

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-35

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2009 Survey Report

Martin Creek Reservoir

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July 31, 2010

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Martin Creek Reservoir were surveyed in 2009 using electrofishing and dual cod trap nets and in 2010 using gill nets. An angler creel survey was conducted from December 2009 through February 2010. An aquatic vegetation survey was conducted in July 2009. This report summarizes the results of these surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Martin Creek Reservoir is located on Martin Creek, a tributary of the Sabine River in Rusk County. Luminant Energy impounded the reservoir in 1974 to provide cooling water for their coal-powered generators. At conservation pool, Martin Creek Reservoir is 4,981 surface acres with a shoreline length of 62 miles, and has a mean depth of 16 feet. Water level fluctuations average 3 feet annually.
- **Management history:** The management plan from the 2001 survey report included stocking blue catfish at 50 fish/acre for two consecutive years in an attempt to establish a self-sustaining population to provide catfish anglers an additional sport fish with greater growth potential. Blue catfish fingerlings were stocked into Martin Creek Reservoir in 2003, but limited hatchery production prevented a second stocking until 2007. Triploid grass carp were stocked from 1996 through 1999 at a rate of 0.6/acre each year to reduce hydrilla that covered about a third of the reservoir. Currently, there is little vegetation in the reservoir. The triploid grass carp stockings in conjunction with extreme low water conditions in 1996, 2005, and 2006 have decreased the aquatic vegetation coverage. Brushpiles were introduced in 2007.
- **Fish community**
 - **Prey species:** Primary prey species were gizzard shad, threadfin shad, and bluegill. Electrofishing catch rates and body condition of largemouth bass suggested that these species provided ample forage for predator species.
 - **Catfishes:** Channel catfish abundance decreased significantly over the last three survey years. Blue catfish fingerlings were stocked in 2003 and 2007, and gill net data indicated good survival and excellent growth. Age data indicated some natural recruitment. However, the popularity of the catfish fishery may have declined, accounting for only 5.9% of the directed angling effort in the winter of 2009/2010 compared to 23.6% directed effort in the spring of 2002.
 - **Largemouth bass:** Largemouth bass provided the most popular fishery during the winter quarter of 2009/2010 (86% of total angling effort). Largemouth bass abundance and size structure were moderate and stable over the last three electrofishing surveys, and fish were in good body condition.
 - **Crappies:** White crappie and black crappie were present but abundance was low. Only seven crappie were collected from trap nets. Although 5.2% of total angling effort was directed towards crappie, no fish were observed caught during the winter-quarter creel survey.
- **Management strategies:** Giant salvinia was discovered in 2009. Inland Fisheries staff has advised park personnel regarding plant identification and transport potential via boat trailers. Vegetation surveys will be conducted annually to monitor giant salvinia. Currently, there is little aquatic vegetation present. Consult with Luminant Energy regarding native plant introduction. When vegetation reestablishes, Inland Fisheries staff will advise the controlling authority on vegetation control. In coordination with State Park staff, additional brushpiles will be introduced.

INTRODUCTION

This document is a summary of fisheries data collected from Martin Creek Reservoir in 2009 and 2010. The purpose of this 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. Past survey data are presented with the 2009 and 2010 data for comparison.

Reservoir Description

Martin Creek Reservoir was impounded in 1974 on Martin Creek. It is located in Rusk County approximately 10 miles northeast of Henderson and is operated and controlled by Luminant Energy to provide cooling water for their coal-powered generators. At conservation pool, Martin Creek Reservoir is 4,981 surface acres in size, has a shoreline length of 62 miles, and a mean depth of 16 feet. Water level fluctuations average three feet annually, but the reservoir was eight feet below conservation pool during 2006 (Figure 1). A public boat ramp and one handicap-accessible fishing pier are present at Martin Creek State Park. The primary habitat type is standing timber. Most of the land around the reservoir is used for agriculture and oil and gas production. Other descriptive characteristics for Martin Creek Reservoir are presented in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ashe and Driscoll 2005) included:

1. Creel survey data from 2001 indicated that the fishery was highly consumptive. Conduct an angler opinion survey to determine public attitude toward stocking additional species to expand harvest opportunity.
Action: An angler opinion survey was conducted from August 2006 to January 2007. However, sample size (N = 40) was inadequate to formulate additional management actions.
2. Stock blue catfish fingerlings at a rate of 50 fish/acre in 2003 and 2006 and monitor stocking success in 2009 and 2010.
Action: Blue catfish fingerlings were stocked at a rate of 50 fish/acre in 2003 and 2007. The angler creel survey conducted from December 2009 to February 2010 indicated only 5.9% of total fishing effort directed toward catfish. A gillnet survey was conducted in 2010, and blue catfish were relatively abundant. Blue catfish were aged in 2009 and 2010, indicating limited natural recruitment and moderate growth (fish reached legal size at about age 3).
3. Conduct surveys every four years to monitor the status of vegetation in the reservoir.
Action: A vegetation survey was conducted in July 2009 and little vegetation was observed.
4. Determine public opinion regarding changing the existing 14-inch minimum length limit for largemouth bass to either a 16- or 18-inch minimum length limit.
Action: An angler opinion survey was conducted from August 2006 to January 2007. However, sample size (N = 40) was inadequate to formulate additional management actions. However, of the 40 surveys received, the majority of the respondents indicated a preference for the current 14-inch minimum length limit.

Harvest regulation history: Sport fishes in Martin Creek Reservoir are currently managed with statewide regulations (Table 2).

Stocking history: Blue catfish were stocked in 2003 (273,789 fingerlings) and 2007 (249,050 fingerlings). The reservoir had not been stocked with blue catfish since 1985. Florida largemouth bass have not been stocked since 1990. Approximately 3,000 triploid grass carp were stocked

annually from 1996 through 1999. The complete stocking history is in Table 3.

Vegetation/habitat history: The controlling authority stocked triploid grass carp in 1993, and 1996 through 1999 to reduce hydrilla that had become problematic. The reservoir had nearly 35% hydrilla coverage prior to the triploid grass carp stockings. Standing timber is present in half of the reservoir and comprises 2,426 acres. There is no residential shoreline development. The majority of the land surrounding the reservoir is used for agriculture and oil and gas production.

METHODS

Fishes were collected by electrofishing (1.0 hour at 12, 5-min stations in November 2009), dual cod trap netting (10 net nights at 5 stations), and gill netting (5 net nights at 5 stations conducted in December 2009 and January 2010, respectively). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and for trap nets and gill nets as the number of fish caught per net night (fish/nn). A vegetation survey was conducted in September 2009. All 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. Blue and channel catfish growth was determined in 2009 and 2010 from otoliths (N=91 and 111 in 2009 and N=47 and 30 in 2010, respectively). Source for water level data was the United States Geological Survey web site (USGS 2009).

