

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

Lake Monticello

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July 31, 2008

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Monticello were surveyed in 2007 using electrofishing and in 2008 using gill nets. Anglers were surveyed from December 2006 to February 2007 with an access creel. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Lake Monticello is a 2,000-acre impoundment constructed in 1972 on Smith and Blundell Creeks in the Big Cypress River Basin. Structural habitat is mainly inundated timber. Native aquatic plant abundance is limited and waterhyacinth is present in the reservoir. A substantial fish kill occurred during the summer 2006.
- **Management history:** Important sport fish include channel catfish and largemouth bass. Channel catfish are managed with the statewide 12-inch minimum length limit. Largemouth bass are managed with a 14- to 24-inch slot length limit and 5-fish daily bag, of which only one fish can be greater than 24 inches. The largemouth bass population consists of a high proportion of pure Florida largemouth bass. TPWD and Texas Utilities are coordinating the management of waterhyacinth. No fish stocking has been conducted since the last survey report.
- **Fish community:**
 - **Prey species:** Few shad were collected during 2007 electrofishing, but bluegill catch rates have doubled since the previous survey. This increase in bluegill abundance will provide adequate prey for largemouth bass in the reservoir.
 - **Catfishes:** There were many channel catfish collected above legal length (12 inches) during the 2008 gill net survey. Thirteen percent of all angling effort at Lake Monticello was directed towards catfish from December 2006 through February 2007. Anglers caught 2 legal catfish for every one fish below 12 inches.
 - **Largemouth bass:** Electrofishing catch rates were low and no fish were observed > 24 inches. Fish body condition was good, indicating adequate prey availability. Age-1 largemouth bass exhibited fast growth rates. Over 80% of the directed effort from December 2006 through February 2007 at Lake Monticello was from anglers targeting largemouth bass.
 - **Crappie:** Trap netting was not conducted during this survey period due to historically poor trap-net catch at this reservoir. An estimated 49 black crappie were harvested between December 2006 and February 2007.
- **Management strategies:** Conduct electrofishing surveys every other year beginning in 2009, and general monitoring with gill nets in 2012. Waterhyacinth surveys will be conducted annually beginning in 2008. Technical guidance will be given to controlling authority regarding waterhyacinth management. Largemouth bass will continue to be managed with a 14- to 24-inch slot length limit.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Monticello in 2007 to 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 fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2007 and 2008 data for comparison.

Reservoir Description

Lake Monticello is a 2,001-acre impoundment constructed in 1972 on Smith and Blundell Creeks in the Big Cypress River Basin. The reservoir is located in Titus County near the City of Mount Pleasant. The controlling authority is Texas Utilities. Primary water uses are power plant cooling and public recreation. It has a watershed of approximately 40 square miles, a shoreline length of 6 miles, and a shoreline development index of 2.6. Water levels are relatively stable and can be maintained by supplemental water supply from Lake Bob Sandlin. Structural habitat consists of inundated timber, overhanging brush, and creek channels. Native aquatic plant abundance is limited and waterhyacinth is present in the upper end of the reservoir. Boat access consisted of one public boat ramp. Bank fishing access is limited. Heated effluent associated with power production limits available fish habitat during summer months. Water temperatures approach and sometimes exceed 95 °F in the epilimnion during July through September, severely reducing preferred habitat for fish and contributing to occasional fish kills.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ryan and Brice 2004) included:

1. Conduct annual fall electrofishing surveys to monitor largemouth bass abundance, population structure, condition, growth, and genetic composition.
Action: Fall surveys have been conducted annually as recommended. Genetic composition was assessed in 2005 and 2007.
2. Conduct biennial angler creel surveys to monitor angling effort and success during winter periods.
Action: Creel surveys have been conducted December 2004 through February 2005 and December 2006 through February 2007.
3. Meet with Titus County officials to discuss facility improvement needs at Titus County Park to increase recreational utilization by the public.
Action: Contact with officials was made. Funds were not available for fishing pier construction. Harvest regulations were posted at check-in station at park entrance.
4. Provide information to inform anglers of fishing opportunities.
Action: District staff made a fisheries management presentation to the Pittsburg Bass Club.

Harvest regulation history: Sport fishes in Lake Monticello are currently managed with statewide regulations except for largemouth bass (Table 2). Largemouth bass are managed with a 14- to 24-inch slot length limit and 5-fish daily bag of which only one fish can be over 24 inches. This regulation was implemented in September 1998. The length limit had previously been a 14- to 21-inch slot length limit.

Stocking history: Lake Monticello was stocked initially with Florida largemouth bass, blue catfish, channel catfish, flathead catfish, walleye, and green x redear sunfish hybrids. Florida largemouth bass and channel catfish stockings have been successful. Previous attempts to establish crappie in this reservoir have not been successful. Crappie recruitment and survival is generally poor in power plant cooling reservoirs; however no stocking has occurred since 1991. The complete stocking history is presented in Table 3.

Vegetation/habitat history: Aquatic vegetation coverage has historically been low with American lotus as the dominant species. Hydrilla has been present in the past but has not been problematic. Waterhyacinth has recently been discovered at the public boat ramp and physically removed.

METHODS

Fishes were collected by electrofishing (1.0 hour at 12, 5-min stations) and gill netting (5 net nights at 5 stations). Since the last survey report, two access-point angler creel surveys were conducted from December 2004 through February 2005 and December 2006 through February 2007. The creel surveys consisted of 4 randomly-selected weekdays and 5 randomly-selected weekend days. Each day was partitioned into two, 5-hour survey periods, which were randomly selected for each survey day. An aquatic vegetation survey was conducted in September 2007. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill nets, as the number of fish caught per net night (fish/nn). All survey sites were randomly selected and electrofishing, gill netting, vegetation, and creel 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 for creel statistics and SE was calculated for structural indices and IOV. Ages were determined using otoliths from 30 randomly-selected largemouth bass (range 8 to 19 inches). Largemouth bass population genetics were assessed with micro-satellite DNA analysis in 2007 and 2005 and with electrophoresis in 2003 from a minimum sample of 30 young-of-the-year fish. Source for water level data was the United States Geological Survey (USGS) website.

RESULTS AND DISCUSSION

Habitat: Structural habitat consisted of inundated timber, brush, and creek channels (Ryan and Brice 2000). American lotus was the most dominant aquatic plant species (191 acres), followed by cattails (45 acres) and waterhyacinth (5 acres) (Table 4). Waterhyacinth was discovered in 2006 and Texas Parks and Wildlife has been coordinating with Texas Utilities to manage the infestation. TPWD treated one acre with aquatic herbicide in fall 2007. The location of the infestation (Smith Creek) has made access to treatment difficult because the creek channel was blocked by waterhyacinth. Future treatments are planned as soon as appropriate access strategies are developed.

Creel: Directed fishing effort by anglers during winter-quarter creels was highest for black bass followed by catfish (Table 5). Total fishing effort for all species at Lake Monticello was 18,930 h from December 2006 through February 2007, which was lower than the December 2004 through February 2005 survey (24,793 h), but similar to the December 2002 through February 2003 survey (18,576 h) (Table 6). Anglers spent an estimated \$136,367 in direct expenditures during the 2006 to 2007 winter survey period (Table 6).

Prey species: Very few threadfin shad and gizzard shad were collected during the 2007 electrofishing survey (Figure 2, Appendix A). However, the electrofishing catch rate of bluegill in 2007 (2,102 fish/h) was twice the catch rates in 2006 and 2005 (Figure 3) and may be related to reduced predation by largemouth bass. This abundance of bluegill provided adequate prey for largemouth bass.

Channel catfish: Gill net catch rate of channel catfish in 2008 was 70.4/nn, which was higher than in 2004 (54.2/nn) or 1999 (13.8/nn) (Figure 5). Body condition was adequate with mean Wr for most inch groups around 90 (Figure 5). The population size structure of channel catfish was excellent. Sixty-two

percent of all channel catfish ≥ 11 inches were longer than 16 inches (PSD = 62, Figure 5). The 2006 to 2007 winter-quarter creel survey indicated that directed effort for catfish was 1.3 hours/acre, which was similar to previous winters (Table 7). Fishing for channel catfish is good during the winter at Lake Monticello. Anglers caught an estimated 3.4 fish/h, and harvested approximately 2 fish > 12 inches for every one fish released below the legal length. Harvested fish ranged in size from 12 inches to 24 inches (Figure 6).

Black bass: No spotted bass were collected during the 2007 electrofishing survey. However, anglers had reported catching and releasing some spotted bass during the December 2006 through February 2007 creel survey period.

The electrofishing catch rate of largemouth bass in 2007 was 53.0/h, which was much lower than previous surveys (Figure 7). This decrease is difficult to explain, but could be related to limited submersed vegetation or a possible unreported fish kill that occurred during summer 2007. A summer 2006 fish kill included an estimated 1,263 largemouth bass from 10 – 23 inches (TPWD unpublished report). Genetic analysis of age-0 largemouth bass indicated that 66.7% of the sample was pure Florida largemouth bass (Table 9). Growth of age-1 largemouth bass was fast. The average length of an age-1 fish was 12.2 inches (Figure 8). No fish were collected over age 3, and there were only a few individuals in the age-2 or age-3 year classes. This was likely a result of negative effects from the 2006 fish kill. Condition of largemouth bass was good with mean W_r for most inch groups > 100 .

Anglers targeting black bass fished 8.2 hours/acre during December 2006 through February 2007, and caught an estimated 0.53 fish/h (Table 8). These estimates were lower compared to the previous creel survey, but similar to the creel survey conducted December 2003 through February 2004. Size of harvested largemouth bass ranged from 10 to 13 inches in the 2006 to 2007 survey and from 6 to 14 inches during the 2004 to 2005 survey (Figure 9). No fish were observed harvested above 24 inches. Anglers released 69% of the legal-size black bass caught (Table 8), which included legal-sized fish below and above the slot length limit.

Crappie: Trap netting was not conducted during this survey period due to limited production of crappie and historically poor trap netting success at this reservoir. An estimated 49 black crappie were harvested during the most recent winter creel survey.

Fisheries management plan for Lake Monticello, Texas

Prepared – July 2008

ISSUE 1: The presence of waterhyacinth in Lake Monticello poses a threat to water quality, power plant operation, and recreational access. The main infestation is located in Smith Creek. Waterhyacinth was likely introduced by a boater using this primitive access point adjacent to a bridge that crosses the creek. This area has never been an authorized access point to the reservoir and TXU has placed a chain across the area to keep boaters from putting in at this location. TPWD's Aquatic Habitat Enhancement team treated one acre of waterhyacinth in fall 2007, and is currently coordinating with Texas Utilities for additional treatment.

MANAGEMENT STRATEGY

1. Continue to provide technical guidance to the controlling authority regarding waterhyacinth management.
2. Recommend to controlling authority to close access to Smith Creek to prevent the spread of waterhyacinth to other area reservoirs.
3. Recommend that a sign be posted at the public boat launch to inform anglers about the threat of invasive aquatic vegetation.
4. Conduct annual surveys to monitor trends and estimate coverage of waterhyacinth.

ISSUE 2: Lake Monticello has traditionally exhibited a high quality largemouth bass fishery. Occasional summer fish kills may have negatively impacted this important fishery, but the population should rebound given a few years with no negative impacts.

MANAGEMENT STRATEGY

1. Conduct winter-quarter creel surveys 2009 to 2010 and 2011 to 2012 to monitor angling effort and catch rates for largemouth bass
2. Conduct electrofishing surveys in fall 2009 and 2011 to monitor relative abundance and size structure of largemouth bass and prey species populations.

ISSUE 3: Anglers and stakeholders need to be informed about fisheries management activities, fishing opportunities, and other issues at Lake Monticello.

MANAGEMENT STRATEGIES

1. Continue to provide news releases to the print and broadcast media.
2. Continue to provide fisheries presentations to the public regarding issues/opportunities at Lake Monticello.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes annual invasive aquatic vegetation surveys, a supplemental electrofishing survey in 2009, winter-quarter creel surveys 2009 to 2010 and 2011 to 2012, and required electrofishing and gill netting surveys in 2011 and 2012, respectively (Table 10). Annual vegetation surveys are necessary to monitor results of vegetation management efforts and to provide coverage estimates to the controlling authority. Winter-quarter creel surveys will be conducted to monitor angling effort and catch rates. Supplemental electrofishing in 2009 will be conducted to monitor the largemouth bass and prey fish populations.

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.
- Ryan, M. J., and M. W. Brice. 2000. Statewide freshwater fisheries monitoring and management program survey report for Lake Monticello, 1999. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Ryan, M. J., and M. W. Brice. 2004. Statewide freshwater fisheries monitoring and management program survey report for Lake Monticello, 2003. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Monthly Water Levels

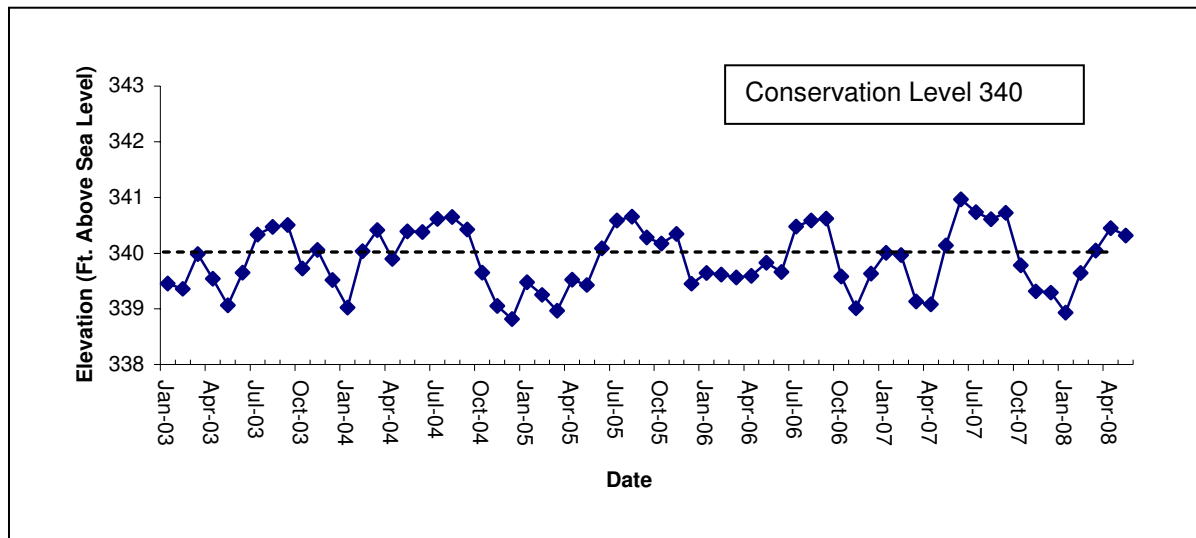


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lake Monticello, Texas. Horizontal line denotes conservation pool level (340 msl).

Table 1. Characteristics of Lake Monticello, Texas.

Characteristic	Description
Year constructed	1972
Controlling authority	Texas Utilities
County	Titus
Reservoir type	Cooling, tributary
Shoreline development index (SDI)	2.6
Conductivity	543 umhos/cm

Table 2. Harvest regulations for Lake Monticello, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish, channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass, white	25	10 - No Limit
Bass, largemouth	5 ^a	14 – 24 ^b
Bass, spotted	5 ^a	No Limit - No Limit
Crappie, white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

^a Daily bag for largemouth bass and spotted bass = 5 in any combination.

^b Largemouth bass 14 inches and less or 24 inches and greater may be retained. Only one largemouth bass 24 inches or greater may be retained each day.

Table 3. Stocking history of Lake Monticello, Texas. Size categories are: FRY=<1 inch, FGL = 1-3 inches, AFGL = advanced fingerlings, ADL = adult, and UNK = unknown.

Species	Year	Number	Size
Blue catfish	1972	10,000	AFGL
	1980	3,250	AFGL
	Total	13,250	
Channel catfish	1972	75,500	AFGL
	1973	91,405	AFGL
	Total	166,905	
Flathead catfish	1973	2,740	AFGL
	Total	2,740	
Florida largemouth bass	1973	197,140	FGL
	1998	50,321	FGL
	Total	247,461	
White crappie	1986	100,800	FGL
	Total	100,800	
Black crappie	1988	50,000	FGL
	1989	50,119	FRY
	1990	100,488	FRY
	1991	98,330	FRY
	Total	298,937	
Walleye	1973	1,000,000	FRY
	1974	40,000	FRY
	Total	1,040,000	
Green x redear sunfish	1972	925	ADL
	Total	925	
Black x white crappie	1995	201,984	FRY
	1996	301,231	FRY
	Total	503,215	

Table 4. Survey of aquatic vegetation, Lake Monticello, Texas, 2007. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation species found.

Habitat type	Species	Acres	Percent of reservoir surface area
Native submerged vegetation	Coontail	1	<1
Native emergent vegetation	Cattail	45	2
	American lotus	191	10
Non-native	Waterhyacinth	5	<1
	Alligatorweed	Trace	Trace

Table 5. Percent directed angler effort by species for Lake Monticello, Texas, 2002 – 2007. Surveys were winter quarter only (December – February).

Species	Year		
	2002-2003	2004-2005	2006-2007
Black bass	86.1	93.1	86.4
Catfish	12.1	5.6	13.4
Crappie	0	1.0	0.2
Anything	1.8	0.3	0

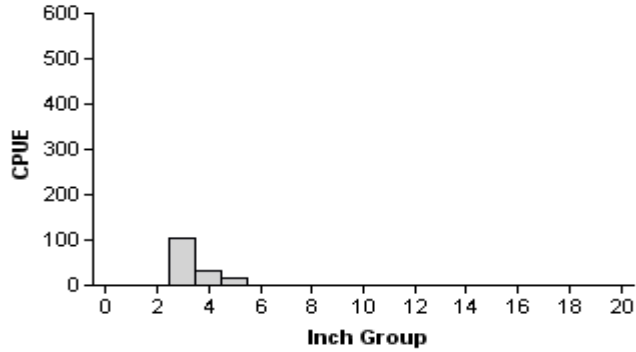
Table 6. Total fishing effort (h) for all species and total directed expenditures at Lake Monticello, Texas, 2002 – 2007. Surveys were winter quarter only (December – February).

Creel statistic	Year		
	2002-2003	2004-2005	2006-2007
Total fishing effort	18,576	24,793	18,930
Total directed expenditures	\$109,075	\$189,847	\$136,367

Gizzard Shad

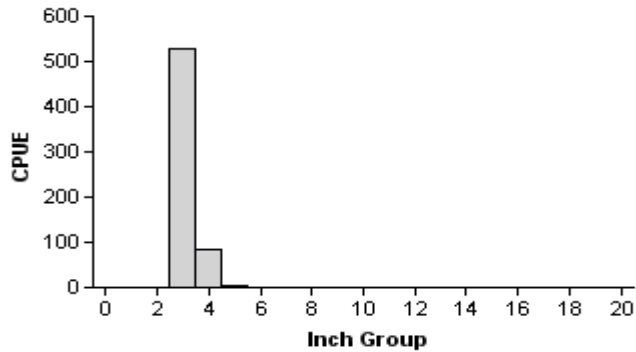
2005

Effort = 1.0
Total CPUE = 157.0 (37; 157)
IOV = 100.0 (0)



2006

Effort = 1.0
Total CPUE = 621.0 (18; 621)
IOV = 99.19 (0.4)



2007

Effort = 1.0
Total CPUE = 7.0 (49; 7)
IOV = 85.71 (15)

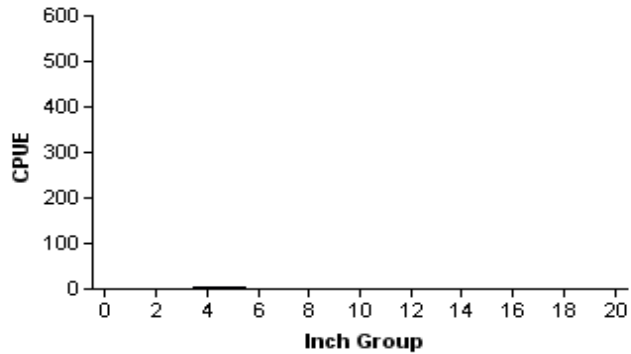


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Monticello, Texas, 2005, 2006, and 2007.

Bluegill

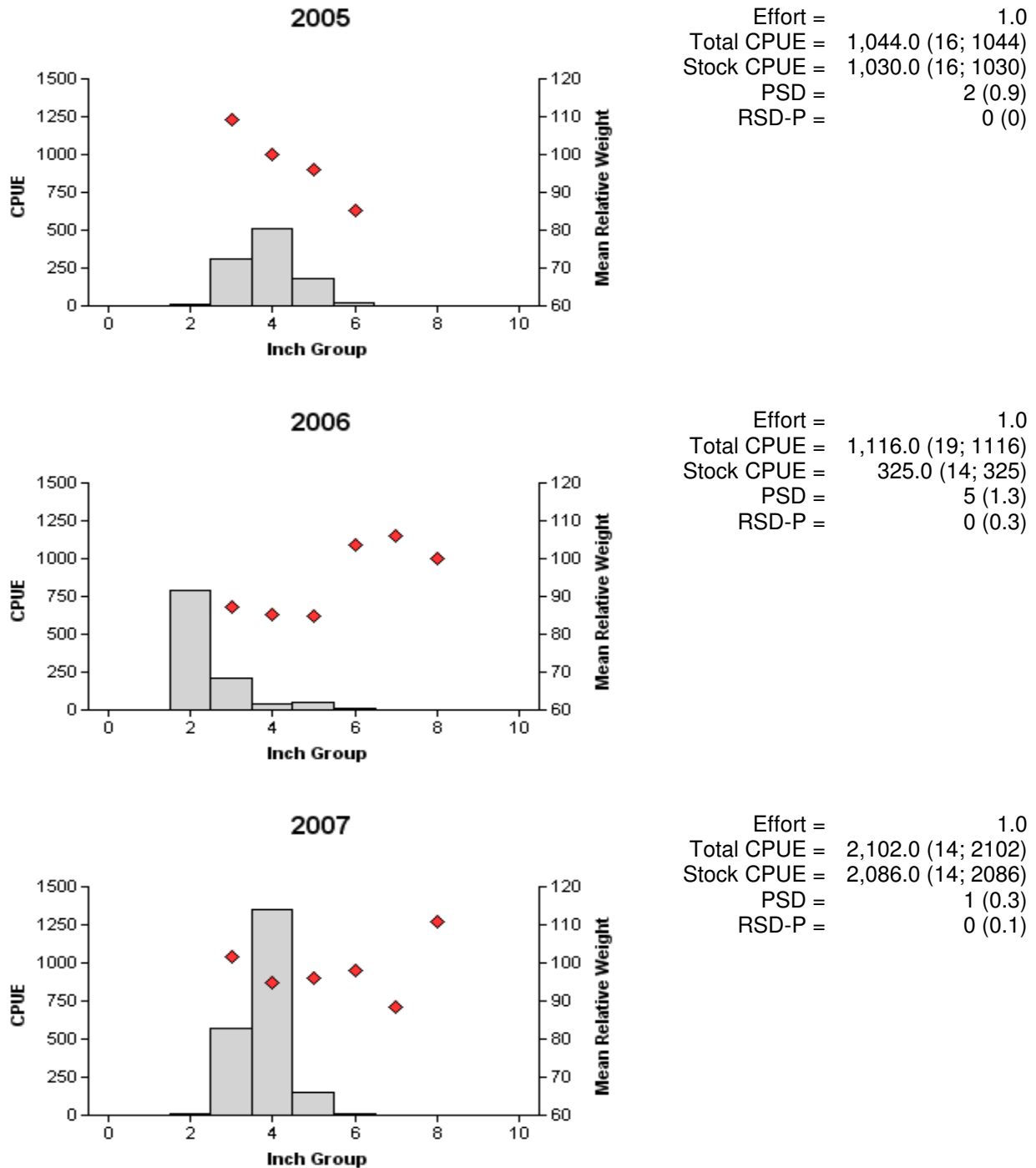


Figure 3. Number of bluegill caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Monticello, Texas, 2005, 2006, and 2007.

Redear Sunfish

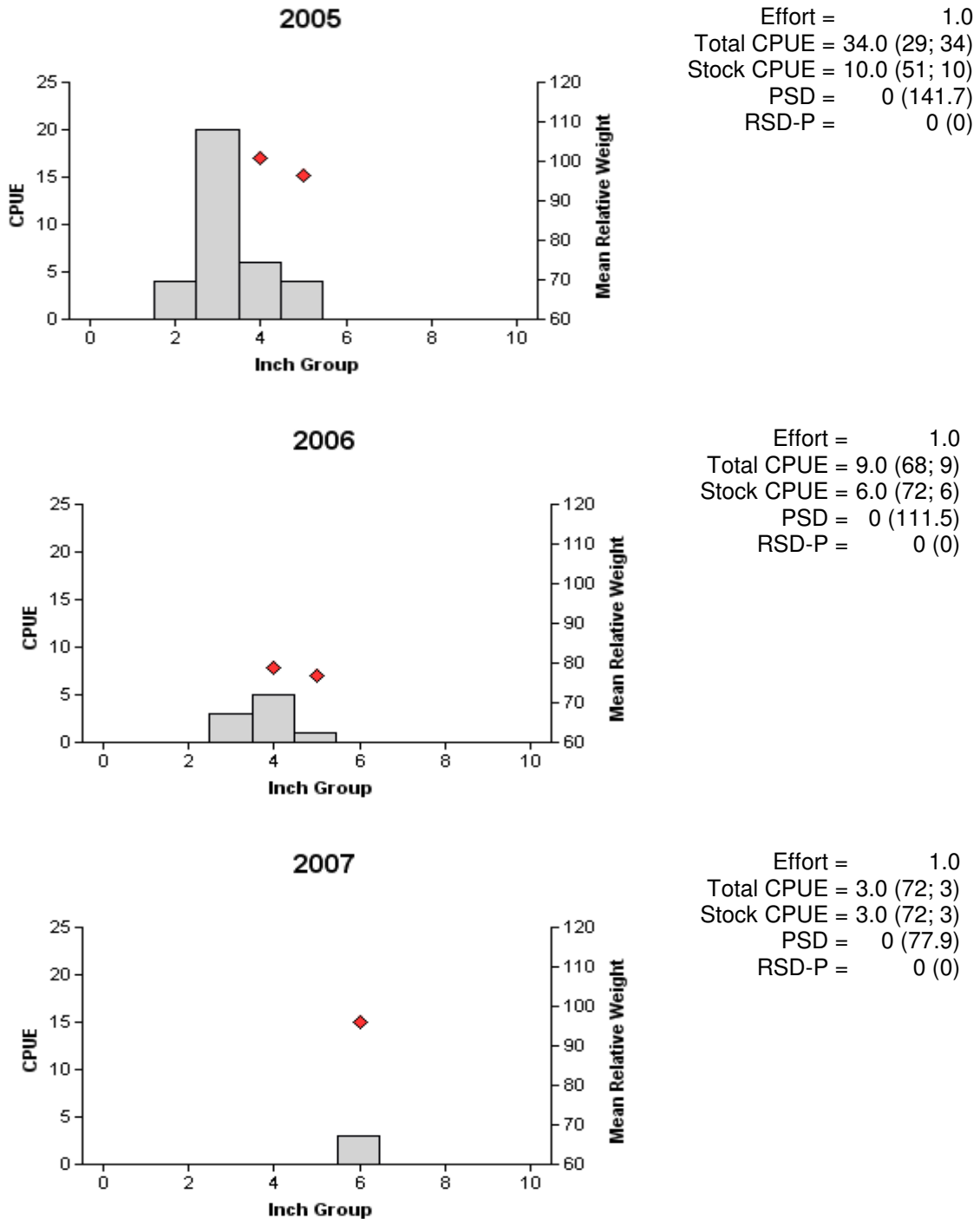
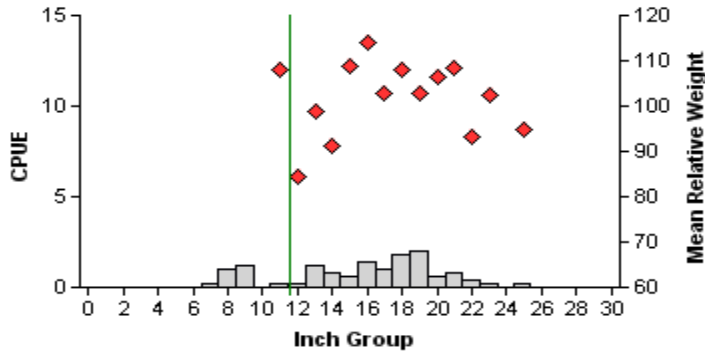


Figure 4. Number of redear sunfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake Monticello, Texas, 2005, 2006, and 2007.

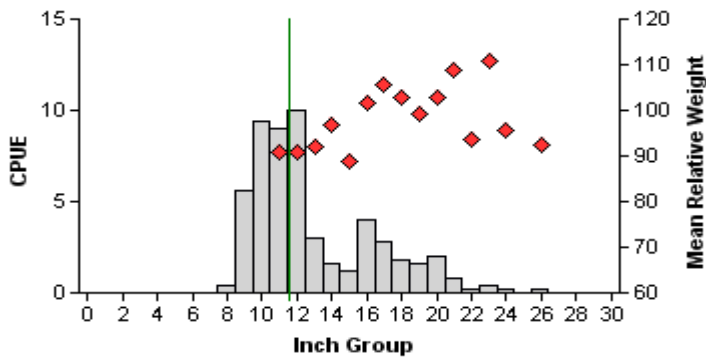
Channel Catfish

1999



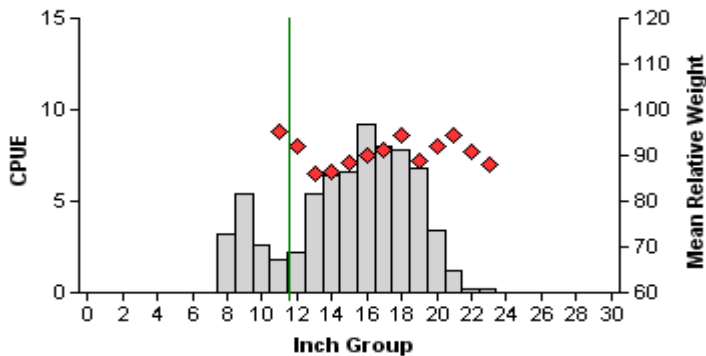
Effort = 5.0
 Total CPUE = 13.8 (26; 69)
 Stock CPUE = 11.4 (32; 57)
 PSD = 74 (6.1)
 RSD-P = 2 (2.1)

2004



Effort = 5.0
 Total CPUE = 54.2 (35; 271)
 Stock CPUE = 38.8 (41; 194)
 PSD = 36 (8.3)
 RSD-P = 1 (0.4)

2008



Effort = 5.0
 Total CPUE = 70.4 (33; 352)
 Stock CPUE = 59.2 (36; 296)
 PSD = 62 (4.3)
 RSD-P = 0 (0)

Figure 5. Number of channel catfish 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 spring gill net surveys, Lake Monticello, Texas, 1999, 2004, and 2008. Vertical lines indicate the minimum length limit.

Channel Catfish

Table 7. Creel survey statistics for channel catfish at Lake Monticello, Texas during winter quarter surveys (December – February), 2002-2003, 2004-2005, and 2006-2007, 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. Harvest estimates include fish held for tournament weigh-in and live release.

Creel survey statistic	Year		
	2002-2003	2004-2005	2006-2007
Directed effort (h)	2,243 (55)	1,378 (54)	2,532 (38)
Directed effort/acre	1.1 (55)	0.7 (54)	1.3 (38)
Total catch per hour	1.9 (33)	2.5 (42)	3.4 (30)
Total harvest	9,354 (94)	3,209 (77)	4,670 (56)
Harvest/acre	4.7 (94)	1.6 (77)	2.3 (56)
Percent legal released	1.3	9.4	0.5

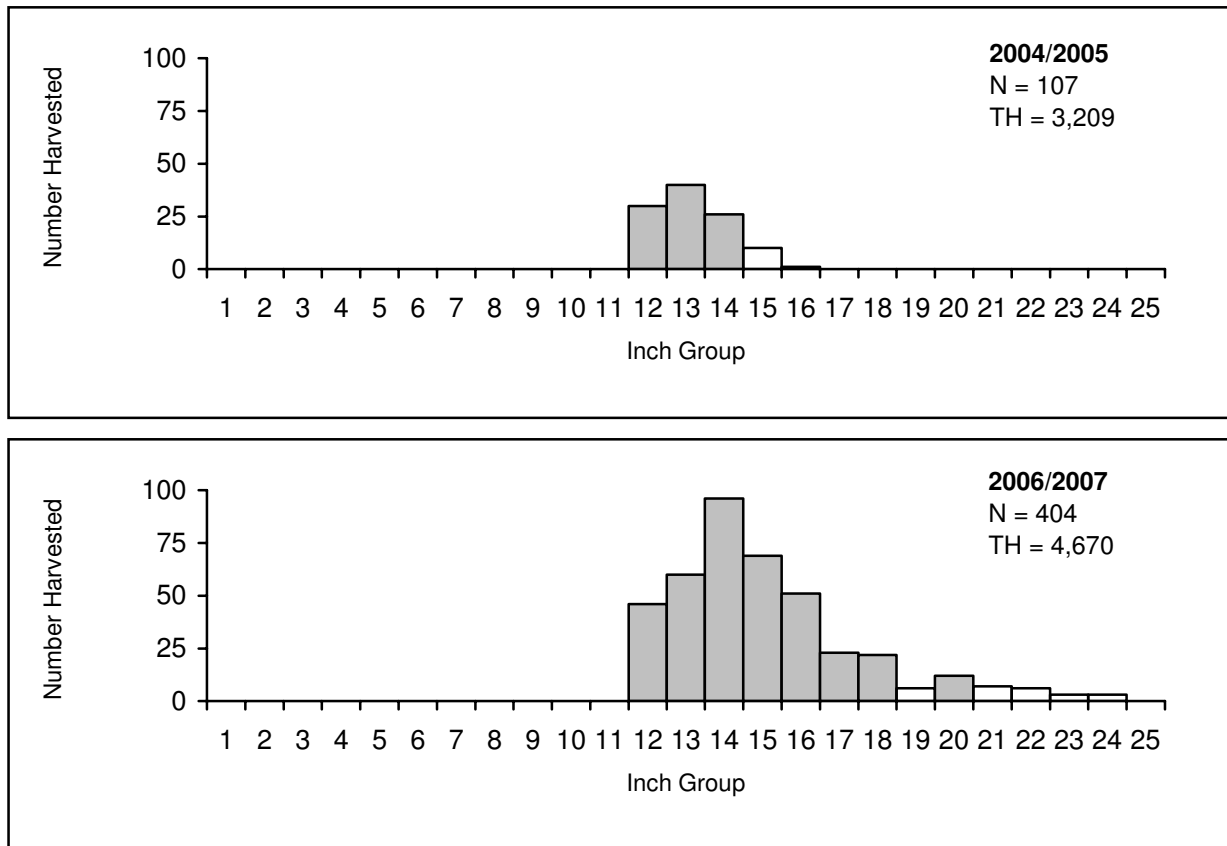
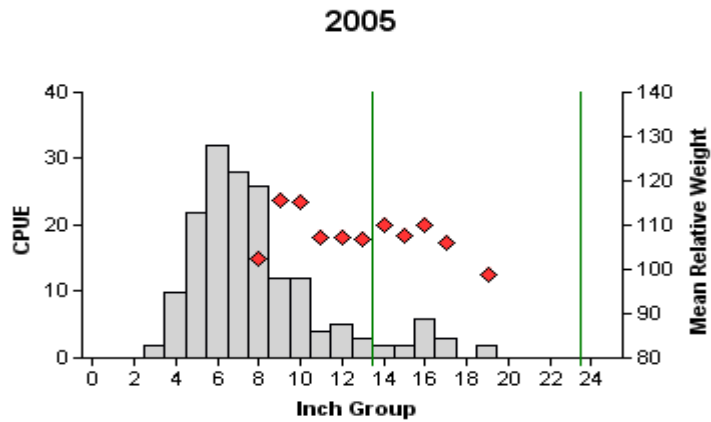
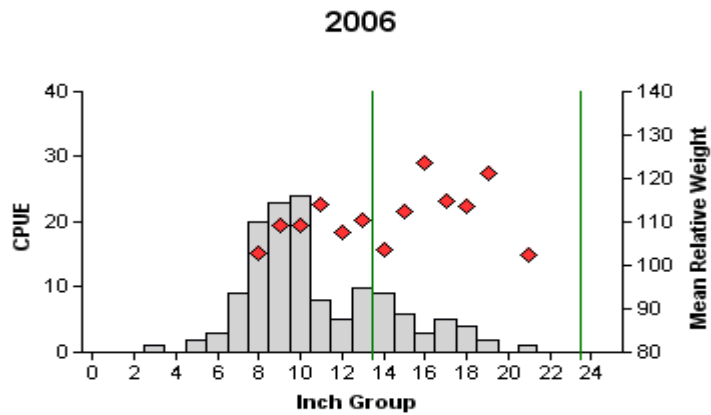


Figure 6. Length frequency of harvested channel catfish observed during winter (December – February) creel surveys at Lake Monticello, Texas, 2004-2005 and 2006-2007, all anglers combined. N is the number of harvested channel catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

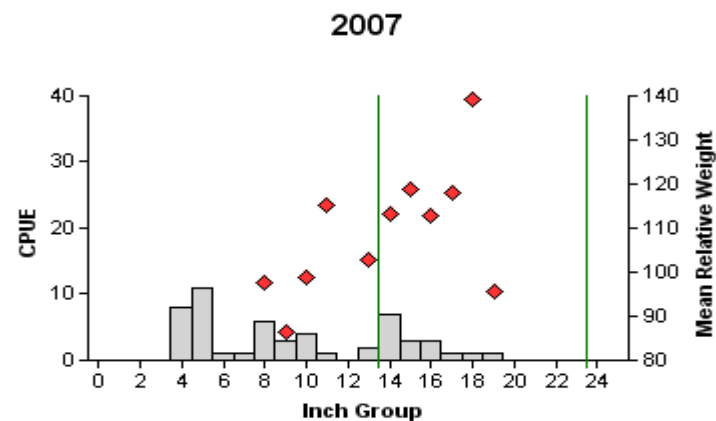
Largemouth Bass



Effort = 1.0
 Total CPUE = 171.0 (15; 171)
 Stock CPUE = 77.0 (28; 77)
 PSD = 30 (7.2)
 RSD-P = 17 (3.6)



Effort = 1.0
 Total CPUE = 135.0 (14; 135)
 Stock CPUE = 120.0 (15; 120)
 PSD = 38 (5.4)
 RSD-P = 18 (4.3)



Effort = 1.0
 Total CPUE = 53.0 (28; 53)
 Stock CPUE = 32.0 (38; 32)
 PSD = 56 (9.9)
 RSD-P = 28 (9)

Figure 7. 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, Lake Monticello, Texas, 2005, 2006, and 2007. Vertical lines indicate the lower and upper end of the slot length limit.

Largemouth Bass

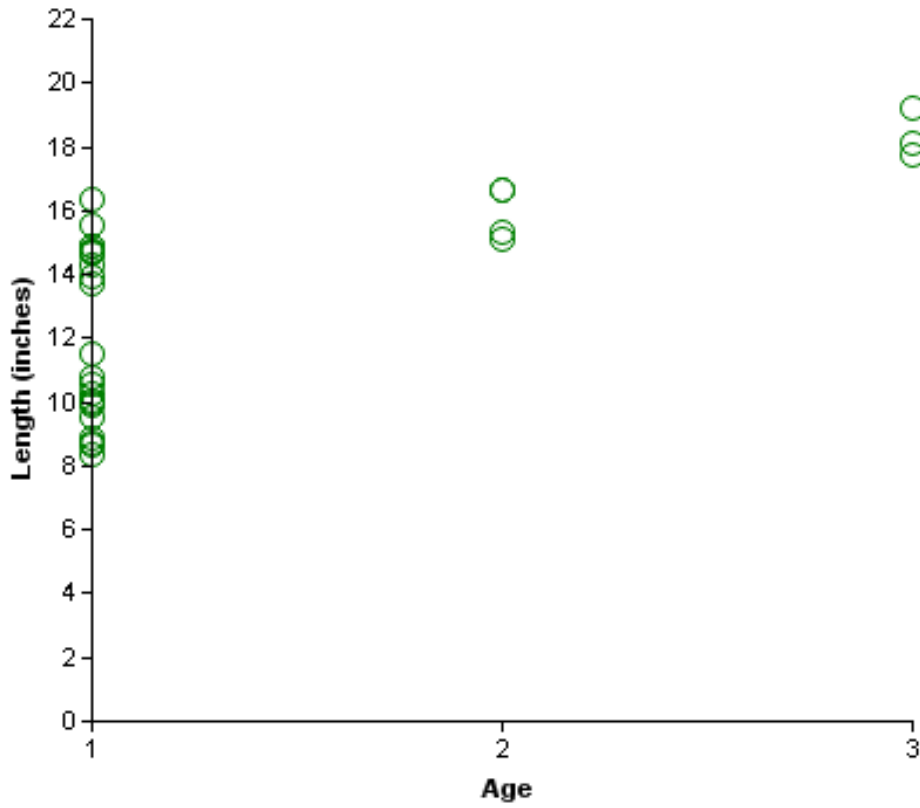


Figure 8. Length at age for largemouth bass collected by electrofishing at Lake Monticello, Texas, November 2007.

Largemouth Bass

Table 8. Creel survey statistics for largemouth bass at Lake Monticello, Texas during winter quarter surveys (December – February), 2002/2003, 2004/2005, and 2006/2007, 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. Harvest estimates include fish held for tournament weigh-in and live release.

Creel survey statistic	Year		
	2002-2003	2004-2005	2006-2007
Directed effort (h)	16,002 (40)	23,090 (40)	16,361 (34)
Directed effort/acre	8.0 (40)	11.5 (40)	8.2 (34)
Total catch per hour	0.35 (14)	0.75 (11)	0.53 (12)
Total harvest	0	541 (78)	653 (61)
Harvest/acre	0	0.27 (78)	0.33 (61)
Percent legal released	100	95	69

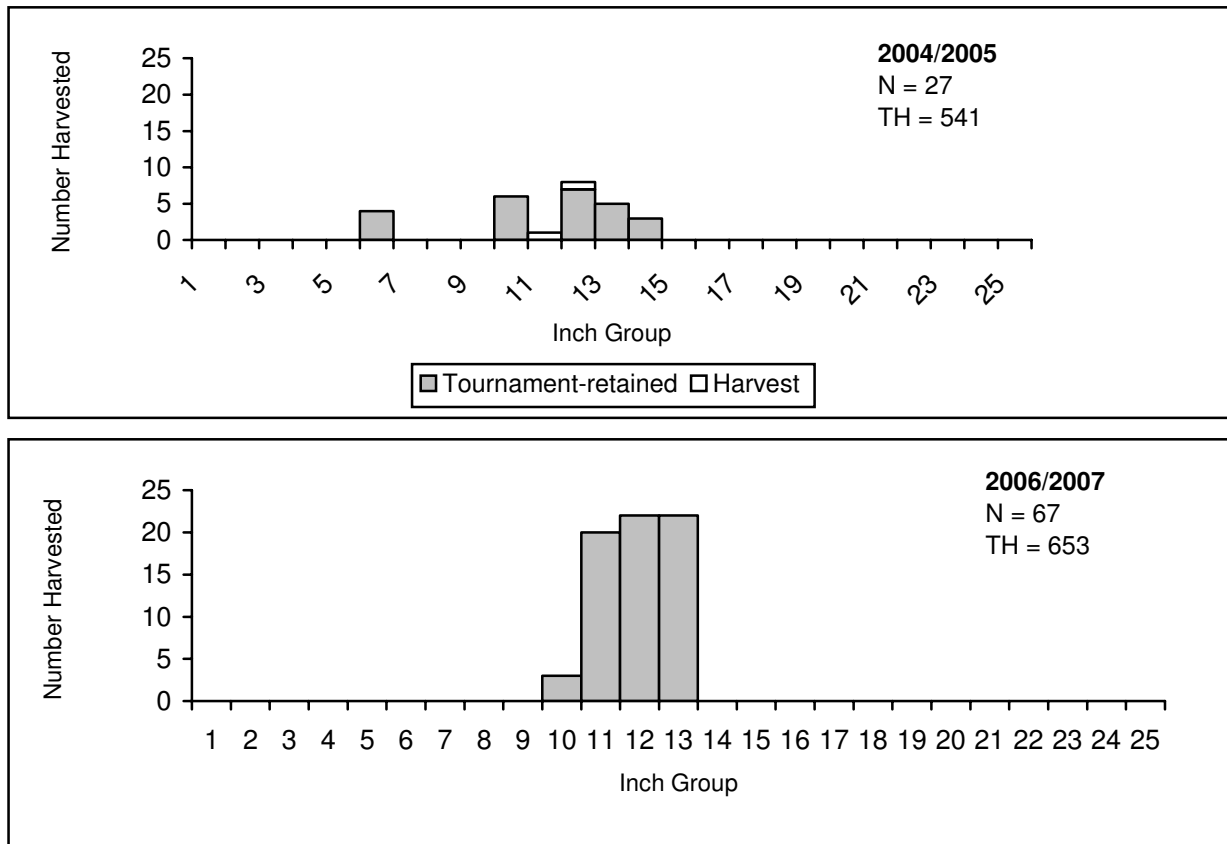


Figure 9. Length frequency of harvested largemouth bass (gray = tournament-retained, white = harvest) observed during winter (December – February) creel surveys at Lake Monticello, Texas, 2004-2005 and 2006-2007, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 9. Results of genetic analysis of largemouth bass collected by fall electrofishing, Lake Monticello, Texas, 2003, 2005, and 2007. Largemouth bass population genetics were assessed with micro-satellite DNA analysis in 2007 and 2005 and with electrophoresis in 2003 from a minimum sample of 30 young-of-the-year fish. 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.

Year	Sample size	Genotype				% FLMB alleles	% pure FLMB
		FLMB	F1	Fx	NLMB		
2003	58	29	1	28	0	85.0	50.0
2005	75	62	^a	13	0	96.7	83.0
2007	30	20	^a	10	0	91.0	66.7

^a Determination of hybrid status not conducted.

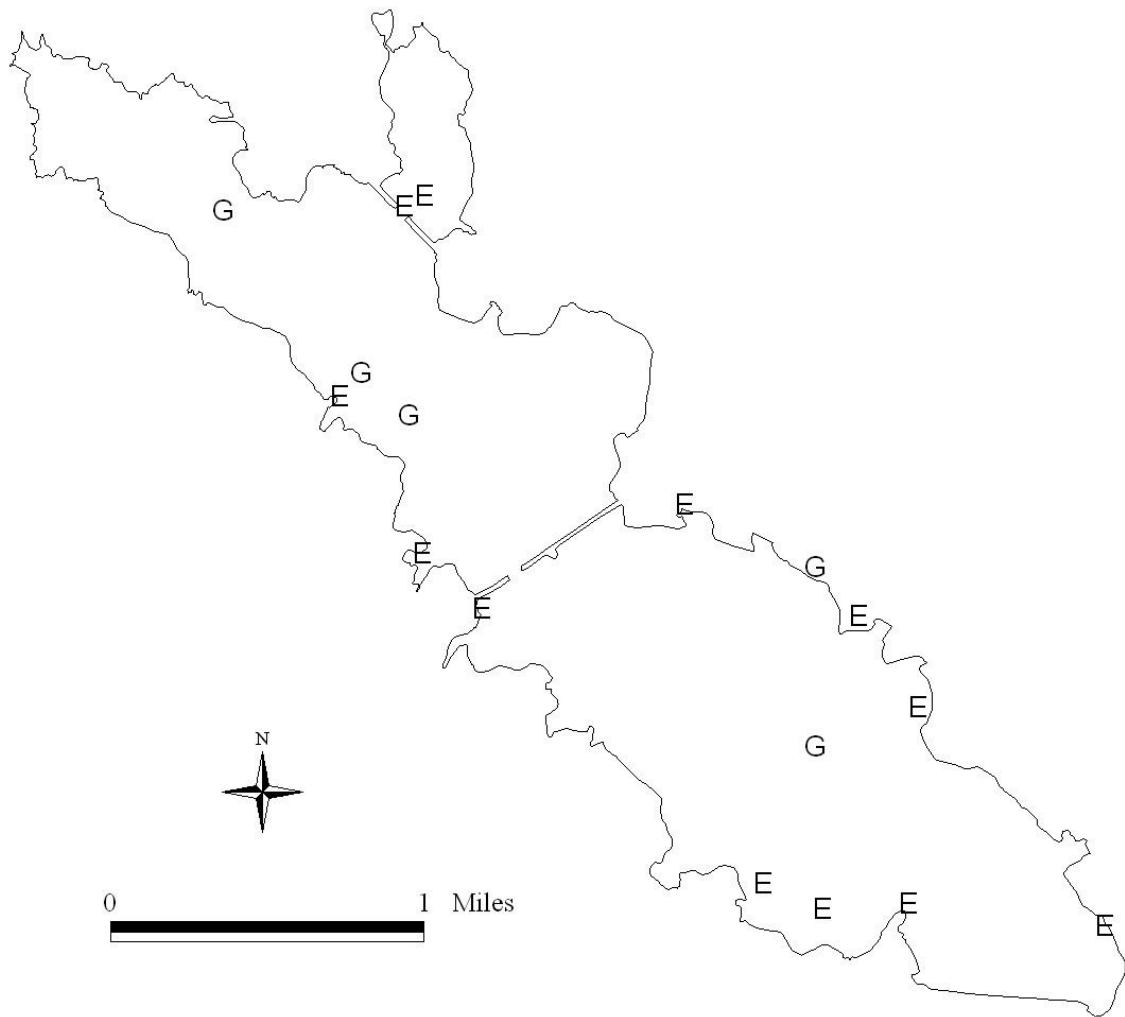
Table 10. Proposed sampling schedule for Lake Monticello, Texas. Gill netting surveys are conducted in the spring, vegetation surveys are conducted in the summer, and electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey Year	Vegetation	Electrofisher	Gill Net	Report
Summer 2008 - Spring 2009	A			
Summer 2009 - Spring 2010	A	A		
Summer 2010 - Spring 2011	A			
Summer 2011 - Spring 2012	S	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Monticello, Texas, 2007-2008. Trap netting was not conducted during this survey period.

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard shad			7	7.0
Threadfin shad			3	3.0
Channel catfish	352	70.4		
Green sunfish			2	2.0
Bluegill			2,102	2,102.0
Longear sunfish			33	33.0
Redear sunfish			3	3.0
Spotted sunfish			3	3.0
Largemouth bass			53	53.0

APPENDIX B

Location of sampling sites, Lake Monticello, Texas, 2007-2008. Gill net and electrofishing stations are indicated by G and E, respectively.