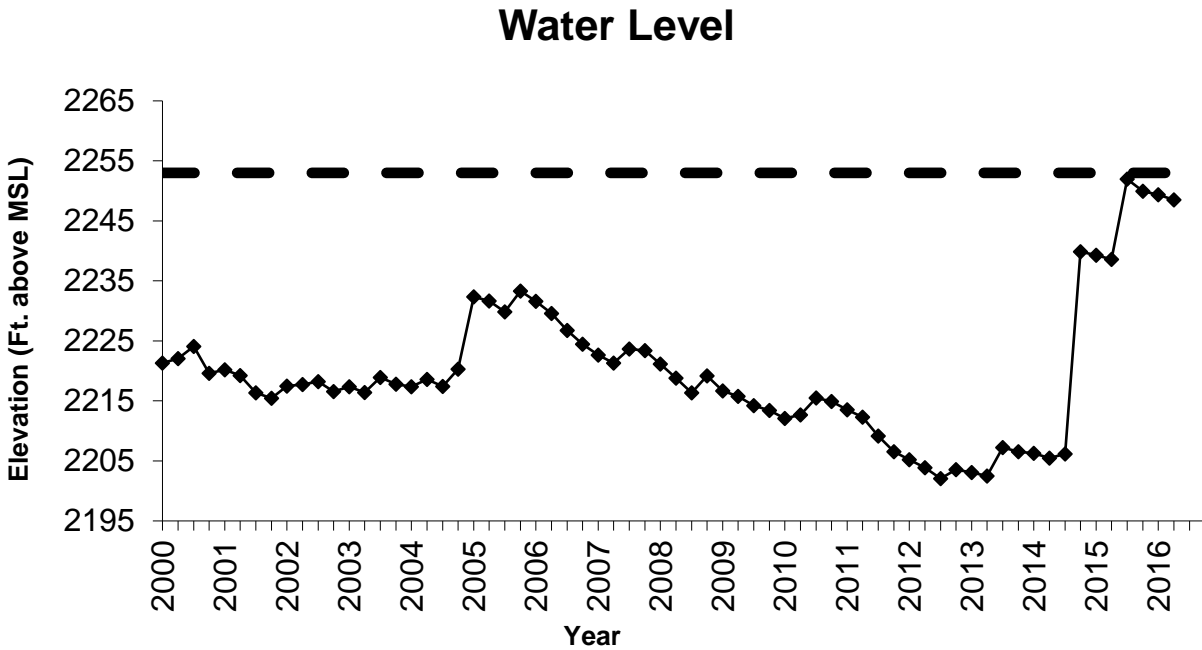


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for J.B. Thomas Reservoir, Texas. Conservation pool elevation at 2,253 feet MSL is represented by the dashed line.

Table 1. Characteristics of J.B. Thomas Reservoir, Texas.

Characteristic	Description
Year constructed	1952
Controlling authority	Colorado River Municipal Water District
County	Scurry
Reservoir type	Main stream
Shoreline Development Index (SDI)	4.38
Conductivity	442 μ mhos/cm

Table 2. Boat ramp characteristic for J.B. Thomas Reservoir, Texas, August, 2015 Reservoir elevation at time of survey was 2,250 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Southside Park	32.57572 -101.14299	Y	10	Unknown	Single lane ramp, Usable
Low Water Ramp ^a	32.57572 -101.14299	Y	10	Unknown	Single lane ramp, Usable
White Island Park	32.57501 -101.16809	Y	0	Unknown	Closed by Colorado River Authority due to no parking
Bull Creek Park	32.59515 -101.17079	Y	5	Unknown	Unusable, too shallow

^aThe Low Water Ramp is located within Southside Park and shares the same parking lot as the Southside Park Ramp.

Table 3. Harvest regulations for J.B. Thomas Reservoir.

Species	Bag Limit	Length Limit
Catfish: Channel and Blue, their hybrids and subspecies	25 (in any combination)	12-inch Minimum
Catfish, Flathead	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 J.B. Thomas Reservoir, Texas. FRY = fry; FGL = fingerling; and UNK = unknown.

Species	Year	Number	Size
Bluegill	2016	64,086	FGL
Blue Catfish	1980	32,928	UNK
	2015	233,989	FGL
	Total	266,917	
Channel Catfish	2015	242,388	FGL
Florida Largemouth Bass	1980	70,088	FGL
	1999	151,019	FGL
	2004	194,986	FGL
	2015	78,828	FGL
	2016	9,559	FGL
	Total	504,480	
Largemouth Bass	1965	20,000	UNK
	1966	220,000	UNK
	1968	88,000	UNK
	1970	40,510	UNK
	1976	15,000	UNK
	Total	383,510	
Walleye	1969	500,000	FRY
	1970	1,350,000	FRY
	1972	600,000	FRY
	1973	300,000	FRY
	Total	2,750,000	

Table 5. Objective-based sampling plan components for J. B. Thomas Reservoir, Texas 2015 – 2016.

Gear/target species	Survey objective	Metrics	Sampling objective
<i>Electrofishing</i>			
Largemouth Bass	Exploratory	CPUE	Presence/Absence
Bluegill	Exploratory	CPUE	Presence/Absence
Gizzard Shad	Exploratory	CPUE	Presence/Absence
<i>Trap netting</i>			
Crappie	Exploratory	CPUE	Presence/Absence
<i>Gill netting</i>			
Blue Catfish	Exploratory	CPUE	Presence/Absence
Channel Catfish	Exploratory	CPUE	Presence/Absence

Table 6. Survey of structural habitat types, J. B. Thomas Reservoir, Texas, September, 2015. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Natural	43.8 miles	91.6
Rocky	4.0 miles	8.4
Standing timber	563.8 acres	9.3

