

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-35

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2009 Survey Report

Alan Henry Reservoir

Prepared by:

John Clayton and Charles Munger
Inland Fisheries Division
District 1-A, Canyon, Texas



Carter Smith
Executive Director

Gary Saul
Director, Inland Fisheries

July 31, 2010

TABLE OF CONTENTS

Survey and management summary	2
Introduction.....	3
Reservoir description	3
Management history.....	3
Methods.....	4
Results and discussion	4
Fisheries management plan.....	6
Literature cited	7
Figures and Tables	8-24
Water level (Figure 1).....	8
Characteristics of Alan Henry Reservoir (Table 1)	8
Harvest regulations (Table 2).....	8
Stocking history (Table 3)	9
Percent Directed Angler Effort per Species (Table 4).....	9
Total Fishing Effort and Fishing Expenditures (Table 5).....	10
Gizzard shad (Figure 2)	11
Bluegill (Figure 3)	12
Blue catfish (Figure 4)	13
Channel catfish (Figures 5-6; Table 6).....	14
Flathead catfish (Figure 7)	16
Alabama spotted bass (Figure 8-9).....	17
Largemouth bass (Figures 10-12; Tables 7-8)	19
White crappie (Figures 13-14; Table 9)	22
Proposed Sampling Schedule(Table 10)	24
Appendix A	
Catch rates for all species from all gear types.....	25
Appendix B	
Map of 2008-2009 sampling locations	26

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Alan Henry Reservoir were surveyed with electrofishing and trap nets in 2009 and gill nets in 2010. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Alan Henry Reservoir was constructed in 1993 on the South Fork of the Double Mountain Fork of the Brazos River. It is located 6 miles east of Justiceburg in Garza County, Texas. At conservation pool (2,220 feet above mean sea level; FMSL), Alan Henry Reservoir is a 2,884-acre impoundment. The reservoir is owned by the City of Lubbock, Lubbock County, Texas and is currently used for recreational purposes and will serve as a water supply beginning in 2012. Alan Henry Reservoir first filled to capacity in October 2004, and the water level has remained within 3 feet of conservation pool since that time. Productivity of Alan Henry Reservoir was characterized as low. Habitat features consisted of flooded woody terrestrial vegetation, rocks, and very little native submerged aquatic plants.
- **Management History:** Sport fish in the Reservoir include blue catfish, channel catfish, flathead catfish, Alabama spotted bass, largemouth bass, and white crappie. Alabama spotted bass have been managed with restrictive harvest regulations since their introduction in 1996 in order to establish a viable population. Restrictions on largemouth bass were liberalized with the allowance of 2 fish under the 18 inch minimum length limit in 2002 in order to promote recruitment of fish into size classes larger than the 18 inch minimum length limit. Alan Henry has produced 25 entries into the ShareLunker program since 2000.
- **Fish Community**
 - **Prey species:** Gizzard shad and bluegill are the primary prey species in the reservoir. Electrofishing catch rate of gizzard shad was 84.0/h with less than 4% considered to be suitably-sized prey for sport fish. Electrofishing catch rate of bluegills was 51.0/h, and most bluegills were less than 4-inches long making them available as prey.
 - **Catfishes:** Blue catfish were present in the reservoir. Only one blue catfish was collected in the 2010 gill net survey; however, a new lake record of 39 pounds was caught on a jug line on September 2, 2009. Channel catfish appeared to be the most abundant catfish species in the reservoir; however, catch rates continued to indicate low relative abundance. The catch rate for the 2010 gill net survey remained similar to previous surveys. The majority of channel catfish sampled were larger than the 12 inch minimum length limit. Two flathead catfish were collected in the 2010 gill net survey. The flathead catch rate remained similar to catch rates from previous surveys.
 - **Black basses:** Over the last several years electrofishing catch rates of Alabama spotted bass have shown a general increase. Catch rates for spotted bass in the 2009 survey were slightly lower than catch rates in 2008. A new lake recorded of 5.01 lbs. was caught on December 19, 2009. Largemouth bass had a catch rate of 75.0/h with the majority of fish sampled being more than 8 inches in length. Of the fish sampled, 3% were greater than 20 inches.
 - **Crappie:** Two white crappie were collected during the 2009 trap net survey, but both fish were larger than the 10 inch minimum length limit.
- **Management Strategies:** Continue annual electrofishing surveys to monitor Alabama spotted bass and largemouth bass populations. Liberalize Alabama spotted bass harvest regulation.

INTRODUCTION

This document is a summary of fisheries data collected from Alan Henry Reservoir in 2009-2010. 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 for comparison.

Reservoir Description

Alan Henry Reservoir is a 2,884-acre impoundment on the South Fork of the Double Mountain Fork of the Brazos River. It is located 6 miles east of Justiceburg, Garza County, Texas. The reservoir is owned by the City of Lubbock, Lubbock County, Texas and is operated by the Brazos River Authority, Waco, McLennon County, Texas. The reservoir is used for recreational purposes and as a water supply beginning in 2012. Alan Henry Reservoir first filled to capacity in October of 2004, and the water level has remained within 3 feet of conservation pool since that time (Figure 1). Alan Henry Reservoir is characterized as a deep reservoir with low productivity. Since impoundment of the reservoir, secchi disk readings have shown wide fluctuations from a low of 0.4 meters to a high of 4.7 meters; however, most historic secchi disk readings range from 2-3 meters. At the time of sampling, the habitat consisted primarily of boulder, rock, and flooded woody terrestrial vegetation. Boat access was limited to one public boat ramp at the Sam Wahl Recreation Area operated by the City of Lubbock. Due to the physical characteristics of the shoreline, shoreline access is limited to a floating fishing dock and a few areas adjacent to the public ramp. The fishing dock is the only handicap-specific facility. Other descriptive characteristics for Alan Henry Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Henegar 2006) included:

1. Collection of adequate life history data on Alabama spotted bass.
Action: Monitoring of Alabama spotted bass population has continued annually since their introduction in 1996.
2. Better characterize the number of memorable and trophy size largemouth bass that are caught by anglers annually.
Action: Trophy bass volunteer reporting program continued for a period of time until various issues began to arise. The location that held volunteer reporting forms changed ownership several times, and anglers began to lose interest in reporting their catch.

Harvest regulation history: Sport fishes in Alan Henry Reservoir are currently managed with statewide regulations with the exceptions of smallmouth bass, Alabama spotted bass, and largemouth bass (Table 2). Until September 1, 1997, largemouth bass were managed under a 3 fish daily bag and 18 inch minimum length limit, and smallmouth bass were managed under a 5 fish daily bag limit and 14 inch minimum length limit. Alabama spotted bass were introduced to Alan Henry in 1996. On September 1, 1997, the harvest regulation for smallmouth bass and Alabama spotted bass changed to a 3 fish daily bag in aggregate and 18 inch minimum length limit. The harvest regulation for largemouth bass was then changed to a 5 fish daily bag and 18 inch-minimum length limit. On September 1, 2002, the largemouth bass harvest regulation changed from a 5 fish daily bag and 18 inch minimum length limit, to a no minimum length limit and 5 fish bag with no more than 2 largemouth bass under 18 inches.

Stocking history: Stocking of Alan Henry Reservoir began in 1993 with the introductions of gizzard shad, blue catfish, channel catfish, smallmouth bass, Florida largemouth bass, and white crappie. Alabama spotted bass were introduced to Alan Henry Reservoir in 1996. The complete stocking history is available in Table 3.

Vegetation/habitat management history: Alan Henry Reservoir has no vegetation/ habitat management history.

METHODS

Fishes were collected by electrofishing (1 hour at 12 5-min stations), gill netting (5 net nights at 5 stations), and trap netting (8 net nights at 8 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 2009/2010 electrofishing, gill netting, and trap netting survey sites were randomly selected, and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined 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 for creel statistics and SE was calculated for structural indices and IOV. Ages were determined using otoliths from 52 largemouth bass measuring 10 inches up to 18 inches total length. Source for water level data was the United States Geological Survey website.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of rocks, flooded woody terrestrial vegetation, and native submerged vegetation. A habitat survey was last conducted in 1996 (Altena 1997).

Creel: Directed fishing effort by anglers was highest for largemouth bass (36.9%) and anglers seeking all species of black bass (31.4%), followed by anglers fishing for anything (15.3%) (Table 4). Total fishing effort for all species at Alan Henry Reservoir was 56,814.5 h from March, 2009 to May, 2009, and anglers spent an estimated \$457,510 on trip expenditures (Table 5).

