PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-2

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2011 Survey Report

**Lake Fork Reservoir**

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Fork Reservoir were surveyed in 2011 and 2012 using electrofishing. Anglers were surveyed with an access point creel survey. Vegetation and habitat surveys were not conducted during the review period because of record-low reservoir water elevations. 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 and approximately 70 miles east of Dallas, Texas.

- **Management history:** Important sport fishes include largemouth bass, crappie (white and black), and channel catfish. The management plan from the 2010 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, an access creel survey, and the Lake Fork Trophy Bass Survey. Water hyacinth abundance and distribution has been monitored in the past through annual vegetation surveys although low reservoir water elevations in 2011 made this impractical.

- **Fish community**
  - **Prey species:** Abundant shad (threadfin and gizzard) and moderate sunfish populations provided the basis for prey populations for largemouth bass and crappie. The majority of shad species were available as prey for adult largemouth bass. The majority of bluegill collected in 2011 were less than five inches in length, a suitable prey size for most size classes of largemouth bass.

  - **Catfishes:** Catfish accounted for between 4- 5% of total angler effort. Channel catfish were the only species encountered in sampling although flathead catfish, blue catfish, and yellow bullheads are also present. Total catch per hour in the creel survey was consistent from 2010-2011 (1.91/h) to 2011-2012 (1.98/h) and harvest rate increased from 0.79/h to 1.36/h during the two most recent survey years. The majority of channel catfish collected in gill nets were greater than 12 inches in length.

  - **Temperate basses:** White bass, yellow bass, white x yellow bass hybrids, and palmetto bass were all present in the reservoir. According to anglers, the white bass population has become more abundant. Creel and gill net surveys also indicated evidence of increased abundance. Harvest of yellow bass was also observed during creel surveys.

  - **Largemouth bass:** Largemouth bass are the most popular game fish in Lake Fork, accounting for between 73% and 81% of total angler effort in the last two survey years. Relative proportions of size groups remained consistent in fall and spring samples. Angler catch rate in 2010-2011 (0.91/h) was highest of any year in the review, declined in the following year (0.59/h) but remained higher than the range of 0.40-0.45/h observed in most years.

  - **Crappie:** Directed angler effort for crappie was second in importance and accounted for between 11% and 18% of total directed effort in the last two survey years. Black crappie accounted for an average of 80% of all harvested crappie observed between June 2010 and May 2012.

- **Management strategies:** Annual actions include: stocking FLMB, spring and fall electrofishing for largemouth bass population assessment, an access point creel survey to monitor angler effort, catch, and harvest rates, annual vegetation surveys of water hyacinth distribution and abundance, and promotion of the Lake Fork Trophy Bass Survey. In addition, the water hyacinth management plan will be used to guide treatment activities.

# INTRODUCTION

This document is a summary of fisheries data collected from Lake Fork Reservoir June 2011 through May 2012. The purpose of the document is to provide a biennial update to fisheries information contained in a more comprehensive report composed every four years, most recently completed in July 2010 (Storey and Jubar 2010). While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Relevant historical data are presented for comparison.

*Reservoir Description*

Lake Fork Reservoir is a 27,264-acre reservoir impounded in 1980 on Lake Fork Creek and Caney Creek. 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 55.4 µg/L (Texas Commission on Environmental Quality 2011). Descriptions of fisheries habitat features (e.g., structural and aquatic vegetation) and angler access were described in a previous report (Storey and Jubar 2008). Vegetation and habitat surveys were not conducted in 2011 because of low lake elevations. Monthly average water levels declined from May 2010 through November 2011 to set an all-time record of 7.8 ft below conservation pool elevation (CPE) (Figure 1). 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 2010) included:

1. Management of largemouth bass fishery.
   **Actions:**
   - Florida largemouth bass fingerlings were stocked (FLMB) in 2010 (515,444), 2011 (724,921) and 2012 (520,243).
   - Conducted genetic analysis on sample of largemouth bass collected during fall electrofishing; 53% FLMB allele composition, all fish in sample were second or higher generation intergrades (Fx) between FLMB and northern largemouth bass (NLMB).
   - Conducted electrofishing sampling in fall 2010 and 2011 and spring 2012 to monitor abundance, size distribution, and condition of largemouth bass, and abundance and size distribution of prey species.
   - Conducted access point creel surveys from June 1, 2010 to May 31, 2012 to estimate angler catch, harvest rates, and fishing effort.
   - Updated time period probabilities and ramp probabilities for Lake Fork using angler count data from creel surveys from June 2001 through May 2011.
   - Continued to monitor angler catches of trophy bass ≥ 24 inches and/or 7 pounds through the Lake Fork Trophy Bass Survey.
   - Communicated proper handling techniques for large bass through posting of information at display boards at boat ramps and in fishery-related businesses at Lake Fork.

2. Management of invasive aquatic plants.
   **Actions:**
   - Aquatic vegetation surveys and post-treatment surveys were not conducted in 2011 because the lake elevation was 7.5 feet below conservation pool elevation and any existing native and invasive aquatic vegetation was exposed on the shoreline. A rapid assessment was done in May 2012 to monitor the re-emergence of water hyacinth at sites which had historically been problematic and in areas where anglers

had reported observing the plant.

- Spray contractors treated 318.5 acres of water hyacinth and alligatorweed using 2,4-D on Lake Fork between June and August 2010.
- 6,000 alligatorweed fleabeetles acquired from the Jacksonville District, US Army Corps of Engineers Invasive Species Management Branch were released in June 2010 at 10 sites on Lake Fork. Follow-up inspections did not show any noticeable impact on alligatorweed colonies.
- A total of 18 aquatic vegetation treatment proposals were approved in 2010 for property owners at Lake Fork to treat problematic vegetation. No proposals were received in 2011. The primary plants targeted were alligatorweed and water hyacinth.
- Staff continued to post materials regarding invasive aquatic plants at area boat ramps and local businesses at Lake Fork.

3. Lake Fork Trophy Bass Survey

**Actions:**

- Continued to promote the Lake Fork Trophy Bass Survey. During the review period a total of 1,265 trophy largemouth bass were entered into the survey. To date 12,347 trophies have been submitted.
- Summaries of catches were provided to participating marinas and outdoor media. A decision was made to decrease the frequency of summaries sent to outdoor writers. Releases will be sent to them on a quarterly basis.
- Staff continued to promote the program by displaying laminated posters at participating marinas and at public and private boat ramps.
- District staff recognized the work of participating marinas by presenting them with certificates of appreciation.

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

**Actions:**

- District staff provided laminated posters detailing fisheries regulations to local fishing-related businesses for display in stores and at boat ramps.
- Staff co-sponsored “State of the Lake” meeting in February 2010 with the Wood County Industrial Commission to provide a status report on Lake Fork to interested parties.
- Staff continued to provide news releases promoting fisheries resources of Lake Fork. Biologist Jubar submitted monthly articles to “The Fisherman’s News”.
- Staff continued to provide information on Lake Fork facilities to interested anglers.

**Harvest regulation history:** Sport fishes in Lake Fork Reservoir are managed with statewide regulations with the exception of largemouth bass and crappie (Table 2). A detailed harvest regulation history was provided in a previous report (Storey and Jubar 2008).

**Stocking history:** Lake Fork Reservoir has a long history of FLMB stockings. Other species (e.g., spotted bass, channel catfish, blue catfish, flathead catfish, bluegill, and redear sunfish) were stocked on one to four occasions prior to 1985. A detailed stocking history is provided in Table 3.

**Vegetation/habitat history:** Lake Fork Reservoir normally supports a diverse mix of aquatic vegetation species, including invasive species such as hydrilla, Eurasian watermilfoil, water hyacinth, and alligatorweed. To date, hydrilla and Eurasian watermilfoil have not created any problems in the reservoir. A detailed aquatic vegetation history was conducted in 2009 (Storey and Jubar 2010). A total area of 318.5 acres of water hyacinth and alligatorweed was treated using 2,4-D herbicide in summer 2010. This treatment was followed by a cold winter, a prolonged drought, and unseasonably hot weather which combined to limit the spread of invasive aquatic vegetation.

**Water transfer:** Lake Fork is primarily used for municipal water supply, recreation, and to a lesser extent, flood control. The following entities withdraw water directly from the reservoir; Dallas Water Utilities, City of Quitman, and Bright Star Salem Supply Corporation. In addition, contracts exist with the cities of Henderson, Kilgore, Longview and Texas Eastman for municipal withdrawal downstream in the Sabine River.

## METHODS

Fishes were collected by electrofishing (2 hours at 24, 5-min stations) in fall 2010 and 2011, and spring 2012, and gill netting (15 net nights at 15 stations) in spring 2012. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and for gill nets as the number of fish caught per net night (fish/nn). Survey sites were randomly selected. An access point angler creel survey consisting of 36 survey days per year (4 weekdays, 5 weekend days per quarter from June 2010 through May 2012) was conducted to estimate angler catch, harvest rates and angling effort in accordance with Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], 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 x [SE of the estimate / estimate]) was calculated for all CPUE statistics and for creel statistics and SE was calculated for structural indices and IOV.

Ages were determined for channel catfish (N = 12) and white bass (N = 5) using otoliths. An insufficient sample size of largemouth bass was collected for meaningful age and growth analysis. A sample of 30 largemouth bass were collected by electrofishing from a range of age classes in fall 2011 and subjected to genetic analysis using DNA microsatellite analysis in accordance with Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2011).

The Lake Fork Trophy Bass Survey was continued using methods described in Storey and Jubar (2008).

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

## RESULTS AND DISCUSSION

**Habitat:** Reservoir water elevations declined from May 2010 through November 2011 as a result of drought conditions and unseasonably hot weather and set an all-time record of 7.78 ft below CPE (Figure 1). Water hyacinth distribution and coverage decreased as a result of herbicide application from June to August 2010, as well as two successive unseasonably cold winters and a prolonged drought that persisted through 2011. In spring 2012, as a result of increased water levels and higher water temperatures, water hyacinth plants started to germinate. Volunteers from the Lake Fork Sportsman's Association (LFSA) and Texas Parks and Wildlife staff planted 1,000 bare-root buttonbush plants in March 2011 and an additional 400, 2-year-old plants in November 2011 to enhance aquatic habitat in Lake Fork. Survival of bare-root plants was low and the performance of the 2-year old plants was variable. Plants in the lower Caney Creek area survived poorly as a result of a combination of factors including disturbance by feral hogs and beaver, and poor site selection. Plants located in the Glade Creek area grew well and responded favorably to increasing reservoir water elevation.

**Creel:** Directed fishing effort for largemouth bass remained highest (81-73%) compared to other species (Table 4). Directed effort for crappie varied (11-18%) but remained second in importance at Lake Fork

(Table 4). Catfish was third in importance, comprising 4-5% of total directed effort. Total fishing effort for all species declined in 2010-2011 (588,692 h) but increased slightly in the following year to 602,127 h (Table 5). Total directed expenditures for the last three years have remained in the range of $7.1 million to $7.6 million.

**Prey species:** Lake Fork contained abundant clupeid and sunfish populations. Catch rate of gizzard shad in fall electrofishing in 2011 (224.5/h) was higher than in previous years and the index of vulnerability (IOV) indicated 83% of gizzard shad were available to most existing predators (Figure 2). Threadfin shad (28.5/h) also provided prey for sport fishes (Appendix A). Catch rate of bluegill in fall 2011 was low because aquatic habitat at the time of sampling was limited due to low reservoir water elevation. The majority of bluegill collected in 2009 and 2010 were 4 inches or less in length, a suitable prey size for adult largemouth bass (Figure 3). Electrofishing catch rate of redear sunfish in 2011 (31.0/h) was also low due to lack of aquatic habitat at the time of sampling (Figure 4). Few sunfish were observed in the creel survey. Good relative weights observed in largemouth bass confirm sufficient availability of prey species in Lake Fork (Figure 9 and Figure 10).

**Channel catfish:** The channel catfish population is of high abundance and dominated by fish of legally-harvestable size. CPUE in 2012 (9.4/nn) was higher than in 2008 (6.8/nn) but lower than in 2004 (12.9/nn). Catfish remained the third most popular group in terms of directed angler effort, accounting for 4% of total effort in 2010-2011 and 5% in 2011-2012. Directed fishing effort in 2011 to 2012 (31,262 h) increased from the previous year (23,225 h) and was at a similar intensity as observed between 2007 and 2010 (Table 6). Total catch rate was similar for the past two years (1.91/h and 1.98/h) (Table 6). Estimated harvest of catfish in 2010-2011 (52,678) declined from the previous year (68,724) but increased in 2011- 2012 (62,873). Harvest rate in 2011-2012 (1.36/h) was the highest of the seven years of creel data reviewed in Table 6. Anglers harvested between 88-92% of the catfish caught in the last two years, and between 22-70% of released fish in 2010-2012 were legal-sized fish. Harvested fish ranged in length from 9 to 26 inches in the two years of this review (Figure 6). Growth rate of channel catfish in Lake Fork was good; average age of 12-inch fish (mean = 12.4 inches; range = 11.2 - 13.0 inches) was 2.8 years (N = 12; range = 2 – 4 years).

**Temperate basses:** White bass, yellow bass, white x yellow bass hybrids, and palmetto bass were present in the reservoir. Population characteristics of temperate basses were described in a previous report (Storey and Jubar 2008). Anglers report catches of white bass with increased frequency. Gill net sampling (Figure 7) and creel surveys (Figure 8) show evidence of increase although numbers are still relatively low. In the 2011-2012 creel survey, white bass angling accounted for 0.4% of total directed effort. Growth rate of white bass in Lake Fork was fast; all fish aged were 2 years old and averaged 13.6 inches in length (range = 13.0 – 14.2 inches). The white bass population does not exhibit consistent recruitment, as all fish collected by gill netting in 2012 were from the 2010 year class.

**Largemouth bass:** Population size structure of largemouth bass remained stable with PSD in fall samples ranging from 48 to 55 (Figure 9) and spring sample estimates ranging from 75 to 79 (Figure 10) during the past three electrofishing surveys. Electrofishing catch rate was depressed in fall 2010 and 2011 (Figure 9) as a result of poor habitat conditions due to low reservoir water elevations. During spring 2012 sampling, the reservoir water elevation had increased by approximately 5 feet which improved habitat and catch rate. Mean relative weights of most sizes of fish within the protected slot limit were above 90 in both spring and fall (Figure 9 and Figure 10).

Directed angler effort for largemouth bass at Lake Fork has decreased for the past three years but this species continues to dominate the fishery and it remains a high pressure fishery (Table 7). The decline in effort during 2011-2012 was likely influenced by the extended drought that affected the area. Catch rate for anglers targeting largemouth bass during 2010-2011 (0.91/h) was the highest recorded in the review period which extends back to 2005-2006 (Table 7). In 2010-2011, largemouth bass harvest rate was 0.09/h but it declined to 0.03/h in the following year.

Live-release tournaments contributed the majority of largemouth bass harvest observed in creel surveys and accounted for 82 to 96% of the fish observed in the last seven years (Table 7). Fishing effort by tournament participants in 2010-2011 (34%) was equal to the effort observed in 2008-2009 and represented the highest level observed in the past seven years. Live-release tournament effort in 2011-2012 declined to 13% of total directed effort for largemouth bass.

Standard fisheries sampling methods do not effectively sample fish longer than the upper end of the 16- to 24-inch slot-length limit, making evaluation of the regulation difficult. Catch rate of largemouth bass ≥24 inches reported in creel surveys by largemouth bass anglers was low (0.006/h) The Lake Fork Trophy Bass Survey (Appendix D) has provided an alternative method of collecting data on trophy-sized fish and it provides evidence that the slot limit is providing anglers the opportunity to catch large numbers of fish over 24 inches. Annual entries in the survey have declined over time but the annual percentage of fish ≥24 inches has increased over the history of the survey. This trend suggests the annual decrease in entries is as a result of decreased angler participation and not from a decrease in fishing quality. The has decreased slightly. Between June 2010 and May 2012, 1,265 trophy largemouth bass (≥7 pounds and/or ≥ 24 inches) were entered into the survey. A total of 12,347 largemouth bass have been reported to date (March 2003 through May 2010) by anglers from 46 states, the District of Colombia and APO addresses. Anglers measured 64.8% of their entries, and 34.2% of these were ≥24 inches. Fish in the 22- and 23-inch classes were most abundant of the measured entries, representing 27.1% and 31.8% of the total, respectively. Anglers weighed 83.6% of their entries, and of these fish, 15.6% were ≥10 pounds. By far, the vast majority of entries were 7-pound (40.4%) and 8-pound fish (29.5%). The top 5 states contributing reporting anglers were Texas (63.0%), Oklahoma (6.9%), Missouri (5.7%), Louisiana (4.9%), and Arkansas (3.8%). With the exception of 2010, more trophy fish catches were reported in March than in any other month.

In 2009, FLMB allele frequency was 53.0%, within the range observed since 1989 (32–58%) (Table 8). No pure Florida bass were observed in the sample, and all of the fish were second or higher generation intergrades between FLMB and NLMB.

**Crappie:** Crappie were the second most popular sport fish at Lake Fork (Table 4). Directed effort for crappie in 2010-2011 (65,152 h) was reduced as compared with the previous year (147,925 h) but it increased in 2011-2012 (106,330 h)(Table 9). Angler catch rate (black and white combined) for the last three years has increased from 1.49/h to 2.36/h, the highest rate observed of the seven years of data presented. Crappie harvest rate increased to near 1.0/h in 2011-2012 (0.98/h) which was higher than in previous years and may be related to decreased fishing pressure. Harvest increased in 2011-2012 as compared with 2010-2011.

Black crappie continued to be the dominant species harvested in the 2010-2011 (81%) and 2011-2012 (79%) creel surveys. The 10-inch class was the most abundant size harvested (black and white crappie combined) and accounted for 40 and 34% of fish observed in the two creel years in this review. Angler compliance with the 10-inch minimum length limit in effect from March through November was high; Illegal fish accounted for less than 1% of harvest during this time. During the winter quarter (December through February) when no minimum length limit is in effect, crappie measuring less than 10 inches accounted for 10 to 14% of the quarter's total harvest (Figure 9), similar to the level observed (15%) in the previous review (Storey and Jubar 2010) but lower than the four previous years (44%, 39%, 43%, and 69%) (Storey and Jubar 2009). The winter quarter in 2010-2011 was unusual in that it only accounted for 2% of the year's crappie harvest, substantially lower than in 2011-2012 (50%) and 2009-2010 (55%) (Storey and Jubar 2010).

## Fisheries management plan for Lake Fork Reservoir, Texas

Prepared – July 2012.

**ISSUE 1:** Lake Fork has a well-established history of producing trophy largemouth bass.

MANAGEMENT STRATEGIES

1. Stock FLMB (25/acre) annually to influence genetics and maintain trophy largemouth bass catch potential.
2. Monitor genetic composition of largemouth bass population by assessing allele frequency from samples collected during fall electrofishing in 2013.
3. Continue to monitor the largemouth bass population with spring and fall electrofishing surveys each year.
4. Collect age sample (Category 2) by fall electrofishing in 2012.
5. Continue to conduct annual access creel survey to monitor the fishery and collect data on catch, harvest, and fishing effort. Continue to collect data on numbers of released bass in the following size ranges; 4-6.9 lbs, 7-9.9 lbs and $\geq$10 lbs.
6. Monitor angler catches of trophy bass ($\geq$24 inches and/or $\geq$7 pounds) through the Lake Fork Trophy Bass survey.

**ISSUE 2:** Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches, and plugging engine cooling systems. Giant salvinia and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

Water hyacinth currently poses the major threat of any invasive aquatic plant currently in Lake Fork. Lake Fork contains three additional invasive aquatic plants: hydrilla, Eurasian watermilfoil and alligatorweed. Although hydrilla is listed as an invasive aquatic plant, it has not created access problems on Lake Fork and it is generally considered beneficial habitat. Eurasian watermilfoil is not considered problematic but it does appear to be displacing hydrilla from certain areas. Alligatorweed has expanded as water levels increased following drought. Landowners submit aquatic vegetation treatment proposals more frequently for alligatorweed than for any other species.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc. so they can communicate these messages to their customers.
3. Educate the public about invasive species through the use of media and the Internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.
6. Conduct vegetation surveys in order to map distribution and acreage of water hyacinth in Lake Fork as appropriate.
7. Work cooperatively with TPWD Austin and Aquatic Habitat Enhancement staff, the Sabine River Authority, and the LFSA to develop management plans and to explore opportunities to underwrite

recommended courses of action.

8. Update "Nuisance aquatic vegetation management plan for Lake Fork Reservoir" as necessary.
9. Treat water hyacinth using foliar applications of 2,4-D-based herbicides by contract herbicide applicator.
10. Conduct post-treatment vegetation surveys to evaluate effectiveness of herbicide application.
11. Investigate reports of unusual or unknown aquatic plants in Lake Fork by anglers and homeowners at the earliest possible opportunity.
12. Continue to review aquatic vegetation treatment proposals submitted by Lake Fork homeowners for control of noxious aquatic vegetation.

**ISSUE 3:** During the protracted drought of mid-2010 through 2011, lake elevations on Lake Fork decreased to record low levels exposing shorelines that were devoid of any structure which would provide fish habitat. The LFSA partnered with TPWD staff in two projects to improve aquatic habitat in 2011 by planting buttonbush along exposed shorelines. A total of 1,000 bare-root plants and 400, 2-year-old plants were planted in March and November, respectively. The LFSA has demonstrated a continued interest in making improvements to the aquatic habitat at Lake Fork by becoming a Chapter member of the Friends of Reservoirs (www.waterhabitatlife.org) of the Reservoir Fisheries Habitat Partnership.

MANAGEMENT STRATEGIES

1. Work cooperatively with the LFSA to develop a habitat action plan.
2. Assist with construction, deployment and promotion of fish attractor structures.
3. Initiate pilot project to establish waterwillow colonies at select sites in Lake Fork using material harvested from a neighboring District reservoir. Eventually increase the number of sites using plants harvested from the original colonies or from external sources.
4. Assist with the planning and development of a small-scale nursery operation to raise native aquatic and marginal plants for eventual establishment in Lake Fork.

**ISSUE 4:** Standard methods employed in monitoring of warmwater fisheries tend to yield little information on the capture of trophy largemouth bass. The Lake Fork Trophy Bass Survey has continued to provide an alternate method of assessing this component of the largemouth bass fishery.

MANAGEMENT STRATEGIES

1. Continue the Lake Fork Trophy Bass Survey to obtain information on the catches of largemouth bass $\geq$7 pounds as well as fish $\geq$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-length 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 as appropriate.
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.
4. Continue to encourage participation by marinas, anglers, and guides.

**ISSUE 5:** Angler awareness of the fisheries resources at Lake Fork other than largemouth bass could be enhanced. There is an opportunity to inform anglers of the significant fisheries for channel catfish, white bass, common carp and smallmouth buffalo. Fisheries regulations need to be prominently displayed and clearly communicated to anglers. District staff will continue efforts to educate resource users about identification of invasive aquatic species and the consequences of introductions of new species such as giant salvinia and zebra mussels

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. Cooperate with interested parties on hosting and promoting tournaments for common carp and smallmouth buffalo.
4. Co-sponsor additional “State of the lake” meetings with local interested parties as needs arise.
5. Continue to provide information packets on Lake Fork facilities to interested anglers by mail and e-mail.
6. Continue efforts to educate the public on identification of invasive aquatic plants and consequences of their introductions into public water.
7. Provide information on identification of zebra mussels, and encourage reporting of any suspicious cases.

**SAMPLING SCHEDULE JUSTIFICATION:**

The proposed sampling schedule includes annual electrofishing sampling in spring and fall to monitor the largemouth bass population (Table 10), a gill netting survey to monitor catfish species and temperate basses in spring 2016, and an annual access creel survey to monitor the lake’s fisheries. Water hyacinth distribution and abundance will continue to be monitored through an annual vegetation survey. An access survey will be conducted every four years.

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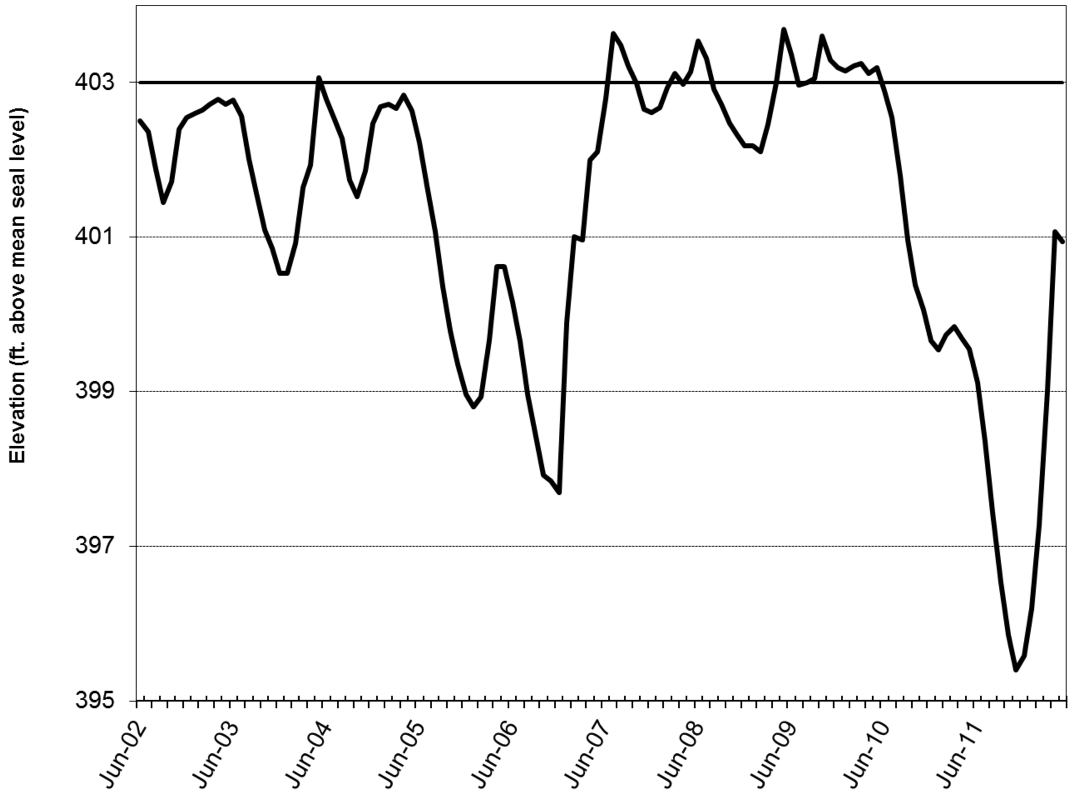



Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lake Fork Reservoir, Texas, June 2002 through May 2012. Bold horizontal line indicates conservation pool elevation; 403 ft. msl.

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 µmho / 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 |

[1]The minimum length limit is waived from December 1 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 |
|---|---|---|
| | Blue catfish | |
| 1980 | 268,423 | FGL |
| 1984 | 29,676 | FGL |
| 1985 | 253,464 | FGL |
| | 551,563 | |
| | Channel catfish | |
| 1977 | 37,787 | FGL |
| 1978 | 80,130 | FGL |
| 1980 | 137,545 | FGL |
| 1984 | 102,103 | FGL |
| | 357,565 | |
| | Flathead catfish | |
| 1979 | 4,800 | FGL & ADL |
| | 4,800 | |
| | Redear sunfish | |
| 1981 | 36,000 | FGL |
| | 36,000 | |
| | Coppernose bluegill | |
| 1981 | 633,911 | FGL |
| | 633,911 | |
| | Spotted bass | |
| 1979 | 41 | ADL |
| | 41 | |

| Year | Number | Size |
|---|---|---|
| | Florida largemouth bass | |
| 1978 | 103 | ADL |
| 1979 | 740,815 | FGL |
| 1979 | 561 | ADL |
| 1980 | 330,800 | FRY |
| 1980 | 300 | ADL |
| 1982 | 49 | ADL |
| 1987 | 250 | AFGL |
| 1995 | 692,281 | FGL |
| 1996 | 697,731 | FGL |
| 1997 | 698,037 | FGL |
| 1998 | 694,211 | FGL |
| 1999 | 710,761 | FGL |
| 2000 | 510,737 | FGL |
| 2001 | 218,240 | FGL |
| 2002 | 692,258 | FGL |
| 2003 | 732,049 | FGL |
| 2004 | 515,101 | FGL |
| 2005 | 705,986 | FGL |
| 2006 | 506,113 | FGL |
| 2007 | 501,174 | FGL |
| 2008 | 504,117 | FGL |
| 2009 | 685,702 | FGL |
| 2010 | 515,444 | FGL |
| 2011 | 724,921 | FGL |
| 2012 | 693,736 | FGL |
| | 12,071,477 | |

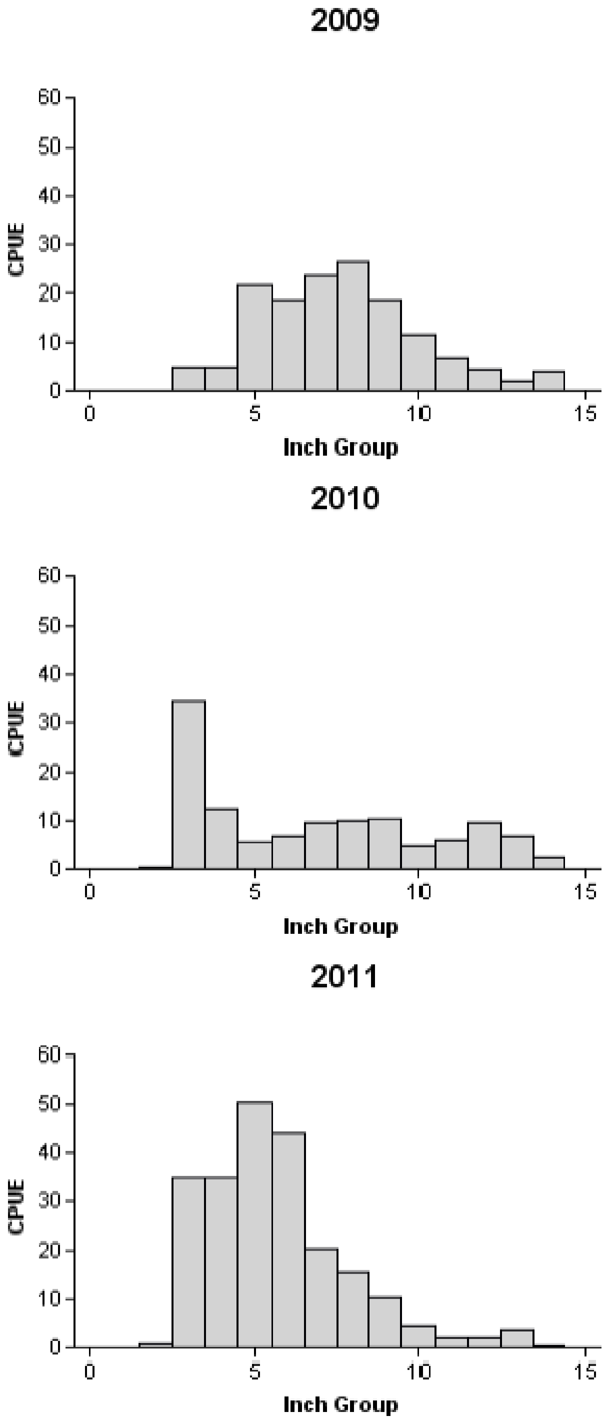
Table 4. Percent directed angler effort by species for Lake Fork Reservoir, Texas, June 2005 through May 2012.

| Species | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 |
| Catfish | 6.15 | 5.90 | 3.91 | 3.03 | 4.95 | 3.95 | 5.19 |
| White bass | - | - | - | - | - | - | 0.38 |
| Yellow bass | - | 0.09 | - | - | - | - | - |
| Sunfish | - | 1.08 | - | - | - | 1.19 | - |
| Largemouth bass | 81.57 | 80.32 | 84.37 | 87.15 | 73.53 | 81.22 | 73.17 |
| Crappie | 12.27 | 12.61 | 11.15 | 8.75 | 20.85 | 11.07 | 17.66 |
| Anything | - | - | 0.56 | 1.06 | 0.67 | 2.58 | 3.60 |

Table 5. Total fishing effort (h) for all species and total directed expenditures (and associated RSEs in parentheses) at Lake Fork Reservoir, Texas, June 2005 through May 2012.

| Species | Year | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 |
| Total fishing effort | 717,074 (11) | 807,892 (12) | 874,230 (14) | 1,128,269 (16) | 709,457 (17) | 588,692 (17) | 602,127 (15) |
| Total directed expenditures | $6,339,343 (17) | $7,858,137 (17) | $10,909,542 (22) | $15,338,593 (24) | $7,569,111 (28) | $7,139,132 (28) | $7,250,375 (27) |

# Gizzard shad



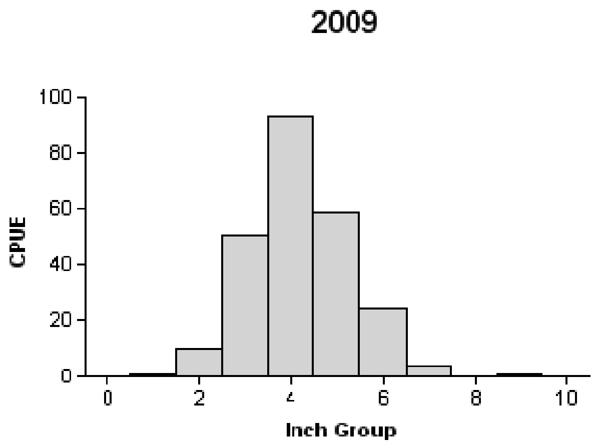

Effort = 2.0
Total CPUE = 148.5 (20; 297)
Stock CPUE = 98.0 (20; 196)
IOV = 50 (6.3)

Effort = 2.0
Total CPUE = 120.0 (17; 240)
Stock CPUE = 60.0 (17; 120)
IOV = 58 (6.7)

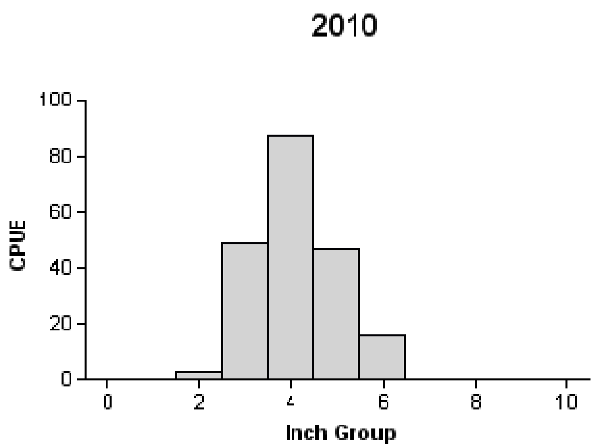
Effort = 2.0
Total CPUE = 224.5 (19; 449)
Stock CPUE = 59.0 (18; 118)
IOV = 83 (3.4)

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, 2009 through 2011.

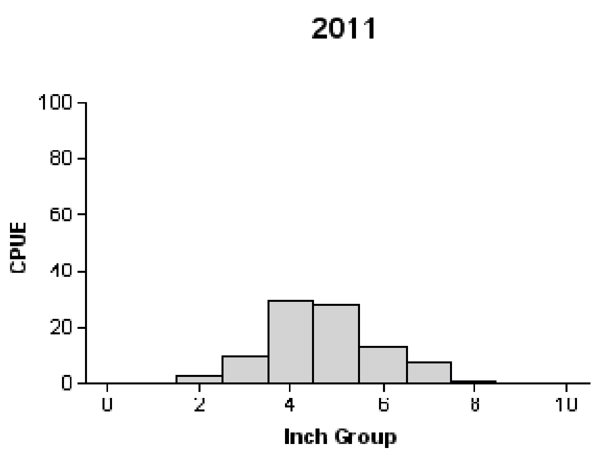
# Bluegill




Effort = 2.0
Total CPUE = 243.0 (16; 486)
Stock CPUE = 232.0 (15; 464)
PSD = 12 (2.2)




Effort = 2.0
Total CPUE = 202.0 (13; 404)
Stock CPUE = 199.5 (13; 399)
PSD = 5 (1.0)




Effort = 2.0
Total CPUE = 90.0 (20; 180)
Stock CPUE = 87.5 (20; 175)
PSD = 23 (5.9)

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, 2009 through 2011.

# Redear sunfish

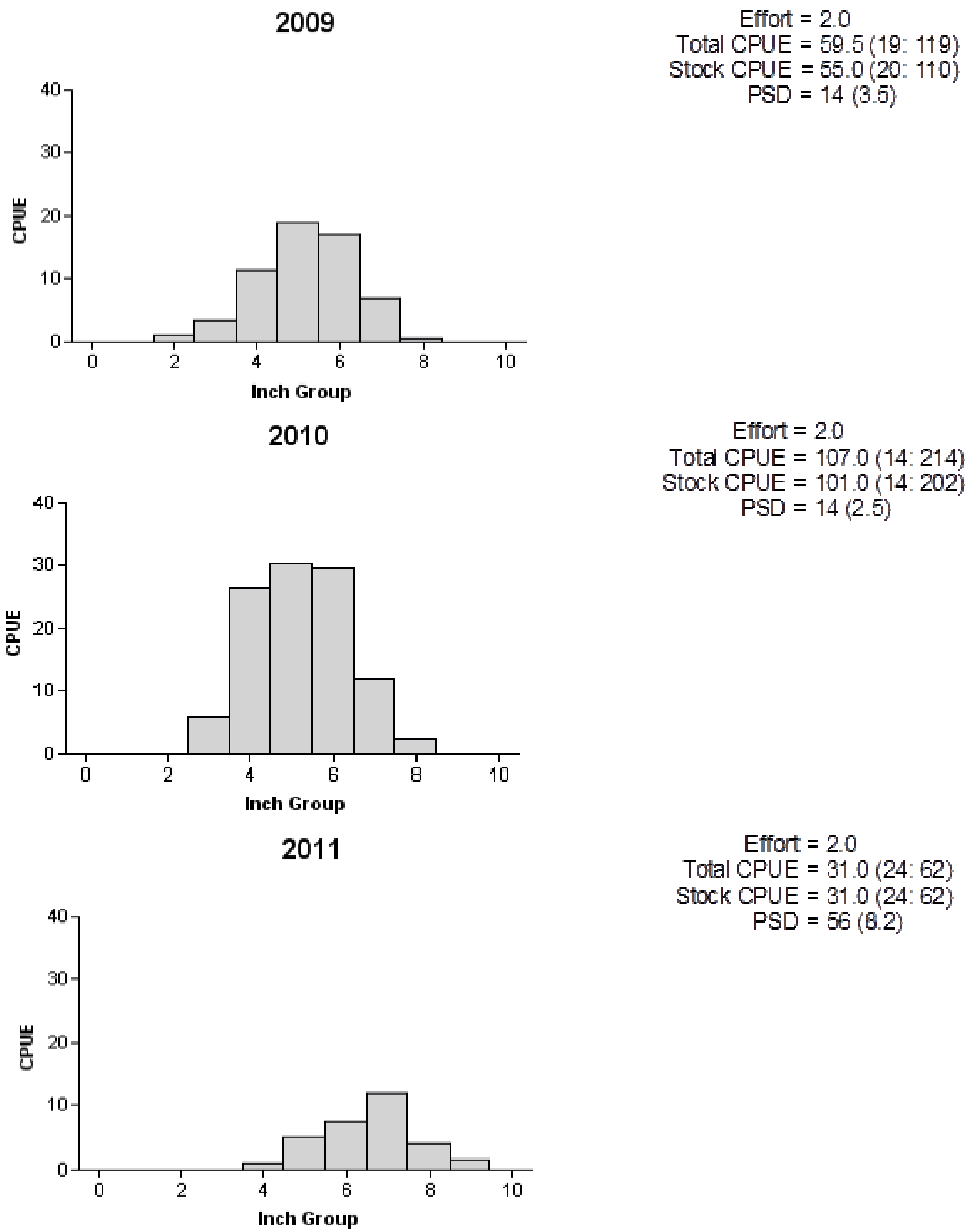
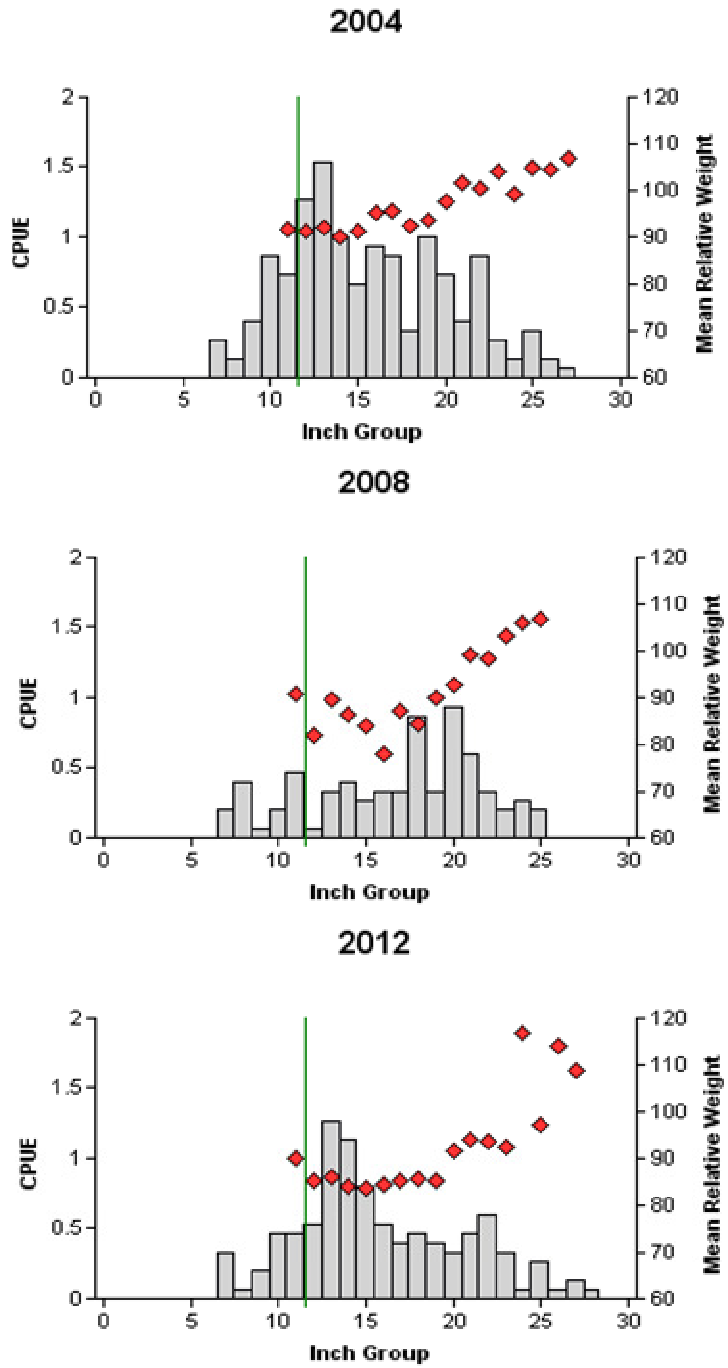



Figure 4. Number of redear sunfish caught per hour (CPUE, bars), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall electrofishing surveys, Lake Fork Reservoir, Texas, 2009 through 2011.

# Channel catfish




Effort = 15.0
Total CPUE = 12.9 (15; 194)
Stock CPUE = 11.3 (16; 169)
PSD = 54 (6.8)
PSD-P = 6 (1.5)

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

Effort = 15.0
Total CPUE = 9.4 (11; 141)
Stock CPUE = 8.3 (11; 125)
PSD = 50 (7.8)
PSD-P = 7 (3.1)

Figure 5. Number of channel catfish caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Fork Reservoir, Texas, 2004, 2008 and 2012. Vertical lines indicate minimum length limit at time of survey.

Table 6. Creel survey statistics for catfish (channel, blue, and flathead catfish combined) at Lake Fork Reservoir from June 2005 through May 2006, to June 2011 through May 2012, 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 | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 |
| Directed effort (h) | 44,109 (18) | 47,663 (18) | 34,213 (26) | 34,221 (32) | 35,112 (31) | 23,225 (35) | 31,262 (30) |
| Directed effort/acre | 1.62 (18) | 1.75 (18) | 1.25 (26) | 1.26 (32) | 1.29 (31) | 0.85 (35) | 1.15 (30) |
| Total catch per hour | 1.07 (27) | 1.34 (24) | 1.02 (24) | 1.86 (36) | 1.73 (55) | 1.91 (70) | 1.98 (46) |
| Catch/acre | 1.90 (39) | 3.21 (37) | 3.67 (58) | 11.45 (74) | 4.22 (91) | 2.11 (45) | 2.62 (45) |
| Harvest per hour | 0.78 (30) | 0.89 (27) | 0.86 (26) | 0.98 (56) | 1.18 (74) | 0.79 (42) | 1.36 (43) |
| Harvest/acre | 1.14 (23) | 2.18 (27) | 2.66 (23) | 8.95 (67) | 2.52 (84) | 1.93 (48) | 2.31 (50) |
| Total harvest | 31,031 (23) | 59,404 (27) | 72,585 (39) | 243,991 (67) | 68,724 (84) | 52,678 (48) | 62,873 (50) |
| Percent of legal sized fish released | 1 | 20 | 66 | 27 | 49 | 70 | 22 |

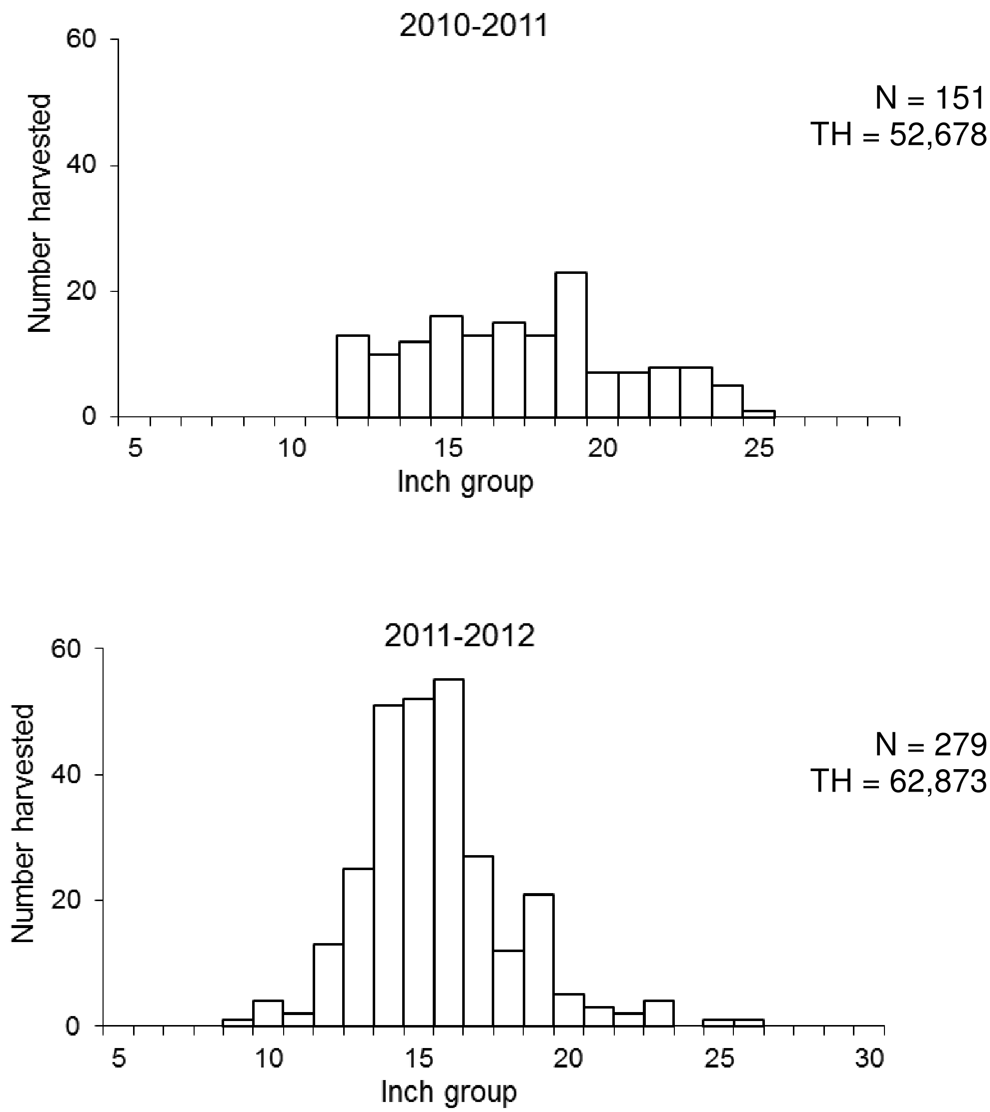
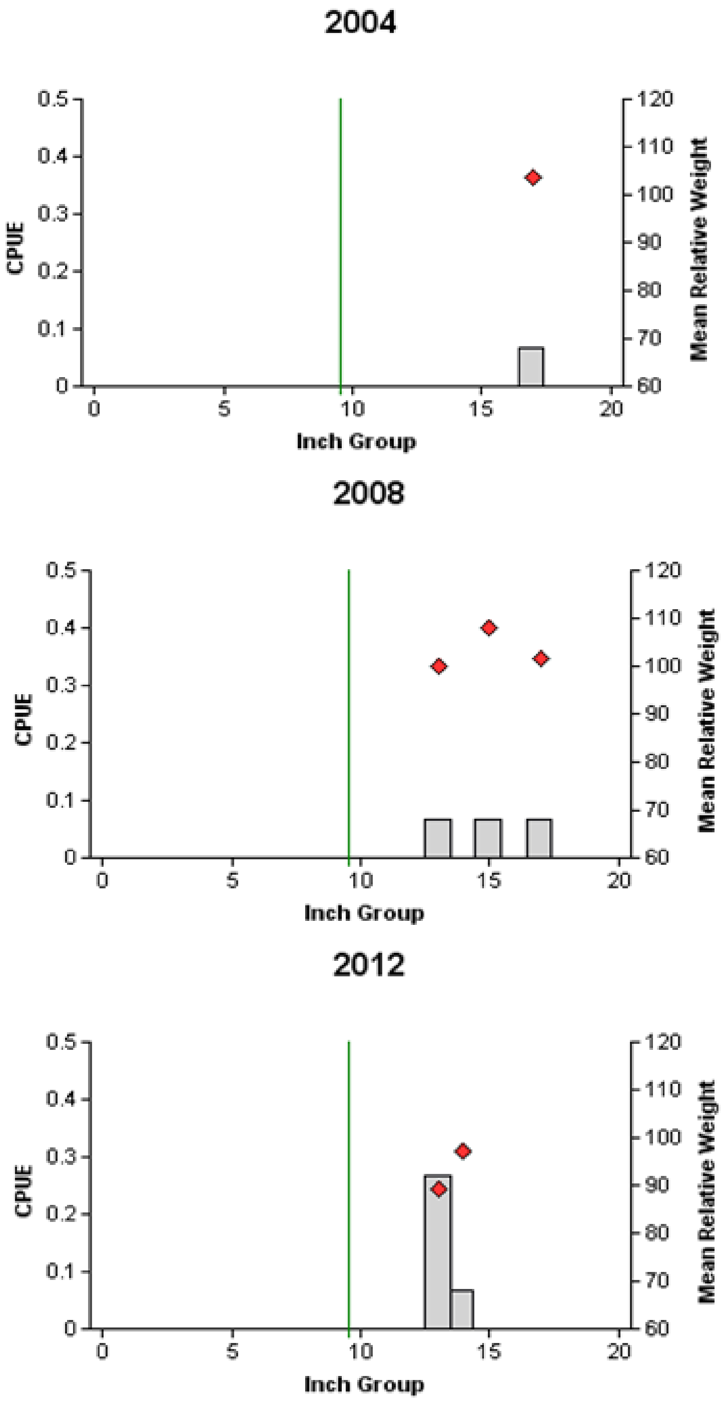



Figure 6. Length frequency of harvested channel catfish observed during creel surveys at Lake Fork Reservoir, Texas, June 2010 through May 2011 and June 2011 through May 2012, all anglers combined. N is the number of harvested channel catfish (no blue or flathead catfish were observed) observed during creel surveys, and TH is the total estimated harvest for the creel period.

# White bass




**2004**

Effort = 15.0
Total CPUE = 0.1 (100; 1)
Stock CPUE = 0.1 (100; 1)
PSD = 100 (0)
PSD-P = 100 (0)

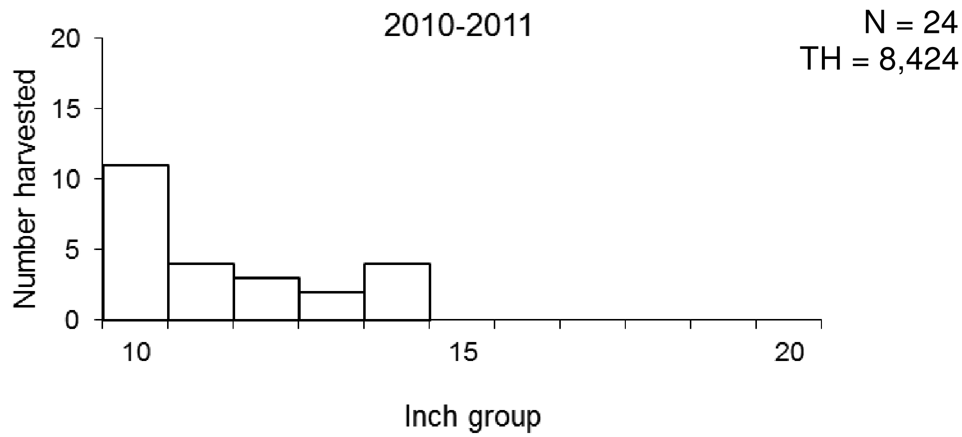
**2008**

Effort = 15.0
Total CPUE = 0.2 (72; 3)
Stock CPUE = 0.2 (72; 3)
PSD = 100 (0)
PSD-P = 100 (0)

**2012**

Effort = 15.0
Total CPUE = 0.3 (70; 5)
Stock CPUE = 0.3 (70; 5)
PSD = 100 (0)
PSD-P = 100 (0)

Figure 7. Number of white bass caught per net night (CPUE), mean relative weights (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lake Fork Reservoir, Texas, 2004, 2008 and 2012. Vertical lines indicate minimum length limit at time of survey.



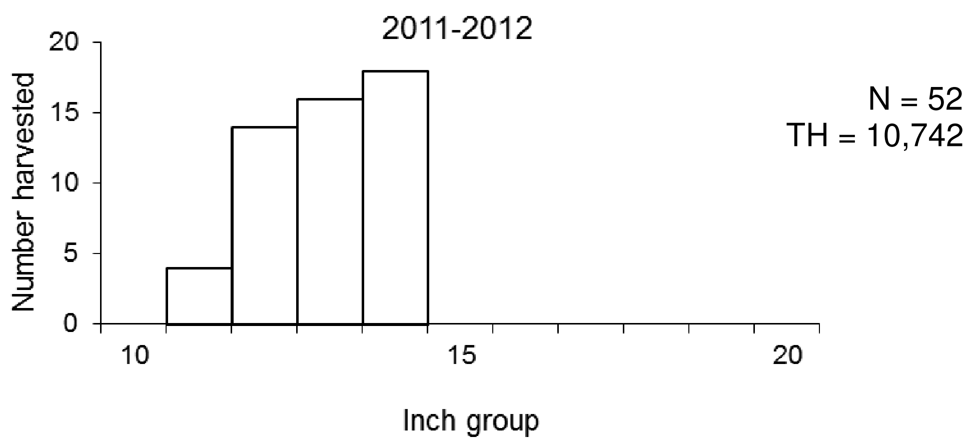




Figure 8. Length frequency of harvested white bass observed during creel surveys at Lake Fork Reservoir, Texas, June 2010 through May 2011 and June 2011 through May 2012, all anglers combined. N is the number of harvested white bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

# Largemouth bass - fall

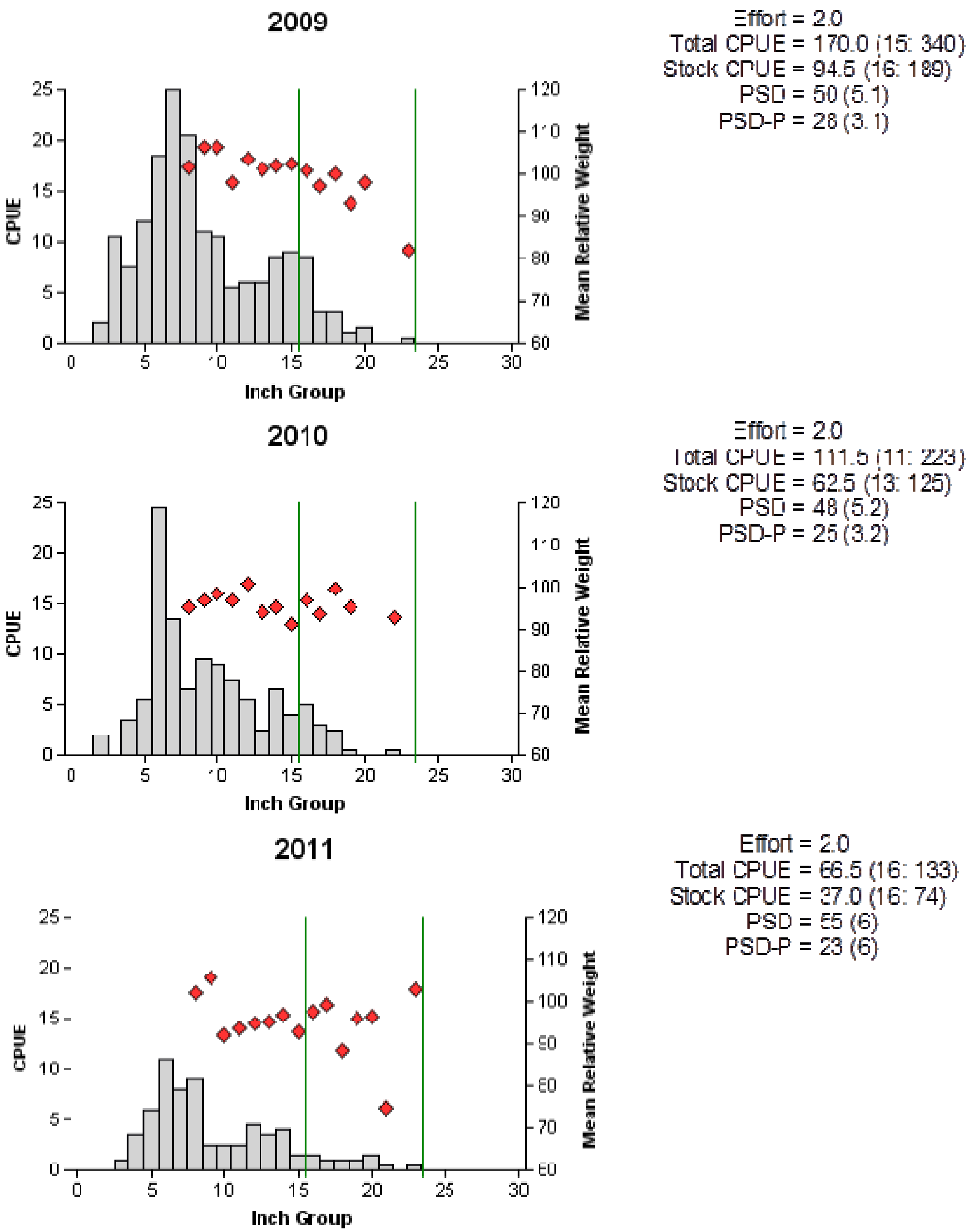
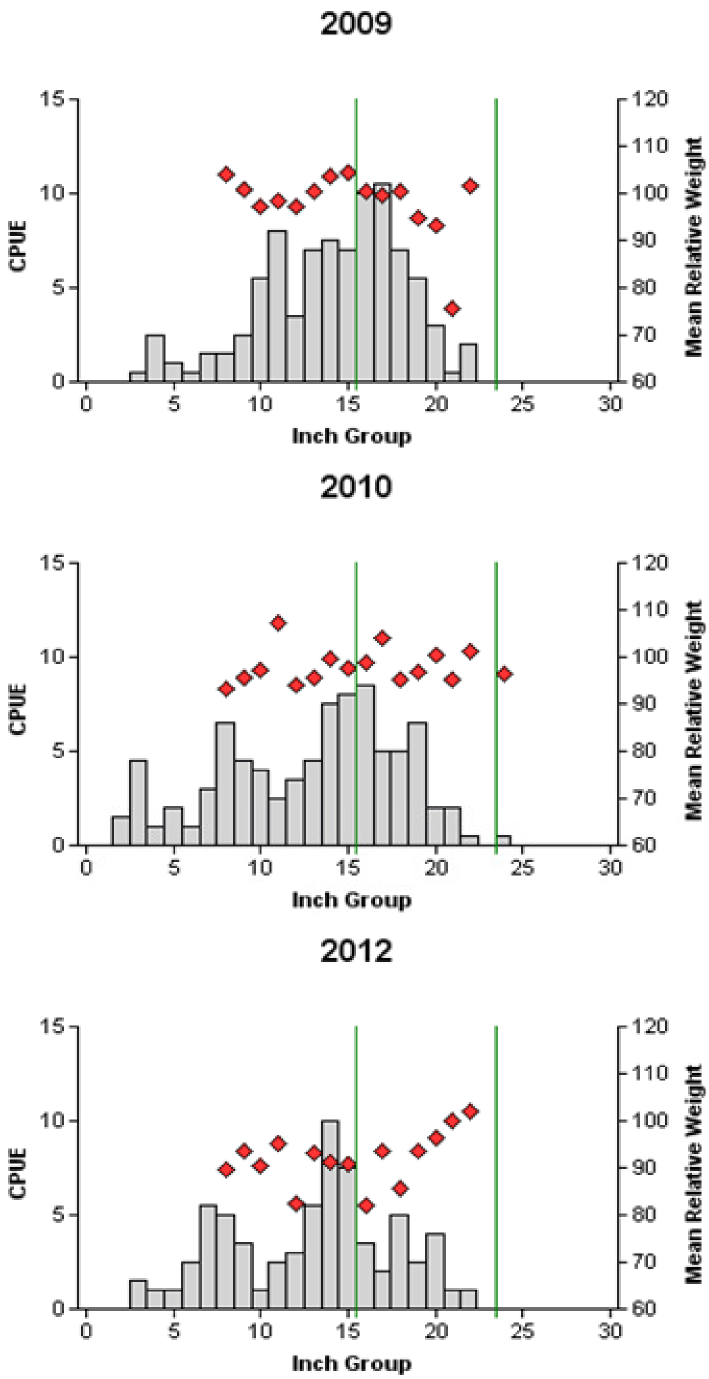



Figure 9. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall electrofishing surveys, Lake Fork Reservoir, Texas, 2009 through 2011. Vertical lines indicate the lower and upper bounds of the protected slot length limit at time of survey.

# Largemouth bass - spring




Effort = 2.0
Total CPUE = 87.0 (19; 174)
Stock CPUE = 81.0 (19; 162)
PSD = 78 (3.5)
PSD-P = 56 (3.6)

Effort = 2.0
Total CPUE = 84.0 (11; 168)
Stock CPUE = 71.0 (13; 142)
PSD = 75 (4.3)
PSD-P = 54 (4.3)

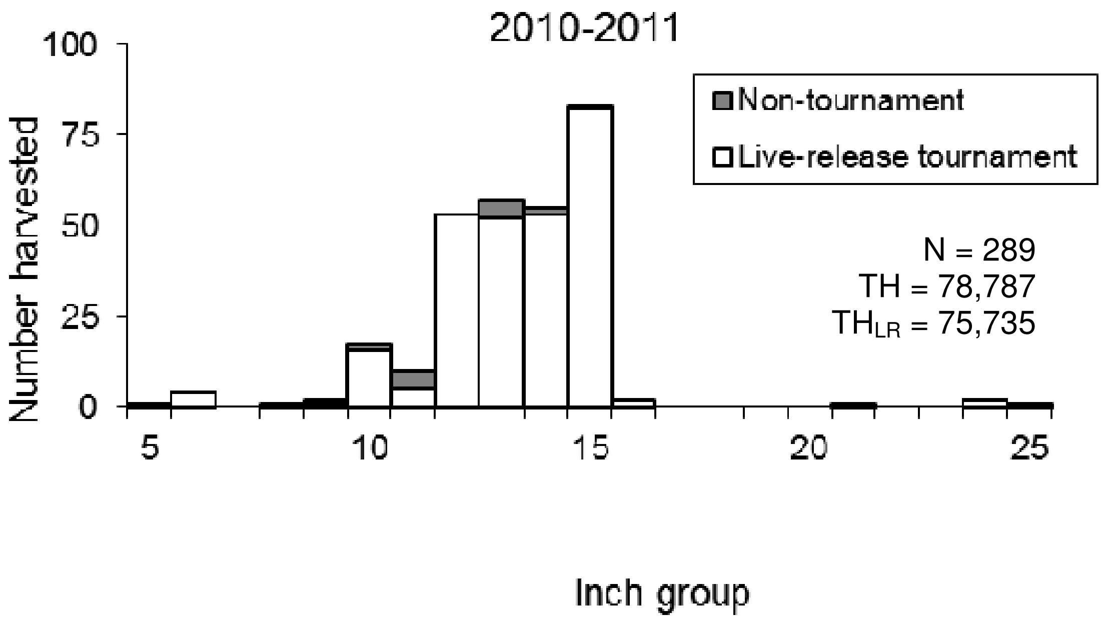
Effort = 2.0
Total CPUE = 68.5 (14; 137)
Stock CPUE = 57.0 (14; 114)
PSD = 79 (4.8)
PSD-P = 46 (5.4)

Figure 10. 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, 2009, 2010 and 2012. Vertical lines indicate the lower and upper bounds of the protected slot length limit at time of survey.

Table 7. Creel survey statistics for largemouth bass at Lake Fork Reservoir from June 2005 through May 2006, to June 2011 through May 2012, 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 | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 |
| Total directed effort (h) | 584,952 (12) | 648,899 (13) | 737,589 (15) | 983,325 (17) | 521,650 (18) | 478,111 (17) | 440,552 (15) |
| Directed effort/acre | 21.46 (12) | 23.80 (13) | 27.05 (15) | 30.07 (17) | 19.13 (18) | 17.54 (17) | 16.16 (15) |
| Live-release tournament effort | 82,308 | 170,986 | 179,724 | 329,477 | 78,816 | 149,123 | 58,417 |
| Percent of live-release tournament effort | 14 | 26 | 24 | 34 | 15 | 31 | 13 |
| Total catch per hour | 0.44 (8) | 0.40 (8) | 0.41 (8) | 0.41 (8) | 0.64 (13) | 0.91 (15) | 0.59 (12) |
| Catch/acre | 11.82 (18) | 11.54 (17) | 17.73 (22) | 23.88 (23) | 11.93 (20) | 18.22 (20) | 10.58 (19) |
| Harvest* per hour | 0.01 (50) | 0.02 (25) | 0.03 (25) | 0.04 (21) | 0.06 (29) | 0.09 (20) | 0.03 (43) |
| Harvest*/acre | 0.20 (27) | 0.94 (29) | 0.75 (31) | 3.64 (29) | 1.38 (49) | 2.89 (37) | 0.94 (52) |
| Total harvest* | 5,346 (27) | 25,545 (9) | 20,490 (31) | 99,140 (47) | 37,579 (49) | 78,787 (37) | 25,756 (52) |
| Percent of harvest from live-release tournaments | 89 | 83 | 89 | 86 | 95 | 96 | 82 |
| Percent of legal sized fish released | 59 | 57 | 57 | 56 | 52 | 72 | 46 |

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



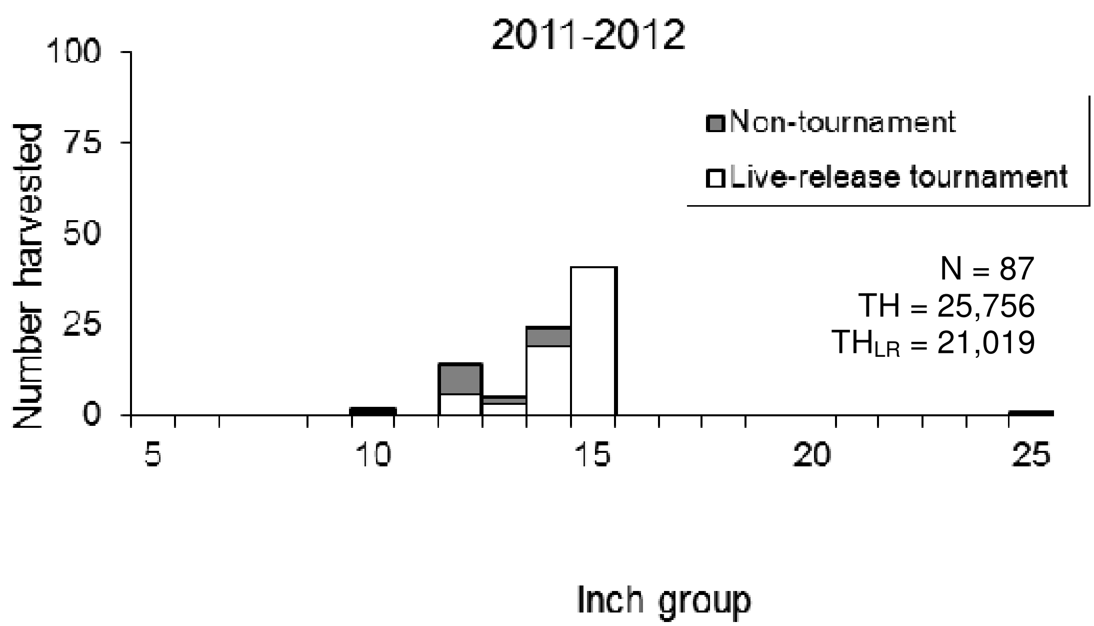




Figure 11. Length frequency of harvested largemouth bass observed during creel surveys at Lake Fork Reservoir, Texas, June 2010 through May 2011 and June 2011 through May 2012, separated by angler type. N is the number of harvested largemouth bass observed during creel surveys which includes fish transported 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 8. Results of genetic analysis of largemouth bass collected by fall electrofishing, Lake Fork Reservoir, Texas, 2006 through 2009 and 2011. 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. Samples collected prior to 2011 were composed exclusively of Age-0 fish.

| | | Genotype | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Sample size | FLMB | F1 | Fx | Combined intergrades | NLMB | % FLMB alleles | % pure FLMB |
| 2006 | 30 | 0 | [a] | [a] | 30 | 0 | 48.0 | 0.0 |
| 2007 | 30 | 0 | [a] | [a] | 30 | 0 | 53.4 | 0.0 |
| 2008 | 30 | 0 | 1 | 29 | 30 | 0 | 52.0 | 0.0 |
| 2009 | 30 | 0 | 0 | 30 | 30 | 0 | 48.0 | 0.0 |
| 2011 | 30 | 0 | 0 | 30 | 30 | 0 | 53.0 | 0.0 |

[a]Analysis did not separate F1 from Fx hybrids

Table 9. Creel survey statistics for crappie (white and black combined) at Lake Fork Reservoir from June 2005 through May 2006, to June 2011 through May 2012, 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 | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2005-2006 | 2006-2007 | 2007-2008 | 2008-2009 | 2009-2010 | 2010-2011 | 2011-2012 |
| Directed effort (h) | 88,012 (14) | 101,904 (13) | 97,518 (16) | 98,751 (20) | 147,925 (19) | 65,152 (22) | 106,330 (20) |
| Directed effort/acre | 3.23 (14) | 3.74 (13) | 3.58 (16) | 3.62 (20) | 5.43 (19) | 2.39 (22) | 3.90 (20) |
| Total catch per hour | 1.62 (20) | 1.69 (24) | 1.86 (27) | 1.93 (30) | 1.49 (26) | 1.71 (46) | 2.36 (34) |
| Catch/acre | 5.49 (17) | 10.96 (31) | 11.45 (35) | 16.82 (47) | 8.45 (32) | 4.71 (51) | 8.74 (31) |
| Harvest per hour | 0.44 (28) | 0.68 (24) | 0.82 (27) | 0.76 (29) | 0.87 (32) | 0.90 (40) | 0.98 (32) |
| Harvest/acre | 1.36 (31) | 6.34 (40) | 4.78 (32) | 8.91 (48) | 4.64 (44) | 3.30 (53) | 3.84 (49) |
| Total harvest | 37,020 (31) | 172,981 (40) | 130,368 (32) | 242,961 (48) | 126,472 (44) | 89,851 (53) | 104,809 (49) |
| Percent of legal sized fish released | 5 | 5 | 7 | 5 | 7 | 5 | 4 |

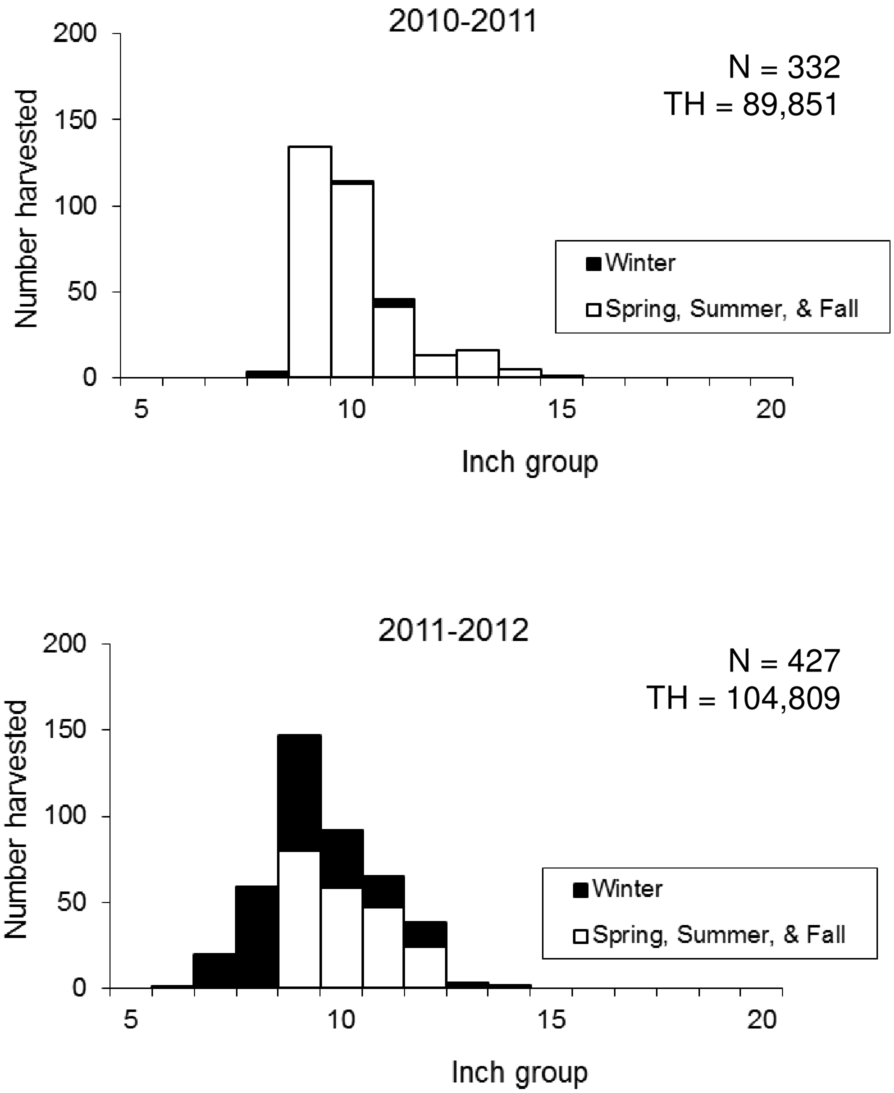



Figure 12. Length frequency of harvested crappie (white and black combined) observed during creel surveys at Lake Fork Reservoir, Texas, June 2010 through May 2011 and June 2011 through May 2012, all anglers combined separated by creel quarter. N is the number of harvested crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 10. 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.

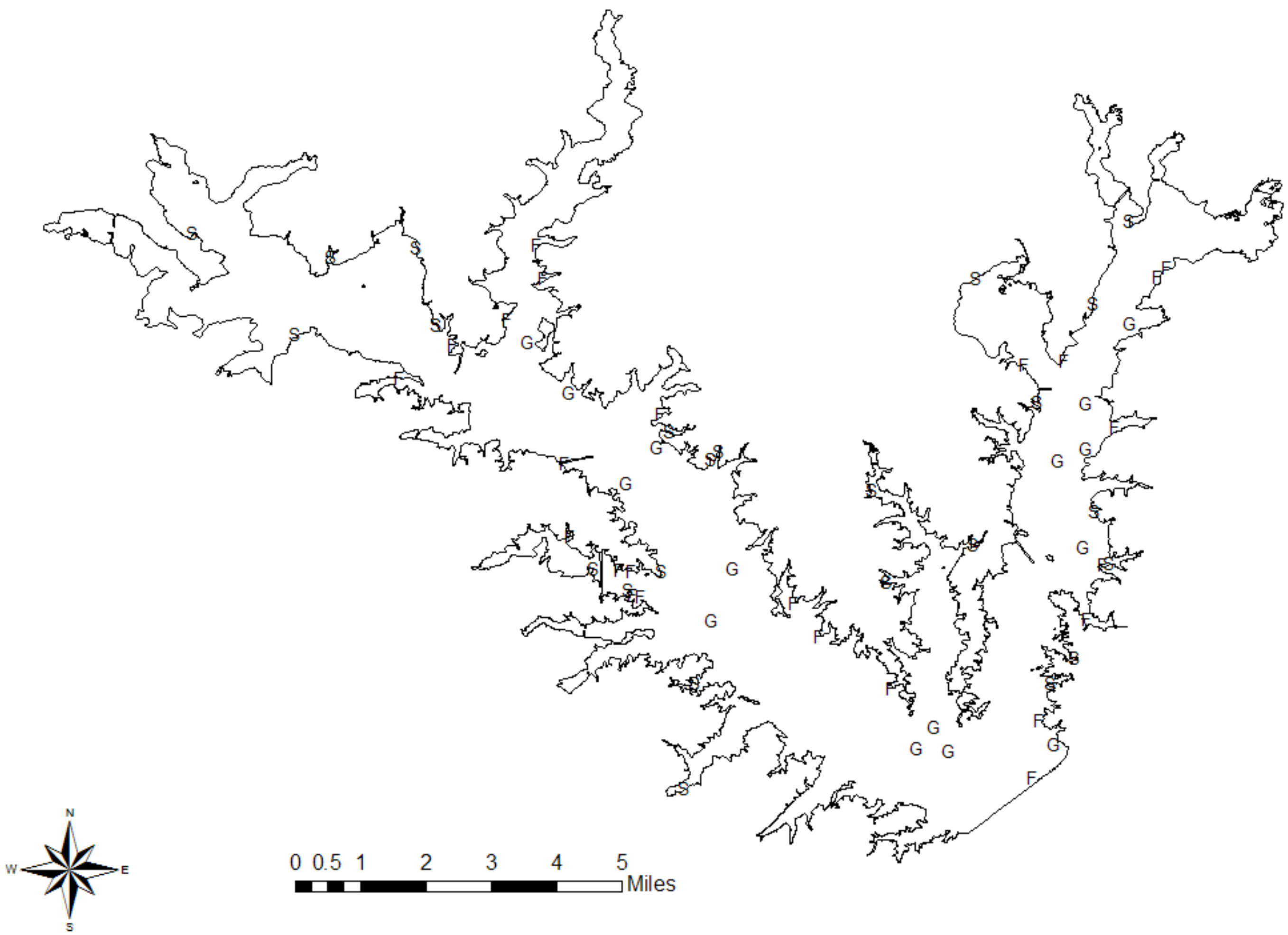
| Survey Year | Electrofishing Spring/Fall | Access survey | Gill netting | Creel survey | Vegetation survey | Habitat survey | Report |
|---|---|---|---|---|---|---|---|
| Summer 2012-Spring 2013 | A/A | | | A | A | | |
| Summer 2013-Spring 2014 | A/A | | | A | A | | A |
| Summer 2014-Spring 2015 | A/A | | | A | A | | |
| Summer 2015-Spring 2016 | A/S | S | S | A | S | S | S |

**APPENDIX A**

Number (N) and catch rate (CPUE) of all target species collected from gill netting and electrofishing, Lake Fork, Texas, 2011-2012.

| Species | Gill Netting | | Electrofishing – Fall | | Electrofishing - Spring | |
|---|---|---|---|---|---|---|
| | N | CPUE | N | CPUE | N | CPUE |
| Gizzard shad | | | 449 | 224.50 | | |
| Threadfin shad | | | 57 | 28.50 | | |
| Channel catfish | 141 | 9.40 | | | | |
| White bass | 5 | 0.33 | | | | |
| Bluegill | | | 180 | 90.00 | | |
| Longear sunfish | | | 30 | 15.00 | | |
| Redear sunfish | | | 62 | 31.00 | | |
| Largemouth bass | | | 133 | 66.50 | 137 | 68.50 |

**APPENDIX B**




Location of fall electrofishing (F), spring electrofishing (S), and spring gill netting sites (G), Lake Fork Reservoir, Texas, 2011-2012.

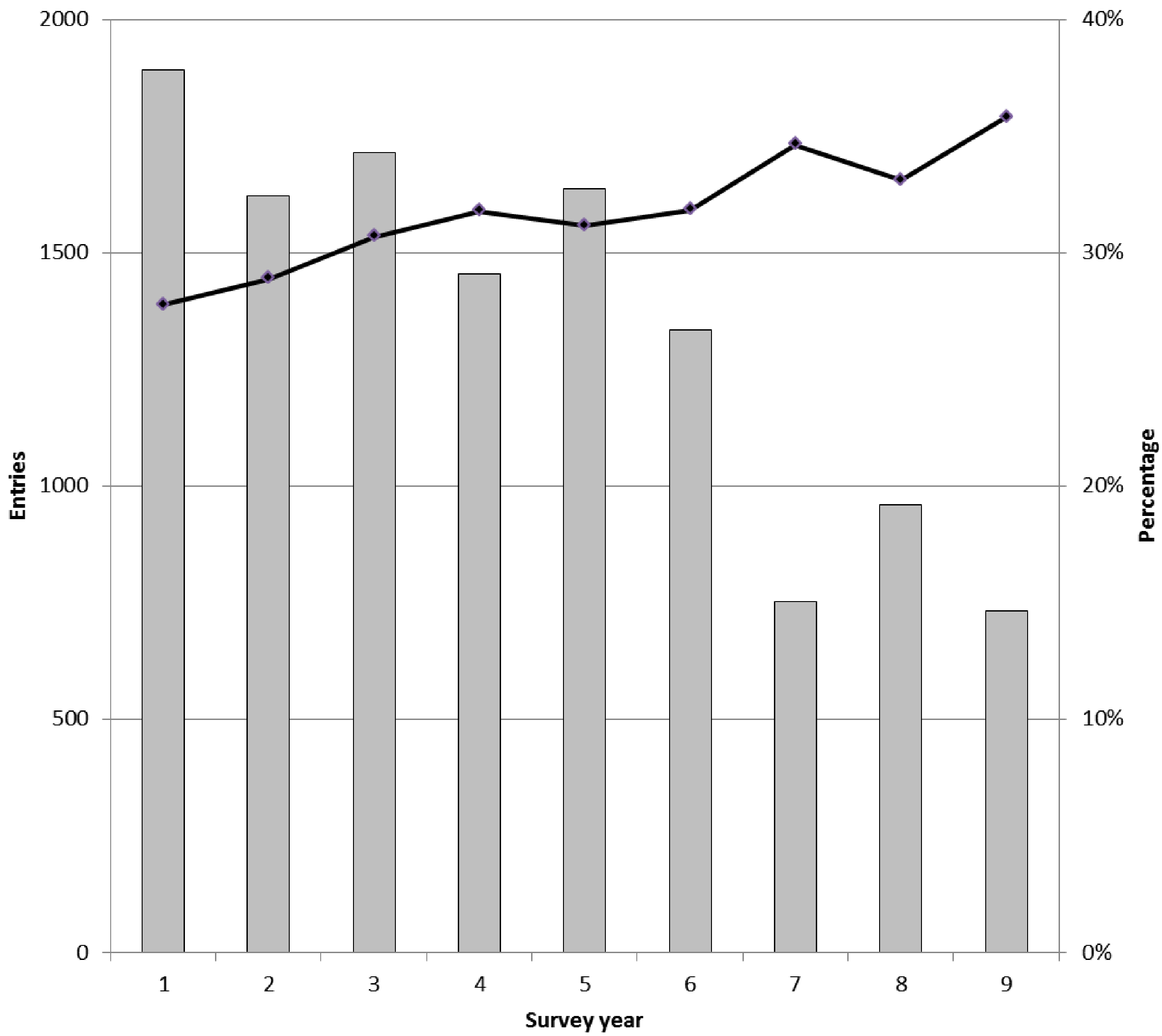
**Appendix C**

Water body records, all tackle category, for Lake Fork as of 5/20/2012

| Species | Weight (lbs) | Length (inches) | Date certified | Gear |
|---|---|---|---|---|
| Bass, hybrid yellow | 4.75 | 19.00 | 3/12/2005 | Rod & reel |
| Bass, largemouth[a] | 18.18 | 25.50 | 1/24/1992 | Rod & reel |
| Bass, Palmetto | 7.96 | 24.25 | 5/26/2009 | Rod & reel |
| Bass, spotted | 3.32 | 17.25 | 12/1/2010 | 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 | 17.65 | 36.50 | 2/21/1993 | Rod & reel |
| Buffalo, bigmouth | 36.00 | 33.50 | 10/19/1997 | Rod & reel |
| Buffalo, smallmouth | 66.00 | - | 3/3/2012 | Rod & reel |
| Bullhead, black | 2.48 | 16.25 | 2/1/1995 | Cane Pole |
| Bullhead, yellow | 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 | 3.92 | 18.50 | 4/27/2003 | Rod & reel |
| Crappie, white | 3.19 | 17.00 | 2/5/1993 | Rod & reel |
| Drum, freshwater | 22.50 | 33.00 | 4/23/2010 | Rod & reel |
| Gar, longnose | 24.38 | 50.00 | 5/4/2009 | Bow & arrow |
| Gar, spotted | 10.85 | 40.50 | 6/23/2009 | Bow & arrow |
| Goldfish | 2.28 | 14.50 | 3/15/2012 | Bow & arrow |
| Shad, Gizzard | 1.44 | 16.25 | 6/16/2009 | Bow & arrow |
| Sunfish, hybrid | 0.23 | 6.65 | 9/14/1999 | Fly rod |
| Sunfish, longear | 0.48 | 7.50 | 6/1/1998 | Rod & reel |
| Sunfish, orangespotted | 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 |

[a] State record

**Appendix D**




Total numbers of largemouth bass entries by survey year (March-February) reported (solid bars) in the Lake Fork Trophy Bass Survey, March 2003 – February 2012 and the annual percentage of entries ≥24 inches (solid line).