

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-31

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2005 Survey Report

Lake Fork Reservoir

Prepared by:

Kevin W. Storey
and
Aaron K. Jubar

Inland Fisheries Division
District 3B, Tyler, Texas



Robert L. Cook
Executive Director

Phil Durocher
Director, Inland Fisheries

July 31, 2006

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake Fork Reservoir were surveyed in 2005 using electrofishing, trap netting, and gill netting and in 2006 using electrofishing, gill netting and trap netting. Anglers were surveyed from June 2005 to May 2006 with an access point creel 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 5 miles northwest of Quitman, Texas. Water levels reached an historic low level of 4.2 feet below conservation pool elevation during January 2006 as a result of a prolonged drought. Total coverage of hydrilla in summer 2005 accounted for 4.8% of the lake surface area, down from 13.4% in 2004.
- **Management history:** Important sport fishes include largemouth bass, crappie (white and black), and channel catfish. The management plan from the 2004 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 annual 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 the Aquatic Habitat Enhancement staff to continue annual spraying to control its spread.
- **Fish community**
 - **Prey species:** Lake Fork contains abundant clupeid and sunfish populations. Gizzard shad size structure remains consistent and the majority of fish are available as prey for adult largemouth bass. Threadfin shad are also present providing prey population for bass and crappie. The majority of bluegill and redear sunfish collected in 2005 were less than 4 inches in length, making them available prey for most size classes of bass.
 - **Catfishes:** The channel catfish population continues to increase in abundance and the quality of the fishery continues to be good. Blue and flathead catfish are also present in the reservoir but they are much less common than channel catfish.
 - **Temperate basses:** White bass, yellow bass and white x yellow bass hybrids are all present in the reservoir. There is a limited fishery for yellow bass and anglers report occasional catches of white bass. White x yellow bass hybrids are periodically caught and submitted as world record yellow bass, but after genetic testing they are all identified as hybrids.
 - **Largemouth bass:** Largemouth bass continue to be the dominant game fish in Lake Fork receiving 81.6% of directed angler effort. Size distribution of the population remains consistent with previous years and relative weights continue to be high. Between three and four years of age largemouth bass grow into the protected 16- to 24-inch slot-length limit.
 - **Crappie:** Crappie are the second most sought game fishes accounting for 12.8% of directed effort. Although black crappie have traditionally been dominant, white crappie may be increasing in abundance.
- **Management strategies:** Stock FLMB to enhance largemouth bass genetics. Continue to monitor 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 2006, and spring 2007 and continue annual access point creel survey.

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INTRODUCTION

This document is a summary of fisheries data collected from Lake Fork Reservoir in 2005-2006. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data is presented with the 2005-2006 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 5 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. Habitat consists mainly of timber, native emergent plants, and native floating plants. Bulkhead, concrete, and rip-rap are present along less than 6% of the shoreline, and boat docks in combination with other habitat types occupy 9% of the shoreline. Total coverage of hydrilla in summer 2005 accounted for 4.8% of the lake surface area, down from 13.4% in 2004. Water levels reached a historic low of 4.2 feet below conservation pool elevation (cpe) during January 2006 as the result of a prolonged drought. 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 2004) included:

1. Stock FLMB fingerlings at 100/acre in a 5,000-acre area of Caney Creek north of Highway 154.
Action: Annual stockings of FLMB have been conducted in this area since spring 2000. In fall 2003, 2004 and 2005 genotype frequencies of samples of age-1 fish from this stocked area were compared to those in the rest of the lake. No significant differences were detected. FLMB allele frequency of age-0 fish in fall 2005 was 43.1%, within the range observed since 1989 (32–58%), and 3% of these fish were pure FLMB (Table 9).
2. Continue to evaluate the 16 to 24-inch slot length limit.
Action: Annual electrofishing surveys are conducted in fall and spring to monitor the largemouth bass population, and an annual access point creel survey is employed to monitor directed angler effort, angler catch and harvest. The Lake Fork Trophy Bass Survey has yielded valuable information on the effectiveness of the slot limit in maintaining the quality of the largemouth bass fishery. Since March 2003, 16.3% of fish reported as weighed were 10 pounds or larger and 31.9% of fish reported as measured, were 24 inches or longer.
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 spraying of aquatic vegetation by TPWD staff encouraged the spread of this plant

outside the Glade Creek area in 1998. Plant colonies were observed in 2000 in Lake Fork Creek and Little Caney Creek. Aquatic vegetation surveys have been conducted annually to monitor waterhyacinth abundance and distribution since 1998. Herbicide applications were resumed in 2001 and since that time have been conducted annually by Aquatic Habitat Enhancement staff using chemicals purchased by the Sabine River Authority.

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 provides an opportunity for anglers to report their catches of largemouth bass ≥ 7 pounds as well as fish ≥ 24 inches. District staff provide monthly summaries of catches by weight class to participating marinas, outdoor writers, and Division administrators. News releases summarizing survey results are distributed through media contacts as appropriate. Since March 2003, 6,046 trophy largemouth bass have been reported to the survey.

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

Action: District staff provided laminated Lake Fork regulation posters for display at boat ramps and local businesses. 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.

Harvest regulation history: Sportfish 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 1st 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. 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 coppernose bluegill in 1981.

Vegetation/habitat history: Lake Fork Reservoir supports a diverse mix of aquatic vegetation species including invasive species such as waterhyacinth and hydrilla. Hydrilla distribution appears to cycle, probably in response to drought events. This plant has never caused 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. By the following year colonies were observed in Birch Creek. The most abundant emergent native aquatic species found on Lake Fork is American lotus which accounted for 2% of the reservoir surface area in 2003.

METHODS

Fishes were collected by electrofishing (2 hours at 24 5-min stations) in spring and fall, gill netting in fall (6 net nights at 6 stations) and spring (15 net nights at 15 stations), and trap netting in fall (20 net nights at 20 stations) and spring (15 net nights at 15 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). Survey sites were randomly selected except for fall trap netting and fall gill netting. All surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and 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. Ages were determined from otoliths of largemouth bass from 15 specimens with lengths ranging from one inch below to one inch above the lower end of the slot length limit (16 inches). Ages were determined from otoliths of white and black crappie collected in trap netting, gill netting and angling to ensure collection of adequate sample sizes. Mortality rates were calculated using methods prescribed by Van Den Avyle and Hayward (1999). Water elevation data was obtained from the Sabine River Authority (SRA) website at http://www.sra.dst.tx.us/basin/lake_fork_monthly.asp (Figure 1).

RESULTS AND DISCUSSION

Habitat: Total coverage of hydrilla in summer 2005 accounted for 4.8% of the lake surface area, down from 13.4% in 2004. A habitat survey was last conducted in September 2001 (Storey and Myers 2002). Habitat features consisted of timber, native emergent plants, and native floating plants (Table 4). Bulkhead, concrete, and rip-rap were present along less than 6% of the shoreline, and boat docks in combination with other habitat types occupied 9% of the shoreline. Waterhyacinth coverage was estimated at 74 acres, the highest level observed since 2000. Water levels reached a historic low level of 4.2 feet below cpe during January 2006 as a result of a prolonged drought (Figure 1).

Creel: Directed fishing effort by anglers was highest for largemouth bass (80.9%), followed by crappie (white and black combined) (12.8%), and catfish (6.3%) (Table 5). Total fishing effort for all species at Lake Fork Reservoir was 717,074 h from June 2005 to May 2006, and anglers

spent an estimated \$6,339,343 in direct expenditures (Table 6) within the ranges observed in the previous 5 years. During the spring quarter (March to May) the highest effort (359,238 h) and trip expenditures (\$3,445,279) were observed.

Prey species: Lake Fork contains abundant clupeid and sunfish populations. Although gizzard shad size structure remains consistent and the majority of fish are available as prey for adult largemouth bass, the index of vulnerability (IOV) for gizzard shad indicated only 41% of gizzard shad were available to existing predators (Figure 2). This index is lower than in previous surveys. Threadfin shad are also present and they provide prey for bass and crappie. The majority of bluegill and redear sunfish collected in 2005 fall electrofishing samples were less than 4 inches in length. Electrofishing catch rates of gizzard shad, bluegill and redear sunfish were 110.0/h, 179.0/h and 97.0/h respectively. Few sunfish were observed in the creel survey and no directed effort was reported.

Channel catfish: The gill net catch rate of channel catfish was higher in 2005 (14.0/nn) than in previous years. Channel catfish in Lake Fork are abundant and have good relative weights (Figure 5) and the fishery is of high quality. Catfish are the third most popular group in terms of directed angler effort (Table 5). Anglers targeting catfish harvested 73% of the fish caught in 2005-2006. During the same time period, 60% of catfish caught by all anglers were harvested. Observed harvest from June 2005 to May 2006 showed good angler compliance (99.5%), and harvested fish ranged in length from 11 to 29 inches (Figure 6). Other catfish species, including blue catfish, flathead catfish, and yellow bullhead are present in the reservoir but contribute little to the total fishery.

Temperate basses: White bass, yellow bass and white x yellow bass hybrids are all present in the reservoir. There is a limited fishery for yellow bass but no directed effort was observed for this species in the 2005-2006 creel survey. Fish ranging in length from 6 to 11 inches were harvested by anglers during this time period. There is an expanding population of white bass which were undoubtedly introduced into the lake by anglers. One fish was collected in spring gill netting in 2004 and two more were collected in supplemental gill netting conducted in fall 2005. Anglers report occasional catches of this species and one fish was 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 are all identified as hybrids. The current lake record is 4.75 pounds. Anecdotal information suggests the temperate bass populations in Lake Fork provide alternatives to the catfish and sunfish fisheries.

Largemouth bass: The largemouth bass population continues to be stable and it provides a fishery of high quality. Statistical testing of catch rate data (analysis of variance) in both spring (1996-2006) and fall (1996-2005) revealed no significant difference ($P < 0.05$) among years in electrofishing catch rate of largemouth bass. Population size structure has remained stable with PSD in spring samples ranging from 64-76 (Figure 7) and estimates from fall samples ranging from 31-38 (Figure 8) during the past five electrofishing surveys. Body condition is above average indicating prey fish populations in Lake Fork are abundant and readily available. Mean relative weight of all sizes of fish within the protected slot limit were above 90 in both spring and fall. Largemouth bass in Lake Fork grow quickly, reaching the lower end of the protected slot length limit (16 inches) between three and four years of age (Figure 9).

Lake Fork continues to receive high directed angler effort for largemouth bass. In 2005-2006, largemouth bass angling effort accounted for 81.6% of the total directed effort. Directed effort in

2005-2006 (21.46 h/acre) was similar to the previous year but higher than the preceding 3 years. During the spring creel quarter (March to May) 53.9% of the total annual fishing effort for largemouth bass was observed. The fall quarter (September to November) recorded the second highest effort (21.5%), the summer quarter (June to August) was third in rank (20.0%) and the winter quarter (December to February) was lowest (4.7%). Total directed expenditures in 2005-2006 were estimated at \$6,339,343, within the range observed in the previous 5 years.

Total catch rate of largemouth bass (0.44/h) was similar to other years. The estimated number of largemouth bass caught (11.82/acre) during 2005-2006 season was similar to 2004-2005 (Table 8). In 2005-2006, 41.2% of released largemouth bass were within the size range 16-24 inches (protected slot limit). Fish below the slot limit accounted for 58.0% of released fish. These values were within the ranges observed in the previous four years (slot limit catches; 26-41%, below slot limit; 55-71%). Catches of largemouth bass 24 inches or longer reported in creel surveys by anglers targeting largemouth bass are low (0.003/h), and these fish accounted for 0.8% of bass released by all anglers. In 2005-2006, largemouth bass harvest was 0.01/hour which included live release tournament fish being transported from ramps to weigh-ins.

Annual stockings of Florida strain largemouth bass (FLMB) have maintained the FLMB allele frequency above 30%. In 2005, FLMB allele frequency of age-0 fish was 43.1% (Table 9), within the range observed since 1989 (32–58%). Pure Florida bass accounted for 3% of this sample of age-0 fish. Since spring 2000, approximately 500,000 FLMB fingerlings have been stocked annually in Caney Creek, north of Highway 154 at an effective stocking rate of 100/acre. This embayment stocking experiment was designed to test the effectiveness of stocking FLMB at a higher rate than that prescribed by Inland Fisheries stocking protocol (25/acre). Genotype frequencies of samples of age-1 fish from the stocked area were compared with those in the rest of the lake from 2003 through 2005 (Table 10). No differences were observed between these two areas.

Since March 2003, a total of 6,044 largemouth bass have been reported in the Lake Fork Trophy Bass Survey by anglers from 43 states. The top 5 states of reporting-angler origin were Texas (61.5%), Oklahoma (6.7%), Missouri (6.0%), Louisiana (5.0%), and Arkansas (4.1%). As expected, most trophy fish catches occurred during spring. By far, the vast majority of entries were 7 pound (39.9%) and 8 pound fish (29.1%). Anglers weighed 81% of their entries, and of these fish, 16.3% were ≥ 10 pounds. Anglers measured 56.5% of their entries, and 31.9% of these were ≥ 24 inches. Fish in the 22 and 23-inch classes were most abundant of the measured entries, representing 27.2% and 30.6% of the total respectively.

Crappie: Fall trap net catches of white crappie (Figure 11) and black crappie (Figure 15) were similar in fall 2005 (0.8/nn vs. 1.1/nn). Trap net catches on Lake Fork tend to be variable and are often quite low. In fall 2005 District staff conducted additional sampling for crappie by setting 6 gill nets. Catch rates for white crappie (Figure 13) and black crappie (Figure 17) (2.7/nn and 2.8/nn) were similar but higher than trap nets. Trap net sampling was also conducted in spring 2006, which yielded considerably higher catches of white crappie (7.2/nn) (Figure 14) than in fall 2005. Catches of black crappie in spring 2006 (0.7/nn) (Figure 18) were similar to fall 2005. Crappie mean relative weights exceeded 85 for all size classes in 2005 and 2006 samples. White crappie grew to 10 inches in total length (legal size) by three years of age (Figure 12), whereas black crappie took a year longer to grow to the same size (Figure 16).

Crappie are the second most popular gamefish on Lake Fork in terms of directed effort (Table

5). From 2005 to 2006 directed effort for crappie was 80,012 h, the lowest level observed in the last 6 years. Total crappie catch rates (black and white combined) continue to show a declining trend over the last six years, from 2.76/hour in 2000-2001 to 1.62/h in 2005-2006. The estimated number of crappie caught during this time period has declined, from 22.02/acre to 5.49/acre. Angler harvest rate of crappie in 2005-2006 was 0.44/h, its lowest level in the last six years. Total crappie harvested has declined from 7.51/acre in 2000-2001 to 1.36/acre in 2005-2006.

The majority of harvested fish observed in creel surveys in 2005-2006 (70%) were black crappie. The most abundant size class of harvested crappie (black and white combined) was the 10-inch class which accounted for 45% of fish observed in creel surveys. Angler compliance with the minimum length limit, in effect from March through November, was high with illegal harvest accounting for only 1.4% of all crappie harvested. Crappie less than 10 inches in the winter quarter (December to February) accounted for 44% of all fish harvested, a contribution which has increased over the last few years (27% in 2004-2005, 19% in 2003-2004 and 7.5% in 2002-2003). Harvest of crappie in the winter quarter was much lower than previous years, 4.5% of the entire year's harvest as compared with 55% in 2004-2005, 44% in 2003-2004 and 15-20% from 2000 through 2003. Harvest was highest in spring (14,502 – 39.2%) and lowest in winter (6,473). Although winter is normally the peak crappie fishing season on Lake Fork, in 2005-2006 fishing effort was lowest (5,710 h), and in summer it was highest (35,382 h).

Based on our standard fall trap net sampling (and additional fall gill net sampling in 2005), it would appear that white and black crappie were equally abundant in Lake Fork. However, the creel data do not reflect our standard sampling results. We were interested in what mechanisms may be driving this inconsistency between standard sampling and creel data. We examined growth rates of white and black crappie, and calculated annual mortality for each species using age data from 2003 and 2005 sampling. All white crappie reached harvestable size by three years of age (Figure 12), while only a portion of black crappie were of legal size by the same age (Figure 16). The instantaneous mortality (i.e. the probability that a fish will die in a given year) was 0.57 for white crappie and 0.44 for black crappie. Combining the growth and mortality data, we found that white crappie grew quicker but died younger than black crappies. This information is critical to sound management of the crappie populations in Lake Fork, and future efforts will be made to partition natural and fishing mortality rates from total mortality.

The continued apparent declining trend in catch rates, and directed pressure, and changes in size composition and seasonality of harvest of Lake Fork's crappie population are of concern and warrant careful monitoring.

Fisheries management plan for Lake Fork Reservoir, Texas

Prepared – July 2006.

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% for the last 17 years but the goal of 20% pure Florida largemouth bass has not been achieved.

MANAGEMENT STRATEGY

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

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

MANAGEMENT STRATEGY

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: Waterhyacinth control. 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. In June 1998, the plant was reported for the first time outside the Glade Creek area, and since that time it has spread throughout the Caney Creek arm of the reservoir. In 2000, the plant had spread to Little Caney Creek and to sections of Lake Fork Creek. During a vegetation survey conducted in September 2005, the total area observed was 74 acres.

MANAGEMENT STRATEGIES

1. Continue annual monitoring of the distribution and acreage of waterhyacinth at Lake Fork.
2. Recommend annual spraying of water hyacinth by AHE staff using herbicide purchased by the Sabine River Authority (SRA).

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 potential that exists in Texas' premier largemouth bass trophy fishery and to provide information on the fisheries regulations that govern this and other fisheries resources in Lake Fork.

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.

ISSUE 6: Probabilities for ramp selection and time strata in the Lake Fork creel survey were calculated from a ramp count survey performed at Lake Fork's 35 boat ramps from July 2000 through June 2001. Creel surveys have been conducted using these values for 5 years. Recalculation of these probabilities should enable better allocation of sampling effort in the Lake Fork access creel survey which should result in increased angler interviews during creel surveys resulting in more reliable estimates.

MANAGEMENT STRATEGIES

1. Summarize data on average numbers of anglers encountered during creel surveys, broken out by season, ramp and time period.
2. Apply updated ramp selection and time strata probabilities to creel scheduling program.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes mandatory monitoring in 2007-2008 (Table 12), a standard ongoing annual access creel survey to monitor the lake's fisheries, electrofishing sampling in spring and fall each year to monitor the largemouth bass population, and gill netting every 2 years to monitor the channel catfish population as well as the expansion of the white bass population. Additional trap net and gill net sampling are scheduled in 2006-2007 as part of an increased emphasis on the monitoring of crappie populations. Waterhyacinth and hydrilla distribution and abundance will continue to be monitored annually through a vegetation survey. Management reports will be prepared on an annual basis.

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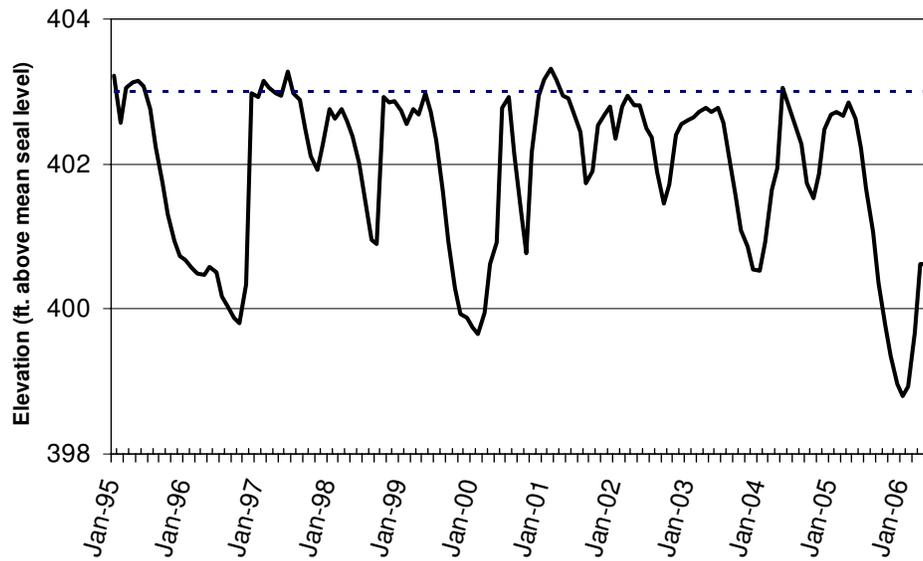


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lake Fork Reservoir, Texas. Dashed line indicates conservation pool elevation; 403 ft. msl.

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)	13.51
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 catfish, their hybrids and subspecies	25 (in any combination)	12 - No limit
Catfish: flathead	5	18 - No limit
Bass, white	25	10 - No limit
Bass: largemouth	5 (only 1 fish >24")	16 - 24
Crappie: white and black crappie, their hybrids and subspecies ¹	25 (in any combination)	10 - 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>Spotted bass</u>		
1980	268,423	FGL	1979	41	ADL
1984	29,676	FGL		41	
1985	253,464	FGL	<u>Florida largemouth bass</u>		
	551,563		1978	103	ADL
<u>Channel catfish</u>			1979	740,815	FGL
1977	37,787	FGL	1979	561	ADL
1978	80,130	FGL	1980	330,800	FRY
1980	137,545	FGL	1980	300	ADL
1984	102,103	FGL	1982	49	ADL
	357,565		1987	250	FGL+
<u>Flathead catfish</u>			1995	692,281	FGL
1979	4,800	FGL & ADL	1996	697,731	FGL
	4,800		1997	698,037	FGL
<u>Redear sunfish</u>			1998	694,211	FGL
1981	36,000	FGL	1999	710,761	FGL
	36,000		2000	510,737	FGL
<u>Coppernose bluegill</u>			2001	218,240	FGL
1981	633,911	FGL	2002	692,258	FGL
	633,911		2003	732,049	FGL
			2004	515,101	FGL
			2005	705,986	FGL
			2006	506,113	FGL
				8,446,383	

Table 4. Survey of littoral zone and physical habitat types, Lake Fork Reservoir, Texas, 2002. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area were determined for each type of aquatic vegetation found.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Boat dock	25.1	9.1		
Bulkhead	5.8	2.1		
Concrete	9.2	3.4		
Rip-rap	0.4	0.1		
Standing timber	143.2	52.3		
Native emergent	125.0	45.6	37.7	0.14%
Native floating	59.1	21.6	154.0	0.57%
Native submerged	1.9	0.7	1.2	<0.01%
Alligatorweed			0.5	<0.01%
Eurasian watermilfoil	2.4	0.9	6.7	0.03%
Hydrilla	32.8	12.0	98.2	0.36%
Waterhyacinth	4.0	1.5	0.9	<0.01%

Table 5. Percent directed angler effort by species for Lake Fork Reservoir, Texas, June 2000 – May 2006.

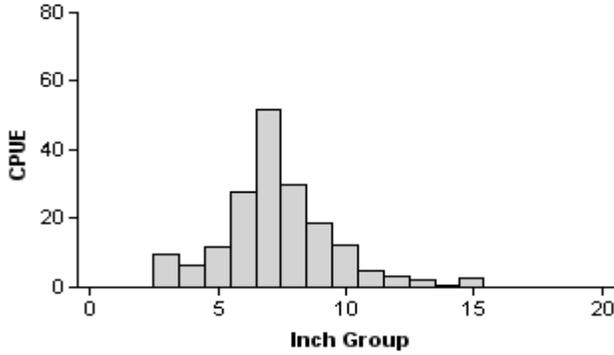
Species	Year					
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Catfish	4.02	7.09	4.58	6.28	4.74	6.15
Yellow bass	-	0.21	0.13	0.03	0.39	-
Sunfish	0.90	0.72	0.96	0.35	0.45	-
Largemouth bass	79.08	62.94	75.11	71.81	77.79	81.57
Crappie	15.69	28.82	18.90	20.88	16.63	12.27
Anything	0.32	0.21	0.33	0.65	-	-

Table 6. Total fishing effort (h) for all species and total directed expenditures (and associated RSEs in parentheses) at Lake Fork Reservoir, Texas, 2000- 2006.

Species	Year					
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Total fishing effort	934,252 (21)	664,082 (12)	757,177 (13)	649,856 (10)	786,911 (16)	717,074 (11)
Total directed expenditures	\$9,626,401 (28)	\$5,396,254 (20)	\$6,295,707 (19)	\$5,307,165 (18)	\$7,143,221 (22)	\$6,339,343 (17)

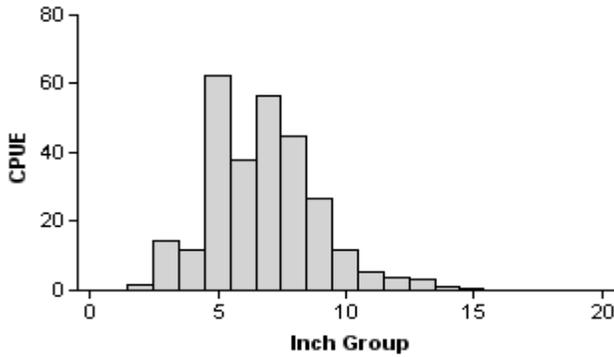
Gizzard shad

2001



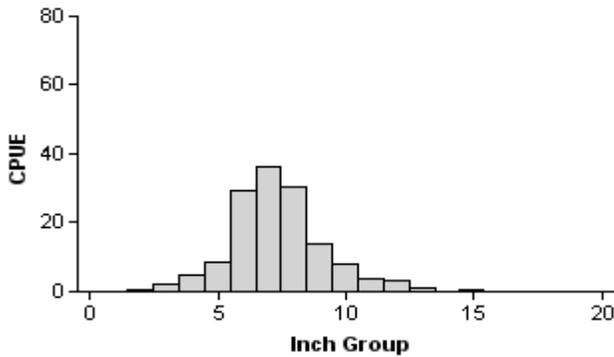
Effort = 2.0
 Total CPUE = 181.5 (20; 363)
 Stock CPUE = 126.0 (16; 252)
 PSD = 10 (0.04)
 IOV = 59 (0.06)

2002



Effort = 2.0
 Total CPUE = 281.5 (13; 563)
 Stock CPUE = 153.0 (16; 306)
 PSD = 9 (0.02)
 IOV = 66 (0.06)

2003

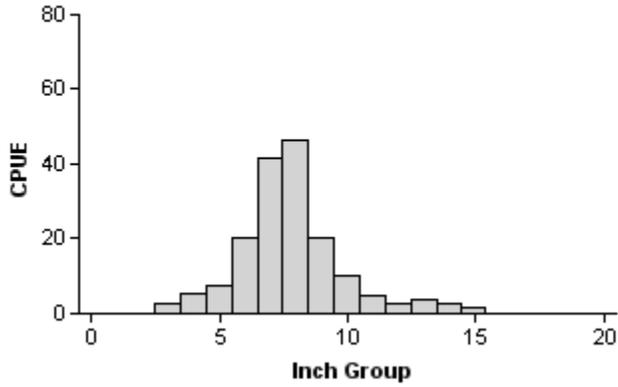


Effort = 2.0
 Total CPUE = 142.5 (23; 285)
 Stock CPUE = 97.0 (22; 194)
 PSD = 8 (0.03)
 IOV = 58 (0.07)

Figure 2. Number of gizzard shad caught per hour 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, 2001 through 2005. Figure continued on page 18.

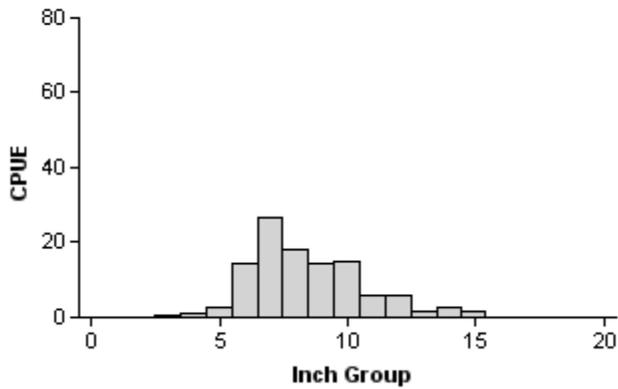
Gizzard shad

2004



Effort = 2.0
 Total CPUE = 169.5 (16; 339)
 Stock CPUE = 133.5 (17; 267)
 PSD = 11 (0.03)
 IOV = 46 (0.07)

2005



Effort = 2.0
 Total CPUE = 110.0 (18; 220)
 Stock CPUE = 91.5 (19; 183)
 PSD = 19 (0.04)
 IOV = 41 (0.04)

Figure 2 continued. Number of gizzard shad caught per hour 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 2001 through 2005.

Bluegill

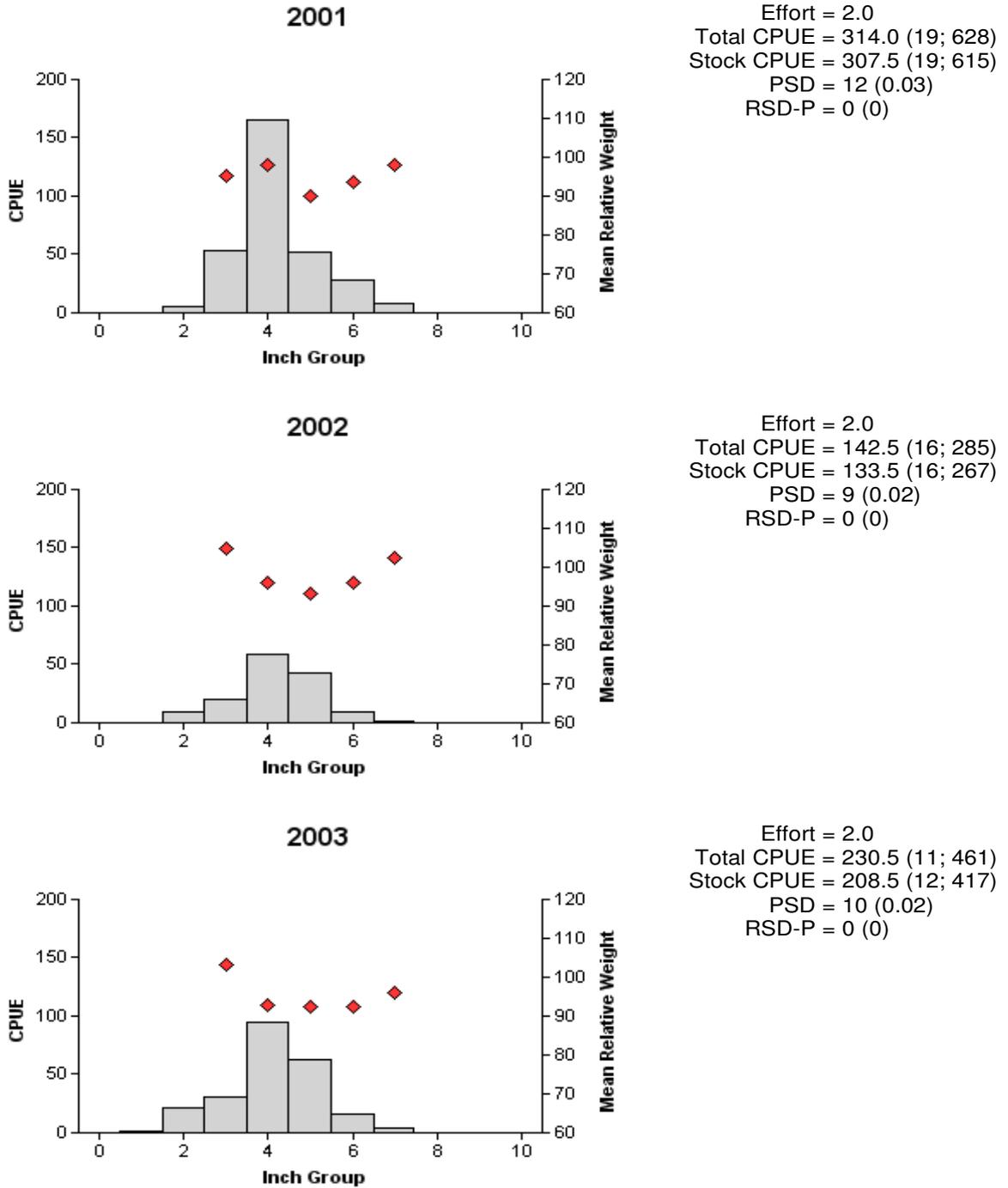


Figure 3. Number of bluegill caught per hour (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall electrofishing surveys, Lake Fork Reservoir, Texas, 2001 through 2005. Figure continued on page 20.

Bluegill



Effort = 2.0
 Total CPUE = 198.0 (17; 396)
 Stock CPUE = 178.5 (16; 357)
 PSD = 13 (0.03)
 RSD-P = 0 (0)



Effort = 2.0
 Total CPUE = 179.0 (21; 358)
 Stock CPUE = 167.5 (21; 335)
 PSD = 10 (0.02)
 RSD-P = 0 (0)

Figure 3 continued. Number of bluegill caught per hour (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, 2001 through 2005.

Redear sunfish

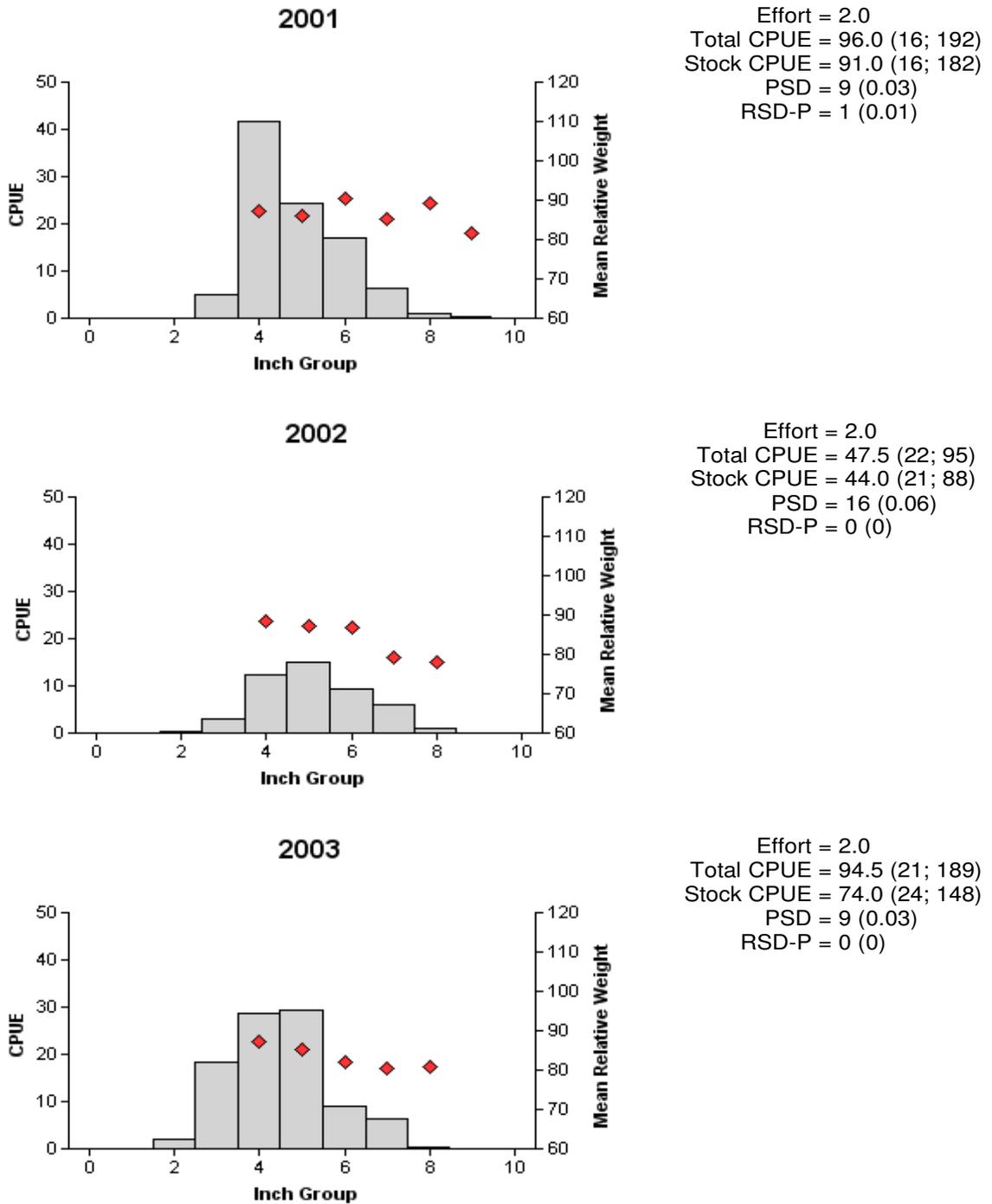
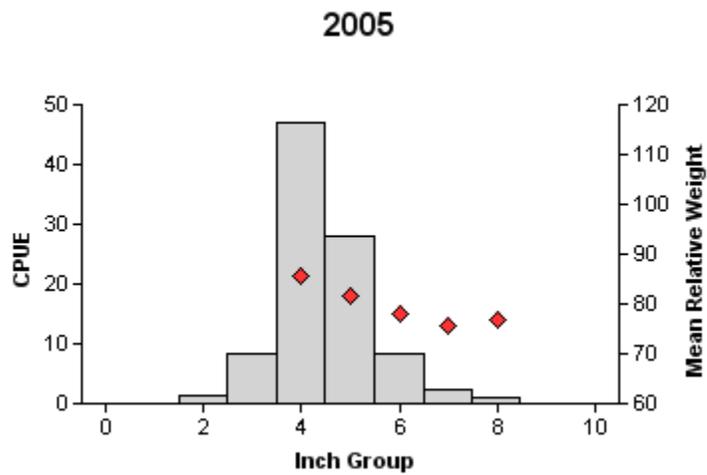


Figure 4. Number of redear sunfish caught per hour (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall electrofishing surveys, Lake Fork Reservoir, Texas, 2001 through 2005. Figure continued on page 22.

Redear sunfish



Effort = 2.0
 Total CPUE = 88.5 (17; 177)
 Stock CPUE = 78.5 (17; 157)
 PSD = 5 (0.02)
 RSD-P = 0 (0)



Effort = 2.0
 Total CPUE = 97.0 (17; 194)
 Stock CPUE = 87.0 (19; 174)
 PSD = 4 (0.02)
 RSD-P = 0 (0)

Figure 4 continued. Number of redear sunfish caught per hour (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, 2001 through 2005.

Channel catfish

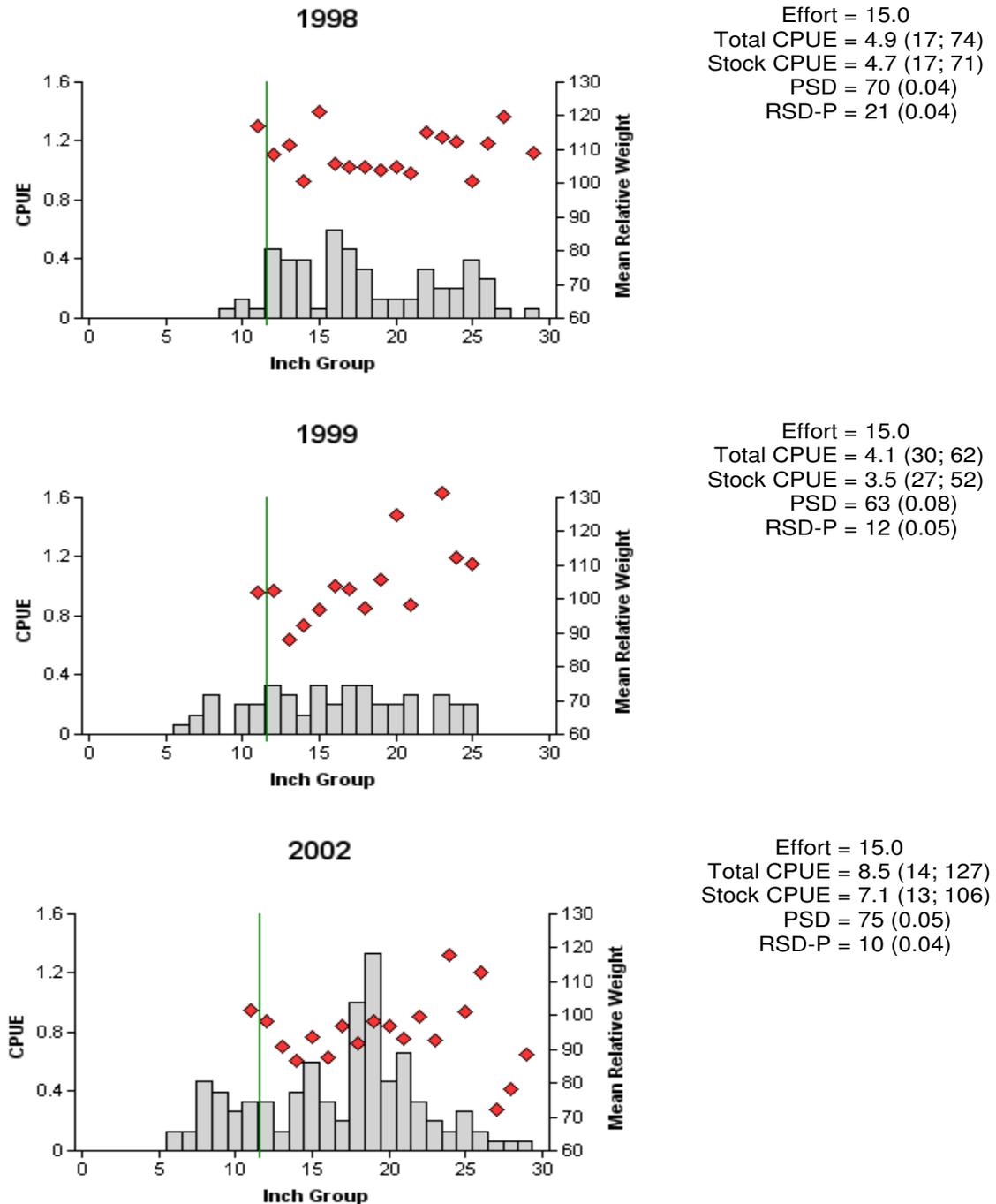
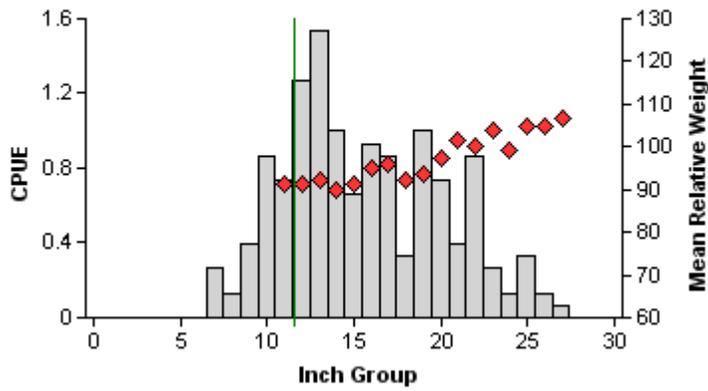


Figure 5. Number of channel catfish caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for spring gill net surveys, Lake Fork Reservoir, Texas, 1998, 1999, 2002, 2004, and 2006. Vertical lines indicate minimum length limit at time of survey. Figure continued on page 24.

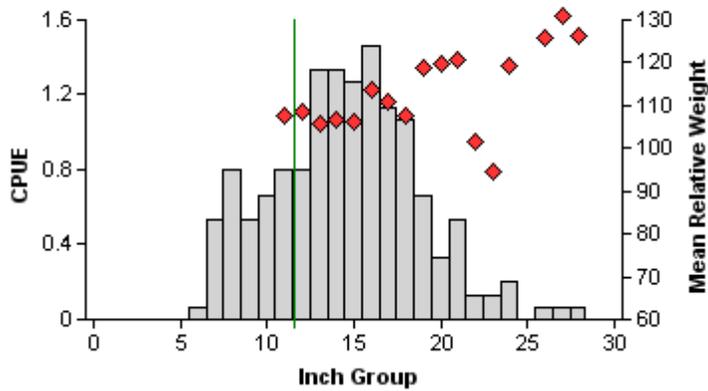
Channel catfish

2004



Effort = 15.0
 Total CPUE = 12.9 (15; 194)
 Stock CPUE = 11.3 (17; 169)
 PSD = 54 (0.07)
 RSD-P = 6 (0.02)

2006



Effort = 15.0
 Total CPUE = 14.0 (17; 210)
 Stock CPUE = 11.4 (18; 171)
 PSD = 51 (0.04)
 RSD-P = 4.(0.01)

Figure 5 continued. 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, 1998, 1999, 2002, 2004, and 2006. Vertical lines indicate minimum length limit at time of survey.

Table 7. Creel survey statistics for channel catfish at Lake Fork Reservoir from June 2000 through May 2001, to June 2005 through May 2006, 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					
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Directed effort (h)	37,518 (34)	47,071 (18)	34,657 (24)	40,809 (19)	37,311 (24)	44,109 (18)
Directed effort/acre	1.36 (34)	1.70 (18)	1.25 (24)	1.47 (19)	1.35 (24)	1.62 (18)
Total catch per hour	0.98 (17)	0.94 (26)	1.01 (33)	1.44 (24)	1.29 (37)	1.07 (27)
Catch/acre	2.44 (78)	3.68 (42)	1.90 (54)	2.87 (25)	2.74 (57)	1.90 (39)
Harvest per hour	0.72 (23)	0.53 (27)	0.65 (34)	1.44 (24)	0.84 (38)	0.78 (30)
Harvest/acre	2.42 (68)	1.14 (28)	1.30 (33)	1.82 (25)	2.01 (38)	1.14 (23)
Total harvest	67,033 (68)	31,534 (28)	36,071 (33)	50,466 (25)	55,691 (38)	31,031 (23)
Percent legal released	2.1	9.8	13.6	28.8	8.5	33.6

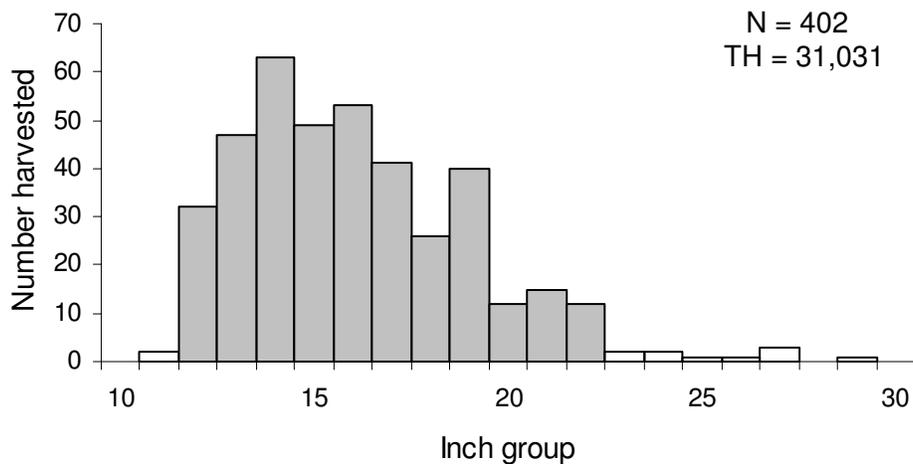


Figure 6. Length frequency of harvested channel catfish observed during creel surveys at Lake Fork Reservoir, Texas, June 2005 through May 2006, all anglers combined. N is the number of harvested channel catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth bass - spring

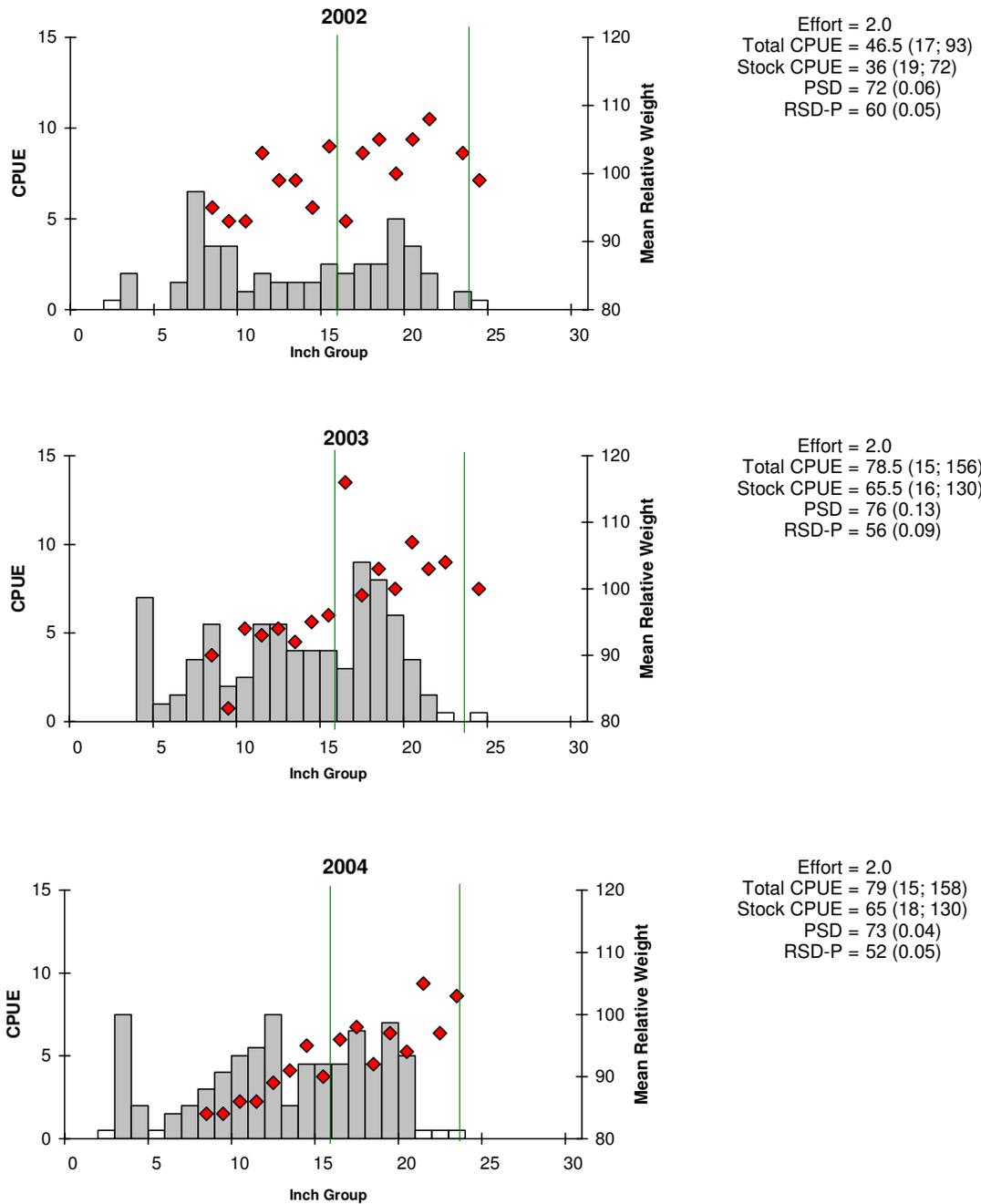


Figure 7. Number of largemouth bass caught per hour (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for spring electrofishing surveys, Lake Fork Reservoir, Texas, 2002 through 2006. Vertical lines indicate minimum and maximum lengths of slot length limit at time of survey. Figure continued on page 27.

Largemouth bass - spring

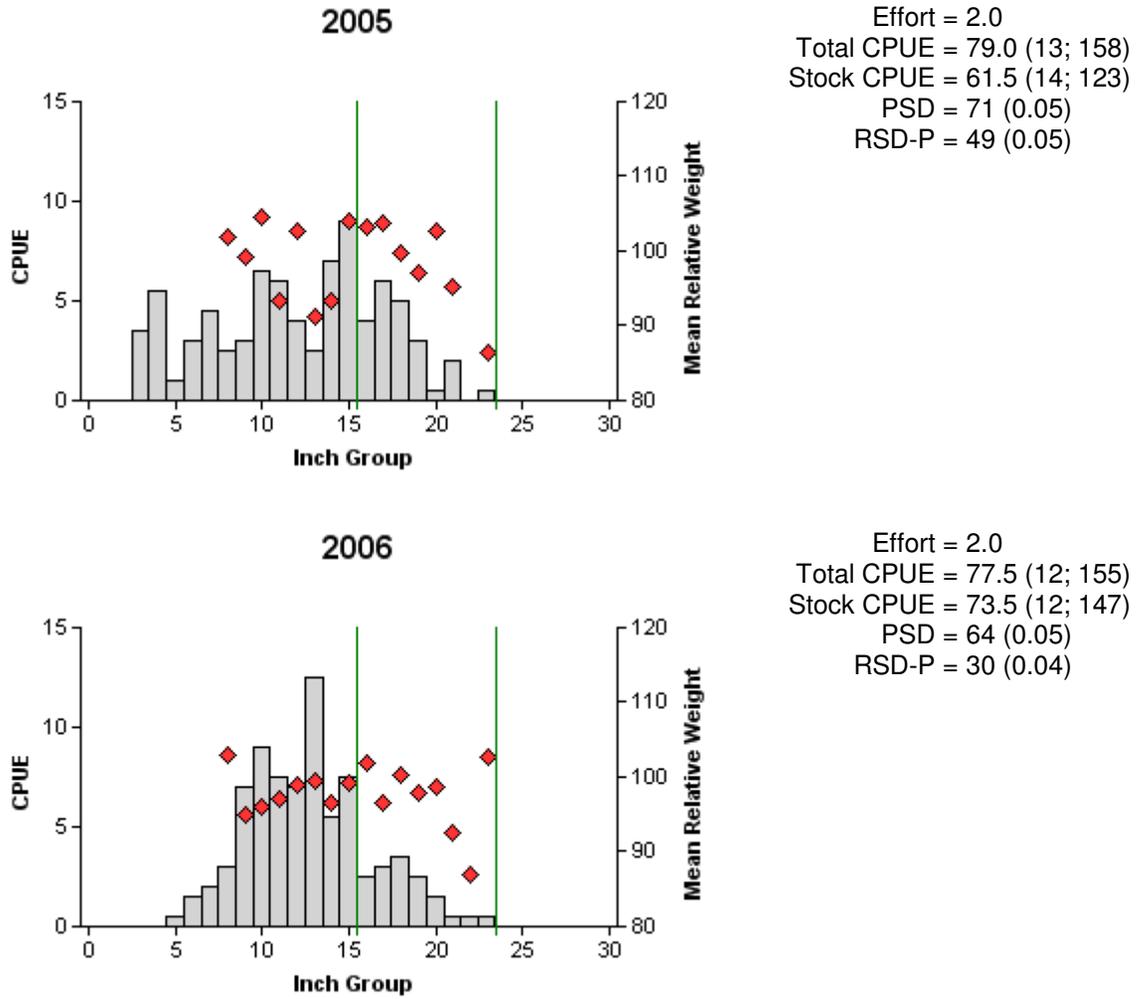
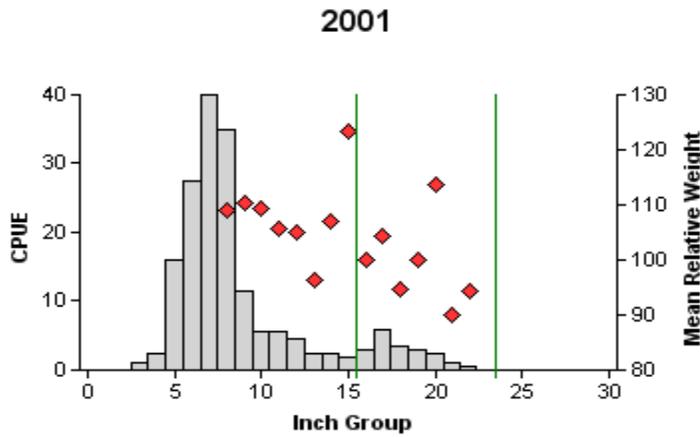
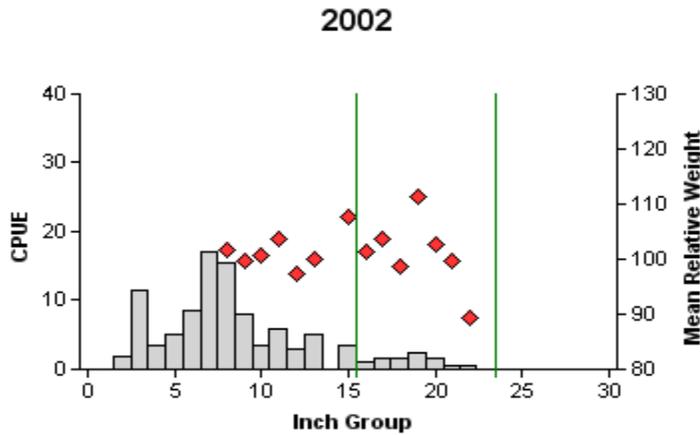


Figure 7 continued. Number of largemouth bass caught per hour (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for spring electrofishing surveys, Lake Fork Reservoir, Texas, 2002 through 2006. Vertical lines indicate minimum and maximum lengths of slot length limit at time of survey

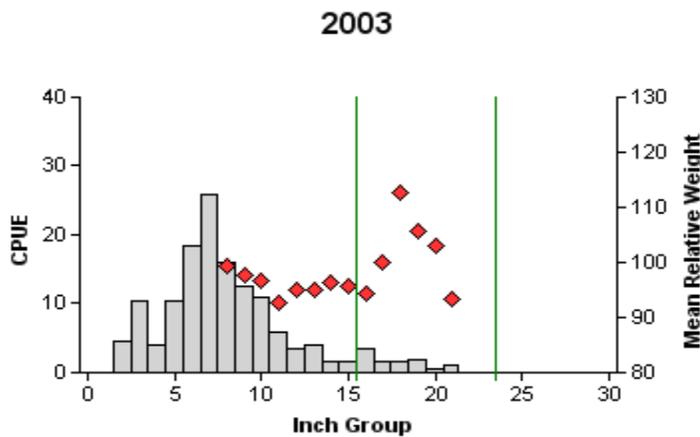
Largemouth bass - fall



Effort = 2.0
 Total CPUE = 175.5 (20; 351)
 Stock CPUE = 88.5 (21; 177)
 PSD = 35 (0.05)
 RSD-P = 24 (0.04)



Effort = 2.0
 Total CPUE = 101.0 (17; 202)
 Stock CPUE = 53.5 (18; 107)
 PSD = 38 (0.05)
 RSD-P = 23 (0.06)



Effort = 2.0
 Total CPUE = 140.0 (12; 280)
 Stock CPUE = 66.0 (16; 132)
 PSD = 31 (0.04)
 RSD-P = 17 (0.03)

Figure 8. Number of largemouth bass caught per hour (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, 2001 through 2005. Vertical lines indicate minimum and maximum lengths of slot length limit at time of survey. Figure continued on page 29.

Largemouth bass – fall

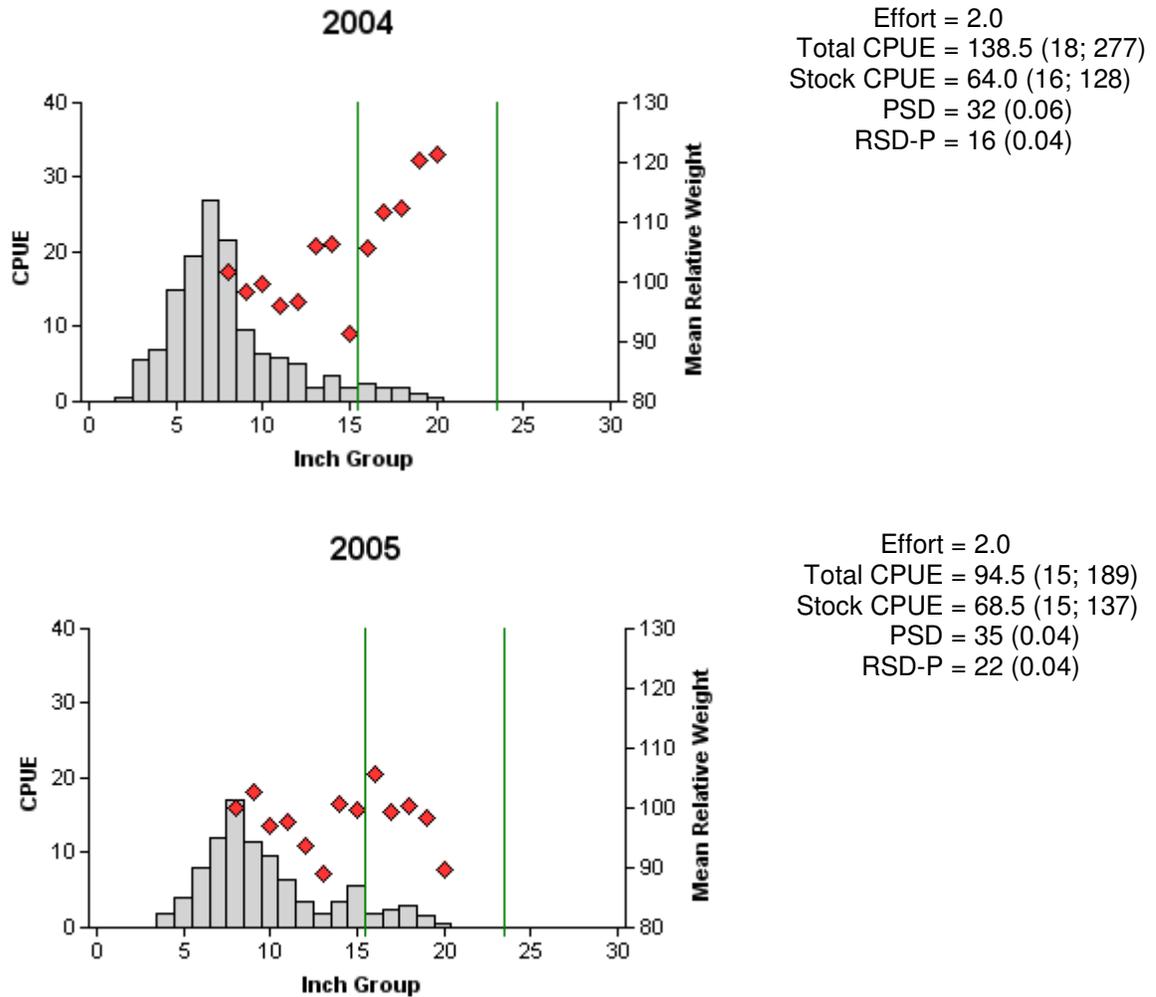


Figure 8 continued. Number of largemouth bass caught per hour (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall electrofishing surveys, Lake Fork Reservoir, Texas, 2001 through 2005. Vertical lines indicate minimum and maximum lengths of slot length limit at time of survey.

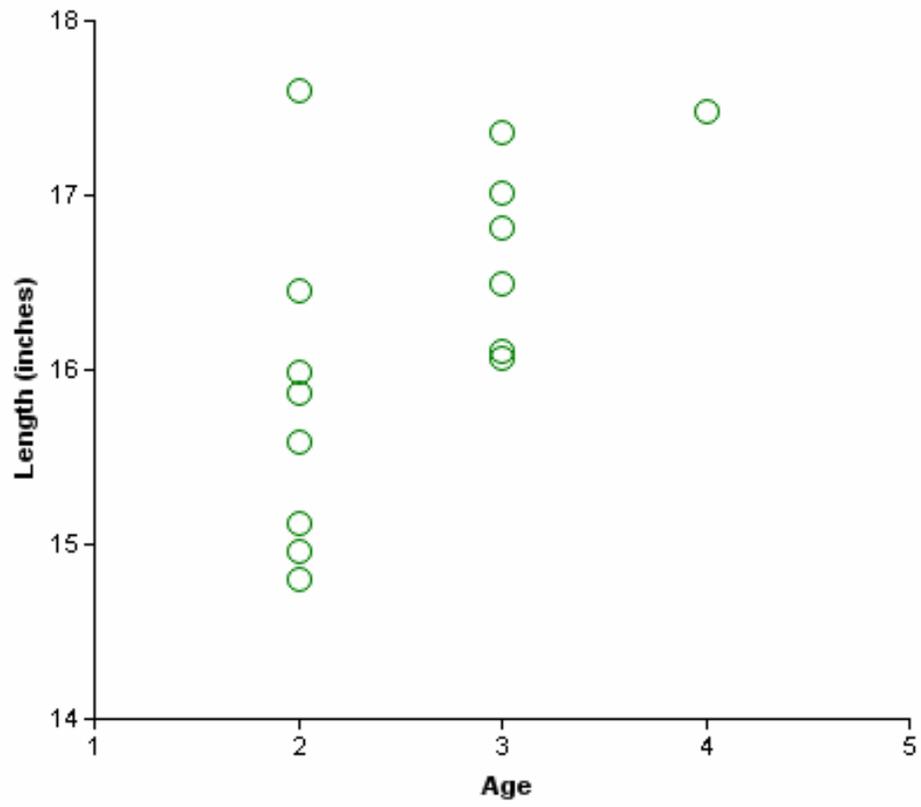


Figure 9. Length at age for largemouth bass collected from electrofishing at Lake Fork Reservoir, Texas, October 2005. Average length of fish in sample = 16.25 inches.

Table 8. Creel survey statistics for largemouth bass at Lake Fork Reservoir from June 2000 through May 2001, to June 2005 through May 2006, 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					
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Directed effort (h)	738,770 (21)	418,029 (13)	568,700 (14)	466,640 (12)	612,123 (17)	584,952 (12)
Directed effort/acre	26.69 (21)	15.10 (13)	20.54 (14)	16.85 (12)	22.11 (17)	21.46 (12)
Total catch per hour	0.27 (9)	0.39 (11)	0.34 (9)	0.36 (9)	0.45 (8)	0.44 (8)
Catch/acre	11.63 (43)	6.72 (18)	8.25 (18)	7.40 (15)	11.99 (21)	11.82 (18)
Harvest* per hour	<0.01 (75)	0.01 (45)	<0.01 (97)	0.01 (60)	0.03 (24)	0.01 (50)
Harvest*/acre	0.21 (94)	0.19 (43)	0.11 (49)	0.40 (38)	0.98 (12)	0.20 (27)
Total harvest*	5,864 (94)	5,333 (43)	2,925 (49)	11,140 (38)	27,184 (12)	5,346 (27)
Percent legal released	95.8	95.5	97.8	92.0	88.9	97.2

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

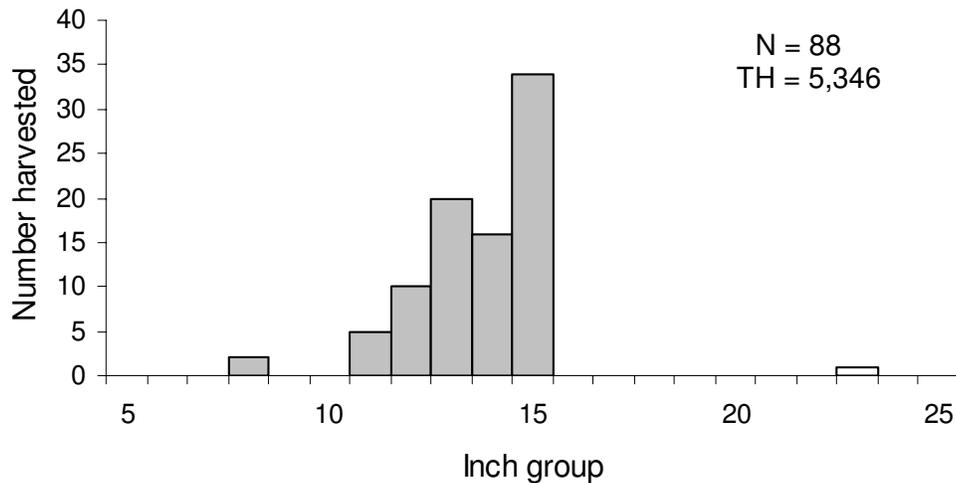


Figure 10. Length frequency of harvested largemouth bass observed during creel surveys at Lake Fork Reservoir, Texas, June 2005 through May 2006, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 9. Results of genetic analysis of Age-0 largemouth bass collected by fall electrofishing, Lake Fork Reservoir, Texas, 1989 through 2005. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between an FLMB and an NLMB, Fx = second or higher generation hybrid between an FLMB and an NLMB.

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

Table 10. Results of genetic analysis of Age-1 largemouth bass collected from stocked (embayment) and un-stocked areas by fall electrofishing, Lake Fork Reservoir, Texas, 2003 through 2005. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between an FLMB and an NLMB, Fx = second or higher generation hybrid between an FLMB and an NLMB.

Year	Stocked area	Sample size	Genotype				% FLMB alleles	% pure FLMB
			FLMB	F1	Fx	NLMB		
2003	Y	41	3	14	23	1	49.5	7.3
2003	N	48	4	10	26	8	41.8	8.3
2004	Y	42	7	6	27	2	57.4	16.7
2004	N	46	8	7	29	2	52.6	17.4
2005	Y	60	6	2	50	2	58.3	10.0
2005	N	59	1	3	54	1	52.4	2.0

White crappie

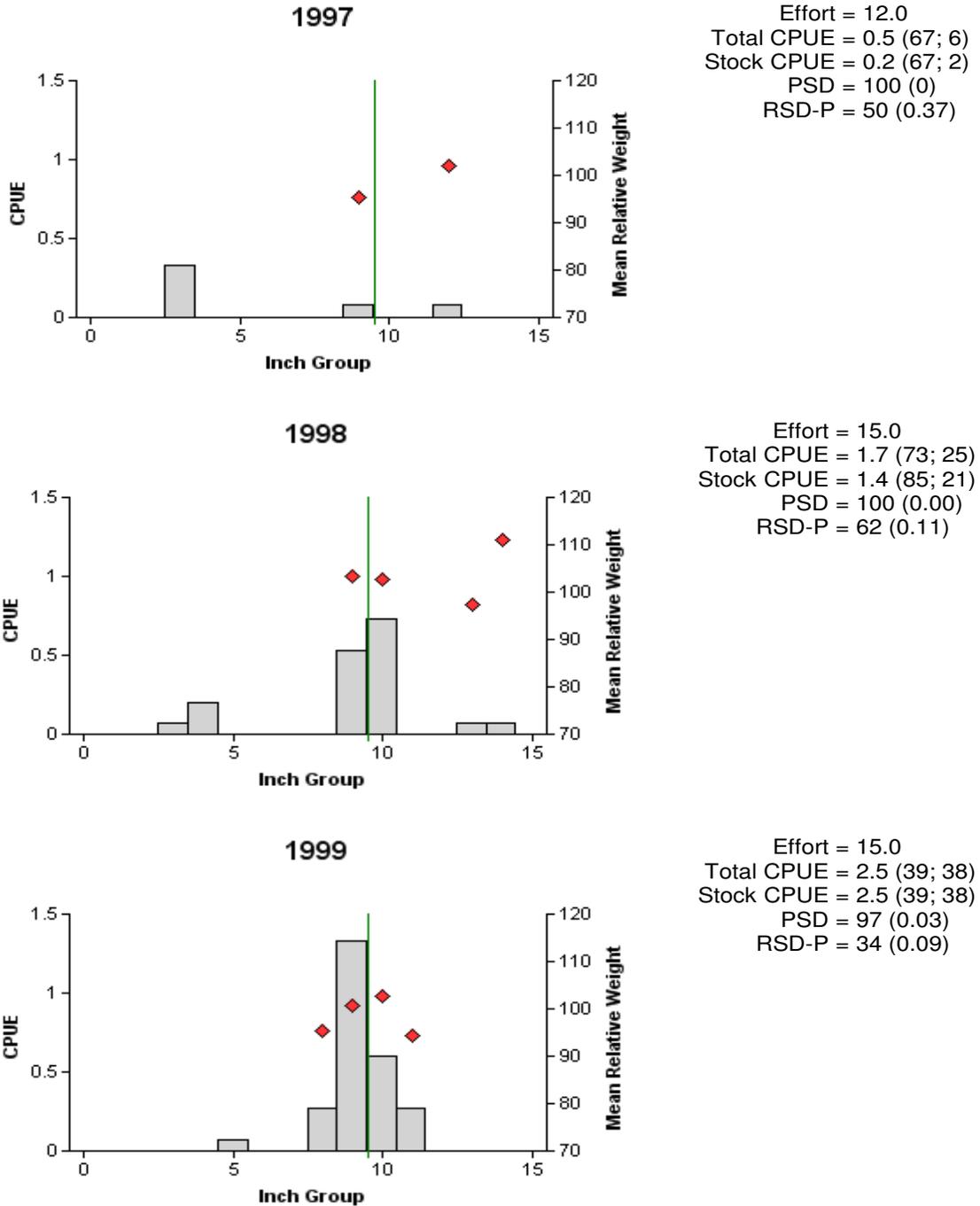


Figure 11. Number of white crappie caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall trap net surveys, Lake Fork Reservoir, Texas, 1997-1999, 2003 and 2005. Vertical lines indicate minimum length limit at time of survey. Figure continued on page 34.

White crappie

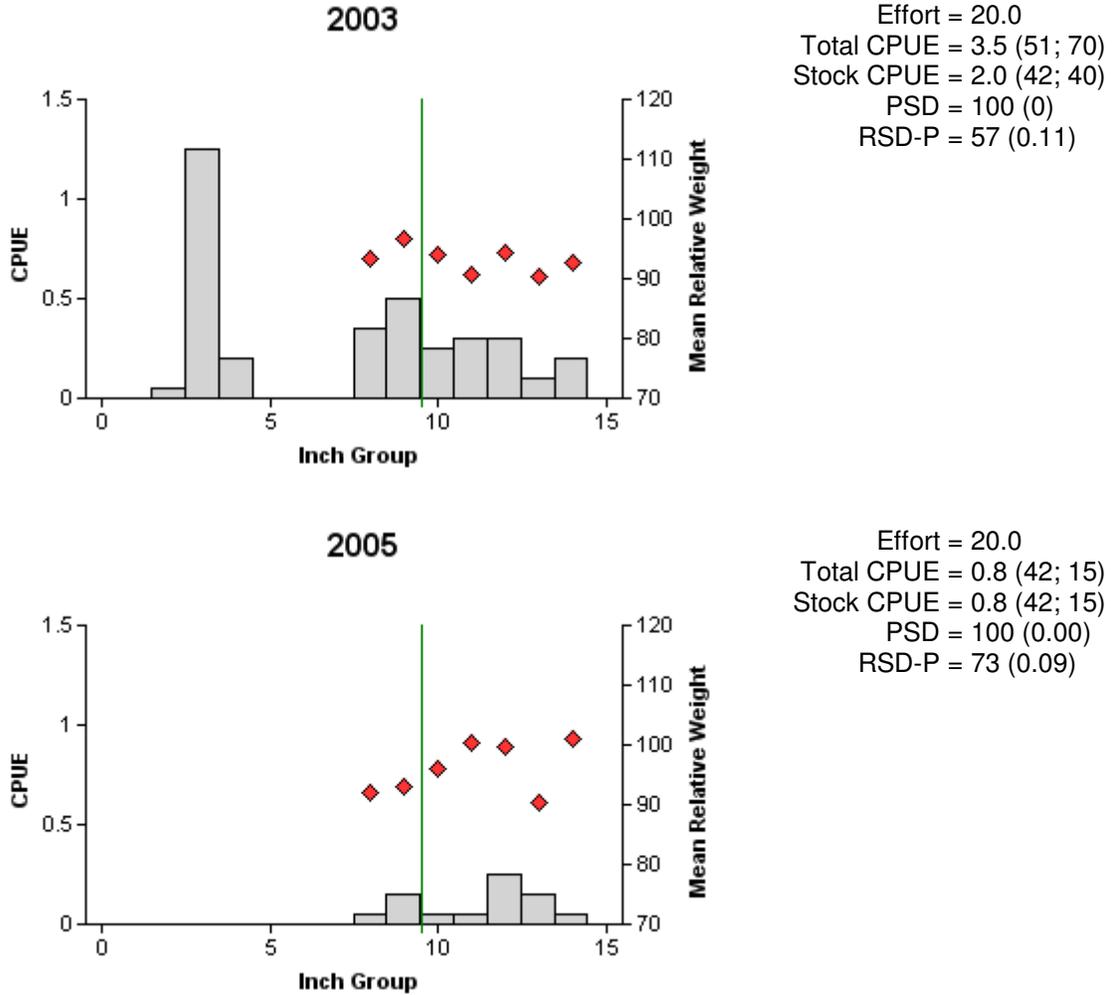


Figure 11 continued. Number of white crappie caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall trap net surveys, Lake Fork Reservoir, Texas, 1997-1999, 2003 and 2005. Vertical lines indicate minimum length limit at time of survey.

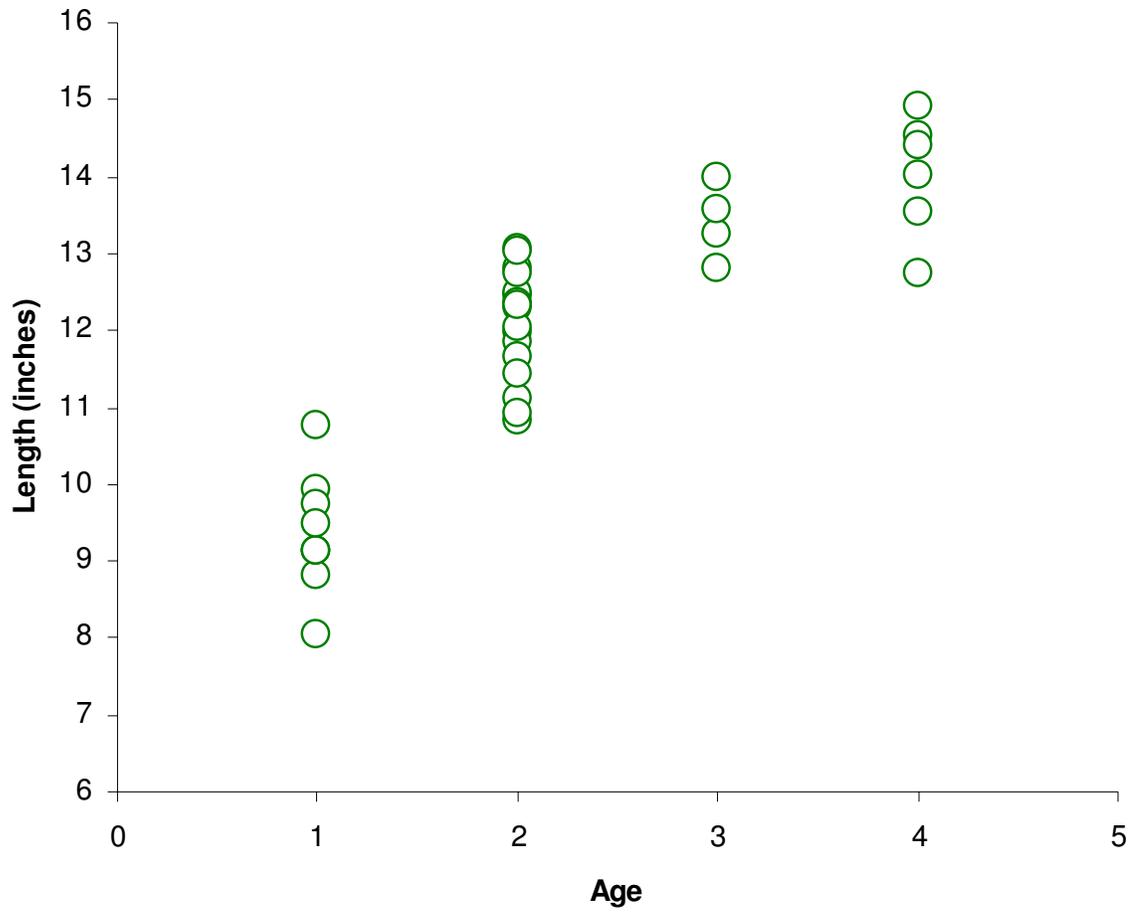


Figure 12. Length at age for white crappie collected from trap nets, gill nets, and angling at Lake Fork Reservoir, Texas, November 2005.

White crappie

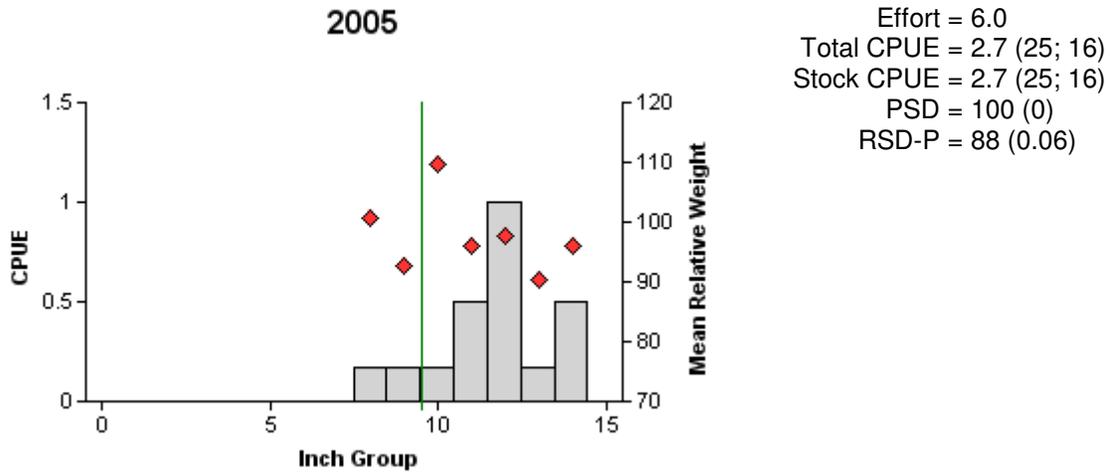


Figure 13. Number of white crappie caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall gill net surveys, Lake Fork Reservoir, Texas, 2005. Vertical lines indicate minimum length limit at time of survey.

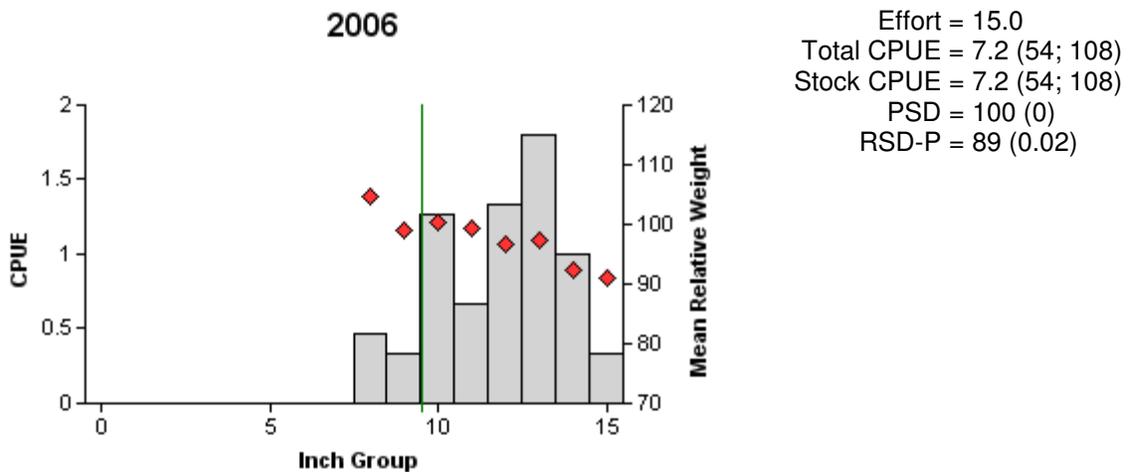


Figure 14. Number of white crappie caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for spring trap net surveys, Lake Fork Reservoir, Texas, 2006. Vertical lines indicate minimum length limit at time of survey.

Black crappie

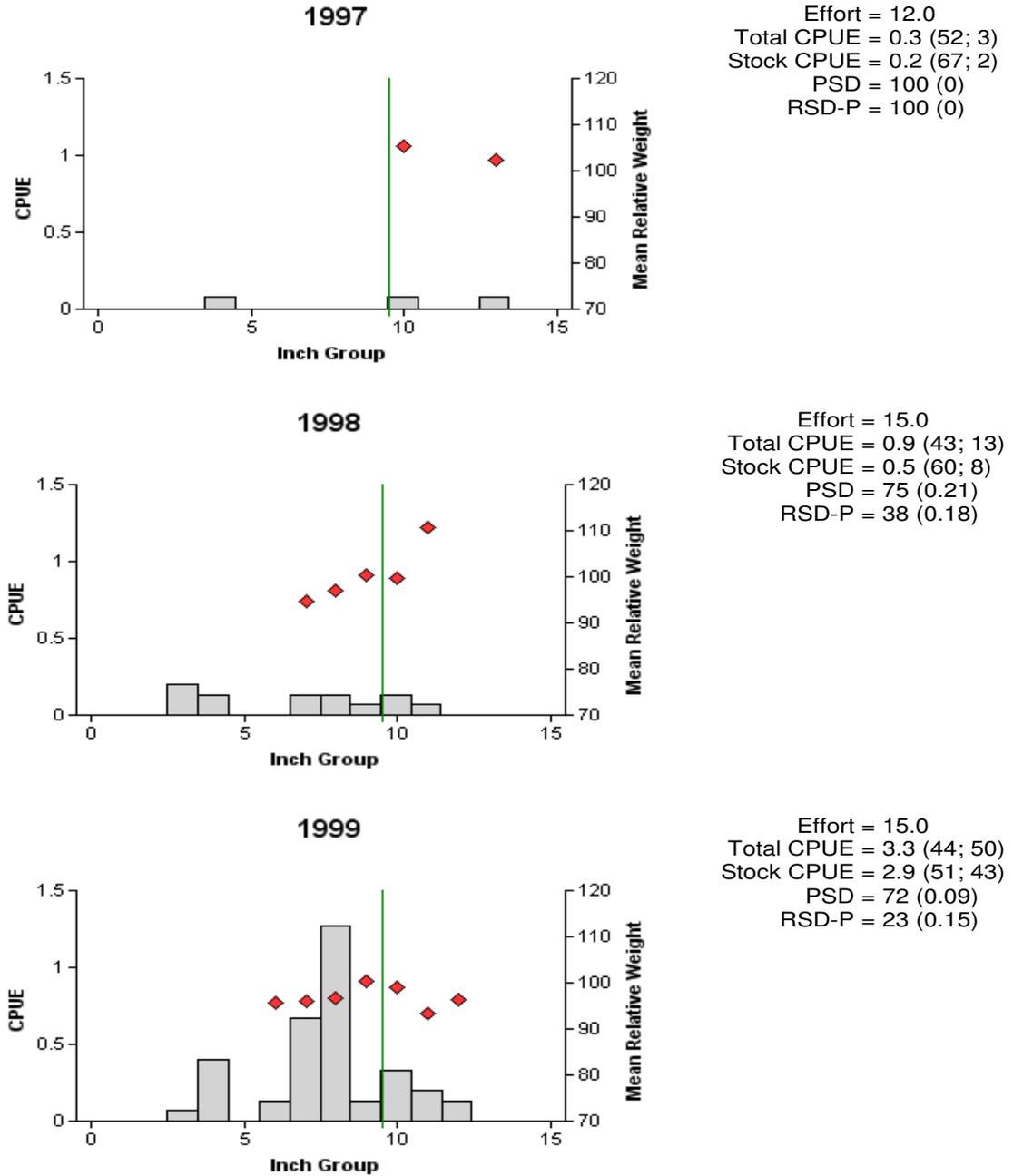


Figure 15. Number of black crappie caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall trap net surveys, Lake Fork Reservoir, Texas, 1997-1999, 2003 and 2005. Vertical lines indicate minimum length limit at time of survey. Figure continued on page 38.

Black crappie

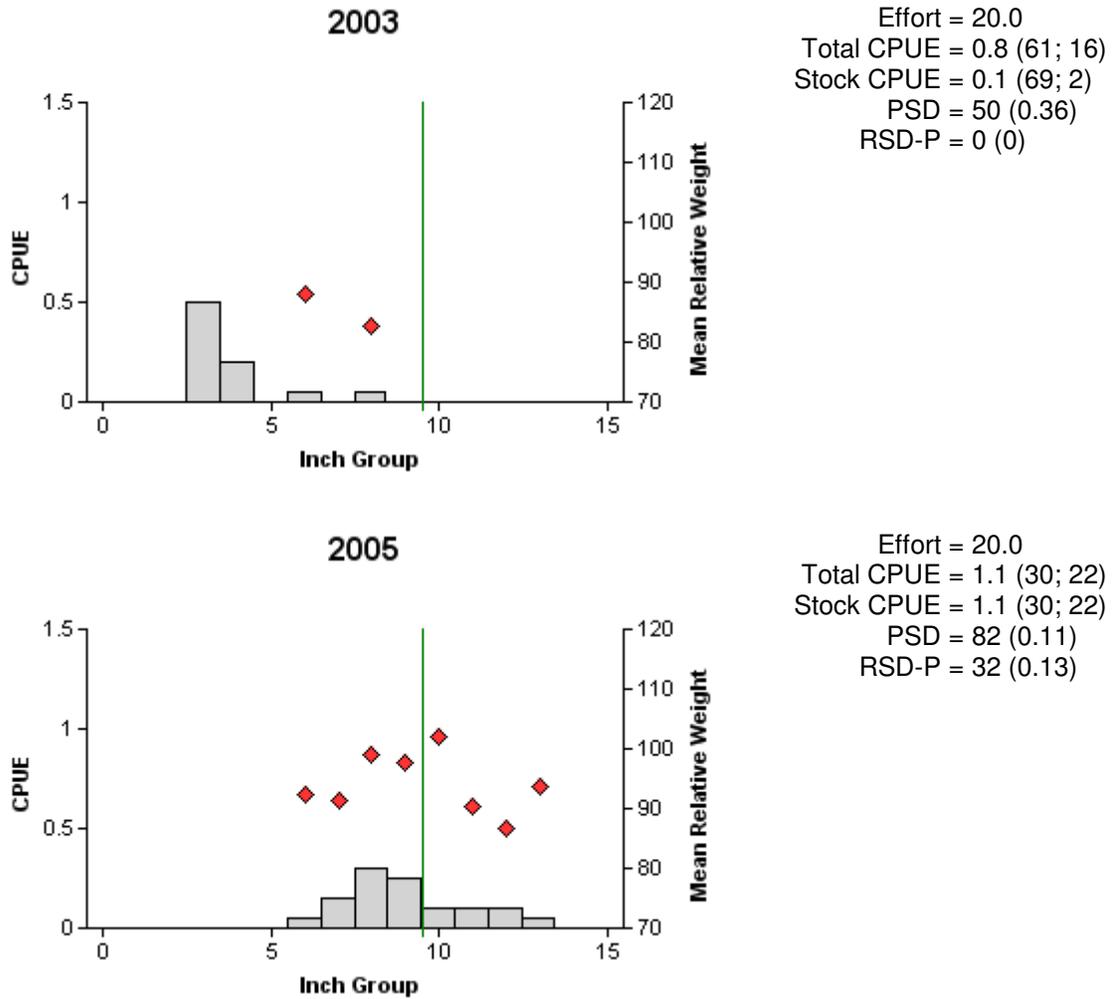


Figure 15 continued. Number of black crappie caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall trap net surveys, Lake Fork Reservoir, Texas, 1997-1999, 2003 and 2005. Vertical lines indicate minimum length limit at time of survey.

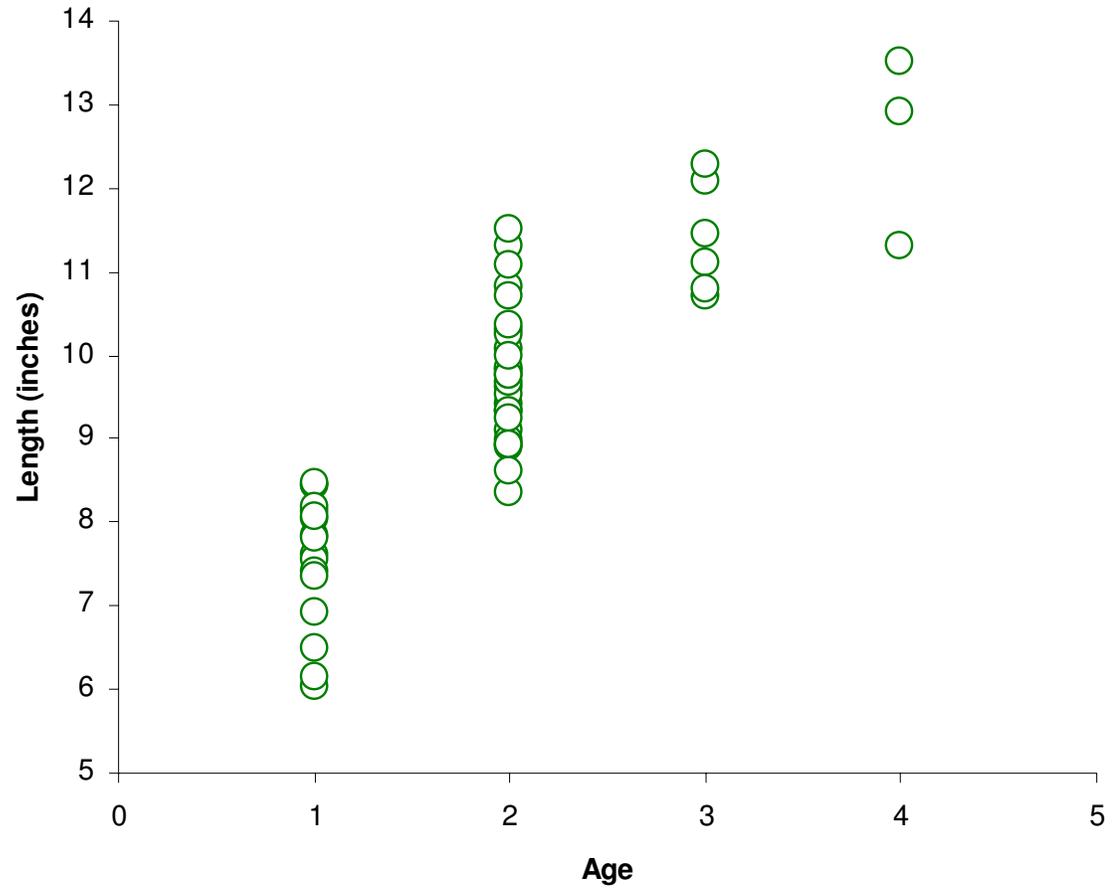


Figure 16. Length at age for black crappie collected from trap nets, gill nets, and angling at Lake Fork Reservoir, Texas, November 2005.

Black crappie

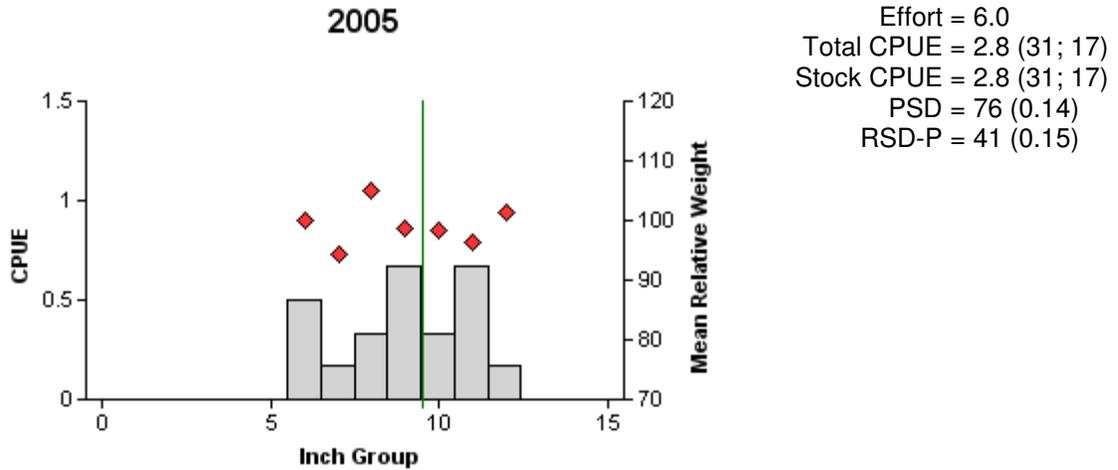


Figure 17. Number of black crappie caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for fall gill net surveys, Lake Fork Reservoir, Texas, 2005. Vertical lines indicate minimum length limit at time of survey.

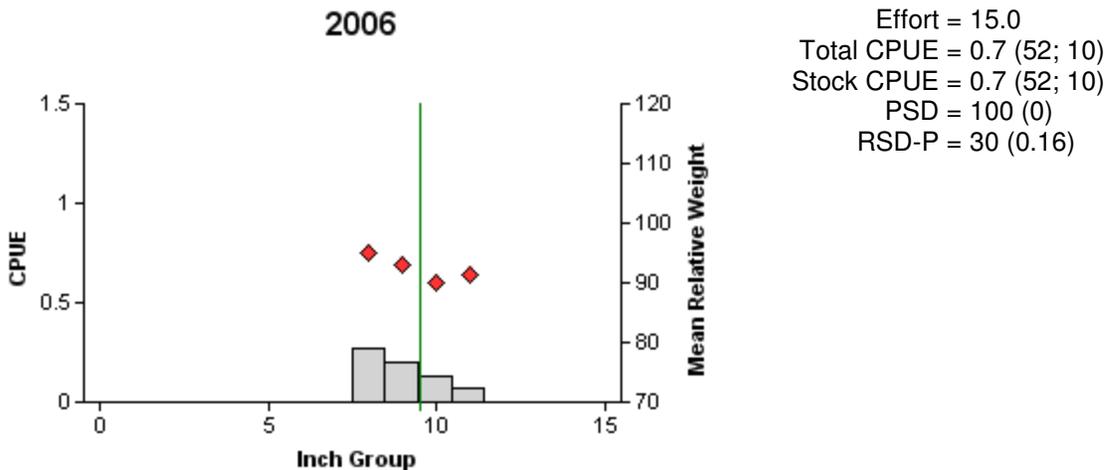


Figure 18. Number of black crappie caught per net night (bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for structural indices are in parentheses) for spring trap net surveys, Lake Fork Reservoir, Texas, 2006. Vertical lines indicate minimum length limit at time of survey.

Table 11. Creel survey statistics for crappie (white and black combined) at Lake Fork Reservoir from June 2000 through May 2001, to June 2005 through May 2006, 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					
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Directed effort (h)	146,595 (24)	191,410 (13)	143,115 (13)	135,708 (13)	130,894 (18)	88,012 (14)
Directed effort/acre	5.29 (24)	6.91 (13)	5.17 (13)	4.90 (13)	4.73 (18)	3.23 (14)
Total catch per hour	2.76 (17)	2.66 (15)	2.37 (20)	2.17 (16)	2.03 (19)	1.62 (20)
Catch/acre	22.02 (50)	19.21 (21)	14.95 (22)	11.65 (21)	11.05 (29)	5.49 (17)
Harvest per hour	0.81 (18)	1.07 (14)	0.80 (21)	0.93 (18)	0.64 (21)	0.44 (28)
Harvest/acre	7.51 (55)	7.08 (24)	5.92 (28)	4.84 (26)	4.22 (41)	1.36 (31)
Total harvest	207,915 (55)	196,042 (24)	163,921 (28)	134,060 (26)	116,857 (41)	37,020 (31)
Percent legal released	5.0	3.3	3.5	3.6	1.2	5.4

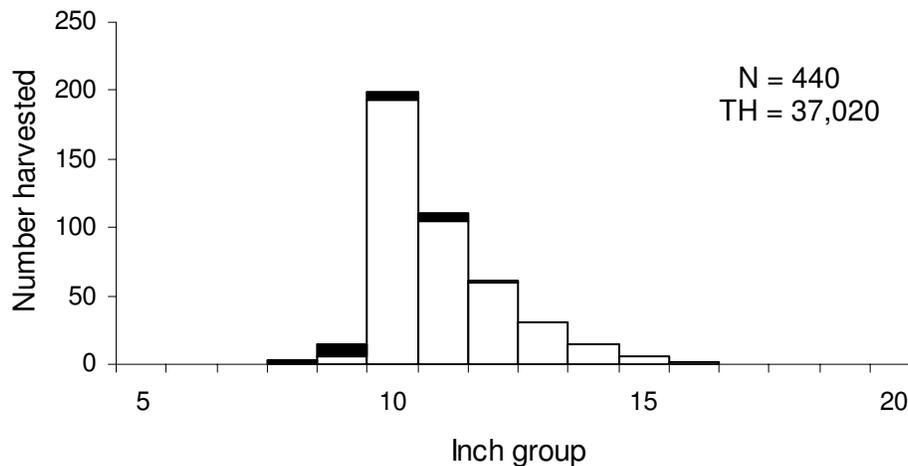


Figure 19. Length frequency of harvested crappie (white and black combined) observed during creel surveys at Lake Fork Reservoir, Texas, June 2005 through May 2006, all anglers combined. Open bars represent crappie caught in summer, fall and spring quarters and black bars represent crappie caught in 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.

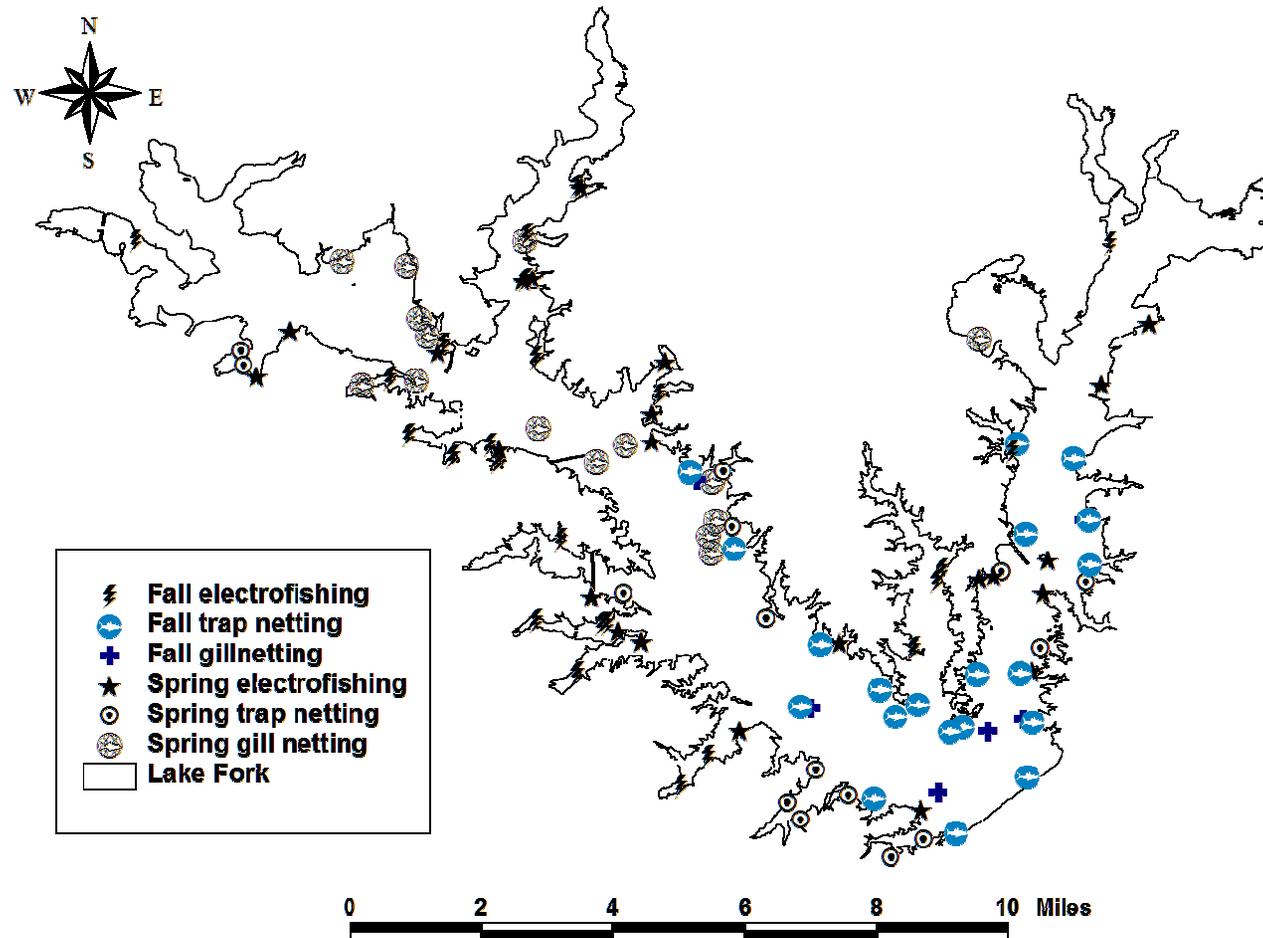
Survey Year	Electrofishing	Trap netting	Gill netting	Creel survey	Vegetation survey	Habitat survey	Report
Fall 2006-Spring 2007	A			S	A		A
Fall 2007-Spring 2008	S	S	S	S	S	S	S
Fall 2008-Spring 2009	A			S	A		A
Fall 2009-Spring 2010	A		A	S	A		A

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake Fork Reservoir, Texas, 2005-2006.

Species	Fall electrofishing		Fall trap netting		Fall gill netting		Spring trap netting		Spring electrofishing		Spring gill netting	
	N	CPUE	N	CPUE	N	CPUE	N	CPUE	N	CPUE	N	CPUE
Gizzard shad	220	110.0										
Threadfin shad	53	26.5										
Channel catfish											210	14.0
White bass					2	0.3						
Warmouth	16	8.0										
Bluegill	358	179.0										
Longear sunfish	34	17.0										
Redear sunfish	194	97.0										
Spotted sunfish	12	6.0										
Largemouth bass	189	94.5							155	77.5		
White crappie			15	0.75	17	2.7	108	7.2				
Black crappie			22	1.10	18	2.8	10	0.7				

APPENDIX B



Location of sampling sites, Lake Fork Reservoir, Texas, 2005-2006. Electrofishing, trap netting, and gill netting stations are identified in legend.

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
Waterhyacinth	40	125	7	130	50	6	3	49	74
Hydrilla	3,900	4,750	3,027	N/A	198	873	1,773	3,701	1,414

Appendix D

Water body records, all tackle category, for Lake Fork as of 5/23/2006

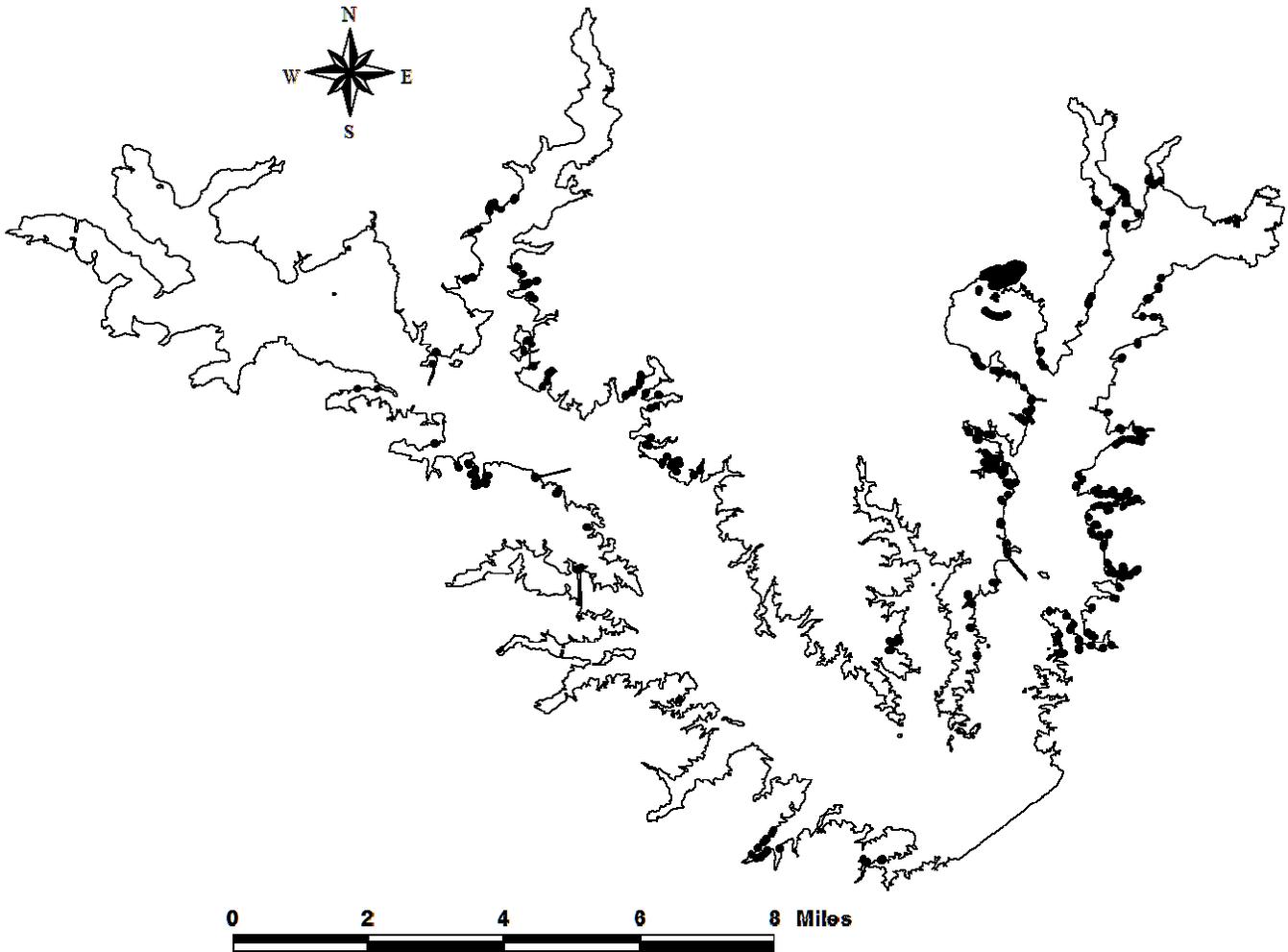
Species	Weight (lbs)	Length (inches)	Date certified	Gear
Bass, Hybrid yellow	4.75	19.00	3/12/2005	Rod & reel
Bass, Largemouth	18.18	25.50	1/24/1992	Rod & reel
Bass, White	3.97	18.25	2/8/2006	Rod & reel
Bass, Yellow	1.37	12.25	11/19/1997	Rod & reel
Bluegill	1.61	11.50	7/9/1995	Rod & reel
Bowfin	17.65	36.50	2/21/1993	Rod & reel
Buffalo, Bigmouth	36.00	33.50	10/19/1997	Rod & reel
Buffalo, Smallmouth	51.50	36.25	12/4/1998	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	17.73	31.00	3/9/2003	Rod & reel
Catfish, Flathead	88.00	51.50	4/26/2004	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	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	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

Appendix E

Distribution by angler-reported weight class of largemouth bass reported in the Lake Fork Trophy Bass Survey, March 2003 – May 2006. Numbers represent combined weighed and estimated entries.

Month-Year	Weight class (pounds)										Total
	7	8	9	10	11	12	13	14	15	16	
Mar-03	277	205	102	62	23	10	4	1		1	685
Apr-03	166	102	61	38	12	4	2	1			386
May-03	95	67	21	14	4	1	1				203
Jun-03	68	47	16	8	0	1	1				141
Jul-03	45	39	30	6	1	0					121
Aug-03	9	14	4	5	1	3					36
Sep-03	9	20	4	7	1	2					43
Oct-03	18	17	8	10	2	1					56
Nov-03	16	21	9	4	3	0					53
Dec-03	3	6	1	2	0	0					12
Jan-04	11	6	4	3	1	1	1				27
Feb-04	42	45	18	13	7	2	2				129
Mar-04	217	156	104	62	35	10	3				587
Apr-04	90	78	45	19	7	1	1				241
May-04	45	33	19	6	4	0					107
Jun-04	43	38	21	7	2						111
Jul-04	50	35	16	9	1	2					113
Aug-04	34	22	17	8	2	3			1		87
Sep-04	16	12	6	3							37
Oct-04	22	15	4	7	3	1	1		1		54
Nov-04	24	20	11	5							60
Dec-04	9	6	5	4		1	1				26
Jan-05	18	7	9	6		1					41
Feb-05	60	41	24	19	9	3	1				157
Mar-05	107	118	71	46	19	8	4				373
Apr-05	98	54	50	24	11	3					240
May-05	66	47	27	11	7	1		1			160
Jun-05	69	40	26	19	3	4	1				162
Jul-05	68	53	25	13	5	2					166
Aug-05	45	23	7	5	2	1					83
Sep-05	35	24	13	8	2	2					84
Oct-05	62	41	16	6	2	1					128
Nov-05	26	16	6	5	2	1					56
Dec-05	9	8	7	2	2	1					29
Jan-06	19	13	10	5	1	0					48
Feb-06	75	49	31	13	9	6	1		1		185
Mar-06	158	118	69	39	18	9	2	2			415
Apr-06	91	53	35	19	4	5	1	2			210
May-06	94	52	25	15	2	2	2				192
Total	2,409	1,761	977	557	207	93	29	7	3	1	6,044

Appendix F



Distribution of waterhyacinth in Lake Fork, September 2005. Total coverage was estimated to be 74 acres.