A roving creel survey (9 days) was conducted from December 2009 through February 2010 to assess angler use and catch in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009). Total angler catch of largemouth bass \geq 4, 7, and 10 pounds was also estimated. Anglers were asked if released fish were within weight categories. Harvested fish lengths were converted to weights for classification (19 inches = 4 lbs; 23 inches = 7 lbs; 25 inches = 10 lbs).

RESULTS AND DISCUSSION

Habitat and vegetation: The habitat survey conducted in 2005 indicated the littoral zone consisted primarily of overhanging brush, concrete, and standing timber (Ashe and Driscoll 2005). Over 2,400 acres of standing dead timber was present. Only trace amounts of American lotus and *Potamogeton spp.* were present (Table 4).

Giant salvinia was discovered in 2009 in one embayment of the reservoir. Luminant Energy immediately isolated the infestation with containment booms and manually removed all visible plants. Cold water temperatures (<10 C) during the winter of 2010 likely reduced plant coverage as well. No plants were found during a reservoir-wide survey in April 2010.

Creel: A creel survey was conducted from December 2009 through February 2010. Directed fishing effort was highest for largemouth bass (85.5%), followed by catfish (5.9%), crappie (5.2%), and anything (3.4%) (Table 5). Total fishing effort for all species at Martin Creek Reservoir was 23,121.1 h and similar to 2002 (Table 6). Anglers spent an estimated \$140,045 on direct expenditures during this time period. In 2002, proportions of directed effort towards largemouth bass and catfishes were 29.6 and 23.6, respectively. However, during 2009 and 2010, 85.5% of total effort was directed at largemouth bass, and only 5.9% was directed towards catfishes. Some of the observed difference may have been due to the difference of the seasons surveyed.

Prey species: Electrofishing catch rates of gizzard shad and bluegill were 25.0/h and 359.0/h, respectively in 2009 (Figures 2 and 3). Index of vulnerability (IOV) for gizzard shad was low (28.0) and declined from previous years (Figure 2). Total CPUE of gizzard shad has been variable during last three surveys (range = 12.7 to 66.0/h; Figure 2). Total CPUE and size structure of bluegill in 2009 was similar to that from 2001 and 2005 (Figure 3). Threadfin shad were present in the reservoir with an electrofishing catch rate of 144.0/h (Appendix A). Prey availability appears to be adequate, given good body condition of largemouth bass and growth rates of blue catfish.

Catfishes: The gill net catch rate of blue catfish was 12.0/nn in 2010, which was similar to 2009 (11.2/nn), but higher than 2006 (3.9/nn) (Figure 4). Catch rates and size structure indices suggest that blue catfish have experienced adequate survival and growth from the 2003 and 2007 stocking. However, abundance of quality-size blue catfish (≥ 20 inches) declined in 2010. Age data indicated that a limited amount of natural recruitment occurred, as year classes of fish were present from years with no stocking (Figure 5). Blue catfish growth was good, as fish reached legal size during their second or third year.

Despite introducing blue catfish with the intent to expand catfish angling and harvest opportunities, directed angler effort declined substantially from 2002 (8,077.0 h) to 2009/2010 (1,364.7 h) (Table 7). Overall harvest also declined from 9,673 fish (2002) to 30 fish (2009/2010) (Table 7; Figure 8).

The gill net catch rate of channel catfish was 5.6/nn in 2010, which was significantly lower than what was observed in 2006 and 2009 (29.8 and 17.5 fish/nn, respectively) (Figure 6). Low relative weights observed in 2009 and a subsequent decrease in CPUE during the last three survey years may reflect competition for prey (intraspecific and interspecific with introduced blue catfish). Age data in 2009 and 2010 indicated poor growth. In 2009, fish reached 10 inches at age 3 and 12 inches at age 5. (Figure 7). In 2010, age-4 fish averaged only 10.2 inches.

In 2002, the channel catfish fishery was popular and productive (8,077.0 h effort, 1.2 fish/h catch rate, and total harvest was 9,672.5 fish) (Table 7). During 2009 and 2010, directed effort for catfish declined to only 1,364.7 h and no channel catfish were observed as harvested.

Largemouth bass: The electrofishing catch rate of largemouth bass in 2009 (108.0/h) was similar to what was observed in 2001 and 2005 (96.7/h and 109.3/h respectively) (Figure 9). Size structure has improved with PSD values increasing from 19 to 38. Body condition in 2009 was adequate ($W_r > 90$) for most size classes and was similar to previous surveys (Figure 9).

Directed fishing effort, catch per hour, and total harvest for largemouth bass was 6,435.8 h, 0.4 fish/h, and 1,039 fish, respectively, from February to April 2002 (Table 8). All three estimates increased significantly in 2009/2010 (19,768.7 h effort, 1.5 fish/h catch rate, and 2,052 fish harvested) (Table 8). A total of 50.5% of all directed effort for largemouth bass was tournament-related (Table 5). The majority of fish caught by anglers above the 14-inch minimum length size limit were released (75.8%), and harvested fish ranged in length from 14 to 21 inches (76% tournament-retained) (Table 8; Figure 10). An estimated 277 fish ≥ 4 lbs (37 ≥ 7 lbs) were estimated as caught during the three-month creel period (Table 8). Florida largemouth bass influence has remained relatively constant, as Florida alleles ranged from 62.0% to 68.1% (Table 9).

Crappies: White and black crappie were present in the reservoir, but both trap net and creel surveys indicated abundance was low. Standard trap net surveys were discontinued in 2001, due to gear inefficiency. In 2009, a dual cod trap net survey was conducted and catch rate of white crappie was 0.1/nn and black crappie was 0.6/nn (Figure 11). The 2009/2010 creel survey indicated directed effort for crappies was only 1,201.7 hours, and no harvest was observed (Table 10).

Fisheries management plan for Martin Creek Reservoir, Texas

Prepared – July 2010

ISSUE 1: Although a reservoir-wide survey during April 2010 documented no plants, giant salvinia is likely still present and the threat for additional introduction via boat trailers is high. Inland Fisheries and Aquatic Habitat Enhancement (AHE) personnel have encouraged Martin Creek State Park staff to inspect all boat trailers for presence of giant salvinia.

MANAGEMENT STRATEGIES

1. Continue to encourage state park personnel to inspect all boat trailers.
2. In conjunction with AHE staff and Luminant Energy, conduct annual vegetation surveys to monitor giant salvinia coverage, and use all applicable means of control (booms, herbicides, and weevils).

