

PERFORMANCE REPORT

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FEDERAL AID PROJECT F-30-R-33

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

Lake Tyler West

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SURVEY AND MANAGEMENT SUMMARY

The Lake Tyler West fish community was surveyed from June 2007 to May 2008 using electrofisher, gill nets, and trap nets. A vegetation survey was conducted in August 2007. A roving creel survey, conducted from December 2004 to February 2005 and March 2008 to May 2008, collected angler use and harvest information. This report summarizes results of the surveys and contains a management plan based on those findings.

- **Reservoir Description:** Lake Tyler West is a 2,224-acre reservoir on Prairie Creek, Texas, a tributary of the Angelina River. The reservoir was built to provide water for municipal and industrial purposes. Boat and bank access are adequate. Although facilities were generally accessible to the physically-challenged, none were specifically marked as ADA approved. Littoral habitat in the lower two thirds of the reservoir consisted mainly of featureless shoreline, boat docks, and bulkhead. Littoral emergent vegetation (primarily maidencane) occupied 53.2 acres. Native submersed vegetation (primarily stonewort and pondweed) occupied only 11.8 surface acres.
- **Management History:** Important sportfish include sunfishes, largemouth bass, channel catfish, white crappie and black crappie. The reservoir is currently managed under the statewide fishing regulations. Biennial electrofishing surveys were conducted to assess the reservoir's largemouth bass population. Supplemental largemouth bass sampling was conducted in 2004 and stockings were conducted in 2004 and 2005.
- **Fish Community**
 - **Prey species:** Threadfin shad were present in the reservoir. Electrofishing catch rate of gizzard shad increased. Catch rates of sunfishes ≤ 6 inches was average and overall prey availability was adequate for sportfishes.
 - **Catfishes:** Channel catfish population was improving as TPWD and the City of Tyler continued to stock advanced fingerlings in late spring.
 - **Temperate basses:** White bass, once a rare catch at Tyler West, are now abundant and available for harvest. Excellent spawning conditions in spring of 2007 yielded a strong year-class.
 - **Largemouth bass:** Largemouth bass were the most sought after species by anglers at Lake Tyler West. Size structure and abundance continued to improve. A strong year-class in 2007 was a result of low water in 2006 followed by high rainfall creating nursery habitat.
 - **Crappie:** Crappie were the second most sought after sportfish during creel surveys. Both white crappie and black crappie were present, but were in low abundance.
 - **Management Strategies:** Additional electrofishing will be conducted in fall 2009 to monitor largemouth bass and prey populations. Channel catfish fingerlings will continue to be produced and stocked annually through the cooperative effort with the City of Tyler. Artificial (bamboo) reefs will be constructed by the Tyler Master Naturalists and distributed throughout the reservoir. An aquatic vegetation enhancement plan will be presented to the City of Tyler. Angling opportunities and fishery status will be promoted through local media. Outreach presentations will be conducted as requested.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Tyler West in 2007 and 2008. 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. Historical data are presented with the 2007 and 2008 data for comparison where appropriate.

Reservoir Description

Lake Tyler West is a 2,224-acre reservoir on Prairie Creek, Texas, a tributary of the Angelina River. The reservoir was built to provide water for municipal and industrial purposes. Lake Tyler West is mesotrophic with a mean TSI *chl-a* of 53.4 (Texas Commission on Environmental Quality 2007). The littoral zone consisted of a variety of physical habitat types (Table 4). The majority of the shoreline was featureless (44%) or a combination consisting of bulkhead and boat docks (23%). Boat access was adequate, but bank angler access was limited to city park locations. Boats could be launched from two public ramps and one marina ramp surrounding the lake. There were no handicap-specific facilities, but most were accessible. Other descriptive characteristics for Lake Tyler West are found in Table 1.

Management History

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

1. Lake Tyler West supports a low-density channel catfish (*Ictalurus punctatus*) population with historical recruitment problems. To address this issue, TPWD and the City of Tyler have joined a cooperative effort to raise and stock advanced-size (9-12 inch) channel catfish.

Action: In cooperation with the City of Tyler, 22,450 channel catfish fingerlings were raised and stocked from 2004 through 2007. Standard gill net sampling was conducted in 2008 to evaluate the success of the stockings. Promotion of this cooperative effort has been publicized through area newspapers and television stations.
2. Lake Tyler West provides a high-quality largemouth bass (*Micropterus salmoides*) fishery and is important to local anglers. Florida largemouth bass (*M. s. Floridanus*) stockings were requested for 2004 and 2005 to enhance trophy bass fishing.

Action: Florida largemouth bass were stocked in 2004 and 2005. Impacts of these stockings on largemouth bass genetic composition were evaluated in fall 2008. The presence of Florida alleles was unchanged by the stockings and remains ~43%.
3. Fishery could benefit from additional promotion.

Action: Lake-specific regulation posters were provided to vendors of angling-oriented businesses serving the Lake Tyler West vicinity. Outdoor writers around the reservoir were provided with news releases and information regarding the fishery.
4. Hydrilla (*Hydrilla verticillata*) declined from 70 acres in the 1996 survey to 0 acres in August 2003. However, because the plant can grow quickly and is still present in Tyler East, it still represents a potential threat to public access.

Action: Evaluation of aquatic plant community was conducted during standard sampling in 2007. Hydrilla was not observed; therefore no additional action was warranted.

Harvest regulation history: Sport fishes in Lake Tyler West have been managed with statewide harvest regulations (Table 2). Regulations have not changed since the last survey.

Stocking history: Channel catfish and Florida largemouth bass are the most frequently stocked species at Lake Tyler West. Channel catfish were stocked annually through a cooperative effort with the City of Tyler to increase abundance in the reservoir. Florida largemouth bass were initially stocked in 1997 and have been stocked periodically since then to enhance the trophy potential of the fishery. White bass (*Morone chrysops*) were collected from Lake Tawakoni in 1993 and transported to Lake Tyler West. A complete stocking history is found in Table 3.

Vegetation/habitat history: Aquatic vegetation in Lake Tyler West has historically been less abundant than in Lake Tyler East. Ott and Bister (2004) reported that native emergent vegetation including spatterdock (*Nuphar luteum*), white water-lily, (*Nymphaea odorata*), and maidencane (*Panicum hemitomon*) occupied <75 acres; primarily in the upper third of the reservoir. Native submersed vegetation including stonewort (*nitella spp*) and pondweed (*potamogeton spp*) occupied approximately four surface acres. Hydrilla became locally abundant in the Hill Creek arm during the mid 1990's but disappeared without treatment by 2003. Waterhyacinth (*Eichhornia crassipes*) was identified at the marina ramp in late March 2008 and was removed by hand; no further infestation has been reported. Littoral habitat in the lower two thirds of the reservoir consists mainly of featureless shoreline, boat docks, and bulkhead. Littoral habitat is better in the upper third of the reservoir (above City of Tyler water intake).

METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations), gill netting (5 net nights at 5 stations), and trap netting (5 net nights at 5 stations). 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). A vegetation survey was conducted in August 2004 and was repeated at the beginning and end of the growing season 2005 through 2007. Roving creel surveys were conducted from December 2004 through February 2005 and March through May 2008. Surveys consisted of 9 creel days per quarter (4 weekdays and 5 weekend days); angler counts were instantaneous and were conducted at a random start time during the survey day. All survey dates were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and condition indices [relative weight (Wr)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (*Dorsoma cepedianum*), (DiGenzo 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. For white bass and largemouth bass, ages were determined using otoliths from 13 specimens with lengths ranging from 10.1-11.9 inches for white bass and 13.0-16.3 inches for largemouth bass. Otoliths used for aging white crappie (*Pomoxis annularus*) and black crappie (*P. nigromaculatus*) were collected using trap nets. Additional specimens were obtained using experimental (dual-cod) trap nets. Thirteen specimens with lengths ranging from 9.4-11.5 inches were used for white crappie and seven specimens with lengths ranging from 9.3-11.6 inches were used for black crappie. Water level data were obtained from the United States Geological Survey web site (USGS 2008).

RESULTS AND DISCUSSION

Habitat: Physical habitat types and composition were similar to that found in previous surveys. Littoral habitat in the lower two thirds of the reservoir consisted mainly of featureless shoreline, boat docks, and bulkhead. Littoral habitat is better in the upper third of the reservoir (above City of Tyler water intake). Native emergent vegetation occupied 53.2 acres of the reservoir. The native vegetation was composed of a narrow fringe of maidencane surrounding the majority of the reservoir and spatterdock and white water-lily located in the upper third of the reservoir. Approximately 9 acres of alligator-weed (*Althernanthera philoxeroides*) was also identified. Hydrilla declined from 70 acres recorded in 1996 to 0 acres in August 2003 and remained only in trace amounts. Native submersed vegetation (primarily stonewort and pondweed) occupied only 11.8 surface acres (Table 1).

Creel: Directed fishing effort by anglers was highest for largemouth bass (72%) during the spring 2008 creel survey (Table 5). Anglers take advantage of the spatially-concentrated crappie (*Pomoxis spp.*) populations at Tyler West during winter months with 41% of the directed angling effort targeting these species from December 2004 through February 2005. Total fishing effort for all species at Tyler West was 4,982 hours from January 2004 through February 2005 and anglers spent an estimated \$12,995 on direct expenditures. During the spring 2008 creel survey, anglers spent an estimated \$149,463 on direct

expenditures and total fishing effort was 20,794 hours (Table 6).

Prey species: Both threadfin shad (*D. petenense*) and gizzard shad were present in Lake Tyler West (Appendix A). The gizzard shad electrofishing catch rate (97 fish/h) increased from the 2003 (46 fish/h) survey but was similar to 2001 (91 fish/h). Index of Vulnerability (IOV) for gizzard shad was 52. The sunfish community includes primarily bluegill and redear sunfish. Combined catch rate for all sunfish species was 466 fish/h. Fish collected were mostly ≤ 6 inches, therefore functioning primarily as prey. There was no directed effort, catch, or harvest of sunfishes reported during the spring 2008 creel survey.

Catfish: Lake Tyler West supports a low-density channel catfish population with poor natural recruitment. Gill net catch rate of channel catfish in 2008 (4.0 fish/nn) was similar to 2004 and higher than 1999 (4.6 and 1.2 fish/nn, respectively). Channel catfish ≥ 12 inches were present and available for harvest. Channel catfish population size structure provides evidence of successful stockings with collected fish between 8-10 inches. Population size distribution in 2008 (PSD=50) appears to have declined since 2004 (Figure 5). Blue catfish were stocked in 1975; however, no blue catfish were collected in subsequent surveys. No directed angling effort for catfish was documented during the 2004-2005 winter or 2008 spring creel surveys.

Temperate basses: White bass were first introduced to the Lake Tyler West in 1993. In 2004, one specimen was collected during gill netting (Figure 6). Gill net catch rate of white bass in 2008 (12.2 fish/nn) was highest on record. Above average rainfall in the spring of 2007 provided excellent spawning conditions for white bass. Specimens collected in the 2008 sample ranged from 10-13 inches in length, providing a fishery that previously did not exist. Size structure (PSD=100) was as expected with no sub-stock fish collected. Body condition of collected fish in 2008 was good ($Wr > 90$) for all inch classes, indicating adequate forage was available. Average age for white bass at 10 inches (10.1-11.9) was 1.0 year ($N = 13$, all were age-1). The white bass population is a recent development and no directed effort was identified during the two quarterly creel surveys conducted.

Largemouth bass: Electrofishing catch rate of largemouth bass in 2007 (42 fish/h) was similar to 2003 (88 fish/h) but was higher than in 2005 (38 fish/h) (Figure 10). Catch rate of stock-size (≥ 8 inches) largemouth bass has continued to decrease since 2003. Proportional stock density (PSD) was improved at 43 and is within the target range of 40–70. The strong year-class observed in 2007 resulted from low reservoir water levels in 2005 and 2006 followed by abundant spring rains in 2007 flooding terrestrial vegetation. Mean relative weight (Wr) was above 90 for most length classes indicating adequate prey availability. Average age for largemouth bass at 14 inches (13.0-16.3) was 1.3 years ($N = 13$, range 1-2 years). The prevalence of Florida bass alleles in the population remains unchanged despite the stockings in 2004 and 2005 (Table 8) and no pure Florida bass were collected. The largemouth bass fishery at Tyler West is the most popular of any species with 52% of the directed angling effort in the winter 2004-2005 creel survey and 84% during the spring 2008 creel survey. Non-tournament anglers released 82% of legal fish caught.

Crappie: Both white and black crappie were collected in 2007. Trap net catch rates continued to be low (0.8 fish/nn) with only 1 black crappie and 3 white crappie collected (Figure 10 & 11). Mean Wr of legal length black crappie collected was > 90 , indicating good body condition. Average age for black crappie at 10 inches (9.3-11.7) was 1.3 years ($N = 7$, range 1-2 years). Average age for white crappie at 10-inches (9.4-11.5) was 1.1 years ($N = 13$, range 1-2 years). Although 41% of the angler effort was directed toward crappie during the winter 2004-2005 creel survey, no catch or harvest was documented. A lower percentage of the effort was directed toward crappie during the spring 2008 creel survey (18%) but success was better with a catch rate of 1.7 fish/h. Most of the legal fish caught were harvested.

Fisheries management plan for Lake Tyler West, Texas

Prepared – July 2008

ISSUE 1: Lake Tyler West has traditionally provided a high-quality largemouth bass fishery and it is important to local anglers.

MANAGEMENT STRATEGY

1. Conduct biennial electrofishing surveys to monitor largemouth bass and prey populations.

ISSUE 2: The channel catfish population is of low density and continues to be hindered by recruitment problems. A cooperative effort between the City of Tyler and TPWD has produced and stocked 22,450 advanced fingerling channel catfish. The stockings have improved abundance and size structure.

MANAGEMENT STRATEGIES

1. Stock all available City of Tyler rearing ponds, beginning in summer of 2008, with fingerling channel catfish.
2. Assist the city with the rearing of fingerling catfish to an advanced size (9-12 inches TL). This will include the monitoring of feeding schedules and growth rates throughout the course of the year.
3. Assist the City of Tyler with the release of advanced-size channel catfish into Lake Tyler West during spring each year.
4. Conduct an additional gill net survey on Lake Tyler West during 2010 to help evaluate the success of the aforementioned advanced-size channel catfish stocking program.
5. Maintain high levels of communication and work closely with the city to promote this program through the local news media.

ISSUE 3: The Lake Tyler West aquatic vegetation community consists of primarily a narrow fringe of maidencane around the reservoir. Spatterdock and white water lily are locally abundant in the upper end of the reservoir. Native submersed vegetation is minimal and deep-water structures are scarce.

MANAGEMENT STRATEGIES

1. In cooperation with the Texas Master Naturalist an artificial fish habitat project is being created.
2. Artificial reefs will be made using bamboo structures and placed throughout the reservoir.
3. Consult City of Tyler about habitat enhancement plan in conjunction with the Lake Tyler East Aquatic Vegetation Management Plan.

ISSUE 4: Lake Tyler West fisheries offers good recreational angling opportunities and are worthy of additional promotion. A substantial white bass population has developed but anglers are not yet utilizing it. Area anglers would benefit from occasional reminders about current fishing regulations on this water body.

MANAGEMENT STRATEGIES

1. Include Lake Tyler West in news releases that promote angling opportunities in East Texas. Give presentations about the lake and fisheries to interested groups and area residents.
2. Inform anglers of the angling opportunities provided by white bass.
3. Provide lake-specific regulation posters to angling-oriented businesses serving the Lake Tyler West area.
4. Maintain regulation signs previously mounted at public and private boat ramps on Lake Tyler West.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes additional electrofishing in 2009, additional gill netting in 2010, and mandatory monitoring in 2011-2012 (Table 13).

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.
- Ott, R. A. and T. J. Bister. 2004. Statewide freshwater fisheries monitoring and management program survey report for Lake Tyler West, 2003. Texas Parks and Wildlife Department, Federal Aid Report F-30-R-27, Austin. 34 pp.
- Texas Commission on Environmental Quality. 2007. Trophic Classification of Texas Reservoirs: 2006 Texas water quality inventory and 303 (d) list. 15 pp.
- United States Geological Survey. 2008. *Real-time Data for Texas lakes and Reservoirs*
http://waterdata.usgs.gov/tx/nwis/uv/?site_no=08063010&PARAMeter_cd=72020,00054

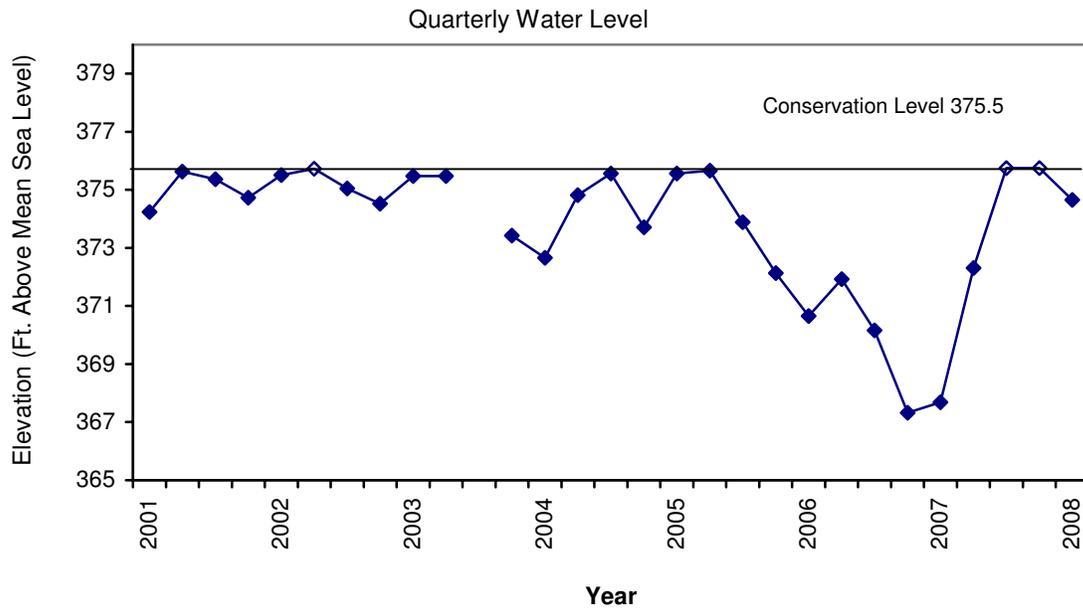


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Lake Tyler West, Texas. Horizontal line represents conservation level.

Table 1. Characteristics of Lake Tyler West, Texas.

Characteristic	Description
Year completed	1951
Controlling authority	Tyler Water Utilities
Counties	Smith (dam)
Reservoir type	City Lake
Shoreline Development Index (SDI)	3.7
Conductivity	100 umhos/cm

Table 2. Harvest regulations for Lake Tyler West, Texas.

Species	Bag Limit	Minimum-maximum length (inches)
Catfish: channel and blue, 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	14–No limit
Crappie: white and black, their hybrids and subspecies	25 (in any combination)	10–No limit

Table 3. Stocking history of Lake Tyler West, Texas. Size categories are: FRY <1 inch; FGL =1-3 inches; ADL = adult; UNK = unknown.

Species	Year	Number	Size
Blue catfish	1975	<u>25,000</u>	FGL
		25,000	
Channel catfish	2004	8,000	ADL
	2005	5,000	ADL
	2006	4,450	ADL
	2007	<u>5,000</u>	ADL
		22,450	
White bass	1993	<u>192</u>	ADL*
		192	
Palmetto bass	1975	25,000	UNK
	1977	36,136	UNK
	1979	24,500	UNK
	1980	<u>276</u>	UNK
		85,903	
Largemouth bass	1974	<u>98,9000</u>	FGL
		98,9000	FGL
Florida largemouth bass	1997	124,593	FGL
	1998	122,647	FGL
	2004	111,663	FGL
	2005	<u>112,507</u>	FGL
		471,410	
Green X redear sunfish	1974	<u>25,000</u>	FGL
		25,000	

* Management stocking; adults collected and transported from Lake Tawakoni.

Table 4. Survey of littoral zone and physical habitat types, Lake Tyler West, Texas. Abiotic¹ habitat survey was conducted in 2003 (Ott and Bister 2004). Vegetation survey was conducted in 2007. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found.

Shoreline habitat type	Shoreline distance		Surface area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Bulkhead ¹	0.7	3		
Bulkhead and boat dock ¹	5.7	23		
Concrete ¹	0.2	<1		
Eroded shoreline ¹	0.1	<1		
Eroded shoreline & boat docks ¹	6.8	27		
Rip rap ¹	0.2	<1		
Overhanging brush	0.3	1		
Featureless ¹	11.1	44		
Native submersed			11.8	<1.0
Native emergent & floating-leaved			53.2	2.0
Alligator-weed			8.9	<1.0
Open water			2,150	96.0

¹ Abiotic habitat features.

Table 5. Percent directed angler effort by species for Lake Tyler West, Texas, December 2004 through February 2005 and March through May 2008.

	Year	
	Winter 2004-2005	Spring 2008
Largemouth bass	31	72
Crappie spp.	41	18
Sunfish spp.	22	0
Anything	6	10

Table 6. Total fishing effort (h) for all species and total directed expenditures at Lake Tyler West, Texas, December 2004 through February 2005 and March through May 2008.

Creel Statistic	Year	
	Winter 2004-2005	Spring 2008
Total fishing effort	4,982	20,794
Total directed expenditures	\$12,995	\$149,463

Gizzard shad

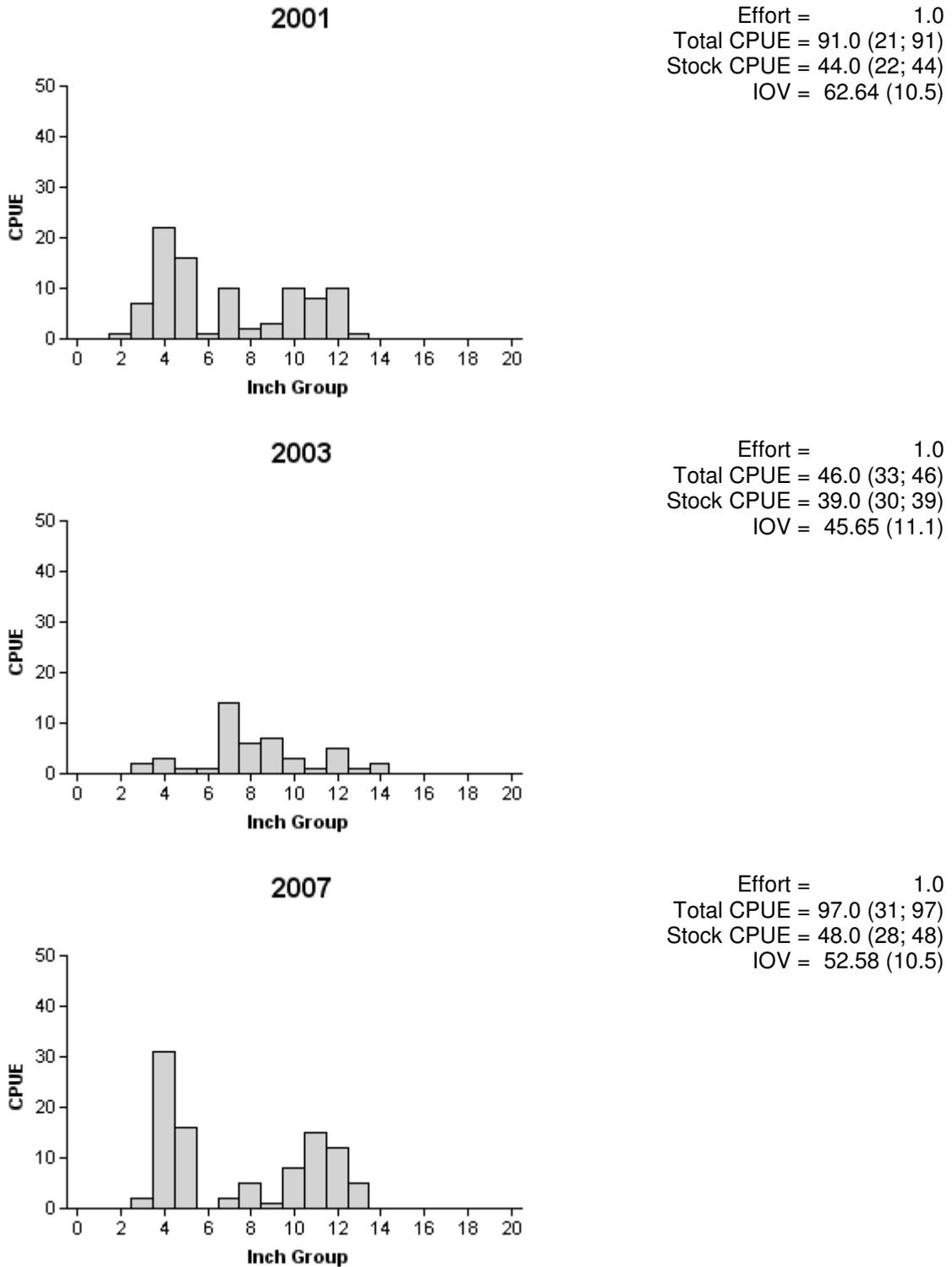
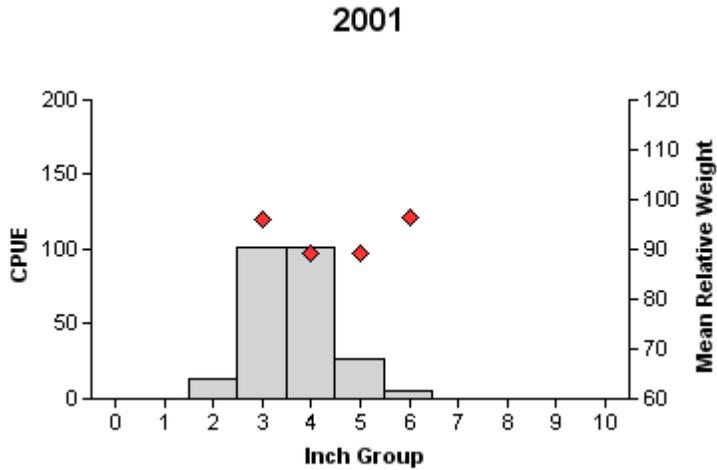
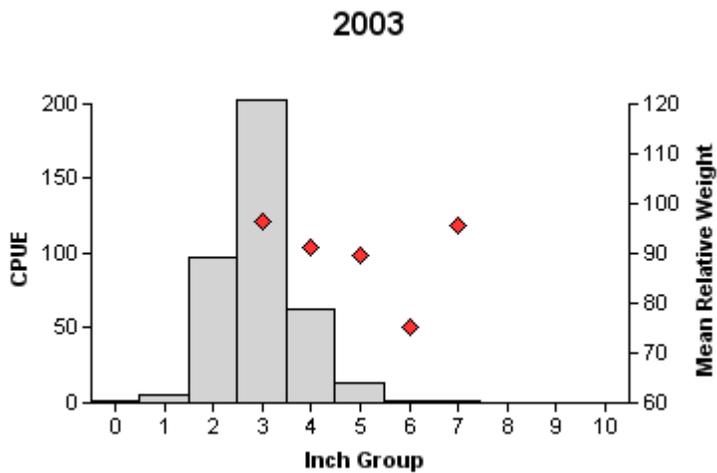


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lake Tyler West, Texas, 2001, 2003, and 2007.

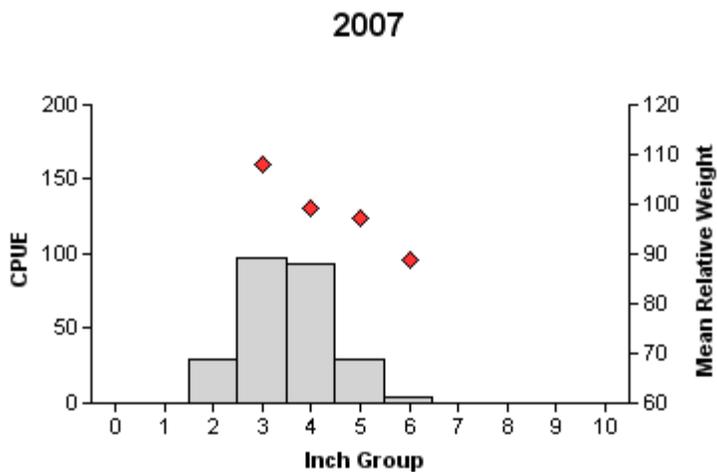
Bluegill



Effort = 1.0
 Total CPUE = 248.0 (18; 248)
 Stock CPUE = 234.0 (18; 234)
 PSD = 2 (1.3)



Effort = 1.0
 Total CPUE = 385.0 (21; 385)
 Stock CPUE = 281.0 (24; 281)
 PSD = 1 (0.6)



Effort = 1.0
 Total CPUE = 255.0 (18; 255)
 Stock CPUE = 225.0 (19; 225)
 PSD = 2 (1)

Figure 3. Number of bluegill caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE are in parentheses) for fall electrofishing surveys, Lake Tyler West, Texas, 2001, 2003, and 2007.

Redear sunfish

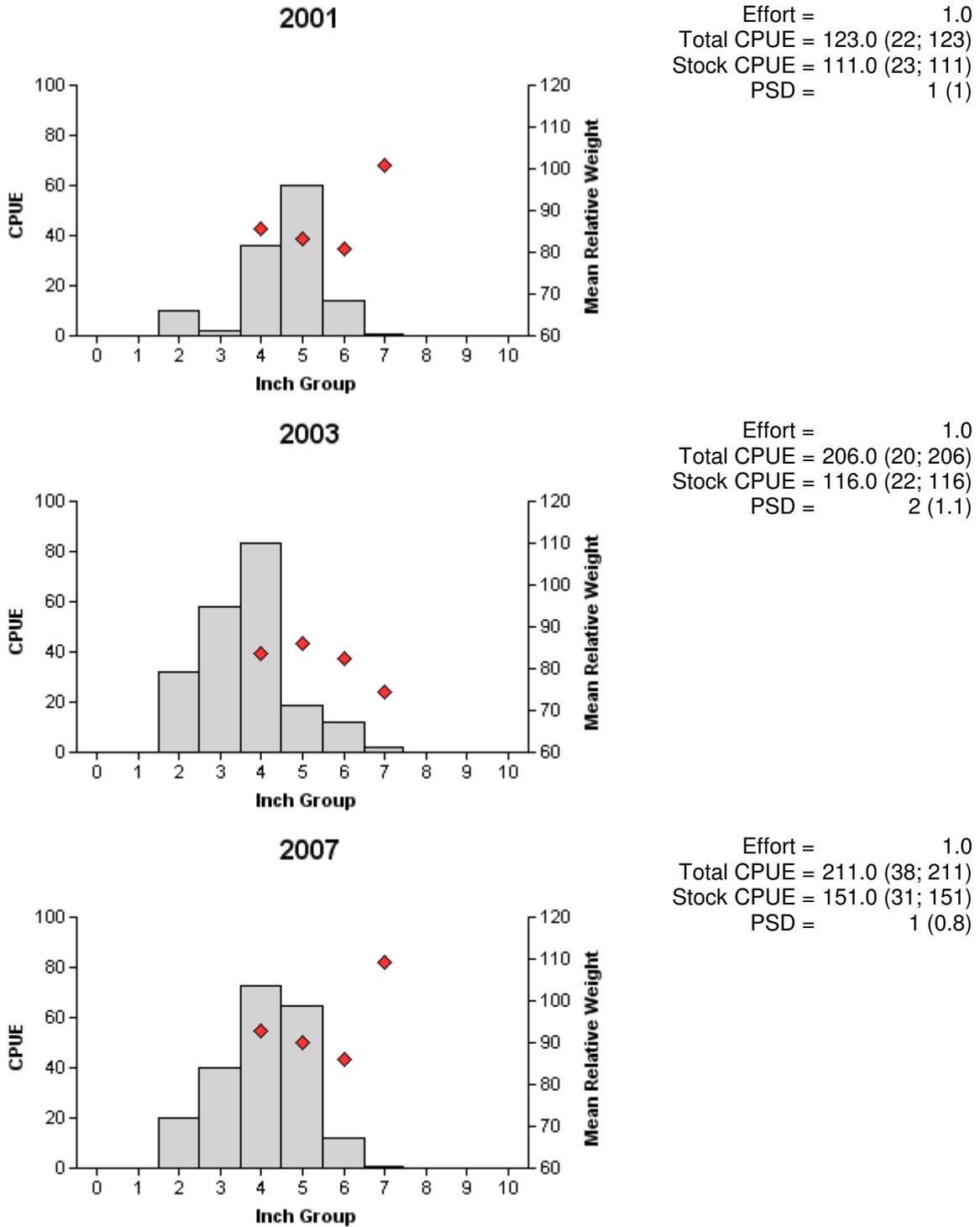
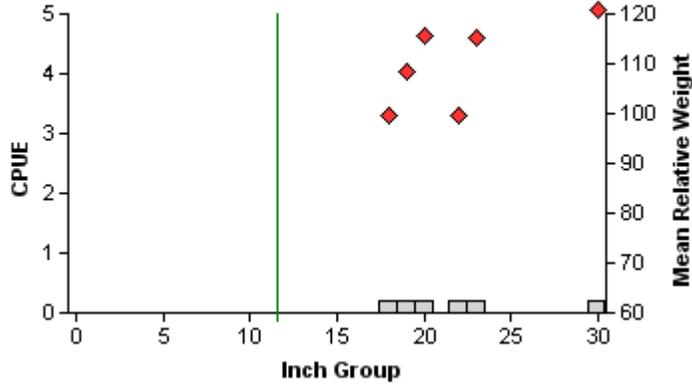


Figure 4. Number of redear sunfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE are in parentheses) for fall electrofishing surveys, Lake Tyler West, Texas, 2001, 2003, and 2007.

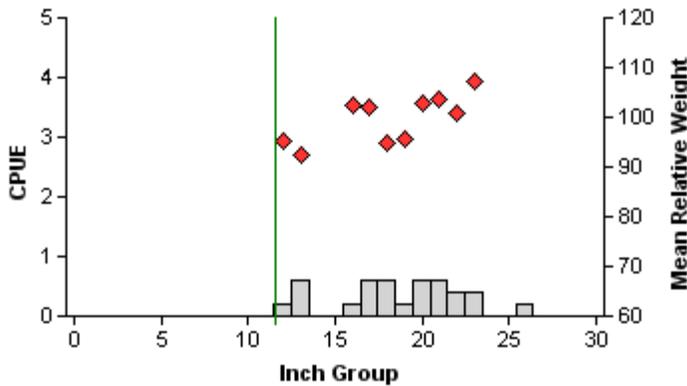
Channel catfish

1999



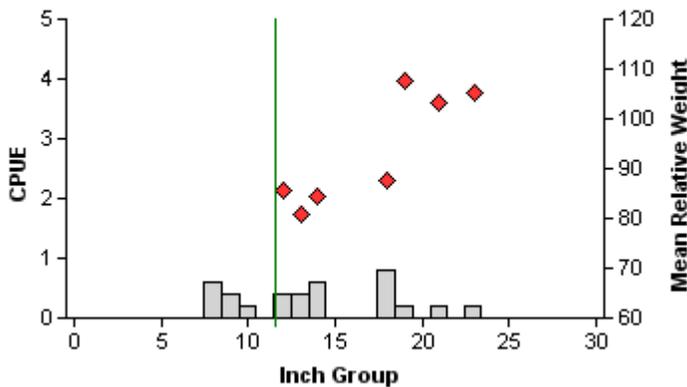
Effort = 5.0
 Total CPUE = 1.2 (31; 6)
 Stock CPUE = 1.2 (31; 6)
 PSD = 100 (0)
 RSD-P = 17 (14.5)

2004



Effort = 5.0
 Total CPUE = 4.6 (29; 23)
 Stock CPUE = 4.6 (29; 23)
 PSD = 83 (6.7)
 RSD-P = 4 (4.4)

2008



Effort = 5.0
 Total CPUE = 4.0 (25; 20)
 Stock CPUE = 2.8 (17; 14)
 PSD = 50 (8)
 RSD-P = 0 (0)

Figure 5. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Tyler West, Texas, 1999, 2004 and 2008. Vertical line represents length limit at time of survey.

White bass

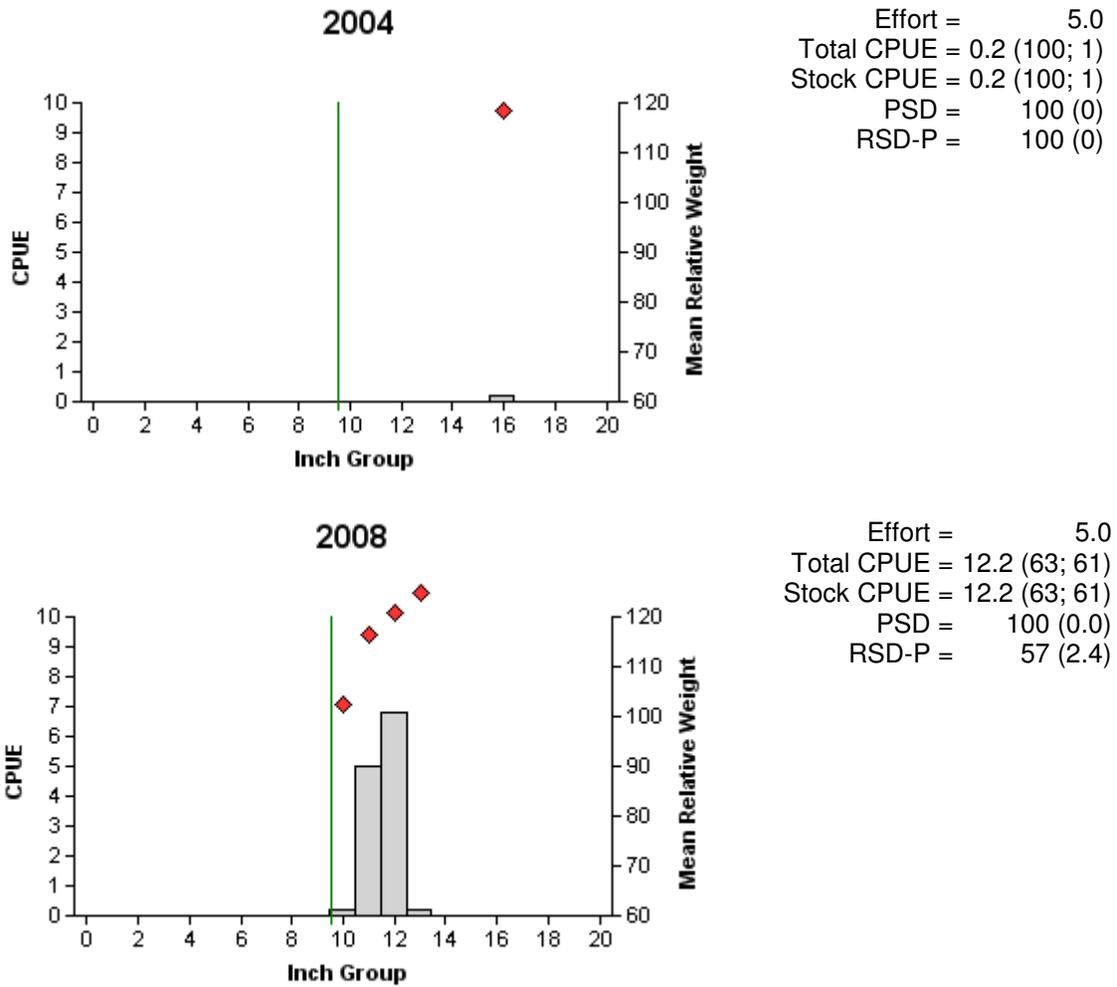
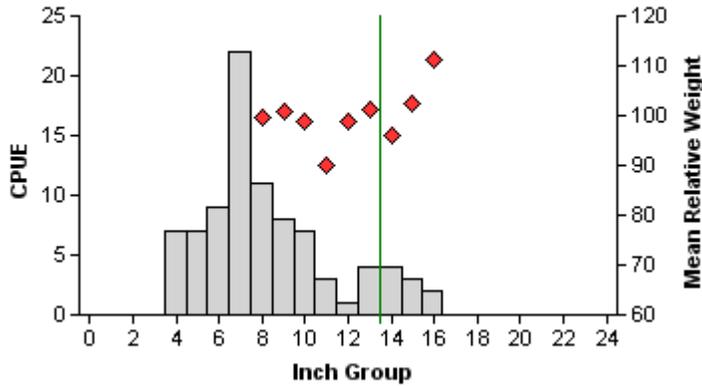


Figure 6. Number of white bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Tyler West, Texas, 2004, and 2008. Vertical line represents length limit at time of survey.

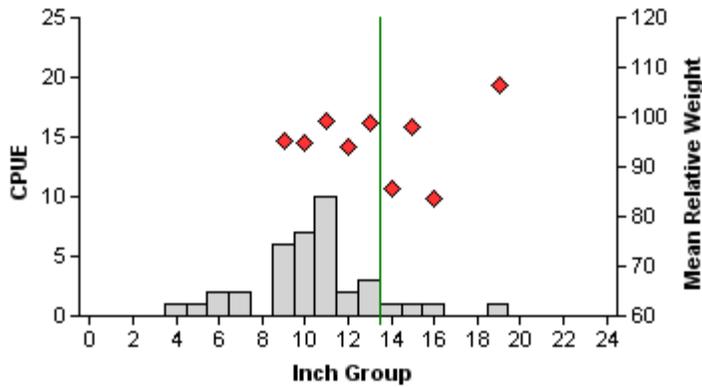
Largemouth bass

2003



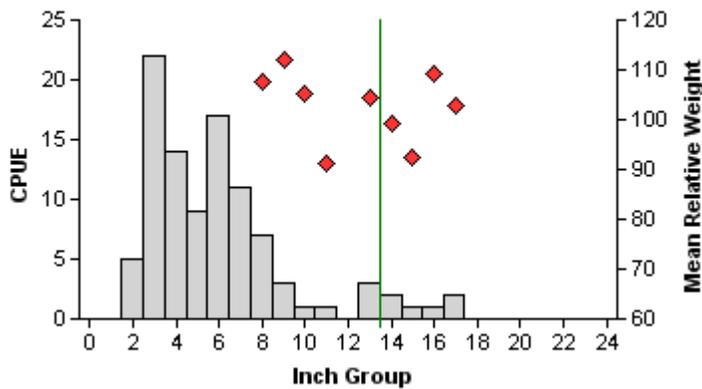
Effort = 1.0
 Total CPUE = 88.0 (18; 88)
 Stock CPUE = 43.0 (22; 43)
 PSD = 33 (6.6)
 RSD-P = 12 (6)

2005



Effort = 1.0
 Total CPUE = 38.0 (18; 38)
 Stock CPUE = 32.0 (22; 32)
 PSD = 28 (6.0)
 RSD-P = 9 (6.6)

2007



Effort = 1.0
 Total CPUE = 99.0 (24; 99)
 Stock CPUE = 21.0 (25; 21)
 PSD = 43 (11.9)
 RSD-P = 19 (5.8)

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 are in parentheses) for fall electrofishing surveys, Lake Tyler West, Texas, 2003, 2005, and 2007. Vertical line represents length limit at time of survey.

Largemouth bass

Table 7. Creel survey statistics for largemouth bass at Lake Tyler West from December 2004 through February 2005 and March through May 2008, where total catch per hour is for anglers targeting all largemouth bass, and total harvest is the estimated number of largemouth bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year	
	Winter 2004-2005	Spring 2008
Directed effort (h)	3,919 (17)	15,039 (22)
Directed effort/acre	1.8 (17)	6.7 (22)
Total catch per hour	0.6 (19)	0.5 (41)
Total harvest	210 (41)	3,898 (72)
Harvest/acre	<0.1 (41)	1.8 (72)
Percent legal released	na	82

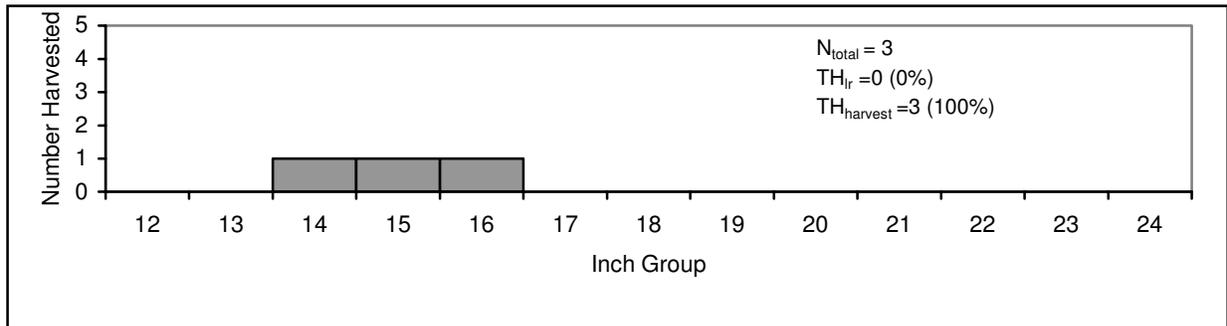


Figure 8. Length frequency of harvested largemouth bass observed during creel surveys at Lake Tyler West, Texas, December 2004 through February 2005 all anglers combined. N_{total} is the total number of largemouth bass observed during the angler creel survey. TH_{lr} is the number of largemouth bass observed during creel surveys in possession by tournament anglers for later released. $TH_{harvest}$ is the number of harvested largemouth bass observed during creel surveys.

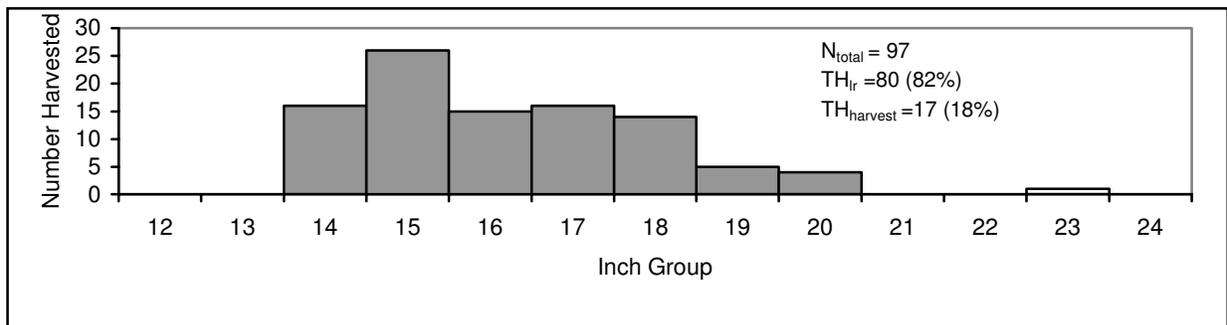


Figure 9. Length frequency of harvested largemouth bass observed during creel surveys at Lake Tyler West, Texas, March through May, 2008 all anglers combined. N_{total} is the total number of largemouth bass observed during the angler creel survey. TH_{lr} is the number of largemouth bass observed during creel surveys in possession by tournament anglers for later released. $TH_{harvest}$ is the number of harvested largemouth bass observed during creel surveys.

Largemouth bass

Table 8. Results of genetic analysis of largemouth bass collected by fall electrofishing at Lake Tyler West, Texas, 1993, 1996, 1999, 2001. In 2007 Microsatellite DNA analysis was used to determine largemouth bass genetic composition and results are not directly comparable to historic data; determination of integrade status was unavailable. 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		
1993	28	3	3	14	8	35.7	10.7
1996	30	2	13	8	7	37.5	6.7
1999	30	0	6	17	7	30.8	0.0
2001	30	0	7	21	2	42.5	0.0
2007	30	0			0	42.6	0.0

White crappie

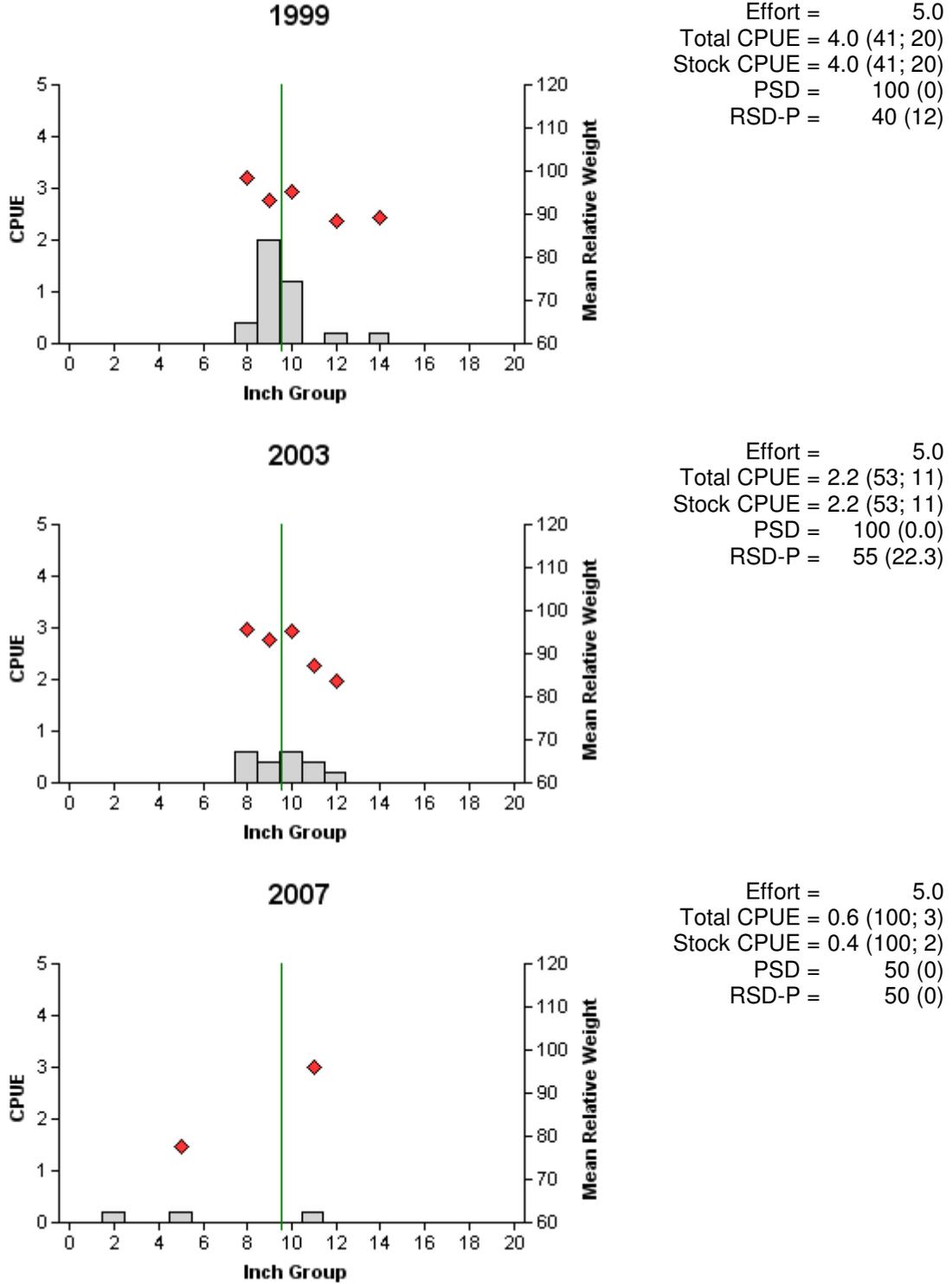
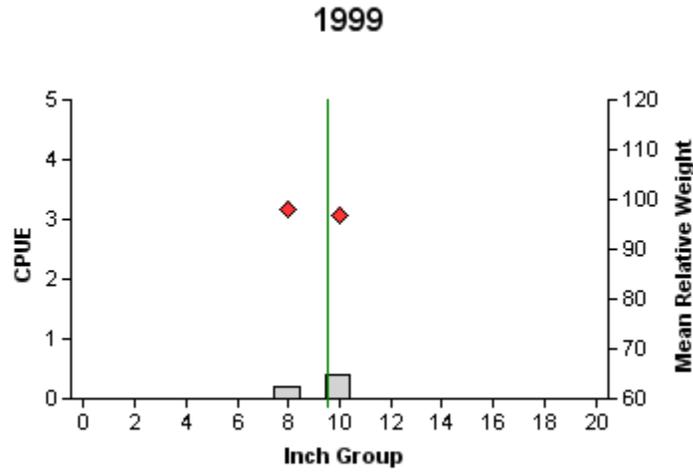
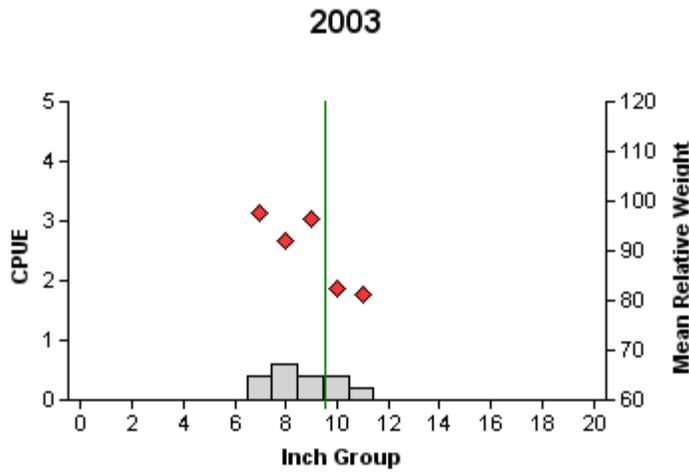


Figure 10. Number of white crappie caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Tyler West, Texas, 1999, 2003 and 2007. Vertical line represents length limit at time of survey.

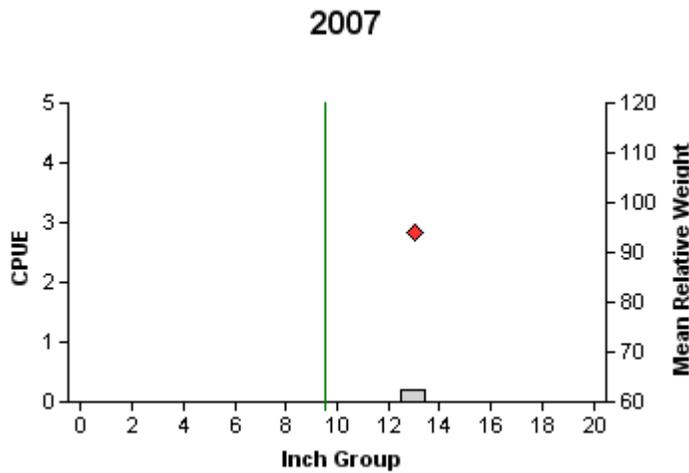
Black Crappie



Effort = 5.0
 Total CPUE = 0.6 (67; 3)
 Stock CPUE = 0.6 (67; 3)
 PSD = 100 (0)
 RSD-P = 67 (17.7)



Effort = 5.0
 Total CPUE = 2.0 (47; 10)
 Stock CPUE = 2.0 (47; 10)
 PSD = 80 (13.8)
 RSD-P = 30 (12.4)



Effort = 5.0
 Total CPUE = 0.2 (100; 1)
 Stock CPUE = 0.2 (100; 1)
 PSD = 100 (0)
 RSD-P = 100 (0)

Figure 11. Number of black crappie caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake Tyler West, Texas, 1999, 2003 and 2007. Vertical line represents length limit at time of survey.

Crappie

Table 9. Creel survey statistics for crappie at Lake Tyler West from December 2004 - February 2005, and March – May 2008, where total catch per hour is for anglers targeting all crappie, and total harvest is the estimated number of crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year	
	Winter 2004-2005	Spring 2008
Directed effort (h)	721 (51)	3,707 (30)
Directed effort/acre	0.3 (51)	1.7 (30)
Total catch per hour	0.0 (0)	1.7 (38)
Total harvest	0 (0)	3,297 (56)
White crappie	0 (0)	987 (83)
Black crappie	0 (0)	2,310 (45)
Harvest/acre	0 (0)	1.5 (56)
White crappie	0.0 (0)	0.4 (83)
Black crappie	0.0 (0)	1.0 (45)
Percent legal released	na	<1.0

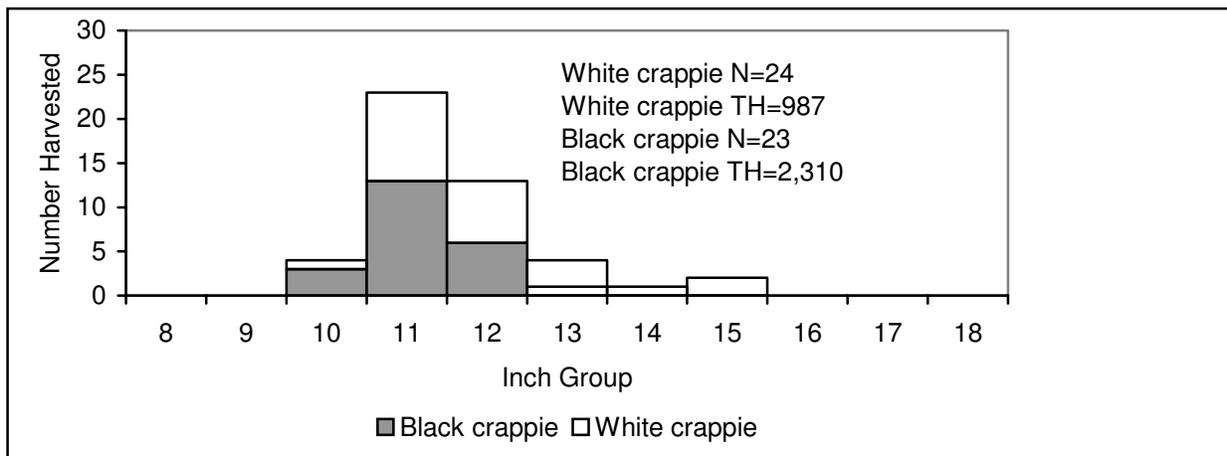


Figure 12. Length frequency of harvested white crappie and black crappie observed during creel surveys at Lake Tyler West, Texas, March-May 2008, all anglers combined. N is the number of harvested white crappie and black crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 12. Proposed sampling schedule for Lake Tyler West, 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.

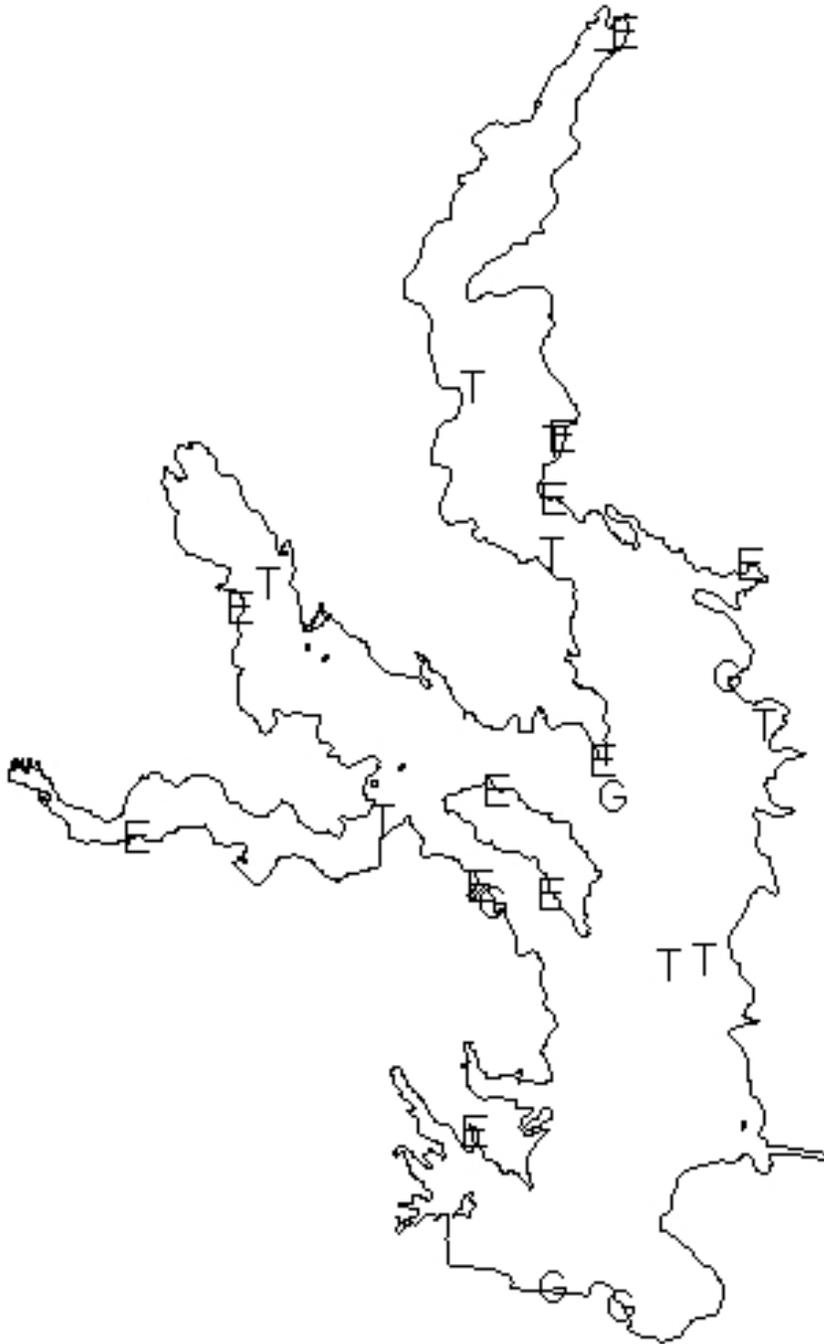
Survey Year	Electrofishing	Trap Net	Gill Net	Habitat	Creel	Report
2008-2009						
2009-2010	A		A			
2010-2011						
2011-2012	S	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Tyler West, Texas, 2007-2008.

Species	Gill netting		Trap netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					97	97.0
Threadfin shad					12	12.0
Channel catfish	20	4.0				
White bass	61	12.2			1	1.0
Redbreast sunfish					39	39.0
Warmouth					2	2.0
Bluegill					255	255.0
Longear sunfish					1	1.0
Redear sunfish					211	211.0
Spotted sunfish					4	4.0
Spotted bass					5	5.0
Largemouth bass					99	99.0
White crappie			3	0.6		
Black crappie			1	0.2		

APPENDIX B



Location of sampling sites, Lake Tyler West, Texas, 2007-2008. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively.