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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2014 Fisheries Management Survey Report

Lake Halbert

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Halbert were surveyed in 2014 using electrofishing and trap netting and in 2015 using gill netting. Vegetation and angler access surveys were conducted in August 2014. This report summarizes results of these surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Lake Halbert is a 531-acre reservoir on Elm Creek, a tributary of the Trinity River, constructed by the City of Corsicana in 1921 to provide water for municipal and industrial purposes. Boat access is adequate, and a fishing pier is available. In addition, shoreline access is available in the park along the west bank. A prolonged drought in 2005-2006 reduced reservoir capacity to approximately 28% and the reservoir was closed to recreation. Littoral habitat fluctuates accordingly with water level.

- **Management History:** Important sport fish include White Bass, Palmetto Bass, , White Crappie, and catfish. Due to limited natural littoral habitat, partners have been sought to collaborate and construct artificial habitat structures, however, no interested parties have been identified to date. Local news media outlets have been contacted regarding the Blue Catfish fishery potential, since the first collection of Blue Catfish in 2003. The city of Corsicana (controlling authority) was notified of the potential spread of invasive species following the construction of a pipeline connecting Lake Halbert to Richland Chambers Reservoir

- **Fish Community**
  - **Prey species:** Threadfin Shad were present in the reservoir. Electrofishing catch of Gizzard Shad was excellent, and most were available as prey to sport fish. Electrofishing catch of Bluegills was low, however all Bluegills were under 4 inches and available to most sport fish.

  - **Catfishes:** Blue Catfish were not collected prior to 2003 but since have become the dominant catfish species. Channel Catfish continue to exhibit low abundance and few are of legal length. Flathead Catfish were present in the reservoir.

  - **White Bass**: White Bass continued to exhibit inconsistent recruitment and low abundance, likely due to limited spawning habitat. Body condition from the 2015 survey was above average, and over half of the fish were > 15 inches.

  - **Largemouth Bass:** Largemouth Bass were present in low numbers and few legal-size fish were available to anglers. Body condition was average. Largemouth Bass have historically persisted at low densities in Lake Halbert.

  - **Crappie:** Black Crappie were present, but at very low density. Trap net catch rate of White Crappie was good in the 2014 survey. Both size distribution and Wr of White Crappie were also good. Growth of White Crappie was excellent, with most fish reaching legal size after one year.

- **Management Strategies:** Collect additional Blue Catfish data through low-pulse electrofishing in 2016 to further characterize population size structure. Conduct general monitoring surveys with trap nets, gill nets, and electrofishing surveys in 2018-2019. Promote the potential Blue Catfish and White Crappie fisheries through appropriate media outlets. Inform the public about the negative impacts of aquatic invasive species. Access and vegetation surveys will be conducted in 2018.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Halbert 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 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

Lake Halbert is a 531-acre impoundment constructed in 1921 on Elm Creek, a tributary of the Trinity River. It is located in Navarro County approximately 1 mile southeast of Corsicana and is operated and controlled by the city of Corsicana. Primary water uses included municipal water supply and recreation. Other descriptive characteristics for Lake Halbert are presented in Table 1. High turbidity and frequent water level fluctuations limit growth of submersed aquatic vegetation and likely has a negative impact on Largemouth Bass reproduction. A prolonged drought in 2005-2006 reduced reservoir capacity to approximately 28% and the reservoir was temporarily closed to recreation. (Figure1).

Angler Access

Lake Halbert has one public boat ramp and no private ramps. Additional boat ramp characteristics are available in Table 2. A fishing pier is available and accessed near the boat ramp. In addition, good shoreline access is available in the park along the west bank.

Management History

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

1. Continue soliciting assistance from area angling clubs in constructing and deploying structure based habitat.
   Action: No interested local outdoor and angling groups were discovered.
2. Promote the Blue Catfish fishery through media outlets and monitor population changes through spring gill netting in 2015.
   Action: Local media contacts were notified of the potential fishery Lake Halbert possesses, and gill netting was conducted in March, 2015.
3. Maintain communication with the City of Corsicana to determine when the proposed pipeline to Richland-Chambers Reservoir becomes operational.
   Action: Communications have been maintained with the city of Corsicana. City officials were informed of the new possible means of transportation of invasive species through the pipeline. City officials have monitored boat ramp area for Zebra Mussels.

Harvest regulation history: All sport fishes in Lake Halbert are managed with statewide harvest regulations (Table 3). Regulations have not changed since the last survey.

Stocking history: Lake Halbert was first stocked with Florida Largemouth Bass in 1974 and was restocked in 1992, 1995 and 1998 (Table 4). Coppernose Bluegill were stocked once in 1983. A management stocking of Threadfin Shad was conducted in 1990 and 1991 to bolster the prey base within Lake Halbert.

Water transfer: Lake Halbert is used primarily as a water supply for municipal and industrial purposes, and for flood control. There is currently one permanent pump station and treatment facility on the reservoir. An additional 36 inch pipeline connects Lake Halbert directly to Richland-Chambers Reservoir.

The pipeline allows water to be pumped directly from Richland Chambers Reservoir to the City of Corsicana water treatment facility, or be diverted first to Lake Halbert and then to the water treatment facility. The City of Corsicana maintains a second permanent pump station and treatment facility on Navarro Mills Reservoir. Water from the two sources are blended after leaving the treatment facilities but prior to distribution. Treated effluent from the City of Corsicana waste-water treatment plant is discharged into Richland-Chambers Reservoir. No interbasin transfers are known to exist.

METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations) and gill 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/h) 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 2014).

A Vegetation survey was conducted in August 2014 to monitor the aquatic macrophyte community. Habitat 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). 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. White Crappie ages were determined using otoliths from 13 specimens ranging from 9.1-10.7 inches.

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

RESULTS AND DISCUSSION

Habitat: The aquatic plant community structure was comparable to the previous report (Ott and Bennett 2011). Emergent species are still the dominant growth form. Smartweed, water willow and American lotus occupied approximately 6% of the reservoir surface area (Table 5). Other emergent species identified included bulrush and cattail. Pondweed was the only submersed species identified, occurring in small, isolated patches along the shoreline of the city park. Low species diversity and overall coverage of aquatic vegetation is likely due to turbidity and frequent water level fluctuation. Giant reed had previously been identified in 2010, but was absent during the 2014 survey. Bister and Ott (2003) reported that most of the shoreline habitat was featureless with 13% riprap by length.

Prey species: Electrofishing catch rates of Bluegill and Gizzard Shad were 20.0/h and 924.0/h, respectively. Index of vulnerability (IOV) for Gizzard Shad was excellent, with 99% of Gizzard Shad available to existing predators; this was comparable to IOV estimates in previous years (Figure 2). Total CPUE of Gizzard Shad was substantially higher in 2014 than the previous two surveys (2010, 2002) (Figure 2). Total CPUE of Bluegill in 2014 was comparable to the previous surveys in 2010 and 2002, and size structure continued to be dominated by small individuals (Figure 3).

Catfish: Blue Catfish were not collected at Lake Halbert in surveys prior to 2003 but have become the dominant catfish species since that time. No recorded stocking of Blue Catfish has been conducted by TPWD, so the mechanism of introduction is unknown. Gill net catch rate in 2015 (4.4/nn) was comparable to the previous survey (2010, 6.8/nn; Figure 4). Relative weight continues to be moderate

($W_r \geq 90$) for most size classes indicating adequate prey availability. Channel Catfish CPUE (0.9/nn) was slightly down from the previous survey (2.2/nn, 2011; Figure 5), but remains comparatively representative of a low density population.

White Bass: The gill net catch rate of White Bass was 2.2/nn in 2015, slightly up from 0.8/nn in 2011 (Figure 6). Catch rates indicated that White Bass continue to be present at low densities in the reservoir. Of the 22 fish collected in 2015, 13 specimens were ≥ 15 inches and body condition was good for most individuals. The prolonged drought and low water levels between 2007-2014 (Figure 1) limited tributary connectivity to Lake Halbert, resulting in limited incoming flow rates and likely, White Bass reproduction.

Largemouth Bass: Lake Halbert continues to support a low density Largemouth Bass population, likely due to limited littoral habitat and overall turbid water. The electrofishing catch rate of stock-length fish was 15/h in 2014, slightly down from 30/h in the 2010 sample (Figure 7). Size structure has remained adequate over the last two surveys; PSD = 57 and 67 in 2010 and 2014 respectively. Body condition has continued to fluctuate, but has remained at least moderate (Wr ≥ 85), over the last two surveys; small sample size likely has some affect on this.

Crappie: Black Crappie were present in the reservoir at a very low density; only one specimen was collected during the 2014 trap net survey. Trap net catch rate of White Crappie was 34.2/nn in 2014, up from 9.8/nn in 2010 (Figure 8). Almost 20% of fish collected in 2014 were of legal size (PSD-P = 19) However, Lake Halbert continues to contain a large number of sub-legal, 8-9 inch fish, with PSD's of 97 and 95 in 2010 and 2014 respectively. Relative weights remain moderate across all size classes (Wr ≥ 90). White Crappie growth was fast; average age at 10 inches (9.1 to 10.7 inches) was 1.0 year (N = 13; Range = all fish were age 1).

Fisheries management plan for Lake Halbert, Texas

Prepared – July 2015.

ISSUE 1: Blue Catfish numbers have increased since their first identification in 2003, however all fish collected in the most recent survey were ≥ 13 inches. The lack of smaller individuals may suggest limited recruitment.

MANAGEMENT STRATEGY

1. Conduct summertime low-pulse electrofishing in 2016 and standard spring gill netting in 2019 to further analyze Blue Catfish relative abundance and size structure.
2. Promote the potential Blue Catfish fishery through media outlets.

ISSUE 2: Lake Halbert contains a good White Crappie population, and has the potential to offer a very good crappie fishery.

MANAGEMENT STRATEGIES

1. Promote the potential White Crappie fishery through media outlets.

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 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 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.
6. Maintain contact with the controlling authority regarding periodic Zebra mussel inspections at the boat ramp.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes additional low-pulse electrofishing in 2016 and mandatory monitoring in 2018/2019 (Table 6). Additional electrofishing survey in 2016 is required to assess the presence of juvenile Blue Catfish not detected in standard gill netting. Gill net, trap net and standard electrofishing surveys will be conducted every four years to monitor presence or absence of Largemouth Bass, Channel Catfish, White Bass and prey species, plus monitor abundance and size structure of Blue Catfish and crappie.

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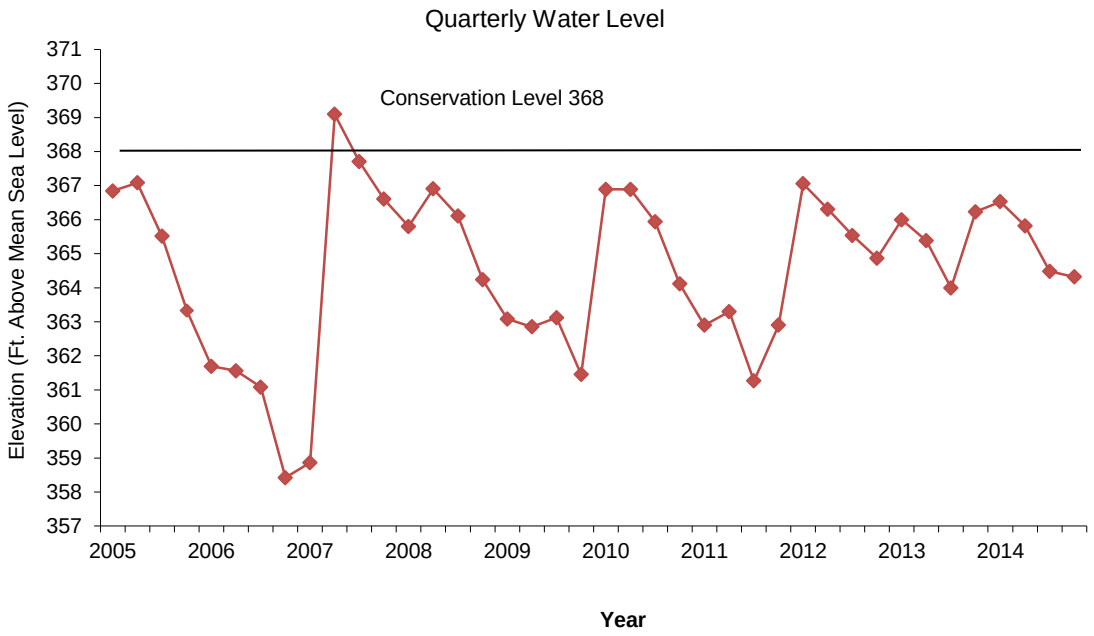


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Halbert, Texas.

Table 1. Characteristics of Lake Halbert, Texas.

Characteristic	Description
Year completed	1921
Controlling authority	City of Corsicana
County	Navarro
Reservoir type	Tributary
Shoreline Development Index (SDI)	1.8
Conductivity	280 umhos/cm

Table 2. Boat ramp characteristics for Lake Halbert, Texas, August, 2014. Reservoir elevation at time of survey was 364 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
City Park	32.071922 -99.416653	Y	15	361.5	Excellent, no access issues

Table 3. Harvest regulations for Lake Halbert, 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 Lake Halbert, Texas. FGL = fingerling; ADL = adults.

Species	Year	Number	Size
Threadfin Shad	1990	3,367	ADL
	1991	2,700	ADL
	Total	6,067	
Bluegill (copper nose)	1983	35,000	FGL
	Total	35,000	
Florida Largemouth Bass	1974	32,000	FGL
	1975	25,000	FGL
	1992	59,984	FGL
	1995	66,340	FGL
	1998	65,289	FGL
	Total	248,613	

Table 5. Survey of aquatic vegetation, Lake Halbert, Texas, 2010 and 2014. Surface area (acres) is listed with percent of total reservoir surface area in parentheses; tr = trace amount.

Vegetation	2010	2014
Native submersed		
Pondweed	9 (1.8)	2 (0.4)
Native emergent		
Bulrush	tr	1 (0.2)
Cattail	<1(<0.1)	1 (0.2)
Smartweed	28 (5.3)	15 (3.1)
Water willow	tr	8 (1.7)
American lotus	<1 (0.1)	7 (1.4)
Non-native		
Giant reed (Tier III)*	<1 (0.1)	

*Tier III is Watch Status

Gizzard Shad

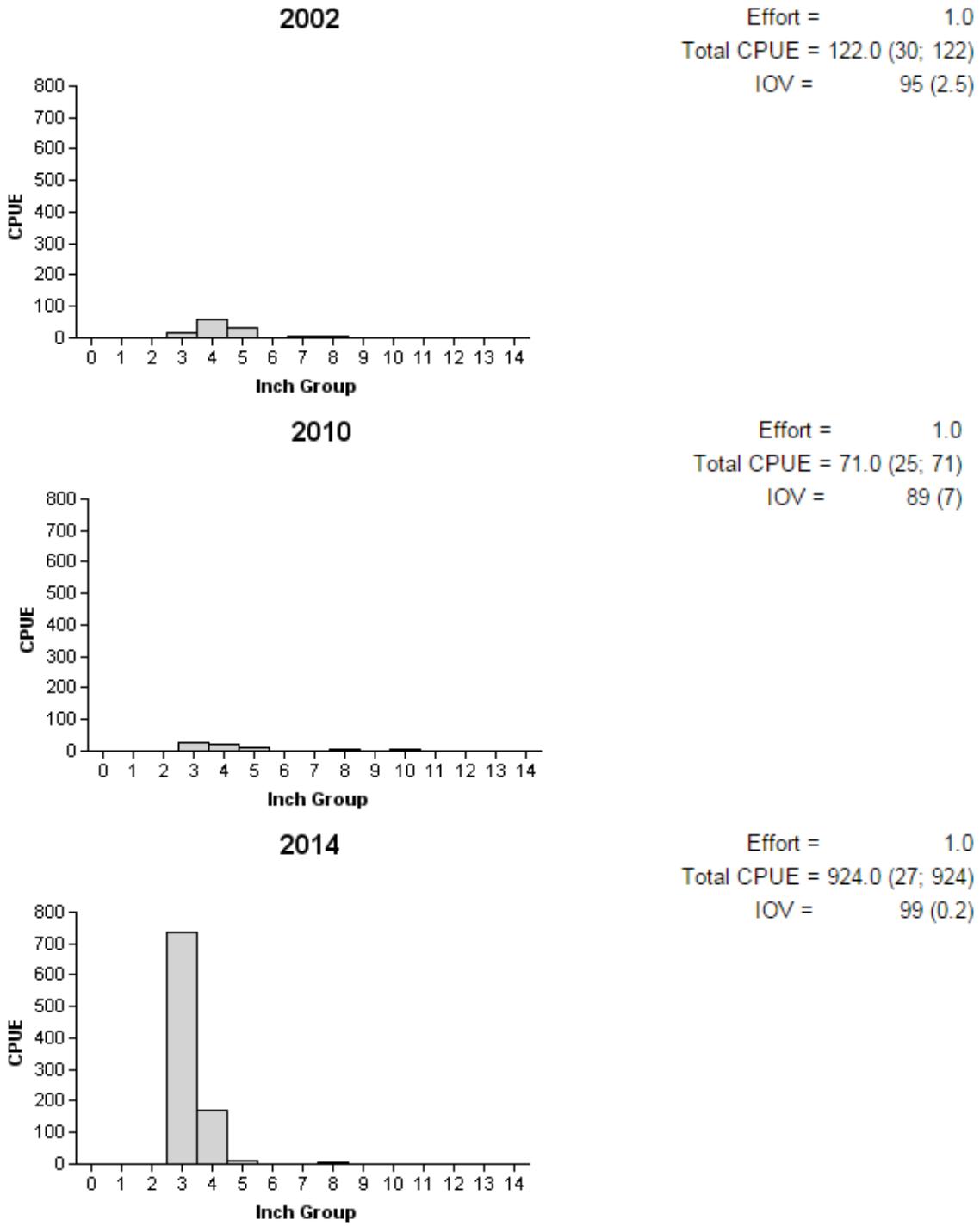


Figure 2. Number of Gizzard Shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Halbert, Texas, 2002, 2010, and 2014.

Bluegill

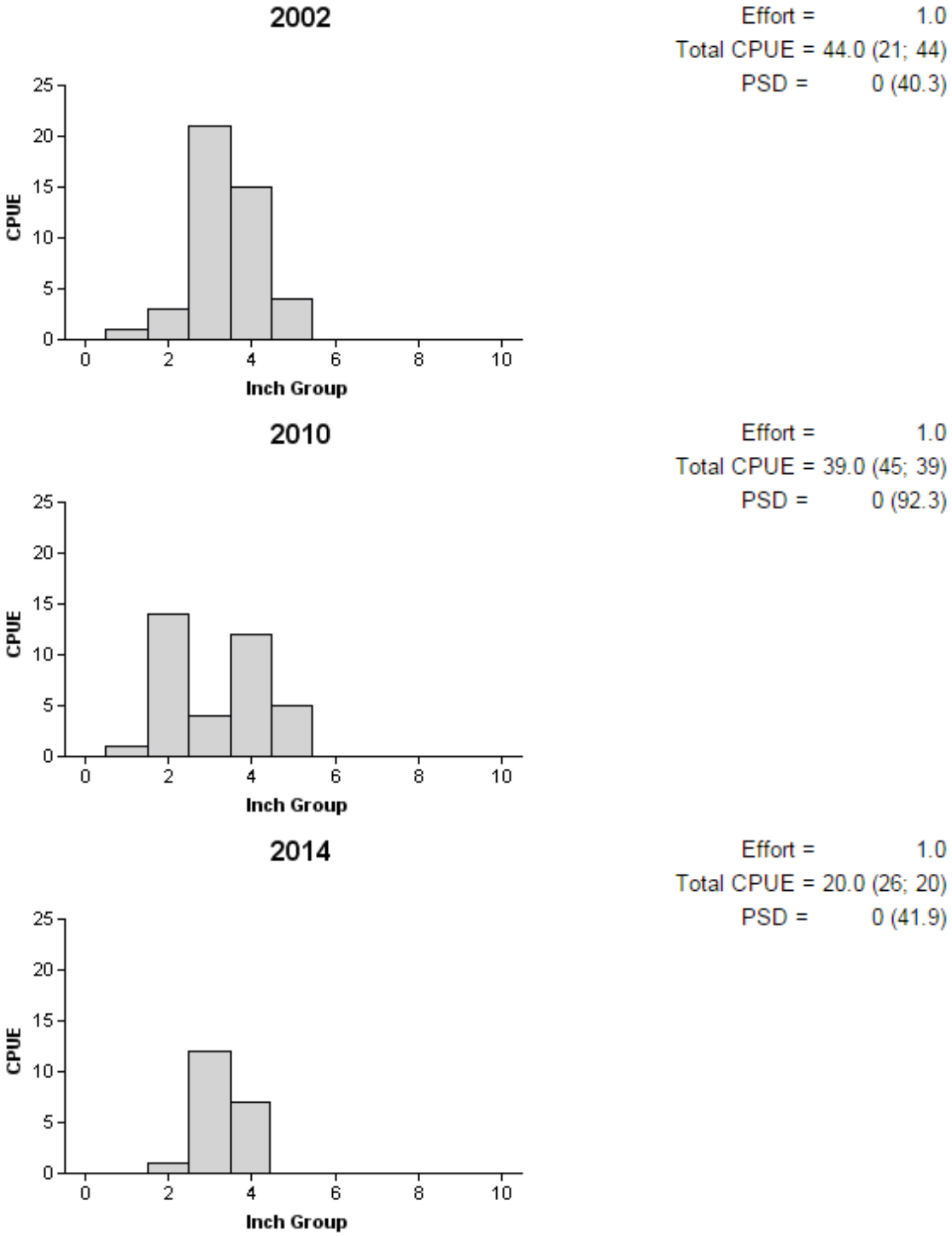


Figure 3. Number of Bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for PSD are in parentheses) for fall electrofishing surveys, Lake Halbert, Texas, 2002, 2010, and 2014.

Blue Catfish

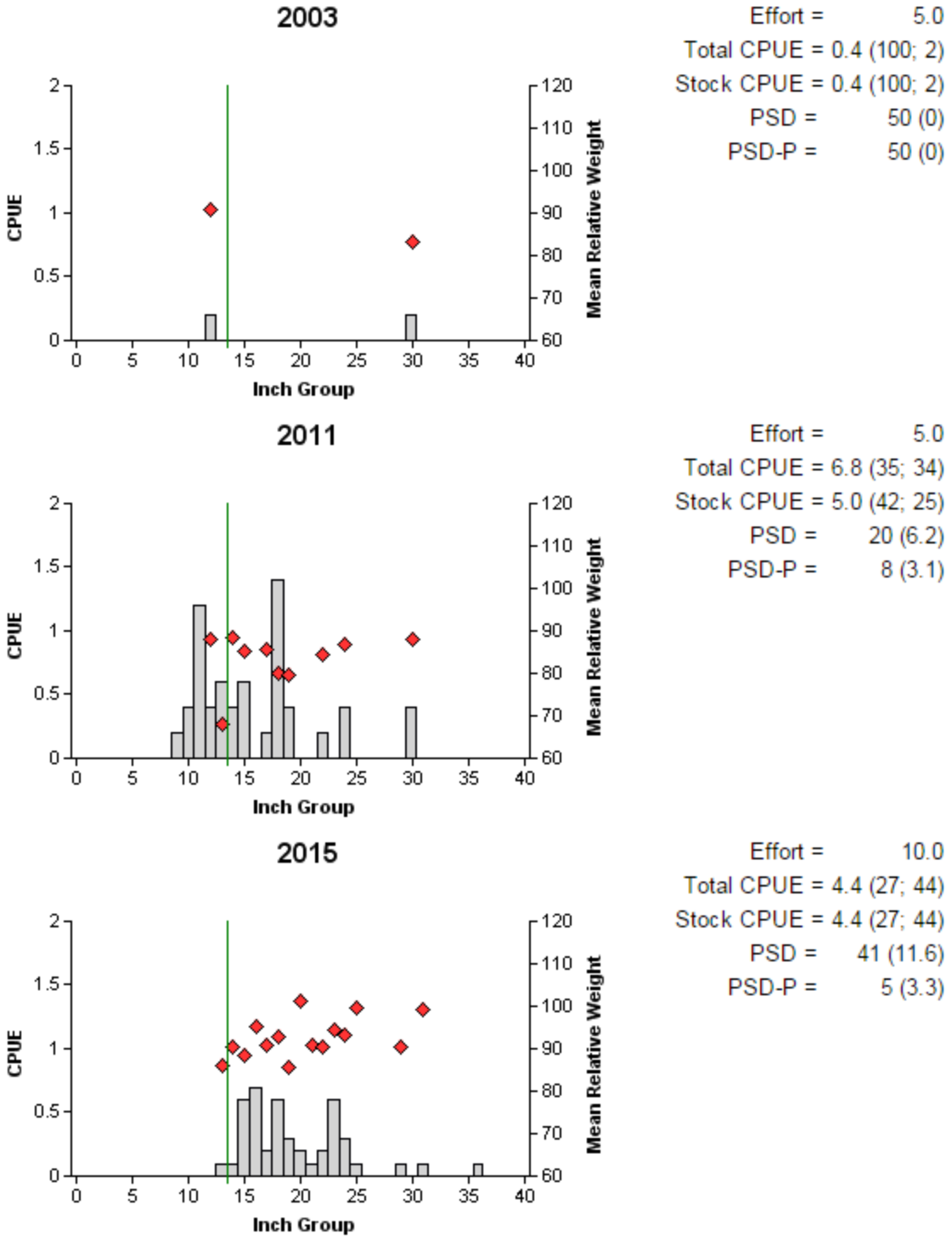


Figure 4. Number of Blue Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for PSD are in parentheses) for spring gill netting surveys, Lake Halbert, Texas, 2003, 2011, and 2015.

Channel Catfish

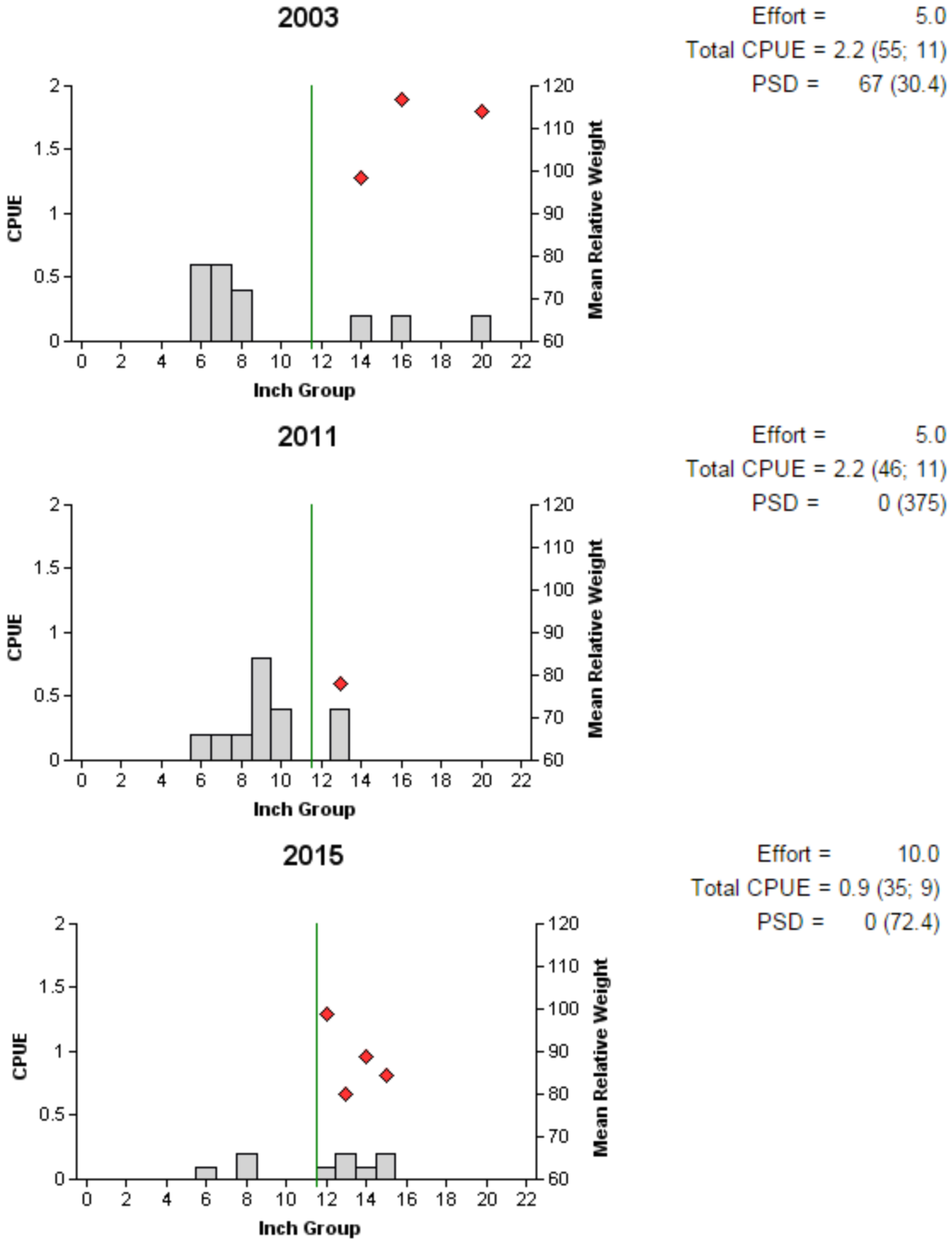


Figure 5. Number of Channel Catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for PSD are in parentheses) for spring gill netting surveys, Lake Halbert, Texas, 2003, 2011, and 2015.

White Bass

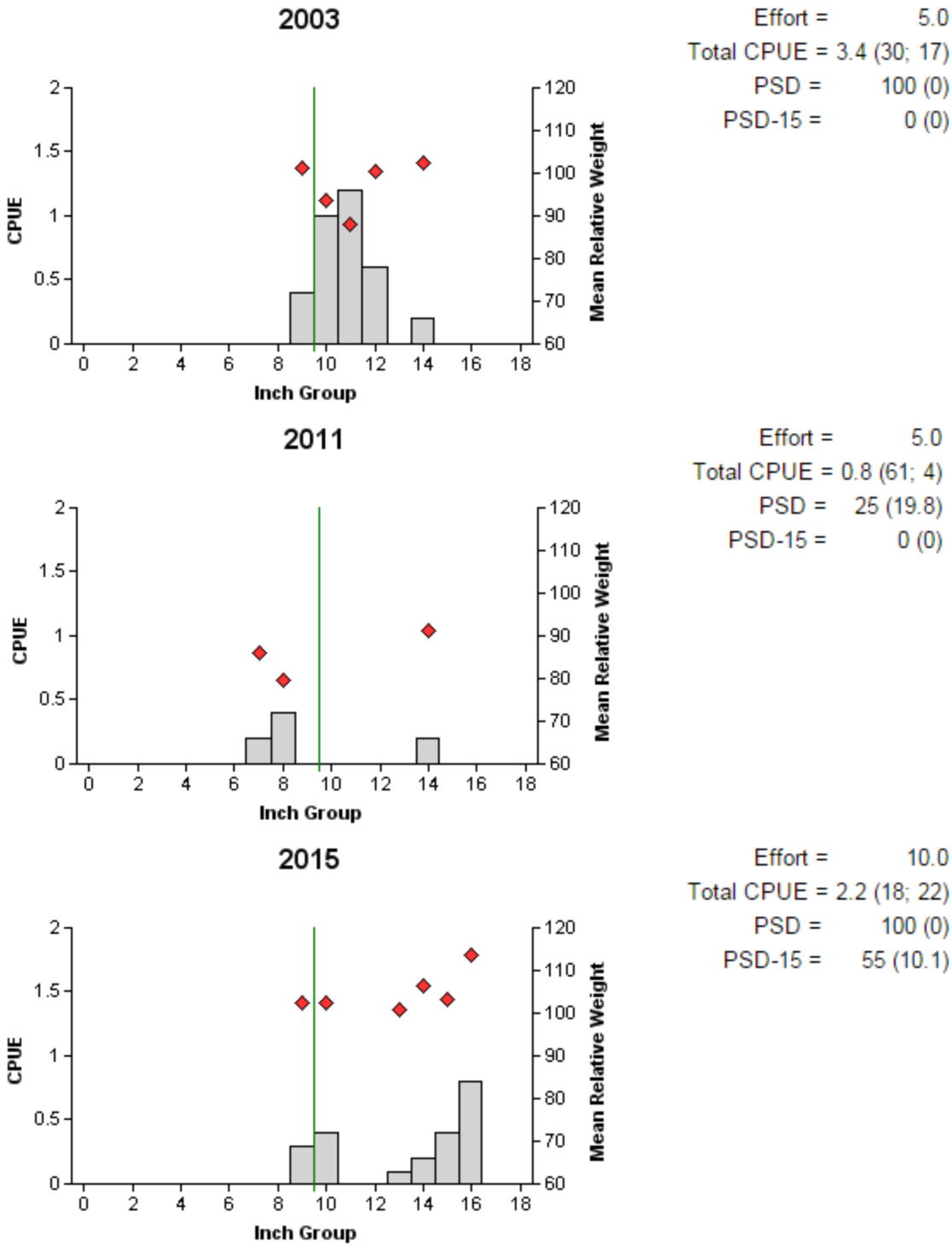


Figure 6. Number of White Bass caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for PSD are in parentheses) for spring gill netting surveys, Lake Halbert, Texas, 2003, 2011, and 2015.

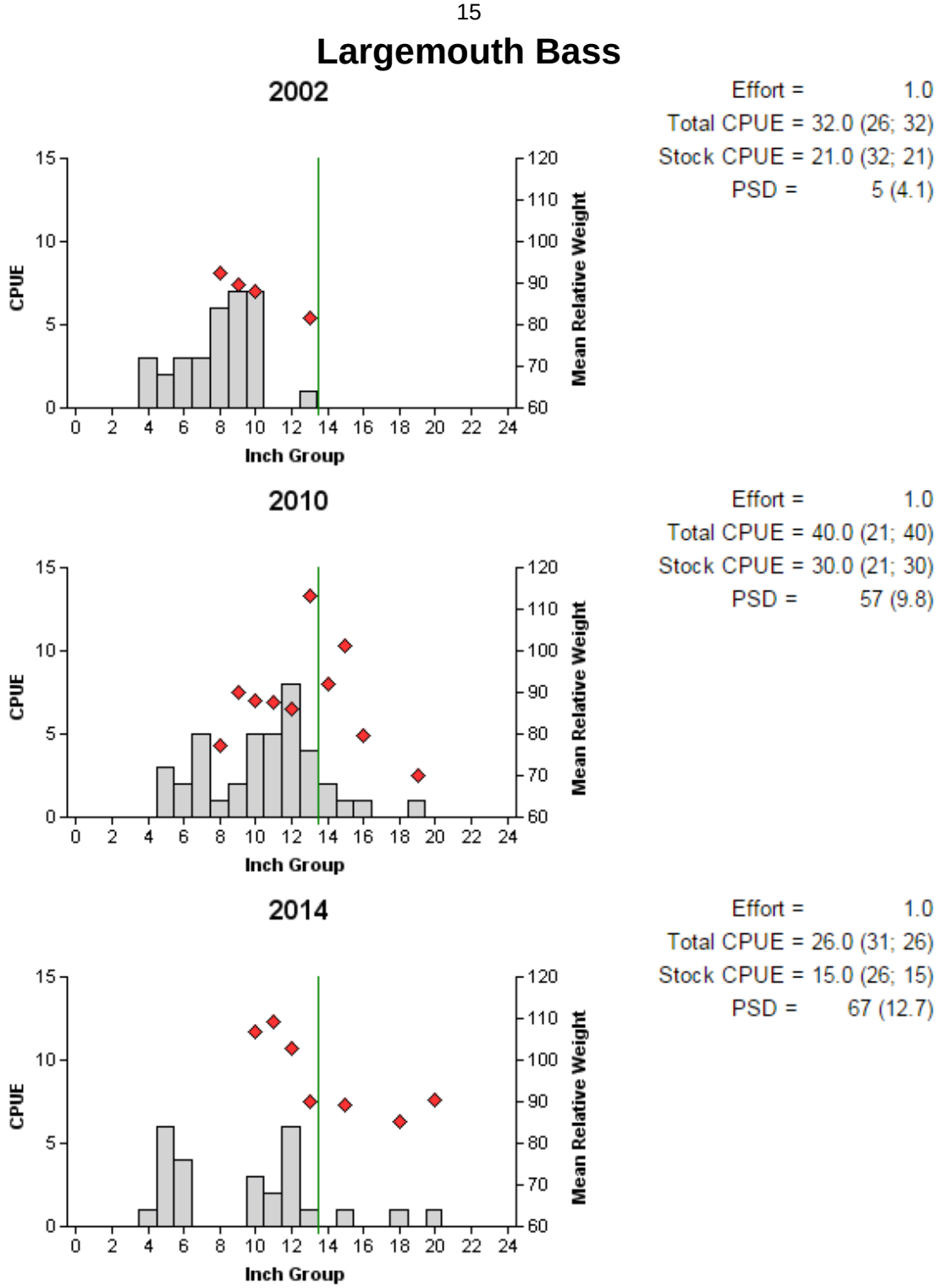


Figure 7. Number of Largemouth Bass caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for PSD are in parentheses) for fall electrofishing surveys, Lake Halbert, Texas, 2002, 2010, and 2014.

White Crappie

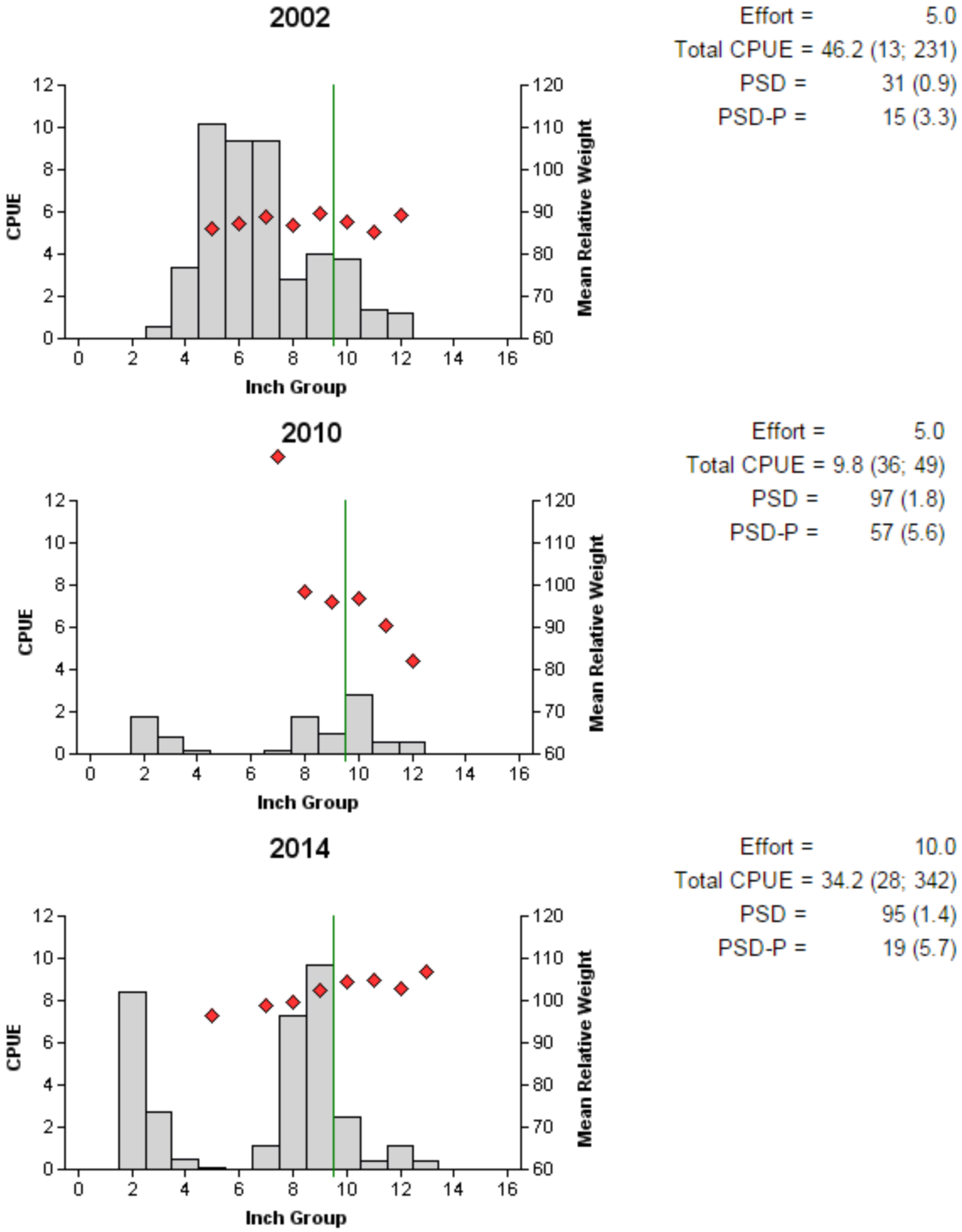


Figure 8. Number of White Crappie caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Lake Halbert, Texas, 2002, 2010, and 2014.

Table 6. Proposed sampling schedule for Lake Halbert, 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

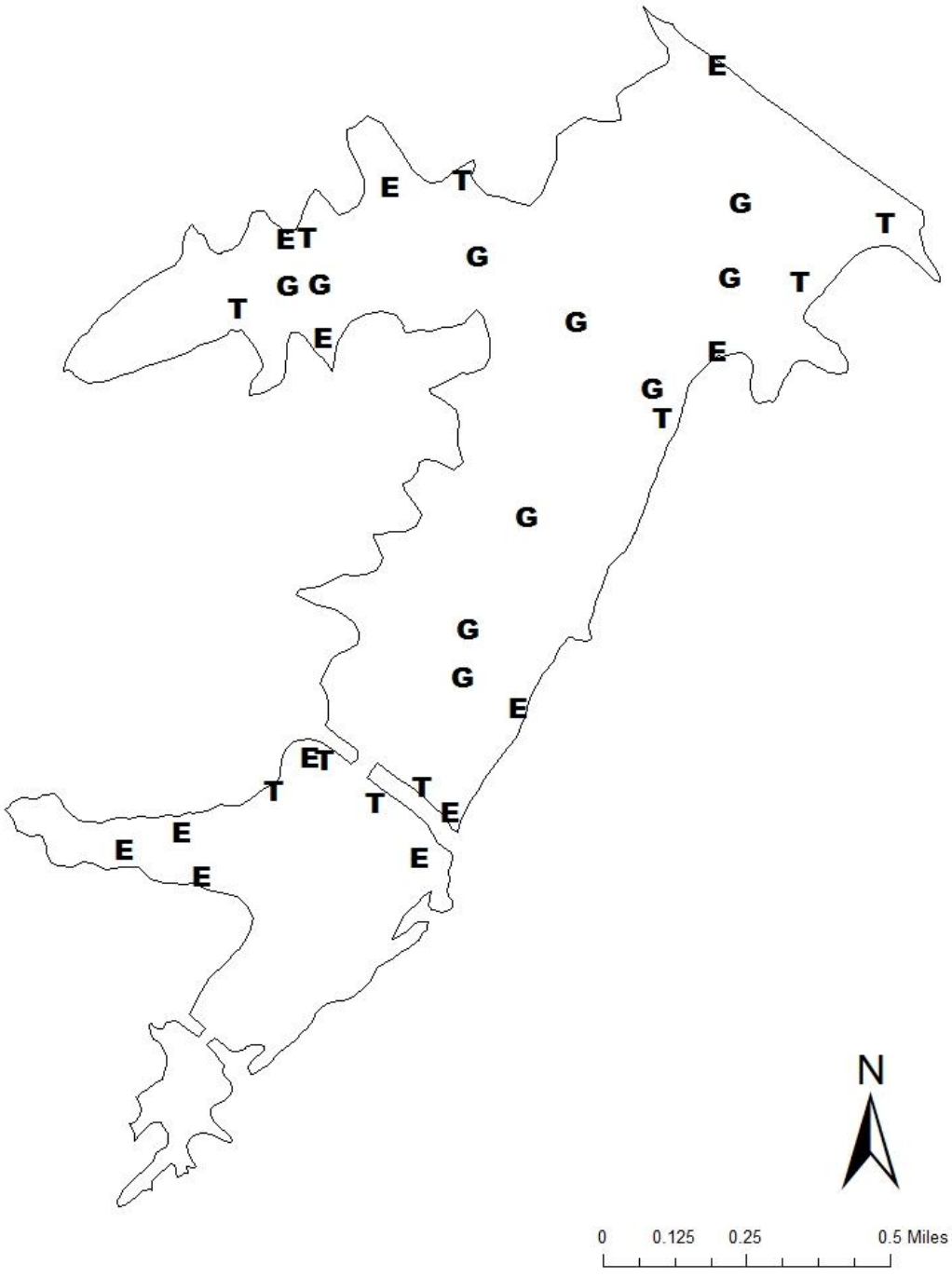
Survey year	Electrofish	Low-Pulse Electrofish	Trap net	Gill net	Vegetation	Access	Report
2015-2016							
2016-2017		A					
2017-2018							
2018-2019	S		A	S	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Halbert, Texas, 2014-2015. Sampling effort was 10 net nights for gill netting, 10 net nights for trap netting, and 1 hour for electrofishing.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard Shad					924	924.0
Threadfin Shad					14	14.0
Blue Catfish	44	4.4				
Channel Catfish	9	0.9				
Flathead Catfish	2	0.2				
White Bass	22	2.2				
Warmouth					5	5.0
Bluegill					20	20.0
Longear Sunfish					6	6.0
Largemouth Bass					26	26.0
White Crappie			342	34.2		
Black Crappie			1	0.1		

APPENDIX B



Location of sampling sites, Lake Halbert, Texas, 2014-2015. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level was 4 feet low at time of sampling.