ISSUE 2: There is virtually no aquatic vegetation present in the reservoir due to the combination of 1996 to 1999 triploid grass carp stockings and low water levels in 2005 and 2006. Lack of vegetation has negatively impacted reproduction and recruitment of largemouth bass, which supports the most popular fishery at the reservoir.

MANAGEMENT STRATEGIES

1. Conduct vegetation surveys annually to monitor the status of vegetation in the reservoir. In the future, if hydrilla reestablishes, consult with Luminant Energy and the state park to develop a vegetation management plan that balances industrial and recreational uses.
2. Coordinate with Luminant Energy and introduce water willow in areas that will not interfere with industrial activities in order to increase total vegetative coverage.
3. Continue to assist state park personnel with placement of brushpiles in the reservoir.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes annual vegetation surveys, fall electrofishing, gill netting, and a winter quarter creel survey in 2013/2014 (Table 11).

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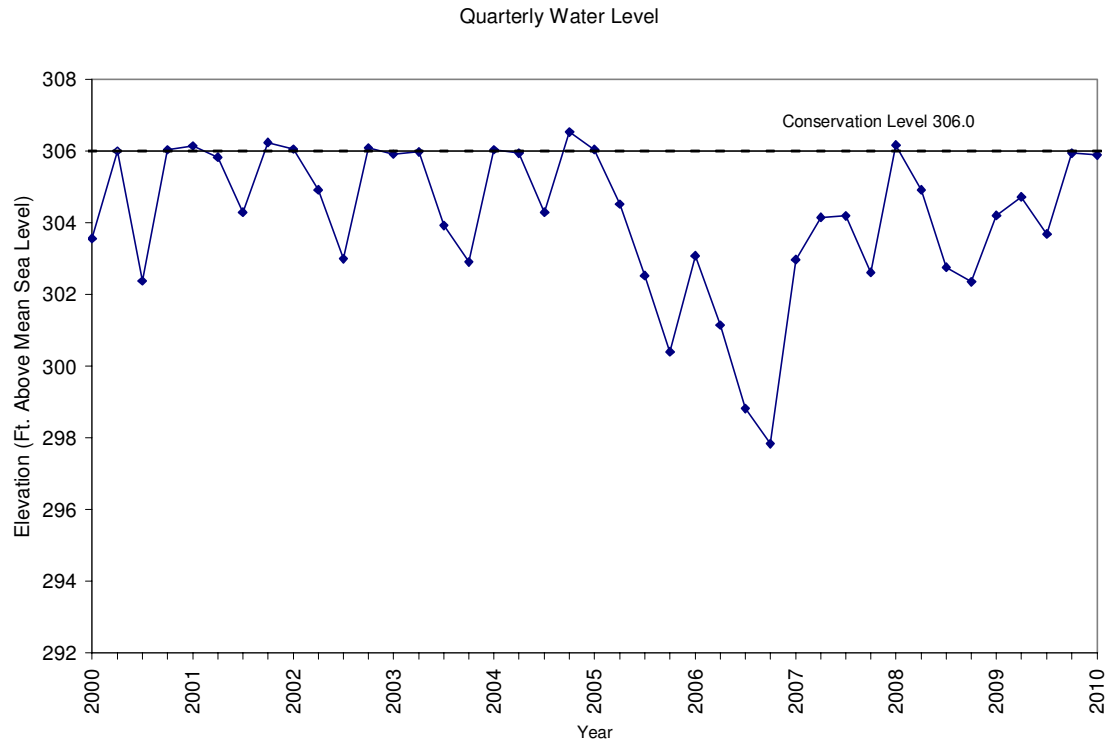


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Martin Creek Reservoir, Texas.

Table 1. Characteristics of Martin Creek Reservoir, Texas.

Characteristic	Description
Year constructed	1974
Controlling authority	Luminant Energy
Counties	Rusk
Reservoir type	Secondary stream
Shoreline Development Index (SDI)	4.7
Conductivity	120 umhos/cm

Table 2. Harvest regulations for Martin Creek Reservoir.

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: largemouth	5	14 – No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 3. Stocking history of Martin Creek Reservoir, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), 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)
Blue catfish	1974	81,520	UNK	UNK
	1982	600	UNK	UNK
	1984	100,758	FGL	2.3
	1985	50,062	FGL	2.0
	2003	273,789	FGL	UNK
	2007	249,050	FGL	2.2
	Total	755,779		
Channel catfish	1973	15	UNK	UNK
	1974	100,888	AFGL	7.9
	Total	100,903		
Florida largemouth bass	1974	365,000	FRY	1.0
	1984	559,970	FGL	2.0
	1990	251,357	FRY	0.7
	Total	1,176,327		
Palmetto bass (striped X white bass hybrid)	1974	49,880	UNK	UNK
	1975	15,000	UNK	UNK
	1983	49,800	UNK	UNK
	1984	99,875	FGL	2.0
	Total	214,555		
Triploid grass carp	1993	800	AFGL	UNK
	1996	2,899	AFGL	UNK
	1997	2,857	AFGL	UNK
	1998	3,000	AFGL	UNK
	1999	3,000	AFGL	UNK
	Total	12,556		
Redbreast sunfish	1983	346,853		UNK
	1984	404,236		1.8
	Total	751,089		
Walleye	1974	1,250,676	FRY	0.2
	Total	1,250,676		
White crappie	1983	30,913	UNK	UNK
	1984	134,227	FGL	2.0
	1986	91,696	FRY	1.0
	Total	256,836		

Table 4. Survey of aquatic vegetation, Martin Creek Reservoir, Texas, 2001, 2005, and 2009. Acreage of each species and percent of total surface area coverage (in parentheses) are presented.

Species	2001	2005	2009
American lotus	3.5 (<1)	10 (<1)	5 (< 1)
<i>Potamogeton spp.</i>	0 (0)	0 (0)	5 (< 1)
Giant salvinia	0 (0)	0 (0)	<1 (< 1)

Table 5. Percent directed angler effort by species or groups for Martin Creek Reservoir, Texas, February to April 2002 and December 2009 to February 2010. For largemouth bass, the percentage of tournament angler effort is in parentheses.

Species/Groups	2002	2009/2010
Largemouth bass	29.6	85.5 (50.5)
Catfishes	23.6	5.9
Crappies	21.8	5.2
Panfishes	2.0	0.0
Anything	22.3	3.4

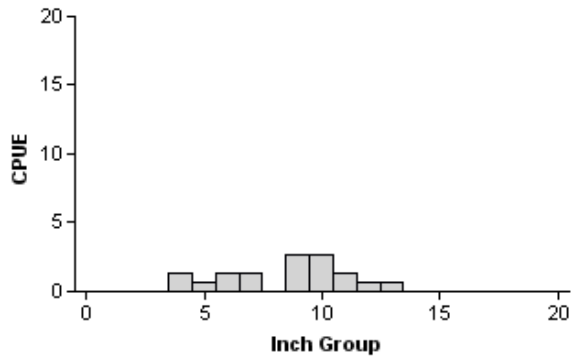
Table 6. Total fishing effort (h) for all species and total directed expenditures at Martin Creek Reservoir, Texas, February to April 2002 and December 2009 to February 2010.