Prey species: In 2009 electrofishing catch rate of gizzard shad was 84.0/h. Gizzard shad IOV was 4, indicating that the majority were not available as forage to existing predators; this was considerably lower than the IOV estimates from 2008 (IOV=49) and 2007 (IOV=36) (Figure 2). Total CPUE of gizzard shad was also lower in 2009 compared to the 2008 and 2007 surveys (Figure 2). Total CPUE of bluegill in 2009 was 51.0/h. This is lower than catch rates from previous surveys (Figure 3). In 2008 the total CPUE was 71.0/h, and in 2007 it was 186.0/h. The bluegill population continued to be dominated by small individuals, making them available to existing predators (Figure 3).

Blue catfish: The gill net catch rate for blue catfish continued to remain low. Historically only one or two blue catfish were collected during gill net surveys. The one blue catfish that was collected during the 2010 survey was of quality size and appeared healthy (Figure 4).

Channel catfish: Catch rates for channel catfish have historically been low; however, they are the most abundant catfish species in the reservoir. Total CPUE for the 2010 gill net survey was 3.4/nn; this is similar to the total CPUE for 2008 (5.0/nn) and 2006 (3.8/nn). Although relative abundance continued to remain low, the majority of fish sampled continued to be available to anglers for legal harvest (Figure 5). Directed fishing effort, catch per hour, and total harvest for channel catfish showed a minimal catfish fishery (Table 6). Creel data collected from March, 2009 through May, 2009 showed that harvest was minimal with only 14 fish measured during the creel survey; however, all fish were greater than 15 inches, and the largest measured 24 inches (Figure 6).

Flathead catfish: Flathead catfish continued to have low relative abundance. The gill net catch rate of flathead catfish was 0.4/nn. This was similar to 2008 (0.2/nn) and to 2006 (0.4/nn) (Figure 7).

Alabama Spotted bass: Electrofishing catch rate of Alabama spotted bass decreased slightly from 38/h in 2008 to 27/h in 2009 (Figure 8). Size structure appeared to have declined from a PSD of 71 in 2008 to a PSD of 48 in 2009. Body condition was similar in 2007 and 2009 (Figure 8). While catch rates over the past seven years have shown a generally increasing trend, size structures during the same time period have typically been dominated by smaller individuals. PSD has ranged from a high of 78 in 2005 to a low of 33 in 2007; samples have resulted in few fish over 15 inches collected (Figure 9). The 2009 creel survey reported the first directed effort specifically targeting Alabama spotted bass (74.2 hours, RSE = 190.9). The 2009 creel survey estimated that 18% (4,697) of released fish during the survey period were spotted bass.

Largemouth bass: The electrofishing catch rate of largemouth bass was 75.0/h in 2009; this is a slight improvement over 2008 (65.0/h) and 2007 (43.0/h) (Figure 10). A reduction in the PSD from the 2007 survey (PSD = 71) to the 2009 survey (PSD = 55) brought the value back into the preferred range for a balanced largemouth bass population (Gablehouse 1984). Relative weight in 2009 averaged between 80 and 90 and was similar to body condition in previous surveys (Figure 10). Largemouth bass continued to be the most sought-after species of fish at the Reservoir with 36.9% of the directed effort; black bass species as a whole received another 31.4% of the directed effort. Creel survey data estimated that there were 20,947.5 hours of directed effort for largemouth bass, an average of 0.4 fish caught per hour, and 771 largemouth bass harvested (Table 7). During the survey period, the majority of legal-sized largemouth bass, caught by anglers, were released (Table 7). During the creel survey, there were 42 fish measured; 71% of these largemouth bass (30 fish) were between 10 and 17 inches in length (Figure 11). Florida largemouth bass influence was 72% and Florida genotype was 10% (Table 8). Although age and growth analysis shows that growth of largemouth bass in Alan Henry Reservoir is slower than average for Texas, it appears to show a slight increase through age 3 (Figure 12). With few fish over age 5 collected in previous age and growth analysis, it is difficult to determine how the September 1, 2002 regulation change has impacted age and growth in older year classes (Figure 12).

White crappie: Trap net location appeared to greatly influence CPUE. Randomly selected trap net sites in 2001 and 2009 resulted in a CPUE of 0.3/nn; much lower than in 2005 (27.6/nn) where sites were biologist selected (Figure 13). The 2009 survey captured 2 fish greater than 10 inches resulting in a PSD of 100 (Figure 13). White crappie were the second most popular individual species targeted by anglers (Table 4). An estimated 7,628.49 hours of directed effort were calculated from the 2009 creel survey from March, 2009 through May, 2009 (Table 9). Harvested white crappie in 2009 ranged from 10 to 16 inches in total length (Figure 14).

Fisheries management plan for Alan Henry Reservoir, Texas

Prepared – July 2010

ISSUE 1: Alabama spotted bass have been managed with restrictive harvest regulations, since their introduction to the reservoir in 1996, to establish a self-sustaining population. Surveys indicated the presence of a growing population with few spotted bass attaining sizes larger than 15 inches. The increased population size and distribution has also resulted in some identification problems for some anglers.

MANAGEMENT STRATEGY

1. Current harvest regulations for black bass include, “For largemouth bass there is no MLL. For spotted bass; MLL = 18 inches. Daily bag = 5 bass in any combination of which no more than 3 fish can be spotted bass. Up to 5 largemouth bass may be retained; however, only 2 may be less than 18 inches.” Propose to change regulation to, “For black bass and their hybrids there is no MLL; however, only 2 may be less than 18 inches. Daily bag = 5 in any combination.”
2. A more liberalized regulation would also result in fewer errors by anglers who misidentify largemouth bass and spotted bass. The proposed regulation would allow anglers more liberal harvest of spotted bass and still provide some protection to the population.

ISSUE 2: Largemouth bass age and growth appears to have improved slightly through age 3; however, growth appears to stall at age 4.

MANAGEMENT STRATEGY

1. Conduct age and growth analysis in 2013 to determine impact of September 1, 2002 harvest regulation on age and growth of largemouth bass.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes electrofishing and creel sampling in 2010/2011 and 2012/2013, electrofishing and gill net sampling in 2011/2012, and a full survey in 2013/2014 (Table 10). Annual electrofishing surveys are necessary to maintain consistent data for trend information on this heavily used black bass fishery. Additional gill net sampling will be used for continued monitoring of catfish species. Trap netting will be conducted using biologist-selected stations.

LITERATURE CITED

- Altena, E.. 1997. Statewide freshwater fisheries monitoring and management program survey report for Alan Henry Reservoir, 1996. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- 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. Stimert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.
- Gabelhouse, D.W., Jr. 1984. A length-categorization system to assess fish stocks. North American Journal of Fisheries Management 4:273-285.
- 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 32:348.
- Henegar, J. 2006. Statewide freshwater fisheries monitoring and management program survey report, Alan Henry Reservoir 2006. Texas Parks and Wildlife Department, Federal Aid in Sport Fish Restoration Act, Federal Aid Grant F-30-R-30, Performance Report, Austin.

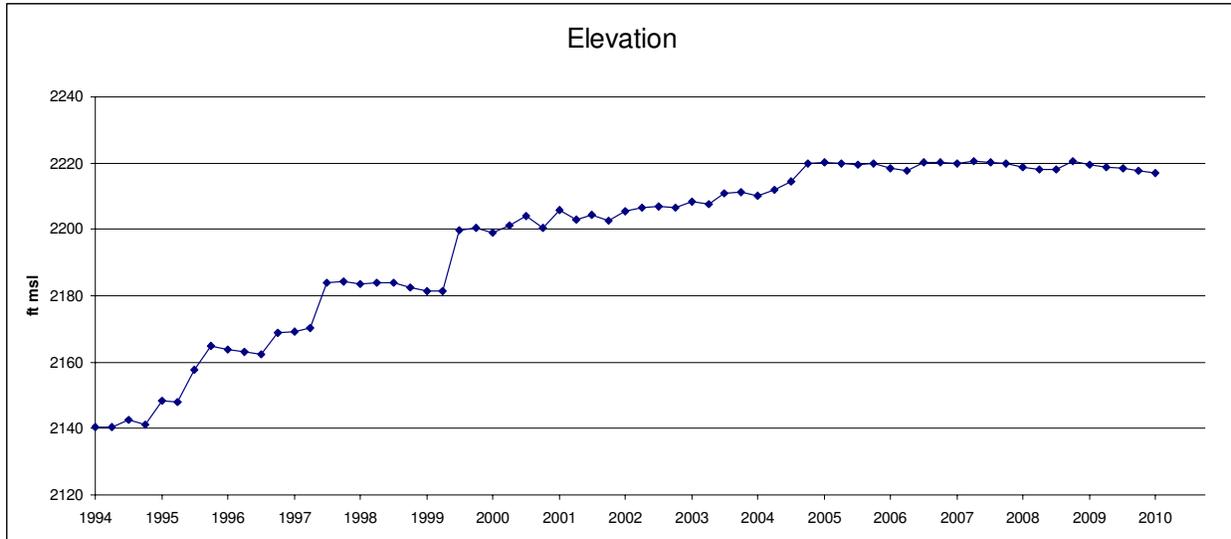


Figure 1. Quarterly water level elevations in feet above mean sea level (FMSL) recorded for Alan Henry Reservoir, Texas. Conservation pool elevation is 2,220 feet above mean sea level.

Table 1. Characteristics of Alan Henry Reservoir, Texas.

Characteristic	Description
Year constructed	1993
Controlling authority	City of Lubbock and Brazos River Authority
County	Garza
Reservoir type	Mainstream
Mean depth (ft)	40.0
Maximum depth (ft)	100.0
Watershed (mi ²)	394
Shoreline Development Index (SDI)	15.15
Conductivity	1124 μ mhos/cm

Table 2. Harvest regulations for Alan Henry Reservoir, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Catfish, Flathead	5	18 - No Limit
Bass: smallmouth	3	18 - No Limit
Bass: spotted, Alabama	(in any combination)	
Bass: largemouth	5	No Limit (only 2 < 18 inches)
Crappie: white and black crappie hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 3. Stocking history of Alan Henry Reservoir, Texas. Size categories are adult (ADL), and fingerling (FGL).

Species	Year	Number Stocked	Size
Shad, Gizzard	1993	80	ADL
Catfish, Blue	1993	143,564	FGL
	1994	143,004	FGL
	Total	286,568	
Catfish, Channel	1993	143,951	FGL
	1994	32,013	FGL
	Total	175,964	
Bass, Smallmouth	1993	72,021	FGL
	1994	75,650	FGL
	Total	147,671	
Bass, Spotted	1996	150	ADL
Bass, Florida Largemouth	1993	144,124	FGL
	1993	149	ADL
	1994	144,000	FGL
	1994	351	ADL
	2009	144,082	FGL
Total	432,706		
Bass, ShareLunker Largemouth	2006	7,184	FGL
	2004	3,038	FGL
	2005	10,000	FGL
	Total	20,222	
Crappie, White	1993	67,042	FGL

Table 4. Percent directed angler effort by species April through June of 2000, and March through May of 2009 for Alan Henry Reservoir, Texas.

Species	Years	
	2000	2009
Catfishes	0.1	
Channel catfish	4.2	2.9
Flathead catfish	0.8	
Bluegill	0.4	
Black basses	6.7	31.4
Alabama spotted bass		0.1
Largemouth bass	48.5	36.9
White crappie	19.5	13.4
Anything	20.0	15.3

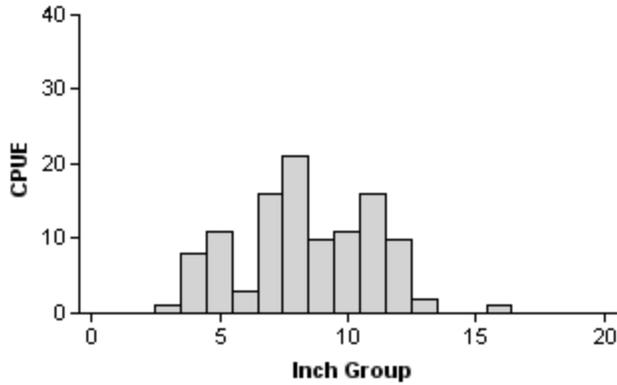
Table 5. Total fishing effort (h) for all species and total directed expenditures April through June of 2000, and March through May of 2009 at Alan Henry Reservoir, Texas.

Creel statistics	Year	
	2000	2009
Total fishing effort	54,024.8	56,814.5
Total directed expenditures	\$379,085	\$457,510

Gizzard Shad

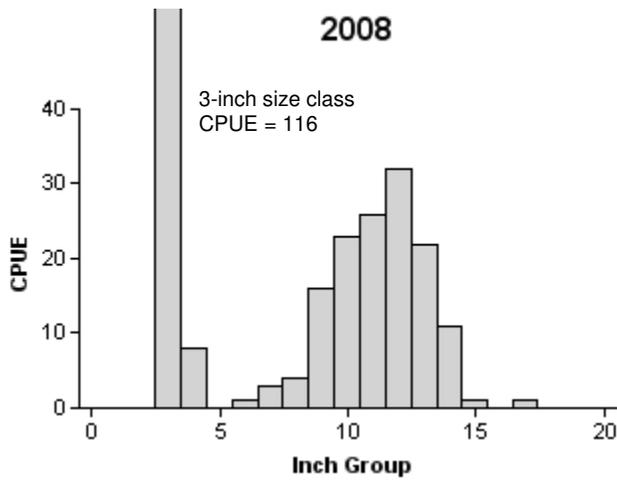
2007

Effort = 1.0
 Total CPUE = 110.0 (52; 110)
 IOV = 36 (7)



2008

Effort = 1.0
 Total CPUE = 264.0 (53; 264)
 IOV = 49 (23)



2009

Effort = 1.0
 Total CPUE = 84.0 (28; 84)
 IOV = 4 (3)

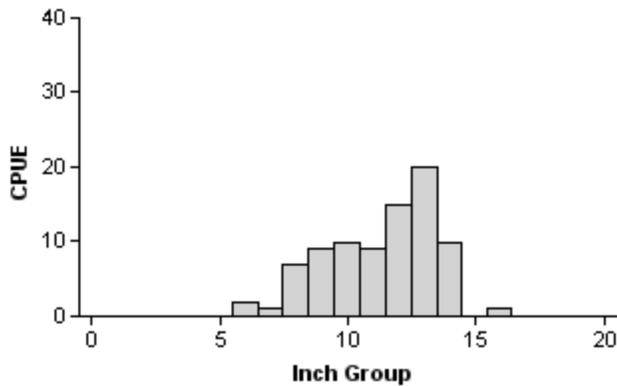
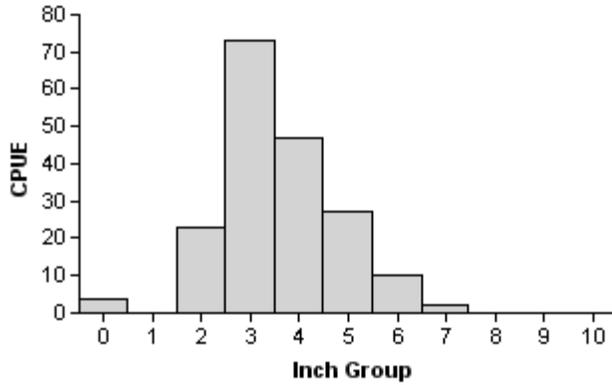


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Alan Henry Reservoir, Texas, 2007, 2008, and 2009.

Bluegill

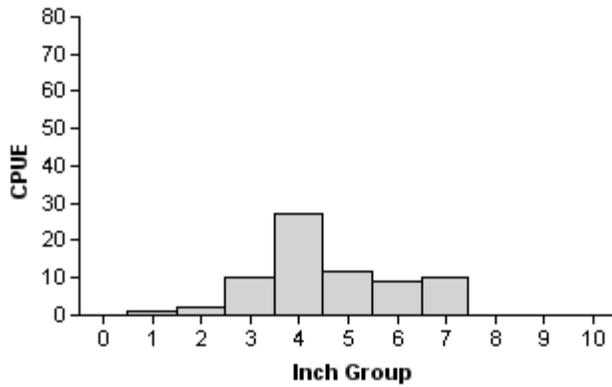
2007

Effort = 1.0
 Total CPUE = 186.0 (19; 186)
 PSD = 8 (3)



2008

Effort = 1.0
 Total CPUE = 71.0 (34; 71)
 PSD = 28 (5)



2009

Effort = 1.0
 Total CPUE = 51.0 (27; 51)
 PSD = 26 (10)

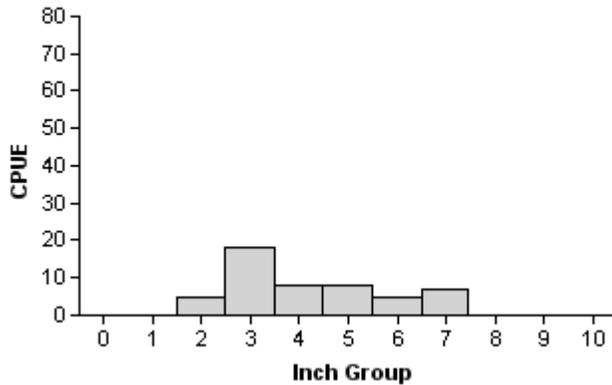
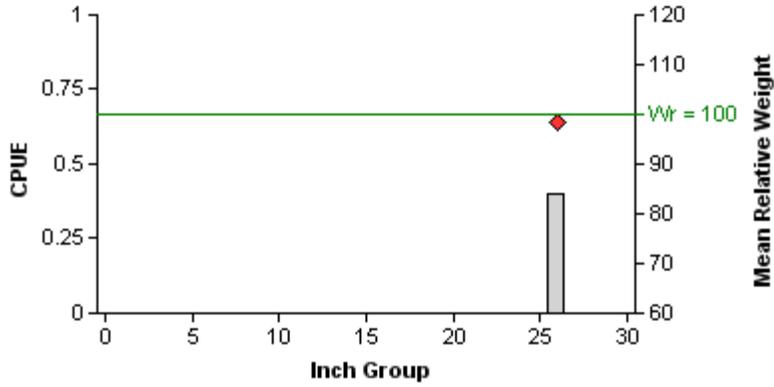


Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Alan Henry Reservoir, Texas, 2007, 2008, and 2009.

Blue Catfish

2006

Effort = 5.0
 Total CPUE = 0.4 (61; 2)
 PSD = 100 (0)



No blue catfish were collected in 2008

2010

Effort = 5.0
 Total CPUE = 0.2 (100; 1)
 PSD = 100 (0)

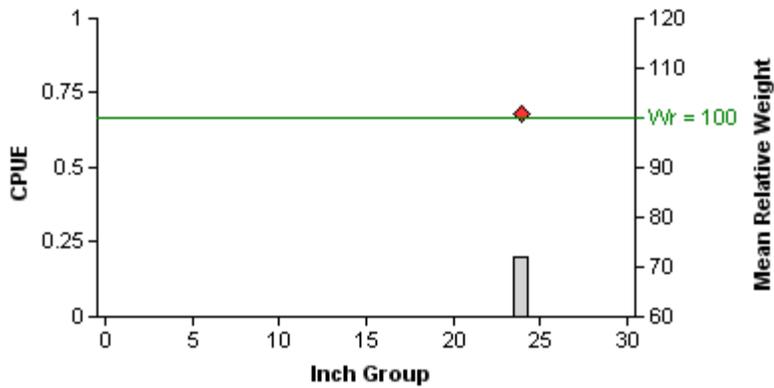
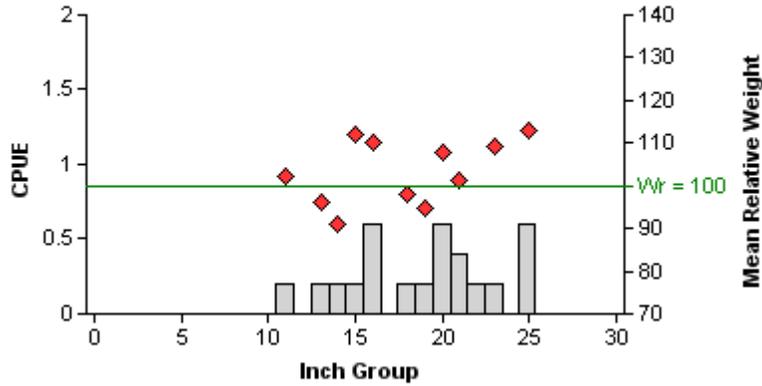


Figure 4. Number of blue catfish caught per net night (CPUE, bars), relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Alan Henry Reservoir, Texas, 2006, 2008, and 2010. No blue catfish were collected in 2008.

Channel Catfish

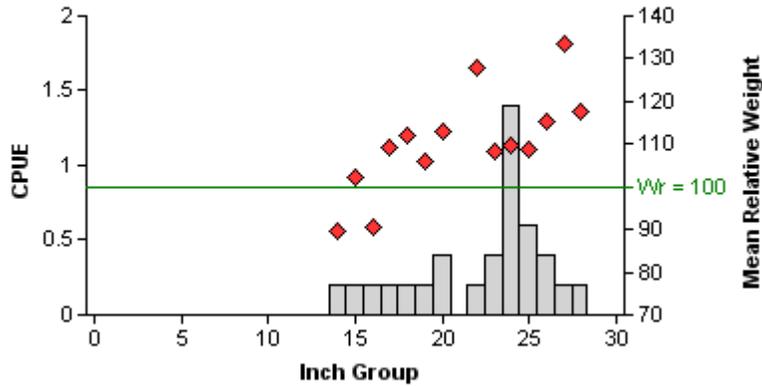
2006

Effort = 5.0
 Total CPUE = 3.8 (30; 19)
 PSD = 79 (5)



2008

Effort = 5.0
 Total CPUE = 5.0 (26; 25)
 PSD = 92 (6)



2010

Effort = 5.0
 Total CPUE = 3.4 (50; 17)
 PSD = 67 (4)

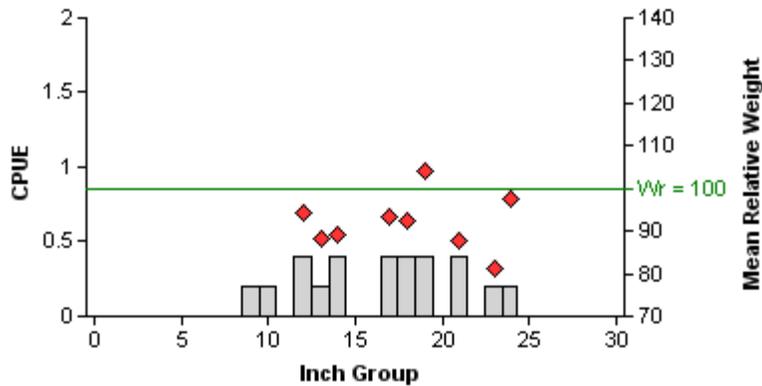


Figure 5. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Alan Henry Reservoir, Texas, 2006, 2008, and 2010.

Channel Catfish

Table 6. Creel survey statistics for channel catfish at Alan Henry Reservoir from April 2000 through June 2000, and March 2009 through May 2009, where total catch per hour is for anglers targeting channel catfish and total harvest is the estimated number of channel catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses. RSE for directed effort and total harvest is the same as directed effort/acre and total harvest/acre, respectively

Creel Survey Statistics	Year	
	2000	2009
Directed effort-hours	2275.3 (35)	1652.3 (39)
Reservoir size (acres)	2,045	2,884
Directed effort/acre	1.1 (35)	0.6 (39)
Total catch per hour	0.2 (51)	0.1 (71)
Total harvest	732 (78)	253 (82)
Harvest/acre	0.4 (78)	0.1 (82)
% legal released	9.9%	41.4%