Gizzard Shad

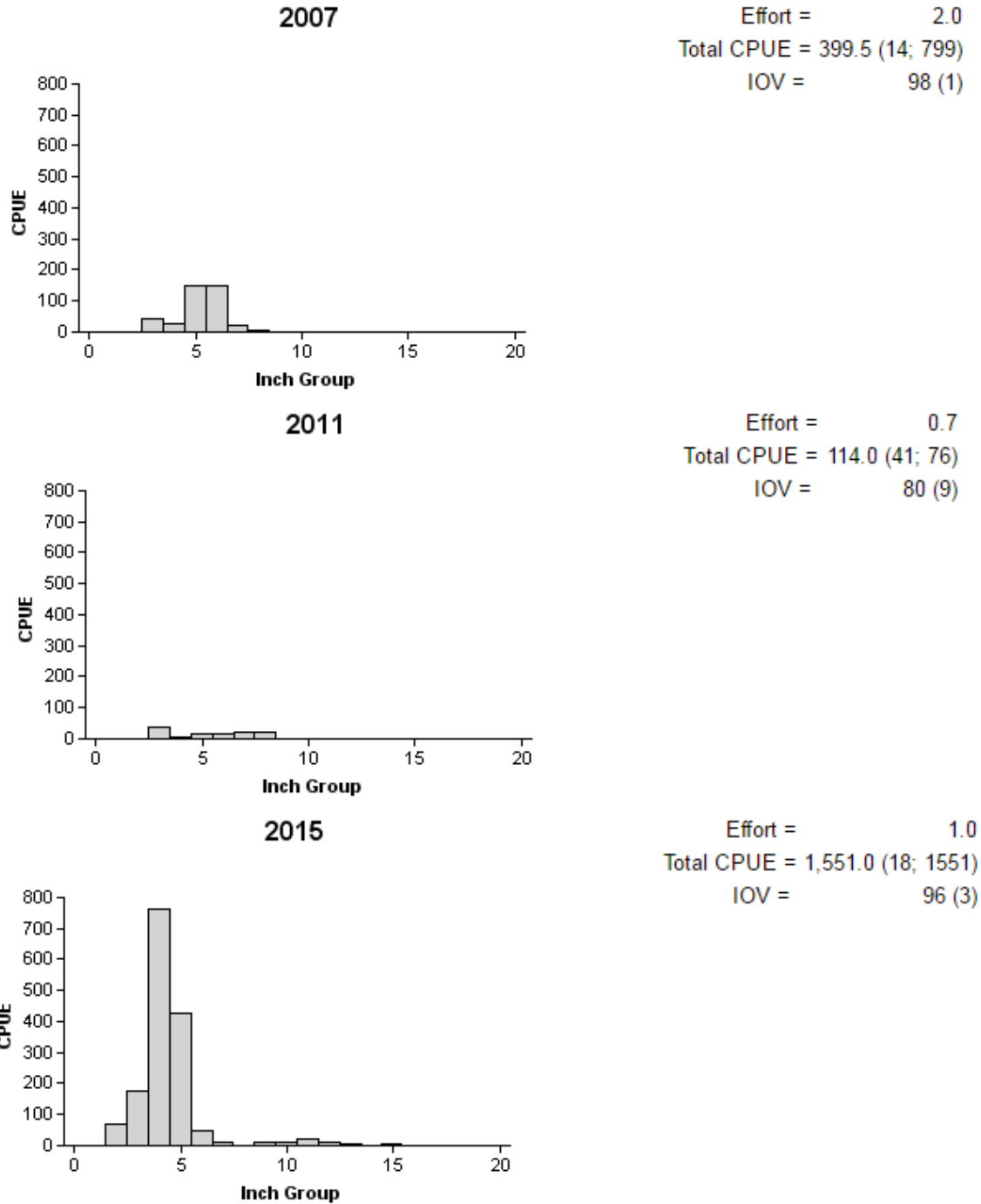


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 2007, 2011 and 2015.

Bluegill

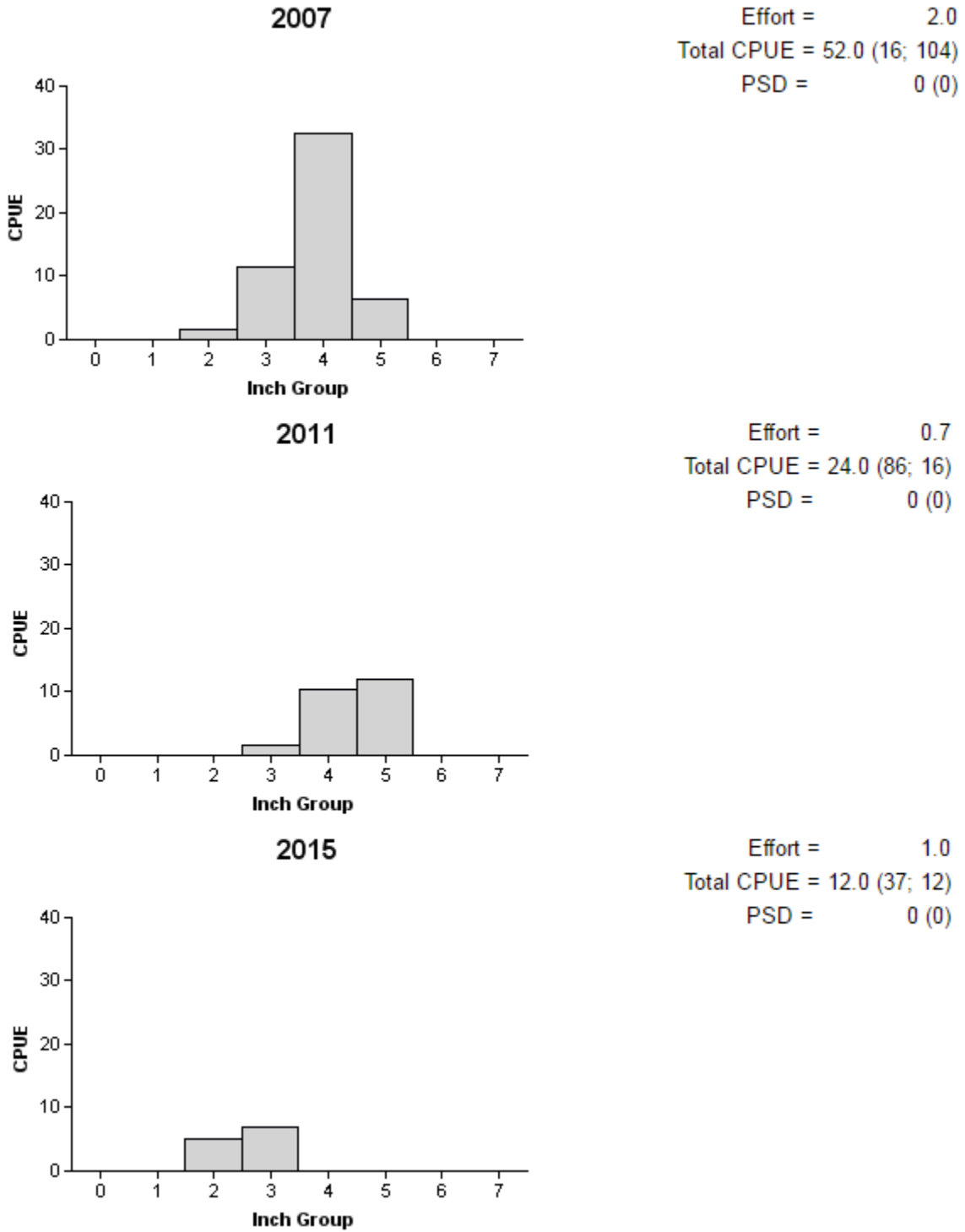


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 2007, 2011, and 2015.

Blue Catfish

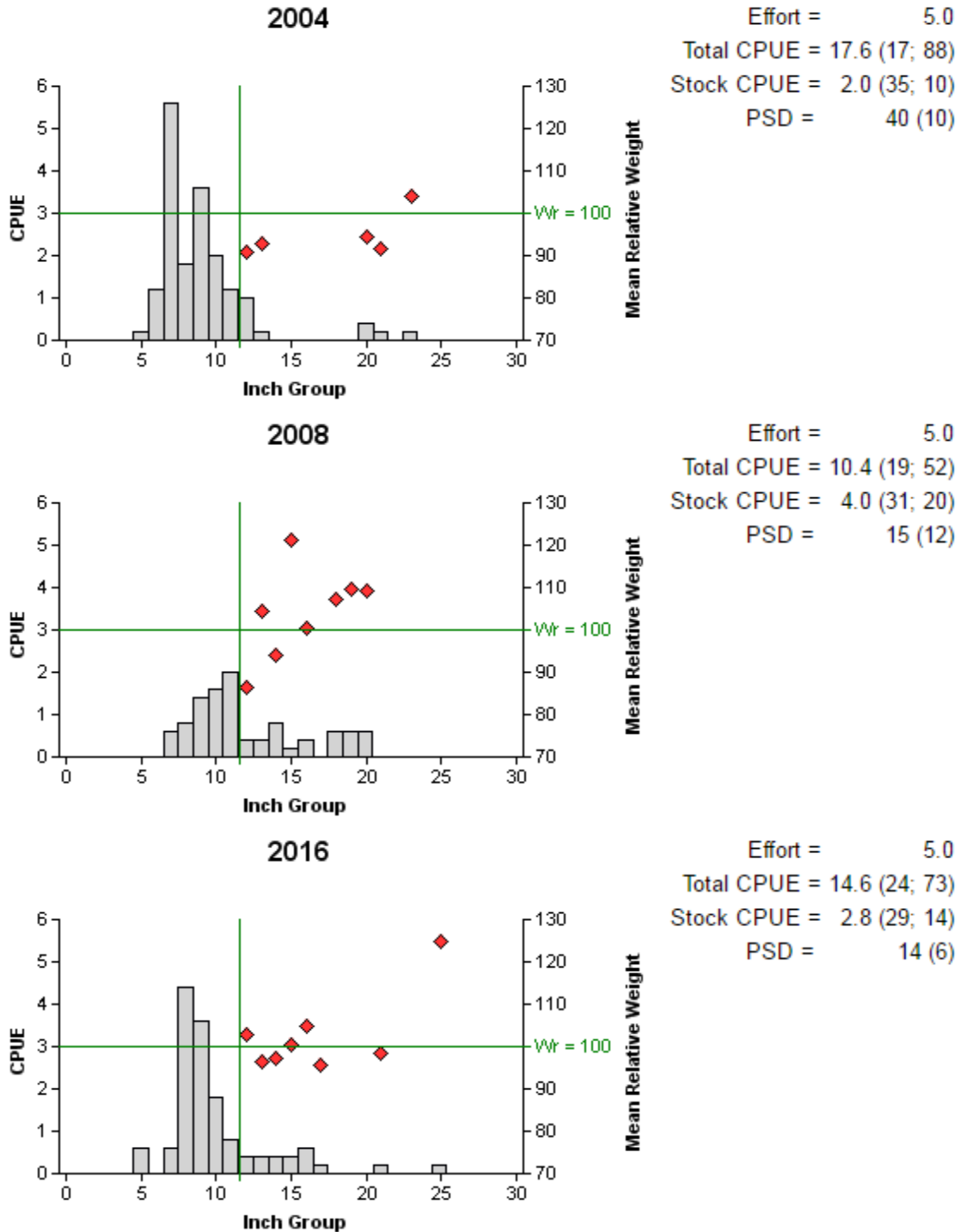


Figure 4. Number of Blue Catfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, J.B. Thomas Reservoir, Texas, 2004, 2008, and 2016. Vertical line indicates minimum length limit and horizontal line represents Mean Relative Weight of 100.

Channel Catfish

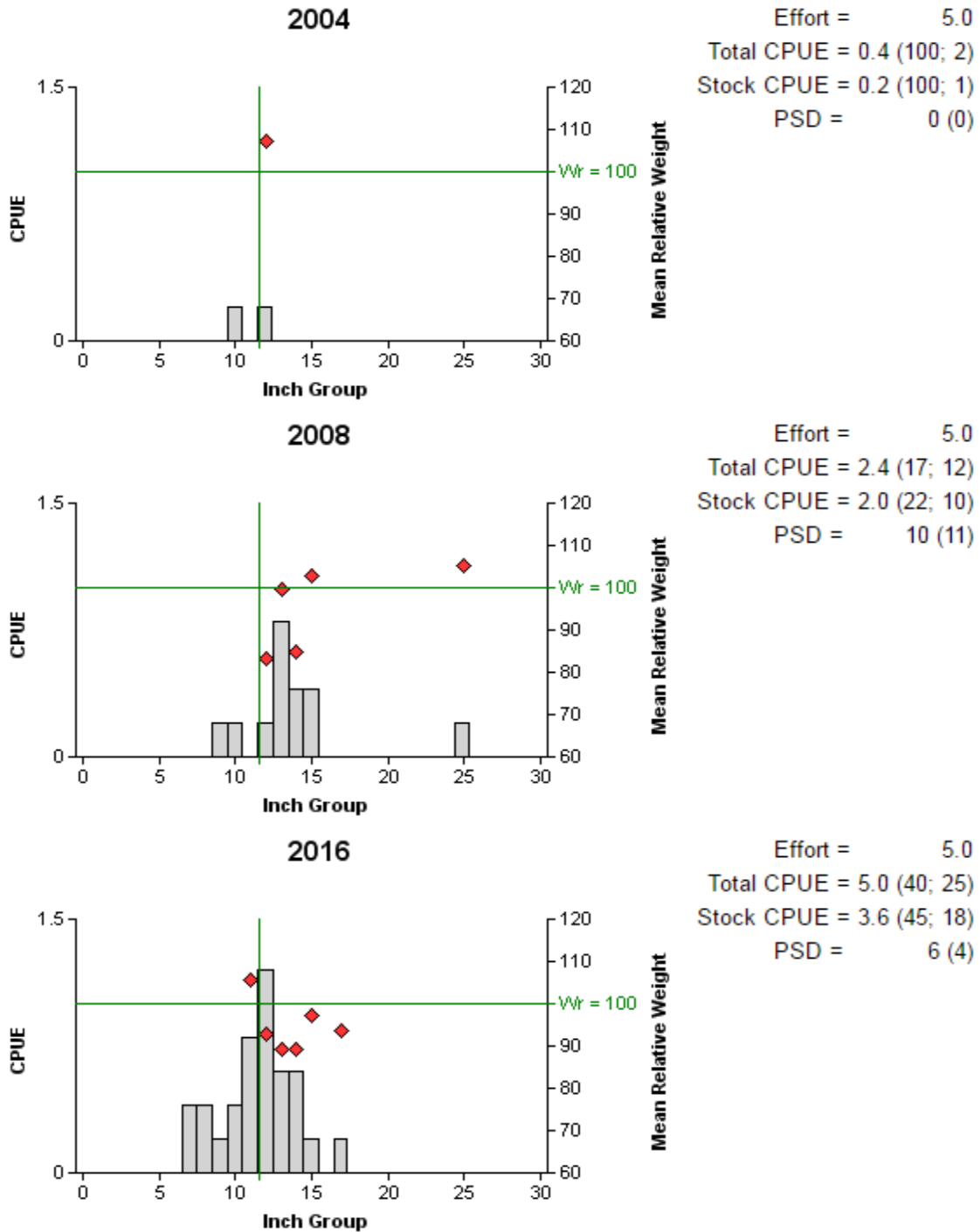


Figure 5. Number of Channel Catfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, J.B. Thomas Reservoir, Texas, 2004, 2008, and 2016. Vertical line indicates minimum length limit and horizontal line represents Mean Relative Weight of 100.

Largemouth Bass

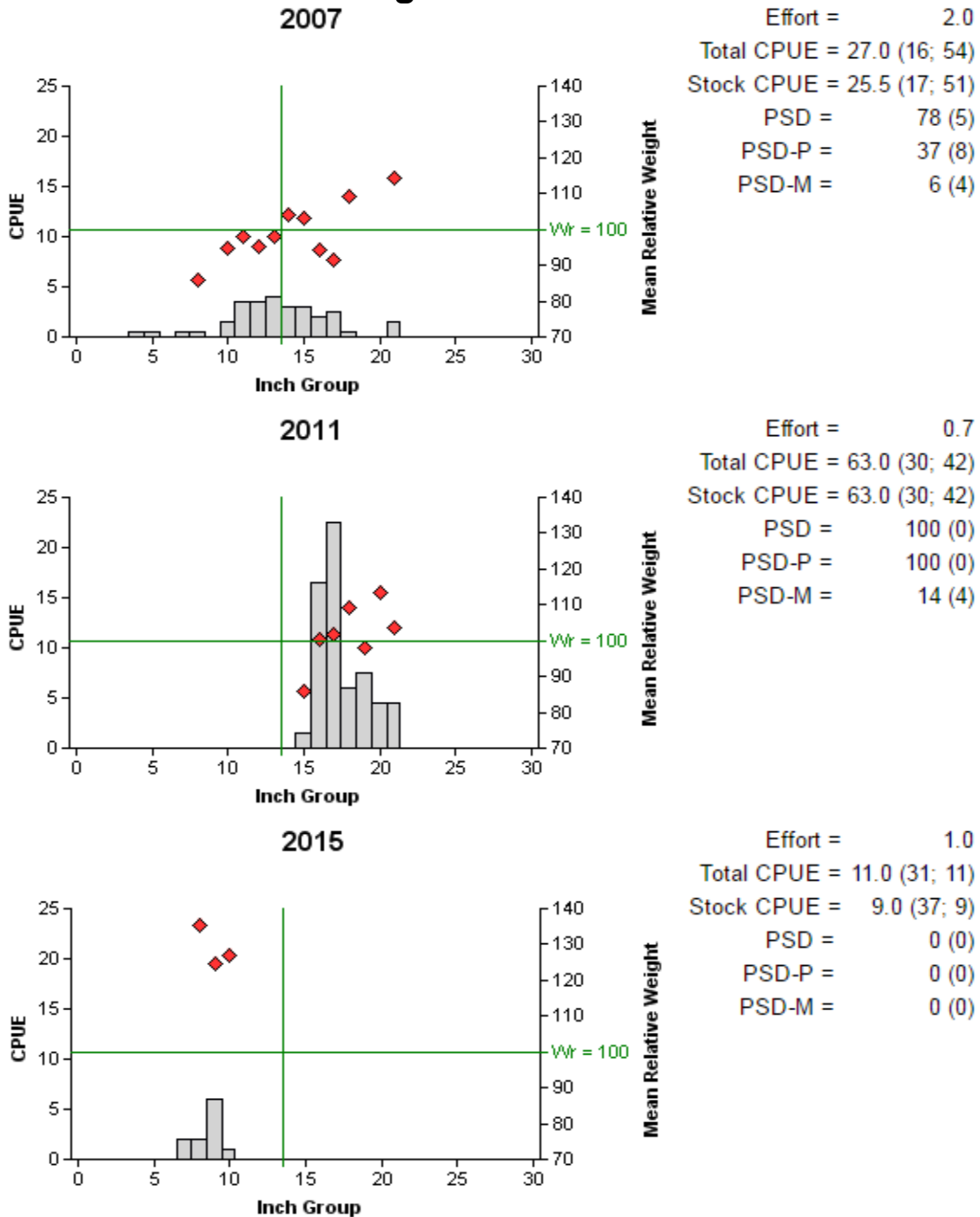


Figure 6. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, J.B. Thomas Reservoir, Texas, 2007, 2011, and 2015. Vertical line indicates minimum length limit and horizontal line represents Mean Relative Weight of 100.

White Crappie

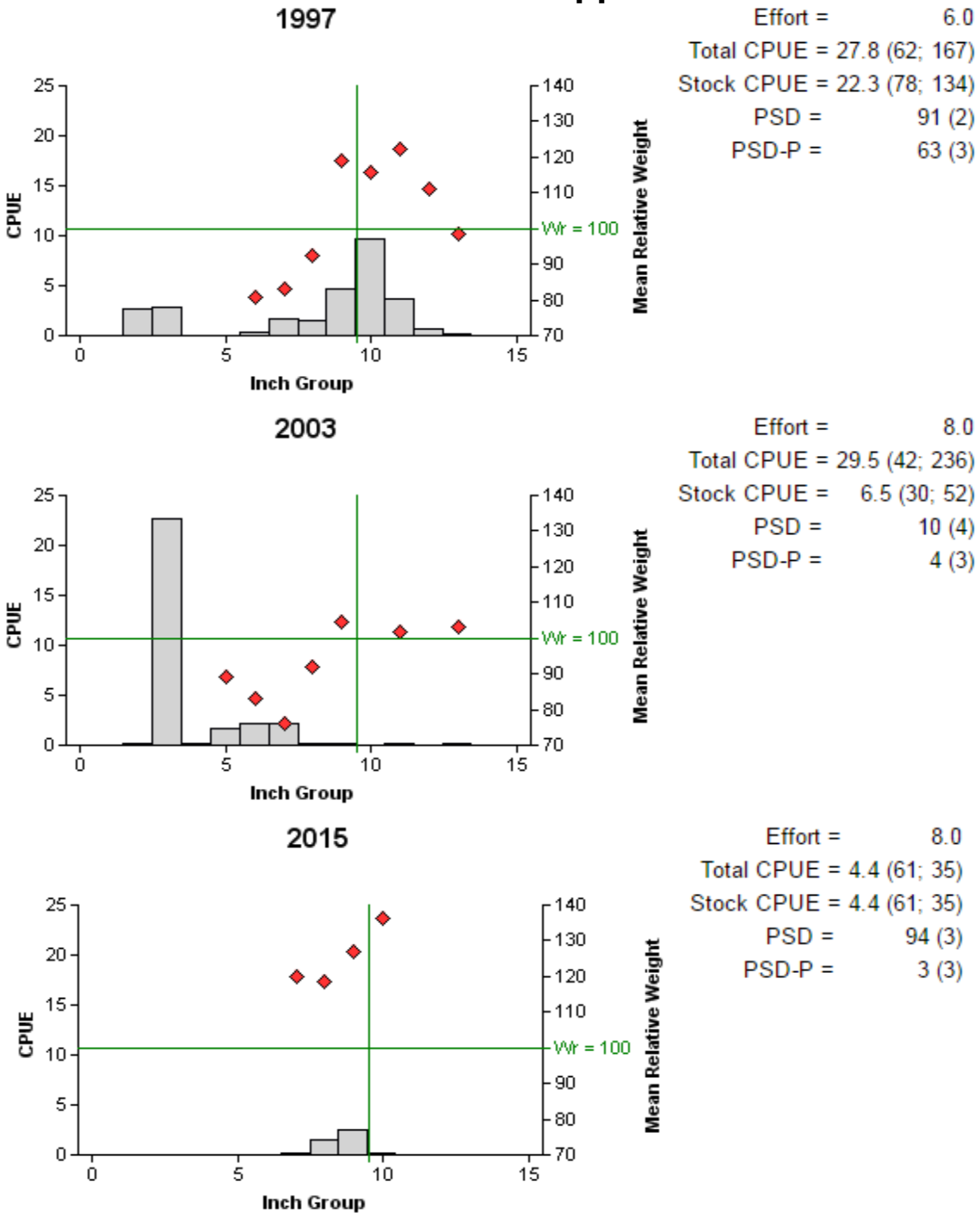


Figure 7. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds, and population indices (RSE and N for CPUE and SE for size structure and in parentheses for fall trap netting surveys, J.B. Thomas Reservoir, Texas, 1997, 2003, 2015. Vertical line indicates minimum length limit and horizontal line represents Mean Relative Weight of 100.

Table 7. Proposed sampling schedule for J.B. Thomas 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.

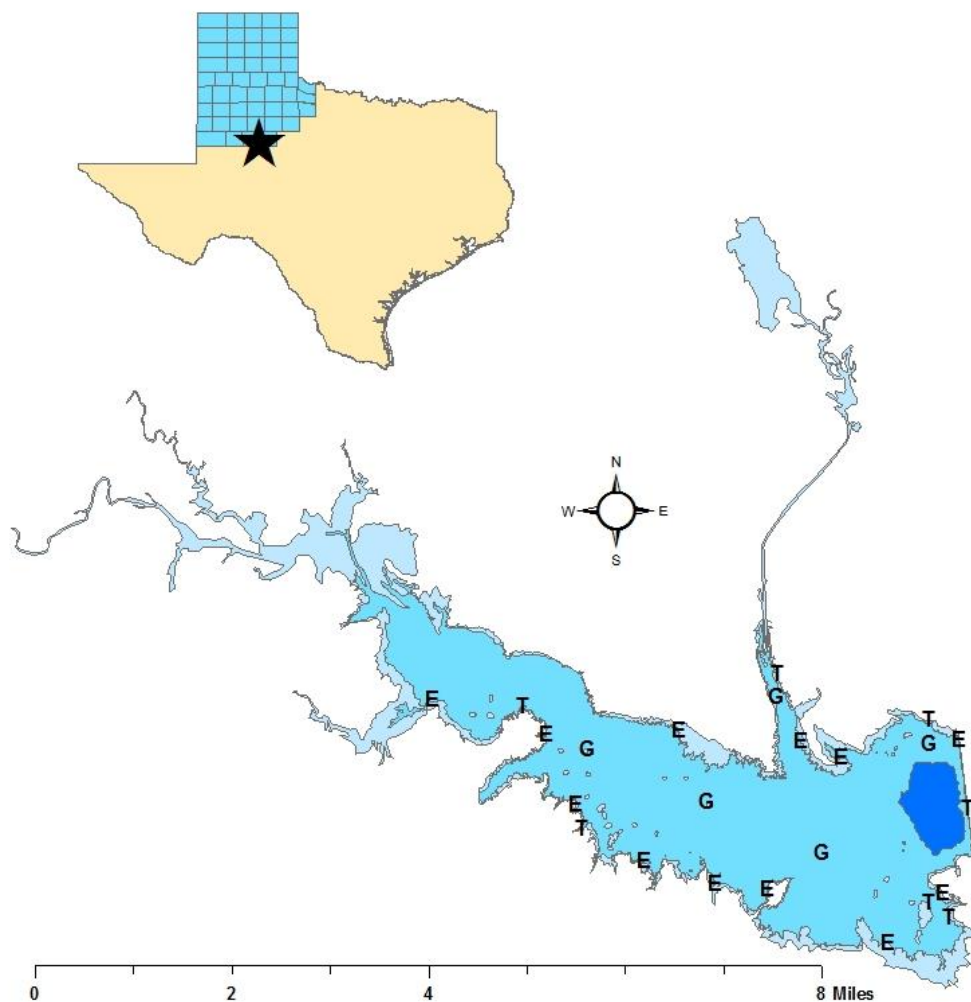
Survey Year	Electrofishing	Trap Net	Gill Net	Habitat		Access	Creel	Report
				Structural	Vegetation			
2016-2017								
2017-2018	A	A	A					
2018-2019								
2019-2020	S	S	S		S		S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from electrofishing from J.B. Thomas Reservoir, Texas, 2015-2016.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad	73	14.6	1	0.13	1551	1551.0
Common Carp	54	10.8			2	2.0
River Carpsucker	62	12.4	19	2.38		
Gray Redhorse			3	0.38		
Blue Catfish	73	14.6				
Black Bullhead	8	1.6	186	23.25		
Channel Catfish	25	5.0	12	1.50	3	3.0
Flathead Catfish	3	0.6			1	1.0
Green Sunfish	1	0.2	53	6.63	11	11.0
Orangespotted Sunfish			15	1.88		
Bluegill			82	10.25	12	12.0
Longear Sunfish	1	0.2	16	2.00	1	1.0
Largemouth Bass	21	4.2			11	11.0
White Crappie	20	4.0	35	4.38		
Freshwater Drum	15	3.0	1	0.13		

APPENDIX B



Location of sampling sites, J.B. Thomas Reservoir, Texas, 2015-2016. Trap net, gill net, and electrofishing stations are indicated T, G, and E respectively. Water level was approximately 9 feet below conservation pool at time of sampling. The light blue color represent conservation pool (2,253 feet above mean sea level) of the reservoir, the medium blue color is the water level at sampling (2,250 feet above mean sea level), and the dark blue represents the lake level (2,2003 feet above mean sea level) prior to the water level rise in 2014.