PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-32

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2006 Survey Report

Marine Creek Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Marine Creek Reservoir were surveyed in 2006 using electrofishing and trap nets and in 2007 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:** Marine Creek, a 250-acre reservoir located on Marine Creek (a tributary of the Trinity River), was constructed in 1958 by the Tarrant Regional Water District primarily for flood control and limited recreational activities. It is located in Tarrant County in northwest Fort Worth, Texas. Habitat is composed mainly of gravel and aquatic vegetation in the forms of water willow, cattails, and bulrush.

- **Management history:** Important sport fish include largemouth bass, spotted bass, white crappie, and channel catfish. Largemouth bass were managed under statewide 14-inch minimum length limit until September 1, 2006 when the minimum length limit was changed to 18 inches. Marine Creek is a study site for the Operation World Record special project.

- **Fish Community**

  - **Prey species:** Gizzard and threadfin shad are present in the reservoir. However, catch rates of these species remain well below averages of other district reservoirs. The primary forage base is sunfishes. The total catch rate of bluegill has increased over the past couple of years, while the catch rate of longear sunfish has fluctuated over the last three years. Redear sunfish are abundant in the reservoir.

  - **Catfishes:** Channel catfish are present in the reservoir. Catch rates were low despite a 2004 stocking. Flathead catfish are present but none were captured this past survey year. Blue catfish are not present in Marine Creek.

  - **White bass:** Past gill netting surveys revealed a small population of white bass present in Marine Creek. In 2007 white bass were caught at a low rate by gill netting. All white bass collected were greater than 10 inches.

  - **Black basses:** The electrofishing catch rate of largemouth bass has varied in abundance over the past three years but remained over 100 fish/hour. The catch rate of fish > 14 inches in length has continued to be low. Growth rates are slow. Spotted bass are moderately abundant in the reservoir.

  - **White crappie:** The white crappie population continued to exhibit fluctuations in abundance with trap net catch rates lower than in previous years.

  Management Strategies: Work closely with the Tarrant Regional Water District to improve facilities at the reservoir. We have been working with them to erect fishing regulation signs at both parks operated by the TRWD. Suggest boat ramp improvements as well.

INTRODUCTION

This document is a summary of fisheries data collected from Marine Creek Reservoir in 2006-2007. 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 2006-2007 data for comparison.

Reservoir Description

Marine Creek Reservoir is a 250-acre impoundment constructed in 1958 on Marine Creek (a tributary of the Trinity River), by the Tarrant Regional Water District for flood control and limited recreational activities. Water level remains fairly constant except during times of prolonged drought. It is located in Tarrant County approximately 7 miles northwest of downtown Fort Worth, Texas. The watershed is small and mostly residential development with some agricultural land remaining. Angler and boat access are adequate. Most of the fishing facilities are accessible to the handicapped. At the time of sampling the fishery habitat was primarily gravel and aquatic vegetation in the forms of cattails and water willow. Other descriptive characteristics for Marine Creek Reservoir are in Table 1. In the spring of 2007, approximately 30 trees were bundled and sunk in the reservoir to provide habitat.

Management History

Previous management strategies and actions: This is the first management report written for Marine Creek Reservoir.

Harvest regulation history: Sport fish populations in Marine Creek Reservoir were managed with statewide regulations with the exception of largemouth bass (Table 2). An 18-inch minimum length limit was implemented in 2006 to protect largemouth bass stocked as part of the Operation World Record special project.

Stocking history: Marine Creek was stocked in 2006 with Sharelunker largemouth bass. The stockings were conducted in accordance with the Operation World Record special project. The complete stocking history is in Table 3.

Vegetation/habitat history: Marine Creek Reservoir aquatic vegetation is primarily composed of shoreline emergent species including cattails, bulrushes, and water willow. Hydrilla and American lotus were historically found in Marine Creek but have not been observed in many years. American lotus seeds were distributed throughout several coves of the reservoir in the fall of 2006.

METHODS

Fishes were collected by electrofishing (0.67 hours at 8 5-min stations), gill netting (3 net nights at 3 stations), and trap netting (3 net nights at 3 stations). Since Marine Creek Reservoir is only 250 acres in size, effort was reduced from standard levels. 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). A roving creel survey was conducted consisting of 36 days between June 1, 2006 and May 31, 2007. 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 (Wr)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for

gizzard shad (DiCenzo et al. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Ages for largemouth bass were determined using otoliths from all fish collected over stock size.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of gravel banks and native emergent aquatic vegetation in the form of water willow, cattail, and bulrush (Table 4).

Creel: Directed fishing effort by anglers was highest for largemouth bass (34%), followed by anglers fishing for anything (29%), and white crappie (16%). Total fishing effort for all species at Marine Creek Reservoir was 20,473 h (81.9 h/acre) from June 2006 to May 2007, and anglers spent an estimated $58,094 on direct expenditures.

Prey species: The electrofishing catch rate of gizzard shad has remained well below the district average of 268.0/hr for the past several surveys (Figure 1). Index of vulnerability for gizzard shad was poor, indicating that only 8% of gizzard shad captured in 2006 were available to existing predators; this was lower than IOV estimates in previous years (Figure 1). The threadfin shad catch rates varied from a high in 2002 of 99.0/hr to a low of 31.5/hr in 2005. The primary forage base in Marine Creek is sunfishes. Electrofishing catch rates of bluegill were variable from 2002 -2006 with an average catch rate of 292.1/hr, and ranging from 417.0/hr in 2002 to 184.5/hr in 2004 (Figure 2). The bluegill population does not contain large numbers of quality sized fish (>6 inches) or preferred sized fish (>8 inches) as evident in PSD and RSD-p values. Longear sunfish catch rates have been increasing from a low of 11.0/hr in 2002 to a high of 201.0/hr in 2005 (Figure 3). However, in 2006 the catch rate of longear sunfish decreased to 133.5/hr. Redear sunfish are also moderately abundant (63.0/hr in 2006; Figure 4). The size structure is skewed towards larger fish with many ≥ 6-inch individuals in the population.

Catfish: The gill net catch rate of channel catfish was 2.3/nn in 2006 (Figure 5). Although gill nets were set in 2003, no channel catfish were sampled. Channel catfish were stocked in 2004 (Table 3). Directed effort for channel catfish was 10.5 hours/acre (Table 5). Channel catfish were a harvest-oriented fish as 0 percent of the legal-sized fish were released. Some illegal harvest was observed (Figure 6).

White bass: The gill netting catch rate of white bass in 2006 (4.7/nn) was below the district average of 7.9/nn (Figure 7). The size structure is dominated by adults as the PSD was 100 and included no individuals below 10 inches. Body condition was between 80 and 90 for all sizes of fish, as one might expect without an abundance of shad. The past several springs have been characterized by low run-off perhaps hindering spawning opportunities. Directed effort for white bass between May 2006 and June 2007 was 2.9 hours/acre (Table 6). Only one white bass was observed harvested (Figure 8).

Black basses: The electrofishing catch rate of spotted bass in 2006 was 40.5/hr (Figure 9). Spotted bass have generally become more abundant since 2002, with a few fluctuations. Size structure continues to be skewed towards smaller individuals. The electrofishing catch rate of largemouth bass has varied from a low of 100.0/hr in 2002 to a high of 202.5/hr in 2005 (Figure 10). Although catch rates have increased, the size structure of the population has decreased from 2002 as PSD values varied from 43 in 2003, 28 in 2004, 24 in 2005, and 17 in 2006. Growth of largemouth bass in Marine Creek Reservoir is slow, indicative of an unexploited population (Figures 12-13). Body conditions have remained fairly good (relative weight about 90) for nearly all size classes of fish (Figure 10). Florida largemouth bass influence was low as Florida alleles were 25% in 2004 and Florida genotype was 0 (Table 8). In 2006, 6,290 Sharelunker largemouth bass were stocked as part of the Operation World Record special project. The fish were raised to 6 inches and tagged with coded-wire tags for evaluation of growth. Directed fishing effort, catch per hour, and total harvest for largemouth bass was estimated at 6,950 h, 0.68 fish/h, and 1,029 fish, respectively, from June 2006 through May 2007 (Table 7; Figure 11). While the harvest estimate seems high, only 4 largemouth bass were observed during the entire survey period by creel

clerks.

White crappie: The trap net catch rate of white crappie was 2.3/nn in 2006, which was much lower when compared to 2002 (15.4/nn; Figure 14). The PSD in 2005 was 86 which was slightly lower than the previous sample in 2002 (90). Directed angling effort for crappie was 12.7 hours/acre (Table 9). Harvest of white crappie was estimated at 10,091 fish and some illegal harvest was observed (Figure 15).

Fisheries management plan for Marine Creek Reservoir, Texas

Prepared – July 2007.

ISSUE 1: Marine Creek is controlled by the Tarrant Regional Water District. With the recent inception of the Operation World Record project at Marine Creek, the minimum length limit on largemouth bass increased to 18 inches. New regulation signs were developed and sent to TRWD, however, they have yet to be posted at the reservoir. Boat ramps could also be improved to facilitate angler access.

MANAGEMENT STRATEGY

1. Work with TRWD to improve angler access at the reservoir. Follow through with the proper personnel to ensure the new regulation signs are erected at both boat ramps to inform public of the recent changes.

ISSUE 2: Marine Creek does not currently have a page on the TPWD public webpage. Information regarding fishing regulations, fishing conditions, and public access is not readily available to constituents.

MANAGEMENT STRATEGY

1. Develop webpage with Inland Fisheries personnel in Austin in the same format as all other district reservoirs.

SAMPLING SCHEDULE JUSTIFICATION

General monitoring of sport fish species with electrofishing, trap netting, and gill netting will be conducted every 4 years. Additional bass-only electrofishing will be conducted in the spring of 2009 and 2010 as a part of the Operation World Record special project.

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.

Table 1. Characteristics of Marine Creek Reservoir, Texas.

Characteristic	Description
Year Constructed	1958
Controlling authority	Tarrant Regional Water District
Counties	Tarrant
Reservoir type	Tributary of Trinity River
Conductivity	375 umhos/cm

Table 2. Harvest regulations for Marine Creek Reservoir.

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: largemouth	5	18 minimum
Bass, spotted	in any combination	no minimum
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 minimum

Table 3. Stocking history of Marine Creek (Ft. Worth), Texas. Size categories are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). 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.

Species	Year	Number	Life Stage	Mean TL (in)
Channel catfish	2004	11,608	AFGL	8.8
	Total	11,608		
Florida largemouth bass	1977	11,880	AFGL	5.0
	1977	12,000	FRY	1.0
	1978	15,200	FGL	3.0
	Total	39,080		
ShareLunker largemouth bass	2006	6,290	AFGL	6.7
	Total	6,290		

Table 4. Survey of littoral zone and physical habitat types, Marine Creek Reservoir, Texas, 2006. 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
Gravel	5.9	34.9		
Eroded bank	1.1	6.5		
Overhanging brush	2.7	16.0		
Rip rap	0.8	4.7		
Native emergent	5.5	32.5		
Standing timber	0.4	2.4		
Nondescript	0.9	5.3		

Gizzard Shad

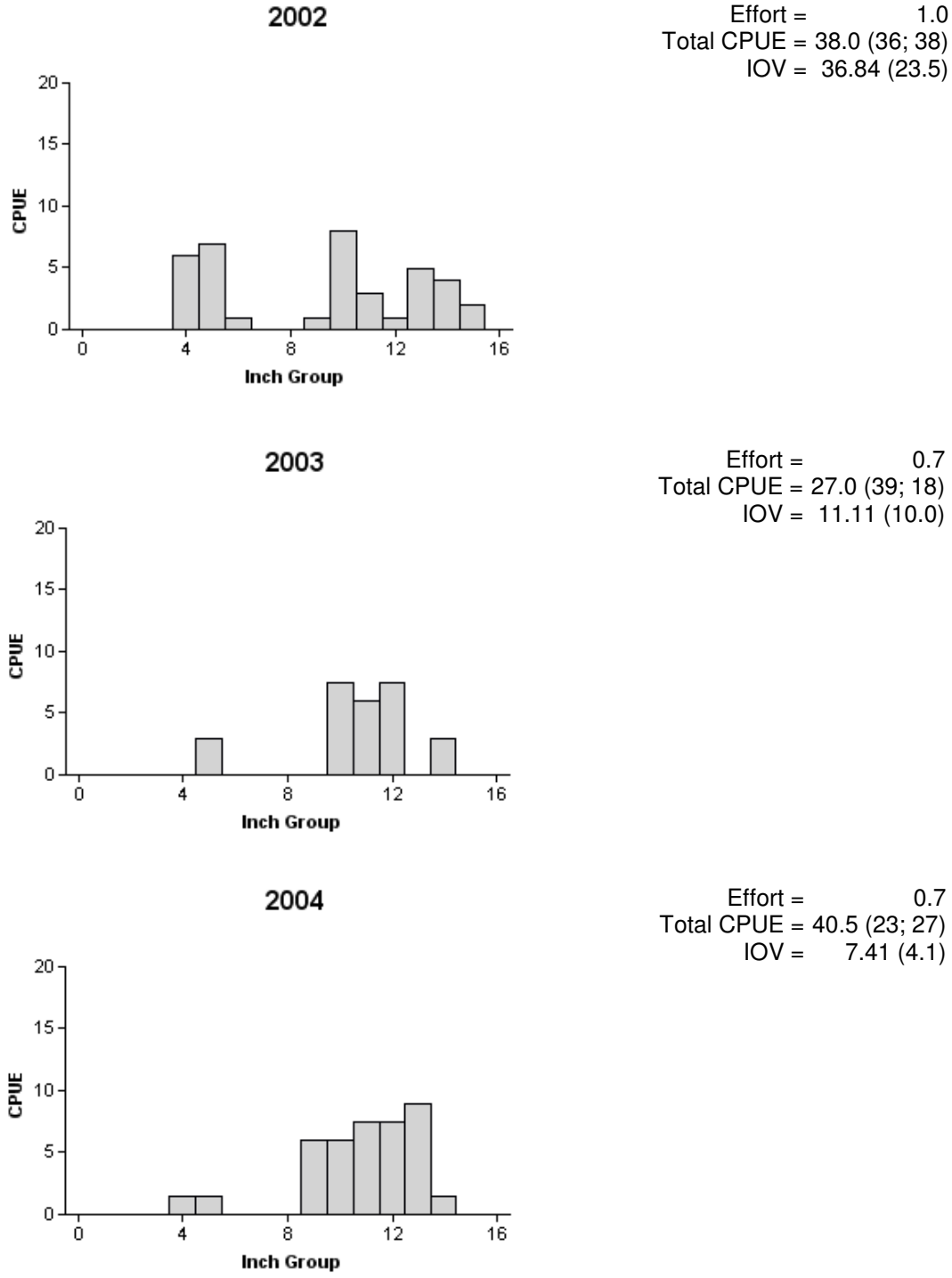
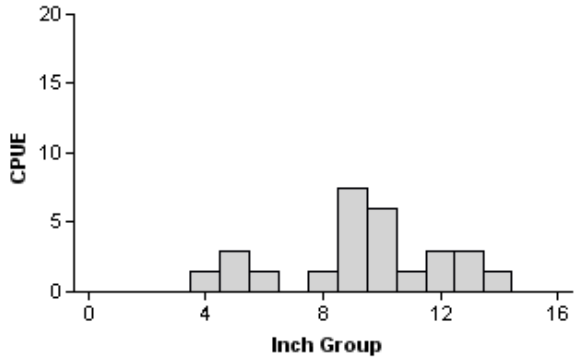


Figure 1. Number of gizzard shad caught per hour (CPUE; bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Marine Creek Reservoir, Texas, 2002-2004.

Gizzard Shad

2005

Effort = 0.7
Total CPUE = 30.0 (45; 20)
IOV = 20.0 (11.2)



2006

Effort = 0.7
Total CPUE = 37.5 (26; 25)
IOV = 8.0 (6.4)

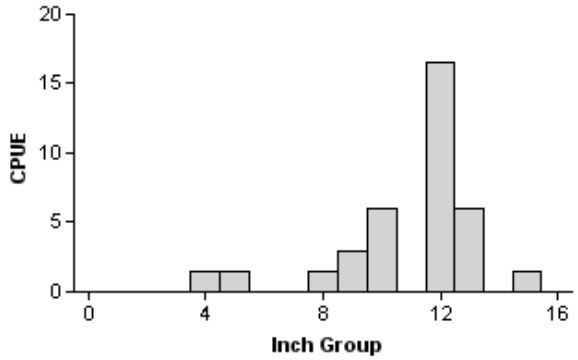
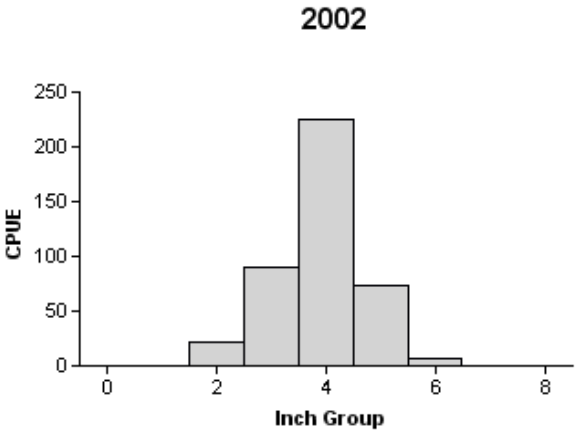
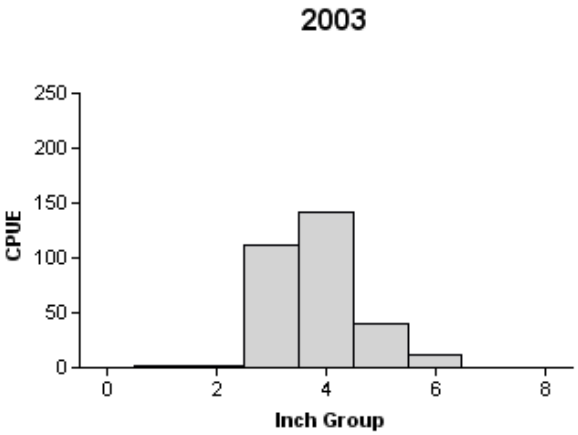


Figure 1 continued.

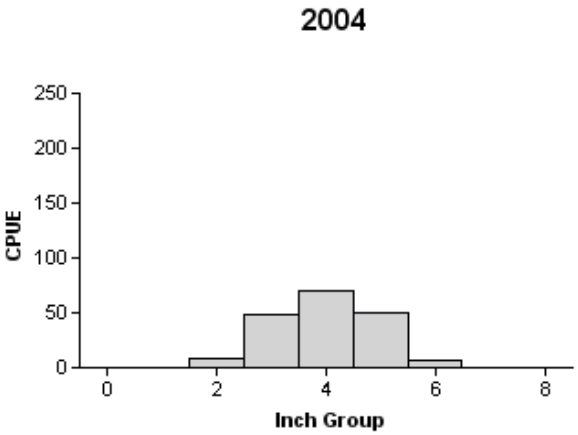
Bluegill



Effort = 1.0
Total CPUE = 417.0 (14; 417)
Stock CPUE = 395.0 (14; 395)
PSD = 2 (0.6)



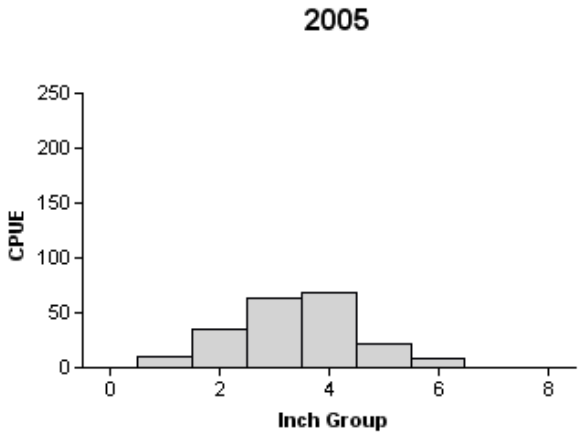
Effort = 0.7
Total CPUE = 307.5 (23; 205)
Stock CPUE = 304.5 (23; 203)
PSD = 4 (2.0)



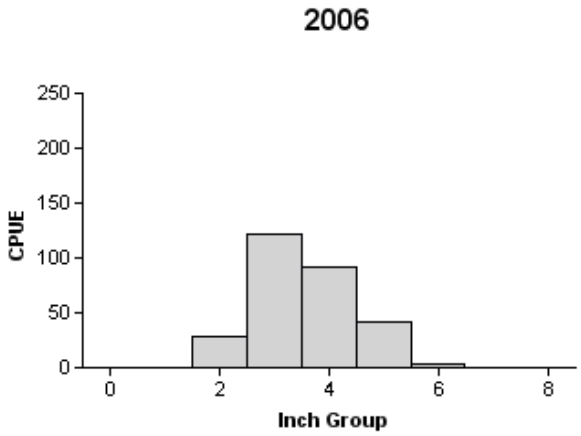
Effort = 0.7
Total CPUE = 184.5 (25; 123)
Stock CPUE = 175.5 (25; 117)
PSD = 4 (1.8)

Figure 2. 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, Marine Creek Reservoir, Texas, 2002-2006.

Bluegill



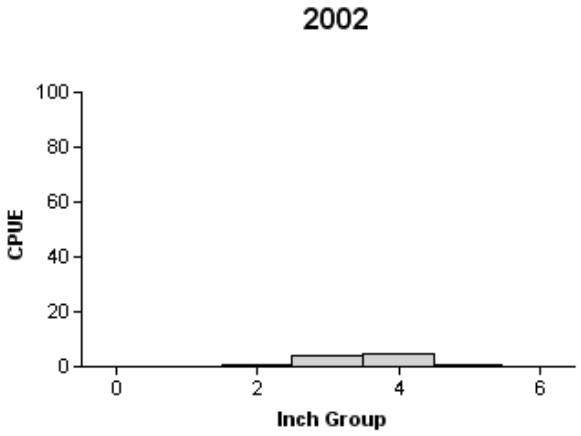
Effort = 0.7
Total CPUE = 208.5 (24; 139)
Stock CPUE = 163.5 (27; 109)
PSD = 6 (3)



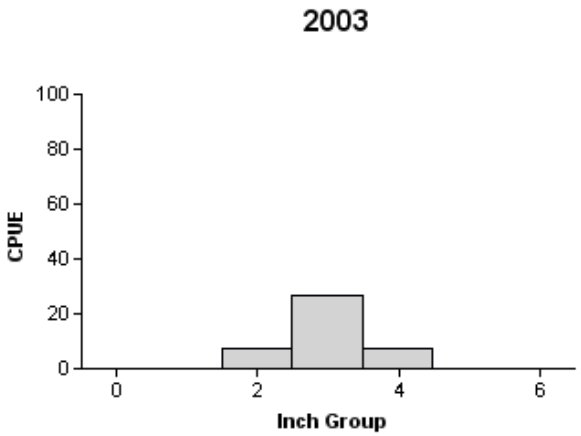
Effort = 0.7
Total CPUE = 286.5 (26; 191)
Stock CPUE = 258.0 (27; 172)
PSD = 1 (0.7)

Figure 2 continued.

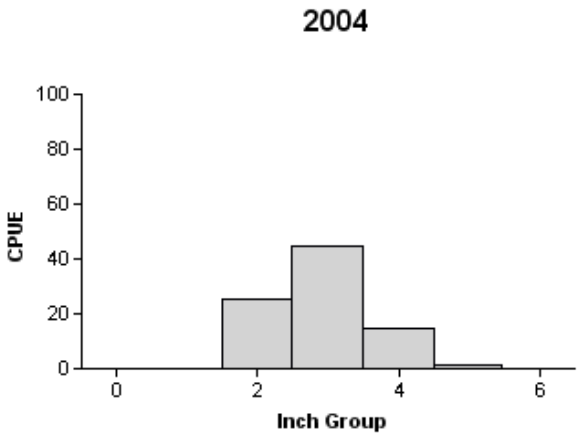
Longear Sunfish



Effort = 1.0
Total CPUE = 11.0 (49; 11)
Stock CPUE = 11.0 (49; 11)



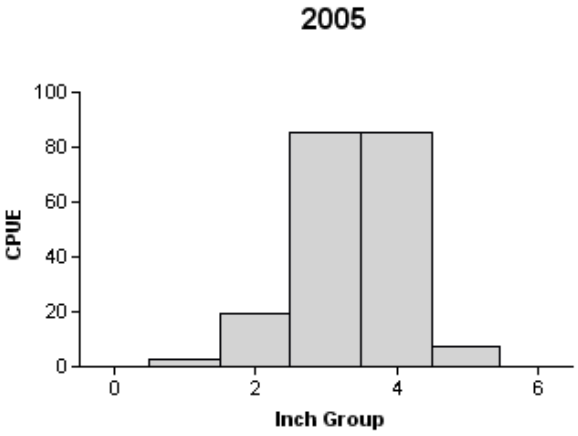
Effort = 0.7
Total CPUE = 42.0 (24; 28)
Stock CPUE = 42.0 (24; 28)



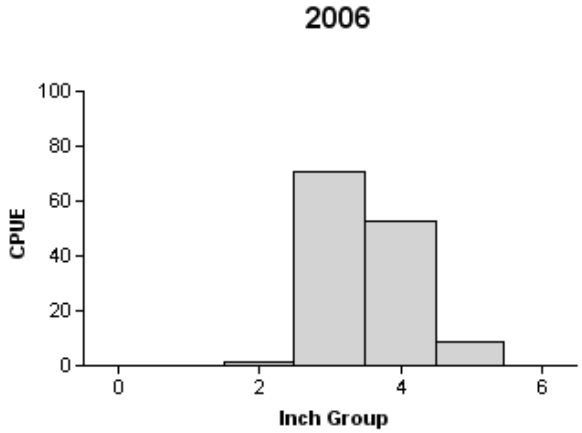
Effort = 0.7
Total CPUE = 87.0 (35; 58)
Stock CPUE = 87.0 (35; 58)

Figure 3. Number of longear sunfish caught per hour (CPUE; bars) (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Marine Creek Reservoir, Texas, 2002-2006.

Longear Sunfish



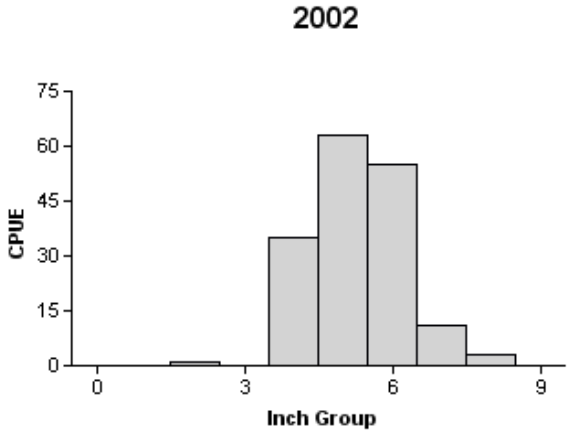
Effort = 0.7
Total CPUE = 201.0 (27; 134)
Stock CPUE = 201.0 (27; 134)



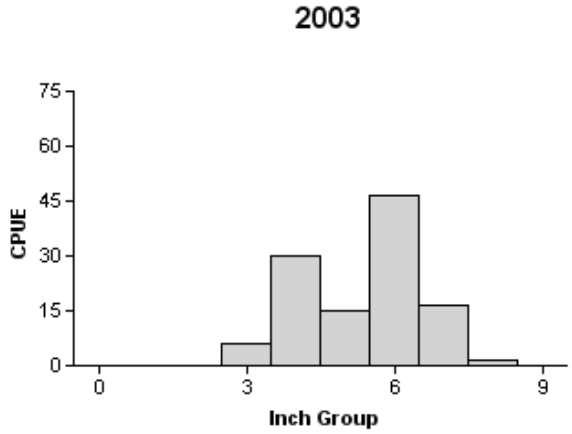
Effort = 0.7
Total CPUE = 133.5 (25; 89)
Stock CPUE = 133.5 (25; 89)

Figure 3 continued.

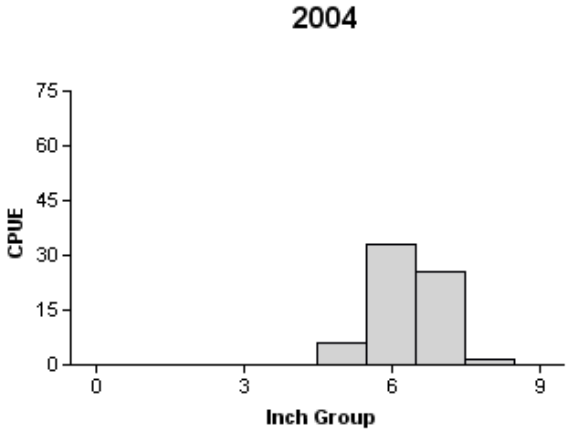
Redear Sunfish



Effort = 1.0
Total CPUE = 168.0 (20; 168)
Stock CPUE = 167.0 (19; 167)
PSD = 8 (3.1)



Effort = 0.7
Total CPUE = 115.5 (21; 77)
Stock CPUE = 109.5 (23; 73)
PSD = 16 (4.9)



Effort = 0.7
Total CPUE = 66.0 (18; 44)
Stock CPUE = 66.0 (18; 44)
PSD = 41 (8.8)

Figure 4. Number of redear sunfish 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, Marine Creek Reservoir, Texas, 2002-2006.

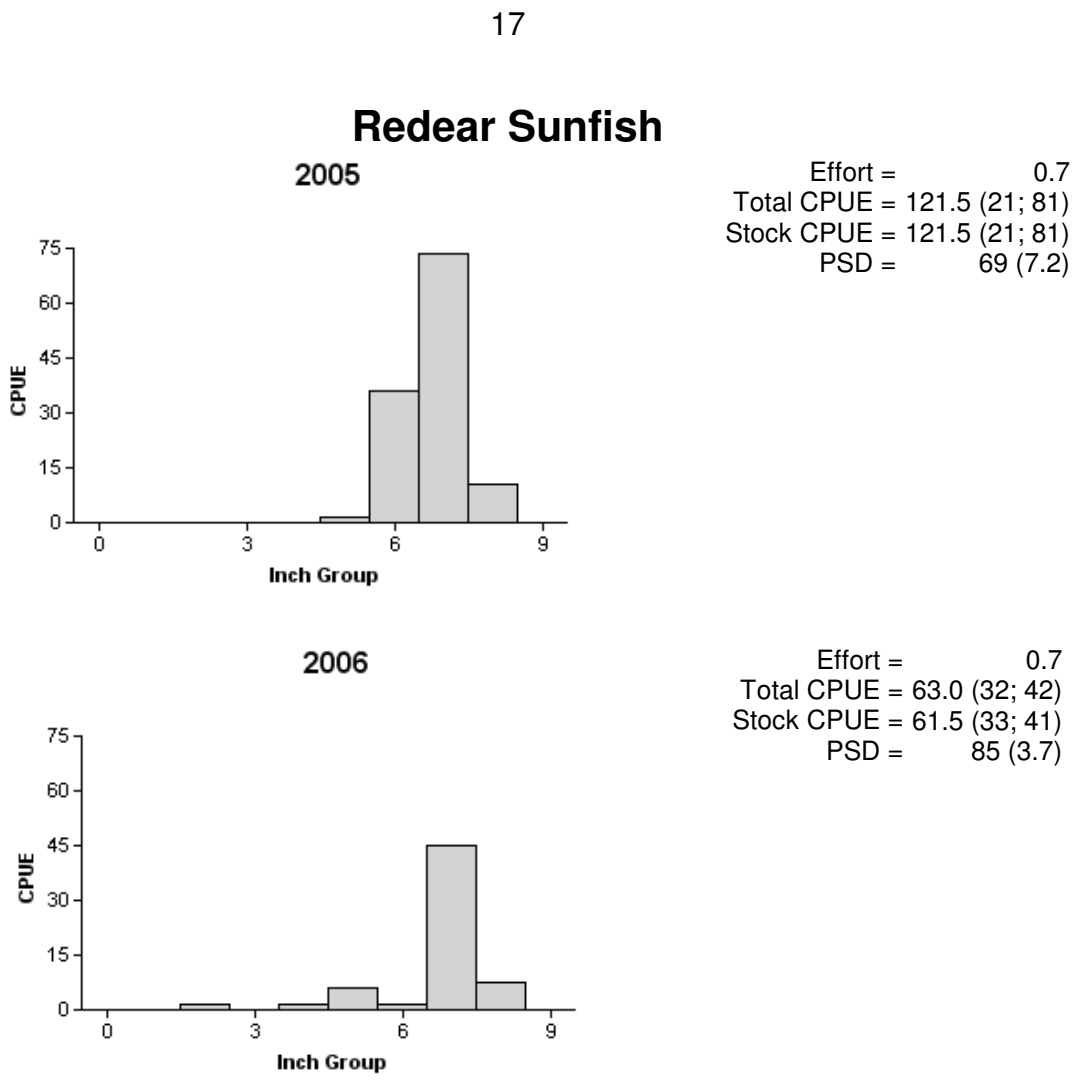
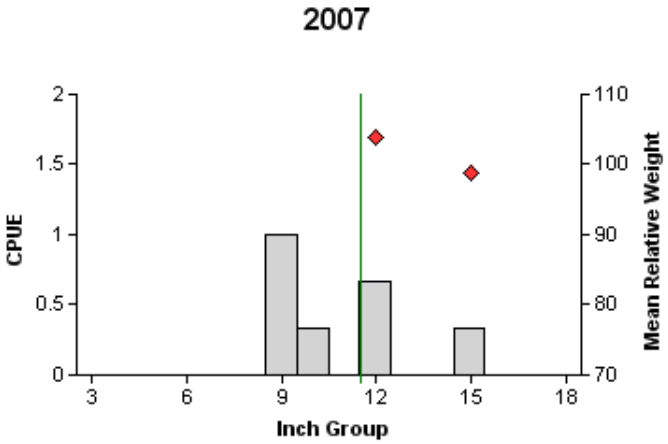


Figure 4 continued.

Channel Catfish



Effort =	3.0
Total CPUE =	2.3 (38; 7)
Stock CPUE =	1.0 (100; 3)
PSD =	0 (187.1)
RSD-12 =	100 (0)

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 survey, Marine Creek Reservoir, Texas, 2007. Vertical line represents length limit at time of sampling.

Table 5. Creel survey statistics for channel catfish at Marine Creek Reservoir from June 2006 through May 2007, 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.

Creel Survey Statistic	Year
	2006/2007
Directed effort (h)	2,626.0 (22.5)
Directed effort/acre	10.5
Total catch per hour	0.2 (73.9)
Total harvest	2,092 (95.3)
Harvest/acre	8.4
Percent legal released	0.0 (0.0)

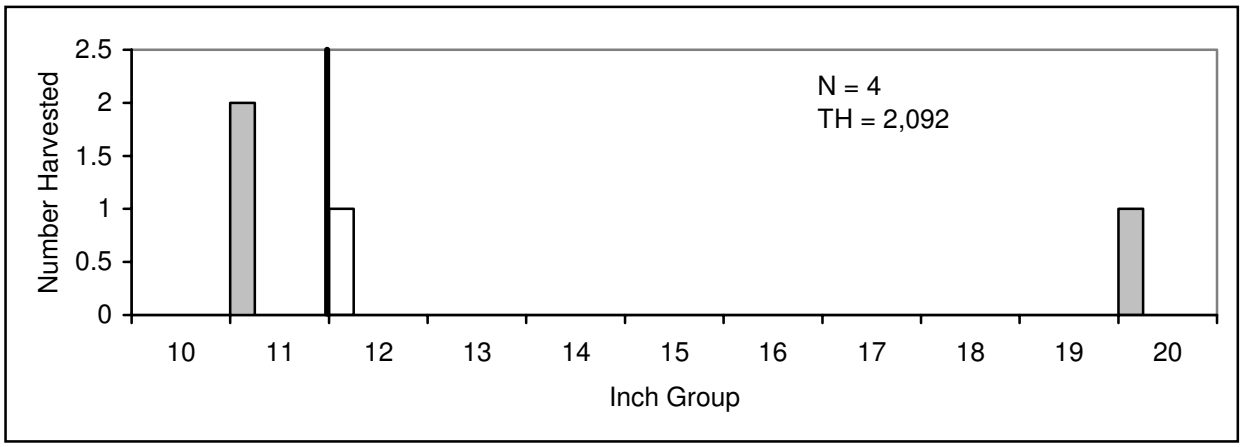
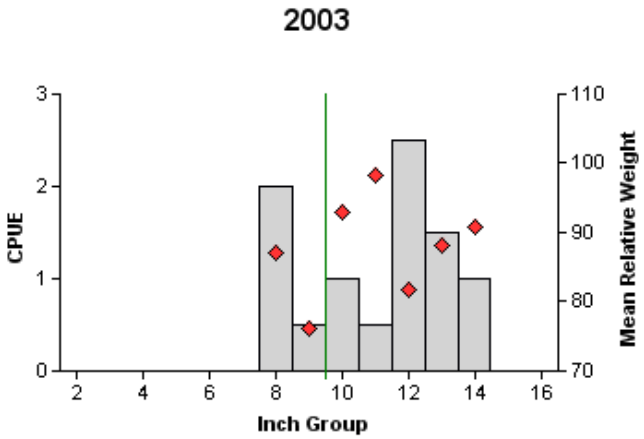
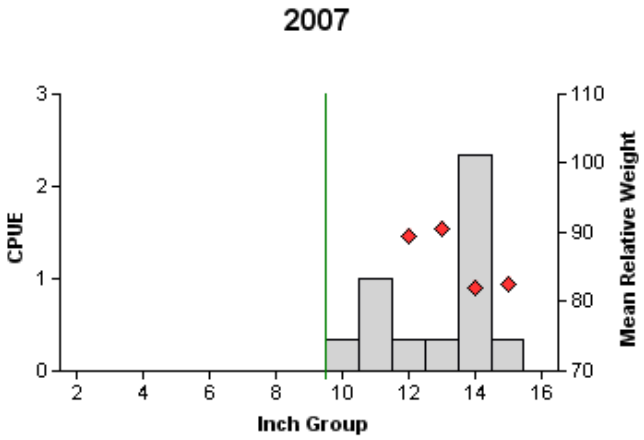


Figure 6. Length frequency of harvested channel catfish observed during creel surveys at Marine Creek Reservoir, Texas, June 2006 through May 2007, all anglers combined. N is the number of harvested channel catfish observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents minimum length limit at time of sampling.

White Bass



Effort = 2.0
Total CPUE = 9.0 (22; 18)
Stock CPUE = 9.0 (22; 18)
PSD = 78 (6.2)
RSD-12 = 56 (12.5)



Effort = 3.0
Total CPUE = 4.7 (43; 14)
Stock CPUE = 4.7 (43; 14)
PSD = 100 (0.0)
RSD-12 = 71 (14)

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, Marine Creek Reservoir, Texas, 2003 and 2007. Vertical line represents length limit at time of sampling.

White Bass

Table 6. Creel survey statistics for white bass at Marine Creek Reservoir from June 2006 through May 2007, where total catch per hour is for anglers targeting white bass and total harvest is the estimated number of white bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year
	2006/2007
Directed effort (h)	716.4 (48.3)
Directed effort/acre	2.9
Total catch per hour	0.0 (0.0)
Total harvest	16.0 (232.6)
Harvest/acre	0.1
Percent legal released	0.0 (0.0)

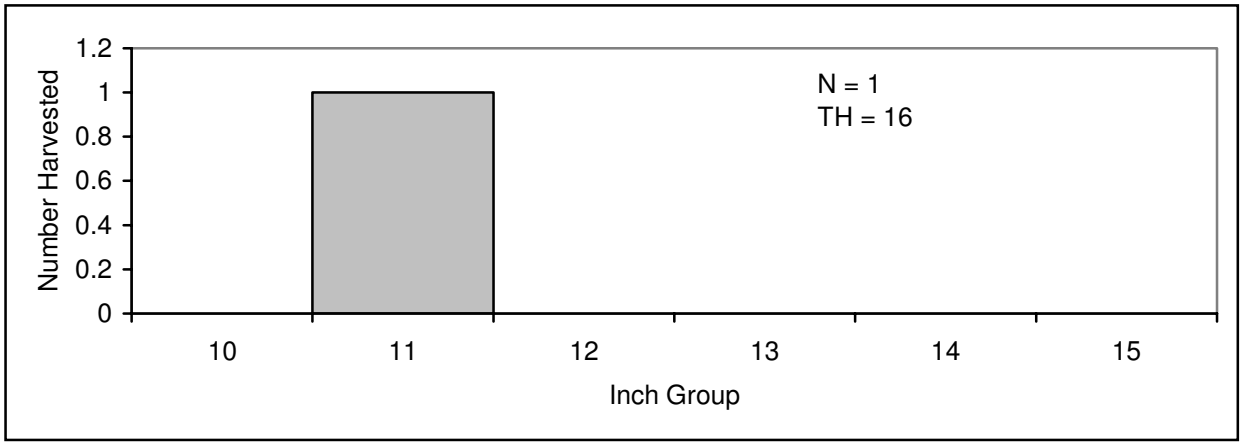
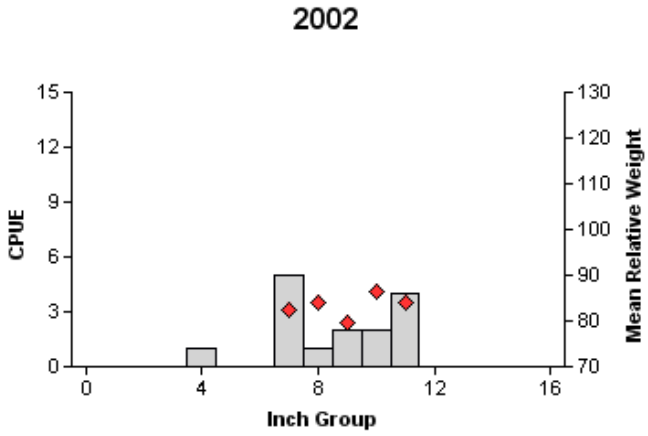
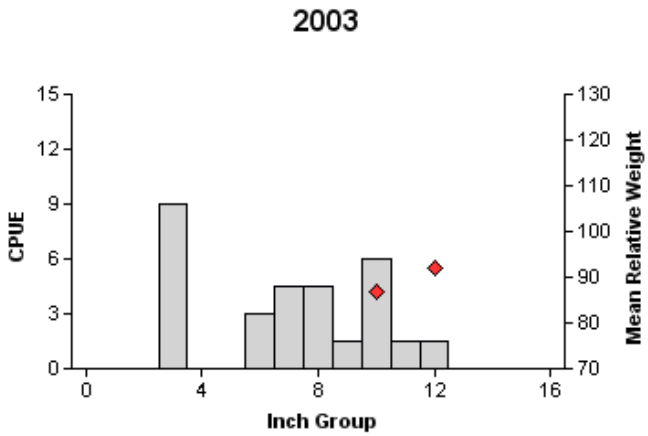


Figure 8. Length frequency of harvested white bass observed during creel surveys at Marine Creek Reservoir, Texas, June 2006 through May 2007, all anglers combined. N is the number of harvested white bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

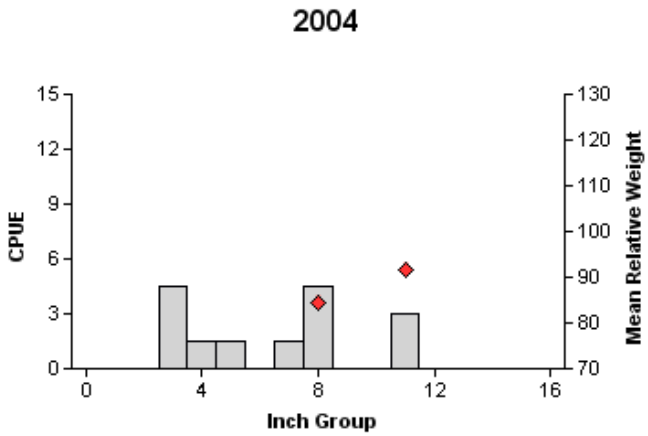
Spotted Bass



Effort = 1.0
Total CPUE = 15.0 (30; 15)
Stock CPUE = 14.0 (30; 14)
PSD = 29 (13.4)
RSD-12 = 0 (0)



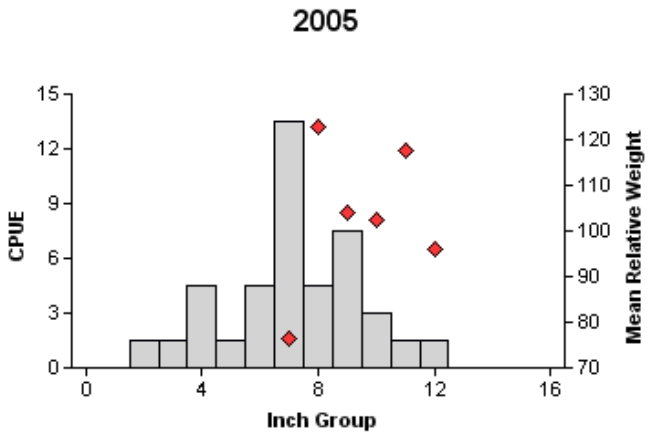
Effort = 0.7
Total CPUE = 31.5 (44; 21)
Stock CPUE = 19.5 (53; 13)
PSD = 15 (7.0)
RSD-12 = 8 (8.6)



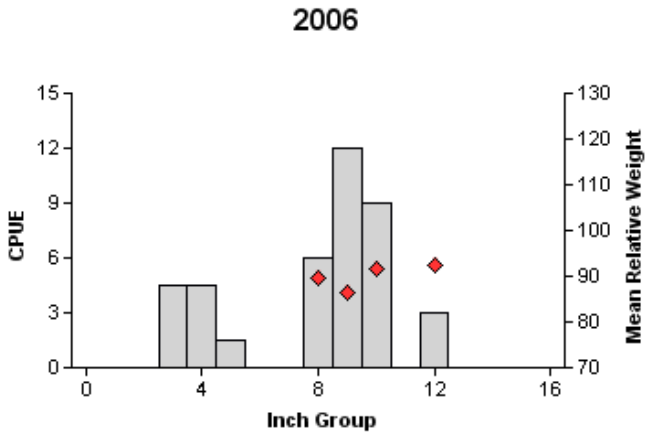
Effort = 0.7
Total CPUE = 16.5 (39; 11)
Stock CPUE = 9.0 (42; 6)
PSD = 33 (11.9)
RSD-12 = 0 (0)

Figure 9. 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, Marine Creek Reservoir, Texas, 2002-2006.

Spotted Bass



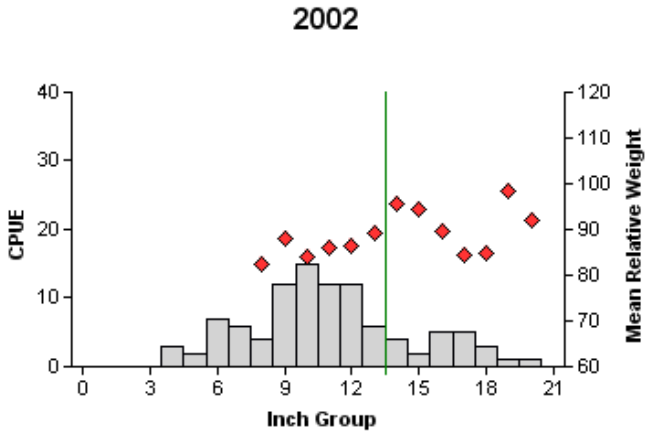
Effort =	0.7
Total CPUE =	45.0 (19; 30)
Stock CPUE =	31.5 (19; 21)
PSD =	10 (6.2)
RSD-12 =	5 (5)



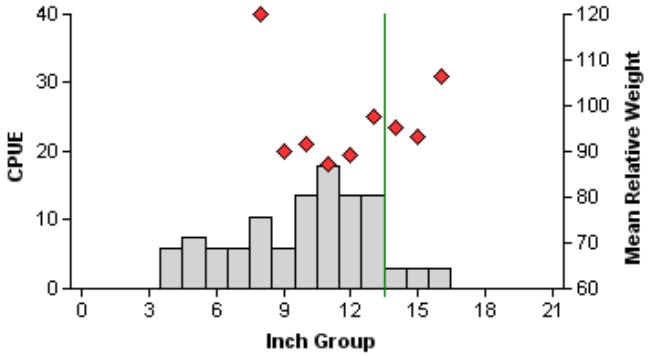
Effort =	0.7
Total CPUE =	40.5 (25; 27)
Stock CPUE =	30.0 (24; 20)
PSD =	10 (6.1)
RSD-12 =	10 (6.1)

Figure 9 continued.

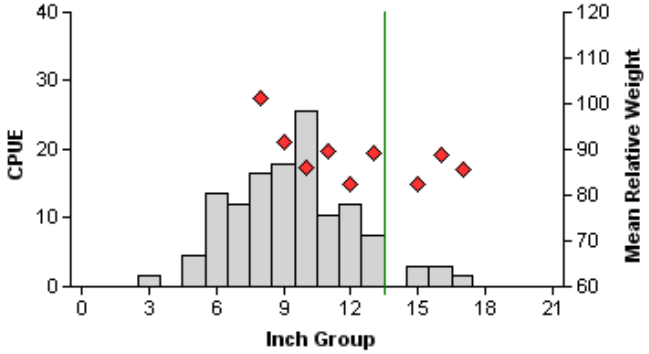
Largemouth Bass



Effort = 1.0
Total CPUE = 100.0 (13; 100)
Stock CPUE = 82.0 (14; 82)
PSD = 48 (3.6)
RSD-18 = 7 (1.9)



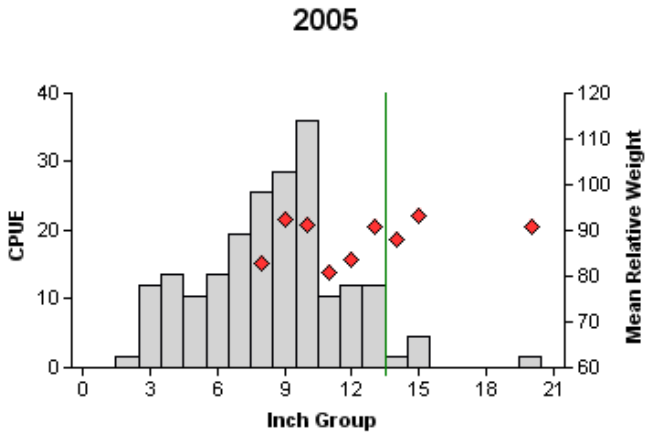
Effort = 0.7
Total CPUE = 109.5 (16; 73)
Stock CPUE = 84.0 (22; 56)
PSD = 43 (4.7)
RSD-18 = 0 (0)



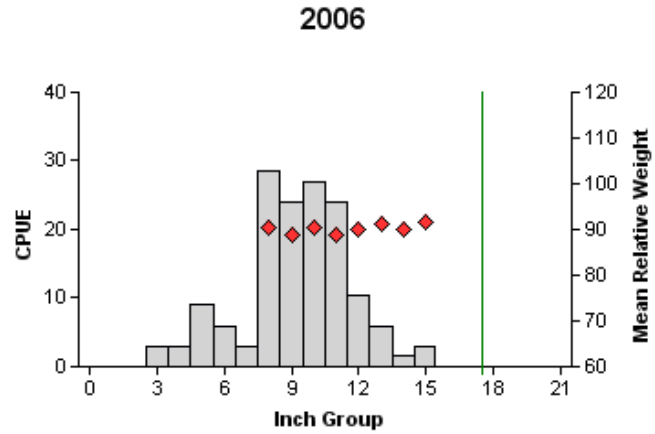
Effort = 0.7
Total CPUE = 129.0 (16; 86)
Stock CPUE = 97.5 (15; 65)
PSD = 28 (8.6)
RSD-18 = 0 (0)

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, Marine Creek Reservoir, Texas, 2002-2006. Vertical lines represent minimum length limit at time of sampling.

Largemouth Bass



Effort = 0.7
Total CPUE = 202.5 (11; 135)
Stock CPUE = 132.0 (14; 88)
PSD = 24 (5.5)
RSD-18 = 1 (1.2)



Effort = 0.7
Total CPUE = 148.5 (22; 99)
Stock CPUE = 124.5 (21; 83)
PSD = 17 (4)
RSD-18 = 0 (0)

Figure 10 continued.

Largemouth Bass

Table 7. Creel survey statistics for largemouth bass at Marine Creek Reservoir from June 2006 through May 2007, 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.

Creel Survey Statistic	Year
	2006/2007
Directed effort (h)	6,949.8 (19.5)
Directed effort/acre	27.8
Total catch per hour	0.7 (41.2)
Total harvest	1,029.4 (6.0)
Harvest/acre	4.1
Percent legal released	54.8

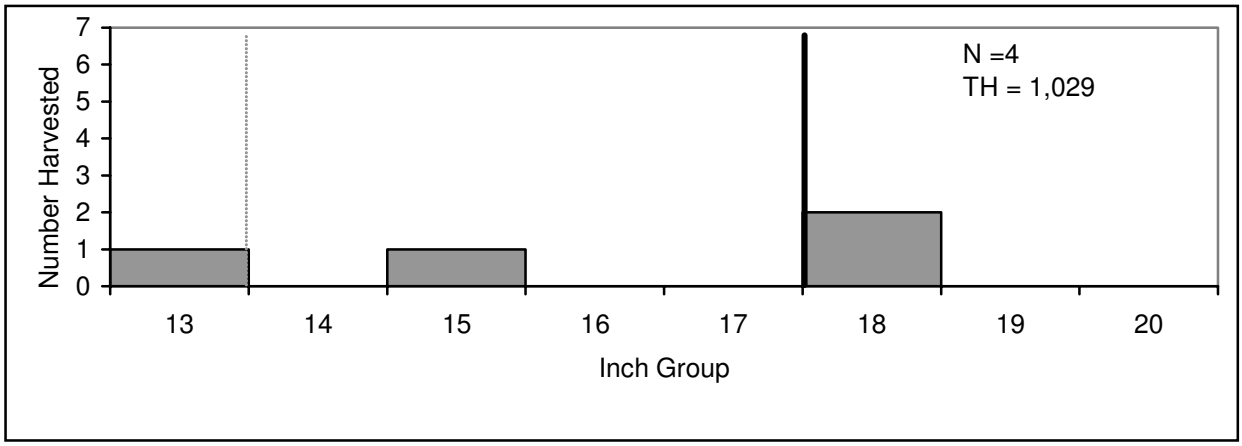


Figure 11. Length frequency of harvested largemouth bass observed during creel surveys at Marine Creek Reservoir, Texas, June 2006 through May 2007, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents minimum length limit at time of sampling. From June 1, 2006 through August 31, 2006, the minimum length limit was 14 inches for largemouth bass. The minimum length limit changed to 18 inches on September 1, 2006.

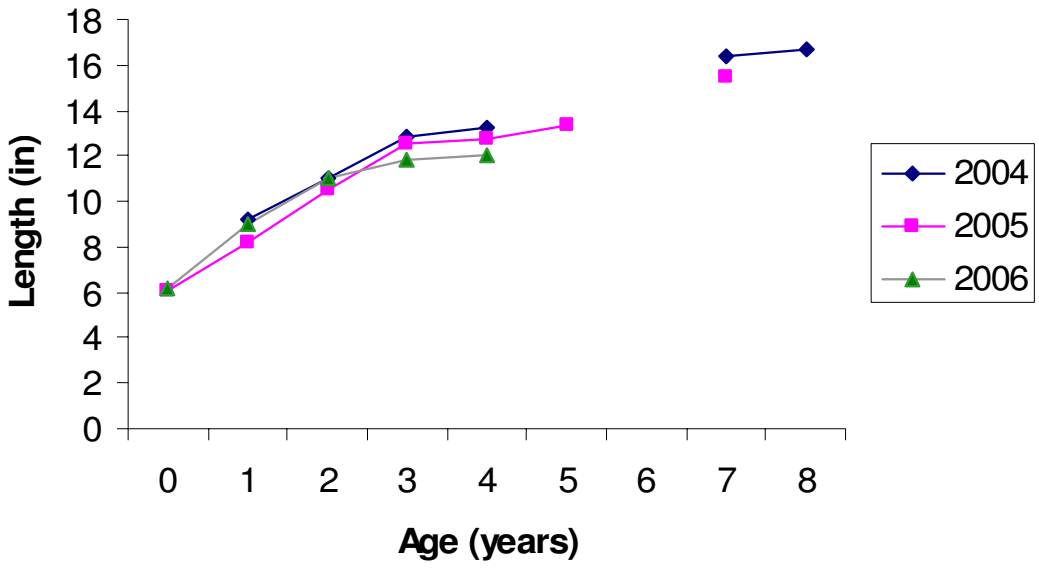


Figure 12. Mean length at age for largemouth bass (sexes combined) collected from electrofishing at Marine Creek Reservoir, Texas, for fall 2004 (N=26), 2005 (N=64), and 2006 (N=86).

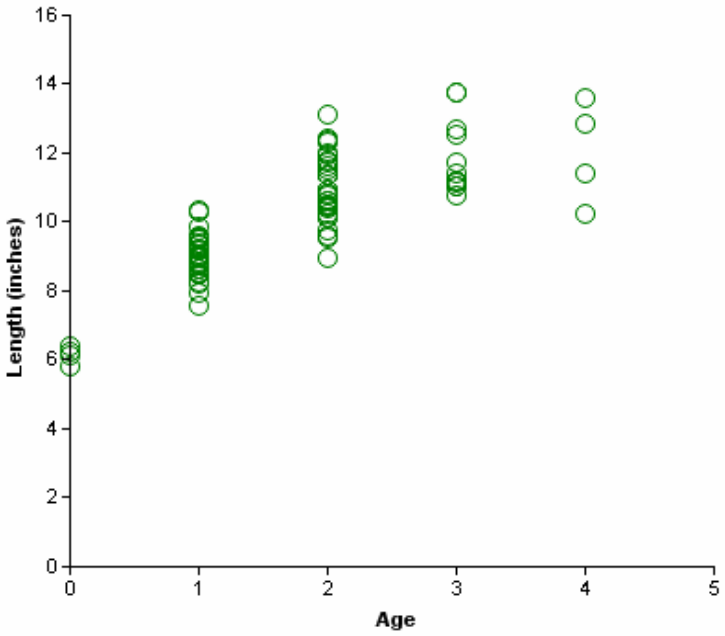


Figure 13. Length at age of largemouth bass (sexes combined) collected from Marine Creek Reservoir, Texas, Fall 2006 (N=86).

Table 8. Results of genetic analysis of largemouth bass collected by fall electrofishing, Marine Creek Reservoir, Texas, 2004. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB.

		Genotype					
Year	Sample size	FLMB	F1	Fx	NLMB	% FLMB alleles	% pure FLMB
2004	18	0	2	12	4	25.0	0.0

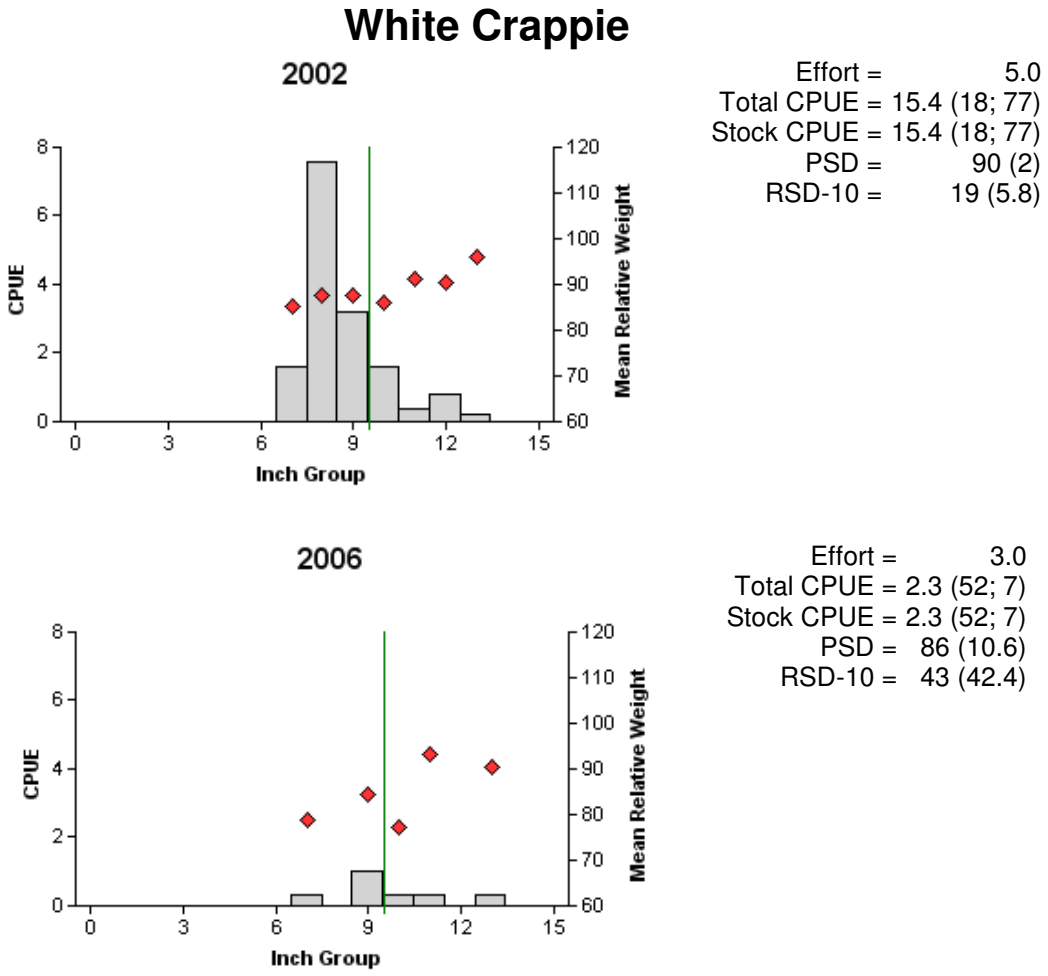


Figure 14. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Marine Creek Reservoir, Texas, 2002 and 2006. Vertical line represents length limit at time of sampling

White Crappie

Table 9. Creel survey statistics for white crappie at Marine Creek Reservoir from June 2006 through May 2007, 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.

Creel Survey Statistic	Year
	2006/2007
Directed effort (h)	3,176.7 (24.7)
Directed effort/acre	12.7
Total catch per hour	1.6 (63.8)
Total harvest	10,090.6 (58.4)
Harvest/acre	40.4
Percent legal released	0.6

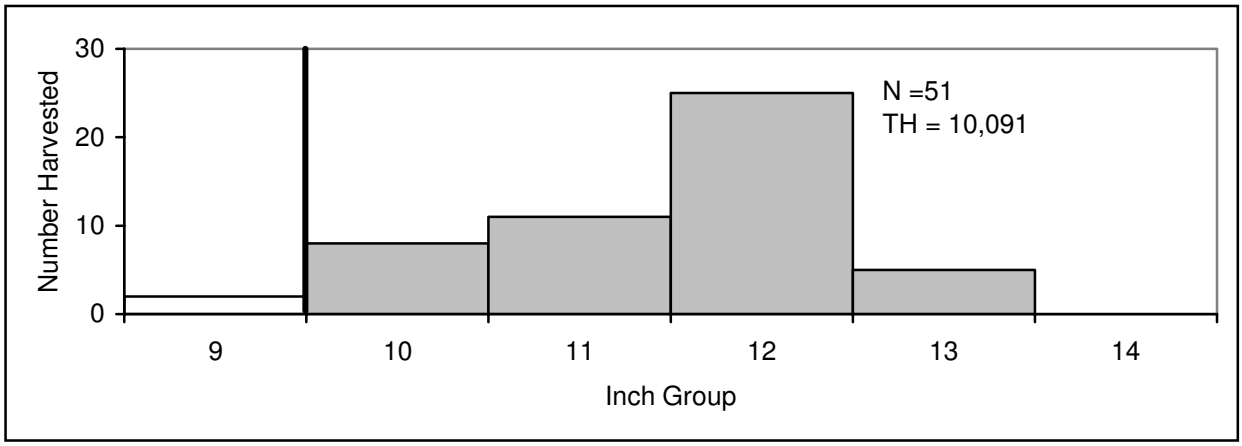


Figure 15. Length frequency of harvested white crappie observed during creel surveys at Marine Creek Reservoir, Texas, June 2006 through May 2007, all anglers combined. N is the number of harvested white crappie observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents minimum length limit at time of sampling.

Table 10. Proposed sampling schedule for Marine Creek 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 2007-Spring 2008					
Fall 2008-Spring 2009	A[1]				
Fall 2009-Spring 2010					
Fall 2010-Spring 2011	S,A[1]	S	S		S

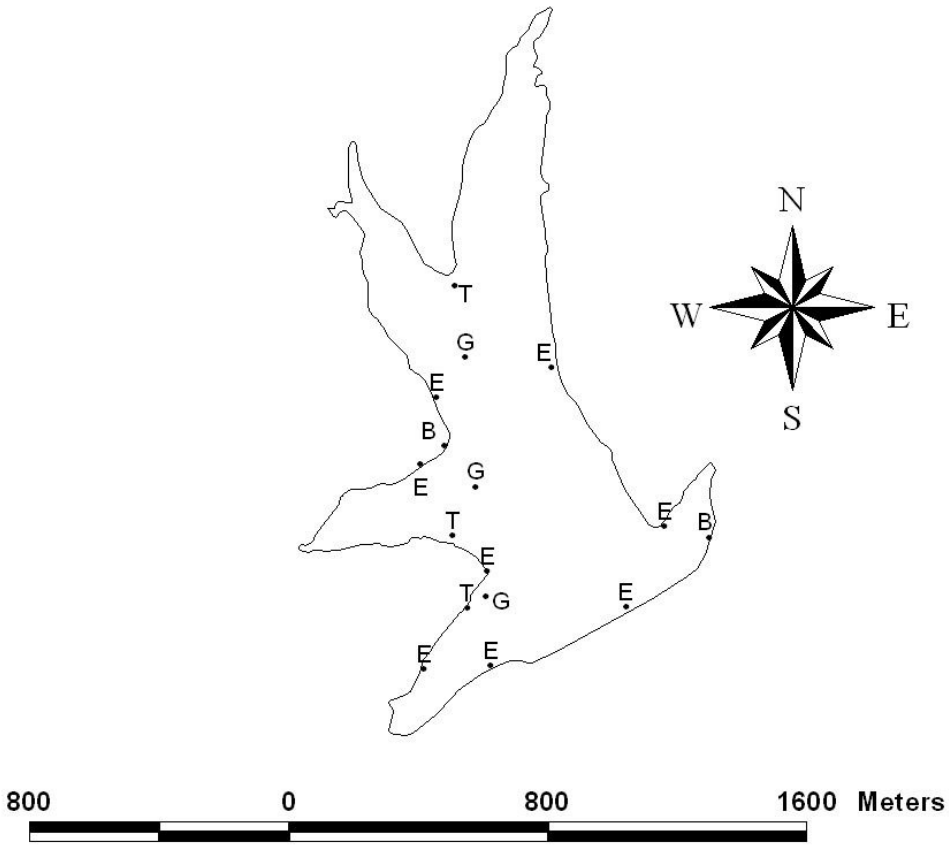
[1]Additional electrofishing surveys will be spring, bass-only as part of the Operation World Record project.

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Marine Creek Reservoir, Texas, 2006-2007.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad	24	8.0			25	37.5
Threadfin shad					40	60.0
Channel catfish	7	2.3				
White bass	14	4.7				
Bluegill	2	0.7			192	286.5
Longear sunfish					89	133.5
Redear sunfish					42	63.0
Spotted bass					27	40.5
Largemouth bass	1	0.3			99	148.5
White crappie	14	4.7	7	2.3		

APPENDIX B



Location of sampling sites, Marine Creek Reservoir, Texas, 2006-2007. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Boat ramps are indicated with a B.