

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-221-M-2

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2011 Survey Report

Cooper Reservoir

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TABLE OF CONTENTS

Survey and management summary.....	2
Introduction	3
Reservoir description.....	3
Management history	3
Methods	4
Results and discussion	5
Fisheries management plan.....	6
Literature cited.....	8
Figures and tables	9-19
Water level (Figure 1).....	9
Reservoir characteristics (Table 1)	9
Harvest regulations (Table 2)	10
Stocking history (Table 3).....	11
Gizzard shad (Figure 2).....	12
Bluegill (Figure 3).....	13
Blue catfish (Figure 4)	14
Channel catfish (Figure 5)	15
White bass (Figure 6).....	16
Palmetto bass (Figure 7)	17
Largemouth bass (Figure 8)	18
Proposed sampling schedule (Table 5).....	19
Appendix A	
Catch rates for all species from all gear types.....	20
Appendix B	
Average daily trailer counts at Cooper Lake State Park	21
Appendix C	
Map of 2011-2012 sampling locations	22

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Cooper Reservoir were surveyed using electrofishing in 2011 and gill netting in 2012. Littoral-zone habitat surveys and aquatic vegetation surveys were not conducted in summer 2011. This report summarizes the results of the surveys and contains a management plan for the reservoir.

- **Reservoir description:** Cooper Reservoir is located in Delta and Hopkins Counties, Texas, on the Middle and South Forks of the Sulphur River. It was constructed by the U. S. Army Corps of Engineers for water supply and flood control. Reservoir elevation during the past four years has fluctuated. From May 2010 through December 2011, levels continuously declined to 12.9 feet below conservation pool elevation, at which time all boat ramps were inaccessible.
- **Management history:** Important sport fishes at Cooper Reservoir include palmetto bass, white bass, blue catfish, channel catfish, and largemouth bass. Annual requests are made to stock palmetto bass at a rate of 10/acre.
- **Fish community**
 - **Prey species:** Cooper Reservoir contained abundant populations of gizzard shad and threadfin shad to provide prey for sport fish. Catches of sunfish species were low as a result of limited aquatic habitat at the time of the survey.
 - **Catfishes:** Cooper Reservoir continued to sustain quality fisheries of blue and channel catfish. Sub-stock sized fish of both species were collected, indicating successful reproduction. Harvestable-size blue catfish occurred in high numbers and exhibited good body condition.
 - **Temperate basses:** Ample open water habitat and a sufficient prey base allow Cooper Reservoir to support populations of white bass and palmetto bass. Cooper Reservoir has received annual stockings of palmetto bass since 2002 with the exception of 2010 and 2012.
 - **Black basses:** Largemouth bass abundance has historically been limited, indicating low population density. Low reservoir water elevations during fall 2011 made electrofishing sampling difficult.
 - **Crappie:** White and black crappie were present in the reservoir. Trap net sampling could not be conducted in 2011 because low reservoir water elevations prohibited boat access to the reservoir.
- **Management strategies:** Annual stockings of palmetto bass should continue at a rate of 10/acre to maintain the fishery. General monitoring with trap netting, gill netting and electrofishing surveys will be repeated in 2015-2016. An additional spring electrofishing survey is planned for 2013 to attempt to collect age and genetics samples. Conduct aquatic vegetation, littoral habitat, and access surveys in 2015.

INTRODUCTION

This document is a summary of fisheries data collected from Cooper Reservoir from June 2011 to May 2012. 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 2011 and 2012 data for comparison.

Reservoir Description

Cooper Reservoir is an impoundment of the Sulphur River in Delta and Hopkins Counties, Texas. The reservoir was constructed by the U. S. Army Corps of Engineers in 1991 for water supply, recreation, and flood control. At conservation pool (440.0 feet above mean sea level), Cooper Reservoir is 19,280 surface acres, has a shoreline length of 125 miles, and a mean depth of 15 feet. Water elevations reached an historic low in December 2006 (422.5 ft msl) and in November and December 2011 the elevation declined to 427.1 ft msl during a protracted drought (Figure 1). The reservoir was eutrophic with a Carlson's Trophic State Index (TSI) chl-*a* of 53.12 µg/L (Texas Commission on Environmental Quality 2005). Other descriptive characteristics for Cooper Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Jubar and Storey 2008) included:

1. Enhancement of palmetto bass fishery.
Action: Annual requests for stocking of palmetto bass at a rate of 10/acre were submitted and fish were stocked in 2008 (9.99/acre), 2009 (4.71/acre), and 2011 (5.40/acre) Gill netting was conducted in 2012 to monitor the palmetto bass population. Trailer counts were conducted by State Park staff at the four boat ramps within the two units of Cooper Lake State Park from July 2008 through July 2009 to document fishing patterns at Cooper Reservoir.
2. Enhancement of the largemouth bass population and fishery.
Action: Heavy rainfall in 2007 and 2008 led to the inundation of terrestrial vegetation and the establishment of large areas of aquatic vegetation. Requests were submitted to stock Florida largemouth bass at a rate of 25/acre and fish were stocked in 2009 (24.67/acre) and 2010 (18.93/acre). As a result of low reservoir water elevations, neither age and growth nor genetics assessment samples could be collected.
3. Management of invasive aquatic plants.
Action: Hydrilla was not observed during summer 2011 because of low reservoir water elevations created by drought and unseasonably hot weather. Hydrilla has never been problematic on Cooper Reservoir but there is concern that growth in the vicinity of boat ramps could impede boater access.
4. Increase angler awareness of the fisheries resources at Cooper Reservoir.
Action: District staff provided information on the fisheries resources available in Cooper Reservoir to outdoor writers and general anglers who have contacted the District office. The visibility of the palmetto bass and white bass fisheries has been increased as a result of a concerted effort by District staff to promote these fisheries through contact with outdoor writers such as Bob Hood (Ft. Worth Star Telegram), Larry Hodge (TPWD), Ray Sasser (Dallas Morning News), and Matt Williams (Matt Williams Outdoors) who have contributed articles promoting these quality fisheries in publications, including the August 2009 issue of *Texas Parks and Wildlife Magazine*.

Harvest regulation history: Sport fishes in Cooper Reservoir are currently managed with TPWD statewide regulations with the exception of largemouth bass (Table 2). The minimum length limit for

largemouth bass has been 18 inches with a five fish daily bag limit from the time the lake was opened to fishing.

