

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-33

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

**Lewisville Reservoir**

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lewisville Reservoir were surveyed in 2007 using electrofishing, and trap nets and in 2008 using gill nets. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Lewisville Reservoir is a 29,592-acre impoundment constructed on the Elm Fork of the Trinity River by the U.S. Army Corps of Engineers in 1954 to provide flood control, municipal and industrial water, and recreation. The lower end of Lewisville Reservoir is surrounded by urban development and is 25 miles northwest of Dallas, Texas in Denton County. The upper end of the reservoir is experiencing rapid development as well. The reservoir contains 640,986 acre-feet of water at conservation elevation (522 ft. mean sea level), has a mean depth of 21.7 feet, and has a maximum depth of 67.0 feet. Angler and boat access is adequate. There is one handicap specific facility on the reservoir. At the time of sampling the fishery habitat was primarily nondescript, gravel shorelines, and standing timber. Lewisville Reservoir has been part of the TPWD Habitat Improvement Initiative since 1998; however, because of water level fluctuations there has been limited success. Mitigation efforts are under way to restore 123 acres of standing timber in the Hickory Creek arm of the reservoir. The habitat was clear cut in 2006 by a land developer when a prolonged drought exposed the lake bed.
  
- **Management history:** Important sport fish include largemouth bass, white crappie, white bass, palmetto bass, and blue and channel catfish. All species are managed with statewide regulations. Palmetto bass are stocked annually at a rate of 5 fish per acre. A ShareLunker largemouth bass was caught at Lewisville in November of 2005. ShareLunker largemouth bass were stocked in the spring of 2006. Florida largemouth bass were stocked in 2006 and 2007.
  
- **Fish Community**
  - **Prey species:** Gizzard and threadfin shad are in great abundance in the reservoir. Bluegill and longear sunfish are also very abundant as prey but few fish over 6 inches are available for anglers.
  
  - **Catfishes:** The blue catfish population continues to be good while the relative abundance of channel catfish declined since previous surveys. No flathead catfish were sampled during annual gill netting.
  
  - **Temperate basses:** White bass catch rates nearly doubled from the previous two surveys. Palmetto bass catch rates slightly increased over the previous survey. Five year classes of palmetto bass were collected in 2008.
  
  - **Black basses:** The spotted bass population has remained relatively stable from previous surveys with the size distribution being good. The largemouth bass population has dramatically increased in abundance from the previous surveys, likely due to major water level increase coupled with a stocking of Florida largemouth bass. Size distribution is skewed towards smaller fish.
  
  - **Crappie:** The white crappie population declined over previous surveys. Black crappie relative abundance increased since the previous survey with mostly sub-stock fish collected.

- **Management Strategies:** Stock palmetto bass at a rate of 5/acre annually. Conduct annual creel survey in 2011-2012. Assist USACE and LAERF with habitat mitigation project regarding habitat loss in winter of 2006. General monitoring with gill netting will be conducted every two years. Electrofishing and trap netting surveys will be conducted in 2011-2012, when the next report will be written.

## INTRODUCTION

This document is a summary of fisheries data collected from Lewisville Reservoir in 2007-2008. 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 2007-2008 data for comparison.

### *Reservoir Description*

Lewisville Reservoir, Denton County, is a 29,592-acre impoundment constructed by the U.S. Army Corps of Engineers (USACE) in 1954 on Elm Fork of the Trinity River. It was built to provide flood control, water for municipal and industrial purposes, and recreation. Other principal tributaries are Hickory Creek and Little Elm Creek. In 1989 the conservation pool level of the reservoir was raised from 514 ft. mean-sea-level (msl) to 522 ft. msl. Lewisville Reservoir has a drainage area of approximately 968 square miles. Rainfall in the watershed averages 33.5 inches per year. Angler and boat access is adequate. There is one handicap accessible facility. A native aquatic plant habitat restoration project was initiated on Lewisville Reservoir in 1998 in cooperation with Lewisville Aquatic Ecosystem Research Facility (LAERF). Partial work on the project began, but drought conditions resulted in no vegetation being planted in 1998. In 1999 the drought continued as water levels declined to 14 feet below conservation pool. Limited plantings have occurred since with little or no success. Striped bass were stocked each year from 1991 until 1999. Stockings were discontinued because of low catch rates and because several summer fish kills of striped bass occurred, however palmetto bass have been stocked annually since 1999, excluding 2001 due to golden alga outbreak at production hatcheries. In January 2006, approximately 123 acres of stumps and standing timber in the Hickory Creek arm of the reservoir were illegally cut by a land developer during an extended drought which had water levels 7-8 feet below conservation pool. A team organized by the USACE was formed to assess the damage as well as develop a mitigation plan for fish and wildlife. The habitat restoration plan is ongoing and will incorporate rock piles, brush piles, and vegetation planted in cages by LAERF staff and volunteers.

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Brock and Hungerford 2004) included:

Maintain palmetto bass population. Collect information regarding angling pressure on palmetto bass fishery.

**Actions:** Continued requesting palmetto bass annually at 10 fish per acre. An annual creel survey was scheduled to begin in summer 2007 but was cancelled due to other district priorities. The stocking rate of palmetto bass has since been reduced to 5 fish per acre in an effort to reduce number of fish requested. Thus far, gill netting catch rates have remained high despite a reduced stocking rate.

Lewisville continues to support an abundant catfish population, but no in-depth research has been conducted.

**Actions:** Lewisville was proposed to be included in the statewide catfish research project

developed by Heart of the Hills Research facility staff to investigate sampling efficiency of catfish species. Lake Livingston was selected for the project.

**Harvest regulation history:** Sport fish populations in Lewisville Reservoir have been managed with statewide regulations (Table 2).

**Stocking history:** The last stocking of Lewisville Reservoir occurred in 2007 consisting of both Florida largemouth bass and palmetto bass. The complete stocking history is in Table 3.

**Vegetation/habitat history:** Lewisville Reservoir aquatic vegetation is currently comprised mainly of sporadic stands of native shoreline emergent species. Gravel and standing timber make up the majority of the habitat.

## METHODS

Fishes were collected by electrofishing (2.0 hours at 24 5-min stations), trap netting (15 net nights at 15 stations), and gill netting (15 net nights at 15 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/hr) 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 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], 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 ( $RSE = 100 \times SE$  of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Age and growth analysis for largemouth bass and palmetto bass was conducted with ages being determined using otoliths from fish collected over stock size (TPWD, Inland Fisheries Division, unpublished manual revised 2005). Source for water level data was the United States Geological Survey website.

## RESULTS AND DISCUSSION

**Habitat:** Littoral zone habitat consisted primarily of nondescript, gravel, and standing timber (Table 4).

**Prey species:** The electrofishing catch rate of threadfin of 475.0/hr was above the district average of 230.0/hr. The gizzard shad electrofishing catch rate of 364.5/hr was well above the district average of 271.0/hr. It was lower than the 2003 survey of 552.0/hr. Index of vulnerability for gizzard shad was high, indicating that 95% of gizzard shad captured in 2007 were available to existing predators. The electrofishing catch rate of bluegill was 314.0/hr (Figure 3). The bluegill population does not contain large numbers of quality sized fish (>6 inches), however, PSD values have increased from 1 in 1999 to 10 in 2007. The longear sunfish catch rate observed in 2007 (140.0/hr) was also much higher than rates observed in 1999 and 2003 and above the district average of 88.0/hr (Figure 4).

**Catfishes:** The gill netting catch rate of blue catfish in 2008 of 4.9/nn was well above the district average of 1.7/nn and similar to the catch rate observed in 2003 (5.2/nn; Figure 5). Size structure of the blue catfish population was good as indicated by a PSD value of 30 and a RSD-p value of 7 observed in 2008. The gill netting catch rate of channel catfish was 1.5 /nn in 2008 which was lower than the previous samples (1.9/nn in 2004, 4.7/nn in 2006; Figure 6). Although the 2008 catch rate was below the district average 5.7/nn, size structure remained average as indicated by a PSD value of 31. Lewisville, like other district reservoirs, has exhibited an inverse relationship between blue catfish and channel catfish relative abundances.

**Temperate basses:** The gill netting catch rates of white bass have historically been above the district average of 7.9/nn. The 2008 survey was no exception with a catch rate of 10.0/nn observed (Figure 7). Size structure of the population was good as indicated by the PSD value of 55. The gill netting catch rate of palmetto bass was 6.1/nn (Figure 8) which was nearly double the district average of 3.8/nn. Of particular interest, five age classes of palmetto bass were collected in 2008. In Lewisville, palmetto bass reach 18 inches between age 2 and 3 (Figure 9).

**Black basses:** The total electrofishing catch rate of spotted bass in 2007 of 31.5/hr was similar to the catch rate observed in 2003 and higher than the district average of 25.0/hr (Figure 10). Size structure of the spotted bass population was good as indicated by a PSD value of 48. The total electrofishing catch rate of largemouth bass rebounded nicely in 2007 with a catch rate of 111.5/hr (Figure 11). This is much higher than the catch rate observed in 2003 (76.5/hr) and near the district average of 126.0/hr. The size structure of the population continues to be below average as indicated by a PSD value of 21, dominated by juvenile fish possibly resulting from a stocking of Florida largemouth bass followed by a major increase in water levels lasting throughout the summer of 2007. Growth of largemouth bass in Lewisville Reservoir was good with fish reaching 14 inches in approximately 2 years (Figure 12). Body conditions in 2007 were at or near optimal for most size classes of fish. Florida largemouth bass influence was not determined due to the recent stocking of Florida largemouth bass in both 2006 and 2007. The 2003 Florida allele percentage was 26.4% (Brock and Hungerford 2004).

**Crappies:** The trap netting catch rate of white crappie was 12.5/nn in 2007, which is below to the district average of 16.1/nn and lower than previous surveys (Figure 13). The size structure of the population is good as indicated by a PSD value of 76. The black crappie trap netting catch rate was 4.8/nn in 2007, which is much higher than the 2003 survey (0.5/nn; Figure 14). The size structure of the black crappie population is dominated by small fish as indicated by a PSD of 0. The increase in black crappie could be attributed to the increase in water level during the spring and summer of 2007, flooding vast amounts of terrestrial vegetation.

### **Fisheries management plan for Lewisville Reservoir, Texas**

Prepared – July 2008.

**ISSUE 1:** A quality fishery for palmetto bass has persisted in Lewisville Reservoir since they were stocked again in 1999. The fishery supports several guides targeting palmetto bass and anecdotal evidence suggests anglers catch many fish. Maintenance of the population relies on annual stockings.

#### MANAGEMENT STRATEGY

1. Request annual stockings of palmetto bass at a rate of 5 fish per surface acre.

**ISSUE 2:** The last annual creel survey conducted at Lewisville was in 1998. District priorities resulted in the postponement of an annual creel survey scheduled for 2007-2008.

#### MANAGEMENT STRATEGY

1. Conduct annual creel on Lewisville Reservoir starting June 2011 ending May of 2012.

**ISSUE 3:** Approximately 123 acres of standing timber was illegally cut down by a land developer during an extended drought in the winter of 2006 that exposed much of the upper end of the Hickory Creek arm of Lewisville Reservoir. The USACE formed a team to assess the habitat loss to fish and wildlife. The developer was ordered by a federal judge to pay restitution. A committee was formed to put together a mitigation plan.

**MANAGEMENT STRATEGIES**

1. Continue to work with USACE and LAERF, providing relevant information on where the habitat restoration will be of the greatest value.
2. Monitor habitat restoration efforts through habitat surveys.

**SAMPLING SCHEDULE JUSTIFICATION**

General monitoring of sport fish species with electrofishing and trap netting every 4 years, gill netting will be conducted every 2 years, and an annual creel survey will be conducted in 2011-2012.

**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, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.

Brock, R. and T. Hungerford 2004. Statewide freshwater fisheries monitoring and management program survey report for Lewisville Reservoir, 2003. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

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.

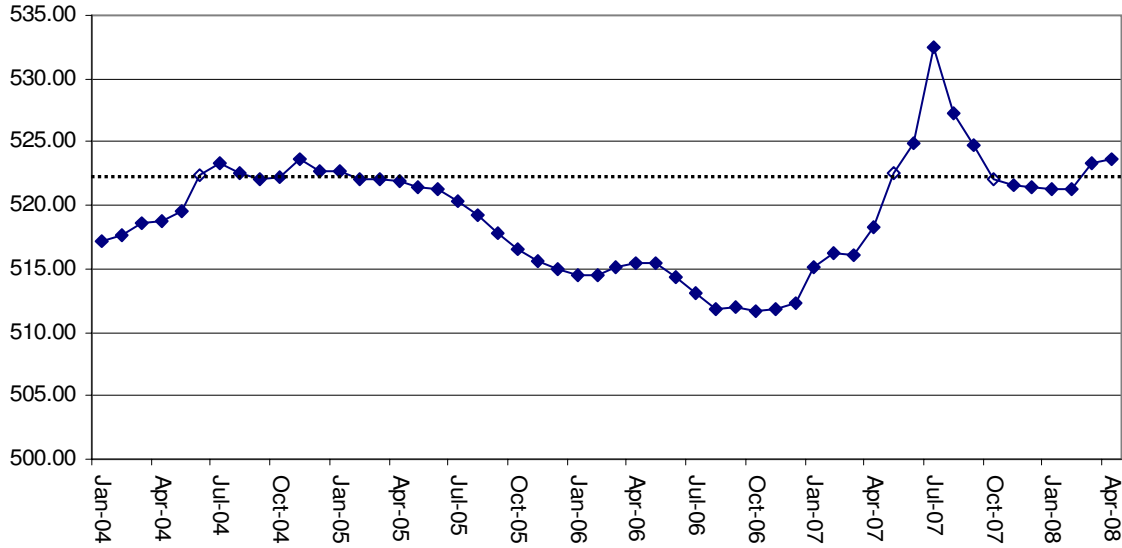


Figure 1. Mean monthly water level elevations in feet above mean sea level (MSL) recorded for Lewisville Reservoir, Texas from January 2004-April 2008. Dashed line indicates conservation pool (522 feet above MSL).

Table 1. Characteristics of Lewisville Reservoir, Texas.

Characteristic	Description
Year Constructed	1954
Controlling authority	US Army Corps of Engineers
Counties	Denton
Reservoir type	Mainstream Trinity River
Conductivity	298 umhos/cm

Table 2. Harvest regulations for Lewisville Reservoir, Texas.

Species	Bag Limit	Length Limit (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 minimum
Catfish, flathead	5	18 minimum
Bass, white	25	10 minimum
Bass, palmetto	5	18 minimum
Bass: spotted	5 In any combination	none
Bass: largemouth		14 minimum
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 minimum



Table 3. Stocking history of Lewisville, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

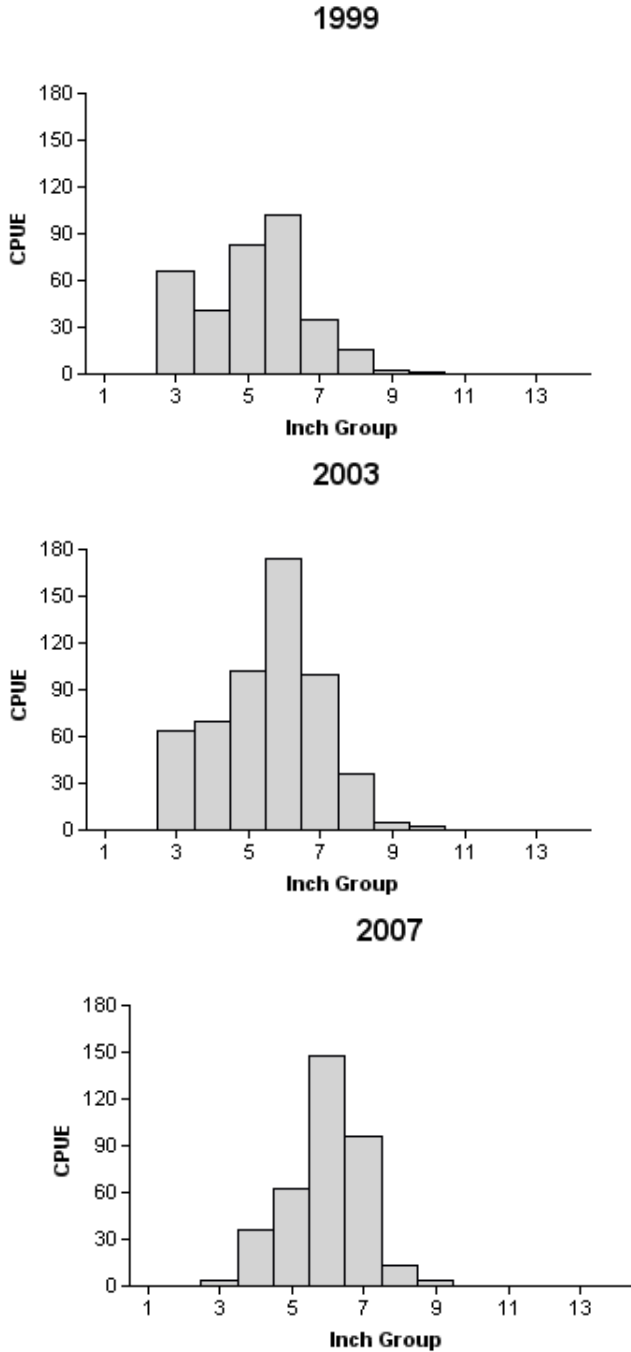
<b>Species</b>	<b>Year</b>	<b>Number</b>	<b>Life Stage</b>	<b>Mean TL (in)</b>
Bluegill	1975	250	UNK	UNK
	Total	250		
Channel catfish	1966	170,000	AFGL	7.9
	1967	30,000	AFGL	7.9
	1968	23,870	AFGL	7.9
	1969	204,200	AFGL	7.9
	1970	25,000	AFGL	7.9
	1971	21,000	AFGL	7.9
	1972	117,800	AFGL	7.9
	1981	76,844	AFGL	7.9
	1993	250	FRY	0.3
	Total	668,964		
Florida largemouth bass	1978	141,588	FGL	2.1
	1978	18,156	FRY	1.0
	1990	743,646	FRY	0.7
	1993	739,751	FGL	1.2
	1998	741,380	FGL	1.4
	2006	507,625	FGL	1.7
	2007	501,720	FGL	1.6
	Total	3,393,866		
Largemouth bass	1966	1,400,500	FRY	0.7
	1967	402,200	FRY	0.7
	1968	640,990	FRY	0.7
	1968	11,385	UNK	UNK
	1969	578,275	FRY	0.7
	1970	35,450	UNK	UNK
	1971	340,000	FRY	0.7
	1975	82	UNK	UNK
	Total	3,408,882		
Palmetto bass (striped X white bass hybrid)	1974	97,570	UNK	UNK
	1976	68,310	UNK	UNK
	1979	232,300	UNK	UNK
	1981	230,740	UNK	UNK
	1983	236,039	UNK	UNK
	1986	18,576	FGL	2.0
	1986	264,239	FRY	1.0
	1999	222,892	FGL	1.3

<b>Species</b>	<b>Year</b>	<b>Number</b>	<b>Life Stage</b>	<b>Mean TL (in)</b>
	2000	221,969	FGL	1.5
	2002	221,983	FGL	1.7
	2003	147,923	FGL	1.4
	2004	295,986	FGL	1.7
	2005	148,670	FGL	1.6
	2006	150,399	FGL	1.5
	2006	1,090,919	FRY	0.2
	2007	149,032	FGL	1.4
	Total	<u>3,797,547</u>		
ShareLunker largemouth bass	2006	<u>3,585</u>	FGL	2.3
	Total	3,585		
Striped bass	1989	120,537	FGL	1.5
	1990	123,827	FGL	1.5
	1991	294,247	FGL	1.3
	1992	133,786	FRY	0.8
	1993	168,107	FGL	1.1
	1994	589,269	FGL	1.1
	1994	3,018,000	FRY	0.8
	1995	272,024	FGL	1.3
	1996	4,617	FGL	1.3
	1997	297,111	FGL	1.2
	1998	<u>151,071</u>	FGL	1.3
	Total	5,172,596		
Threadfin shad	1984	<u>3,200</u>	AFGL	3.0
	Total	3,200		
Walleye	1972	405,000	FRY	0.2
	1973	207,800	FRY	0.2
	1974	<u>475,000</u>	FRY	0.2
	Total	1,087,800		

Table 4. Survey of littoral zone and physical habitat types, Lewisville Reservoir, Texas, 2007. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Bluff	4.6	2.0		
Eroded bank	7.2	3.1		
Concrete	2.3	1.0		
Gravel	56.3	24.2		
Rip rap	12.5	5.4		
Bulkhead	0.6	0.3		
Hydrilla	<0.1	<0.1		
Native emergent	4.5	1.9		
Boulders	9.3	4.0		
Boat docks, piers	7.2	3.1	12	<0.1
Flooded terrestrial	18.7	8.0		
Overhanging brush	5.8	2.5		
Standing timber	44.0	18.9	4225	14.3
Nondescript	60.0	25.8		

## Gizzard Shad



Effort = 2.0  
 Total CPUE = 345.5 (15; 691)  
 Stock CPUE = 55.0 (21; 110)  
 IOV = 94.21 (2)

Effort = 2.0  
 Total CPUE = 552.5 (21; 1105)  
 Stock CPUE = 143.0 (18; 286)  
 IOV = 92.22 (2.3)

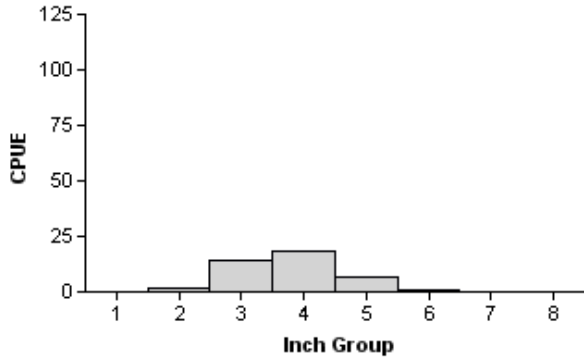
Effort = 2.0  
 Total CPUE = 364.5 (16; 729)  
 Stock CPUE = 115.0 (15; 230)  
 IOV = 94.92 (1.7)

Figure 2. Number of gizzard shad caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lewisville Reservoir, Texas, 1999, 2003, and 2007.

# Bluegill

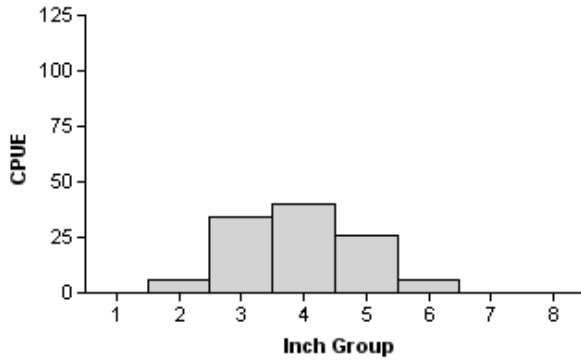
**1999**

Effort = 2.0  
 Total CPUE = 41.5 (60; 83)  
 Stock CPUE = 40.0 (60; 80)  
 PSD = 1 (1)



**2003**

Effort = 2.0  
 Total CPUE = 111.5 (32; 223)  
 Stock CPUE = 106.0 (33; 212)  
 PSD = 6 (2.4)



**2007**

Effort = 2.0  
 Total CPUE = 314.0 (14; 628)  
 Stock CPUE = 278.0 (16; 556)  
 PSD = 10 (2.9)

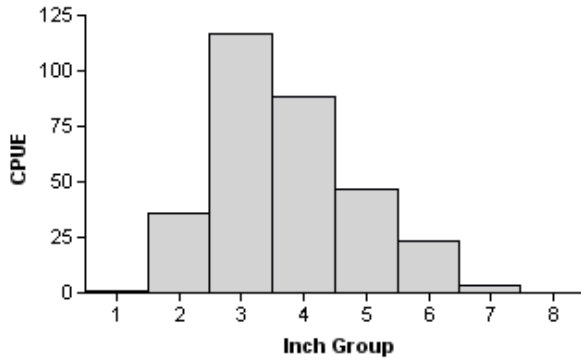


Figure 3. Number of bluegill caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lewisville Reservoir, Texas, 1999, 2003, and 2007.

## Longear Sunfish

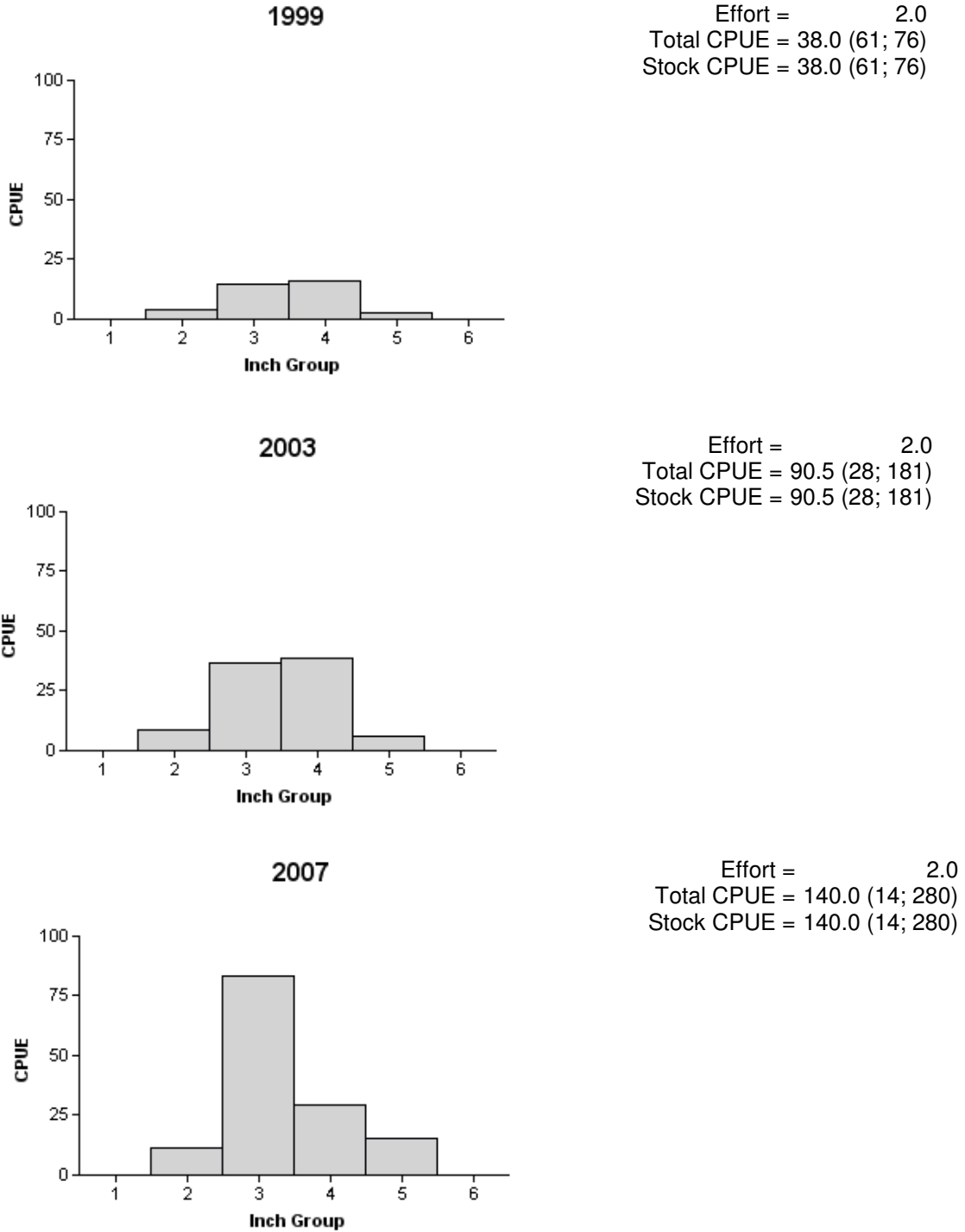
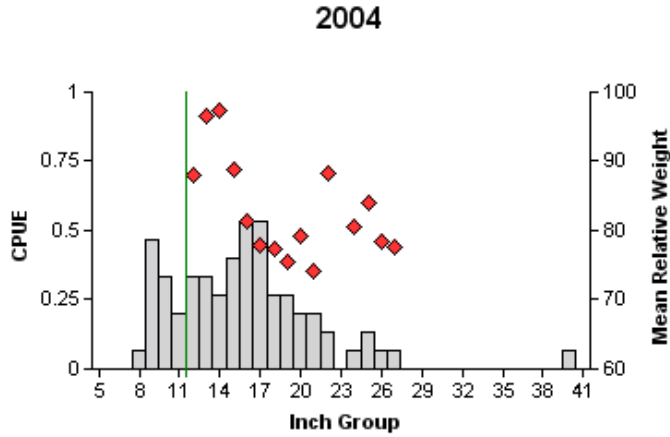
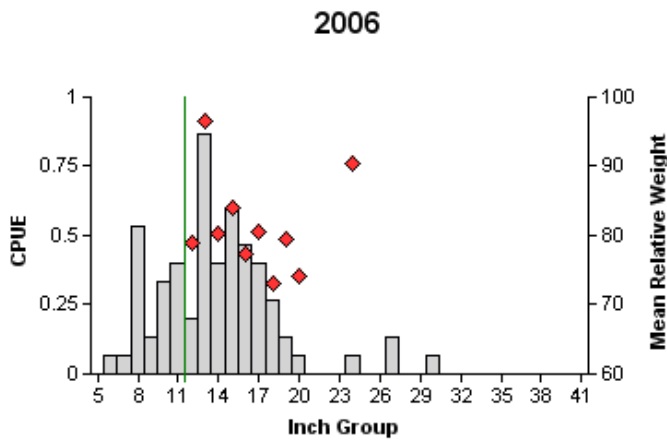


Figure 4. Number of longear sunfish caught per hour (CPUE; RSE and N for CPUE) for fall electrofishing surveys, Lewisville Reservoir, Texas, 1999, 2003, and 2007.

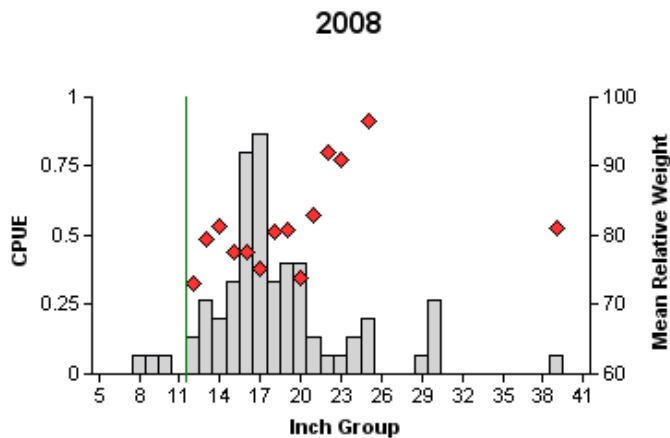
## Blue Catfish



Effort = 15.0  
 Total CPUE = 4.9 (20; 74)  
 Stock CPUE = 3.9 (21; 58)  
 PSD = 24 (3.9)  
 RSD-P = 2 (1.6)



Effort = 15.0  
 Total CPUE = 5.2 (27; 78)  
 Stock CPUE = 3.7 (23; 55)  
 PSD = 9 (4.9)  
 RSD-P = 2 (1.9)

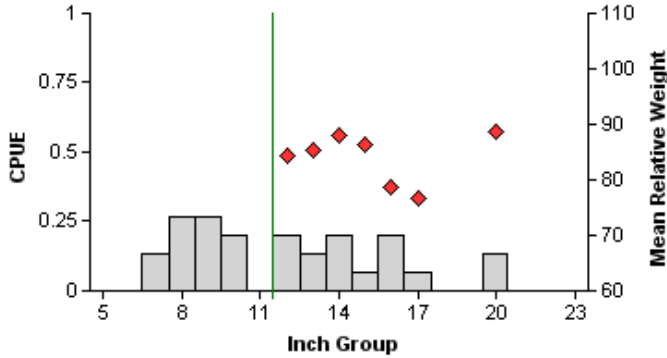


Effort = 15.0  
 Total CPUE = 4.9 (28; 74)  
 Stock CPUE = 4.7 (28; 71)  
 PSD = 30 (5.7)  
 RSD-P = 7 (3.1)

Figure 5. Number of blue catfish caught per net night (CPUE; bars) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lewisville Reservoir, Texas, 2004, 2006, and 2008. Vertical line represents length limit at time of sampling.

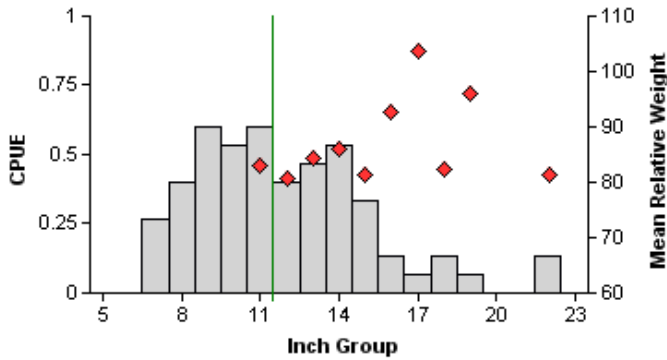
# Channel Catfish

2004



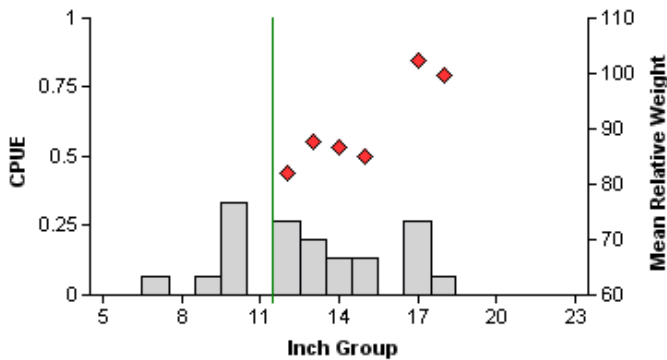
Effort = 15.0  
 Total CPUE = 1.9 (23; 28)  
 Stock CPUE = 1.0 (29; 15)  
 PSD = 40 (14.6)  
 RSD-12 = 100 (0)

2006



Effort = 15.0  
 Total CPUE = 4.7 (22; 70)  
 Stock CPUE = 2.9 (24; 43)  
 PSD = 19 (8.0)  
 RSD-12 = 79 (5.9)

2008



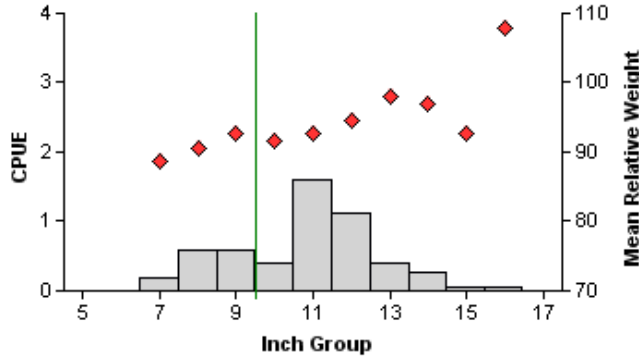
Effort = 15.0  
 Total CPUE = 1.5 (30; 23)  
 Stock CPUE = 1.1 (30; 16)  
 PSD = 31 (10.4)  
 RSD-12 = 100 (0)

Figure 6. 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, Lewisville Reservoir, Texas, 2004, 2006, and 2008. Vertical line represents length limit at time of sampling.



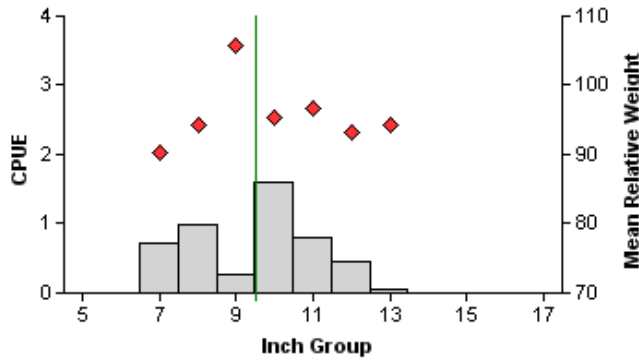
# White Bass

2004



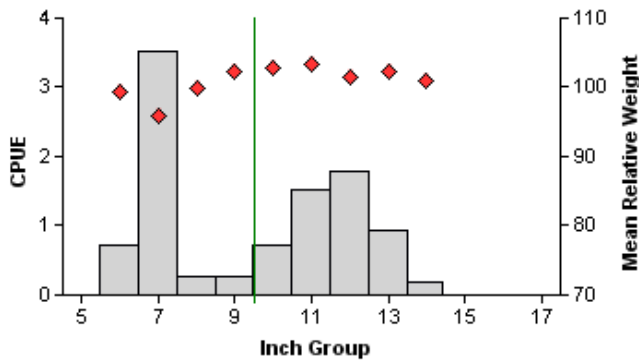
Effort = 15.0  
 Total CPUE = 5.3 (39; 80)  
 Stock CPUE = 5.3 (39; 80)  
 CPUE-10 = 3.9 (43; 59)  
 PSD = 85 (6.1)

2006



Effort = 15.0  
 Total CPUE = 4.9 (42; 74)  
 Stock CPUE = 4.9 (42; 74)  
 CPUE-10 = 2.9 (48; 44)  
 PSD = 65 (7.1)

2008



Effort = 15.0  
 Total CPUE = 10.0 (32; 150)  
 Stock CPUE = 10.0 (32; 150)  
 CPUE-10 = 5.2 (43; 78)  
 PSD = 55 (7.9)

Figure 7. Number of white bass caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Lewisville Reservoir, Texas, 2004, 2006, and 2008. Vertical line represents length limit at time of sampling.

## Palmetto Bass

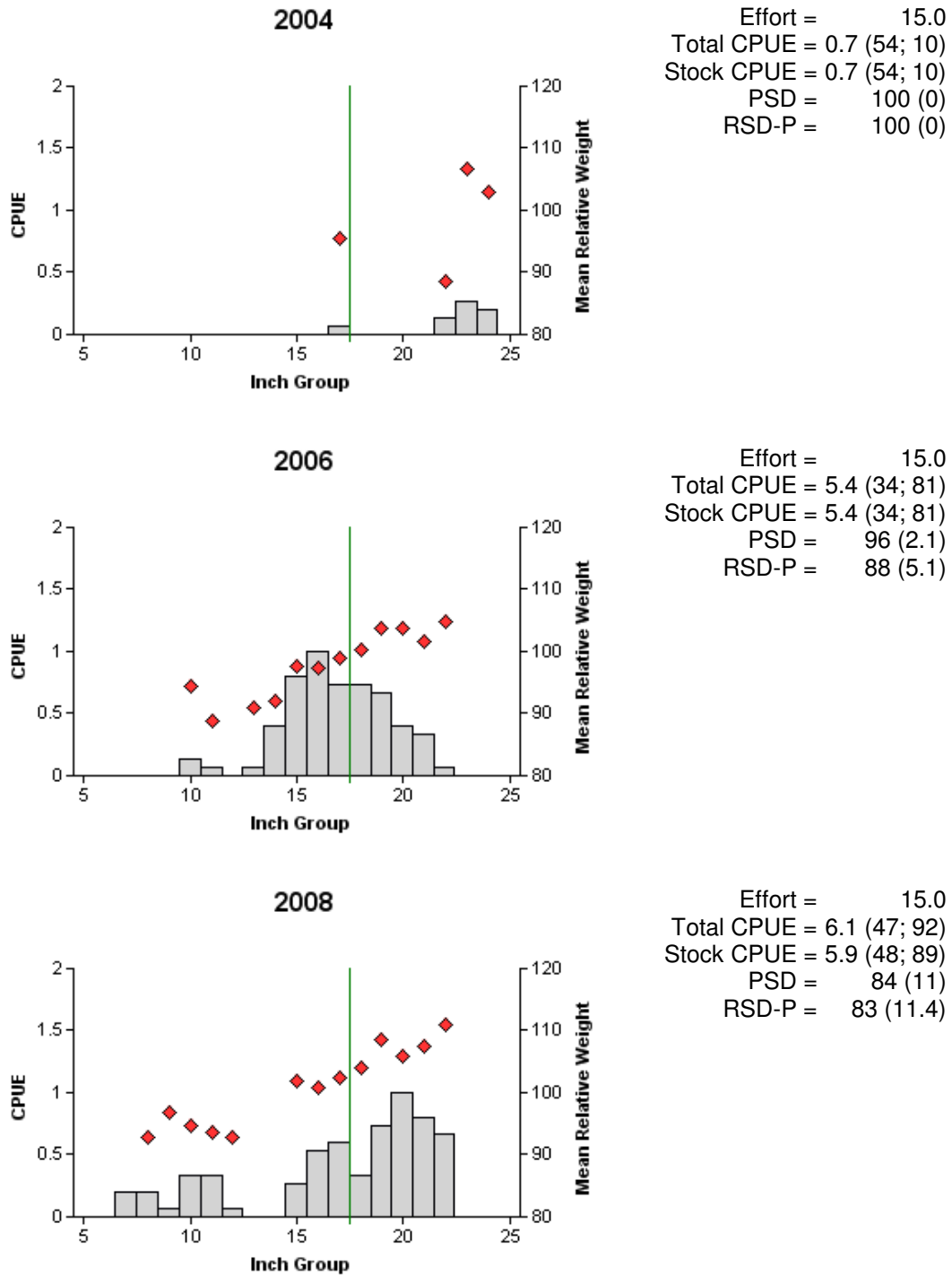


Figure 8. Number of palmetto bass caught per net night (CPUE; bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Lewisville Reservoir, Texas, 2004, 2006, and 2008. Vertical line represents length limit at time of sampling.

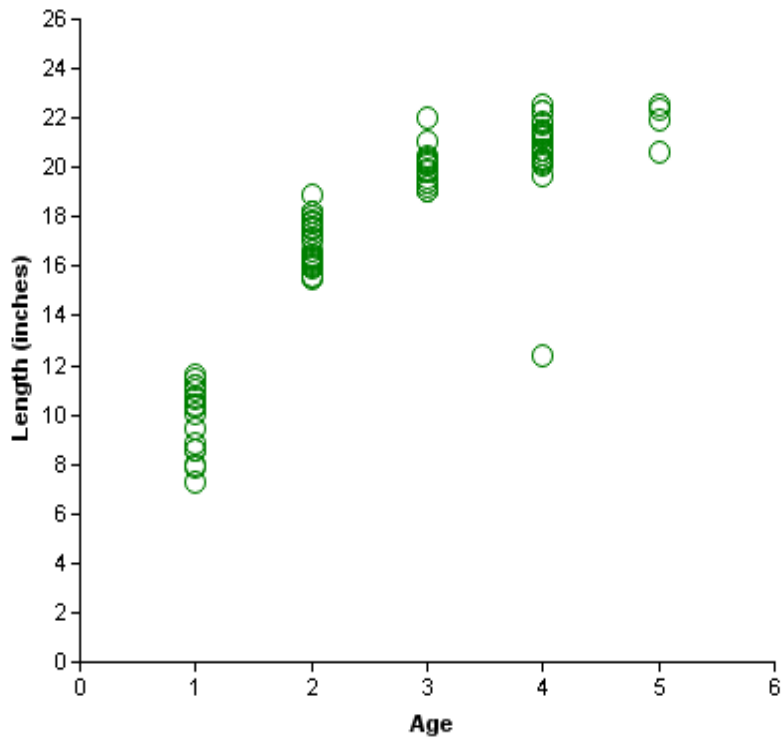


Figure 9. Length at age for palmetto bass (sexes combined) collected from gill netting at Lewisville Reservoir, Texas, for spring 2008 (N=85).

## Spotted Bass

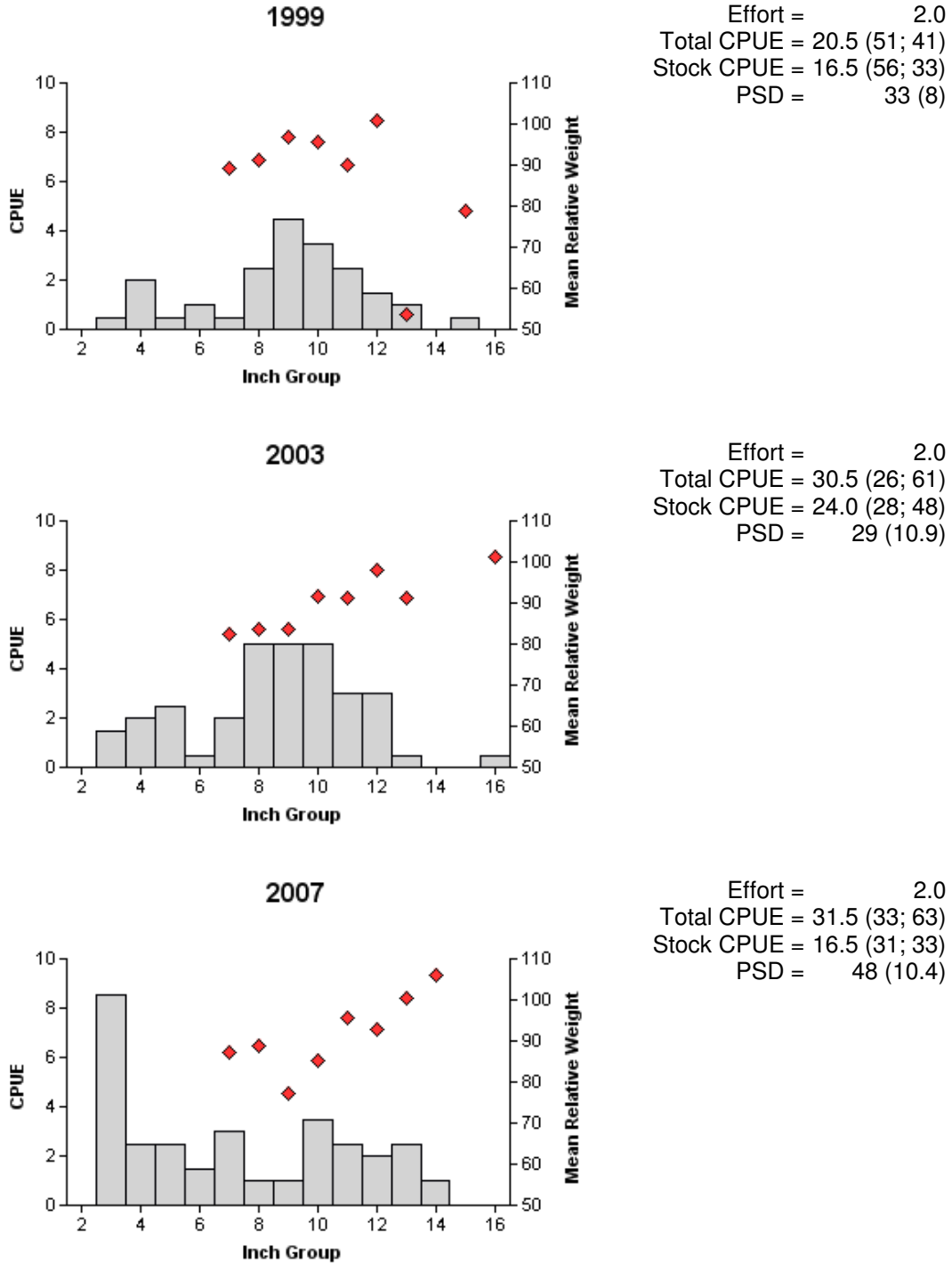
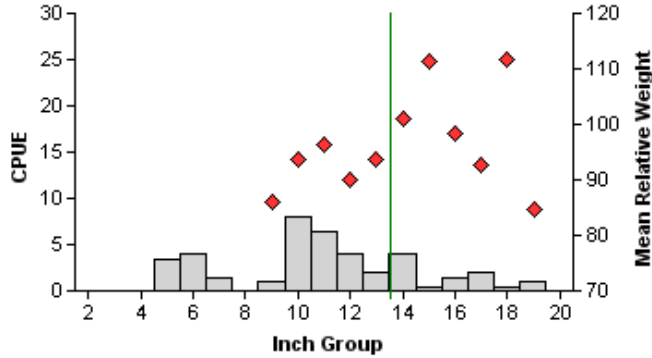


Figure 10. Number of spotted bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lewisville Reservoir, Texas, 1999, 2003, and 2007.

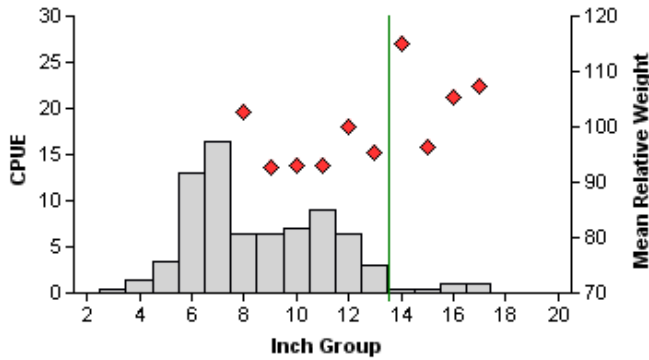
## Largemouth Bass

1999



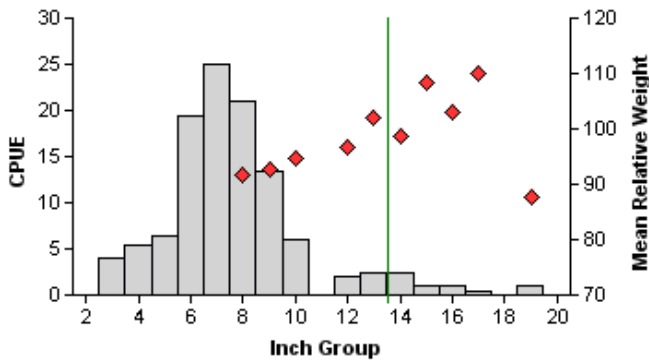
Effort = 2.0  
 Total CPUE = 40.0 (30; 80)  
 Stock CPUE = 31.0 (32; 62)  
 PSD = 50 (6.4)  
 RSD-14 = 31 (5.8)

2003



Effort = 2.0  
 Total CPUE = 76.5 (14; 153)  
 Stock CPUE = 41.5 (17; 83)  
 PSD = 30 (6.5)  
 RSD-14 = 7 (2.8)

2007



Effort = 2.0  
 Total CPUE = 111.5 (16; 223)  
 Stock CPUE = 51.0 (20; 102)  
 PSD = 21 (4.9)  
 RSD-14 = 12 (3.8)

Figure 11. 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, Lewisville Reservoir, Texas, 1999, 2003, and 2007. Vertical lines represent length limit at time of sampling.

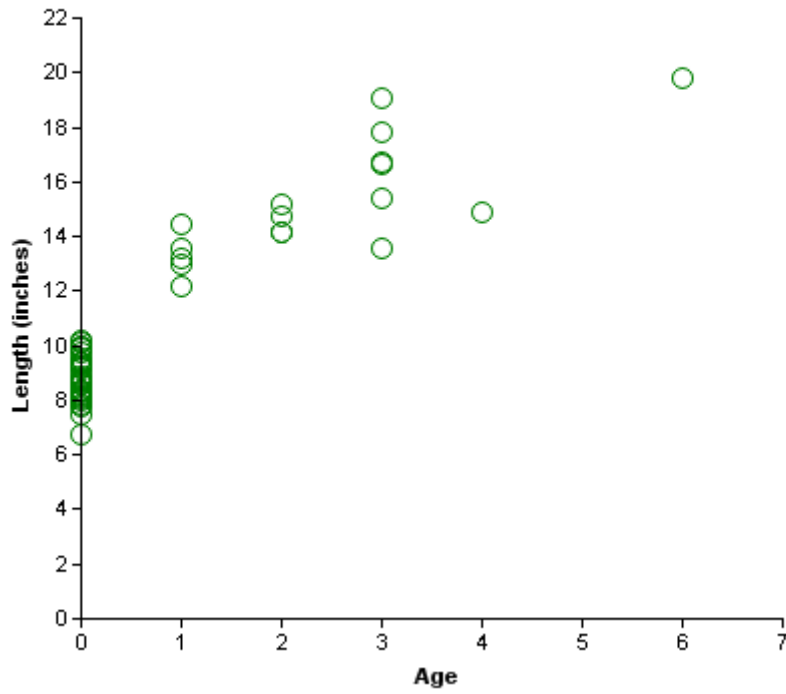


Figure 12. Length at age for largemouth bass (sexes combined) collected from electrofishing at Lewisville Reservoir, Texas, for fall 2007 (N=49).

# White Crappie

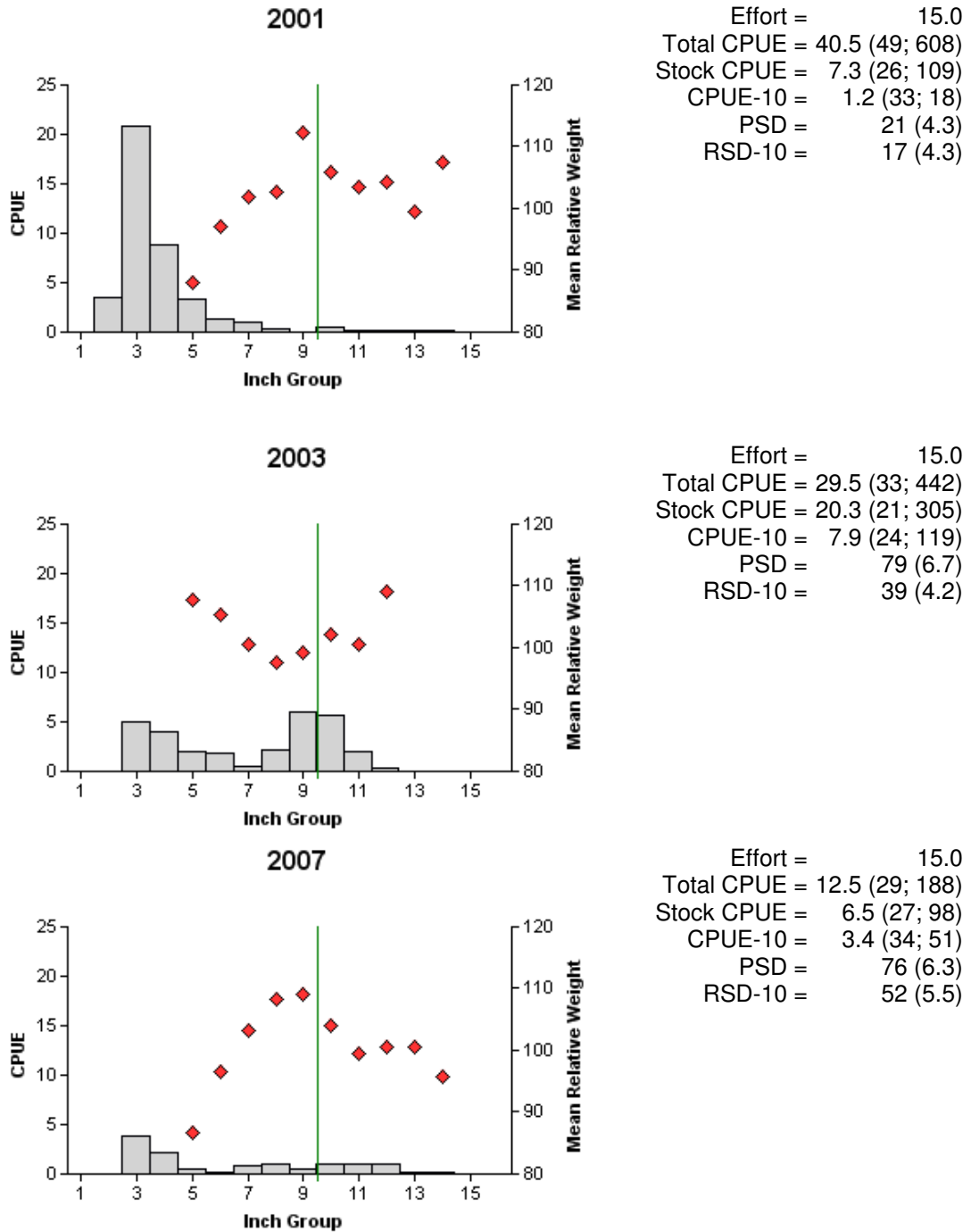


Figure 13. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lewisville Reservoir, Texas, 2001, 2003, and 2007. Vertical line represents length limit at time of sampling.

## Black Crappie

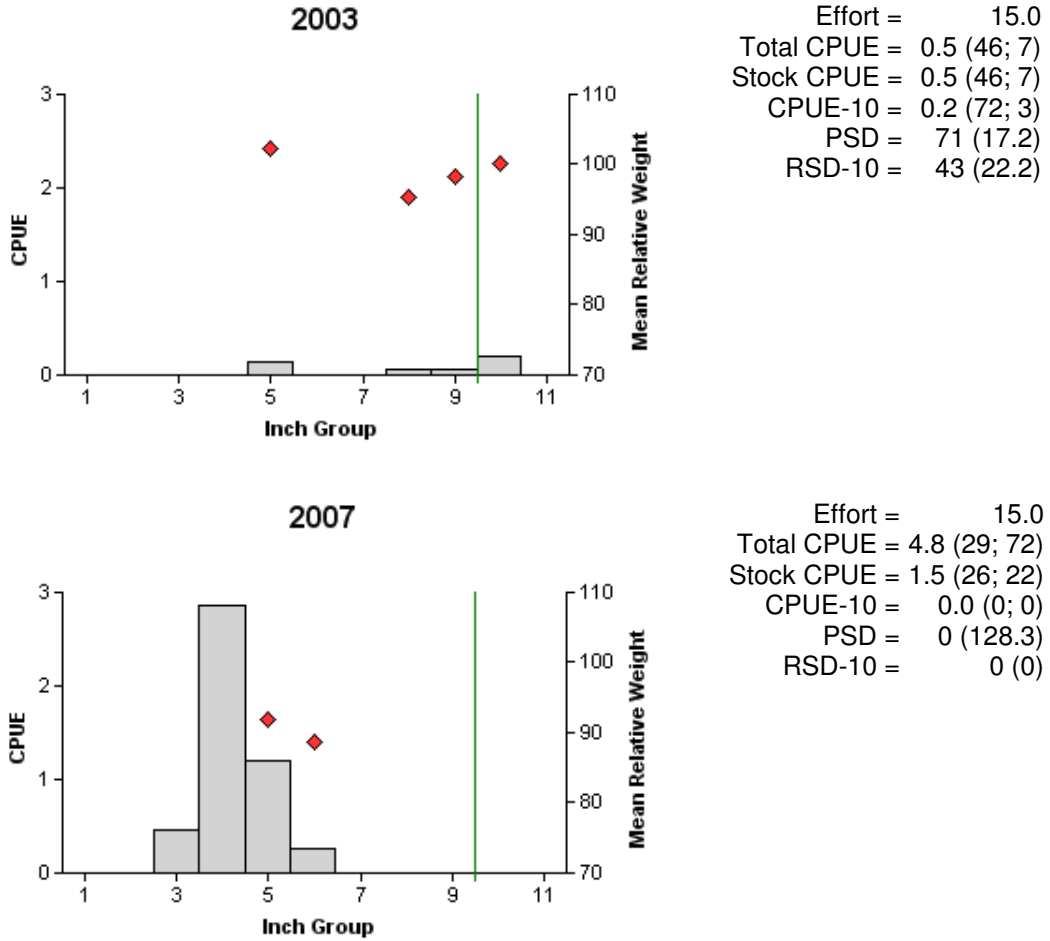


Figure 14. Number of black crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lewisville Reservoir, Texas, 2003 and 2007. Vertical line represents length limit at time of sampling.



Table 6. Proposed sampling schedule for Lewisville Reservoir, Texas. 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 denoted by A.

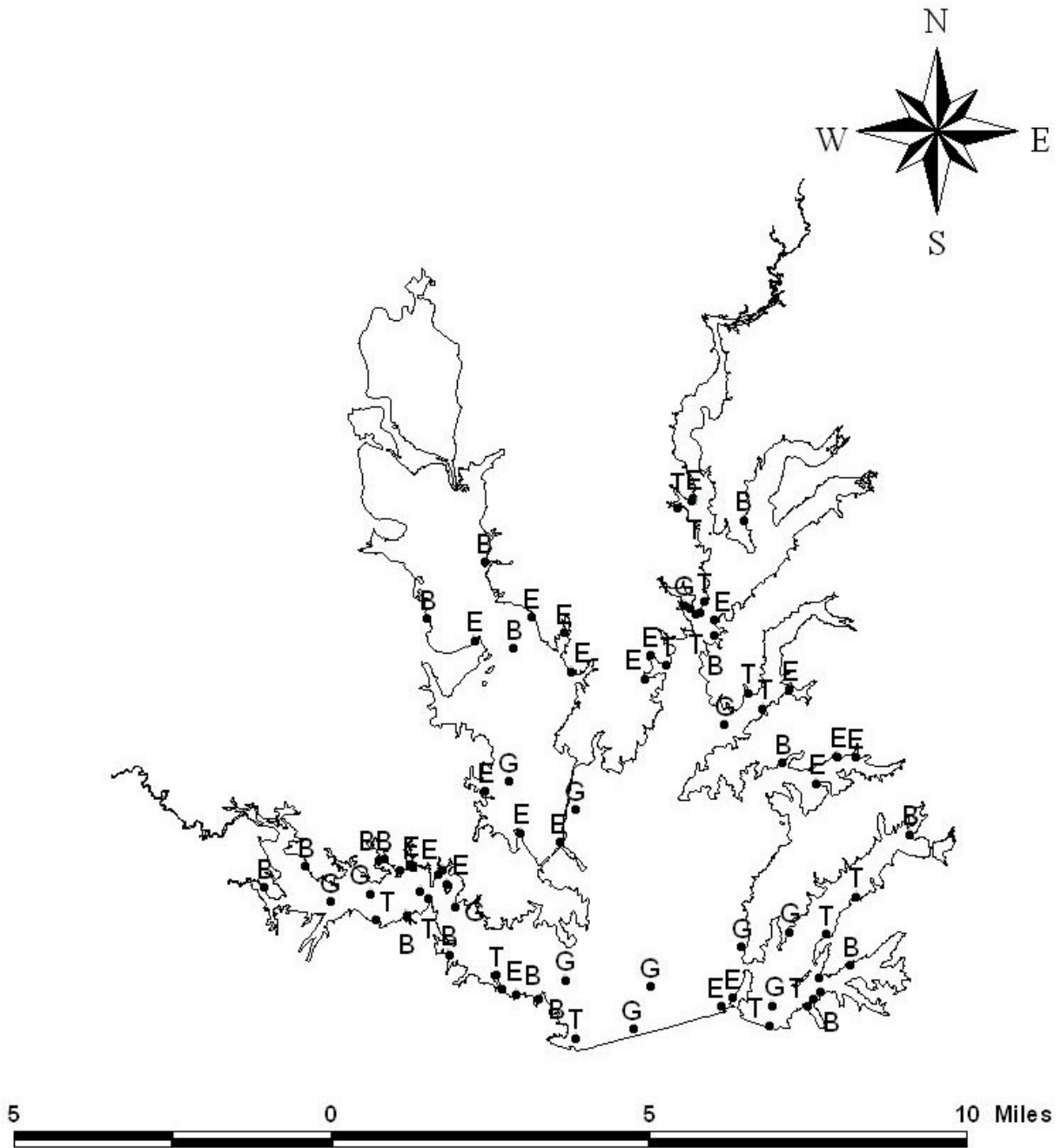
Survey Year	Electrofisher	Trap Net	Gill Net	Creel Survey	Report
Fall 2008-Spring 2009					
Fall 2009-Spring 2010			A		
Fall 2010-Spring 2011					
Fall 2011-Spring 2012	S	S	S	A	S

**APPENDIX A**

Number (N) and catch rate (CPUE) of all species collected from all gear types from Lewisville Reservoir, Texas, 2007-2008.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Spotted gar	1	0.1				
Gizzard shad	148	9.9			729	364.5
Threadfin shad	1	0.1			950	475.0
Common carp	3	0.2				
River carp sucker	3	0.2				
Smallmouth buffalo	61	4.1				
Blue catfish	74	4.9				
Channel catfish	23	1.5				
White bass	150	10.0				
Palmetto bass	92	6.1				
Bluegill					628	314.0
Longear sunfish					280	140.0
Redear sunfish					26	13.0
Spotted bass					63	31.5
Largemouth bass	2	0.1			223	111.5
White crappie	5	0.3	188	12.5		
Black crappie			72	4.8		
Freshwater drum	18	1.2				

## APPENDIX B



Location of sampling sites, Lewisville Reservoir, Texas, 2007-2008. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Boat ramps are indicated with a B.