Creel Statistic	2002	2009/2010
Total fishing effort	27,261.0	23,121.1
Total directed expenditures	\$95,500	\$140,045

Gizzard Shad

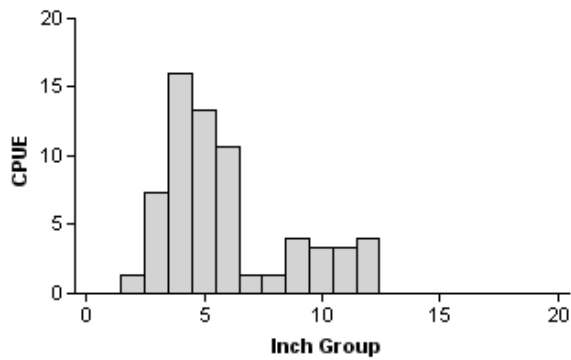
2001

Effort = 1.5
Total CPUE = 12.7 (25; 19)
IOV = 36.84 (13.9)



2005

Effort = 1.5
Total CPUE = 66.0 (23; 99)
IOV = 75.76 (8)



2009

Effort = 1.0
Total CPUE = 25.0 (32; 25)
IOV = 28.0 (9.3)

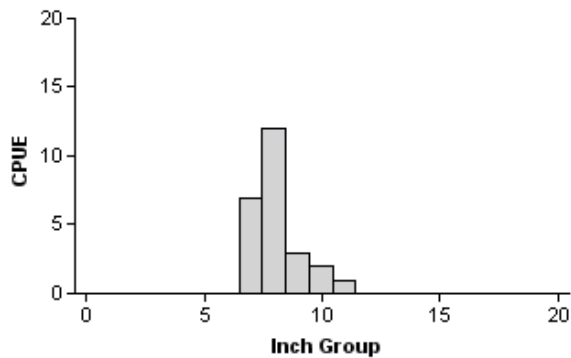
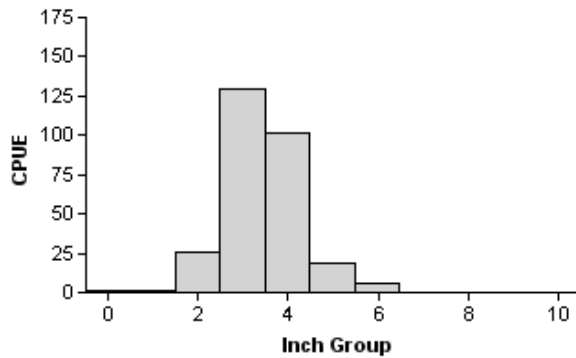


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Martin Creek Reservoir, Texas, 2001, 2005, and 2009.

Bluegill

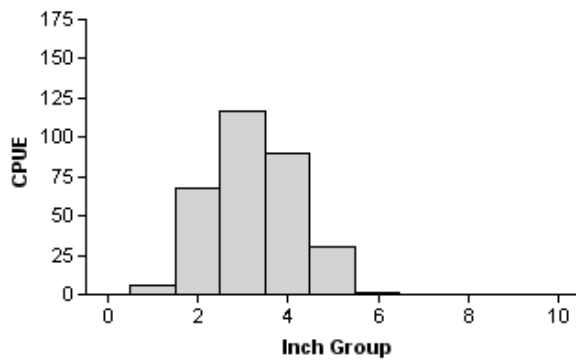
2001

Effort = 1.5
Total CPUE = 284.7 (19; 427)



2005

Effort = 1.5
Total CPUE = 310.0 (24; 465)



2009

Effort = 1.0
Total CPUE = 359.0 (16; 359)

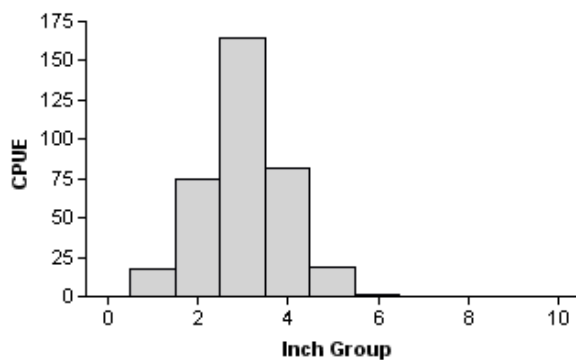
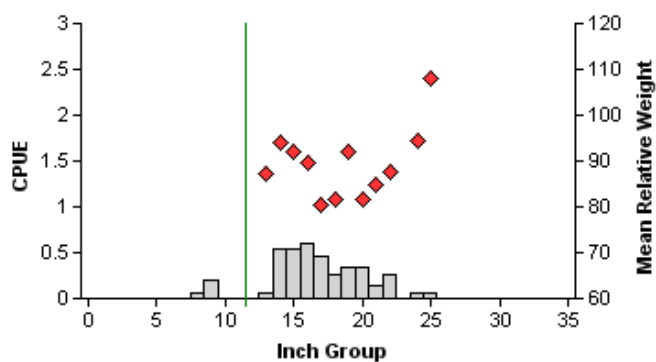


Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, Martin Creek Reservoir, Texas, 2001, 2005, and 2009.

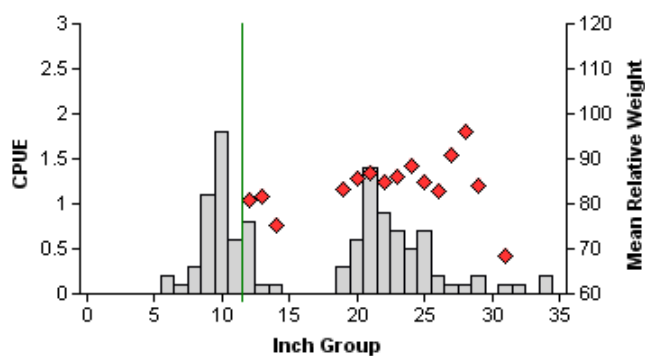
Blue Catfish

2006



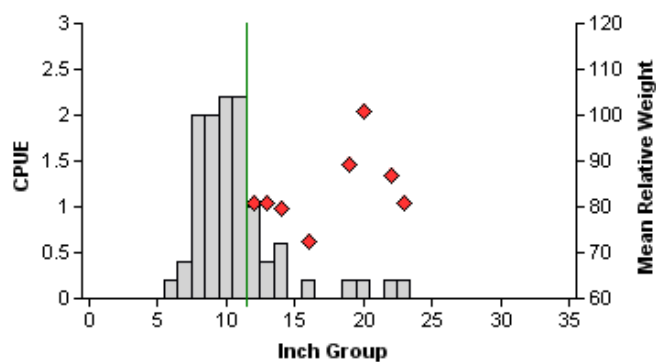
Effort = 15.0
Total CPUE = 3.9 (21; 59)
PSD = 24 (9.5)

2009



Effort = 10.0
Total CPUE = 11.2 (30; 112)
PSD = 82 (8.2)

2010



Effort = 5.0
Total CPUE = 12.0 (46; 60)
PSD = 20 (13.2)

Figure 4. Number of blue 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, Martin Creek Reservoir, Texas, 2006, 2009, and 2010.

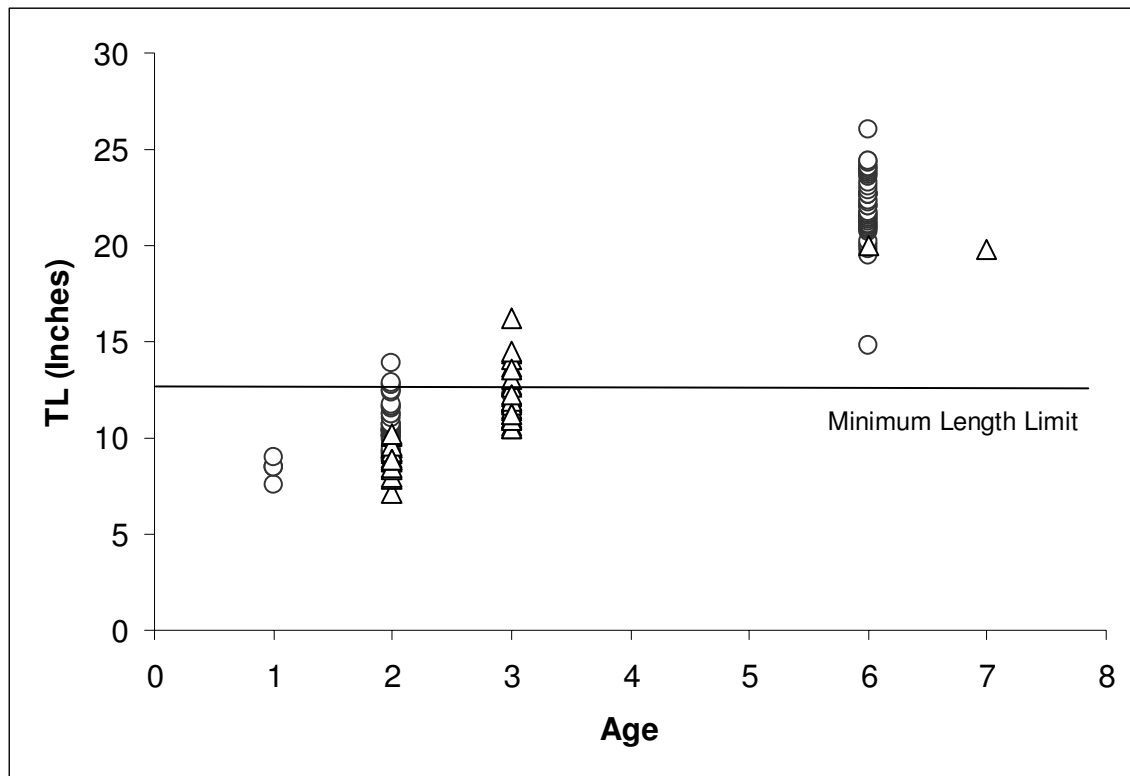


Figure 5. Length at age of blue catfish collected during January 2009 (circles) and 2010 (triangles), Martin Creek Reservoir, Texas (N=91 and 47, respectively).

Channel Catfish

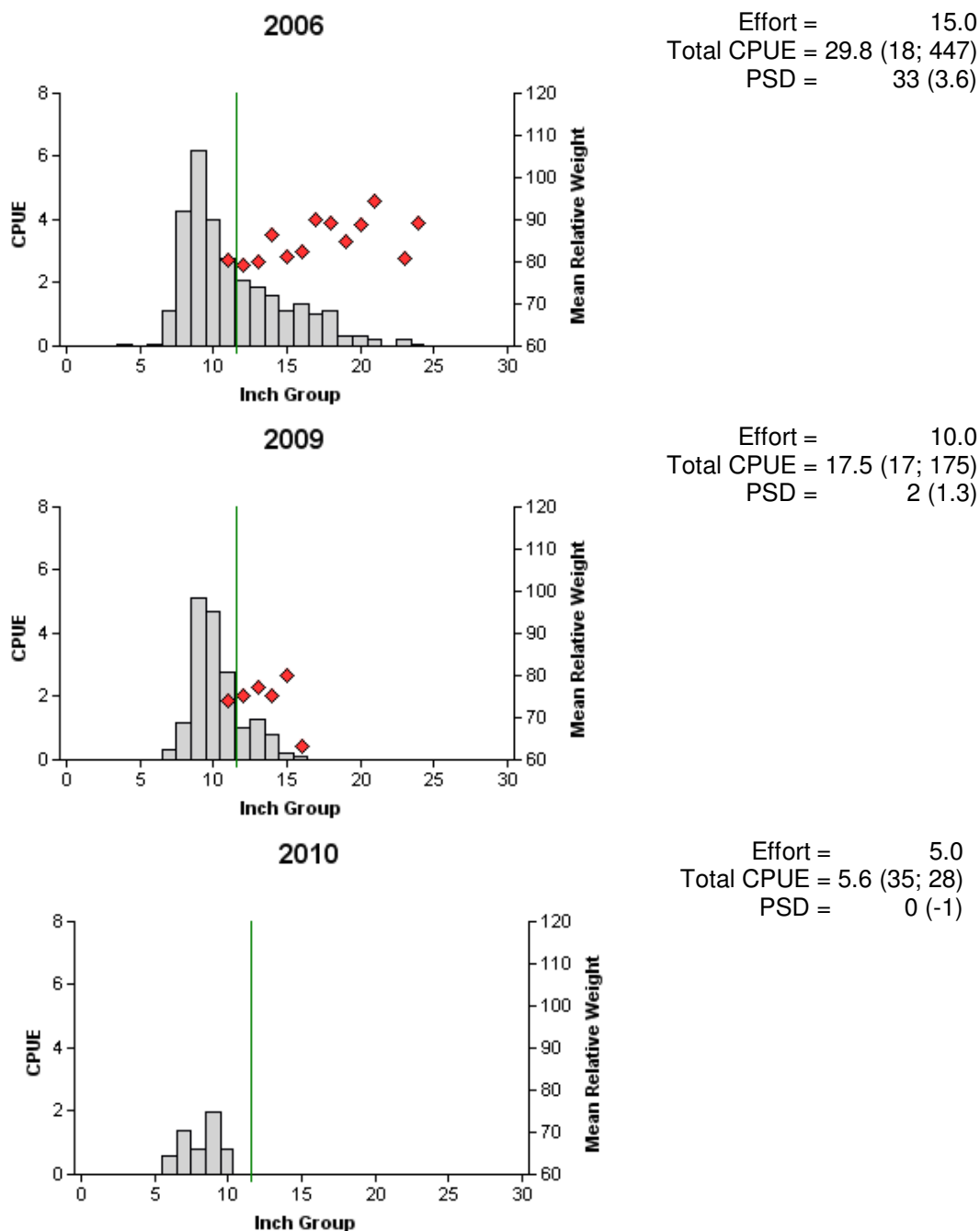


Figure 6. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Martin Creek Reservoir, Texas, 2006, 2009, and 2010.

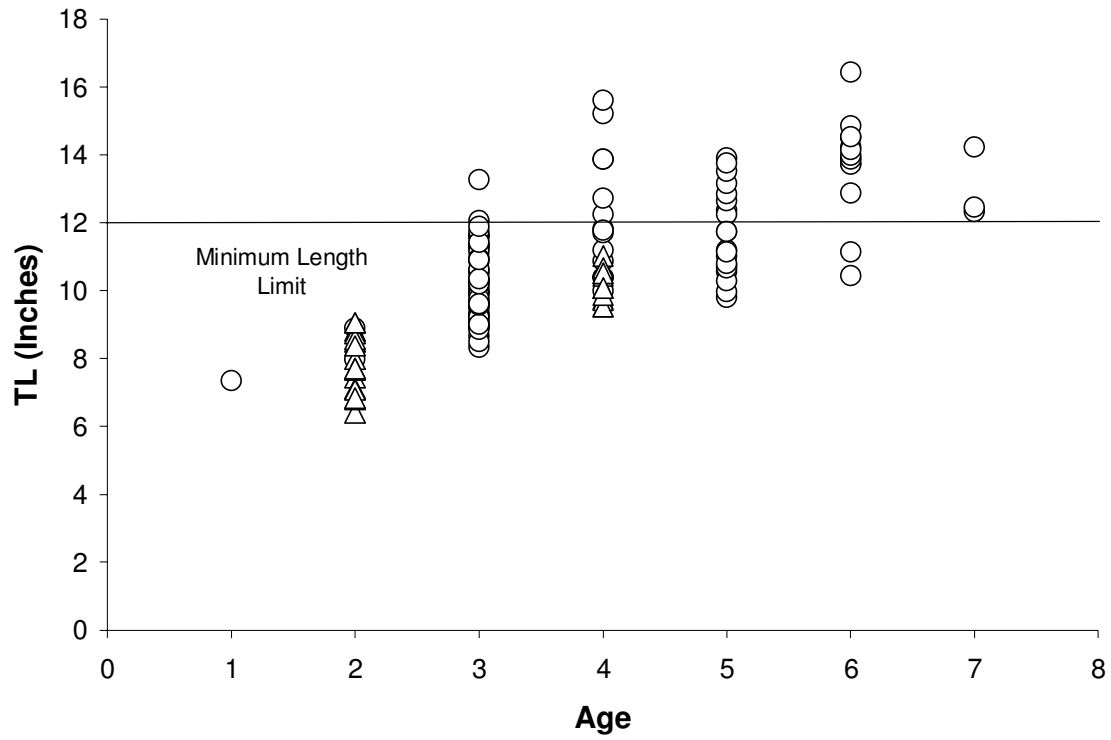


Figure 7. Length at age of channel catfish collected during January 2009 (circles) and 2010 (triangles), Martin Creek Reservoir (N=111 and 30, respectively).

Catfishes

Table 7. Creel survey statistics for catfishes for Martin Creek Reservoir from February to April 2002 and December 2009 to February 2010, where total catch per hour is for anglers targeting catfishes and total harvest is the estimated number of catfishes harvested by all anglers. Relative standard errors (RSE) are in parentheses. No channel catfish were observed as harvested during the December 2009 to February 2010 creel survey.

Creel Survey Statistic	2002	2009/2010
Directed effort (h)	8,077.0 (30)	1,364.7 (52)
Directed effort/acre	1.6 (30)	0.3 (52)
Total catch per hour	1.2 (29)	0.1 (110)
Total harvest	9,672.5 (54)	30.0 (491)
Harvest/acre	1.9 (54)	0.01 (491)
Percent legal released	0.0	0.0

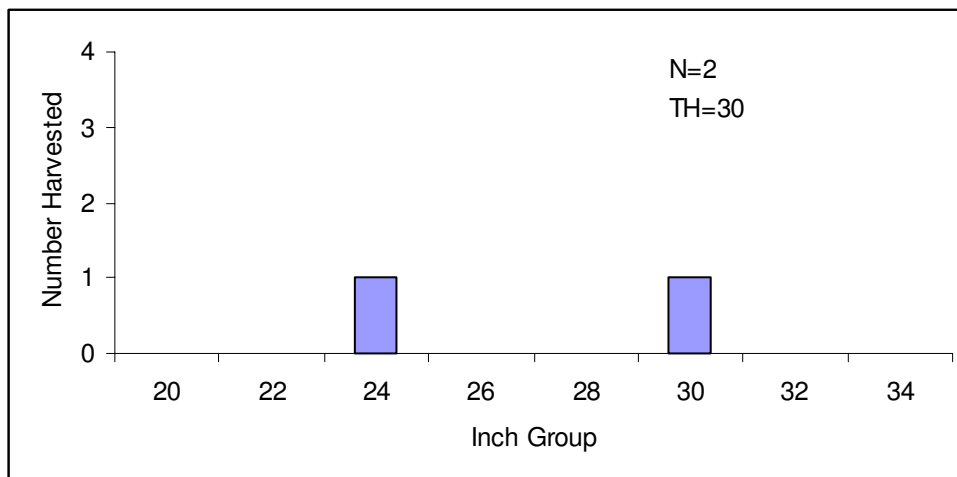
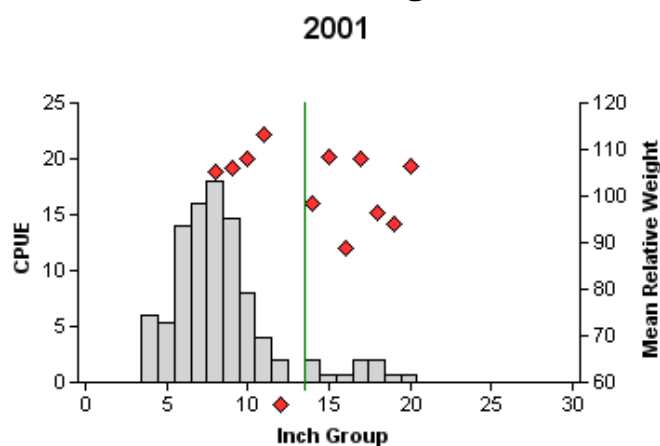
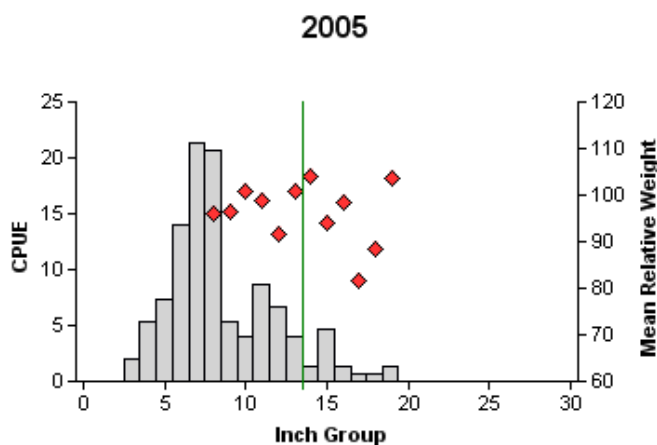


Figure 8. Length frequency of harvested blue catfish observed during creel surveys at Martin Creek Reservoir, Texas, December 2009 to February 2010, all anglers combined. N is the number of harvested blue catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

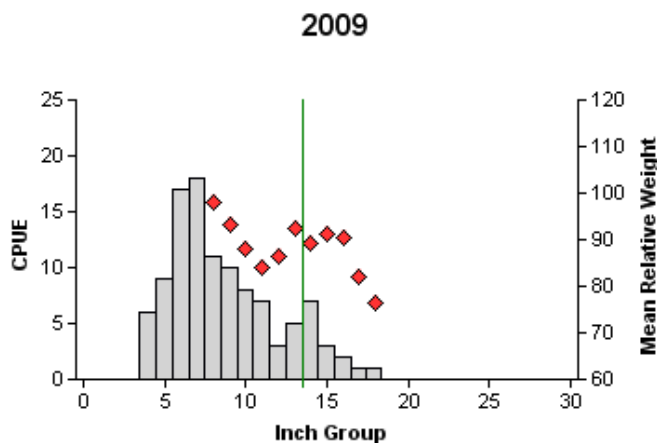
Largemouth Bass



Effort = 1.5
 Total CPUE = 96.7 (18; 145)
 PSD = 19 (4.4)



Effort = 1.5
 Total CPUE = 109.3 (12; 164)
 PSD = 35 (4.9)



Effort = 1.0
 Total CPUE = 108.0 (18; 108)
 PSD = 38 (7.7)

Figure 9. 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, Martin Creek Reservoir, Texas, 2001, 2005, and 2009.

Largemouth Bass

Table 8. Creel survey statistics for largemouth bass for Martin Creek Reservoir from February to April 2002 and December 2009 to February 2010, 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. For estimated catch of 4, 7, and 10-pound fish, the percentages of total catch are provided.

Creel Survey Statistic	2002	2009/2010
Directed effort (h)	6,435.8 (36)	19,768.7 (35)
Directed effort/acre	1.2 (36)	4.0 (35)
Total catch per hour	0.4 (29)	1.5 (11)
Total catch		
4 – 6.9 pound fish	NA	240 – 0.7%
7 – 9.9 pound fish	NA	37 – 0.1%
≥ 10 pound fish	NA	0 – 0.0%
Total harvest	1,039.2 (174)	2,051.8 (44)
Percent harvest tournament-retained	NA	76.0
Harvest/acre	0.2 (174)	0.4 (44)
Percent legal released	< 1.0	75.8

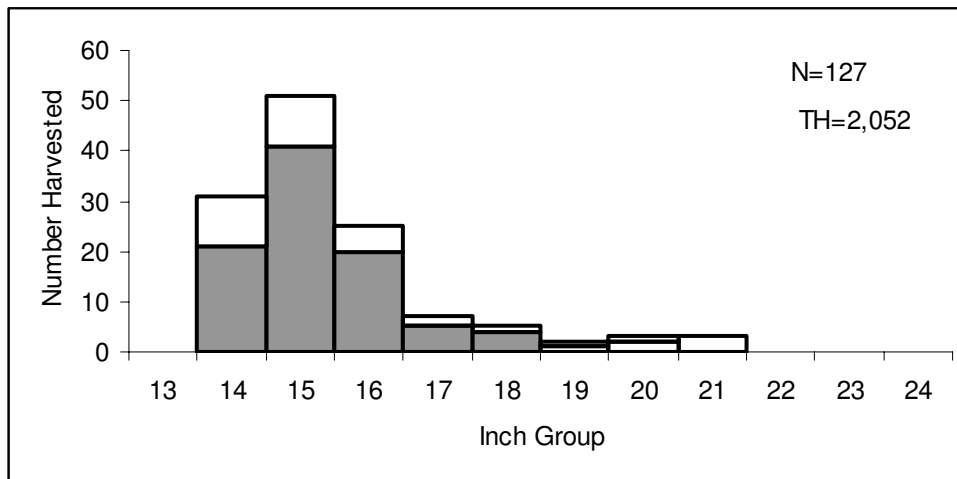


Figure 10. Length frequency of harvested largemouth bass (white = harvested; grey = tournament-retained) observed during creel surveys at Martin Creek Reservoir, Texas, December 2009 to February 2010, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 9. Results of genetic analysis of largemouth bass collected by fall electrofishing, Martin Creek Reservoir, Texas, 2001, 2005, and 2009. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, Fx = first or higher generation hybrid between a FLMB and a NLMB.

Year	Sample size	Genotype			% FLMB alleles	% pure FLMB
		FLMB	Fx	NLMB		
2001	47	12	34	1	68.1	26.7
2005	55	1	54	0	65.4	2.0
2009	30	0	30	0	62.0	0.0

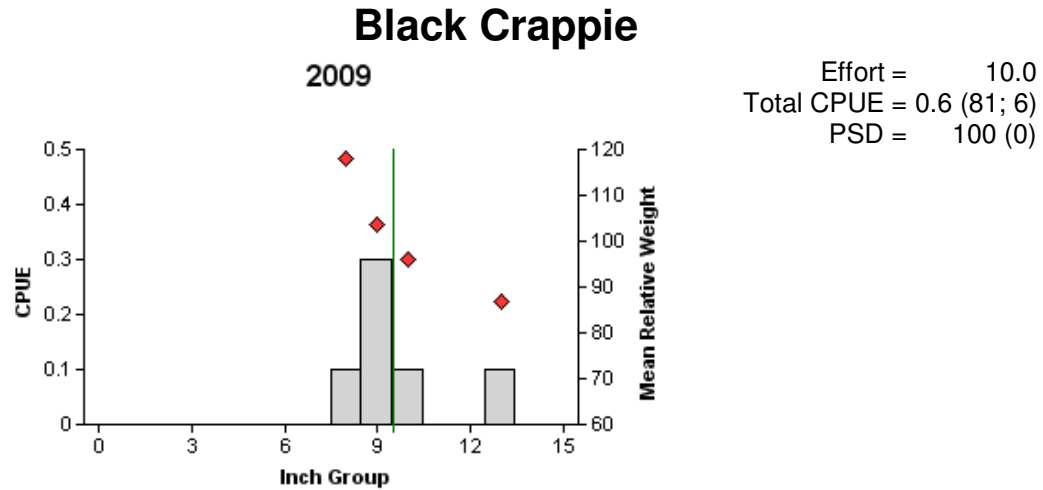


Figure 11. Number of black crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall dual cod trap net surveys, Martin Creek Reservoir, Texas, 2009.

Crappies

Table 10. Creel survey statistics for crappies (white and black crappies combined) at Martin Creek Reservoir from December 2009 to February 2010, where total catch per hour is for anglers targeting crappies and total harvest is the estimated number of crappies harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	2002	2009/2010
Directed effort (h)	5,933.6 (35.46)	1,201.7 (46)
Directed effort/acre	1.1 (35.46)	0.2 (46)
Total catch per hour	0.8 (56)	0.0
Total harvest	5,044.9 (109)	0.0
Harvest/acre	1.0 (109)	0.0
Percent legal released	0.0	0.0

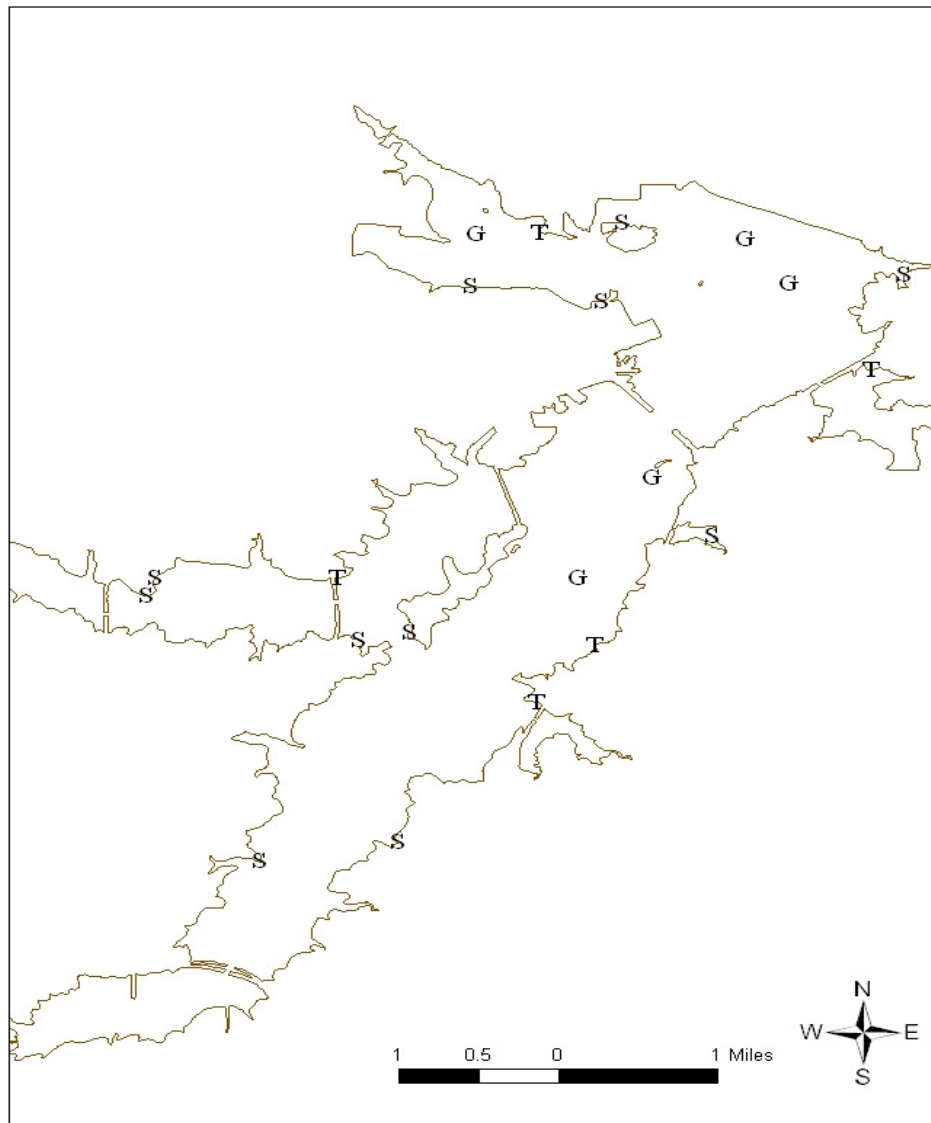
Table 11. Proposed sampling schedule for Martin Creek Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing surveys are conducted in the fall. Standard survey denoted by S.

Survey Year	Fall Electrofisher	Gill Net	Creel Survey	Vegetation	Report
2010-2011				A	
2011-2012				A	
2012-2013				A	
2013-2014	S	S	A	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of target species collected from gill netting, dual cod trap netting and fall electrofishing, Martin Creek Reservoir, Texas, 2009 and 2010.

Species	Gill Net		Trap Net		Fall Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Spotted gar	2	0.4				
Gizzard shad	18	3.6			25	25.0
Threadfin shad					144	144.0
Blue catfish	60	12.0				
Channel catfish	28	5.6				
Redbreast sunfish					62	62.0
Bluegill					359	359.0
Longear sunfish					99	99.0
Redear sunfish					10	10.0
Spotted sunfish					1	1.0
Largemouth bass					108	108.0
White crappie			1	0.1		
Black crappie			6	0.6		

APPENDIX B

Location of sampling sites, Martin Creek Reservoir, Texas, 2009 and 2010. Gill net, dual cod trap net, and electrofishing stations are indicated by G, T, and S, respectively. Water level was near conservation pool at time of sampling.