Stocking history: Cooper Reservoir has received annual stockings of palmetto bass since 1998, with the exception of 2000, 2001, and 2010 as a result of limited hatchery production (Table 3). Florida largemouth bass were most recently stocked in 2009 and 2010. The complete stocking history is listed in Table 3.

Vegetation/habitat history: Historically, habitat in Cooper Reservoir has been comprised of natural shoreline and flooded timber. Aquatic vegetation coverage generally consists of limited quantities of native emergent vegetation. A habitat enhancement project was initiated on Cooper Reservoir in 1999, but low water conditions in 2003 to 2004 limited the success of plantings. In 2007, extensive areas of smartweed were present which covered 20% of the reservoir surface area. A small amount of hydrilla (16 acres) was also detected in 2007.

Water transfer: Cooper Reservoir provides water supply storage for the North Texas Municipal Water District, the Sulphur River Municipal Water District, and the City of Irving. This water supply storage exists in the conservation pool between elevations 415.5 ft msl and 440.0 ft msl. The water intake structure is located on the south shore of the lake, which provides anywhere from 2.0 million gallons per day of water in the winter months to 5.0 million gallons per day in the summer months.

METHODS

Fishes were collected by electrofishing (2.0 hours at 24, 5-min stations) in 2011 and gill netting (15 net nights at 15 stations) in 2012. 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 nets as the number of fish caught per net night (fish/nn). All survey sites were randomly selected and the survey was conducted according to the Fishery Assessment Procedures (Texas Parks and Wildlife Department (TPWD), Inland Fisheries Division, unpublished manual revised 2011). Aquatic vegetation, littoral habitat, and trap net surveys were not conducted due to low reservoir water elevations.

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and 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 ($RSE = 100 \times SE$ of the estimate/estimate) was calculated for all CPUE and SE was calculated for structural indices and IOV.

Ages were determined from otoliths of white bass collected in gill netting ($N = 14$). No genetic analysis or age and growth analysis was performed on largemouth bass as a result of insufficient sample size from electrofishing in fall 2011.

Staff at Cooper Lake State Park conducted trailer counts at four of the five boat ramps on the lake during routine patrols in two time periods (morning and afternoon) during the period July 2008 through July 2009. The most popular ramps were sampled more intensively and information was presented as average counts by time period. The function of the survey was to collect basic information on seasonal boat ramp use patterns. Counts combined trailers of anglers and other recreational users.

Water elevation and rainfall data were obtained from the U. S. Army Corps of Engineers website at <http://www.swf-wc.usace.army.mil/cgi-bin/rcshtml.pl?page=Reports>.

RESULTS AND DISCUSSION

Habitat: Reservoir elevation declined from May 2010 through December 2011 and reached a minimum of 12.9 feet below conservation pool elevation (Figure 1). During this period littoral habitat was severely reduced and boat ramps were inaccessible. Littoral zone habitat generally consists of natural shoreline, standing timber, flooded terrestrial vegetation, and native emergent vegetation (Jubar and Storey 2008).

Prey species: Primary prey species included gizzard shad, threadfin shad, and bluegill. Gizzard shad and threadfin shad provided abundant prey. Gizzard shad catch rate in 2011 (209.5/h) was lower than 2007 (429.5/h) and higher than in 2003 (93.5/h). Index of vulnerability (IOV) values were similar across surveys (range = 88 to 93), indicating high prey availability of gizzard shad. CPUE of bluegill in 2011 was low (3.0/h) as a result of poor habitat conditions experienced during fall sampling. Most bluegill in Cooper Reservoir are of appropriate size to provide prey for sport fishes (Figure 3), but catches of sunfish species were low as a result of limited aquatic habitat at the time of sampling (Appendix A).

Catfishes: The gill net catch rate of blue catfish in 2012 (14.6/nn) was higher than in 2008 (8.0/nn) and 2006 (10.2/nn), and 76% of fish were longer than the minimum length limit (Figure 4). Mean relative weights for all inch groups ranged from 85 to 110. Channel catfish are also present but not as abundant as blue catfish. During the last three surveys, catch rates ranged from 1.1 to 2.7/nn and the population was dominated by fish below the minimum length limit (Figure 5).

White bass: The gill net catch rate of white bass in 2012 (5.1/nn) was lower than in 2008 (8.1/nn) but higher than in 2006 (1.7/nn) (Figure 6). Most white bass were of harvestable size (≥ 10 inches) and in excellent body condition as relative weights exceeded 90. Growth of white bass in Cooper Reservoir was fast with an average age at 10 inches (9.3 to 10.7 inches) of 1.0 year (N = 14; all fish collected were 1 year old).

Palmetto bass: The gill net catch rate of palmetto bass was lower in 2012 (2.3/nn) than in 2008 (5.1/nn) or 2006 (11.9/nn) (Figure 7). The majority of fish collected in 2012 were of harvestable size (≥ 18 inches). Body condition of all size groups was good with relative weights exceeding 80, indicating abundant prey fish availability. No data on age and growth was obtained in 2012 as a result of low sample size. Average daily trailer count data showed maximum ramp utilization from May through August with a peak in July with greater afternoon use (Appendix B). Although trailer count data cannot separate anglers and other recreational users, the pattern of maximum utilization during summer is consistent with fishing patterns reported anecdotally by anglers seeking temperate basses at Cooper Reservoir.

Largemouth bass: Historically, electrofishing catch rates of largemouth bass have been low in Cooper Reservoir. CPUE in 2011 (8.5/h) was lower than in 2007 (15.0/h) or 2003 (11.5/h). Aquatic habitat at the time of sampling was limited as a result of reservoir water elevation being over 11 feet below conservation pool elevation. These conditions made sampling difficult and insufficient fish were collected for age or genetics analyses. Historic data from spring 2003 indicated largemouth bass grew to 18 inches (length range 16.4 – 20.5 inches) on average in 5.5 years (age range 3 – 9 years) (Storey and Myers 2004). In fall 2007, the FLMB allele frequency was 62.1% and pure FLMB and NLMB both comprised 10% of the sample (Jubar and Storey 2008). Florida largemouth bass were most recently stocked in 2009 and 2010.

Crappie: Populations of both white and black crappie are present in the reservoir, but white crappie are most abundant. Trap netting could not be conducted in 2011 as a result of low reservoir water elevation which prohibited access during the recommended sampling period.

Fisheries management plan for Cooper Reservoir, Texas

Prepared – July 2012

ISSUE 1: Palmetto bass have supported a high-quality fishery in Cooper Reservoir since the late 1990s.