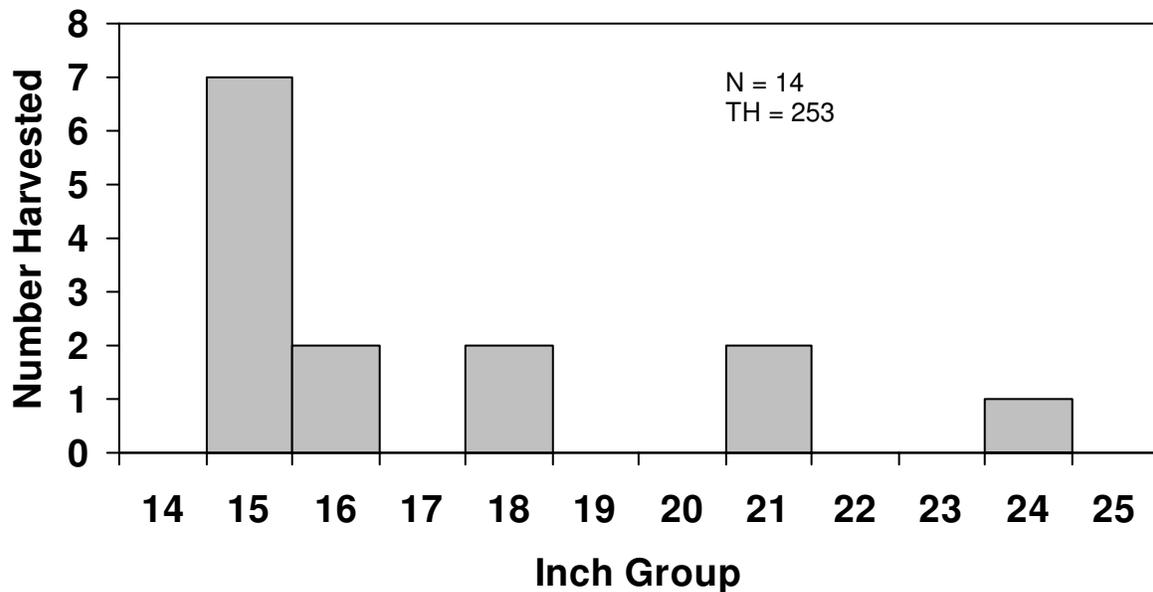
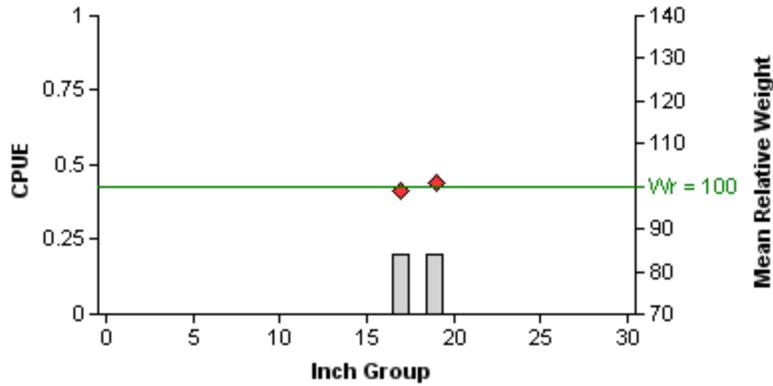


Figure 6. Length frequency of harvested channel catfish observed during creel surveys at Alan Henry Reservoir, Texas, March 2009 through May 2009, all anglers combined. N is the number of harvested channel catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Flathead Catfish

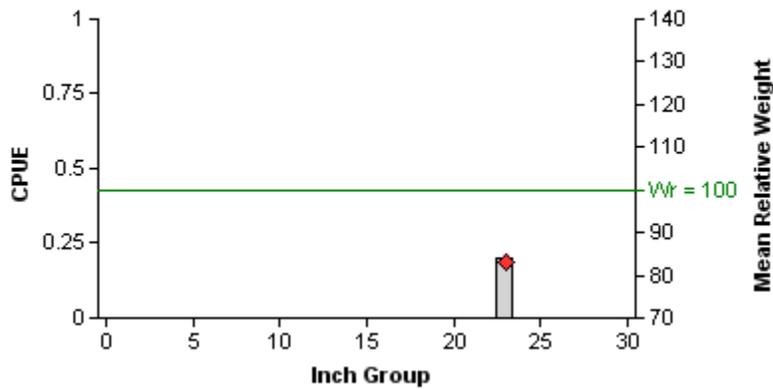
2006

Effort = 5.0
 Total CPUE = 0.4 (61; 2)
 PSD = 0 (79)



2008

Effort = 5.0
 Total CPUE = 0.2 (100; 1)
 PSD = 100 (0)



2010

Effort = 5.0
 Total CPUE = 0.4 (100; 2)
 PSD = 50 (0)

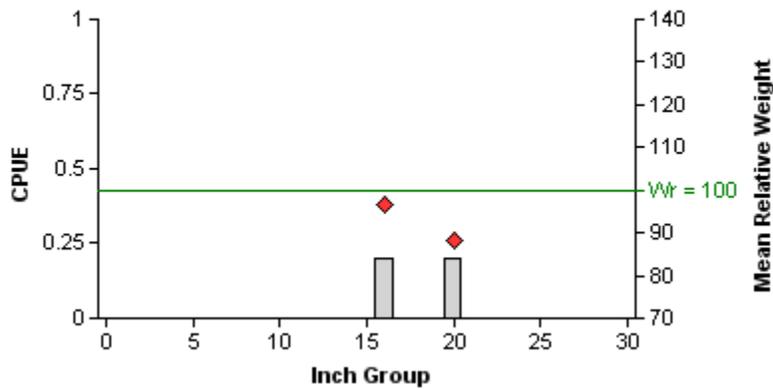
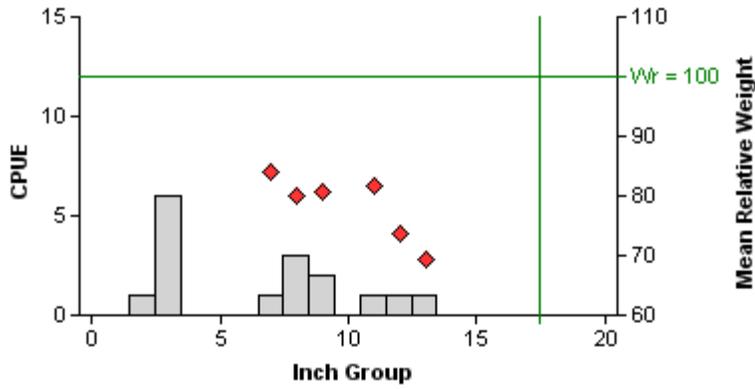


Figure 7. Number of flathead catfish caught per net night (CPUE, bars), relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Alan Henry Reservoir, Texas, 2006, 2008, and 2010.

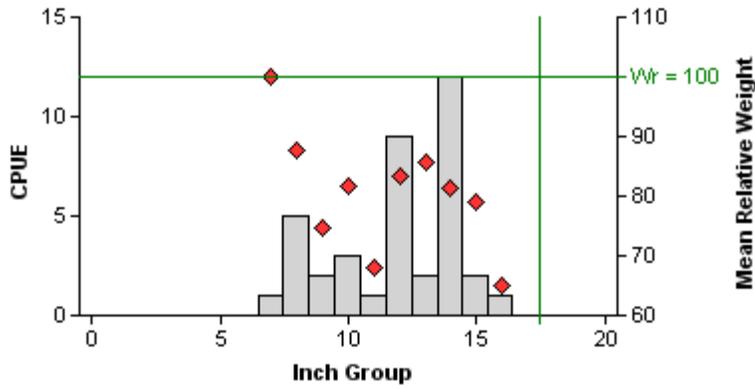
Alabama Spotted Bass 2007

Effort = 1.0
Total CPUE = 16.0 (42; 16)
PSD = 33 (21)



2008

Effort = 1.0
Total CPUE = 38.0 (23; 38)
PSD = 71 (8)



2009

Effort = 1.0
Total CPUE = 27.0 (32; 27)
PSD = 48 (9)

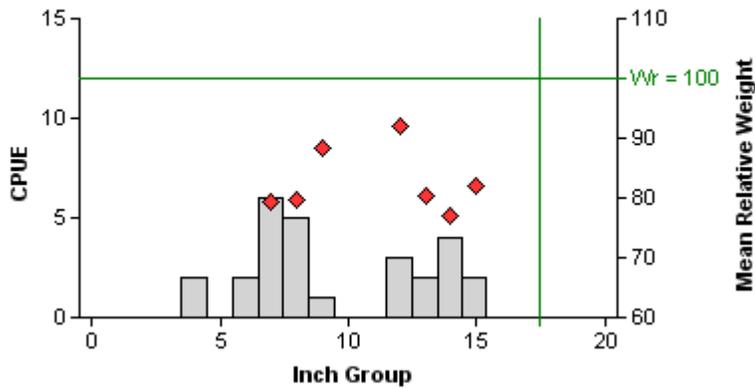


Figure 8. Number of Alabama spotted bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Alan Henry Reservoir, Texas, 2007, 2008, and 2009. Vertical line indicates minimum length limit (18 inches), and horizontal line represents a relative weight of 100.

Alabama Spotted Bass

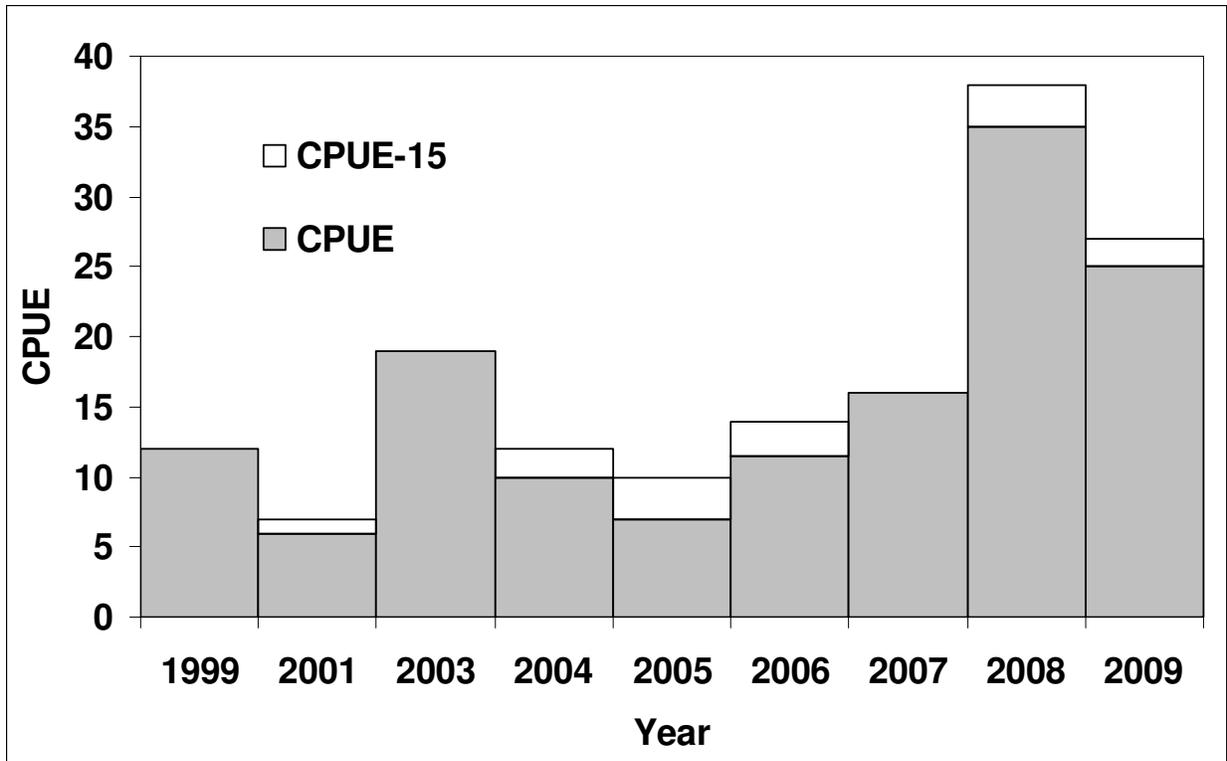
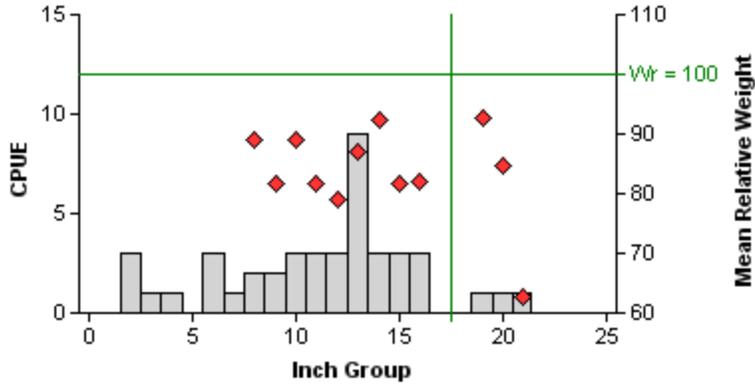


Figure 9. Number of Alabama spotted bass caught per hour (CPUE, bars) and number of Alabama spotted bass greater than or equal to 15 inches caught per hour (CPUE-15, white bars) for fall electrofishing surveys, Alan Henry Reservoir, Texas, 1999, 2001, 2003 – 2009.

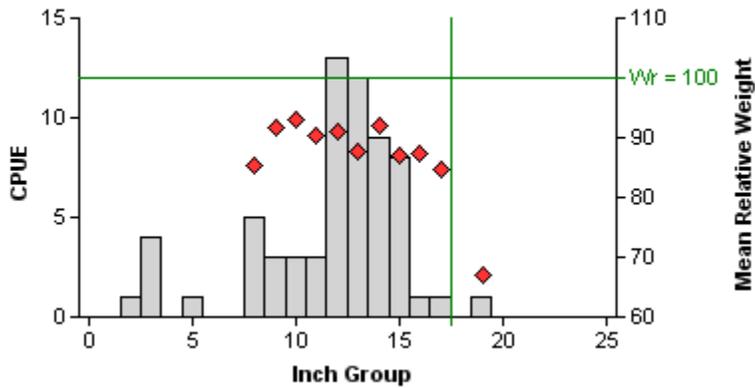
Largemouth Bass

2007



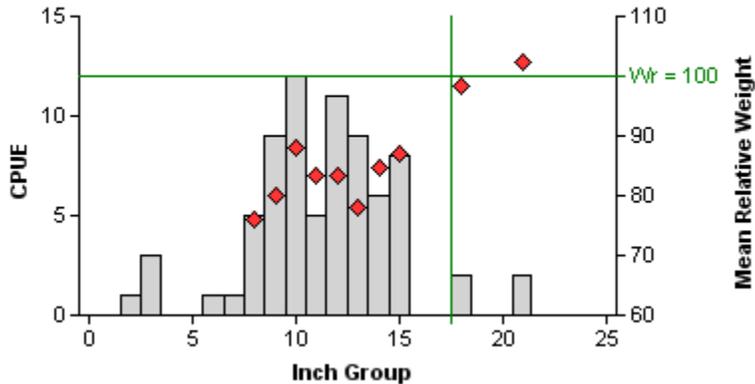
Effort = 1.0
 Total CPUE = 43.0 (26; 43)
 PSD = 71 (7)
 PSD-M = 6 (4)
 PSD-18 = 9 (4)

2008



Effort = 1.0
 Total CPUE = 65.0 (24; 65)
 PSD = 76 (7)
 PSD-M = 0 (0)
 PSD-18 = 2 (2)

2009



Effort = 1.0
 Total CPUE = 75.0 (22; 75)
 PSD = 55 (5)
 PSD-M = 3 (2)
 PSD-18 = 6 (2)

Figure 10. 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, Alan Henry Reservoir, Texas, 2007, 2008, and 2009. Vertical line represents length of 18 inches, and horizontal line represents relative weight of 100.

Table 7. Creel survey statistics for largemouth bass at Alan Henry Reservoir from April 2000 through June 2000, and March 2009 through May 2009, where total catch per hour is for anglers targeting largemouth bass and total harvest is the estimated number of largemouth bass harvested by all anglers. Relative standard errors (RSE) are in parentheses. RSE for directed effort and total harvest is the same as directed effort/acre and total harvest/acre, respectively

Creel Survey Statistics	Year	
	2000	2009
Directed effort-hours	26,191.6 (22)	20,947.5 (20)
Reservoir size (acres)	2,045	2,884
Directed effort/acre	12.8 (22)	7.3 (20)
Total catch per hour	0.4 (11)	0.4 (13)
Total harvest	234 (67)	771 (32)
Harvest/acre	0.1 (67)	0.3 (32)
% legal released	85.1%	76.1%

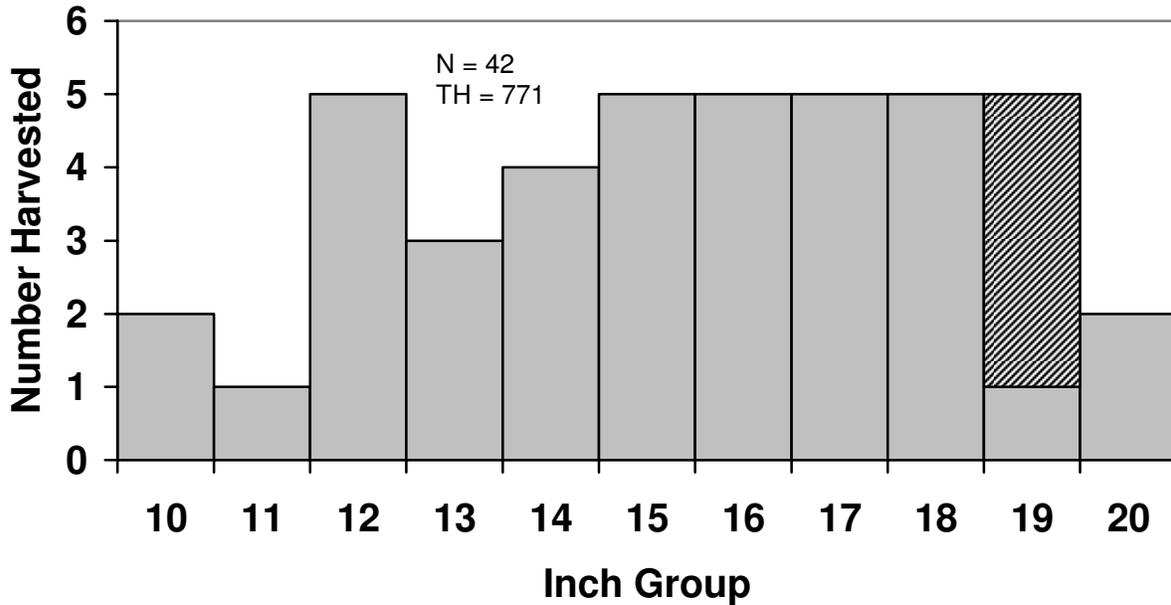


Figure 11. Length frequency of harvested largemouth bass observed during creel surveys at Alan Henry Reservoir, Texas, March 2009 through May 2009, all anglers combined. The hatched bar represents the number of tournament harvested largemouth bass. N is the number of harvested largemouth bass observed during creel survey and TH is the total estimated harvest for the creel period.

Table 8. Results of genetic analysis of largemouth bass collected by fall electrofishing, Alan Henry Reservoir, Texas, 2003, 2005, and 2009. N = Northern largemouth bass, F = Florida largemouth bass, F1 = first generation hybrid between a F and a N.

Year	Genotype					
	Sample Size	N-alleles	F-alleles	N-genotypes	F-genotypes	F1
2003	19	37%	63%	16%	37%	21%
2005	19	43%	57%	16%	21%	5%
2009	30	28%	72%	0%	10%	10%

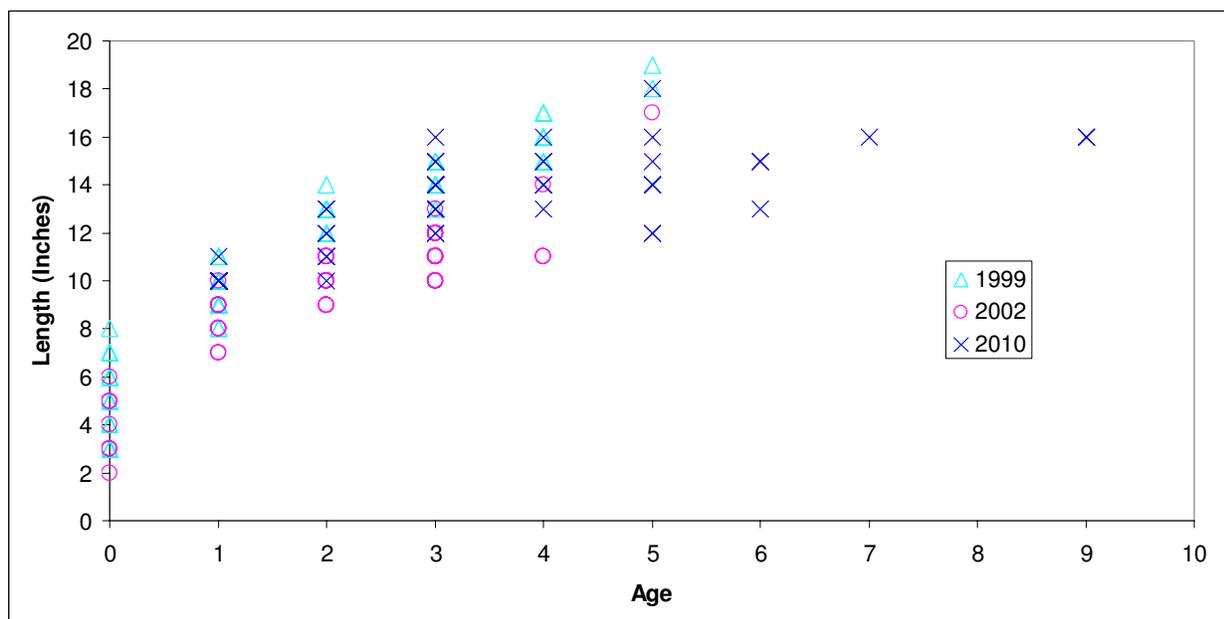


Figure 12. Length at age for largemouth bass collected from electrofishing at Alan Henry Reservoir, Texas, 1999, 2002, and 2010.

White Crappie

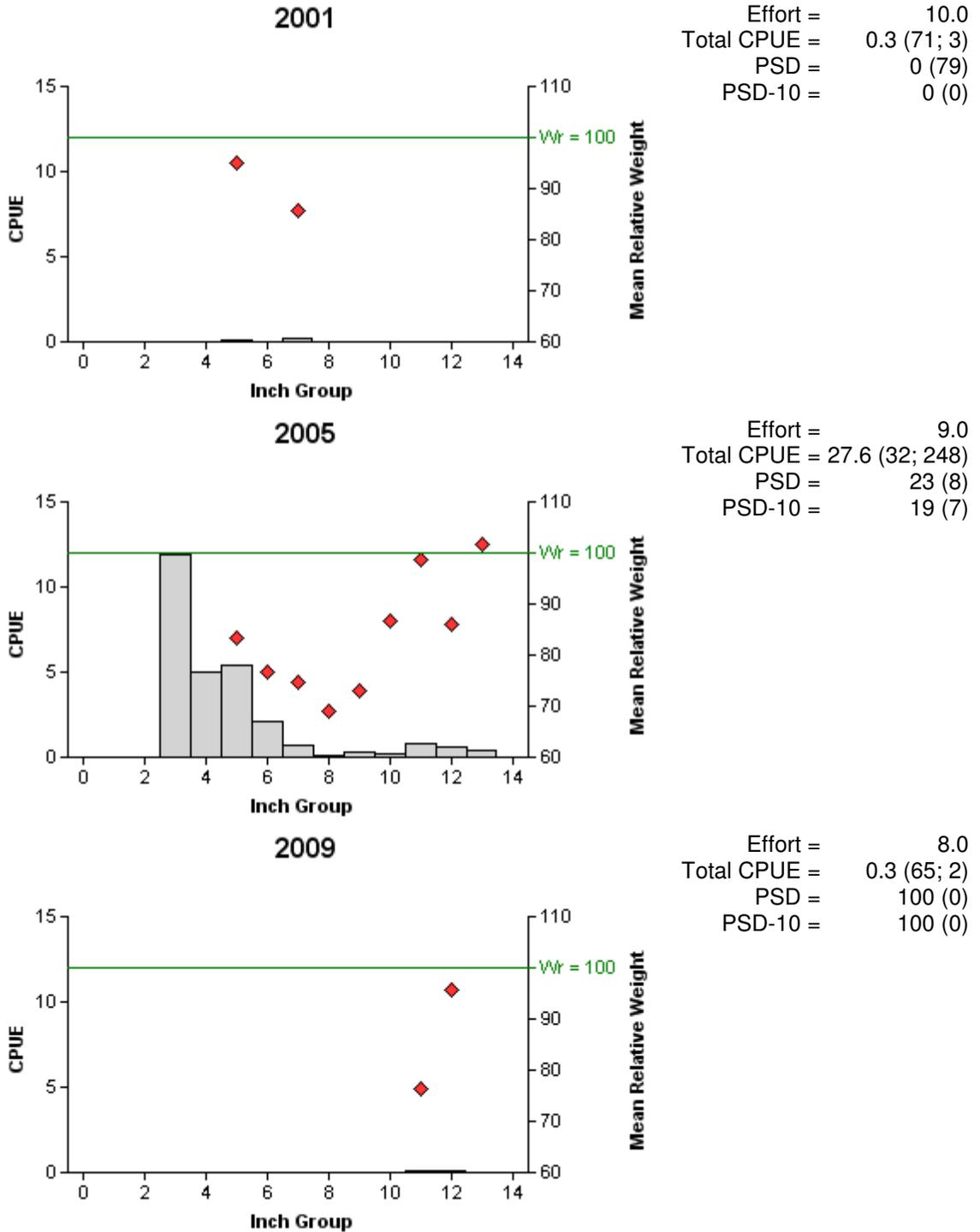


Figure 13. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Alan Henry Reservoir, Texas, 2001, 2005, and 2009. The 2001 and 2009 surveys were the results of randomly selected stations, while the 2005 survey results are from biologist selected stations.

White crappie

Table 9. Creel survey statistics for white crappie at Alan Henry Reservoir from April 2000 through June 2000, March 2005 through May 2005, and March 2009 through May 2009, where total catch per hour is for anglers targeting white crappie and total harvest is the estimated number of white crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses. RSE for directed effort and total harvest is the same as directed effort/acre and total harvest/acre, respectively

Creel Survey Statistic	Year	
	2000	2009
Directed effort (h)	10,526 (21)	7,628.5 (23)
Reservoir size (acres)	2,045	2,884
Directed effort/acre	5.2 (21)	2.7 (23)
Total catch per hour	0.9 (32)	0.3 (42)
Total harvest	1,296 (59)	1,520 (35)
Harvest/acre	0.6 (59)	0.5 (35)
% legal released	0.3%	0.04%

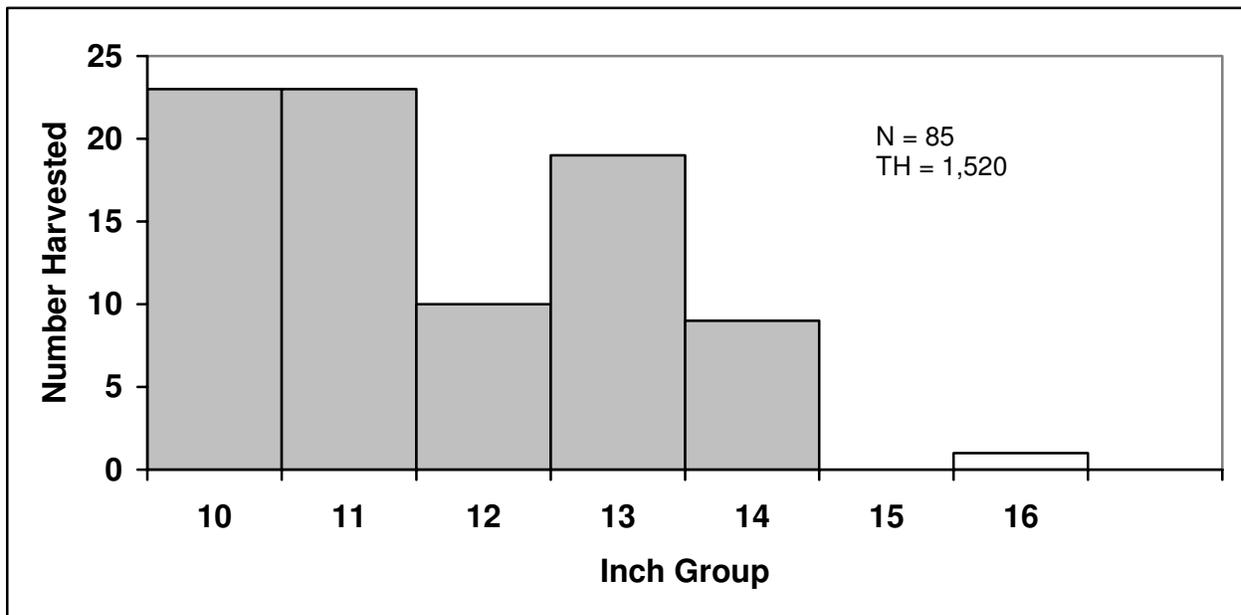


Figure 14. Length frequency of harvested white crappie observed during creel surveys at Alan Henry Reservoir, Texas, March 2009 through May 2009, all anglers combined. N is the number of harvested White crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 10. Proposed sampling schedule for Alan Henry Reservoir, Texas. 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.

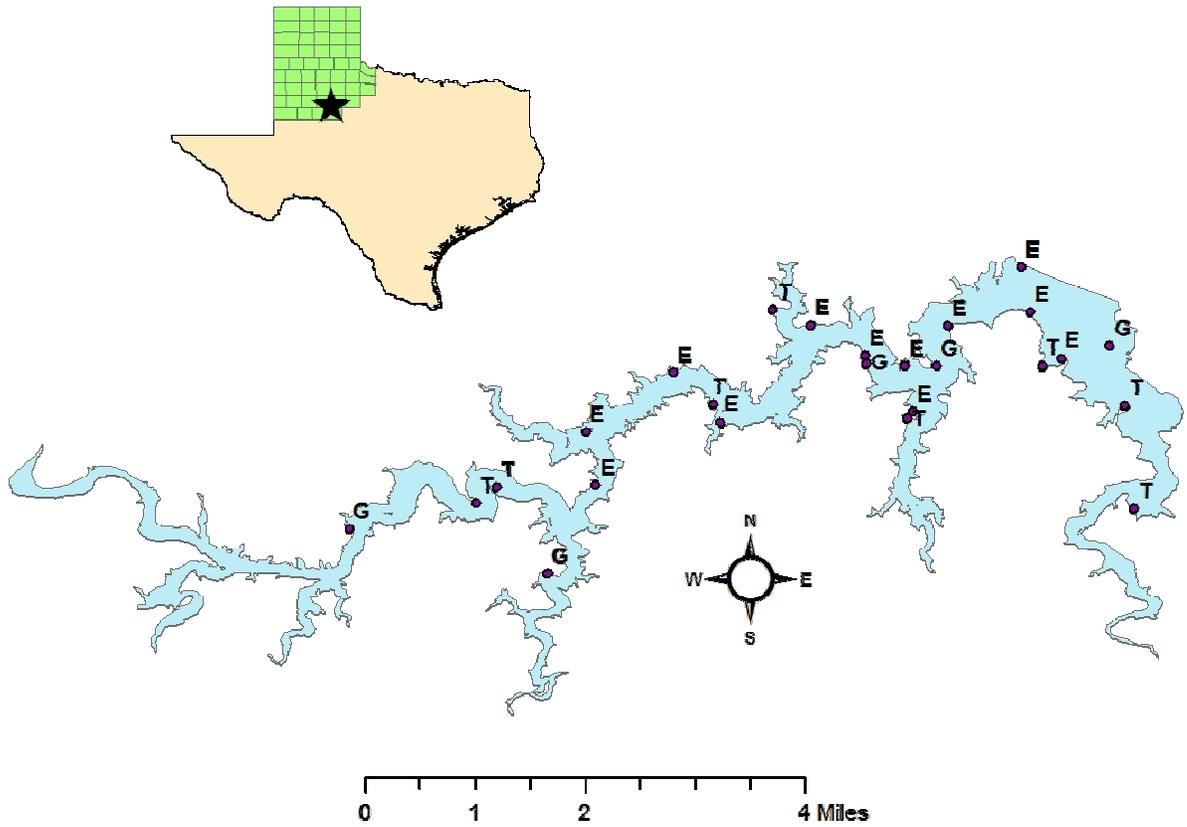
Survey Year	Electrofishing	Trap Net	Gill Net	Creel Survey	Report
Fall 2010-Spring 2011	A			A	
Fall 2011-Spring 2012	A		A		
Fall 2012-Spring 2013	A			A	
Fall 2013-Spring 2014	S	A	S		S

APPENDIX A

Catch rate of all species collected from all gear types from Alan Henry Reservoir, Texas, 2009-2010. Effort was 1 h for electrofishing, 5 net nights for gill nets, and 8 net nights for trap nets.

Species	Electrofishing	Gill Netting	Trap Netting
Gizzard shad	84.00	6.20	0.13
Common carp	10.00	0.40	
River carpsucker	2.00	0.80	
Blue catfish		0.20	
Channel catfish	4.00	3.40	
Flathead catfish	2.00	0.40	
Green sunfish	18.00		
Bluegill	51.00	0.20	7.88
Longear sunfish		0.20	
Spotted bass	27.00	2.00	
Largemouth bass	75.00	2.40	0.38
White crappie		0.80	0.25
Freshwater drum		3.40	

APPENDIX B



Location of sampling sites, Alan Henry Reservoir, Texas, 2009-2010. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively.