

PERFORMANCE REPORT

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STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

Lake Fork Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Fork Reservoir were surveyed in 2007 using electrofishing and trap netting, and in 2008 using electrofishing and gill netting. Anglers were surveyed with an access point creel survey, and vegetation was assessed through an aquatic vegetation survey. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Lake Fork Reservoir is a 27,264-acre impoundment located on Lake Fork Creek, a tributary of the Sabine River, approximately five miles northwest of Quitman, Texas. Water levels have been stable for the past 12 months, remaining within one foot of conservation pool elevation. Total coverage of hydrilla in summer 2007 (1.5% of reservoir surface area) was reduced as compared with 2006 (3.8%) and 2005 (4.8%). Eurasian watermilfoil appears to have displaced hydrilla in some areas and occupied the same total area (418 acres) as hydrilla in summer 2007.
- **Management history:** Important sport fishes include largemouth bass, crappie (white and black), and channel catfish. The management plan from the 2007 survey report included continued stocking of Florida largemouth bass (FLMB). The 16- to 24-inch slot-length limit continues to be evaluated through annual electrofishing surveys, and an access creel survey. District staff continue to promote the Lake Fork Trophy Bass Survey. Waterhyacinth abundance and distribution is monitored through annual vegetation surveys and recommendations are made to continue annual spraying to control its spread.
- **Fish community**
 - **Prey species:** Abundant clupeid (threadfin and gizzard shad) and sunfish populations provided adequate prey for largemouth bass and crappie. The majority of gizzard shad were available as prey for adult largemouth bass. Most bluegill and redear sunfish collected in 2007 were less than four inches in length, a suitable prey size for most size classes of bass.
 - **Catfishes:** The quality of the catfish fishery was good and accounted for 3.9% of total angler effort. Channel catfish was the predominant catfish species although flathead catfish, blue catfish and yellow bullheads were also present.
 - **Temperate basses:** White bass, yellow bass and white x yellow bass hybrids were all present in the reservoir. There was a limited fishery for yellow bass and anglers reported increasingly frequent catches of white bass. Four white bass were observed during the creel survey. This species has also been collected in low abundances in gill net sampling.
 - **Largemouth bass:** Largemouth bass were the most popular game fish in Lake Fork, accounting for over 84% of total angler effort in 2007–2008. Size distribution of the population remained consistent and relative weights were high. Largemouth bass grew into the protected 16- to 24-inch slot-length limit between three and four years of age.
 - **Crappie:** Crappie accounted for 11.2% of total directed effort in 2007–2008. The vast majority of crappie observed in creel surveys were black crappie (83%). During the winter quarter (December 2007 through February 2008), 48% of the annual harvest of crappie was observed.
- **Management strategies:** Stock FLMB to enhance largemouth bass genetics. Continue to evaluate the 16- to 24-inch slot length limit. Conduct annual vegetation surveys of waterhyacinth and recommend chemical control as needed. Continue to promote the Lake Fork Trophy Bass Survey. Conduct electrofishing surveys in fall 2008 and spring 2009 and continue annual access point creel survey at standard effort of 36 days/year.

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INTRODUCTION

This document is a summary of fisheries data collected from Lake Fork Reservoir June 2007 through May 2008. The purpose of the document is to provide fisheries information and to 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.

Reservoir Description

Lake Fork Reservoir is a 27,264-acre reservoir on Lake Fork Creek and Caney Creek that was impounded in 1980. It is located approximately five miles northwest of Quitman, Texas, in Wood, Rains and Hopkins Counties. It is operated and controlled by the Sabine River Authority (SRA) primarily as a municipal water supply and for recreation. The reservoir was hypereutrophic with a Carlson's Trophic State Index (TSI) chl-a of 55.7 µg/L (Texas Commission on Environmental Quality 2008). Habitat observed during the most recent survey in 2006 consisted mainly of featureless shoreline and standing timber resulting from low lake elevation. Boat docks (5.2%), eroded bank (4.7%) and concrete (3.6%) in combination with other habitat types added to the diversity of shoreline habitat in the reservoir. Total coverage of hydrilla in summer 2007 (417 acres) was at its lowest level in the last five years. Water elevation has remained within about one foot of conservation pool elevation for the last year, an improvement following approximately three years of drought (Figure 1). Boat access consists of four public boat ramps and numerous private boat ramps. Bank fishing access at Lake Fork is limited to public boat ramps, an SRA day use area, and pay facilities at a number of private marinas. Other descriptive characteristics for Lake Fork Reservoir are shown in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Storey and Jubar 2007) included:

1. Stock FLMB fingerlings (25/acre) annually.
Action: Annual stockings of FLMB have been conducted in Lake Fork since 1995. From 1995 through 1999, fish were stocked at a rate of 25/acre throughout the reservoir. From 2000 to 2005, stockings were conducted at 100/acre in a 5,000-acre embayment north of Highway 154. Since 2006, fingerlings have been stocked in suitable habitat throughout the lake because embayment stockings did not have any detectable influence on population genetics. FLMB allele frequency of age-0 fish in fall 2006 was 48.0%, within the range observed since 1989 (32–58%; Table 10). All fish sampled were intergrades (F1 and/or Fx).
2. Continue to evaluate the 16- to 24-inch slot length limit.
Action: Annual electrofishing surveys were conducted in fall and spring to monitor the largemouth bass population, and an annual access point creel survey was employed to monitor directed angler effort, catch and harvest. The Lake Fork Trophy Bass Survey has yielded some of the most valuable information on the effectiveness of the slot limit in maintaining the quality of the largemouth bass fishery. Since March 2003, 32.6% of fish reported as measured were above the upper end of the slot length limit (24 inches). The estimated angler catch rate of this size range of fish in the 2007-2008 creel survey was 0.0001/hr.
3. Conduct annual aquatic vegetation surveys for waterhyacinth and recommend treatment if necessary.
Action: Waterhyacinth was first documented in Lake Fork in 1993 and an herbicide treatment was conducted in 1996. Imposition of a moratorium on TPWD herbicide application of aquatic vegetation allowed the spread of this plant outside the Glade Creek area in 1998. Since that time, colonies have spread to most areas of the reservoir. Aquatic vegetation surveys have been conducted annually to monitor waterhyacinth

abundance and distribution since 1998. Herbicide applications resumed in 2001 and were conducted annually until 2006 by Aquatic Habitat Enhancement (AHE) staff using chemicals purchased by the Sabine River Authority. In summer 2007, AHE staff were unable to treat any waterhyacinth at Lake Fork.

4. Promote the Lake Fork Trophy Bass Survey.

Action: The Lake Fork Trophy Bass Survey was started as a cooperative project of TPWD, the Lake Fork Chamber of Commerce and the Lake Fork Sportsmans' Association in March 2003. The survey provided an opportunity for anglers to report their catches of largemouth bass ≥ 7 pounds as well as fish ≥ 24 inches. District biologists provided monthly summaries of catches by weight class to participating marinas, outdoor writers, and Division administrators. News releases summarizing survey results have been distributed through media contacts as appropriate. From March 2003 through April 2008, 9,014 trophy largemouth bass were reported to the survey.

5. Increase angler awareness of the fisheries resources at Lake Fork

Action: District staff provided laminated posters on Lake Fork fishing regulations and the Lake Fork Trophy Bass Survey for display at boat ramps and local businesses. A special poster showing identification characteristics of giant salvinia was created by district staff in response to documented sightings at other lakes in the region. These posters were displayed at boat ramps and marinas. Biologists provided information on fisheries resources of Lake Fork through telephone interviews and written news releases to interested outdoor writers. Information on Lake Fork recreational facilities was provided to anglers by mail, e-mail, or by telephone.

6. Reduce creel effort in order to accommodate creel surveys at other district waters.

Investigate impact on relative standard effort (RSE) of angler catch and harvest rates and angler effort estimates

Action: Creel effort was reduced to 4 surveys per month (2 weekend days, 2 weekdays) in winter in order to accommodate monthly ramp counts at Lake Tawakoni. Effort will be further reduced to 9 surveys per quarter (5 weekend days, 4 weekdays) beginning in June 2008 to accommodate the access point creel at Lake Tawakoni. Reducing the sampling effort from 72 days per annum to 36 is expected to have little impact on bass catch rate estimate precision, but it is expected to decrease precision of pressure estimates, bass harvest, crappie and catfish catch and harvest rates, number of bass, crappie and catfish caught and harvested, and total fishing expenditure.

Harvest regulation history: Sport fishes in Lake Fork Reservoir are managed with statewide regulations with the exception of largemouth bass and crappie (Table 2). From 1980 to 1985, largemouth bass were managed with a 14-inch minimum length limit, 5 fish daily bag limit. A 14- to 18-inch slot length limit, 5 fish daily bag limit was implemented in September 1985 to improve the population size structure. In September 1993, the slot limit was modified to a 14- to 21-inch slot length limit, 3 fish daily bag limit, with one fish over 21 inches. In September 1995 the bag limit was relaxed to 5, to make largemouth bass bag limits consistent across the state. In September 1998 the slot length limit was increased to a 16- to 22-inch slot, 5 fish daily bag with 1 fish over 22. This encouraged harvest of fish under the slot and provided heavier fish for tournament weigh-ins. Over the next 2 years the upper end of the slot increased by 1 inch each year until in September 2000, the limit became the current 16- to 24-inch slot, 5 fish daily bag with 1 fish over 24.

In 1985, a 10-inch minimum length limit, 25-fish daily bag limit was imposed for white and black crappie. In September 1991, the current length limit waiver from December 1 through the last day of February was imposed. Anglers are required to keep the first 25 fish caught, regardless of size. This regulation was instituted as a result of angler concerns about the death of crappie caught in deep water during winter months.

Stocking history: Lake Fork Reservoir has a long history of FLMB stockings. Prior to 1995, fish of various sizes (fry, fingerlings, advanced fingerlings, and adults) were stocked in Lake Fork (Table 3).

Since 1995, annual stockings of fingerling FLMB have been conducted. From 2000 to 2005, stockings of FLMB were conducted at 100/acre in a 5,000-acre embayment north of Highway 154. During that time no detectable change in population genetics was observed so lakewide stockings were resumed in 2006. Spotted bass adults were stocked prior to impoundment in 1979, but there are no records of these fish surviving. Blue catfish fingerlings were stocked on three occasions between 1980 and 1985 and channel catfish fingerlings were stocked on four occasions between 1977 and 1984. Flathead catfish were introduced in 1979, and redear sunfish and copperside bluegill in 1981.

Vegetation/habitat history: Lake Fork Reservoir supports a diverse mix of aquatic vegetation species including invasive species such as hydrilla, Eurasian watermilfoil, waterhyacinth, and alligatorweed. Hydrilla distribution is cyclical, probably in response to environmental events. This plant has never caused the access problems observed in many other systems and it has always been considered beneficial habitat. Waterhyacinth was first documented in Lake Fork in 1993 and an herbicide treatment was conducted in 1996. The plant spread outside the Glade Creek area in 1998 as a result of a moratorium on spraying of aquatic vegetation by TPWD staff. By summer 2000, plant colonies had spread to Lake Fork Creek and Little Caney Creek. To date, the major concentrations of waterhyacinth colonies are located in the Caney Creek arm upstream of the Highway 154 bridge and in Birch Creek extending into Lake Fork Creek between the Highway 515 and 2946 bridges.

METHODS

Fishes were collected by electrofishing (2 hours at 24, 5-min stations) in spring and fall and gill netting in spring (15 nets nights at 15 stations). In 2007 an approved research study examining standard trap nets in comparison with experimental trap nets was conducted on Lake Fork (46 net nights at 22 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 trap nets and gillnets, as the number of fish per net night (fish/nn). Survey sites were randomly selected.

An aquatic vegetation survey was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005). Shoreline distances and areas of vegetation were estimated using ArcView GIS software.

An access point angler creel survey consisting of 60 survey days (3 weekdays, 3 weekend days per month from June 2007 through November 2007, 2 weekdays, 2 weekend days per month from December 2007 through May 2008) was conducted to estimate angler catch and harvest rates and angling effort in accordance with 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 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 ($RSE = 100 \times [SE \text{ of the estimate} / \text{estimate}]$) was calculated for all CPUE statistics and for creel statistics and SE was calculated for structural indices and IOV. Largemouth bass electrofishing catch rate data was evaluated to determine if abundance was significantly different across years. Catch at individual stations (5 minutes of sampling at each station was used to calculate mean catch rates (MCPE) for each year and season. Analysis of variance (ANOVA) was used to test for significant difference across years. If ANOVA revealed a significant difference ($P < 0.05$), the Tukey-Kramer multiple range test (controlled for an overall error rate) was used to separate significantly different means.

Average ages for 16-inch (15-17 inches) largemouth bass and 10-inch white and black crappie (9-11 inches) were determined from otoliths.

A sample of 30 age-0 largemouth bass were collected by electrofishing in fall 2007 and subjected to

genetic analysis using DNA microsatellite analysis in accordance with Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

In March 2003, Texas Parks and Wildlife Department instituted the Lake Fork Trophy Bass Survey in conjunction with the Lake Fork Area Chamber of Commerce and the Lake Fork Sportsman's Association. This voluntary reporting survey is designed to document catches of largemouth bass 7 pounds and larger and catches of fish over 24 inches. Actual weights and lengths or estimated values are accepted. Anglers can record their catches at thirteen reporting stations around the lake. At the beginning of each month, district personnel collect ledgers and analyze the data and distribute monthly summaries electronically.

Water elevation data (Figure 1) was obtained from the Sabine River Authority (SRA) website at http://www.sra.dst.tx.us/basin/lake_fork_monthly.asp.

RESULTS AND DISCUSSION

Habitat: Total acreage of hydrilla in summer 2007 (Table 5) represented 1.5% of the lake surface area as compared with 3.8% in 2006 (Storey and Jubar 2007). Waterhyacinth coverage was estimated at 12.2 acres. Alligatorweed abundance has increased following the prolonged drought but it still only represents 0.2% of the lake surface area (41.6 acres). Native submerged vegetation species (primarily coontail) accounted for 2.0% of the surface area in 2007, American lotus accounted for 1.4%, and native emergent species represented 0.3% of Lake Fork's surface area. Total aquatic vegetation coverage was estimated at 7.0% of reservoir surface area, similar to the levels observed in 2006 (7.9%). Approximately 43% of Lake Fork has water depths less than 18 feet, and the observed vegetated area represents 16.2% of this area. Lake elevation remained within about one foot of conservation pool elevation for the past year, an improvement over declines observed during the previous 2 to 3 years of drought (Figure 1).

Creel: Directed fishing effort by anglers was highest for largemouth bass (84.4%), followed by crappie (11.2%), and catfish (3.9%), similar to previous years (Table 6). Total fishing effort for all species at Lake Fork Reservoir was 874,230 h from June 2007 to May 2008, and anglers spent an estimated \$10,909,542 in direct expenditures (Table 6). It is noteworthy that these are the highest levels observed compared with previous years despite the rising price of gasoline and concerns about the U.S. economy. As expected, the highest effort (470,552 h) and trip expenditures (\$6,618,266) were observed during the spring quarter (March to May). Trip expenditures during spring 2008 were 16.6% higher than in spring 2007.

Relative standard errors (RSE) of fishing effort estimates were lower than the target level (20%) for monitoring trends set by Fisheries Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005) (Table 6). In addition RSEs of directed effort for largemouth bass (Table 9) and crappie (Table 10), and angler catch rate of largemouth bass were all lower than the target level.

Prey species: Lake Fork contains abundant clupeid and sunfish populations. Gizzard shad size structure was optimal with the majority of fish available as prey for adult largemouth bass. The index of vulnerability (IOV) indicated 70% of gizzard shad were available to existing predators (Figure 2). Threadfin shad provided prey for bass and crappie. The majority of bluegill and redear sunfish collected in 2007 fall electrofishing samples were less than 4 inches in length (Figures 3 and 4 respectively). Electrofishing catch rates of gizzard shad, bluegill and redear sunfish were 74.0/h, 287.5/h and 119.5/h respectively. Few sunfish were observed in the creel survey.

Channel catfish: Gill net catch of channel catfish in 2008 was lower than in previous years (Figure 5) but the population is dominated by legally-retainable fish. Relative weights of most inch classes of fish were above 90 indicating an adequate supply of prey.

Catfish were the third most popular group in terms of directed angler effort. Fishing effort in 2007-2008

was at the lowest level compared with previous years (Table 8). Anglers harvested 73% of catfish caught in 2007-2008, but 66% of legal-sized channel catfish caught were released. Observed harvest of channel catfish from June 2007 to May 2008 reflected good angler compliance (100%) with the length limit, and harvested fish ranged in length from 12 to 24 inches (Figure 5). The percentage of legal-sized catfish that are released varies widely by year (Table 8). Many anglers targeting largemouth bass catch legal-sized catfish and do not retain them and this is likely the driving force behind these changes in numbers of legal-sized released catfish. Other catfish species, including blue catfish, flathead catfish, and yellow bullhead were present in the reservoir but contributed little to the total fishery.

Temperate basses: White bass, yellow bass and white x yellow bass hybrids are present in the reservoir. There is a limited fishery for yellow bass which is periodically characterized by low directed effort (Table 6). There is an expanding population of white bass that were probably introduced into the lake by anglers. A few fish have been collected in gill netting in previous years (Storey and Jubar 2007) and three fish were collected in spring 2008. Anglers report occasional catches of this species and four fish were harvested in the creel survey.

White x yellow bass hybrids are periodically caught and submitted as world record yellow bass, but after genetic testing they have all been identified as hybrids. The current lake record is 4.75 pounds. Temperate bass populations in Lake Fork are unlikely to negatively impact existing fish populations and they have the potential to provide alternative fisheries resources, but they may provide identification challenges to anglers and law enforcement staff.

Largemouth bass: The largemouth bass population has remained stable and continues to provide a high quality fishery. Statistical testing of electrofishing catch rate data (analysis of variance) in both spring (1998-2008) and fall (1997-2007) revealed no significant difference ($P < 0.05$) among years. Population size structure has remained stable with PSD in spring samples ranging from 64-75 (Figure 7) and estimates from fall samples ranging from 34-50 (Figure 8) during the past three electrofishing surveys. Body condition was above average indicating the presence of abundant and readily available prey fish populations. Mean relative weight of all sizes of fish within the protected slot limit were above 85 in both spring and fall. Largemouth bass in Lake Fork grow to the lower end of the protected slot length limit, in three or four years; average age at 16 inches (mean = 16.5 inches, range = 15.3 – 17.8 inches) was 3.2 years ($N = 14$; range = 1 - 4 years).

Lake Fork continues to receive high directed angler effort for largemouth bass. In 2007-2008, largemouth bass angling effort (27.05 h/acre) accounted for 84.3% of total fishing effort and was higher than all previous years (Table 9). The spring creel quarter (March to May) received the highest percentage of the annual effort for largemouth bass (60.9%), followed by summer (June to August) (18.8%), fall (September to November) (15.2%) and winter (December to February) (5.1%). Total directed expenditures in 2007-2008 were estimated at \$10,909,542, the highest level observed (Table 7).

Catch rate for anglers targeting largemouth bass during 2007-2008 (0.41/h) was similar to other years (range 0.27-0.45/h) and the estimated number of bass caught (17.73/acre) is at the highest observed level (Table 9). In 2007-2008, fish within the protected slot limit (16-24 inches) accounted for 42.6% of released largemouth bass, which is the same as in 2006 (42.7%). Fish below the slot limit accounted for 57.2% of releases, within the previously observed range (55-71%). In 2007-2008, largemouth bass harvest was 0.03/hour. An estimated 20,490 fish were harvested during this time period and 89% of these were released following tournament weigh-ins by anglers participating in live-release tournaments (Figure 9).

Standard fisheries sampling methods do not effectively sample fish above the upper end of the slot length limit (≥ 24 inches), which makes evaluation of the 16-24 inch slot limit difficult. Catch rate of largemouth bass 24 inches or longer reported in creel surveys by anglers targeting largemouth bass was low (0.001/h), and accounted for 0.2% of bass released by all anglers. Since spring 1990, District staff have conducted 71 hours of electrofishing and collected 7,445 stock-sized fish; only five were ≥ 24 inches. The

Lake Fork Trophy Bass Survey (see Appendix E) has provided an alternative method of collecting data on trophy-sized fish and it provides evidence that the slot limit is enabling anglers to catch large numbers of fish over 24 inches. Between March 2003 and April 2008, a total of 9,014 largemouth bass were reported in the Lake Fork Trophy Bass Survey by anglers from 47 states. Anglers measured 63.0% of their entries, and 32.6% of these were ≥ 24 inches. Fish in the 22- and 23-inch classes were most abundant of the measured entries, representing 29.0% and 30.4% of the total, respectively. Anglers weighed 83.3% of their entries, and of these fish, 16.0% were ≥ 10 pounds. By far, the vast majority of entries were 7 pound (40.8%) and 8 pound fish (28.9%). The top 5 states of reporting-angler origin were Texas (62.0%), Oklahoma (6.7%), Missouri (6.3%), Louisiana (5.0%), and Arkansas (3.8%). As expected, most trophy fish catches occurred during spring.

Annual stockings of Florida strain largemouth bass (FLMB) have helped maintain the FLMB allele frequency above 30% (Table 10). In 2007, FLMB allele frequency of age-0 fish was 53.4%, within the range observed since 1989 (32–58%). No pure Florida bass were observed in the sample of age-0 fish collected in fall 2007.

Crappie: Fall trap net catches of white crappie (Figure 10) were lower than black crappie (Figure 11) in fall 2007 (0.7/nn vs. 1.8/nn). Trap net catches on Lake Fork tend to be variable and are often quite low. Crappie mean relative weights exceeded 90 for all size classes in 2007 samples. All white crappie collected (N = 12) were 1 year old and average length was 10.1 inches (range = 9.0 – 11.4 inches) indicating white crappie grow to legal size by two years of age. The average length of black crappie collected in the age and growth sample (N=16, range=9.1 – 11.9) was 10.6 inches. The mean age of fish in the sample was 1.9 years, indicating black crappie grow to legal size from two to three years of age.

Crappie were the second most popular sport fish at Lake Fork (Table 6). From 2007-2008 directed effort for crappie was 97,518 h, higher than in 2005-2006 but lower than all previous years. Total crappie angler catch rates (black and white combined) (1.86/h) were higher than the two previous years but lower than rates observed from 2001-2005 (Table 11). The estimated number of crappie caught during 2007-2008 was 11.45/ac which is higher than it has been for the last three years. Crappie harvest rate was 0.82/h which is higher than the last three years. The vast majority of fish over 10 inches that were caught were harvested; only 7.3% of legal sized fish were released in 2007-2008. Total estimated crappie harvest (130,368) is lower than last year, but within the range observed in the last six years (37,020 – 196,042).

Black crappie was the most abundant species harvested in creel surveys in 2007-2008 (83.0%) in similar levels to those observed in 2006-2007. The most abundant size class of harvested crappie (black and white combined) was the 10-inch class which accounted for 30.6% of fish observed in creel surveys. Illegal harvest accounted for 5% of all crappie harvested from March through November when the minimum length limit is in effect. During the winter quarter (December to February) when there is no minimum length limit, crappie harvested that were less than 10 inches accounted for 43% of fish harvested, similar to the two previous years (37% and 44%) but higher than earlier years (27% in 2004-2005, 19% in 2003-2004 and 8% in 2002-2003). The winter quarter accounted for the highest directed effort for crappie (30,354 h), and the highest quarterly harvest (48%).

Fisheries management plan for Lake Fork Reservoir, Texas

Prepared – July 2008.

ISSUE 1: Continue annual FLMB stocking. The percentage of FLMB alleles in samples of age-0 largemouth bass at Lake Fork have remained in the range of 30–60. Lake Fork has a well-established history of producing trophy largemouth bass.

MANAGEMENT STRATEGIES

1. Stock FLMB (25/acre) annually.
2. Monitor genetic composition of age-0 largemouth bass population by assessing allele frequency from samples collected during annual fall electrofishing.

ISSUE 2: Continue to evaluate the largemouth bass 16- to 24-inch slot length limit. This regulation was adopted in September 2000 to enhance trophy fish production.

MANAGEMENT STRATEGIES

1. Continue to monitor the largemouth bass population with biannual electrofishing surveys (spring and fall).
2. Continue to conduct annual access creel survey to monitor the fishery and collect data on catch, harvest and fishing effort.
3. Use results from the Lake Fork Trophy Bass survey to monitor angler catches of trophy bass (≥ 24 inches and/or ≥ 7 pounds).

ISSUE 3: Invasive aquatic plant monitoring and control. Lake Fork contains three prominent invasive aquatic plants, hydrilla, waterhyacinth, and alligatorweed, which District staff monitor on an ongoing basis. Although hydrilla is listed as an invasive aquatic plant, it has not created access problems on Lake Fork and it is generally considered an important component of the reservoir's aquatic habitat. Waterhyacinth was first documented in Lake Fork in 1993. By 1995, coverage had increased considerably. Herbicide treatments using 2,4-D were conducted by the TPWD Aquatic Habitat Enhancement staff (AHE) in 1996. From 1998 to present, waterhyacinth gradually spread westward to many sections of the reservoir. Alligatorweed has expanded as water levels increased following the drought. Landowners submit aquatic vegetation treatment proposals more frequently for this plant than for any other species. However, it does not pose an obstacle for access at public boat ramps and it contributes to the aquatic habitat. As a result of a number of recent sightings of giant salvinia in the region, fisheries managers, anglers and business owners are concerned about preventing this plant from being established in Lake Fork.

MANAGEMENT STRATEGIES

1. Conduct annual monitoring of distribution and acreage of invasive aquatic plants (waterhyacinth, hydrilla, alligatorweed) in Lake Fork.
2. Recommend annual spraying of waterhyacinth by AHE staff using herbicide purchased by the Sabine River Authority (SRA).
3. Investigate reports of unusual or unknown aquatic plants in Lake Fork by anglers and homeowners.
4. Continue efforts to educate the general public on the identification of invasive aquatic plants and the consequences of their introductions into public water.

ISSUE 4: Continue to promote the Lake Fork Trophy Bass Survey, a cooperative venture of TPWD, the Lake Fork Area Chamber of Commerce, and the Lake Fork Sportsman's Association.

MANAGEMENT STRATEGIES

1. Continue the Lake Fork Trophy Bass Survey to obtain information on the catches of largemouth bass ≥ 7 pounds as well as fish ≥ 24 inches. Data gathered through this program will be used to quantify the catches of trophy bass as well as to monitor the performance of the slot limit.
2. Provide monthly summaries of catches by weight class to participating marinas and local media. Produce news releases summarizing survey results and distribute information on a statewide basis.
3. Continue to promote the program by providing laminated posters for display at public and private boat ramps and in area businesses. Provide marina ledgers to participants on a monthly basis.

ISSUE 5: Increase angler awareness of the fisheries resources at Lake Fork. There is a need to inform anglers of the significant fisheries for largemouth bass, crappie and catfish that exist in the reservoir. Fisheries regulations need to be prominently displayed and clearly communicated to anglers.

MANAGEMENT STRATEGIES

1. Continue to provide posters detailing fisheries regulations in effect at Lake Fork to local fishing-related businesses that serve the Lake Fork area, for display in stores and at boat ramps.
2. Continue to produce news releases promoting the fisheries resources of Lake Fork for distribution to local lake papers and other media outlets.
3. Continue to provide information packets on Lake Fork facilities to interested anglers by mail and e-mail.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes annual electrofishing sampling in spring and fall each year to monitor the largemouth bass population (Table 12), and a standard ongoing annual access creel survey to monitor the lake's fisheries. Optional gill netting every two years to monitor the channel catfish population was discontinued as a result of the stability of the population and the ability to monitor the fishery using the access point creel survey. Waterhyacinth and hydrilla distribution and abundance will continue to be monitored through a vegetation survey. Management reports will be prepared on an annual basis.

LITERATURE CITED

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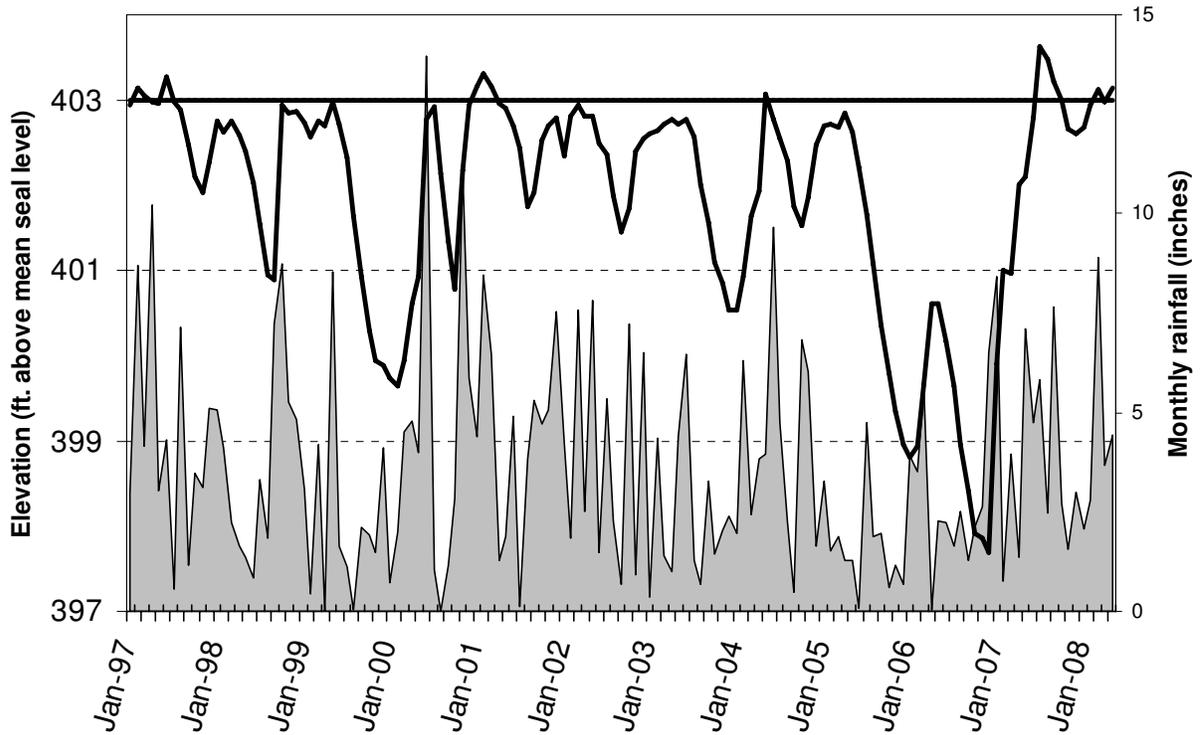


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) and monthly rainfall (inches) recorded for Lake Fork Reservoir, Texas, January 1997 through May 2008. Bold horizontal line indicates conservation pool elevation; 403 ft. msl.

Table 1. Characteristics of Lake Fork Reservoir, Texas.

Characteristic	Description
Year constructed	1980
Controlling authority	Sabine River Authority
Surface area	27,264 acres
Counties	Wood (location of dam), Hopkins, Rains
Reservoir type	Mainstream
Mean depth	12.0 ft.
Maximum depth	70.0 ft.
Shoreline development index (SDI)	13.5
Conductivity	135 $\mu\text{mho} / \text{cm}$
Secchi disc range	4 – 6 ft.
Watershed area	490 mi^2

Table 2. Harvest regulations for Lake Fork Reservoir, 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 (1 fish 24 inches or longer)	16 – 24 slot length limit
Crappie, white and black, their hybrids and subspecies	25 (in any combination)	10 ¹ - No limit

¹The minimum length limit is waived from December 1st to the last day of February each year. Anglers must harvest the first 25 crappie caught, regardless of size, with no catch-and-release or culling.

Table 3. Stocking history of Lake Fork Reservoir, Texas. Size categories are: FRY =<1 inch; FGL = 1-3 inches; AFGL = 8 inches, and ADL = adults.

Year	Number	Size	Year	Number	Size
<u>Blue catfish</u>			<u>Florida largemouth bass</u>		
1980	268,423	FGL	1978	103	ADL
1984	29,676	FGL	1979	740,815	FGL
1985	253,464	FGL	1979	561	ADL
	<u>551,563</u>		1980	330,800	FRY
			1980	300	ADL
<u>Channel catfish</u>			1982	49	ADL
1977	37,787	FGL	1987	250	AFGL
1978	80,130	FGL	1995	692,281	FGL
1980	137,545	FGL	1996	697,731	FGL
1984	102,103	FGL	1997	698,037	FGL
	<u>357,565</u>		1998	694,211	FGL
			1999	710,761	FGL
<u>Flathead catfish</u>			2000	510,737	FGL
1979	4,800	FGL & ADL	2001	218,240	FGL
	<u>4,800</u>		2002	692,258	FGL
			2003	732,049	FGL
<u>Redear sunfish</u>			2004	515,101	FGL
1981	36,000	FGL	2005	705,986	FGL
	<u>36,000</u>		2006	506,113	FGL
			2007	501,174	FGL
<u>Coppernose bluegill</u>			2008	501,220	FGL
1981	633,911	FGL		<u>9,448,777</u>	
	<u>633,911</u>				
<u>Spotted bass</u>					
1979	41	ADL			
	<u>41</u>				

Table 4. Survey of littoral zone and physical habitat types, Lake Fork Reservoir, Texas, August 2006. A linear shoreline distance (miles) was recorded for each habitat type found. The sum of shoreline distances exceeds the lake perimeter because of overlap of habitat types. Surface area (acres) and percent of reservoir surface area were determined for each type of aquatic vegetation found. Lake elevation (399.1 ft msl) was 3.9 feet below conservation pool elevation at the time of the survey.

Shoreline habitat type	Shoreline Distance	
	Miles	Percent of total
Boat dock	13.0	5.2
Concrete	9.0	3.6
Eroded bank	11.7	4.7
Featureless bank	143.9	57.7
Standing timber	194.8	78.0
Native emergent	8.6	3.4
Native floating	40.8	16.3
Native submerged	67.0	26.8
Eurasian watermilfoil	40.4	16.2
Hydrilla	89.8	36.0
Waterhyacinth	1.8	0.7

Table 5. Vegetation survey, Lake Fork Reservoir, Texas, August 2007. Lake elevation (403.59 ft msl) was 0.59 feet above conservation pool elevation at the time of the survey.

Vegetation species / type	Acres	Percent of reservoir surface area
Native emergent	79.55	0.29
Native submerged	570.98	2.09
American lotus	370.20	1.36
Alligatorweed	41.63	0.15
Eurasian watermilfoil	417.62	1.53
Hydrilla	417.14	1.53
Waterhyacinth	12.16	0.04
TOTAL	1909.27	7.00

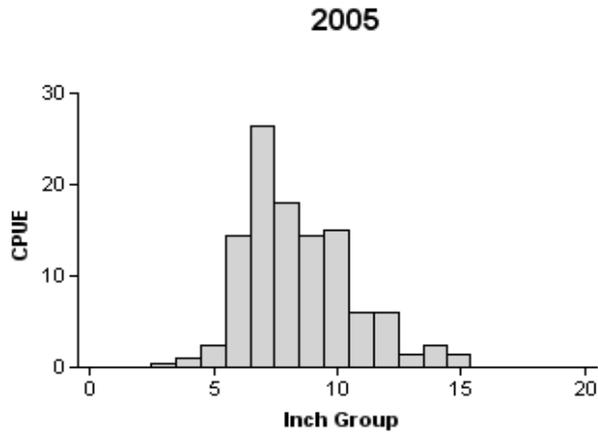
Table 6. Percent directed angler effort by species for Lake Fork Reservoir, Texas, June 2001 – May 2008.

Species	Year						
	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Catfish	7.09	4.58	6.28	4.74	6.15	5.90	3.91
Yellow bass	0.21	0.13	0.03	0.39	-	0.09	-
Sunfish	0.72	0.96	0.35	0.45	-	1.08	-
Largemouth bass	62.94	75.11	71.81	77.79	81.57	80.32	84.37
Crappie	28.82	18.90	20.88	16.63	12.27	12.61	11.15
Anything	0.21	0.33	0.65	-	-	-	0.56

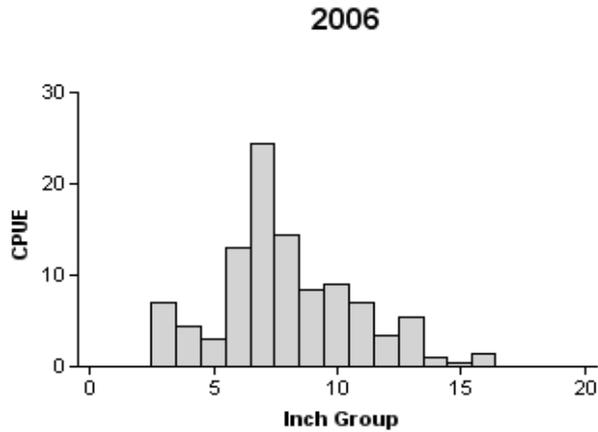
Table 7. Total fishing effort (h) for all species and total directed expenditures (and associated RSEs in parentheses) at Lake Fork Reservoir, Texas, June 2001 - May 2008.

Species	Year						
	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Total fishing effort	664,082 (12)	757,177 (13)	649,856 (10)	786,911 (16)	717,074 (11)	807,892 (12)	874,230 (14)
Total directed expenditures	\$5,396,254 (20)	\$6,295,707 (19)	\$5,307,165 (18)	\$7,143,221 (22)	\$6,339,343 (17)	\$7,858,137 (17)	\$10,909,542 (22)

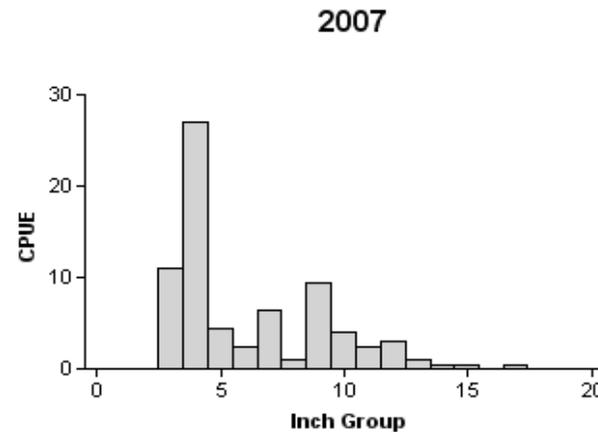
Gizzard shad



Effort = 2.0
 Total CPUE = 110.0 (18; 220)
 Stock CPUE = 91.5 (19; 183)
 PSD = 19 (4)
 IOV = 41 (4.5)



Effort = 2.0
 Total CPUE = 103.0 (12; 206)
 Stock CPUE = 75.5 (15; 151)
 PSD = 25 (9.0)
 IOV = 50 (7.9)

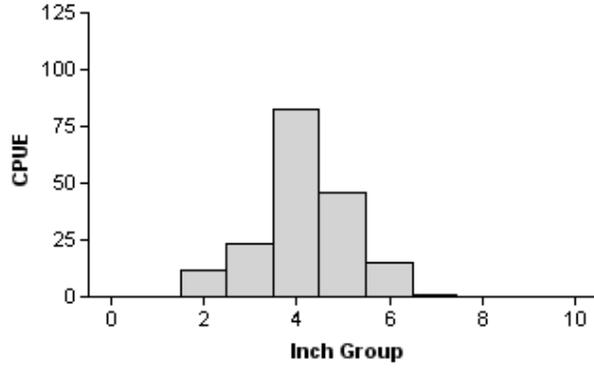


Effort = 2.0
 Total CPUE = 74.0 (44; 148)
 Stock CPUE = 29.0 (20; 58)
 PSD = 28 (6.9)
 IOV = 70 (11.1)

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

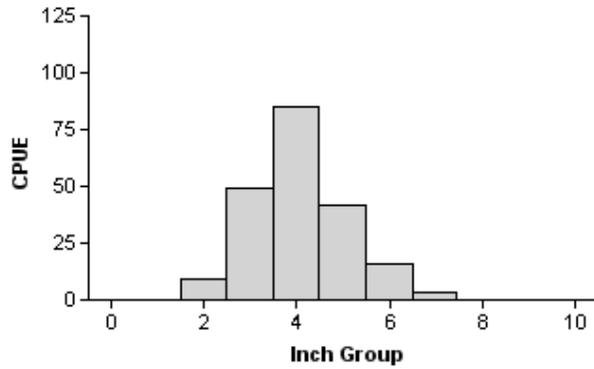
Bluegill

2005



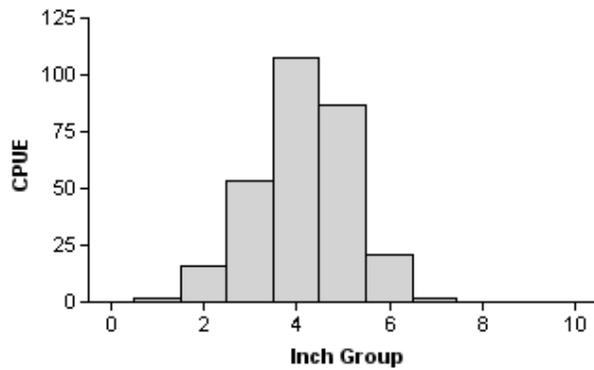
Effort = 2.0
 Total CPUE = 179.0 (21; 358)
 Stock CPUE = 167.5 (21; 335)
 PSD = 10 (2.2)
 RSD-P = 0 (0)

2006



Effort = 2.0
 Total CPUE = 204.0 (14; 408)
 Stock CPUE = 195.0 (14; 390)
 PSD = 10 (1.6)
 RSD-P = 0 (0)

2007



Effort = 2.0
 Total CPUE = 287.5 (12; 575)
 Stock CPUE = 270.0 (13; 540)
 PSD = 8 (1.3)
 RSD-P = 0 (0)

Figure 3. Number of bluegill caught per hour (CPUE, bars), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall electrofishing surveys, Lake Fork Reservoir, Texas, 2005 through 2007.

Redear sunfish

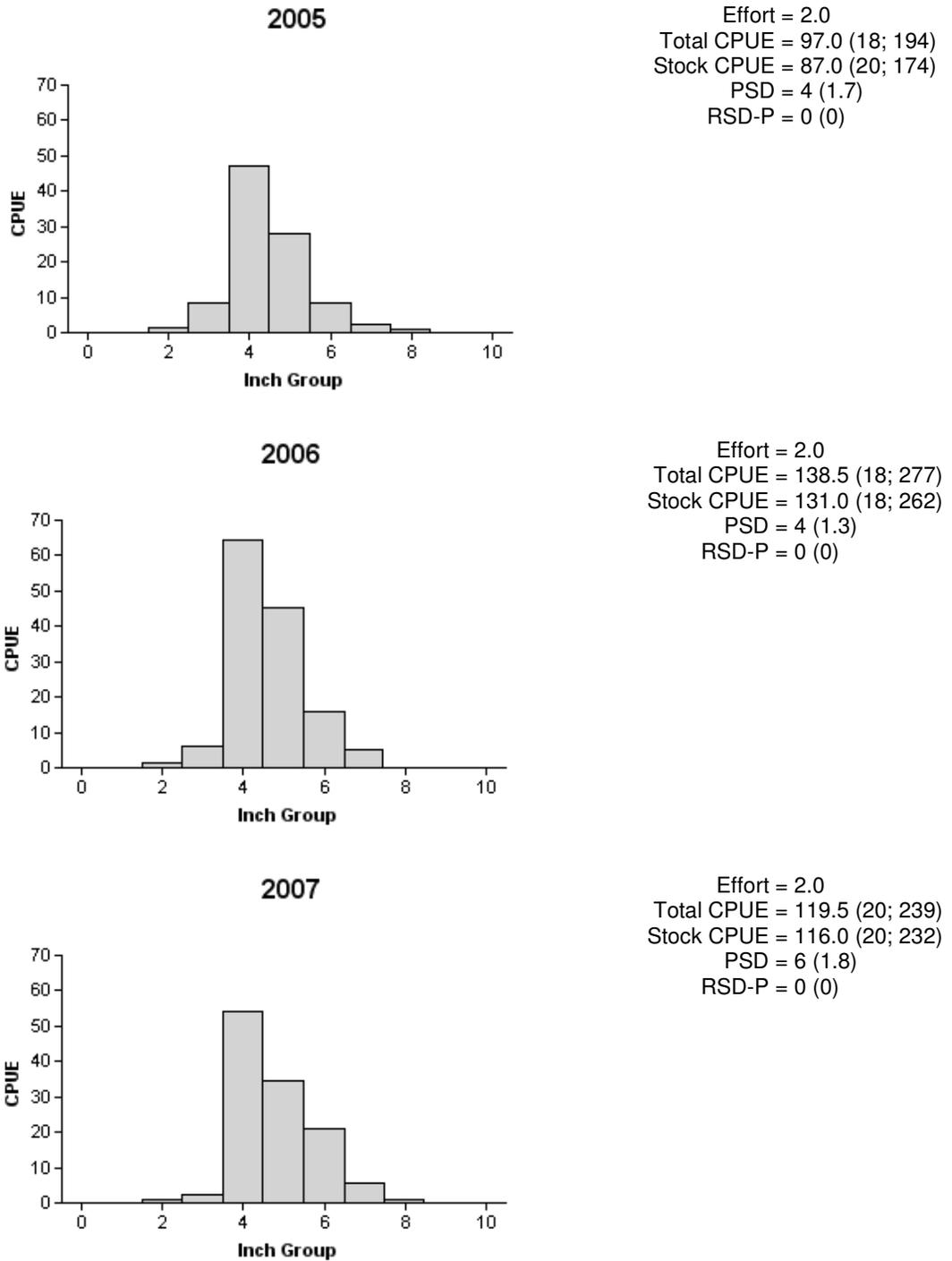
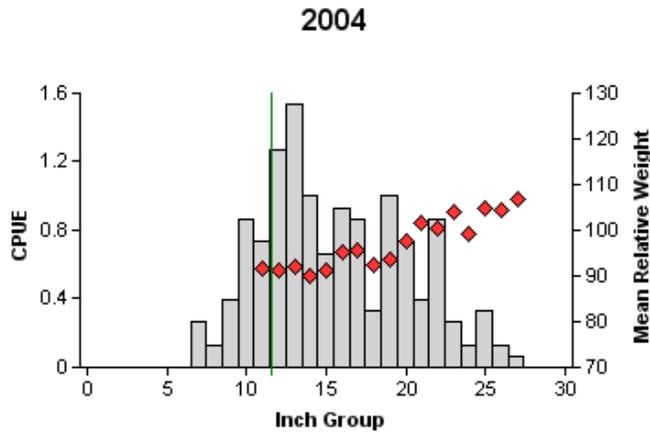
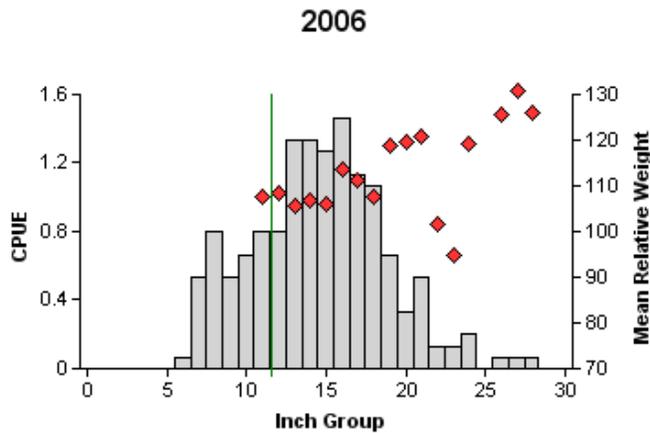


Figure 4. Number of redear sunfish caught per hour (CPUE, bars), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall electrofishing surveys, Lake Fork Reservoir, Texas, 2005 through 2007.

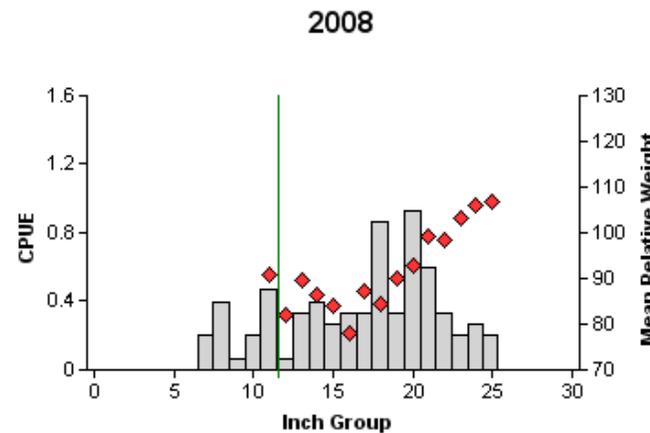
Channel catfish



Effort = 15.0
 Total CPUE = 12.9 (15; 194)
 Stock CPUE = 11.3 (17; 169)
 PSD = 54 (6.8)
 RSD-P = 6 (1.5)



Effort = 15.0
 Total CPUE = 14.0 (17; 210)
 Stock CPUE = 11.4 (18; 171)
 PSD = 51 (4.1)
 RSD-P = 4 (1.2)



Effort = 15.0
 Total CPUE = 6.8 (24; 102)
 Stock CPUE = 5.9 (26; 89)
 PSD = 74 (5.5)
 RSD-P = 8 (3.2)

Figure 5. Number of channel catfish caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for spring gill net surveys, Lake Fork Reservoir, Texas, 2004, 2006, and 2008. Vertical lines indicate minimum length limit at time of survey.

Table 8. Creel survey statistics for catfish (channel, blue, and flathead catfish combined) at Lake Fork Reservoir from June 2001 through May 2002, to June 2007 through May 2008, where total catch per hour is for anglers targeting catfish and total harvest is the estimated number of catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year						
	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Directed effort (h)	47,071 (18)	34,657 (24)	40,809 (19)	37,311 (24)	44,109 (18)	47,663 (18)	34,213 (26)
Directed effort/acre	1.70 (18)	1.25 (24)	1.47 (19)	1.35 (24)	1.62 (18)	1.75 (18)	1.25 (26)
Total catch per hour	0.94 (26)	1.01 (33)	1.44 (24)	1.29 (37)	1.07 (27)	1.34 (24)	1.02 (24)
Catch/acre	3.68 (42)	1.90 (54)	2.87 (25)	2.74 (57)	1.90 (39)	3.21 (37)	3.67 (58)
Harvest per hour	0.53 (27)	0.65 (34)	1.44 (24)	0.84 (38)	0.78 (30)	0.89 (27)	0.86 (26)
Harvest/acre	1.14 (28)	1.30 (33)	1.82 (25)	2.01 (38)	1.14 (23)	2.18 (27)	2.66 (31)
Total harvest	31,534 (28)	36,071 (33)	50,466 (25)	55,691 (38)	31,031 (23)	59,404 (27)	72,585 (31)
Percent legal released	9.8	13.6	28.8	32.1	0.5	20.3	65.8

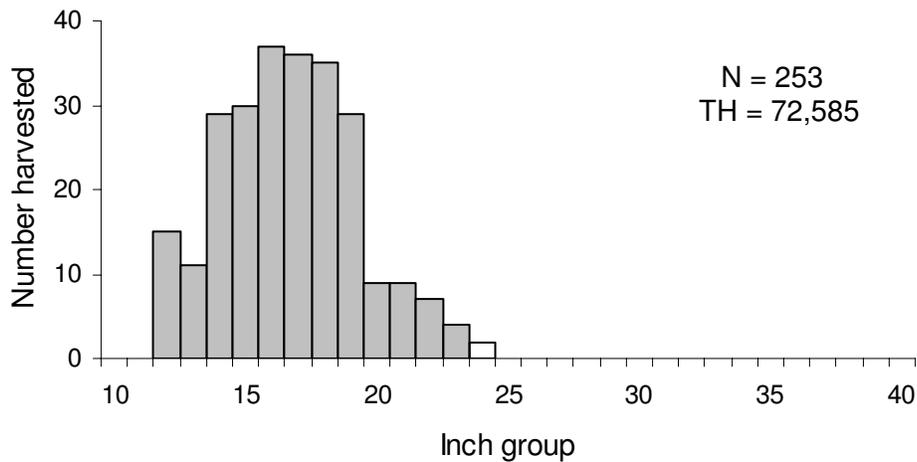


Figure 6. Length frequency of harvested channel catfish observed during creel surveys at Lake Fork Reservoir, Texas, June 2007 through May 2008, all anglers combined. N is the number of harvested channel catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth bass - spring

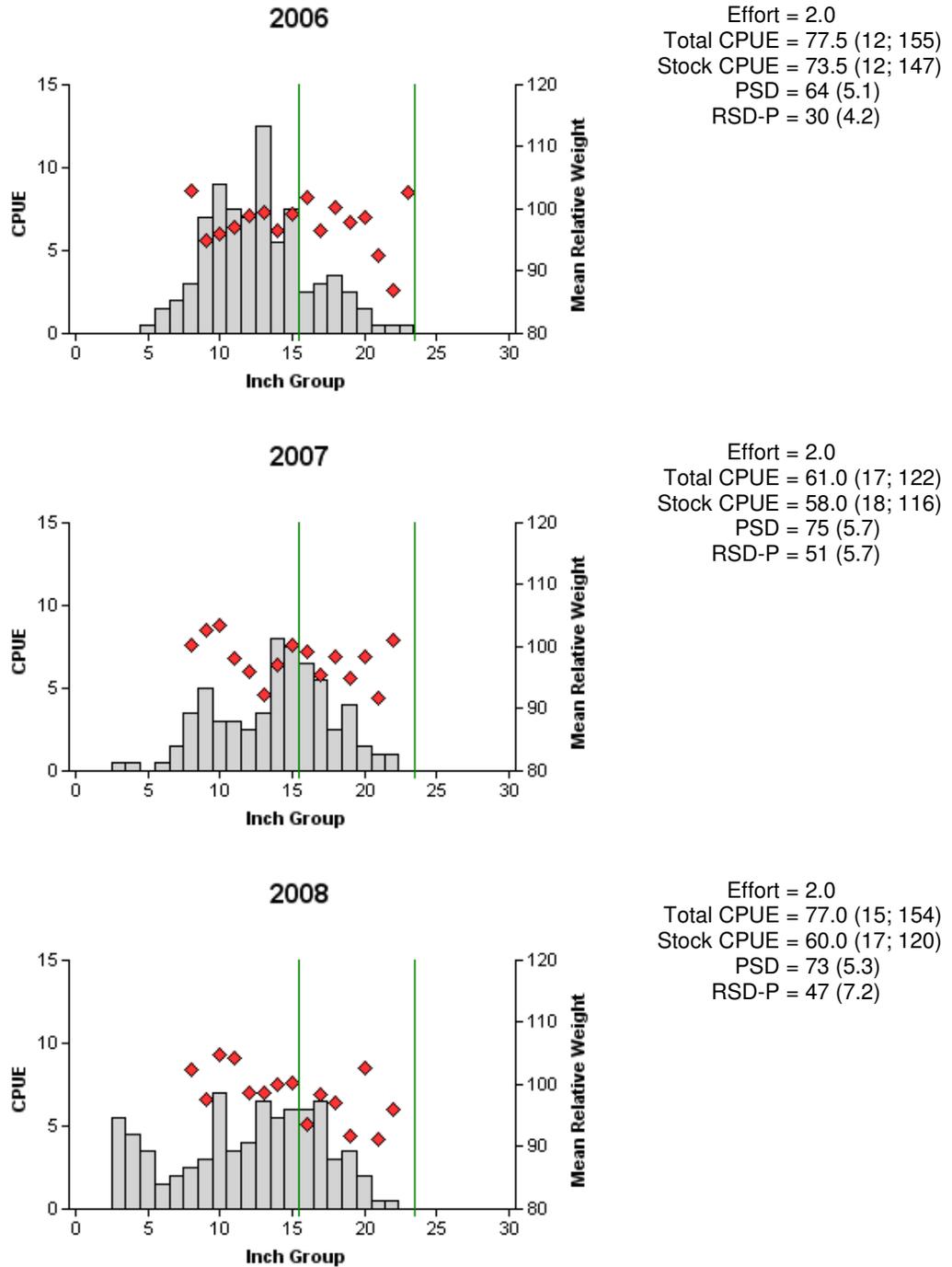


Figure 7. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for spring electrofishing surveys, Lake Fork Reservoir, Texas, 2006 through 2008. Vertical lines indicate the lower and upper bounds of the protected slot length limit at time of survey.

Largemouth bass - fall

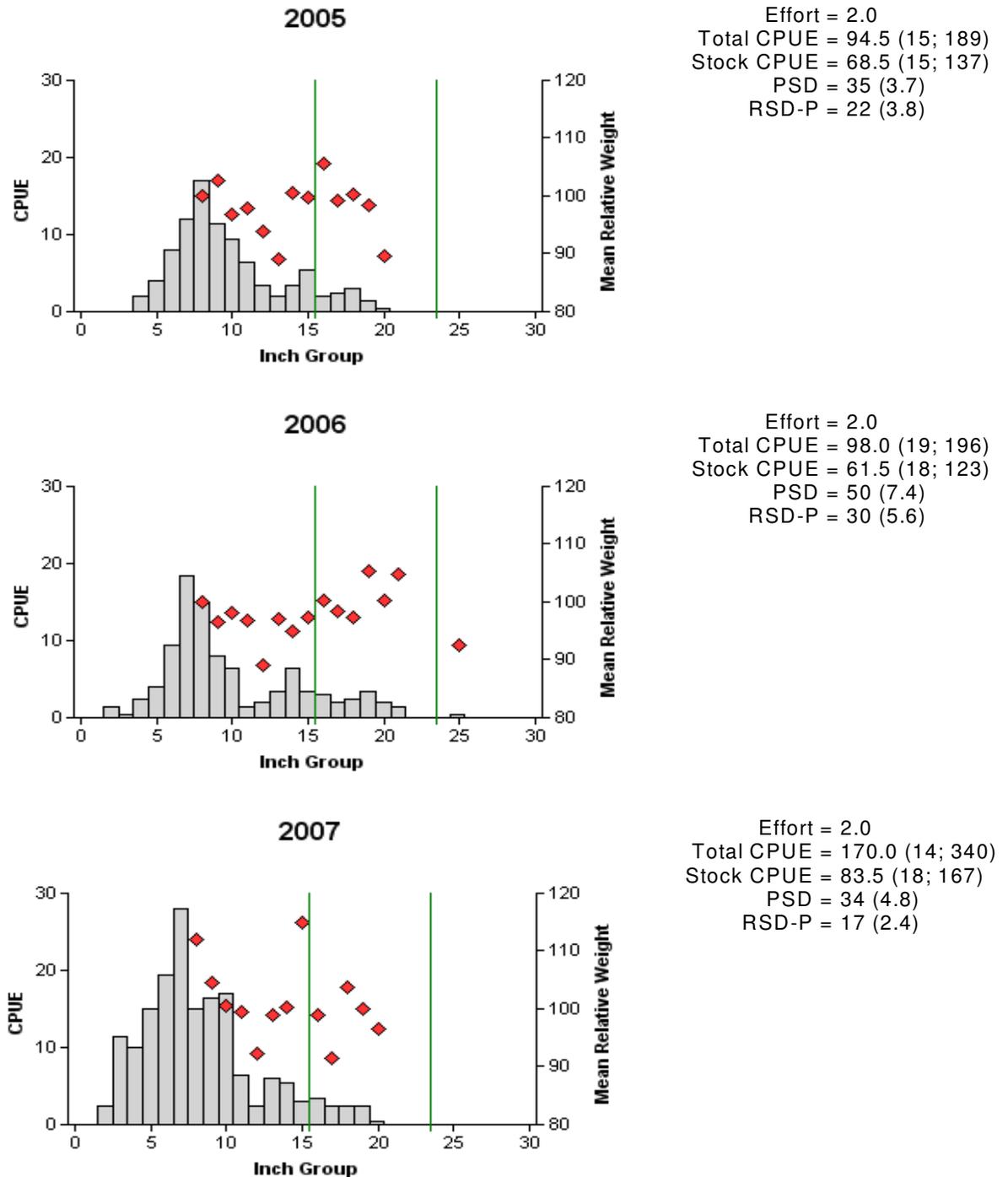


Figure 8. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall electrofishing surveys, Lake Fork Reservoir, Texas, 2005 through 2007. Vertical lines indicate the lower and upper bounds of the protected slot length limit at time of survey.

Table 9. Creel survey statistics for largemouth bass at Lake Fork Reservoir from June 2001 through May 2002, to June 2007 through May 2008, where total catch per hour is for anglers targeting largemouth bass and total harvest is the estimated number of largemouth bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year						
	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Directed effort (h)	418,029 (13)	568,700 (14)	466,640 (12)	612,123 (17)	584,952 (12)	648,899 (13)	737,589 (15)
Directed effort/acre	15.10 (13)	20.54 (14)	16.85 (12)	22.11 (17)	21.46 (12)	23.80 (13)	27.05 (15)
Total catch per hour	0.39 (11)	0.34 (9)	0.36 (9)	0.45 (8)	0.44 (8)	0.40 (8)	0.41 (8)
Catch/acre	6.72 (18)	8.25 (18)	7.40 (15)	11.99 (21)	11.82 (18)	11.54 (17)	17.73 (22)
Harvest* per hour	0.01 (45)	<0.01 (97)	0.01 (60)	0.03 (24)	0.01 (50)	0.02 (25)	0.03 (25)
Harvest*/acre	0.19 (43)	0.11 (49)	0.40 (38)	0.98 (12)	0.20 (27)	0.94 (29)	0.75 (31)
Total harvest*	5,333 (43)	2,925 (49)	11,140 (38)	27,184 (12)	5,346 (27)	25,545 (9)	20,490 (31)
Percent legal released	62.9	58.8	66.0	71.5	58.8	57.3	57.4

*Harvest includes traditional harvest and fish temporarily retained during live release fishing tournaments

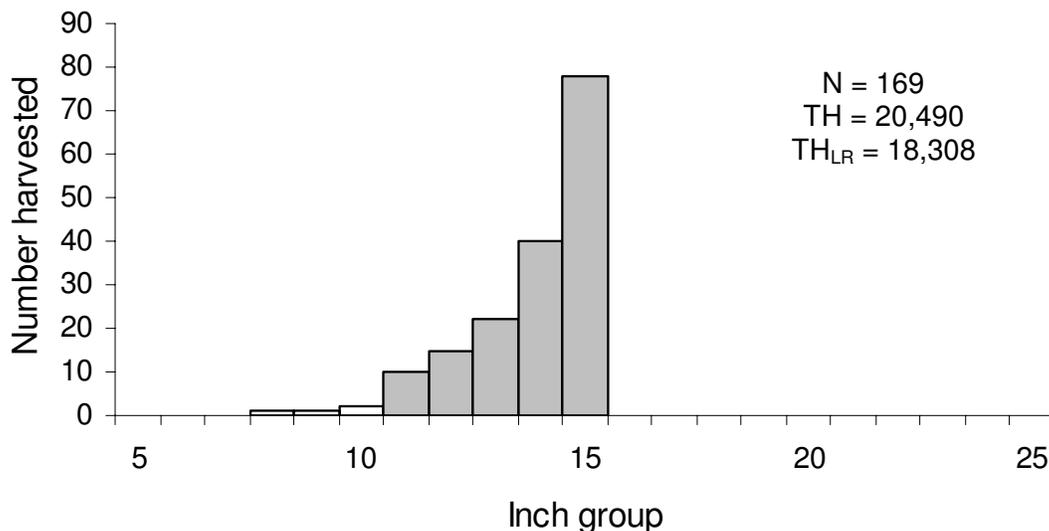


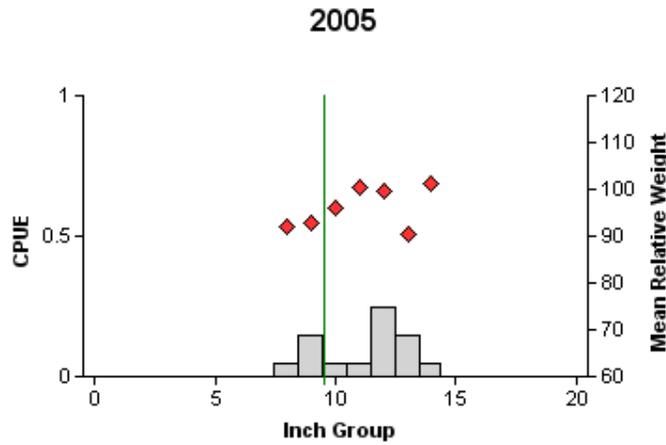
Figure 9. Length frequency of harvested largemouth bass observed during creel surveys at Lake Fork Reservoir, Texas, June 2007 through May 2008, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys which includes fish transported to weigh-ins at live-release tournaments. TH is the total estimated harvest for the creel period and TH_{LR} is the total estimated number of fish retained by anglers participating in live-release tournaments.

Table 10. Results of genetic analysis of Age-0 largemouth bass collected by fall electrofishing, Lake Fork Reservoir, Texas, 1989 through 2006. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation intergrade between an FLMB and an NLMB, Fx = second or higher generation intergrade between an FLMB and an NLMB. Since 2006 analyses have been conducted using DNA microsatellite analysis. Prior to that time starch gel electrophoresis was employed.

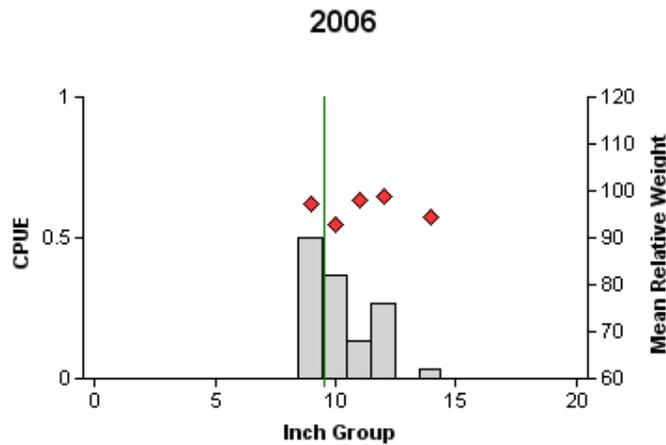
Year	Sample size	Genotype					% FLMB alleles	% pure FLMB
		FLMB	F1	Fx	Combined intergrades	NLMB		
1989	30	2	8	13	21	7	31.7	6.7
1990	30	1	12	15	27	2	44.2	3.3
1991	30	4	5	15	20	4	51.8	13.3
1992	35	3	11	16	27	5	39.3	8.6
1993	35	2	7	18	25	8	33.6	5.7
1994	35	1	3	23	26	8	38.6	2.9
1995	35	0	8	17	25	10	31.4	0.0
1996	35	5	7	19	26	2	53.7	14.3
1997	50	4	12	27	39	6	40.3	8.0
1998	54	1	6	37	43	10	31.9	1.8
1999	35	2	14	10	24	9	34.3	5.7
2000	55	4	15	29	44	7	50.5	7.3
2001	56	3	6	28	34	19	31.9	5.4
2002	50	6	14	28	42	2	58.0	12.0
2003	50	3	33	10	43	4	41.0	6.0
2004	50	2	13	31	44	4	54.0	4.0
2005	59	2	3	51	54	3	43.1	3.0
2006	30	0	^a	^a	30	0	48.0	0.0
2007	30	0	^a	^a	30	0	53.4	0.0

^aAnalysis no longer separates F1 from Fx hybrids

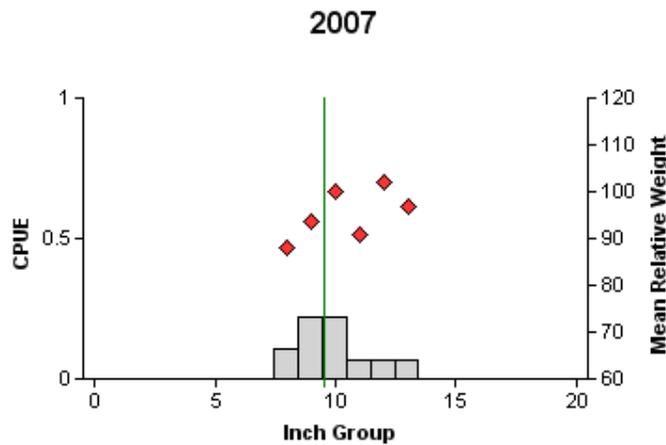
White crappie



Effort = 20.0
 Total CPUE = 0.8 (42; 15)
 Stock CPUE = 0.8 (42; 15)
 PSD = 100 (0)
 RSD-P = 73 (9.3)



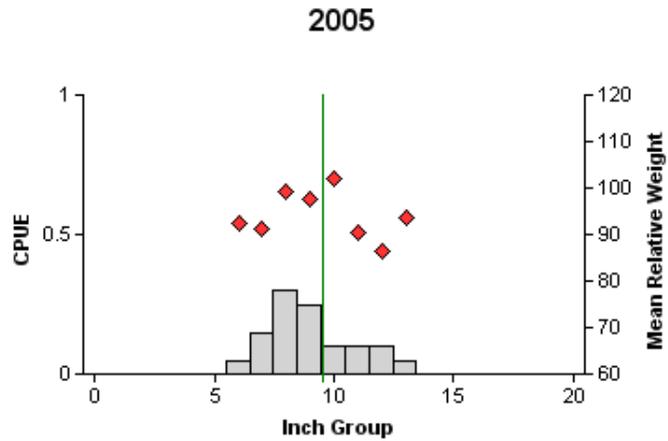
Effort = 30.0
 Total CPUE = 1.3 (68; 39)
 Stock CPUE = 1.3 (68; 39)
 PSD = 100 (0.0)
 RSD-P = 62 (4.2)



Effort = 46.0
 Total CPUE = 0.7 (41; 34)
 Stock CPUE = 0.7 (41; 34)
 PSD = 100 (0)
 RSD-P = 56 (6.1)

Figure 10. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall trap net surveys, Lake Fork Reservoir, Texas, 2005 to 2007. Vertical lines indicate minimum length limit at time of survey.

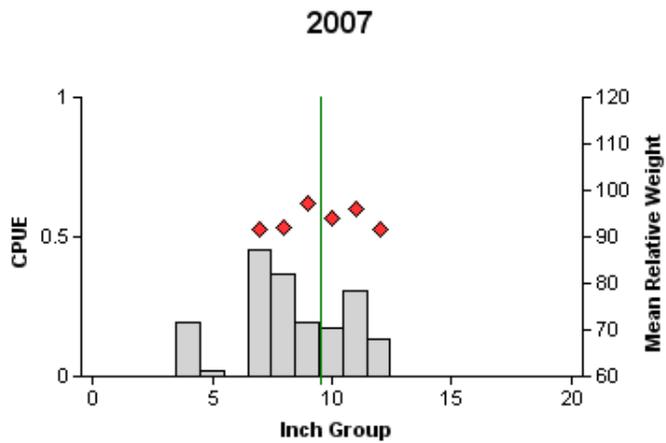
Black crappie



Effort = 20.0
 Total CPUE = 1.1 (30; 22)
 Stock CPUE = 1.1 (30; 22)
 PSD = 82 (11.1)
 RSD-P = 32 (13.4)



Effort = 30.0
 Total CPUE = 0.2 (56; 5)
 Stock CPUE = 0.1 (68; 4)
 PSD = 100 (0.0)
 RSD-P = 0 (0)



Effort = 46.0
 Total CPUE = 1.8 (40; 85)
 Stock CPUE = 1.7 (43; 76)
 PSD = 71 (4.5)
 RSD-P = 37 (4.8)

Figure 11. Number of black crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall trap net surveys, Lake Fork Reservoir, Texas, 2005 to 2007. Vertical lines indicate minimum length limit at time of survey.

Table 11. Creel survey statistics for crappie (white and black combined) at Lake Fork Reservoir from June 2001 through May 2002, to June 2007 through May 2008, where total catch per hour is for anglers targeting 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						
	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Directed effort (h)	191,410 (13)	143,115 (13)	135,708 (13)	130,894 (18)	88,012 (14)	101,904 (13)	97,518 (16)
Directed effort/acre	6.91 (13)	5.17 (13)	4.90 (13)	4.73 (18)	3.23 (14)	3.74 (13)	3.58 (16)
Total catch per hour	2.66 (15)	2.37 (20)	2.17 (16)	2.03 (19)	1.62 (20)	1.69 (24)	1.86 (27)
Catch/acre	19.21 (21)	14.95 (22)	11.65 (21)	11.05 (29)	5.49 (17)	10.96 (31)	11.45 (35)
Harvest per hour	1.07 (14)	0.80 (21)	0.93 (18)	0.64 (21)	0.44 (28)	0.68 (24)	0.82 (27)
Harvest/acre	7.08 (24)	5.92 (28)	4.84 (26)	4.22 (41)	1.36 (31)	6.34 (40)	4.78 (32)
Total harvest	196,042 (24)	163,921 (28)	134,060 (26)	116,857 (41)	37,020 (31)	172,981 (40)	130,368 (32)
Percent legal released	5.1	3.5	3.6	2.0	5.4	5.1	7.3

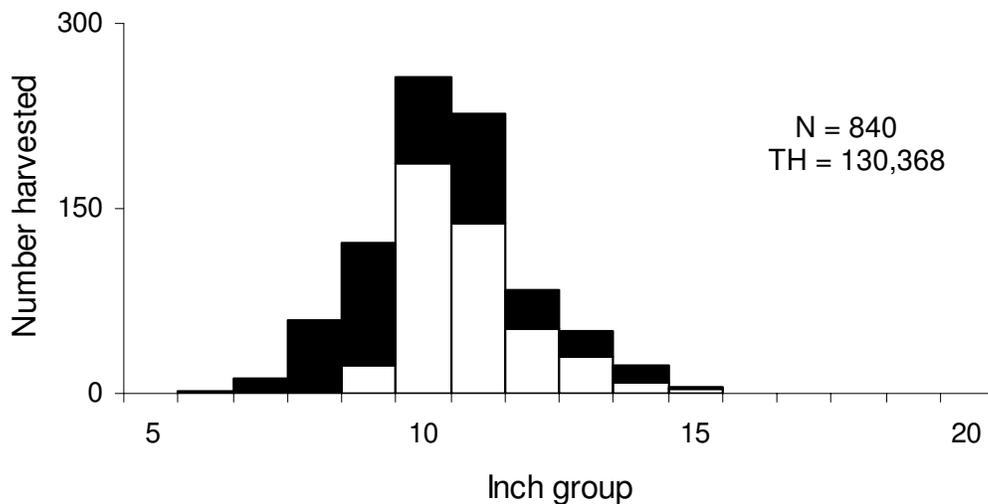


Figure 12. Length frequency of harvested crappie (white and black combined) observed during creel surveys at Lake Fork Reservoir, Texas, June 2007 through May 2008, all anglers combined. Open bars represent crappie caught in summer, fall and spring quarters and black bars represent crappie caught in winter quarter (December to February). N is the number of harvested crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 12. Proposed sampling schedule for Lake Fork 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.

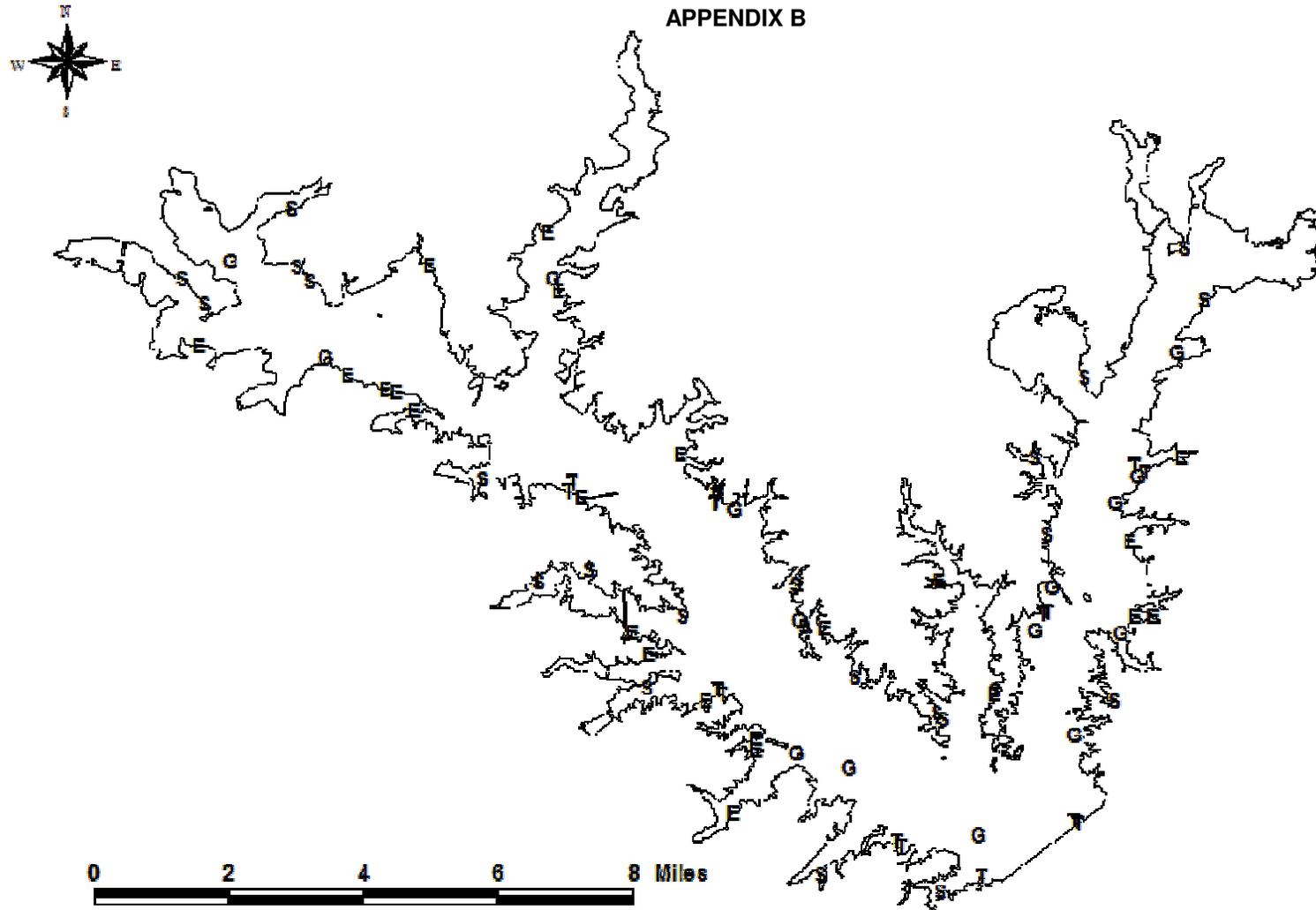
Survey Year	Electrofishing Spring	Electrofishing Fall	Gill netting	Creel survey	Vegetation survey	Habitat survey	Report
Summer 2008-Spring 2009	A	A		S	A		A
Summer 2009-Spring 2010	A	A		S	A		A
Summer 2010-Spring 2011	A	A		S	A		A
Summer 2011-Spring 2012	A	S	S	S	S	S	S

APPENDIX A

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

Species	Fall electrofishing		Fall trap netting		Spring electrofishing		Spring gillnet	
	N	CPUE	N	CPUE	N	CPUE	N	CPUE
Gizzard shad	148	74.0						
Threadfin shad	90	45.0						
Channel catfish							34	6.8
White bass							3	0.2
Warmouth	3	1.5						
Bluegill	575	287.5						
Longear sunfish	90	45.0						
Redear sunfish	239	119.5						
Largemouth bass	340	170.0			154	77.0		
White crappie			39	0.7				
Black crappie			5	1.8				

APPENDIX B



Location of fall electrofishing (E), trap netting (T), spring electrofishing (S) and spring gill netting (G) sites, Lake Fork Reservoir, Texas, 2007-2008.

Appendix C

Waterhyacinth and hydrilla surface area coverage (acres) at Lake Fork, Texas, estimated in summer (August or September) for various years.

Species	Year										
	1996	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Waterhyacinth	40	125	7	130	50	6	3	49	74	10	12
Hydrilla	3,900	4,750	3,027	N/A	98	873	1,773	3,701	1,414	1,047	417

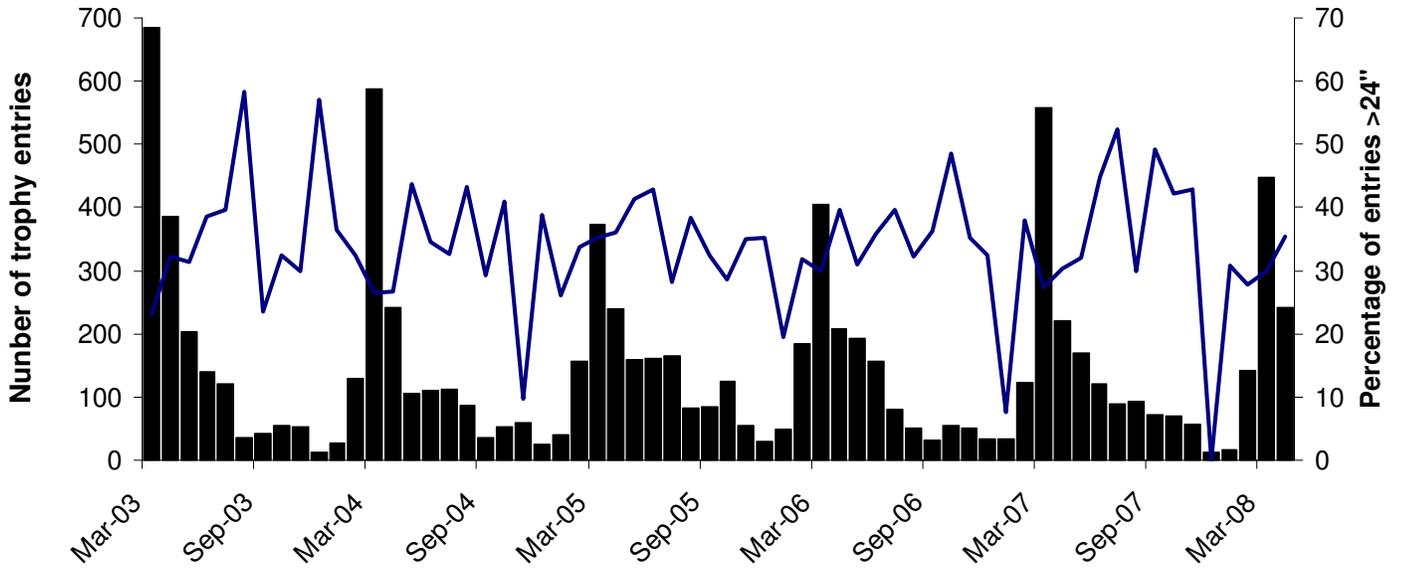
Appendix D

Water body records, all tackle category, for Lake Fork as of 6/2/2008

Species	Weight (lbs)	Length (inches)	Date certified	Gear
Bass, hybrid yellow ^a	4.75	19.00	3/12/2005	Rod & reel
Bass, largemouth ^a	18.18	25.50	1/24/1992	Rod & reel
Bass, spotted	3.03	17.00	9/13/2007	Rod & reel
Bass, white	3.97	18.25	2/8/2006	Rod & reel
Bass, yellow	1.37	12.25	11/19/1997	Rod & reel
Bluegill	1.61	11.50	7/9/1995	Rod & reel
Bowfin ^a	17.65	36.50	2/21/1993	Rod & reel
Buffalo, bigmouth	36.00	33.50	10/19/1997	Rod & reel
Buffalo, smallmouth	57.75	-	11/8/2007	Rod & reel
Bullhead, black	2.48	16.25	2/1/1995	Cane Pole
Bullhead, yellow ^a	3.20	16.25	3/22/1997	Rod & reel
Carp, common	36.50	36.50	4/10/1999	Trotline
Catfish, blue	89.00	49.25	3/1/2002	Trotline
Catfish, channel	25.33	35.50	5/9/2007	Trotline
Catfish, flathead	100.00	55.00	4/27/2007	Trotline
Crappie, black ^a	3.92	18.50	4/27/2003	Rod & reel
Crappie, white	3.19	17.00	2/5/1993	Rod & reel
Drum, freshwater	14.01	27.50	6/24/1995	Rod & reel
Gar, longnose	6.40	33.50	4/18/1993	Trotline
Gar, spotted	10.31	39.00	4/19/2003	Bow & arrow
Sunfish, hybrid	0.23	6.65	9/14/1999	Fly rod
Sunfish, longear ^a	0.48	7.50	6/1/1998	Rod & reel
Sunfish, orangespotted ^a	0.18	6.00	11/26/2005	Rod & reel
Sunfish, redear	1.27	12.75	6/2/1995	Rod & reel
Warmouth	0.84	9.5	5/16/2004	Rod & reel

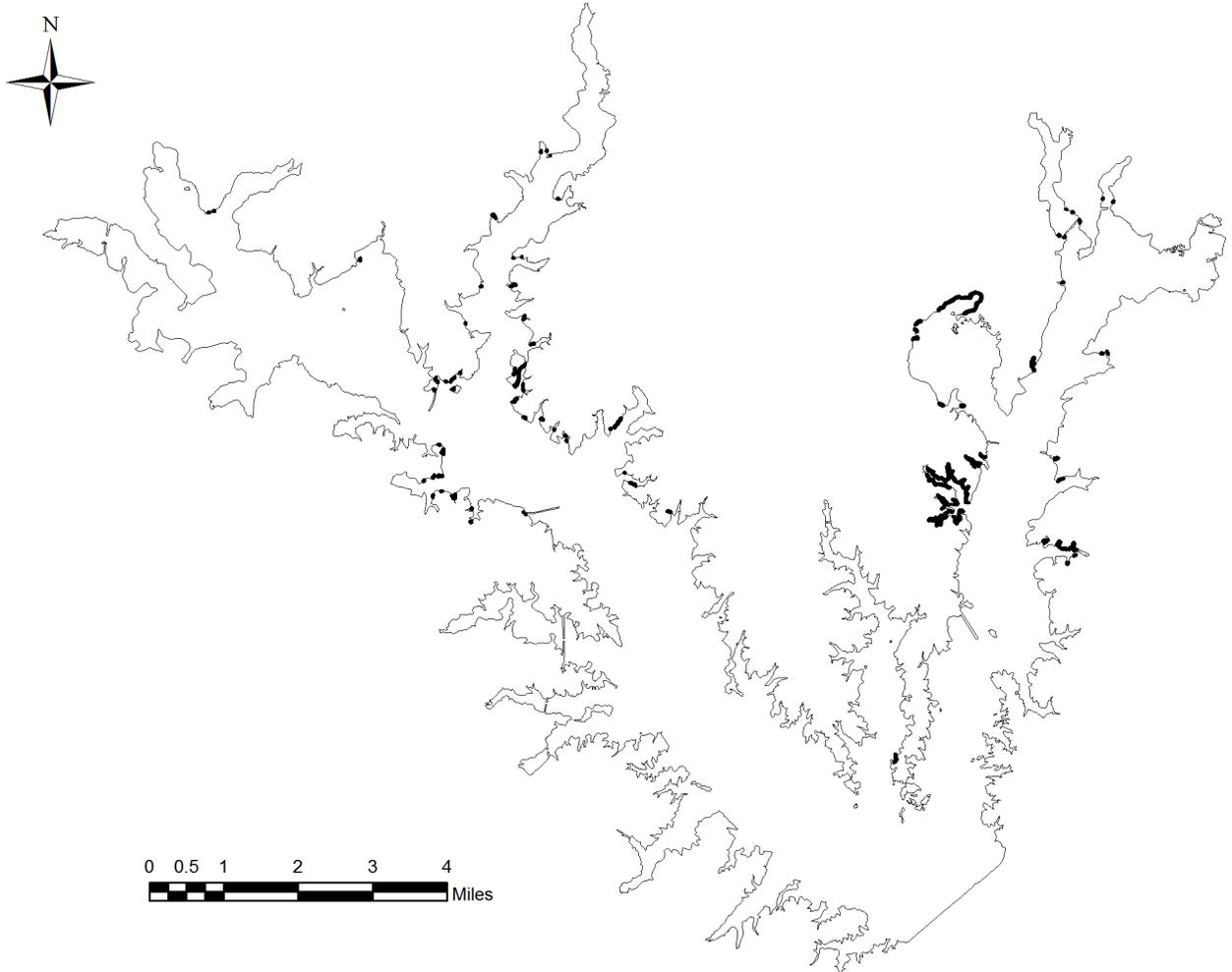
^aState record

Appendix E



Monthly total numbers of largemouth bass entries reported (solid bars) in the Lake Fork Trophy Bass Survey, March 2003 – April 2008, and percentage of monthly entries that were ≥ 24 inches (line). Numbers represent combined weighed and estimated entries.

Appendix F



Distribution of waterhyacinth in Lake Fork, August 2007. Total coverage was estimated to be 12.2 acres.