MANAGEMENT STRATEGIES

1. Continue annual palmetto bass stockings at a rate of 10 fish/acre to maintain the fishery.
2. Conduct spring gill net surveys every four years to monitor the palmetto bass population.

ISSUE 2: Largemouth bass have historically been an important fishery in Cooper Reservoir. This reservoir has produced four entries in the ShareLunker Program since 1997, with the most recent caught in spring 2000.

MANAGEMENT STRATEGIES

1. Conduct standard electrofishing survey in 2015.
2. Collect age sample (Category 2) in spring 2013.
3. Assess largemouth bass genetics in spring 2013 using a sample from multiple age classes.

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.

Hydrilla has been documented in Cooper Reservoir but it has never created access problems for anglers. This plant is unlikely to create problems as a result of the reservoir's turbidity, but it would be prudent to monitor its distribution, especially in the vicinity of public boat ramps. Giant salvinia has become established in some northeast Texas lakes and is often spread between reservoirs via boat trailers.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate state park staff 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. Conduct vegetation surveys as appropriate for hydrilla and giant salvinia.
7. Conduct comprehensive vegetation and habitat surveys every 4 years.

ISSUE 4: Increased awareness of Cooper Reservoir's fisheries resources would provide additional fishing opportunities to anglers. Dissemination of information describing the sport fish harvest regulations on Cooper Reservoir would serve as a helpful public service.

MANAGEMENT STRATEGIES

1. Post regulation posters detailing fisheries regulations in effect at Cooper Reservoir in both state park units and at all boat ramps.
2. Promote fisheries resources of Cooper Reservoir through news releases whenever opportunities arise.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes electrofishing to monitor the largemouth bass population in 2015. An optional electrofishing survey in spring 2013 is planned to attempt to collect samples for age and growth and genetics assessment. Gill net surveys will be conducted every four years to monitor catfish, white bass, and palmetto bass populations. Trap nets will be used every four years to monitor crappie populations. Comprehensive vegetation and habitat surveys will be conducted every four years, and hydrilla coverage will be monitored as necessary. An access survey will be conducted every four years.

LITERATURE CITED

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.
- 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.
- Jubar and Storey 2008. Statewide freshwater fisheries monitoring and management program survey report for Cooper Reservoir, 2007. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-33, Austin. 24pp.
- Storey, K., and R. Myers. 2004. Statewide freshwater fisheries monitoring and management program survey report for Cooper Reservoir, 2003. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-29, Austin. 33pp.
- Texas Commission on Environmental Quality. 2005. Trophic Classification of Texas Reservoirs: 2004 Water Quality Inventory and 303(d) List. 15pp.

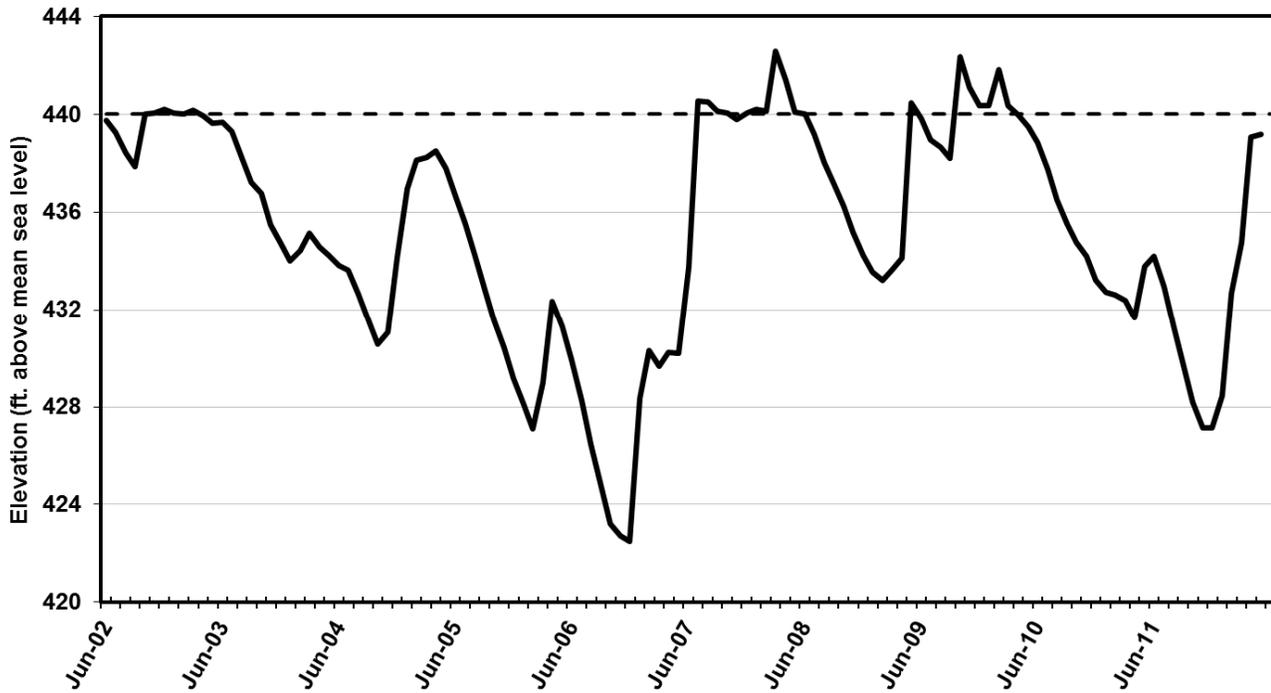


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Cooper Reservoir from June 2002 through May 2012. Conservation pool elevation for Cooper Reservoir is 440.0 ft msl.

Table 1. Characteristics of Cooper Reservoir.

Characteristic	Description
Year constructed	1991
Controlling authority	U. S. Army Corps of Engineers
Counties	Delta and Hopkins
Reservoir type	Mainstream
Shoreline development index (SDI)	6.42
Conductivity	150 umhos/cm

Table 2. Harvest regulations for Cooper Reservoir, Texas.

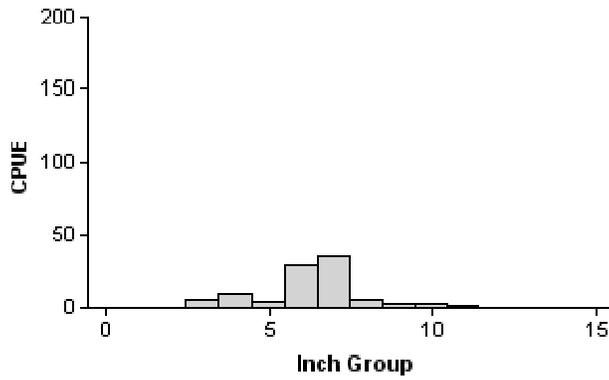
Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish	25 (in any combination)	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass, white	25	10 – No Limit
Bass, palmetto	5	18 – No Limit
Bass: largemouth	5	18 - No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 3. Stocking history of Cooper Reservoir, Texas. Size categories are: FGL = 1-3 inches, and ADL = adults.

Species	Year	Number	Size
Blue catfish	1991	3,500	FGL
	1992	482,075	FGL
	Total	485,575	
Channel catfish	1991	12,500	FGL
	Total	12,500	
Bluegill	1991	41,600	FGL
	Total	41,600	
Palmetto bass	1996	193,665	FGL
	1998	146,573	FGL
	1999	97,749	FGL
	2002	96,410	FGL
	2003	95,100	FGL
	2004	167,717	FGL
	2005	190,388	FGL
	2006	142,178	FGL
	2007	188,931	FGL
	2008	192,522	FGL
	2009	90,775	FGL
	2011	104,070	FGL
Total	1,706,078		
Florida largemouth bass	1991	5,142	FGL
	1991	151	ADL
	1992	1,929,012	FGL
	1992	192	ADL
	1993	681,829	FGL
	1993	30	ADL
	1997	482,879	FGL
	1998	482,084	FGL
	1999	484,695	FGL
	2000	9,132	FGL
	2002	489,878	FGL
	2003	477,289	FGL
	2009	475,672	FGL
	2010	365,041	FGL
	Total	5,883,026	

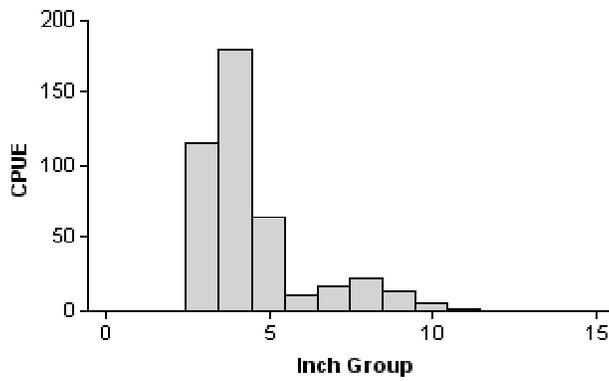
Gizzard shad

2003



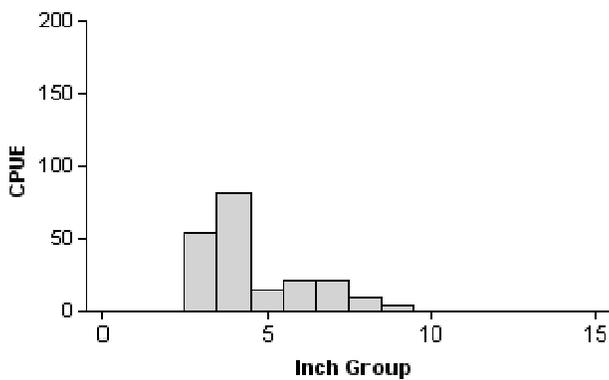
Effort = 2.0
 Total CPUE = 93.5 (25: 187)
 Stock CPUE = 46.5 (33: 93)
 PSD = 2 (2.3)
 IOV = 88 (3.9)

2007



Effort = 2.0
 Total CPUE = 429.5 (9: 859)
 Stock CPUE = 60.0 (22: 120)
 PSD = 2 (1.3)
 IOV = 90 (2.6)

2011

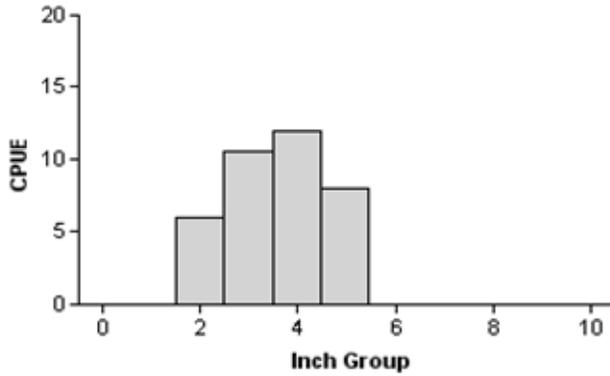


Effort = 2.0
 Total CPUE = 209.5 (21: 419)
 Stock CPUE = 37.0 (29: 74)
 PSD = 3 (2)
 IOV = 93 (1.7)

Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure and IOV are in parentheses) for fall electrofishing surveys, Cooper Reservoir, Texas, 2003, 2007 and 2011.

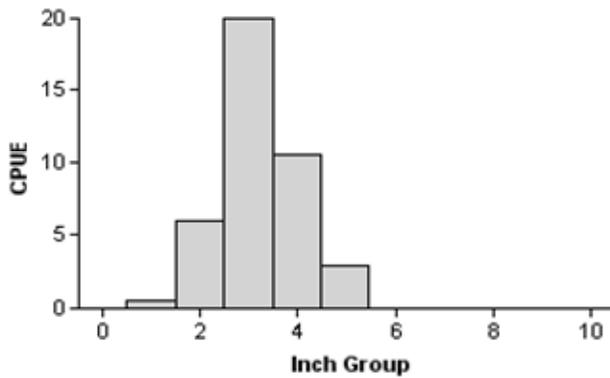
Bluegill

2003



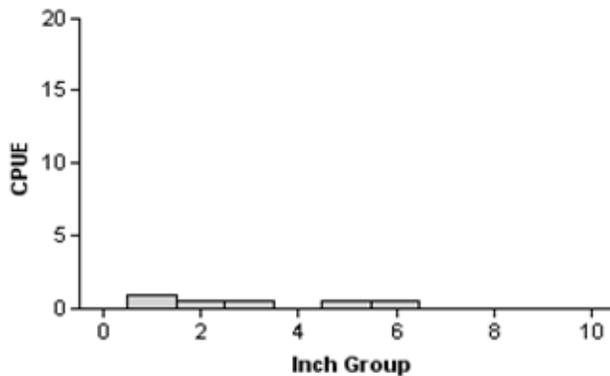
Effort = 2.0
 Total CPUE = 36.5 (45; 73)
 Stock CPUE = 30.5 (46; 61)
 PSD = 0 (59.3)

2007



Effort = 2.0
 Total CPUE = 40.0 (23; 80)
 Stock CPUE = 33.5 (22; 67)
 PSD = 0 (37.2)

2011



Effort = 2.0
 Total CPUE = 3.0 (73; 6)
 Stock CPUE = 1.5 (73; 3)
 PSD = 33 (16.1)

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, Cooper Reservoir, Texas, 2003, 2007 and 2011.

Blue catfish

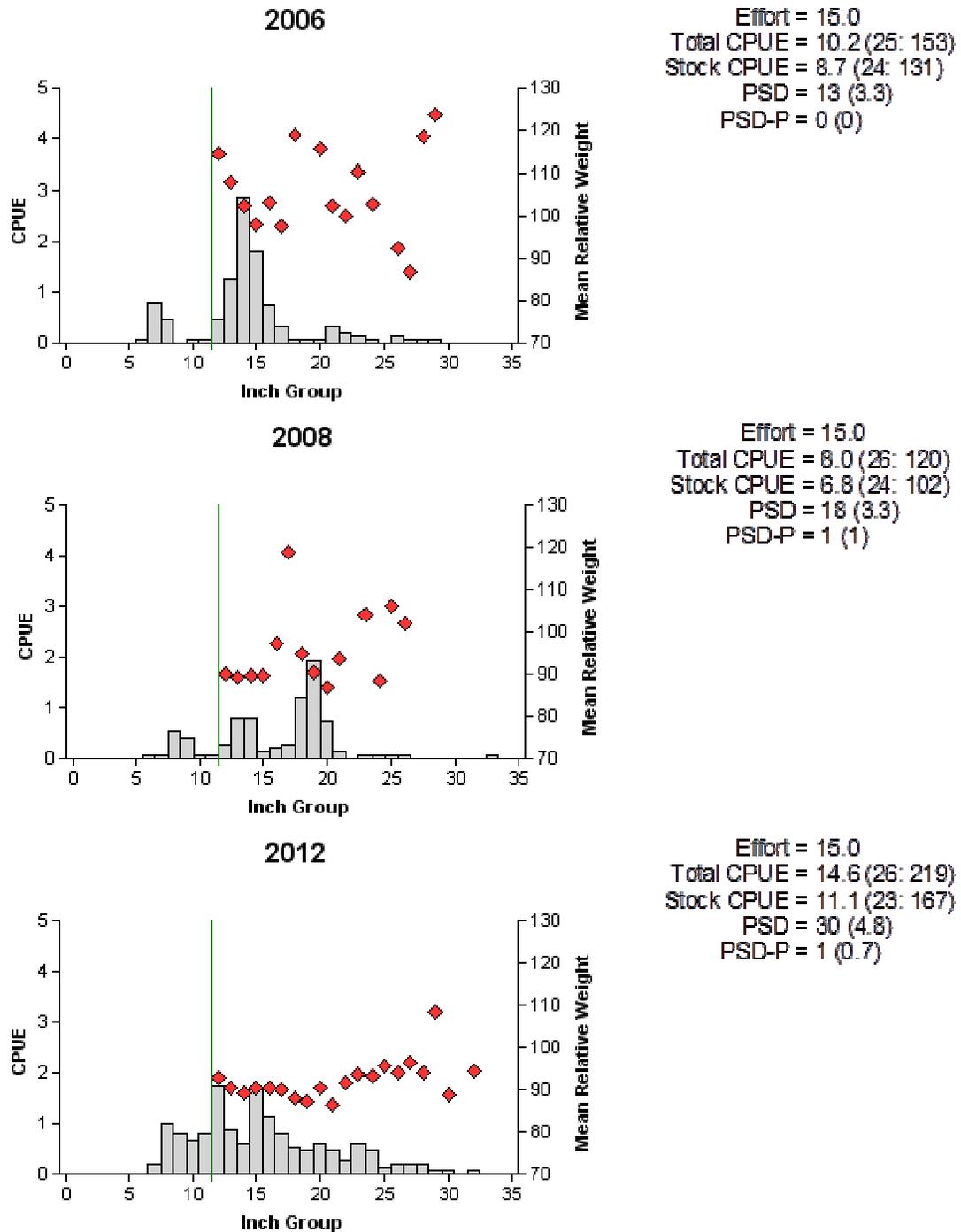


Figure 4. Number of blue catfish caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Cooper Reservoir, Texas, 2006, 2008, and 2012. Vertical lines represent minimum length limit at time of survey.

Channel catfish

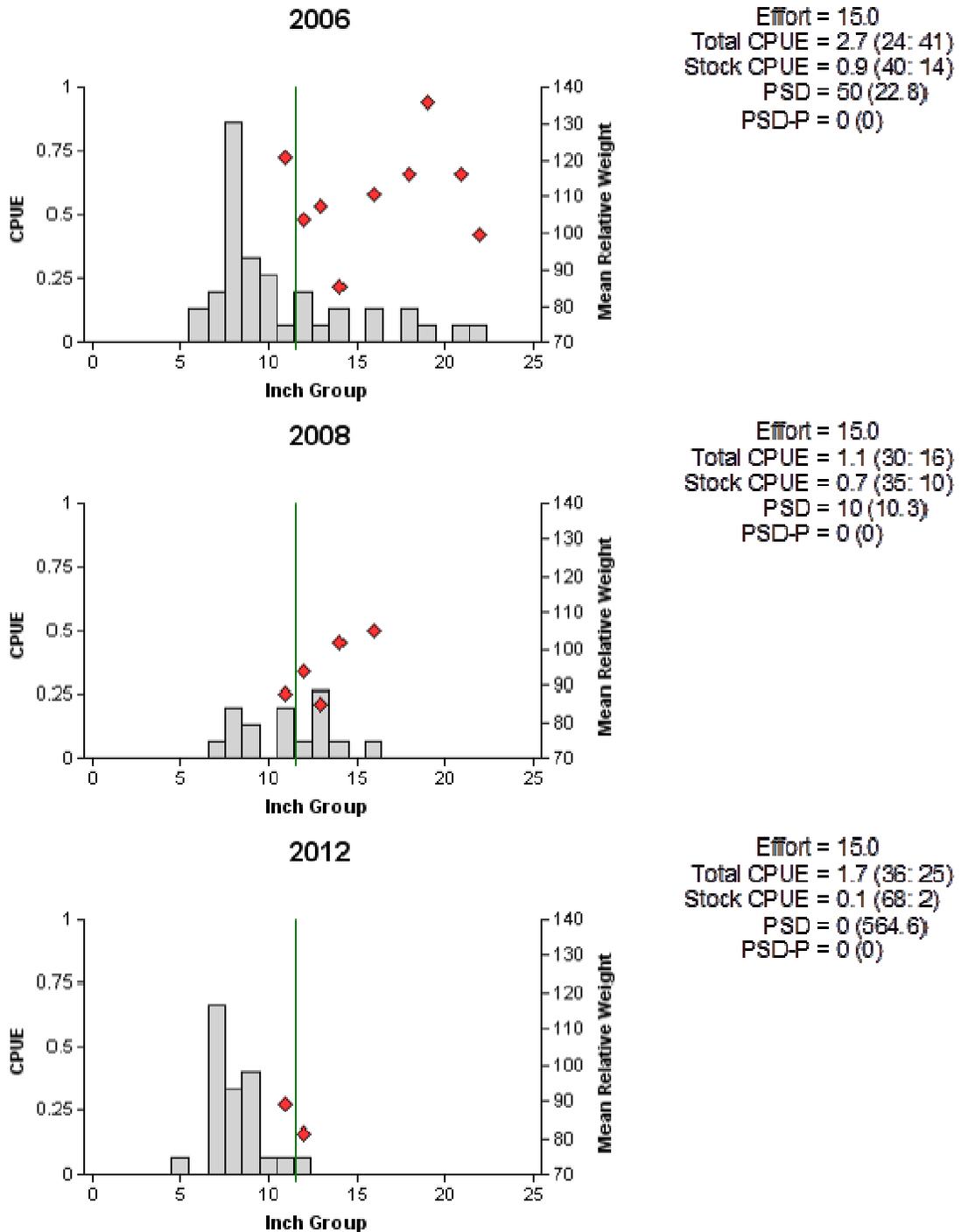


Figure 5. Number of channel catfish caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Cooper Reservoir, Texas, 2006, 2008, and 2012. Vertical lines represent minimum length limit at time of survey.

White bass

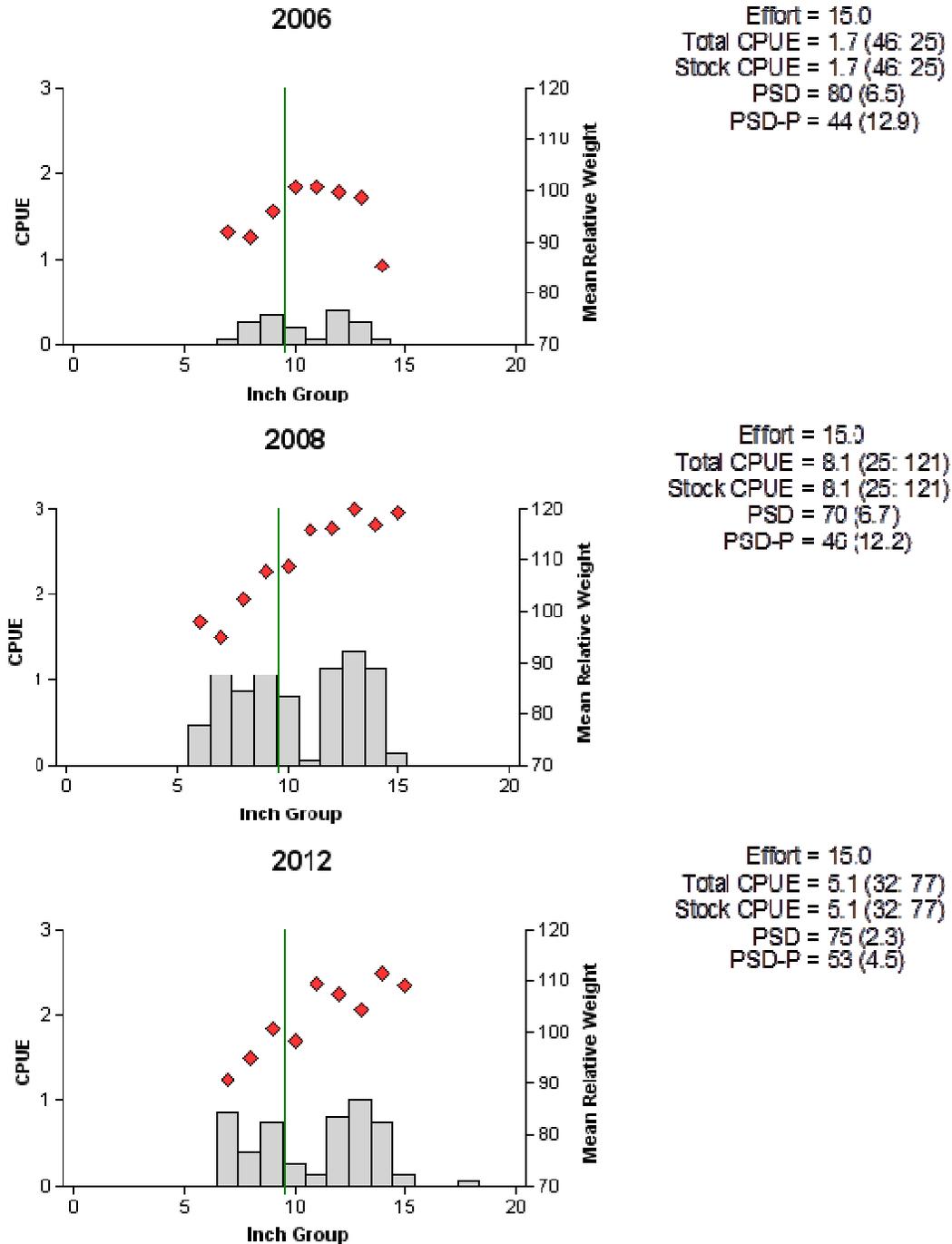


Figure 6. Number of white bass caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Cooper Reservoir, Texas, 2006, 2008, and 2012. Vertical lines represent minimum length limit at time of survey.

Palmetto bass

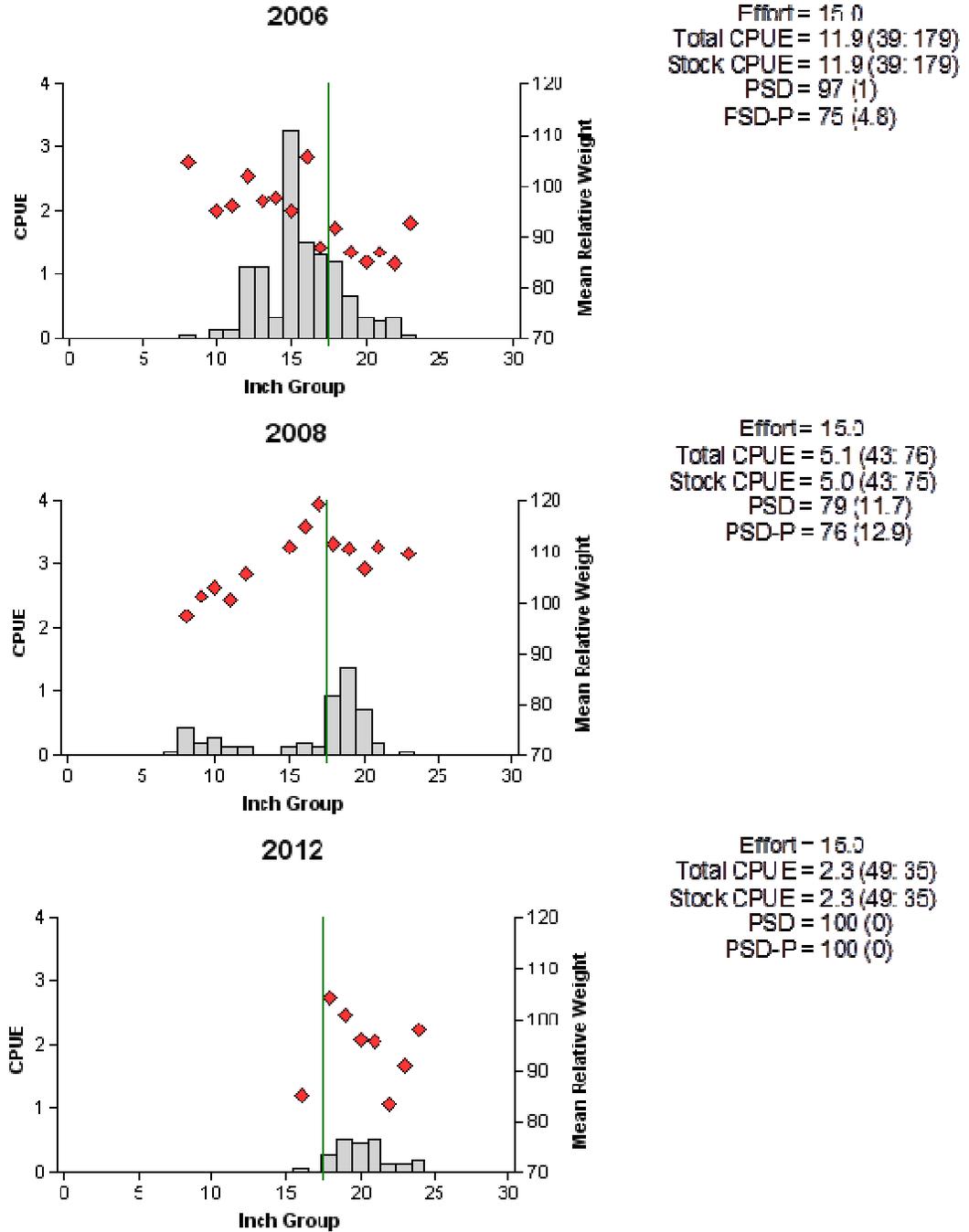


Figure 7. Number of palmetto bass caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Cooper Reservoir, Texas, 2006, 2008, and 2012. Vertical lines represent minimum length limit at time of survey.

Largemouth bass

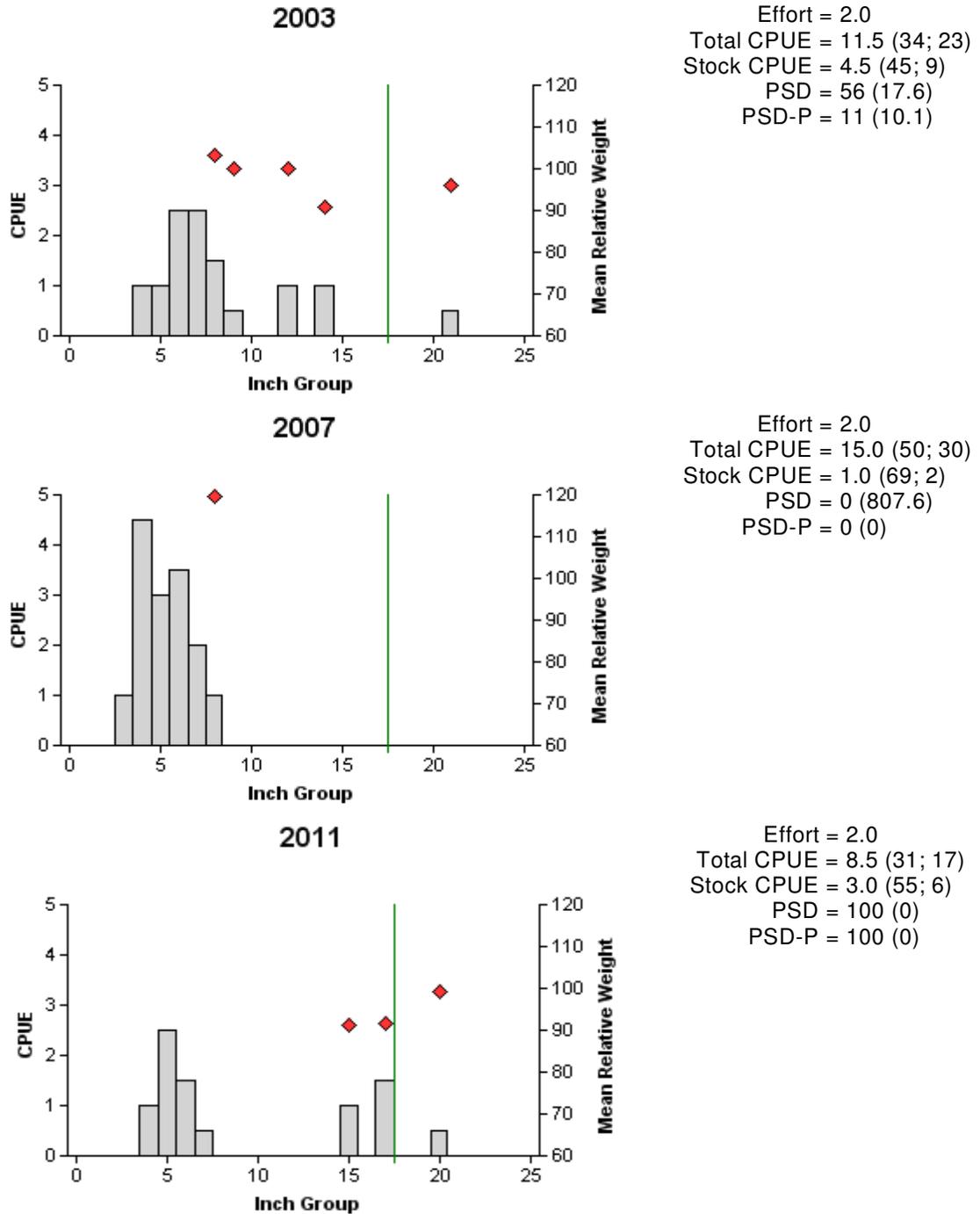


Figure 8. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Cooper Reservoir, Texas, 2003, 2007, and 2011. Vertical lines represent minimum length limit at time of survey.

Table 5. Proposed sampling schedule for Cooper Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing is conducted in the fall. Standard surveys denoted by S and additional surveys denoted by A.

Survey Year	Access	Electrofishing	Gill Net	Habitat	Report	Trap Net	Vegetation
2013-2014		A					
2015-2016	S	S	S	S	S	A	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from gill netting and electrofishing, Cooper Reservoir, Texas, 2011-2012.

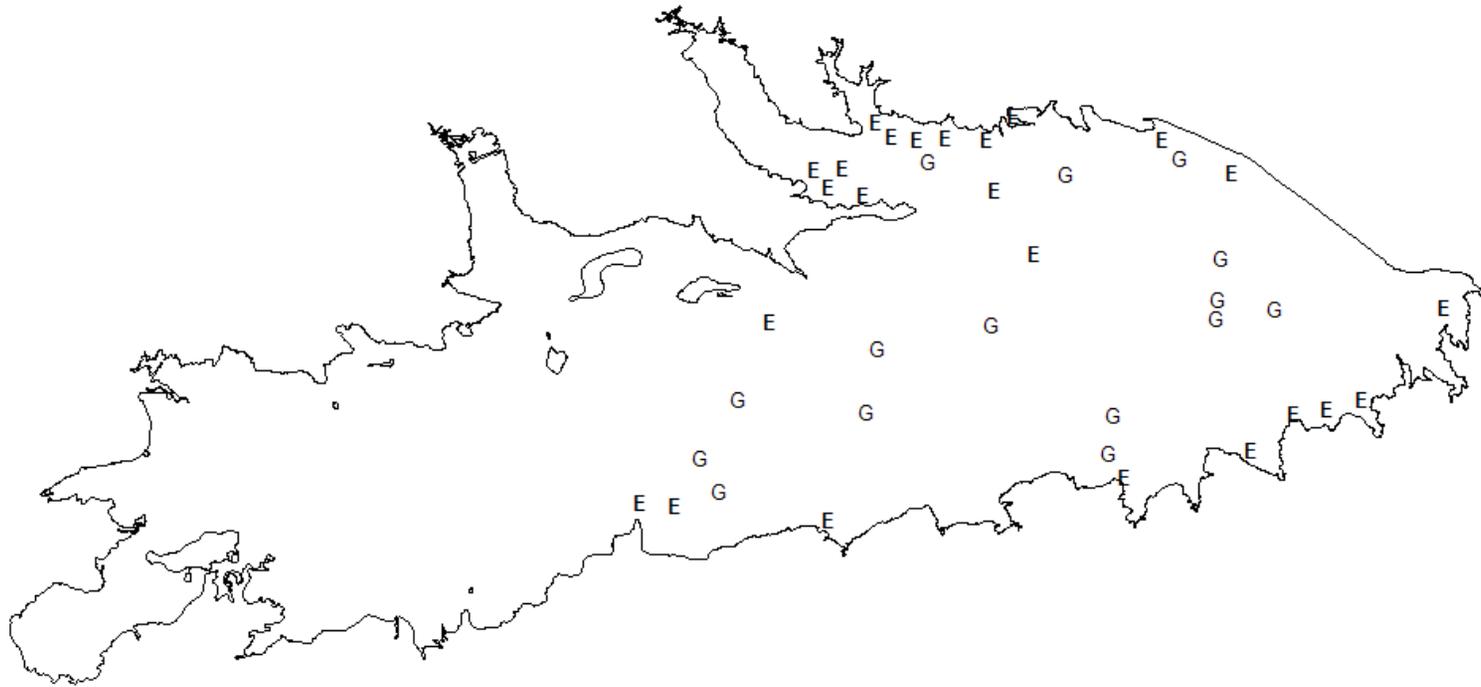
Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard shad			419	209.5
Threadfin shad			1,280	640.0
Blue catfish	219	14.6		
Channel catfish	25	1.7		
White bass	77	5.1		
Palmetto bass	35	2.3		
Warmouth			1	0.5
Bluegill			6	3.0
Longear sunfish			6	3.0
Largemouth bass			17	8.5

APPENDIX B

Average daily trailer counts conducted by Cooper Lake State Park staff at boat ramps (Honey Creek, Gulls Bluff, Lone Pine, Tira) on Cooper Reservoir from July 2008 through July 2009.

Month	am mean	pm mean	Daily mean
7	3.8	5.8	5.1
8	3.8	3.7	3.7
9	1.9	3.2	2.7
10	1.5	2.3	2.1
11	0.4	0.5	0.5
12	0.2	0.3	0.2
1	0.4	0.7	0.6
2	0.2	0.7	0.5
3	1.9	2.6	2.3
4	0.6	2.4	1.7
5	2.7	3.8	3.6
6	2.6	4.2	3.6
Overall mean	1.8	3.0	2.6

APPENDIX C



Location of fall electrofishing (E) and spring gill netting sites (G), Cooper Reservoir, Texas, 2011-2012

