PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

White River Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in White River Reservoir were surveyed in 2014 using electrofishing and trap netting and in 2015 using gill netting. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings. Historical data are presented for comparison.

- **Reservoir Description:** At conservation pool (2,372.2 feet above Mean Sea Level - MSL), White River Reservoir is a 2,020-acre impoundment constructed in 1963 on the White River, a tributary of the Salt Fork of the Brazos River. The reservoir is located in Crosby County approximately 55 miles east of Lubbock, Texas. From 1992 to 2014, White River Reservoir experienced a declining trend in lake level. A record low was set in May 2014 when the reservoir reached an elevation of 2,336.7 feet MSL and a surface area of 239 acres. During sampling, the reservoir maintained an elevation near 2,343 feet MSL and 484 acres. White River Reservoir is owned and operated by the White River Municipal Water District as a municipal water supply and for recreational purposes. The reservoir has three boat ramps; during extremely low water level there is a temporary launch site in place. At current elevation only the low water ramp is usable. There are no handicapped-specific facilities.

- **Management History:** Sport fish in the reservoir included Walleye, White Bass, Largemouth Bass, White Crappie, and catfishes. Past surveys have shown that White Crappie were overabundant in the reservoir and exhibited poor growth. Walleye stockings have been utilized in part to mitigate overabundance of White Crappie. Florida Largemouth Bass were stocked in 1982, 2000, 2003, 2009, and 2012 in order to maintain a trophy Largemouth Bass fishery.

- **Fish Community**
  - **Prey species:** Gizzard Shad and Bluegill served as the primary prey species in the reservoir. The 2014 electrofishing catch rate of Gizzard Shad and Bluegill was lower than in previous years; most likely attributed to low water level due to drought and municipal pumping. Although the numbers of prey fish were low the majority sampled were small and available as prey for most sport fishes.

  - **Catfishes:** Blue Catfish and Channel Catfish catch rates were down slightly from past surveys, while the Flathead Catfish catch rate increased slightly.

  - **White Bass:** White Bass numbers have shown a slight increase in catch rates since 2007. Nearly half of the fish sampled in 2015 were above the 10-inch minimum length limit.

  - **Largemouth Bass:** Significant rain events in 2010 improved reservoir conditions and contributed to an increased catch rate of Largemouth Bass in 2011; however, extreme drought and record low water level between 2011 and 2014 resulted in a sample of only 6 bass collected in 2014.

  - **Crappie:** White Crappie size structure appears to have improved. While the number of fish sampled was lower than in previous surveys, the number of legal-sized White Crappie was substantially higher.

  - **Walleye:** Although few Walleye were detected during the survey, all Walleye sampled were 18 to 25 inches.

- **Management Strategies:** Continue stocking Walleye and Florida Largemouth Bass. Conduct electrofishing survey in 2016, trap net surveys in 2015 and 2017, gill net and creel surveys in 2017, and general monitoring with electrofishing, trap net, and gill net surveys in 2018 – 2019. Conduct habitat survey in 2018.

INTRODUCTION

This document is a summary of fisheries data collected from White River Reservoir in 2014-2015. 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 2014-2015 data for comparison.

Reservoir Description

At conservation pool (2,372.2 feet above Mean Sea Level - MSL), White River Reservoir is a 2,020-acre impoundment constructed in 1963 on the White River, a tributary of the Salt Fork of the Brazos River. The reservoir is located in Crosby County approximately 55 miles east of Lubbock, Texas. Since 1992 White River Reservoir experienced a general decline in water level (Figure 1). Heavy rain events in September 2008 and July 2010 resulted in a substantial increase in lake level elevation (2,356.9 feet MSL) and surface area (930 acres); however, extreme drought resulted in continued water level decline. A record low was set in May 2014 when the lake reached an elevation of 2,336.7 feet MSL and a surface area of 239 acres. During study period the reservoir maintained an elevation near 2,343 feet MSL. White River Reservoir is owned and operated by the White River Municipal Water District as a municipal water supply and for recreational purposes. Other descriptive characteristics for White River Reservoir are presented in Table 1.

Angler Access

White River Reservoir has three public boat ramps and one low water ramp. The three regular use public boat ramps were unavailable to anglers in 2014 because the end of the boat ramp was above the waterline. Extension of the ramps is not feasible. Only the low water ramp was usable. Additional boat ramp characteristics are in Table 2. There is abundant shoreline access around several areas of the reservoir; however, there are no facilities for physically challenged anglers.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Clayton and Munger 2011) included:

1. Maintain the Walleye fishery through biennial stockings of 3,000 fry/acre.
   Action: Walleye fry were stocked in 2012, but due to record low water level Walleye were not stocked in 2014.
2. Monitor White Crappie population with additional trap net survey in 2012, and conduct age and growth analysis for White Crappie in 2012.
   Action: An approximate 8 foot drop in water level through 2012 provided only limited areas of the reservoir that were accessible for sampling; however, a trap net survey was completed, and a Category 1 age and growth analysis was conducted on 26 fish.
3. Monitor Largemouth Bass populations with standard electrofishing to determine impact of 2009 stocking and reservoir water level fluctuations.
   Action: Electrofishing was conducted in 2011, 2012, and 2014. To determine the impact of the 2009 Florida Largemouth Bass stocking, genetic analysis was planned for 2014. Record low water level resulted in loss of boat access in spring 2014 preventing a spring electrofishing survey to collect bass for genetic analysis. Only six bass were sampled during the fall 2014 survey; genetic analysis was postponed until water conditions and catch improved.
4. 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 that also operates the marina.

Harvest regulation history: Sport fishes in White River Reservoir are currently managed with statewide regulations (Table 3). From 1993 to 2001, Smallmouth Bass were managed with an 18-inch minimum length limit and 3-fish daily bag limit in an effort to increase relative abundance and improve size structure. In 2001, harvest regulations for Smallmouth Bass were changed to the statewide 14-inch minimum length limit and 5-fish bag as no discernable change in the population was observed. Regulations on harvest of Walleye changed from 16-inch minimum and 5-fish bag, to a 5-fish bag with no more than 2 Walleye under 16 inches on September 1, 1999.

Stocking history: White River Reservoir has been stocked with multiple species since impoundment in 1963. In 2009 there were 143,705 Florida Largemouth Bass fingerlings stocked; an additional 37,067 were stocked in 2012. There were also 1,620,000 Walleye fry stocked in 2012. The complete stocking history is available in Table 4.

Vegetation/habitat management history: White River Reservoir has no vegetation/ habitat management history.

Water transfer: White River Reservoir is primarily used for municipal water supply and recreation. The reservoir currently supplies water to the Cities of Crosbyton, Post, Ralls, and Spur in a rural region located approximately 65 miles southeast of Lubbock. There is one permanent pumping station on the reservoir that pumps water to the White River Municipal Water District's water treatment plant to be distributed to the 4 member cities. Recent proposals include negotiations with the City of Lubbock to purchase the water rights in the reservoir. If purchased, water management strategies could include the use of reclaimed effluent from the City of Lubbock being pumped to the reservoir. Other strategies include the possible transfer of water to and from Alan Henry Reservoir and the proposed Post Reservoir.

METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations), gill netting (5 net nights at 5 stations), and trap netting (5 net nights at 5 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All electrofishing and gill netting survey sites were randomly selected, and trap netting survey sites were biologist selected. All surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2014)

A structural habitat survey and aquatic vegetation survey was conducted in July 2014. Habitat and vegetation was assessed with the digital shapefile method (TPWD, Inland Fisheries Division, unpublished manual revised 2014).

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). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics, and SE was calculated for structural indices and IOV. Ages were determined by using otoliths from 5 fish per inch group.

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

RESULTS AND DISCUSSION

Habitat: Habitat was typified by natural shoreline (eroded bank, clay, silt, or sand) with scattered areas of gravel (rock <4 in) and rocky shoreline (rock >4 in) (Table 5). Vegetation in the reservoir consisted of native emergent, flooded timber, and flooded terrestrial vegetation (Table 6).

Prey species: In 2014 electrofishing catch rate of Gizzard Shad was 109.0/h. Gizzard Shad IOV was 88, indicating that the majority of shad sampled were available as forage to existing predators (Figure 2). The 2014 IOV was similar to the IOV estimates from 2012 (IOV=90) and 2011 (IOV=82) (Figure 2). Total CPUE of Gizzard Shad was lower in 2014 compared to the 2012 and 2011 surveys (Figure 2). Total CPUE of Bluegill in 2014 was 36.0/h. This is lower than catch rates from 2012 (172.0/h) and 2011 (397.0/h) (Figure 3). The Bluegill population was comprised predominantly of small individuals and available as prey to existing predators (Figure 3). Low catch rates for prey species in 2014 are most likely attributed to record low reservoir level and loss of habitat from 2012 to 2014.

Blue Catfish: The gill net catch rate for Blue Catfish was 1.6/nn in 2015, which is down from 2013 (2.8/nn) and 2011 (5.2/nn) (Figure 4). Size structure remained shifted toward larger individuals; all fish collected were 14 inches or larger (Figure 4). Lack of juvenile Blue Catfish collected indicates that declining lake level and loss of habitat have impacted spawning and recruitment. Collected fish appeared healthy with most W_r values near 100 (Figure 4).

Channel Catfish: Catch rates for Channel Catfish increased from 4.0/nn in 2011 to 10.8/nn in 2013 and declined to 3.4/nn in 2015 (Figure 5). Declining catch rates were most likely attributed to loss of favorable habitat from 2012 to 2015 or dispersed populations due to the water rise in fall 2014. Overall body condition appears good with W_r values greater than 90 for most inch groups (Figure 5).

Flathead Catfish: Flathead Catfish continued to have low relative abundance. The gill net catch rate of Flathead Catfish was 1.4/nn. This was similar to 2013 (1.8/nn) and slightly higher than 2011 (0.4/nn) (Figure 6).

White Bass: The gill net catch rate for White Bass was 4.4/nn in 2015 (Figure 7). This catch rate is higher than 2013 (0.8/nn), and 2011 (1.4/nn) (Figure 7). Although relative abundance of White Bass is low, the sampled fish appeared healthy with all W_r values greater than 100 (Figure 7).

Largemouth Bass: The electrofishing catch rate of Largemouth Bass was 6.0/h in 2014, down from 2012 (40.0/h) and 2011 (122.0/h) (Figure 8). Decreasing reservoir level and loss of habitat have impacted reproduction and recruitment. Improvements in lake level in 2008 and 2010 allowed for implementing previous management strategies of stocking Florida Largemouth Bass in 2009 in an attempt to mitigate poor recruitment (Henegar and Munger 2007). The higher catch rates in the 2011 survey were likely a result of the improved reservoir water level and the stocking, the majority of fish sampled were not available for harvest (Figure 8). Severe drought and record low water level were likely responsible for the reduced catch rates in 2012 and 2014.

White Crappie: In the past, White Crappie in the reservoir were overabundant with slow growth (6.4 inch average by age 3) and poor size structure (PSD = 1 (Henegar and Munger 2007). The trap net catch rate for White Crappie in 2014 was 25.4/nn (Figure 9). This is down from 45.4/nn in 2012, and 51.0/nn in 2010 (Figure 9). Size Structure appears to have improved with a shift towards larger individuals; the majority of fish sampled in 2014 were larger than 10 inches in length (Figure 9). Age and Growth analysis showed improved growth of White Crappie; growth at age 3 improved from 6.9 inch average in 2002 and 6.4 inch average in 2007 to 9.8 inch average in 2012 (Figure 10).

Walleye: As natural recruitment in the reservoir is limited, the fishery is maintained by stocking. Declining water level and loss of viable habitat have impacted nearly all species in the reservoir including

Walleye. Gill net catch rates dropped from 4.0/nn in 2011 to 2.2/nn in 2013 and 1.6/nn in 2015 (Figure 11). All fish sampled were legal-size and ranged from 18 to 25 inches (Figure 11).

Fisheries management plan for White River Reservoir, Texas

Prepared – July 2015

ISSUE 1: The Walleye fishery was developed in White River Reservoir through a stocking program beginning in the early 1970s. Due to above optimal water temperatures during the winter cooling period, natural recruitment in the reservoir is limited, and the population needs to be maintained by supplemental stockings.

MANAGEMENT STRATEGY

1. Maintain the Walleye fishery through biennial stockings of 3,000 fry/acre.

ISSUE 2: Historically, the reservoir has had an overabundant White Crappie population with poor size structure and growth. Age and growth data for White Crappie in the reservoir showed that growth slowed from a mean length of 13 inches at age 5 in 1999 (Hutt 2003) to 7 inches at age 5 in 2006 (Henegar and Munger 2007). While the 2014 survey showed a favorable size structure, it is possible that low relative abundance of predatory fish may result in a rapid increase of White Crappie allowing them to become overly abundant.

MANAGEMENT STRATEGIES

1. Monitor White Crappie population with additional trap net survey in 2015 and 2017.
2. Conduct age and growth analysis for White Crappie in 2015 and 2017.

ISSUE 3: The Largemouth Bass fishery in White River Reservoir has suffered from poor recruitment for several years due to declining water level. Recent rains have increased water level and improved conditions at the reservoir.

MANAGEMENT STRATEGIES

1. Monitor Largemouth Bass population with standard electrofishing to determine impact of 2009 and 2012 stocking and lake level fluctuations.
2. Conduct genetic analysis to determine genetic influence from 2009 and 2012 Florida Largemouth Bass stockings.
3. Conduct age and growth analysis of Largemouth Bass.
4. Stock Florida Largemouth Bass fingerlings at a rate of 100/acre in 2016.
5. Write press releases to local media outlets to inform the public about improved conditions at the reservoir due to recent rains and stocking.

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. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes trap net sampling in 2015 and 2017, electrofishing sampling in 2016, gill netting in 2017, a creel survey in spring 2016, and a full standard survey in 2018-2019 (Table 7). The additional electrofishing surveys are necessary to monitor the Largemouth Bass population and determine if additional stockings are required to help mitigate poor recruitment of the fishery. Additional trap net sampling will be used for continued monitoring of White Crappie and to closely monitor age and growth. The additional creel survey will be used to determine angling pressure and preferences.

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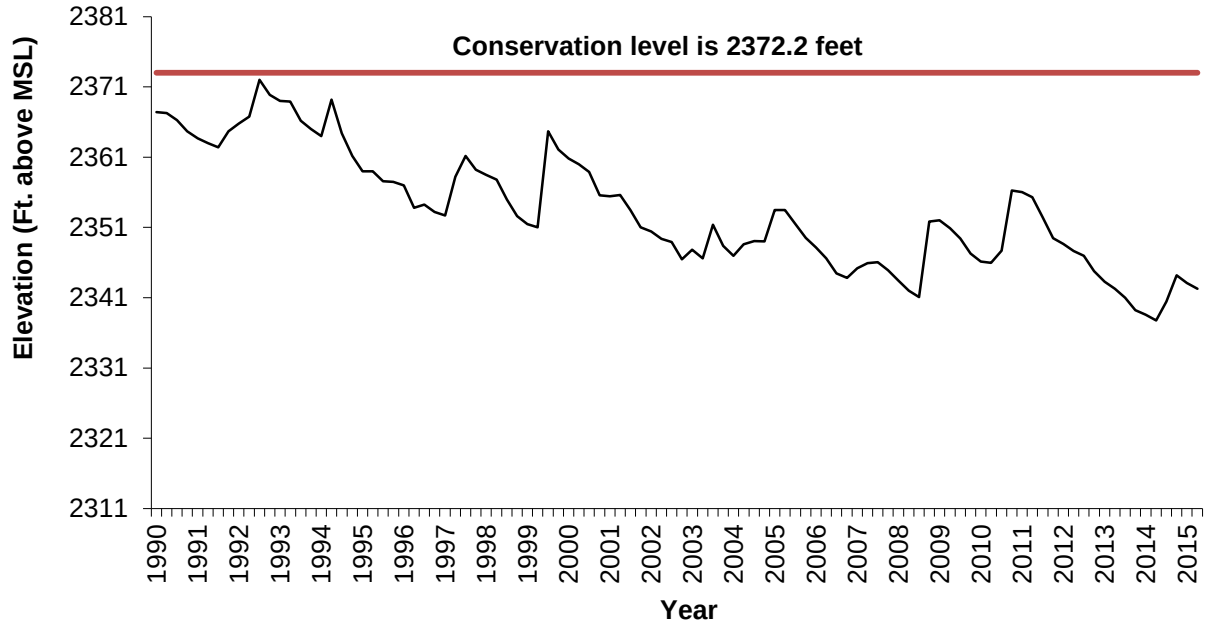


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for White River Reservoir, Texas.

Table 1. Characteristics of White River Reservoir, Texas.

Characteristic	Description
Year constructed	1963
Controlling authority	White River Municipal Water District
County	Crosby
Reservoir type	Mainstream
Mean depth (ft)	11
Maximum depth (ft)	65
Watershed (mi^2)	3,069
Contributing Watershed (mi^2)	689
Shoreline Development Index (SDI)	4.87
Conductivity	1,043 µmhos/cm

Table 2. Boat ramp characteristics for White River Reservoir, Texas, July 2014. Reservoir elevation at time of survey was 2,343 feet above mean sea level. UNK = unknown.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
White River Marina	33.46014 -101.09301	Y	30	UNK	Out of water, unable to extend
River Crest Road (2 ramps)	33.46090 -101.08558	Y	20	UNK	Out of water, unable to extend
Low Water Ramp	33.45996 -101.08340	Y	5	2340	Usable, unable to extend

Table 3. Harvest regulations for White River Reservoir, Texas.

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, White	25	10-inch minimum
Bass: Smallmouth	5	14-inch minimum
Bass: Largemouth	5	14-inch minimum
Crappie: White and Black hybrids and subspecies	25 (in any combination)	10-inch minimum
Walleye	5	Only 2 fish allowed under 16 inches

Table 4. Stocking history of White River Reservoir, Texas. FRY = fry; FGL = fingerling; UNK = unknown.

Year	Number	Size
Blue Catfish		
1970	5,000	UNK
1975	9,300	UNK
Species Total	14,300	
Channel Catfish		
1967	30,000	FGL
1970	9,000	FGL
1972	21,000	FGL
1973	25,000	FGL
1974	10,000	FGL
Species Total	95,000	
Flathead Catfish		
1971	1,500	UNK
1972	1,500	UNK
1973	1,500	UNK
Species Total	4,500	
Green X Redear Sunfish		
1969	3,000	UNK
1970	7,500	UNK
1971	7,500	UNK
1972	1,000	UNK
Species Total	19,000	
Smallmouth Bass		
1979	15,654	UNK
1980	5,212	UNK
1981	50,300	UNK
Species Total	71,166	
Largemouth Bass		
1964	100,000	UNK
1972	15,000	UNK
Species Total	115,000	
Florida Largemouth Bass		
1982	105,000	FGL
2000	200,531	FGL
2003	19,105	FGL
2009	143,705	FGL
2012	37,067	FGL
Species Total	505,408	
Walleye		
1975	500,000	FRY
1976	500,000	FRY
1979	2,456,250	FRY
1980	5,478,500	FRY
1983	5,800,004	FRY
1988	1,515,488	FRY
1989	3,989,200	FRY
1990	3,762,064	FRY
1991	5,000,000	FRY
1994	4,100,000	FRY
2000	58,000	FGL
2005	2,385,745	FRY
2007	2,145,000	FRY
2010	2,958,150	FRY
2012	1,620,000	FRY
Species Total	42,268,401	
Yellow Perch		
1994	200,200	FGL
1996	116,700	FGL
1997	3,745	FGL
Species Total	320,645	
Red Drum		
1975	14,415	UNK

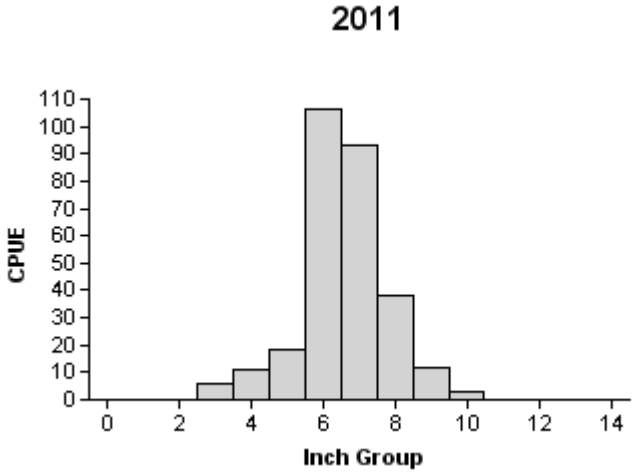
Table 5. Survey of structural habitat types, White River Reservoir, Texas, 2014. Shoreline habitat type units are in miles and standing timber is acres.

Habitat type	Estimate	% of total
Natural/Featureless	13.56 miles	86.81
Rocky	1.3 miles	8.07
Rocky with boat docks	0.61 miles	3.91
Gravel	0.61 miles	1.02
Rock bluff	0.03 miles	0.19
Standing timber	8.90 acres	1.84

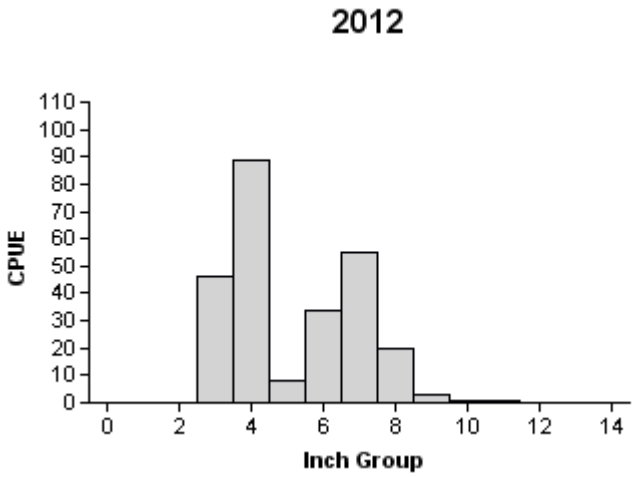
Table 6. Survey of aquatic vegetation, White River Reservoir, Texas, 2014. Surface area estimates are listed in acres.

Vegetation	Estimate	% of total
Open water	332.75	68.75
Native emergent	142.18	29.38
Standing timber, stumps	8.90	1.84
Flooded terrestrial vegetation	0.17	0.17

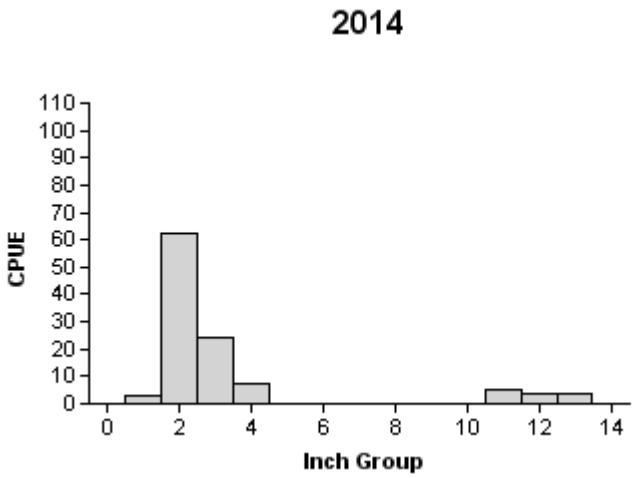
Gizzard Shad



Effort = 1.0
Total CPUE = 287.0 (22; 287)
IOV = 82 (9)



Effort = 1.0
Total CPUE = 257.0 (27; 257)
IOV = 90 (4)



Effort = 1.0
Total CPUE = 109.0 (38; 109)
IOV = 88 (7)

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, White River Reservoir, Texas, 2011, 2012, and 2014.

Bluegill

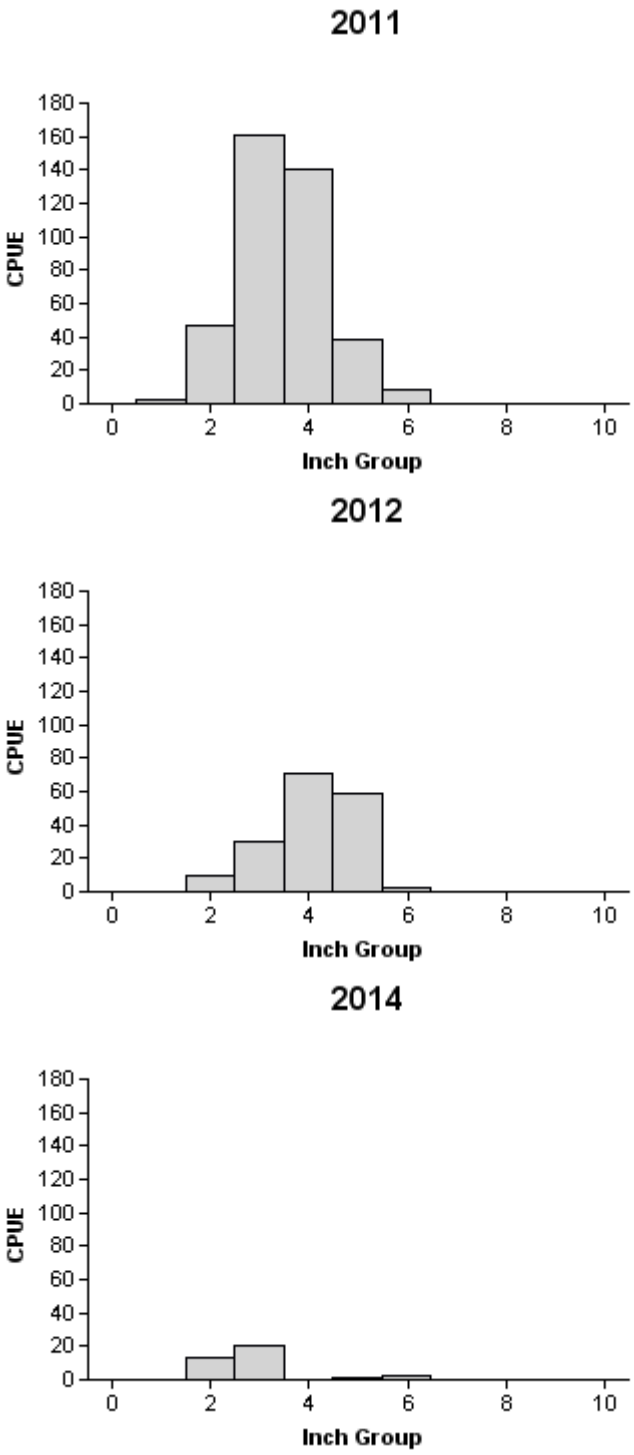


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, White River Reservoir, Texas, 2011, 2012, and 2014.

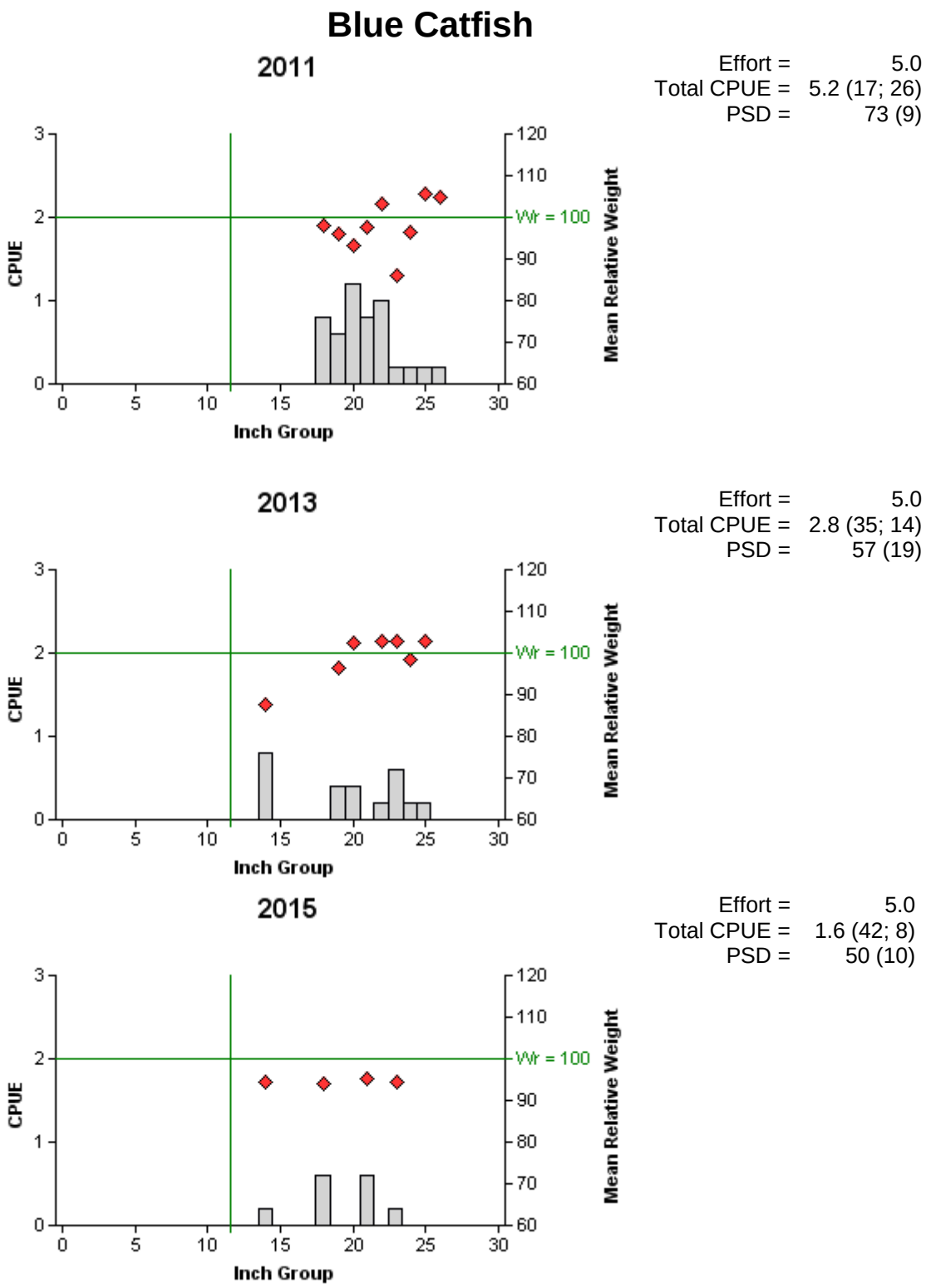


Figure 4. Number of Blue Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, White River Reservoir, Texas, 2011, 2013, and 2015. Vertical line represents length of 12 inches, and horizontal line represents relative weight of 100.

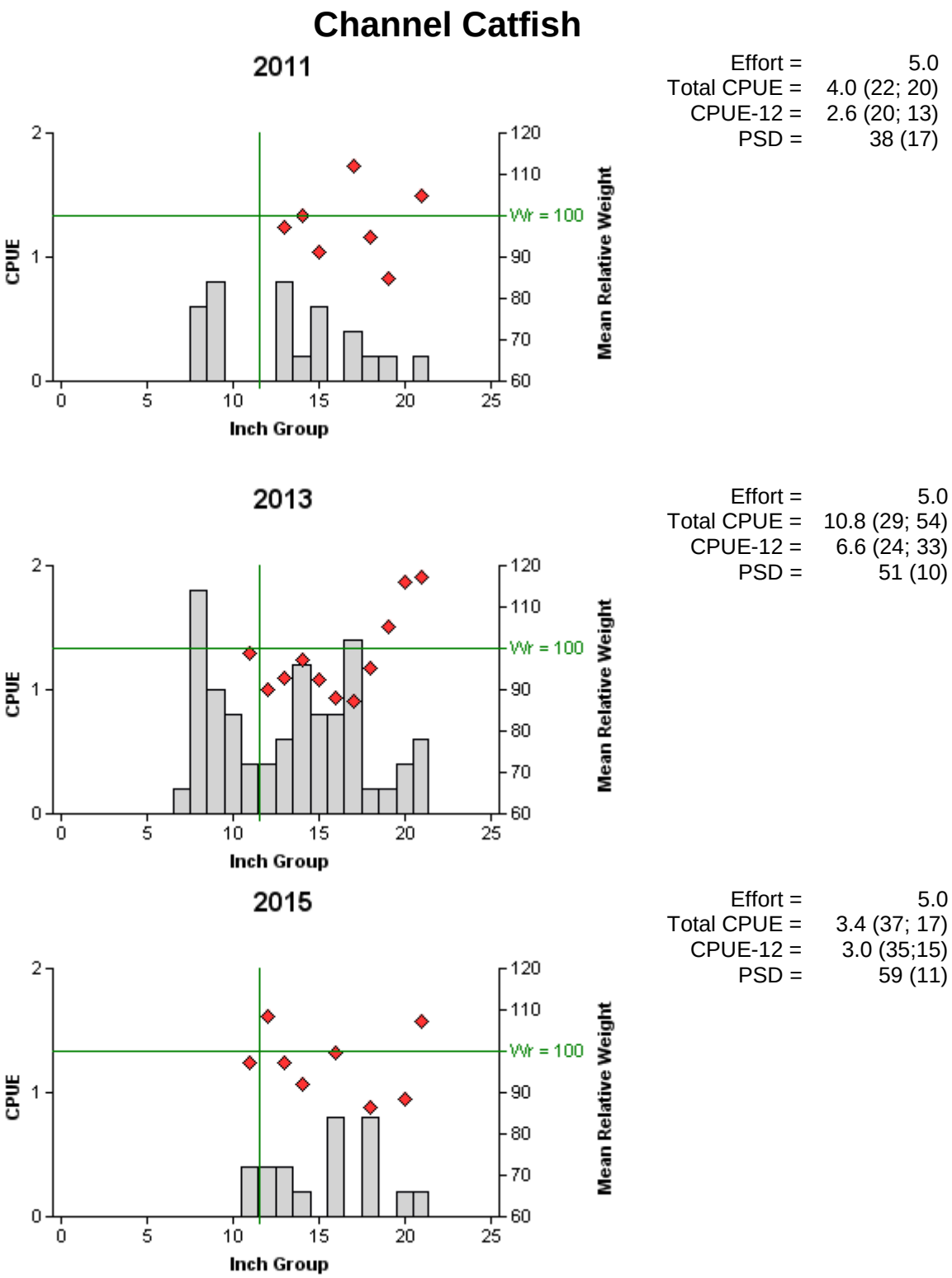


Figure 5. Number of Channel Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, White River Reservoir, Texas, 2011, 2013, and 2015. Vertical line represents length of 12 inches, and horizontal line represents relative weight of 100.

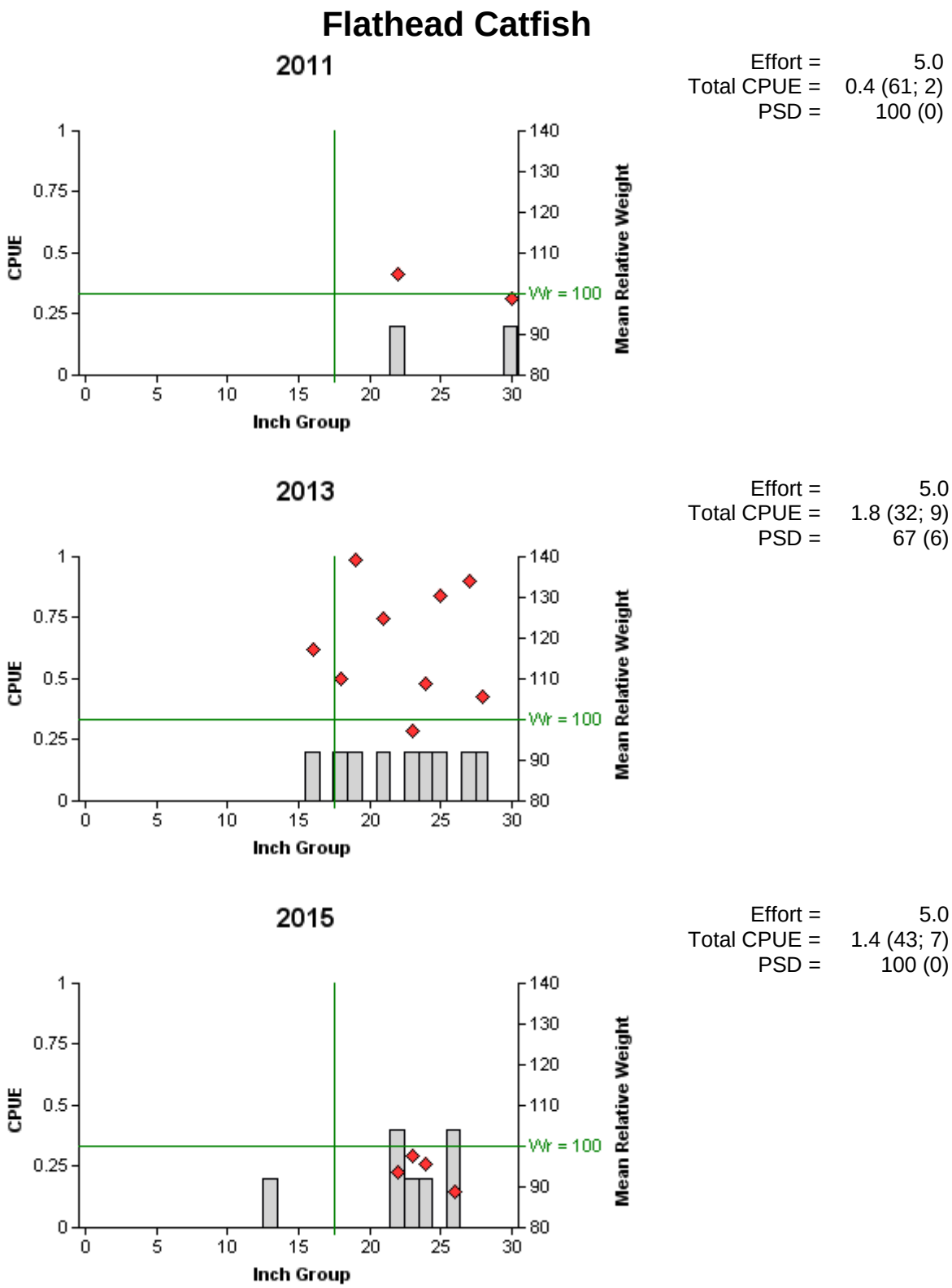


Figure 6. Number of Flathead Catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, White River Reservoir, Texas, 2011, 2013, and 2015. Vertical line represents length of 18 inches, and horizontal line represents relative weight of 100.

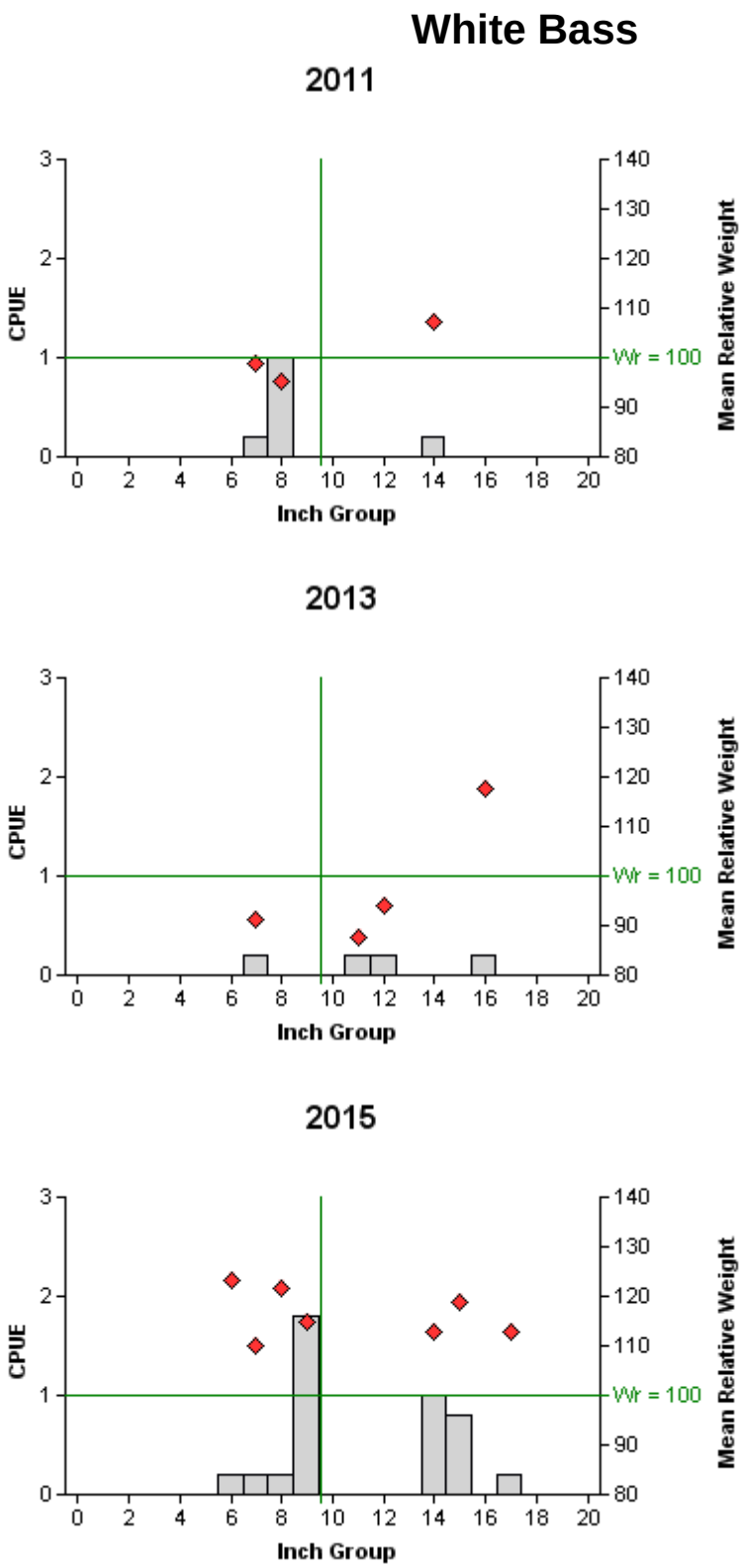


Figure 7. Number of White Bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, White River Reservoir, Texas, 2011, 2013, and 2015. Vertical line represents length of 10 inches, and horizontal line represents relative weight of 100.

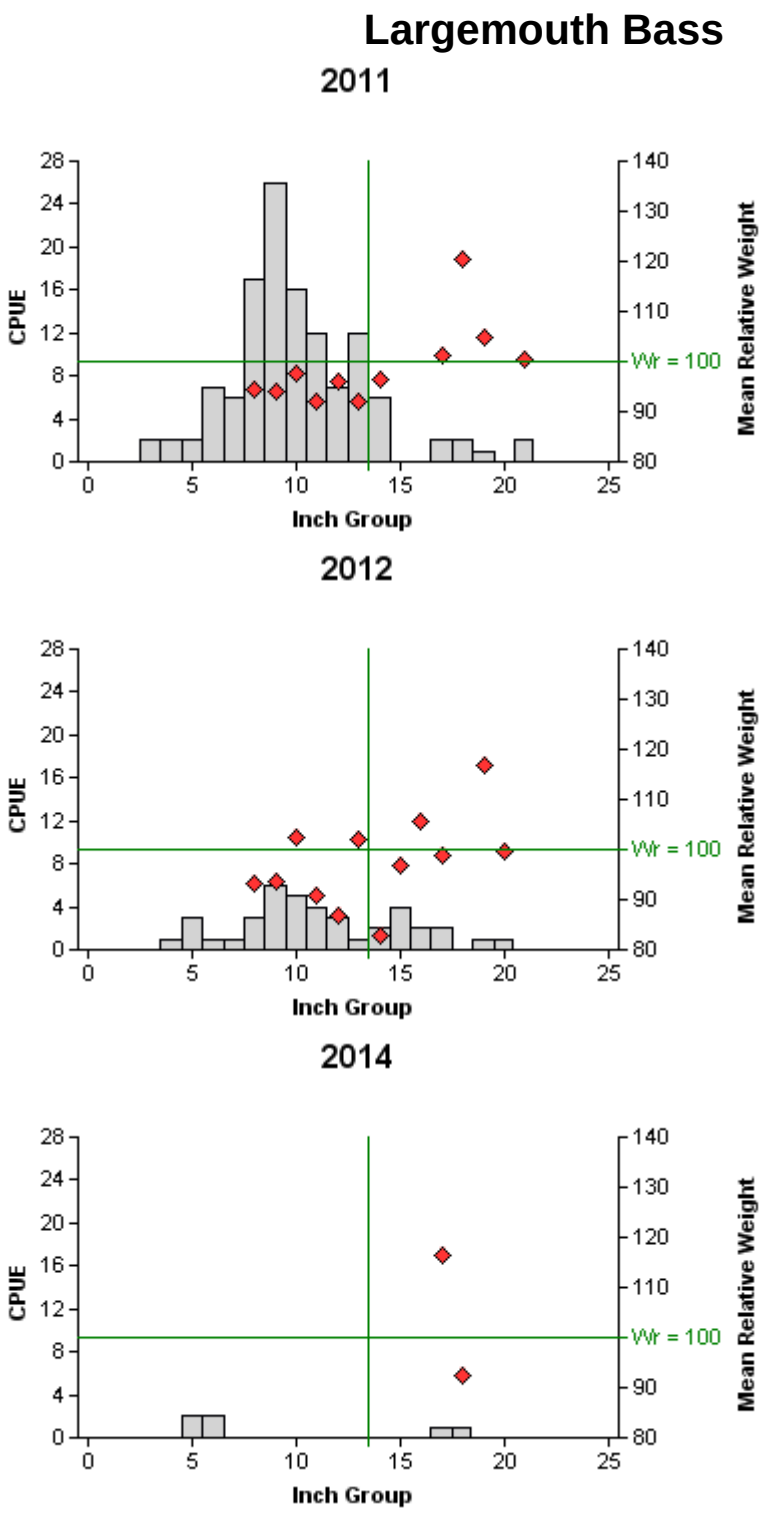


Figure 8. Number of Largemouth Bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, White River Reservoir, Texas, 2011, 2012, and 2014. Vertical line represents length of 14 inches, and horizontal line represents relative weight of 100.

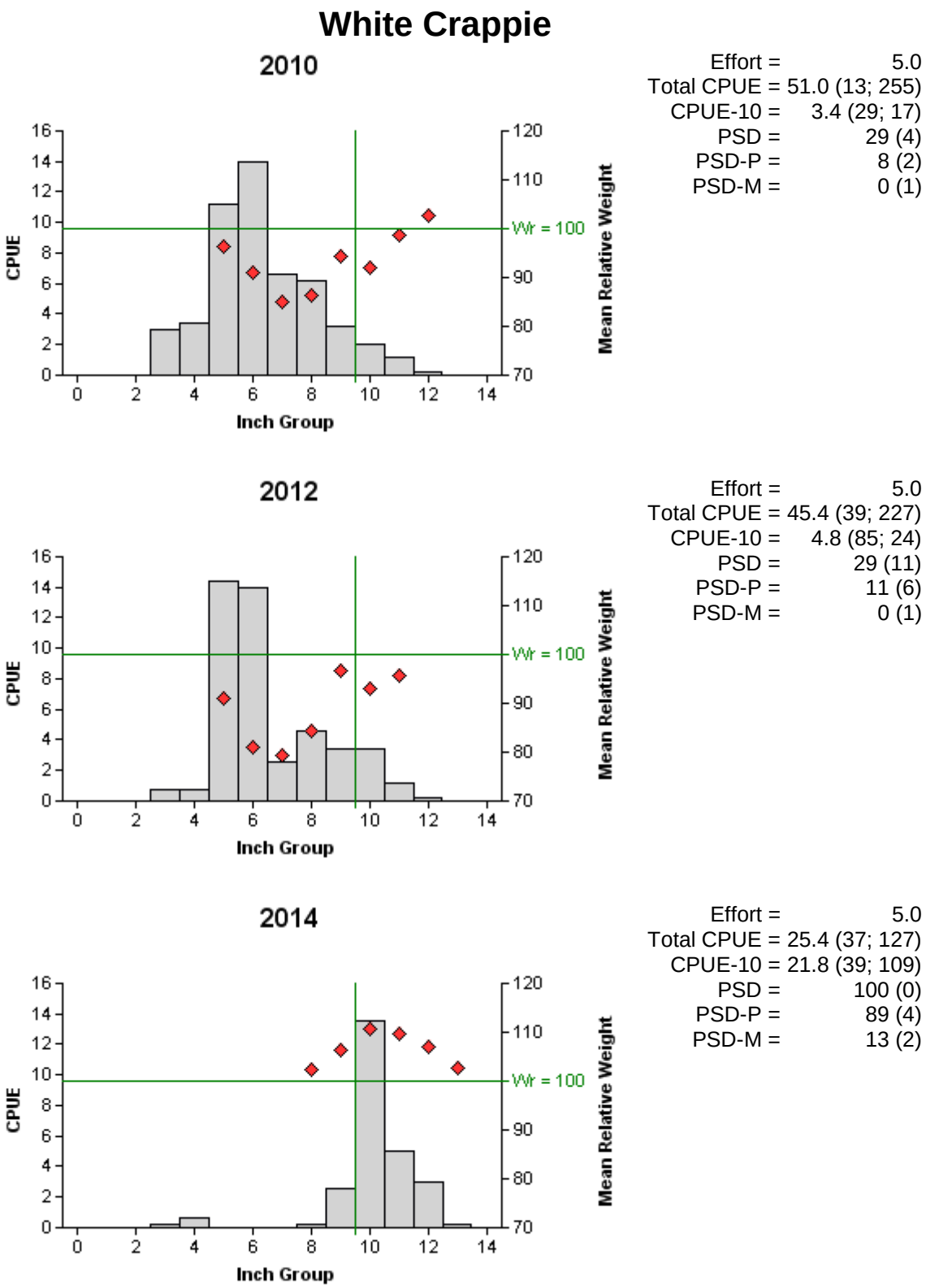


Figure 9. Number of White Crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, White River Reservoir, Texas, 2010, 2012, and 2014. Vertical line represents length of 10 inches, and horizontal line represents relative weight of 100.

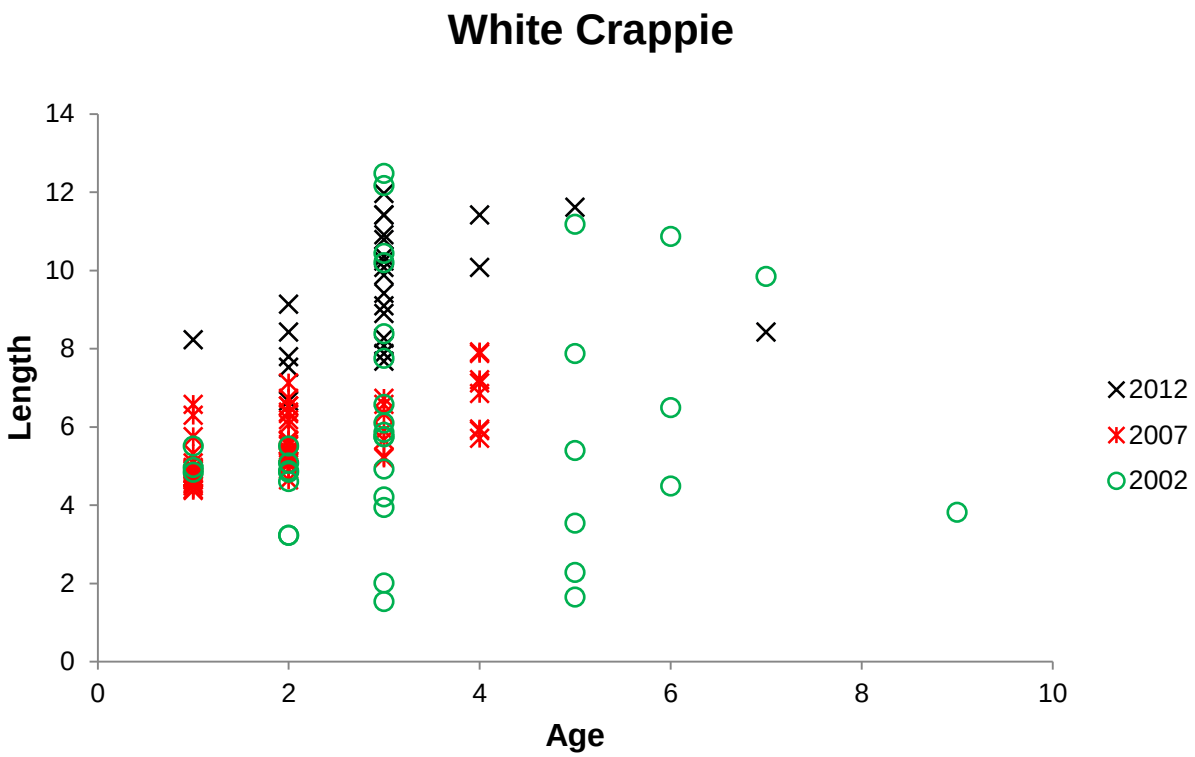


Figure 10. Length at age for White Crappie collected from trap netting at White River Reservoir, Texas, November 2002 (N=47), 2007 (N=60), and 2012 (N=26).

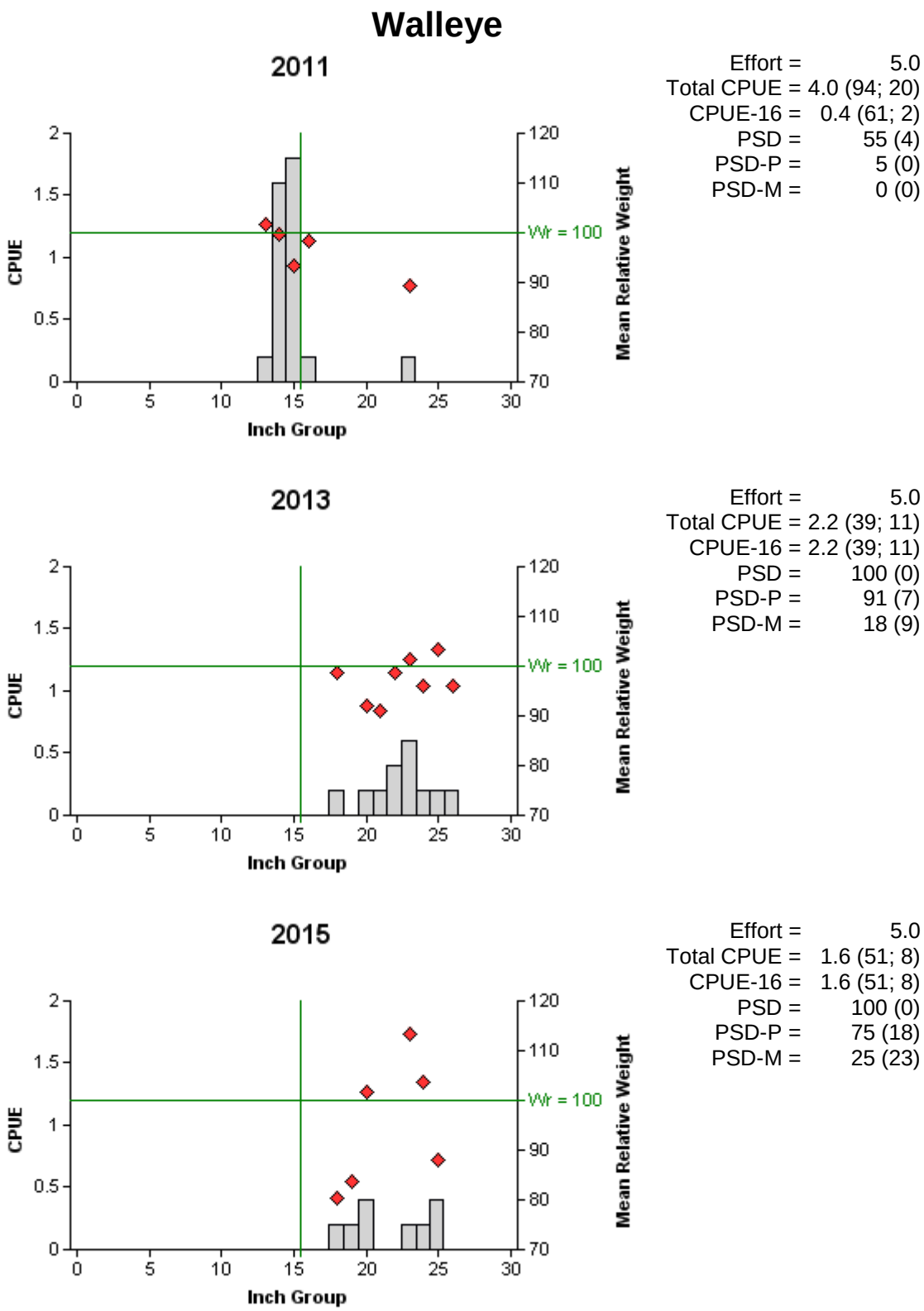


Figure 11. Number of Walleye caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, White River Reservoir, Texas, 2011, 2013, and 2015. Vertical line represents length of 16 inches, and horizontal line represents relative weight of 100.

Table 7. Proposed sampling schedule for White River 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 surveys are denoted by S and additional surveys are denoted by A.

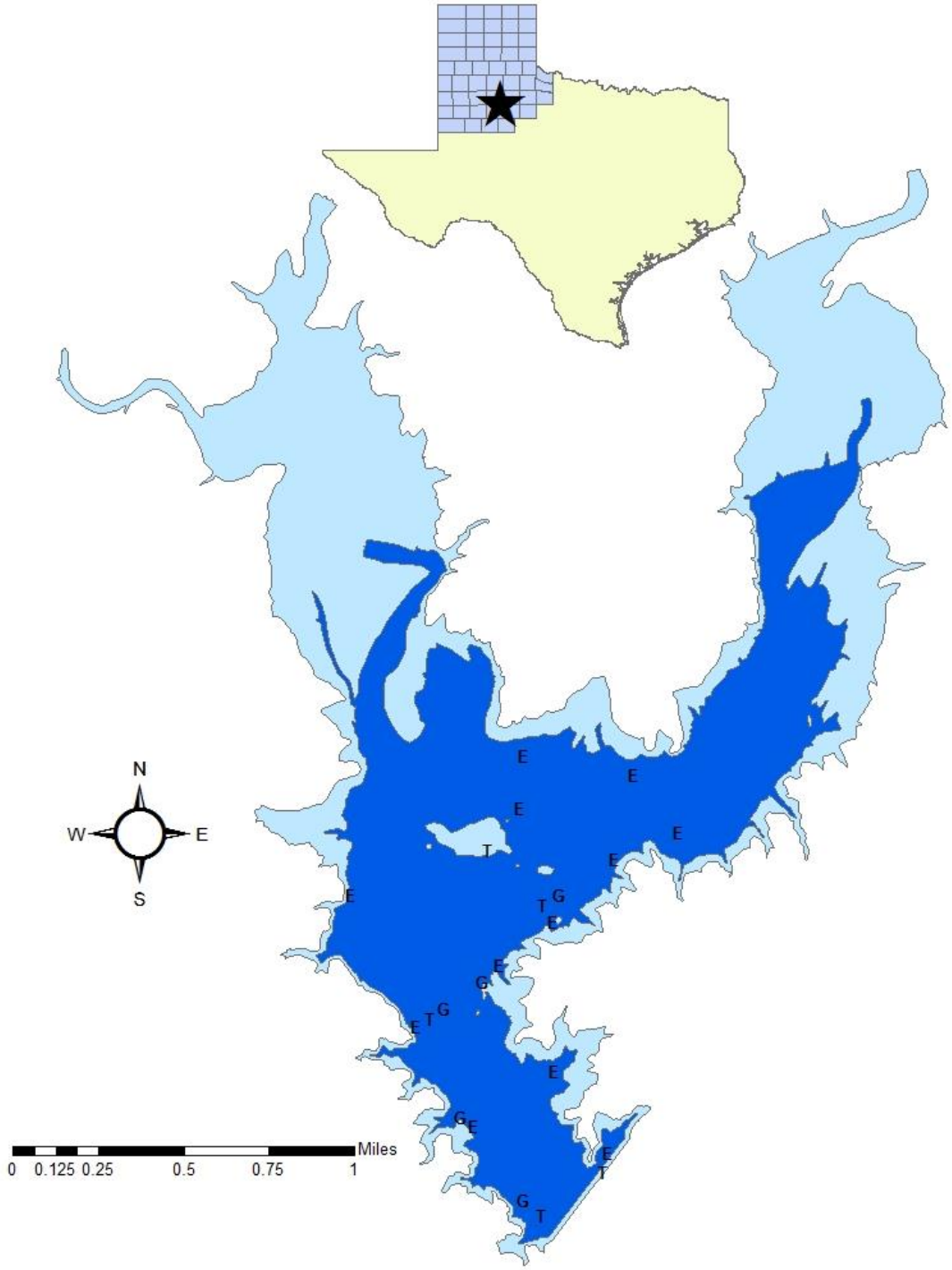
				Habitat				
Survey year	Electrofish	Trap net	Gill net	Structural	Vegetation	Access	Creel survey	Report
2015-2016		A					A	
2016- 2017	A		A					
2017- 2018		A						
2018- 2019	S	S	S	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from all gear types from White River Reservoir, Texas, 2014-2015. Sampling effort was 1 h for electrofishing, 5 net nights for gill nets, and 5 net nights for trap nets.

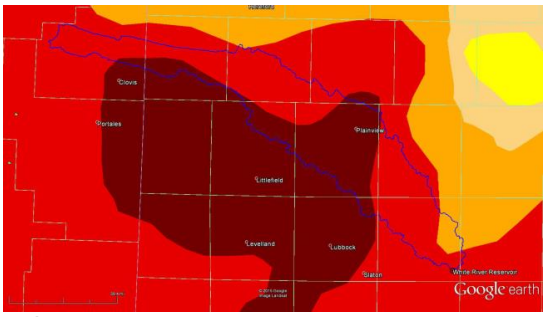
	Electrofishing		Gill Netting		Trap Netting	
Species	CPUE	N	CPUE	N	CPUE	N
Gizzard Shad	109.0	109	25.2	126	0.4	2
Common Carp	226.0	226	2.0	10	0.2	1
Golden Shiner	3.0	3				
River Carpsucker	51.0	51	31.4	157	1.2	6
Blue Catfish			1.6	8		
Channel Catfish	4.0	4	3.4	17		
Flathead Catfish	2.0	2	1.4	7	0.2	1
White Bass			4.4	22		
Green Sunfish	8.0	8				
Bluegill	36.0	36			6.0	30
Longear Sunfish	9.0	9				
Largemouth Bass	6.0	6				
White Crappie	52.0	52	1.8	9	25.4	127
Walleye	1.0	1	1.6	8	0.2	1
Freshwater Drum	7.0	7	0.6	3	0.8	4

APPENDIX B

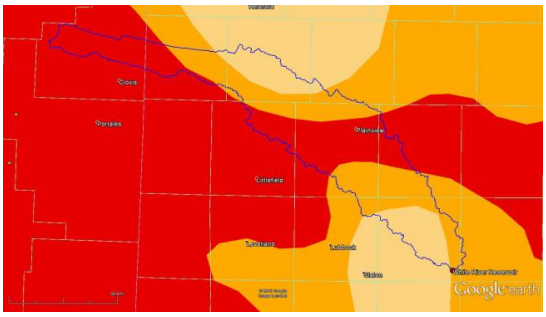


Location of sampling sites, White River Reservoir, Texas, 2014-2015. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Light blue color represents lake at conservation pool (2,372.2 ft MSL), and dark blue represents lake level during sampling (2,343 ft MSL).

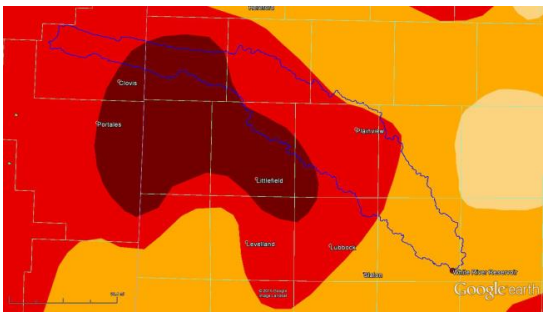
APPENDIX C



February 2012



August 2012



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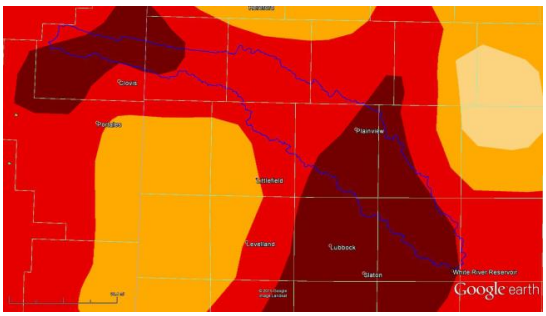

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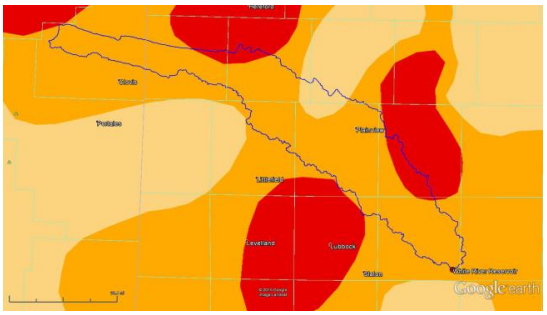

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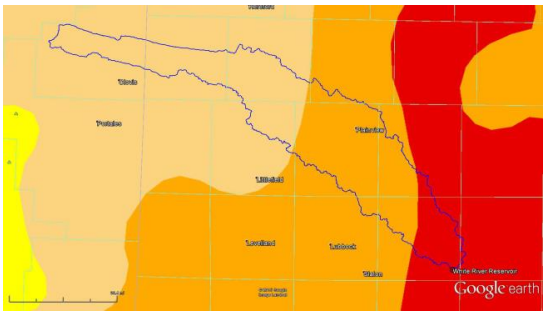

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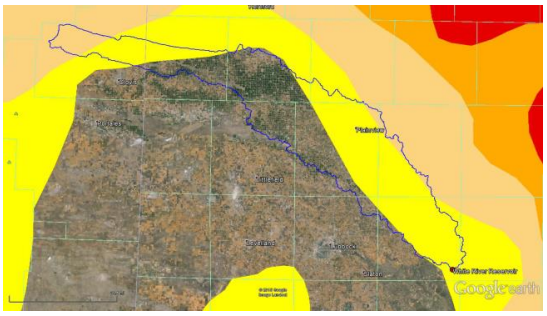

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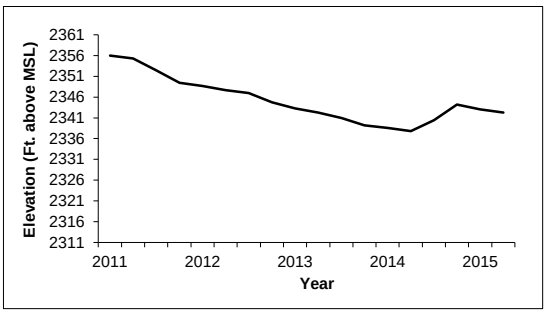

Reservoir elevation in feet above mean sea level (MSL) for White River Reservoir, Texas.

Level of drought on White River Reservoir watershed (outlined in blue) from February 2012 to February 2015. Intensity: - Abnormal - Moderate - Severe - Extreme - Exceptional. Data obtained from the National Drought Mitigation Center (NDMC), the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA).