

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

Lady Bird Reservoir

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SURVEY AND MANAGEMENT SUMMARY

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

- **Reservoir Description:** Lady Bird reservoir is a stable-level, 469-acre impoundment of the Colorado River located in the city of Austin, Travis County, Texas. Prior to 2007 the reservoir was named Town Lake. The reservoir runs through the mid-section of the city and was constructed in 1960 for purposes of flood control, municipal and industrial water supply and recreation. The reservoir also serves as a cooling source for steam-electric power generation and is owned and operated by the City of Austin (COA). The reservoir lies within the Edwards Plateau ecological area and has shoreline length of 18.3 miles and a drainage area of approximately 38,240 square miles. Some of the adjacent land has been developed into city parks. Other shoreline areas have been developed by private businesses.
- **Management history:** Important sport fish included largemouth bass and channel catfish. Largemouth bass were managed under a 14-inch minimum length limit until September 1, 2000 when a 14- to 21-inch slot length limit was initiated. Prior to this more restrictive length limit harvest may have been limited due to a fish consumption advisory. The Florida sub-species of largemouth bass was stocked in 1998 to improve trophy largemouth bass potential.
- **Fish Community**
 - **Prey species:** Small *Lepomis* sp. continued to be the dominant forage species, although small gizzard shad were present in the 2007 survey.
 - **Common carp:** Catch-and-release common carp (*Cyprinus carpio*) fishing is a popular activity on this reservoir, but little relative abundance data has been collected on this species.
 - **Catfishes:** The channel catfish population continued to have few fish available to anglers. Previous attempts to supplement the channel catfish population through stocking were unsuccessful. Flathead catfish were present in low density.
 - **Largemouth bass:** Largemouth bass were abundant. Past creel surveys indicate most anglers fishing the reservoir target this species. Population size structure was good. Individuals exceeding the upper end of the slot length limit (21 inches) were collected in the last three electrofishing surveys.
 - **Triploid grass carp:** Triploid grass carp (*Ctenopharyngodon idella*) were first documented in the reservoir in 2007. These fish probably escaped from Lake Austin, which is directly upstream, where grass carp were used to control the aquatic plant hydrilla (*Hydrilla verticillata*).
- **Management Strategies:** The reservoirs fish population should continue to be managed with existing regulations. Aquatic vegetation should be annually monitored to; 1) detect the presence of hydrilla; and, 2) the influence of triploid grass carp emigrating from upstream Lake Austin on the aquatic plant community. Additional information should be collected on the triploid grass carp and common carp populations.

INTRODUCTION

This document is a summary of fisheries data collected from Lady Bird Reservoir in 2007-2008. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data is presented with the 2007-2008 data for comparison.

Reservoir Description

Lady Bird Reservoir is a stable-level, 469-acre impoundment of the Colorado River located in the city of Austin, Travis County, Texas. The reservoir runs through the mid-section of the city and was constructed in 1960 for purposes of flood control, municipal and industrial water supply and recreation. The reservoir also serves as a cooling source for steam-electric power generation and is owned and operated by the City of Austin (COA). The reservoir lies within the Edwards Plateau ecological area and has shoreline length of 18.3 miles and a drainage area of approximately 38,240 square miles. Some of the land bordering the reservoir has been developed into city parks. Other shoreline areas have been developed by private businesses. A fish consumption advisory was placed on the reservoir by the Texas Department of Health from 1985 to 1999 because of elevated levels of the pesticide chlordane. Boat access consisted of three public boat ramps (Appendix B). Bank fishing access was available at the city parks. Other descriptive characteristics for Lady Bird Reservoir are in Table 1.

Management History

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

1. Monitor the development of the largemouth bass fishery with annual electrofishing surveys.
Action: Electrofishing surveys were conducted from 2005-2007.
2. Growth rates of largemouth bass to 14 inches collected in 2003 were below previous estimates. Additional age-and-growth analysis was recommended in the 2004 electrofishing survey.
Action: An electrofishing survey was not conducted in 2004 due to inclement weather and conflicts with mandatory sampling. Age-and-growth analysis was conducted in 2007, which confirmed growth had slowed compared to pre-slot length limit estimates. Some individuals reach 14 inches by age-2.
3. This is a popular fishery, but boat and fishing pier access was inadequate. This limited fishing opportunity.
Action: The COA was made aware that fishing pier access was poor, boat ramp facilities were antiquated and there were no public boat ramps in the middle and upper portions of the reservoir.

Harvest regulation history: Sportfishes in Lady Bird Reservoir are currently managed with statewide regulations with the exception of largemouth bass (Table 2). From 1985 to 1999, largemouth bass were managed with a 14-inch minimum length limit. A 14- to 21-inch slot length limit was implemented in 2000.

Stocking history: Lady Bird Reservoir has not been stocked since 2001 (channel catfish). Florida largemouth bass were stocked in 1998 to improve potential for trophy size largemouth bass. A complete stocking history is included in Table 3.

Vegetation/habitat history: Only a few acres (8-17 acres) of aquatic plants were found in annual vegetation surveys from 2004-2007 (Tables 5a–5d), which is similar to findings reported previously (Magnelia and Bonds 2004). Lake Austin (directly upstream) had dense stands of the exotic plant hydrilla (*Hydrilla verticillata*) (Magnelia and Bonds 2005) and the possible establishment of this aquatic plant in Lady Bird Reservoir was of concern, necessitating the need for annual aquatic vegetation monitoring. Floating hydrilla has often been observed in Lady Bird Reservoir (personal observation), but has never become established. Eurasian water milfoil (*Myriophyllum spicatum*) continued to be the dominant species. Grass carp were first detected in the reservoir in 2007 (Appendix A). This species probably emigrated from Lake Austin, directly upstream, which had an active grass carp stocking program to control hydrilla (Chilton and Magnelia, in press).

The continued paucity of aquatic vegetation in this reservoir was puzzling, since the upstream reservoir Lake Austin (Magnelia and Bonds 2005) and downstream Colorado River (Magnelia et al. 2003) had dense stands of aquatic plants. The presence of grass carp in the reservoir may eventually lead to the total eradication of the reservoirs few stands of submersed aquatic vegetation, although Eurasian water milfoil coverage has increased in upstream Lake Austin, despite high grass carp stocking rates (numbers/vegetated acre) (Chilton and Magnelia 2008). Eurasian water milfoil was reported to be one of the least preferred species for grass carp (Fowler and Robson 1978). Another cover type of value to cover seeking fishes was overhanging brush, which was found along 68% of the shoreline (Table 4).

METHODS

Fishes were collected by electrofishing (1 hour at 12 five-min stations), gill netting (5 net nights at 5 stations). No trap netting was conducted because the reservoir has historically not had a viable crappie population. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error ($RSE = 100 \times SE \text{ of the estimate/estimate}$) was calculated for all CPUE statistics and for creel statistics and SE was calculated for structural indices and IOV. Ages for largemouth bass were determined using otoliths from 13 individuals between 13 and 15 inches in length (category-2 age analysis). The reservoir maintains a stable water level, with little change in elevation, so a water level figure was omitted from this report.

RESULTS AND DISCUSSION

Angler access: Access for boats launched with trailers was inadequate. Three unimproved boat ramps were available in the lower end of the reservoir. A fourth ramp (Red Bud Island) in the upper end of the reservoir was improved by the City of Austin in 2000, but was subsequently closed. This ramp was reserved for emergency use only. The closure of this ramp impeded boat angling on the upper end of the reservoir, since gasoline powered motors could not be used as a source of propulsion. The use of gasoline-powered motors was prohibited by city ordinance; however, the use of electric trolling motors was permitted. Accessing the upper end of the reservoir from lower reservoir ramps with an electric motor was impractical. Shoreline access was excellent, although no public fishing piers were available. Improvements in both the condition and location of boat ramps; and, the addition of fishing piers were needed to increase fishing opportunities. This has been a recommendation to the City since 1994 (Terre and Magnelia 1994).

Habitat: Shoreline habitat consisted primarily of overhanging brush and vegetated bank. The last structural habitat survey was conducted in 2004 (Magnelia and Bonds 2004). No major structural habitat changes have occurred in the interim period.

Prey species: Electrofishing catch rates of gizzard shad, redbreast sunfish and bluegill were 69.0/h, 190.0/h and 338.0/h, respectively. Index of vulnerability (IOV) for gizzard shad was 46, indicating 46% of gizzard shad were available to existing predators. Total CPUE of gizzard shad was similar to previous surveys, but the IOV was much higher than in 2003. Total CPUE of bluegill and redbreast sunfish in 2007 was higher than total CPUE from surveys in 2003 and 2000, and size structure continued to be dominated by small individuals (Figures 2 and 3).

Catfishes: The gill net catch rate of channel catfish was 1.0/nn in 2007. The channel catfish population continued to have low relative abundance. Advanced fingerling channel catfish were stocked in 2000 and 2001 in order to supplement natural reproduction and increase angler opportunity. Subsequent gill net surveys (2003, 2004) were unable to detect an increase in relative abundance. Channel catfish accounted for 6.6% of the directed fishing effort in the last creel survey conducted on the reservoir (2002), but no catches were documented (Magnelia and Bonds 2004). The supplemental channel catfish stocking strategy was abandoned in 2004. Flathead catfish were present in low density.

Largemouth bass: Largemouth bass were the most sought after species on Lady Bird Reservoir, accounting for 67% of the directed fishing effort (Magnelia and Bonds 2004). The total electrofishing catch rate for largemouth bass in 2007 was 127.0/h, which was lower than the 2006 survey (221.0/h), but similar to 2005 catch rate (123.0/h) (Figure 6). Electrofishing catch rate for largemouth bass 14 inches and longer (CPUE-14(45/h)) was lower than the previous two surveys, but was higher than the mean CPUE-14 from 2001-2003 (post-slot length limit) of 40.7/h and much higher than the mean pre-slot length limit CPUE-14 (25.7/h) (Appendix C). The electrofishing CPUE of largemouth bass exceeding the upper end of the slot length limit (21 inches) (3.0/h) was similar to the previous two surveys (Figure 6) and the mean from 2001-2003 (2.3/h). The percentage of Florida largemouth bass alleles was similar to the previous survey, but percentage pure Florida bass decreased (Table 6). The decrease in pure Florida bass may be due to natural mortality of individuals stocked in 1998. Some individuals reached 14 inches by age-2 (Figure 7), which was similar to growth reported in 2003 (Magnelia and Bonds 2004). This is slower than growth reported for most years prior to initiation of the slot-length limit in 2001. This is probably the result of increased intraspecific competition as adult bass density increased. Growth is still similar to ecological area averages (Prentice 1987).

Triploid grass carp: Triploid grass carp were first documented in the reservoir in 2007. These fish probably emigrated from Lake Austin (directly upstream) which had an active stocking program to control the aquatic plant hydrilla.

Fisheries management plan for Lady Bird Reservoir, Texas

Prepared – July 2008.

ISSUE 1: Large scale emigration of triploid grass carp from Lake Austin into Lady Bird Reservoir may cause a decline in aquatic vegetation coverage. A decline in coverage may decrease recruitment of largemouth bass and other cover seeking species.

MANAGEMENT STRATEGY

1. Continue annual aquatic vegetation surveys.
2. Continue collecting catch rate information on triploid grass carp during electrofishing surveys.

ISSUE 2: Hydrilla was present in Lake Austin, which is directly upstream. This aquatic plant has the potential to cause access problems in Lady Bird Reservoir.

MANAGEMENT STRATEGY

1. Continue annual aquatic vegetation surveys to document the presence of hydrilla.
2. Recommend immediate treatment to the City of Austin should stands of hydrilla be documented.

ISSUE 3: Boat access for trailered boats in the upper and middle portions of the reservoir was not available. There were no fishing piers available. This limited fishing opportunities.

MANAGEMENT STRATEGIES

1. Continue to encourage the City of Austin to build additional, and improve existing boat ramps; and, build at least one fishing pier.

ISSUE 4: Catch-and-release common carp fishing was a popular activity on this reservoir. Little data on the common carp population was available on which to base management recommendations.

MANAGEMENT STRATEGIES

1. Start collecting length frequency information on common carp collected during electrofishing surveys.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes additional electrofishing in 2009 and mandatory monitoring in 2011/2012 (Table 7). Additional electrofishing in 2009 is necessary to monitor the largemouth bass, grass carp and common carp populations.

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Table 1. Characteristics of Lady Bird Reservoir, Texas.

Characteristic	Description
Year Constructed	1960
Controlling authority	City of Austin
County	Travis
Reservoir type	Mainstream
Shoreline Development Index (SDI)	4.1
Conductivity	700 umhos/cm

Table 2. Harvest regulations for Lady Bird 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 (only 1 > 21 inches)	14 – 21*
Bass: spotted, Guadalupe	5 (in any combination)	No Limit - No Limit

*Implemented September 1, 2000.

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

Species	Year	Number	Life Stage	Mean TL (in)
Atlantic croaker	1975	250		2.0
	Total	250		
Channel catfish	1966	400	UNK	UNK
	1967	2,400	AFGL	7.9
	1969	27,100	AFGL	7.9
	2000	29,988	AFGL	4.9
	2001	24,974	AFGL	10.1
	Total	84,862		
Coppernose bluegill	1981	5,000	UNK	UNK
	Total	5,000		
Florida largemouth bass	1998	52,800	FGL	1.4
	1998	108,660	FRY	0.3
	Total	161,460		
Green sunfish x redear sunfish	1966	300		UNK
	1969	300		UNK
	Total	600		
Kemp's largemouth bass	1984	15,980		3.0
	1987	6,300		1.0
	1988	21,209		1.0
	Total	43,489		
Largemouth bass	1966	94,350	UNK	UNK
	1967	5,050	UNK	UNK
	1973	8,000	UNK	UNK
	Total	107,400		
Northern pike	1974	2,984		UNK
	1975	3,389		UNK
	1976	10,400		UNK
	1981	23,003		UNK
	Total	39,776		
Palmetto bass (striped X white bass hybrid)	1974	500	UNK	UNK
	1975	20,000	UNK	UNK
	1976	13,000	UNK	UNK

Species	Year	Number	Life Stage	Mean TL (in)
	1977	9,994	UNK	UNK
	1980	6,140	UNK	UNK
	1983	10,450	UNK	UNK
	1984	11,900	FGL	2.0
	1986	21,194	FGL	2.0
	Total	93,178		
Red drum	1975	100	UNK	UNK
	Total	100		
Redear sunfish	1981	2,000		UNK
	Total	2,000		
Smallmouth bass	1975	301	UNK	UNK
	1978	15,000	UNK	UNK
	Total	15,301		
Spotted bass	1974	14,400		UNK
	Total	14,400		
Striped bass	1977	108,475	UNK	UNK
	1978	340	UNK	UNK
	1983	5,317	UNK	UNK
	Total	114,132		
Walleye	1974	2,500	FRY	0.2
	1975	1,011,500	FRY	0.2
	Total	1,014,000		

Table 4. Survey of littoral and physical habitat types, Lady Bird Reservoir, Texas, 2004. 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 in August, 2007.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Overhanging brush	12.3	68		
Vegetated bank	3.5	20		
Concrete	1.0	5		
Rock bluff	0.5	3		
Eroded bank	0.5	3		
Boat dock	0.3	1		
Arrowhead			0.4	<1
Bulrush			2.2	<1
Cattail			0.4	<1
Eelgrass			0.2	<1
Eurasian watermilfoil			4	<1
Pickerelweed			<0.1	<1
Water willow			0.3	<1

Table 5a. Aquatic plants observed during aquatic vegetation surveys in Lady Bird Reservoir, Texas, August 2007. Surface area (acres) and percent reservoir coverage were determined for each plant species.

Common Name	Scientific name	Acres	% coverage
Arrowhead	<i>Sagittaria latifolia</i>	0.4	<1
Bulrush	<i>Scirpus</i> spp.	2.2	<1
Cattail	<i>Typha</i> spp.	0.4	<1
Eelgrass	<i>Vallisneria americana</i>	0.2	<1
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	4	<1
Pickerelweed	<i>Pontederia cordata</i>	<0.1	<1
Water willow	<i>Dianthera americana</i>	0.3	<1
Total		7.6	0.02

Table 5b. Aquatic plants observed during aquatic vegetation surveys in Lady Bird Reservoir, Texas, July 2006. Surface area (acres) and percent reservoir coverage were determined for each plant species.

Common Name	Scientific name	Acres	% coverage
Bulrush	<i>Scirpus</i> spp.	2	<1
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	14	3
Water willow	<i>Dianthera americana</i>	1	<1
Total		17	4

Table 5c. Aquatic plants observed during aquatic vegetation surveys in Lady Bird Reservoir, Texas, August 2005. Surface area (acres) and percent reservoir coverage were determined for each plant species.

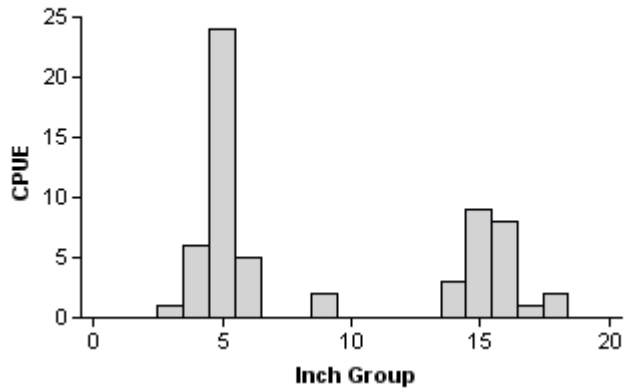
Common Name	Scientific name	Acres	% coverage
Arrowhead	<i>Sagittaria latifolia</i>	0.1	<1
Bulrush	<i>Scirpus</i> spp.	1.9	<1
Cattail	<i>Typha</i> spp.	0.2	<1
Chara	<i>Chara</i> spp.	1.8	<1
Elephant ear	<i>Colocasia esculenta</i>	2.9	<1
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	0.9	<1
Water stargrass	<i>Heteranthera dubia</i>	0.1	<1
Water willow	<i>Dianthera americana</i>	1.0	<1
Total		8.9	1.9

Table 5d. Aquatic plants observed during aquatic vegetation surveys in Lady Bird Reservoir, Texas, August 2004. Surface area (acres) and percent reservoir coverage were determined for each plant species.

Common Name	Scientific name	Acres	% coverage
Arrowhead	<i>Sagittaria latifolia</i>	0.3	<1
Bulrush	<i>Scirpus</i> spp.	2.0	<1
Cattail	<i>Typha</i> spp.	0.2	<1
Chara	<i>Chara</i> spp.	0.2	<1
Elephant ear	<i>Colocasia esculenta</i>	2.5	<1
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	8.6	1.8
Water stargrass	<i>Heteranthera dubia</i>	0.1	<1
Water willow	<i>Dianthera americana</i>	1.0	<1
Total		14.9	3.2

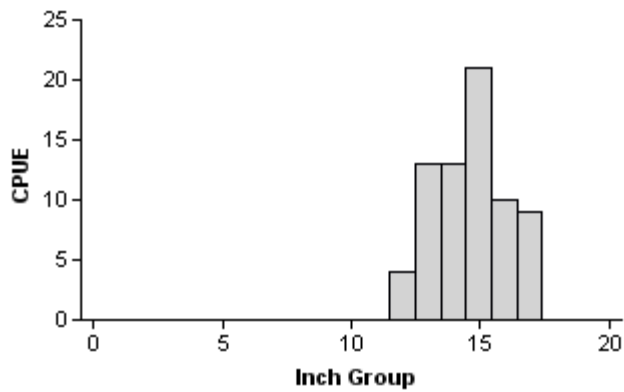
Gizzard Shad

2000



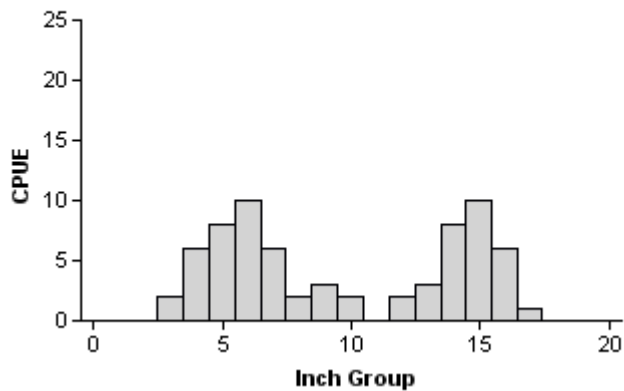
Effort = 1.0
 Total CPUE = 61.0 (57; 61)
 IOV = 59.02 (27.6)

2003



Effort = 1.0
 Total CPUE = 70.0 (16; 70)
 IOV = 0.0 (0.0)

2007

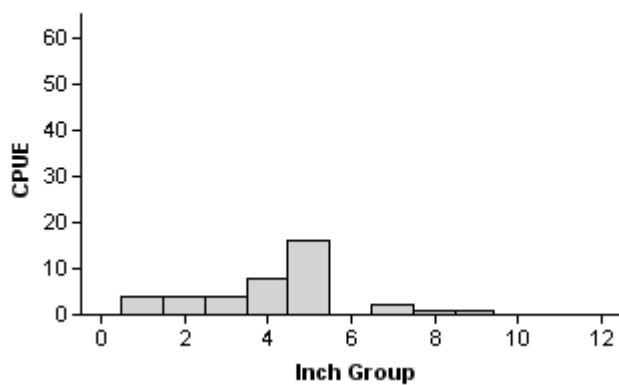


Effort = 1.0
 Total CPUE = 69.0 (29; 69)
 IOV = 46.38 (13.1)

Figure 1. 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, Lady Bird Reservoir, Texas, 2000, 2003, and 2007.

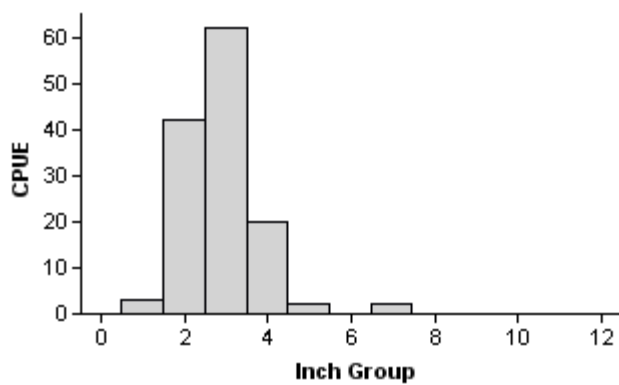
Redbreast Sunfish

2000



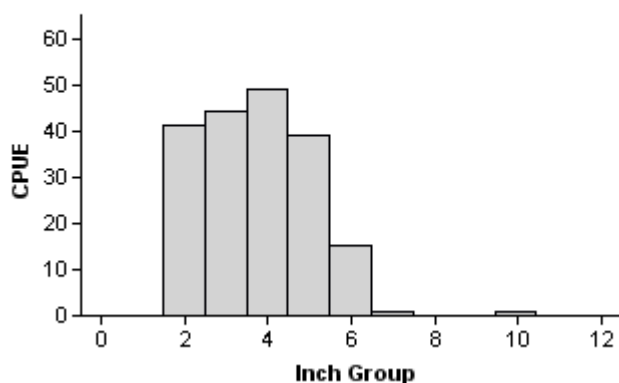
Effort = 1.0
 Total CPUE = 40.0 (27; 40)
 PSD = 12 (10.4)

2003



Effort = 1.0
 Total CPUE = 131.0 (38; 131)
 PSD = 2 (2.6)

2007

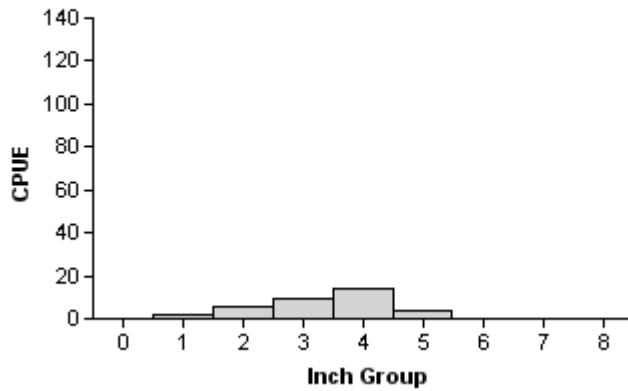


Effort = 1.0
 Total CPUE = 190.0 (26; 190)
 PSD = 11 (2.5)

Figure 2. Number of redbreast sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lady Bird Reservoir, Texas, 2000, 2003, and 2007.

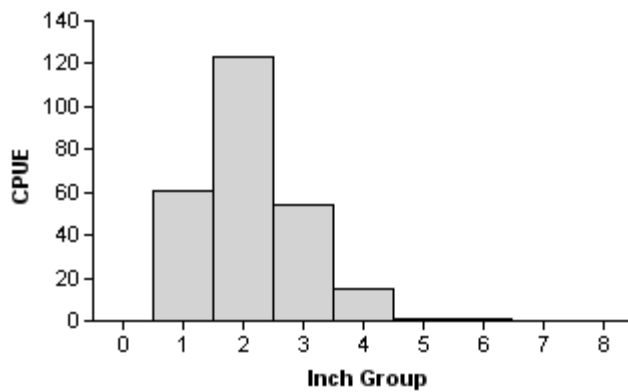
Bluegill

2000



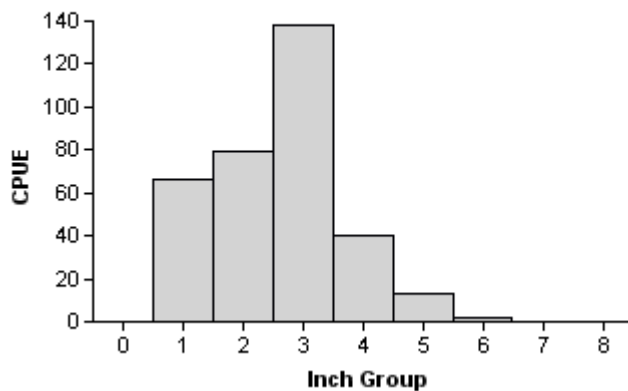
Effort = 1.0
 Total CPUE = 35.0 (34; 35)
 PSD = 0 (58.8)

2003



Effort = 1.0
 Total CPUE = 255.0 (35; 255)
 PSD = 1 (1.5)

2007

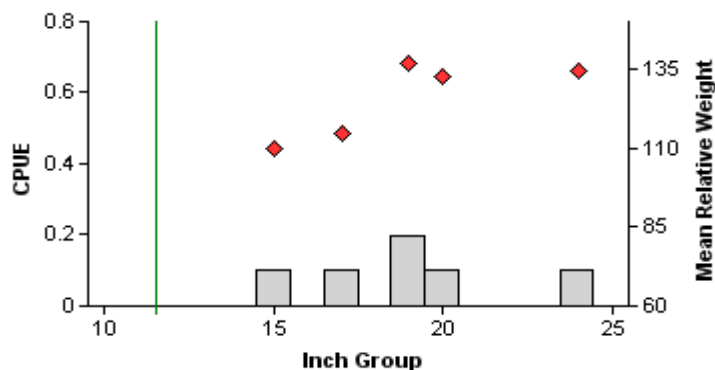


Effort = 1.0
 Total CPUE = 338.0 (28; 338)
 PSD = 1 (0.8)

Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lady Bird Reservoir, Texas, 2000, 2003, and 2007.

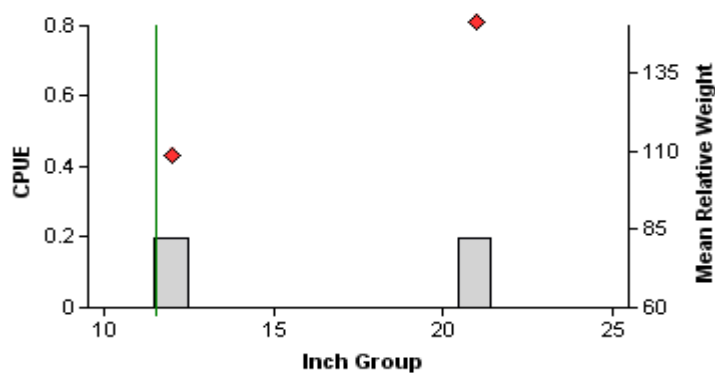
Channel Catfish

2003



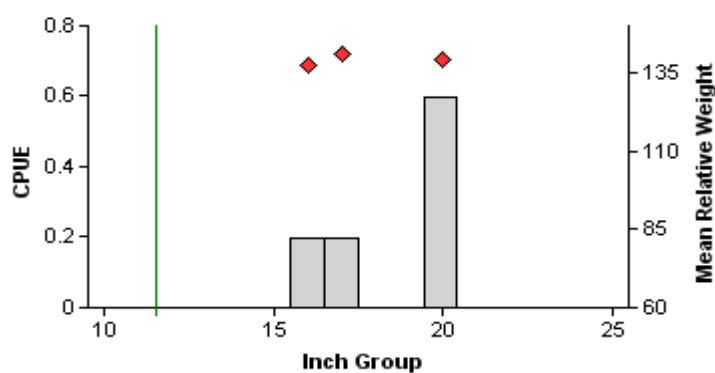
Effort = 10
 Total CPUE = 0.6 (51; 6)
 CPUE-12 = 0.6 (51; 6)
 PSD = 83 (17.6)

2004



Effort = 5
 Total CPUE = 0.4 (61; 2)
 CPUE-12 = 0.4 (61; 2)
 PSD = 50 (39.5)

2008

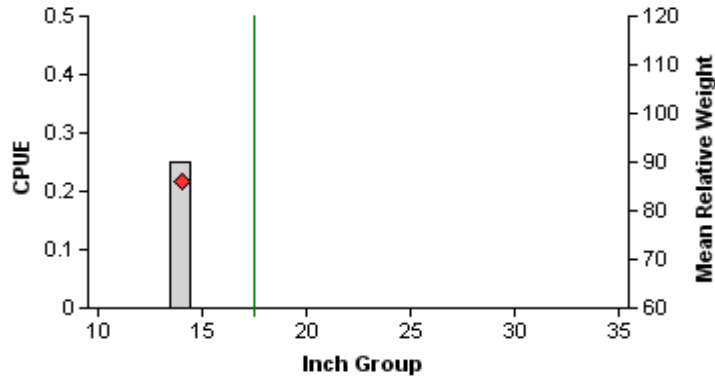


Effort = 5
 Total CPUE = 1.0 (32; 5)
 CPUE-12 = 1.0 (32; 5)
 PSD = 100 (0)

Figure 4. 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, Lady Bird Reservoir, Texas, 2003, 2004, and 2008.

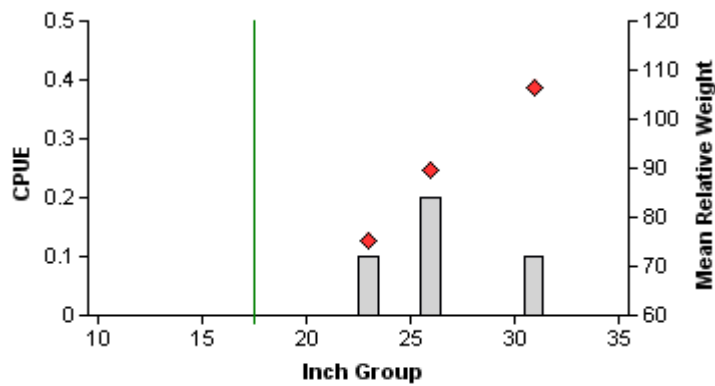
Flathead Catfish

1999



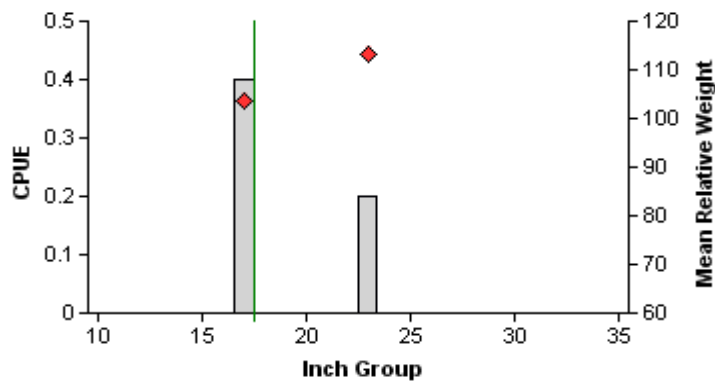
Effort = 4
 Total CPUE = 0.3 (100; 1)
 CPUE-18 = 0.0 (0; 0)

2003



Effort = 10
 Total CPUE = 0.4 (55; 4)
 CPUE-18 = 0.4 (55; 4)

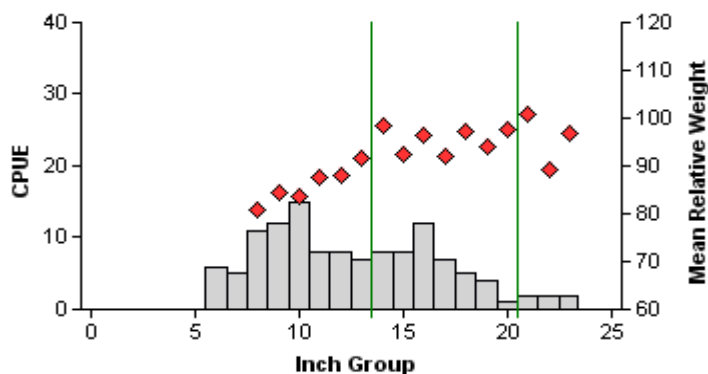
2008



Effort = 5
 Total CPUE = 0.6 (67; 3)
 CPUE-18 = 0.4 (61; 2)

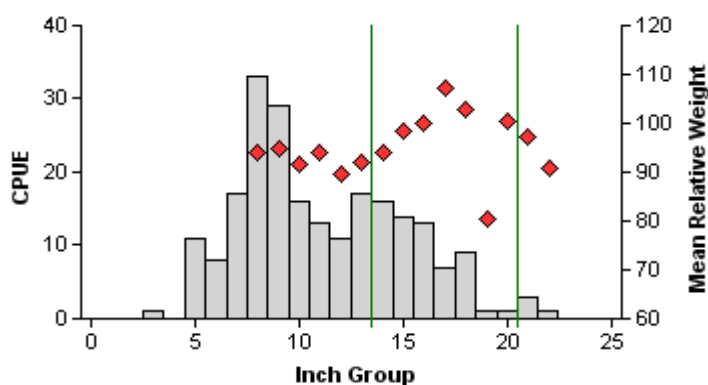
Figure 5. Number of flathead catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lady Bird Reservoir, Texas, 1999, 2003, and 2008.

Largemouth Bass 2005



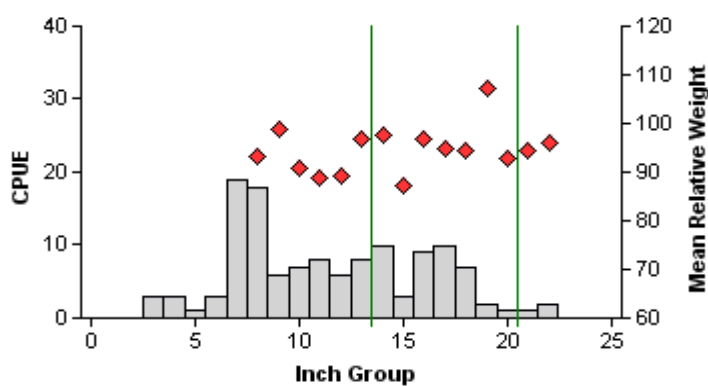
Effort =	1.0
Total CPUE =	123.0 (11; 123)
Stock CPUE =	112.0 (14; 112)
CPUE-14 =	51.0 (20; 51)
CPUE-21 =	6.0 (46; 6)
PSD =	59 (7.9)
RSD-14 =	46 (6.3)
RSD-21 =	5 (2.2)

2006



Effort =	1.0
Total CPUE =	221.0 (10; 221)
Stock CPUE =	184.0 (12; 184)
CPUE-14 =	65.0 (15; 65)
CPUE-21 =	4.0 (43; 4)
PSD =	51 (3.4)
RSD-14 =	35 (4.2)
RSD-21 =	2 (1)

2007



Effort =	1.0
Total CPUE =	127.0 (11; 127)
Stock CPUE =	98.0 (13; 98)
CPUE-14 =	45.0 (20; 45)
CPUE-21 =	3.0 (52; 3)
PSD =	60 (6.4)
RSD-14 =	46 (8)
RSD-21 =	3 (1.6)

Figure 6. 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, Lady Bird Reservoir, Texas, 2005, 2006, and 2007. Vertical lines represent slot length limits.

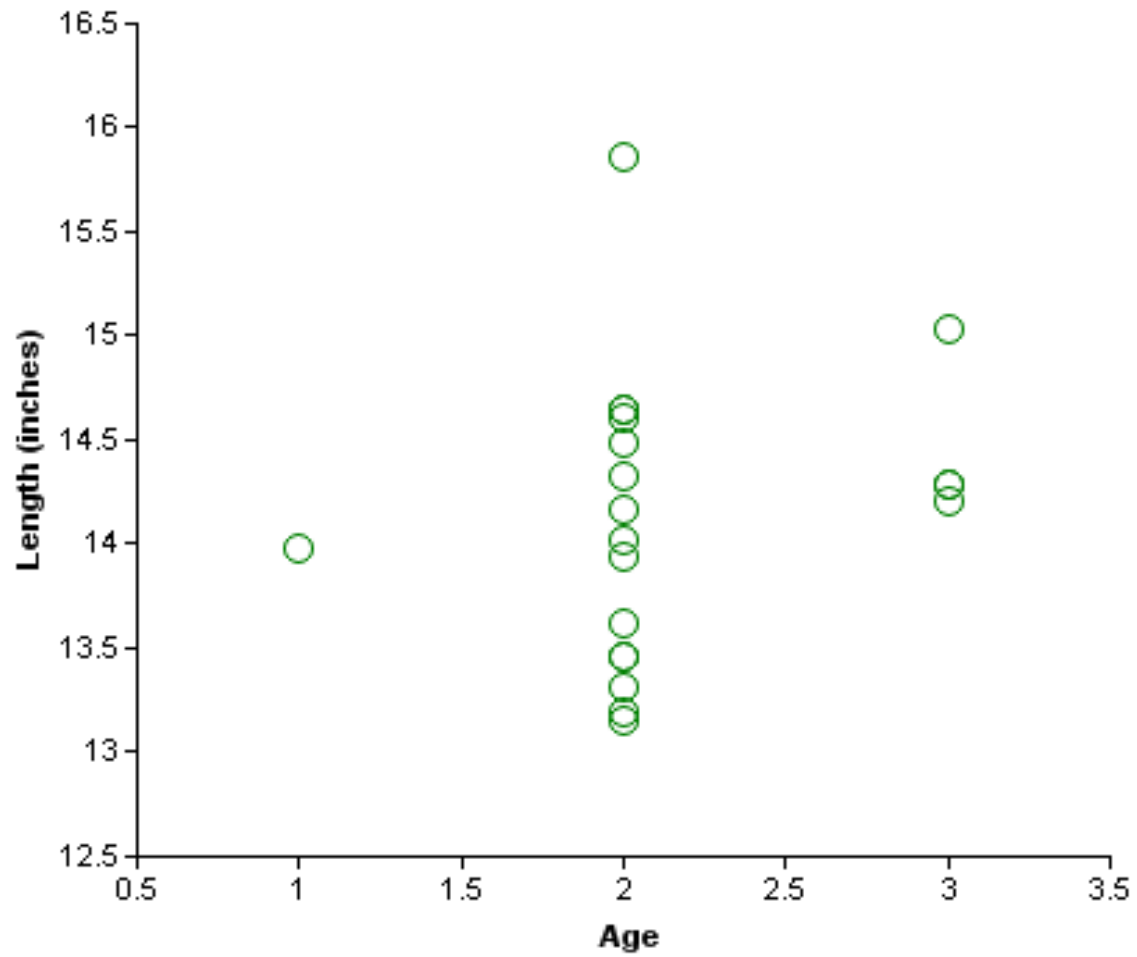


Figure 7. Length at age for largemouth bass collected from electrofishing surveys at Lady Bird Reservoir, Texas, November 2007 (N = 13).

Table 6. Results of genetic analysis of largemouth bass collected by fall electrofishing, Lady Bird Reservoir, Texas, 2007. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, Fx = any generation hybrid between a FLMB and a NLMB.

Year	Sample size	Genotype			% FLMB alleles	% pure FLMB
		FLMB	Fx	NLMB		
2003	40	7	30	3	61.9	17.5
2007	30	1	29	0	62.8	3.3

Table 7. Proposed sampling schedule for Lady Bird Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

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

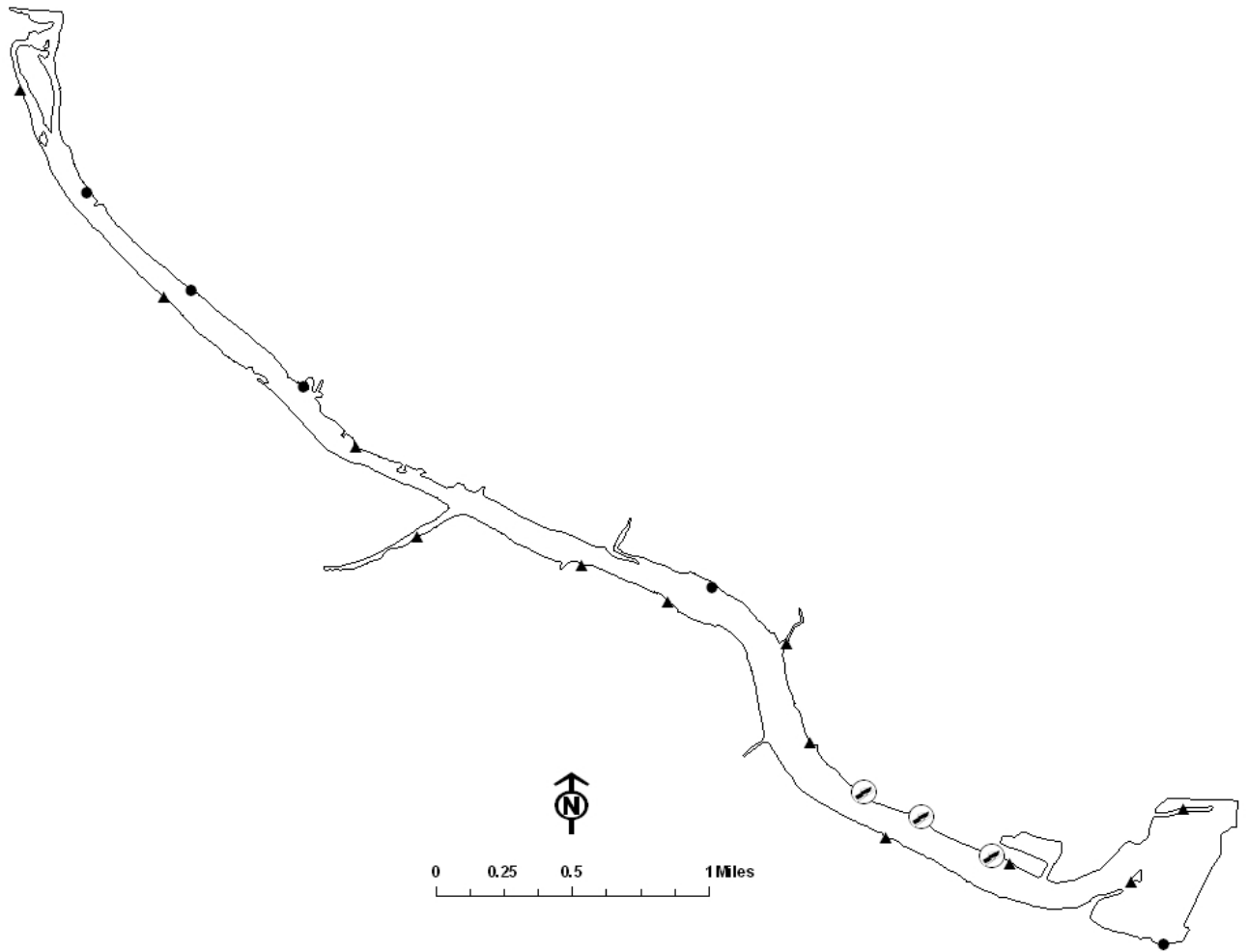
Appendix A

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

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard shad			69	69.0
Common carp			7	7.0
Inland silverside			5	5.0
Blacktail shiner			12	12.0
Mexican tetra			9	9.0
Channel catfish	5	1.0		
Flathead catfish	3	0.6		
White bass	1	0.2		
Redbreast sunfish			190	190.0
Green sunfish			3	3.0
Warmouth			8	8.0
Bluegill			338	338.0
Longear sunfish			18	18.0
Redear sunfish			20	20.0
Spotted sunfish			28	28.0
Largemouth bass			127	127.0
Guadalupe bass			2	2.0
Rio Grande cichlid			3	3.0
Triploid grass carp	1	0.2	14	14.0

APPENDIX B

Location of sampling sites, Lady Bird Reservoir, Texas, 2007-2008. Gill net, and electrofishing stations are indicated by circles and triangles, respectively. Boat ramps are indicated by open circles.



APPENDIX C

Appendix C: Means of pre-regulation (1996, 1999, 2000) and post-regulation (2001, 2002, 2003) largemouth bass electrofishing catch per-unit-effort (CPUE) for various size classes, Lady Bird Reservoir, Texas. All six surveys used random site selection. A 14-21 inch slot length limit regulation for largemouth bass was implemented on Lady Bird Reservoir September 1, 2000.

CPUE (inches)	Pre-regulation	Post-regulation
Total CPUE	212.0	122.3
CPUE < 8	133.0	39.3
CPUE 8 to <14	53.3	42.3
CPUE \geq 14	25.7	40.7
CPUE 14 to <21	25.0	38.3
CPUE \geq 21	0.7	2.3