

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-32

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2006 Survey Report

Gibbons Creek Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Gibbons Creek Reservoir were surveyed in 2006 using electrofishing and trap nets and in 2007 using gill nets. Anglers were surveyed from March to May 2007 with a creel. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Gibbons Creek Reservoir is a 2,770-acre reservoir located in Grimes County on Gibbons Creek in the Brazos River Basin. Impounded in 1981 by Texas Municipal Power Agency (TMPA), the reservoir is used for power plant cooling and recreational purposes. Angler access is excellent, with a 5-lane boat ramp, plentiful bank access around the boat launch area, and a 750 square foot fishing pier. Americans with Disabilities Act (ADA) approved restrooms are available.
- **Management history:** Gibbons Creek Reservoir opened for angling in March 1981 under a 14-24-inch slot length limit for largemouth bass. The slot limit on bass was amended to a 14-21-inch slot limit after one year and remained under that regulation until 1992, when a catch-and-release-only regulation was adopted. On September 1, 2002, the bass fishery was placed back under a 14-24-inch slot length limit and a five-fish daily bag limit with one fish over 24 inches allowed per angler per day. Crappie have been managed under a 10-inch minimum length limit with a 25 fish bag since 1985. Channel and blue catfish were managed with a 9-inch minimum length limit and 25 fish bag until 1995 when the length limit was increased to 12 inches.
- **Fish community**
 - **Prey species:** The prey fish community at Gibbons Creek Reservoir consists primarily of threadfin shad, bluegill, and redear sunfish. Gizzard shad are also present but provide limited forage.
 - **Catfishes:** Blue and channel catfish are present in Gibbons Creek Reservoir in very good numbers and sizes. Flathead catfish are present in small numbers.
 - **Largemouth bass:** Largemouth bass are moderately abundant in Gibbons Creek Reservoir and provide quality angling opportunities. The lake has a history of producing trophy largemouth bass. The reservoir record largemouth bass weighed 16.12 pounds. Florida largemouth bass fingerlings are periodically stocked to enhance and maintain the trophy potential of the population.
 - **Crappie:** Both white and black crappie are present in numbers that provide a significant fishery at Gibbons Creek Reservoir. Trap net catches in monitoring surveys have been low in recent years, but angler catches are fair to good. A few crappie up to 12 inches were collected in the fall 2006 electrofishing survey.
- **Management strategies:** District staff will continue to monitor the largemouth bass population annually in the fall with electrofishing. Largemouth bass genetics will be assessed, and Florida largemouth bass fingerlings stocked when appropriate. Every four years, district staff will monitor crappie populations by trap netting and catfish populations by gill netting. An access-point creel survey will be conducted in the spring of 2011. District staff will continue to work with TMPA personnel to assess exotic vegetation coverage and implement treatments as needed.

3
INTRODUCTION

This document is a summary of fisheries data collected from Gibbons Creek Reservoir in 2006-2007. The purpose of this document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2006-2007 data for comparison.

Reservoir Description

Gibbons Creek Reservoir is a 2,770-acre reservoir located in Carlos, Texas (Grimes County) on Gibbons Creek in the Brazos River Basin. Impounded in 1981 by Texas Municipal Power Agency (TMPA), the reservoir is used for power plant cooling and recreational purposes. Bank and boat access are excellent, and ADA approved restroom facilities are available. Other descriptive characteristics of Gibbons Creek Reservoir are found in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Webb and Henson 2003) included:

1. Completion of a long-term evaluation of the Gibbons Creek largemouth bass fishery.
Action: Jeff Henson completed a case history study of the Gibbons Creek largemouth bass fishery concluding that fluctuations in the fishery are largely driven by strength of largemouth bass year classes (Henson 2005).
2. Evaluate changes in habitat at Gibbons Creek Reservoir.
Action: Vegetation was surveyed annually. Primary productivity data were collected to determine if fertilization was appropriate. Chlorophyll-a values indicated fertilization is not necessary at this time.
3. Assist TMPA with facility improvements.
Action: TMPA continues to improve the facilities at Gibbons Creek Reservoir. TPWD assisted with information and publicity whenever possible. TPWD also assisted TMPA in planning of exotic vegetation control and by conducting spring creel surveys to determine extent and economic value of fisheries.

Harvest regulation history: Since September 1, 2002, largemouth bass have been managed under a 14-24-inch slot length limit with a five fish daily bag. Only one fish 24 inches or larger may be harvested per day per angler. Prior to that, a catch-and-release-only regulation was in place for ten years in an attempt to increase the angler catch of trophy-sized bass; however, the regulation did not accomplish the intended objective, and the current slot limit was adopted. All other sport fish are managed under statewide regulations (Table 2).

Stocking history: Immediately after impoundment in 1981, Gibbons Creek Reservoir was stocked with channel and blue catfish, coppernose bluegill, redear sunfish, and Florida largemouth bass fingerlings. Kemp's bass were stocked in 1985, and Florida bass were stocked in 2002 and 2003 to enhance the potential for trophy bass production (Table 3).

Vegetation/habitat history: The primary habitat in Gibbons Creek Reservoir is aquatic vegetation, both native and exotic. From the early 1980s through the mid 1990s, hydrilla was present in moderate quantities and provided excellent fish habitat. By the late 1990s, hydrilla had almost disappeared, and fish populations began to decline as well. Hydrilla and other mixed native plants recently recovered, and the fish populations are beginning to improve. Waterhyacinth was chemically treated in the summer of 2006, and treatment will probably be continued in summer 2007.

4 METHODS

Fishes were collected by electrofishing (1 hour at 12 5-min stations), gill netting (5 net nights at 5 stations), and trap netting (5 net nights at 5 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and for gill and trap nets as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005). Average age at length was determined for blue catfish from 12.0-12.9 inches total length (n=8). An access-point creel survey was conducted in the spring quarter of 2007 (March–May). Nine creel days (5 weekend days, 4 weekdays) were chosen randomly with each survey lasting 3 hours. Anglers were counted and interviewed as they completed their fishing trips. Analyses were conducted in accordance with the Texas Parks and Wildlife Inland Fisheries Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005). Shoreline structural habitat and vegetation were surveyed in the summer of 2006 according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and condition indices [Relative Weight (Wr)] were calculated for target fishes according to Anderson and Neumann (1996). Index of Vulnerability (IOV) was calculated for gizzard shad (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.

RESULTS AND DISCUSSION

Habitat: A physical habitat survey in 2006 revealed no substantial changes in shoreline structural habitat since 2002. The vegetation survey from 2006 indicated a slight increase in abundance of native plants. Native submersed plants were not observed in 2002, but in 2006, they occupied over 16 acres. An increase in exotic species was noted in 2006, particularly waterhyacinth which increased from a trace amount in 2002 to over 60 acres in 2006 (Table 4).

Creel: Total angler effort decreased slightly from 2003 (24,210) to 2007 (22,697); however, the proportion of directed effort for largemouth bass declined from 52% to 18%, while for channel catfish, the proportion of directed effort almost doubled from 28% to 55% (Table 5). Though total angler effort decreased slightly, angler expenditures increased from \$52,000 in 2003 to over \$86,000 in 2007, possibly reflecting higher fuel prices in 2007 (Table 6).

Prey species: Threadfin shad relative abundance increased from 77.0/h in 2002 to 386.0/h in 2006, the highest catch rate observed since 1991 and the first time since 1994 that the species was the primary prey fish collected in an electrofishing sample (Appendix A). Gizzard shad CPUE decreased from 155.0/h in 2002 to 78.0/h in 2006. The index of vulnerability (IOV) for gizzard shad has been over 95 in every sample since 1999 (Figure 1). Bluegill CPUE dropped from 297.0/h in 2002 to 120.0/h in 2006 (Figure 2). The total CPUE of all prey fish species combined was 615.0/h in 2006 and included other species such as longear sunfish, redear sunfish (Figure 3), warmouth, bullhead minnow, and inland silverside. Blue tilapia are also present, but it is not known whether they contribute significantly to the prey base. Tilapia captured by electrofishing were generally too large for largemouth bass prey.

Catfishes: Blue catfish remain the dominant catfish species in Gibbons Creek Reservoir. The gill net CPUE in 2007 (31.8/nn) increased since 2003 (27.2/nn), with fish up to 34 inches in length present in the sample (Figure 5). The relative abundance of larger blue catfish increased in the 2007 sample (PSD = 26) compared to 2003 (PSD = 12), and the mean relative weights of larger fish were much higher compared to smaller fish, indicating excellent prey availability for large individuals. An estimated 7,443 blue catfish were harvested by anglers during the spring creel period in 2007 with only 2% of legal fish caught being released, indicating a highly harvest-oriented fishery. Fish up to 22 inches were observed during the creel survey. In 2003, no blue catfish harvest was observed. Average age at 12 inches (12.0 – 12.9 inches)

was 3 years ($n = 8$).

Gill net CPUE of channel catfish has changed very little over the last several years. The 2007 catch rate was 8.6/nn, slightly higher than the 7.2/nn captured in 2003. PSD for channel catfish was 68 in 2007 indicating a good proportion of harvestable fish in the population. Angler harvest during the spring 2007 creel period was estimated at 7,037, with fish up to 22 inches in length observed in the creel.

Largemouth bass: Largemouth bass continue to be available to anglers in sufficient numbers to provide angling opportunities. However, electrofishing catch rates declined from 158.0/h in 2003 to 33.0/h in 2006. PSD increased from 34 in 2003 to 55 in 2006. The majority of the 2003 sample was composed of fish less than 8 inches. The length frequency from electrofishing indicates a low relative abundance of bass in the 14 to 24 inch slot (Figure 8). The angler catch rate also declined from 0.78/h in 2003 to 0.45/h in 2007. Direct angling effort for largemouth bass dropped by more than half from 2003 (10,081 h) to 2007 (4,166 h) (Table 9). Only 7% of the sub-sample of age-0 bass collected for genetics analysis were pure Florida genotypes. The FLMB allele frequency was 69.2 and no northern genotypes were collected.

White and black crappie: Trap net catches of both black and white crappie have been low since 2002; however, the results of the spring creel survey indicated anglers spent more time targeting crappie in 2007 (5,121 h) than in 2003 (3,111 h), and the harvest of both black and white crappie increased considerably from 2003 to 2007. Anglers harvested an estimated 1,027 white crappie and 1,575 black crappie during that period in 2007 compared to an estimated 684 white crappie and no black crappie during that same period in 2003 (Table 10).

Fisheries management plan for Gibbons Creek Reservoir, Texas

Prepared—July 2007.

ISSUE 1: Largemouth bass fishery continues to decline.

MANAGEMENT STRATEGIES

1. Continue to monitor largemouth bass relative abundance and population size structure annually by electrofishing.
2. Sample collected in spring 2007 was composed of < 20% pure Florida genotypes. Request stocking of fingerling Florida largemouth bass at 100/acre in 2008 and 2009.
3. Continue to monitor vegetation annually and determine feasibility of enhancing native vegetation community.
4. Continue to regulate largemouth bass fishery with the 14-24-inch slot length limit and a 5-fish daily bag limit with one fish > 24 inches allowed per angler per day, with the exception that any slot fish caught may be retained and weighed at lake-side weigh station and either immediately released or, if qualifying, be donated to the ShareLunker Program.

ISSUE 2: Exotic vegetation continues to be an issue at Gibbons Creek Reservoir. Hydrilla has begun to expand again and waterhyacinth abundance is great enough to be of concern, requiring continuous monitoring and repeated herbicide treatments.

MANAGEMENT STRATEGIES

1. Continue to monitor hydrilla and waterhyacinth annually.
2. Assist the controlling authority as needed with treatments of waterhyacinth.

SAMPLING SCHEDULE JUSTIFICATION:

District staff will conduct annual electrofishing surveys for largemouth bass and biennial surveys for forage species to monitor health of this important fishery (Table 11). District staff will monitor changes in the crappie populations biennially (2008 and 2010) with trap net surveys, and catfish populations every four years with gill net surveys. A spring creel will be conducted from March through May 2011 to monitor sport fish catch and harvest and economic expenditures associated with the Gibbons Creek fisheries. Annual vegetation surveys will be conducted to monitor exotic vegetation, and a structural habitat survey will be conducted summer 2010.

LITERATURE CITED

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Table 1. Characteristics of Gibbons Creek Reservoir, Texas.

| Characteristic | Description |
|-----------------------------------|------------------------------|
| Year constructed | 1981 |
| Controlling authority | Texas Municipal Power Agency |
| County | Grimes |
| Reservoir type | Power plant cooling |
| Shoreline Development Index (SDI) | 2.3 |
| Conductivity | 370 μ mhos/cm |

Table 2. Harvest regulations for Gibbons Creek 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, largemouth | 5 (only 1 > 24 inches) | 14 – 24 |
| Crappie, white and black crappie, their hybrids and subspecies | 25 (in any combination) | 10 – No limit |

Table 3. Stocking history of Gibbons Creek Reservoir, Texas. Size Category is FGL = 1-3 inches.

| Species | Year | Number | Size |
|-------------------------|-------|---------|------|
| Blue catfish | 1981 | 115,768 | FGL |
| | Total | 115,768 | |
| Channel catfish | 1981 | 120,000 | FGL |
| | Total | 120,000 | |
| Coppernose bluegill | 1981 | 24,500 | FGL |
| | Total | 24,500 | |
| Redear sunfish | 1981 | 8,780 | FGL |
| | Total | 8,780 | |
| Florida largemouth bass | 1981 | 121,522 | FGL |
| | 2002 | 126,116 | FGL |
| | 2003 | 211,359 | FGL |
| | Total | 458,997 | |
| Kemp's largemouth bass | 1985 | 254,696 | FGL |
| | Total | 254,696 | |

Table 4. Survey of littoral zone and physical habitat types, Gibbons Creek Reservoir, Texas, 2006. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found.

| Shoreline habitat type | Shoreline Distance | | Surface Area | |
|------------------------------|--------------------|------------------|--------------|-----------------------------------|
| | Miles | Percent of total | Acres | Percent of reservoir surface area |
| Featureless | 3.5 | 23 | | |
| Featureless/dead trees | 3.8 | 25 | | |
| Overhanging brush | 0.6 | 4 | | |
| Overhanging brush/dead trees | 5.0 | 33 | | |
| Cut bank | 1.2 | 0.8 | | |
| Rock bluff/dead trees | 0.2 | 1 | | |
| Concrete | 0.8 | 5 | | |
| Rocky shoreline/dead trees | 0.1 | 0.4 | | |
| Alligatorweed | | | 16.4 | 0.6 |
| Hydrilla | | | 0.5 | <0.1 |
| Waterhyacinth | | | 64.4 | 2.3 |
| Native submersed | | | 16.9 | 0.6 |
| Native floating | | | 28.5 | 1.0 |
| Native emergent | | | 26.1 | 0.9 |

Table 5. Percent directed angler effort by species for Gibbons Creek Reservoir, Texas, March-May 2003 and 2007.

| Species | Year | |
|-----------------|------|------|
| | 2003 | 2007 |
| Catfishes | 28.4 | 55.2 |
| Largemouth bass | 51.8 | 18.4 |
| Crappies | 16.0 | 22.5 |
| Anything | 3.7 | 3.9 |

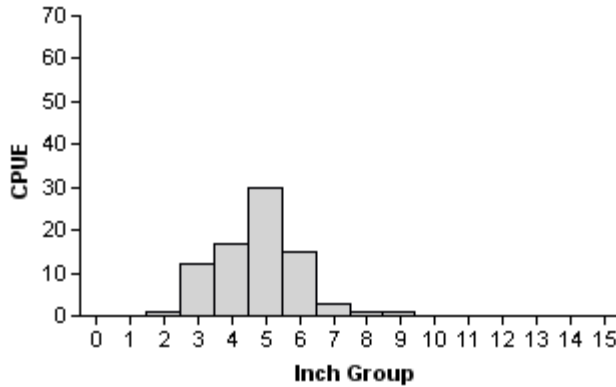
Table 6. Total fishing effort (h) for all species and total directed expenditures at Gibbons Creek Reservoir, Texas, March–May 2003 and 2007.

| Creel Statistic | Year | |
|-----------------------------|----------|----------|
| | 2003 | 2007 |
| Total fishing effort (h) | 24,210 | 22,697 |
| Total directed expenditures | \$51,897 | \$86,429 |

Gizzard Shad

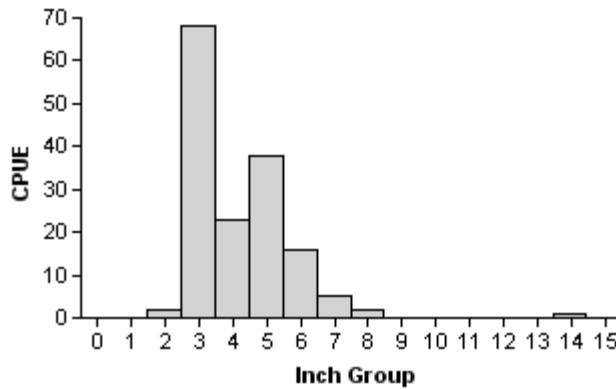
1999

Effort = 1.0
Total CPUE = 80.0 (26; 80)
IOV = 97.5 (1.9)



2002

Effort = 1.0
Total CPUE = 155.0 (36; 155)
IOV = 98.06 (1.7)



2006

Effort = 1.0
Total CPUE = 78.0 (26; 78)
IOV = 96.15 (2.2)

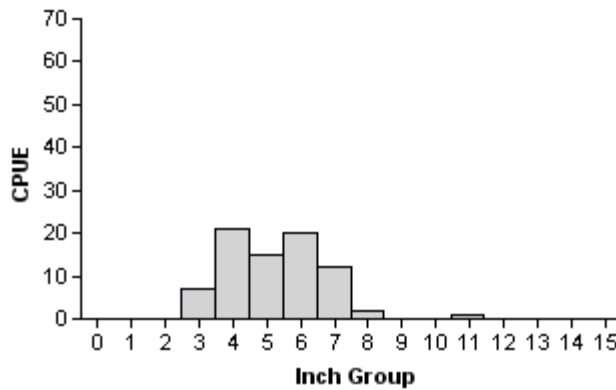
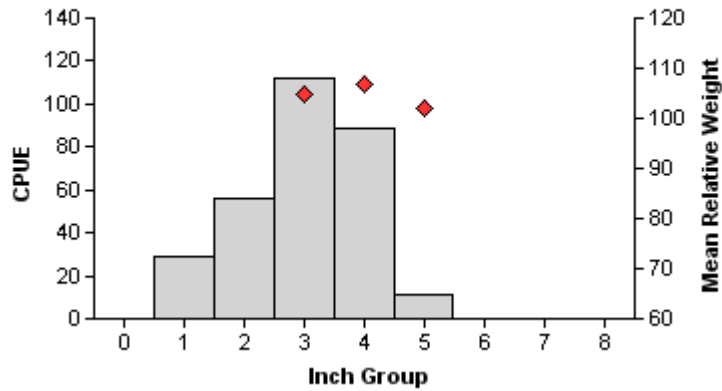
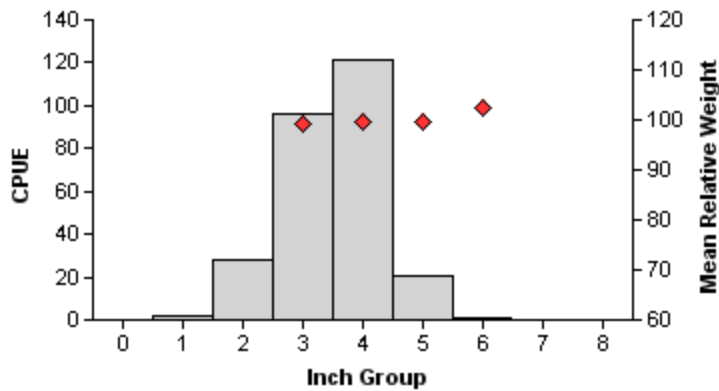


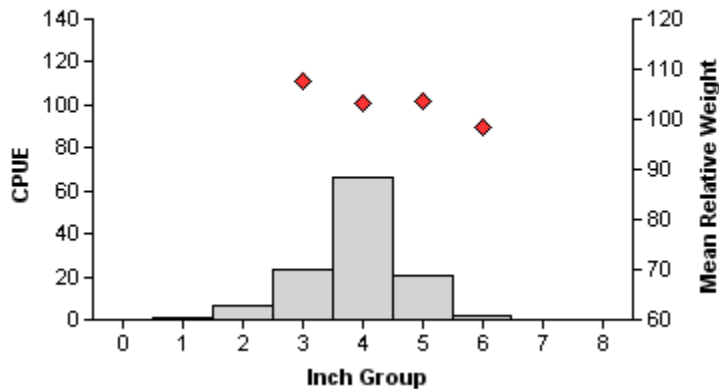
Figure 1. Number of gizzard shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Gibbons Creek Reservoir, Texas, 1999, 2002, and 2006.

Bluegill**2002**

Effort = 1.0
 Total CPUE = 297.0 (13; 297)
 PSD = 0 (46.3)

2003

Effort = 1.0
 Total CPUE = 269.0 (23; 269)
 PSD = 0 (0.4)

2006

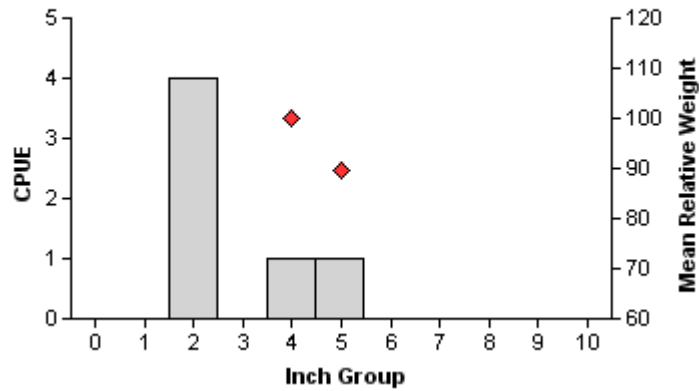
Effort = 1.0
 Total CPUE = 120.0 (29; 120)
 PSD = 2 (1.3)

Figure 2. Number of bluegill caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Gibbons Creek Reservoir, Texas 2002, 2003, and 2006.

Redear Sunfish

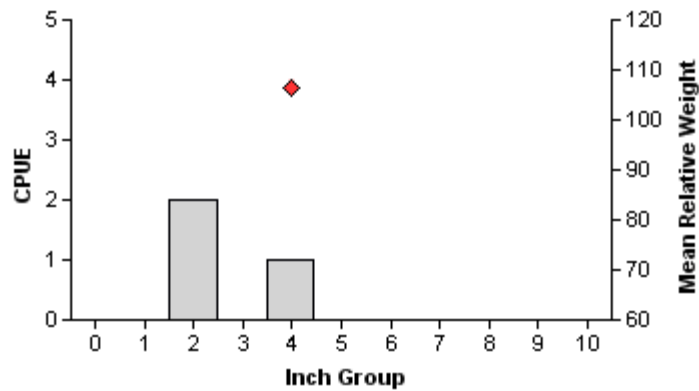
2002

Effort = 1.0
Total CPUE = 6.0 (67; 6)
PSD = 0 (221.6)



2003

Effort = 1.0
Total CPUE = 3.0 (72; 3)
PSD = 0 (233.6)



2006

Effort = 1.0
Total CPUE = 1.0 (100; 1)
PSD = 100 (0)

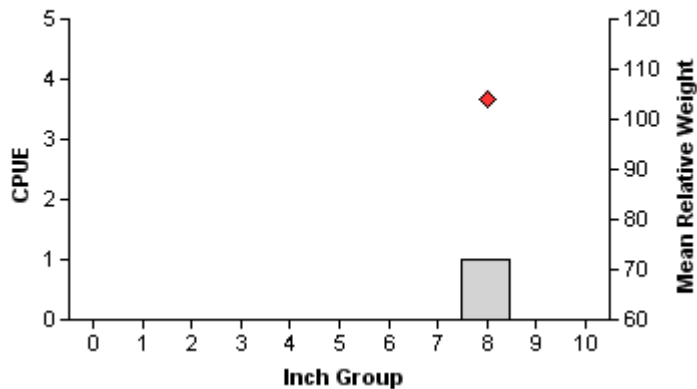
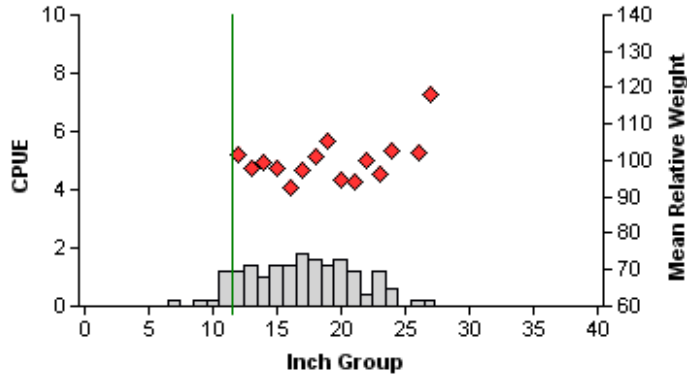
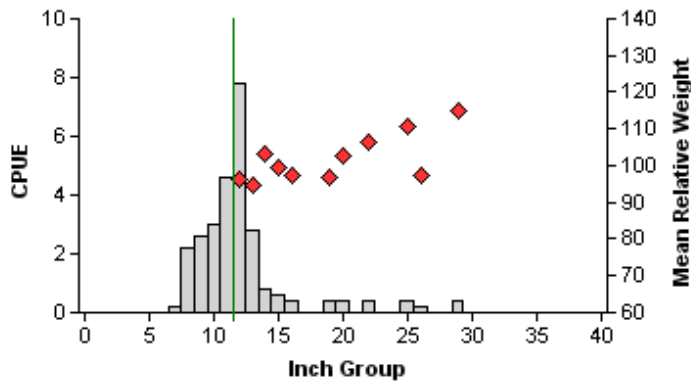


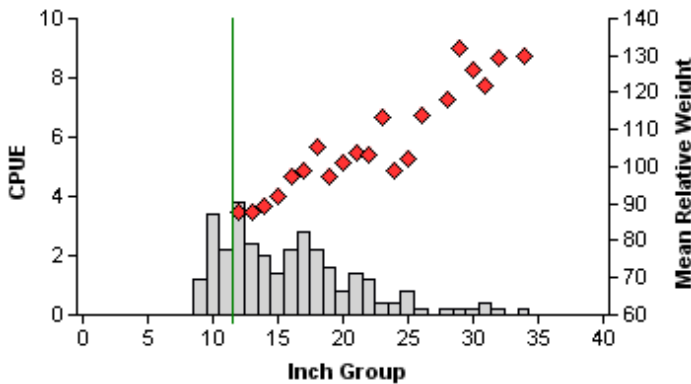
Figure 3. Number of redear sunfish caught per hour (CPUE, bars), mean Relative Weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Gibbons Creek Reservoir, Texas, 2002, 2003, and 2006.

Blue Catfish**1998**

Effort = 5.0
 Total CPUE = 18.4 (11; 92)
 PSD = 33 (5)
 RSD-12 = 100 (0)

2003

Effort = 5.0
 Total CPUE = 27.2 (26; 136)
 PSD = 12 (8.0)
 RSD-12 = 100 (0)

2007

Effort = 5.0
 Total CPUE = 31.8 (22; 159)
 PSD = 26 (7.2)
 RSD-12 = 100 (0)

Figure 4. Number of blue catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Gibbons Creek Reservoir, Texas, 1998, 2003, and 2007. Vertical lines indicate minimum length limit.

Blue Catfish

Table 7. Creel survey statistics for catfishes at Gibbons Creek Reservoir from March through May 2003 and 2007, where total catch per hour is for anglers targeting catfishes (species combined) and total harvest is the estimated number of blue catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

| Creel Survey Statistic | Year 2003 | Year 2007 |
|------------------------|--------------|--------------|
| Directed effort (h) | 4,524 (27) | 12,518 (43) |
| Directed effort/acre | 1.63 (27) | 4.52 (43) |
| Total catch per hour | 0.56 (30) | 1.39 (26) |
| Harvest/acre | | 2.69 (42) |
| Total harvest | | 7,443 (42) |
| Percent legal released | | 1.7 |

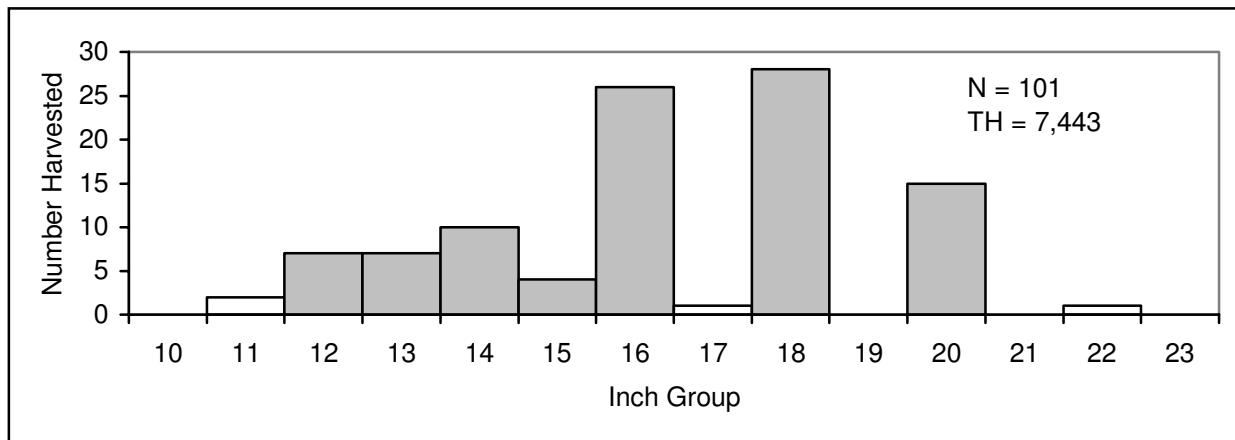
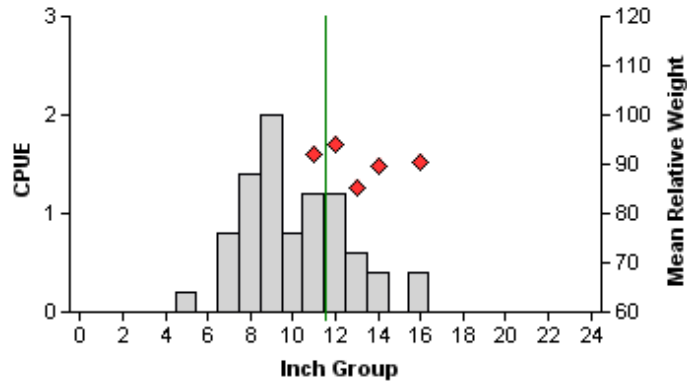


Figure 5. Length frequency of harvested blue catfish observed during creel surveys at Gibbons Creek Reservoir, Texas, March through May 2007. N is the number of harvested blue catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

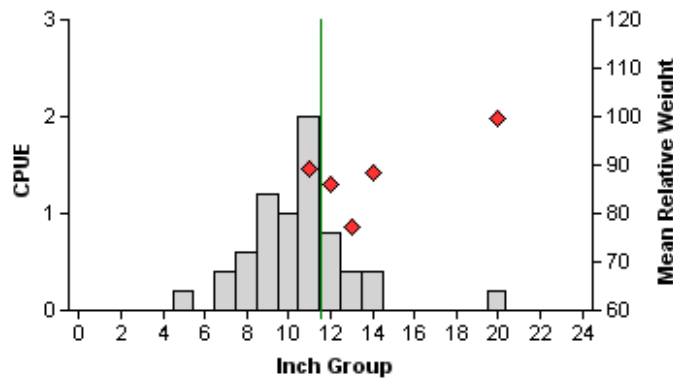
Channel Catfish

1998



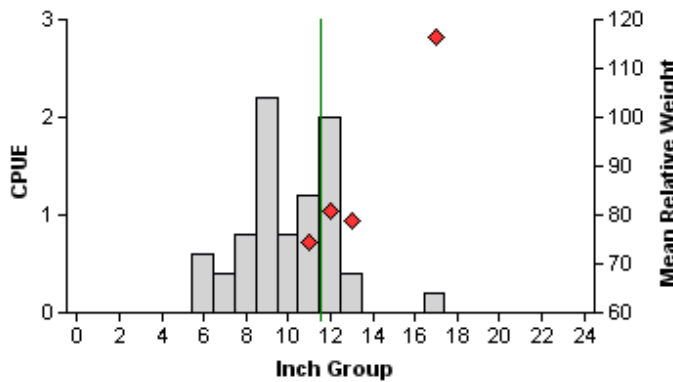
Effort = 5.0
Total CPUE = 9.0 (14; 45)
PSD = 11 (6.9)
RSD-12 = 68 (3.4)

2003



Effort = 5.0
Total CPUE = 7.2 (48; 36)
PSD = 5 (3.1)
RSD-12 = 47 (4.8)

2007



Effort = 5.0
Total CPUE = 8.6 (41; 43)
PSD = 5 (5.9)
RSD-12 = 68 (4.2)

Figure 6. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Gibbons Creek Reservoir, Texas, 1998, 2003, and 2007. Vertical lines indicate minimum length limit.

Channel Catfish

Table 8. Creel survey statistics for catfishes at Gibbons Creek Reservoir from March through May 2003 and 2007, where total catch per hour is for anglers targeting catfishes (species combined) and total harvest is the estimated number of channel catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

| Creel Survey Statistic | Year 2003 | Year 2007 |
|------------------------|--------------|--------------|
| Directed effort (h) | 4,524 (27) | 12,518 (43) |
| Directed effort/acre | 1.63 (27) | 4.52 (43) |
| Total catch per hour | 0.56 (30) | 1.38 (26) |
| Harvest/acre | 0.14 (12) | 2.54 (40) |
| Total harvest | 410.8 (12) | 7,037 (40) |
| Percent legal released | 31.3 | 12.1 |

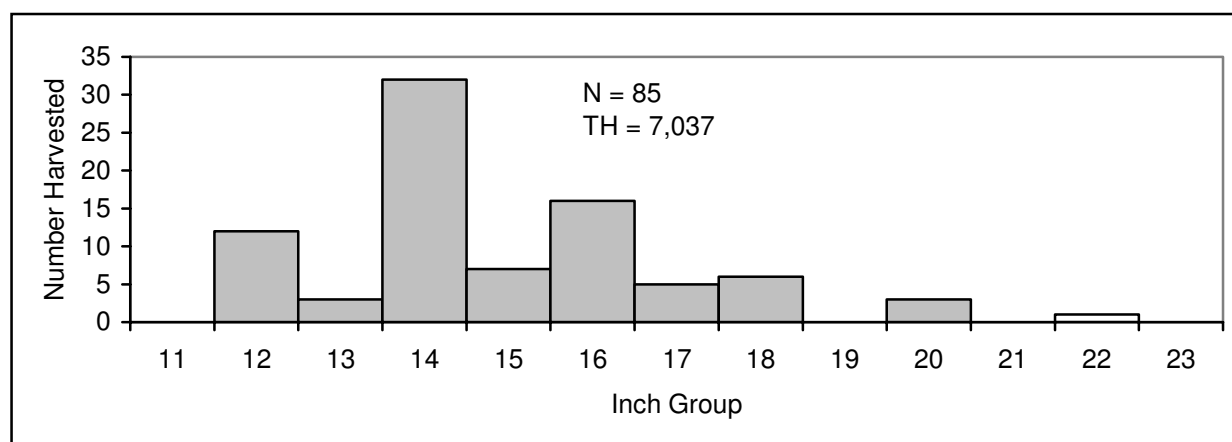
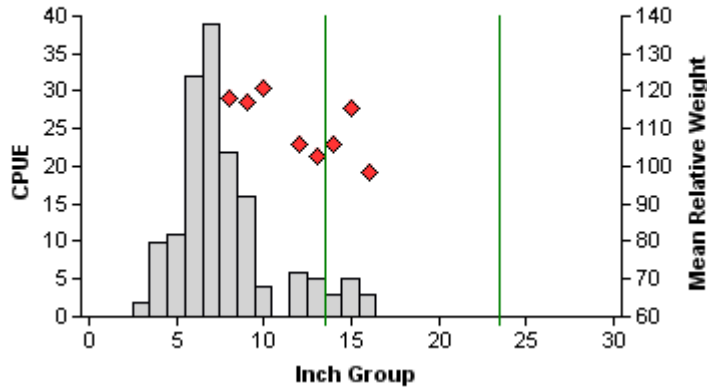


Figure 7. Length frequency of harvested channel catfish observed during creel surveys at Gibbons Creek Reservoir, Texas, March through May 2007. N is the number of harvested channel catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

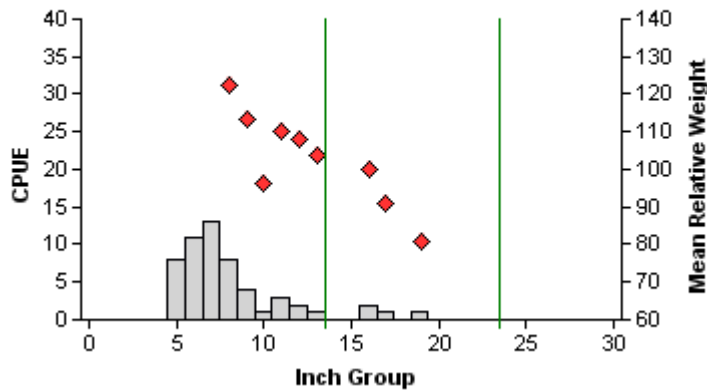
Largemouth Bass

2003



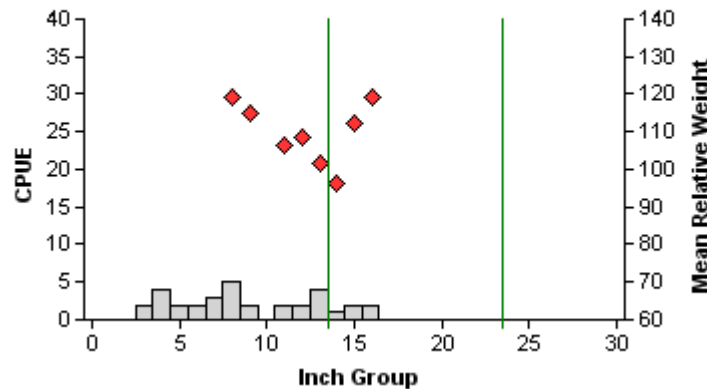
Effort = 1.0
 Total CPUE = 158.0 (46; 158)
 Stock CPUE = 64.0 (43; 64)
 PSD = 34 (6.4)
 RSD-P = 12 (6.3)

2004



Effort = 1.0
 Total CPUE = 55.0 (47; 55)
 Stock CPUE = 23.0 (38; 23)
 PSD = 30 (8.3)
 RSD-P = 17 (6.2)

2006



Effort = 1.0
 Total CPUE = 33.0 (36; 33)
 Stock CPUE = 20.0 (30; 20)
 PSD = 55 (15.2)
 RSD-P = 20 (13.9)

Figure 8. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Gibbons Creek Reservoir, Texas, 2003, 2004, and 2006. Vertical lines indicate minimum and maximum lengths of slot length limit at time of survey.

Largemouth Bass

Table 9. Creel survey statistics for largemouth bass at Gibbons Creek Reservoir from March through May 2003 and 2007, 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 2003 | Year 2007 |
|------------------------|--------------|--------------|
| Directed effort (h) | 10,081 (25) | 4,166 (54) |
| Directed effort/acre | 3.64 (25) | 1.50 (54) |
| Total catch per hour | 0.78 (45) | 0.45 (31) |
| Harvest/acre | 0 | 0 |
| Total harvest | 0 | 0 |
| Percent legal release | 100 | 100 |

Largemouth Bass

Table 10. Results of genetic analysis of largemouth bass collected by fall electrofishing at Gibbons Creek Reservoir, Texas, 1993-1995, 1998, 2002, 2004, and 2007. The 2007 data are age-0 largemouth bass collected in a spring sample. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB.

| Year | Sample size | Genotype | | | | % FLMB alleles | % pure FLMB |
|------|-------------|----------|----------|----------|------|----------------|-------------|
| | | FLMB | F1 | Fx | NLMB | | |
| 1993 | 30 | 14 | 9 | 7 | 0 | 76.7 | 46.7 |
| 1994 | 37 | 14 | 8 | 15 | 0 | 75.0 | 37.8 |
| 1995 | 33 | 15 | 5 | 12 | 1 | 76.1 | 42.9 |
| 1998 | 41 | 11 | 7 | 19 | 1 | 67.1 | 26.8 |
| 2002 | 50 | 30 | <i>a</i> | <i>a</i> | 3 | 76.0 | 60.0 |
| 2004 | 42 | 14 | 7 | 19 | 2 | 69.8 | 33.3 |
| 2007 | 46 | 3 | | | 0 | 69.2 | 7.0 |

^aThe GOT marker was not coded in 2002, thus F1 and Fx hybrids could not be separated.

White Crappie

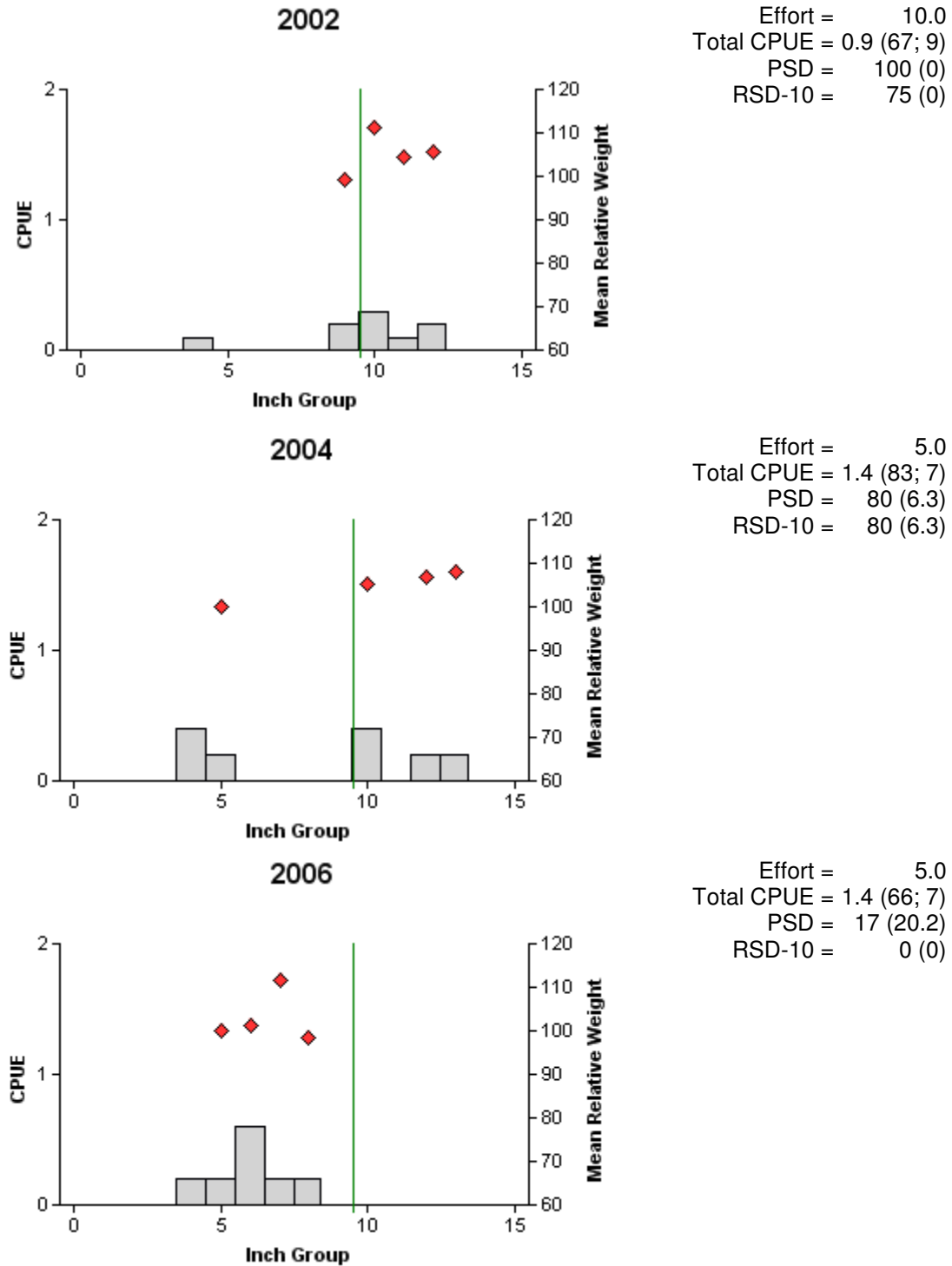


Figure 9. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Gibbons Creek Reservoir, Texas, 2002, 2004, and 2006. Vertical lines represents minimum length limit.

White Crappie

Table 11. Creel survey statistics for crappie (species combined) at Gibbons Creek Reservoir, Texas, from March through May 2007, where total catch per hour is for anglers targeting crappie (species combined) and total harvest is the estimated number of white crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

| Creel Survey Statistic | Year 2003 | Year 2007 |
|------------------------|--------------|--------------|
| Directed effort (h) | 3,111.7 (36) | 5121.6 (50) |
| Directed effort/acre | 1.12 (36) | 1.85 (50) |
| Total catch per hour | 0.44 (61) | 0.22 (65) |
| Harvest/acre | 0.25 (130) | 0.38 (104) |
| Total harvest | 684.6 (130) | 1027.0 (104) |
| Percent legal released | 0 | 4.1 |

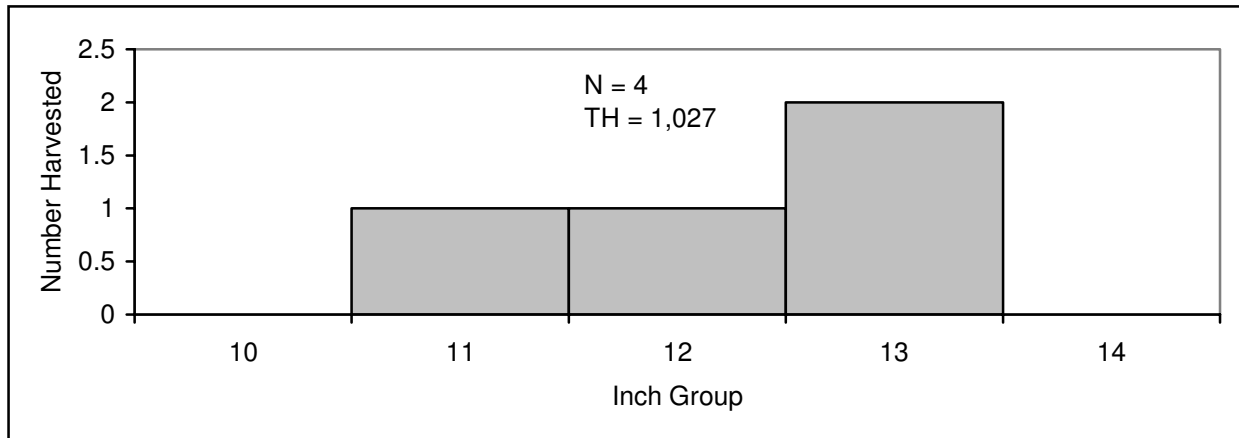
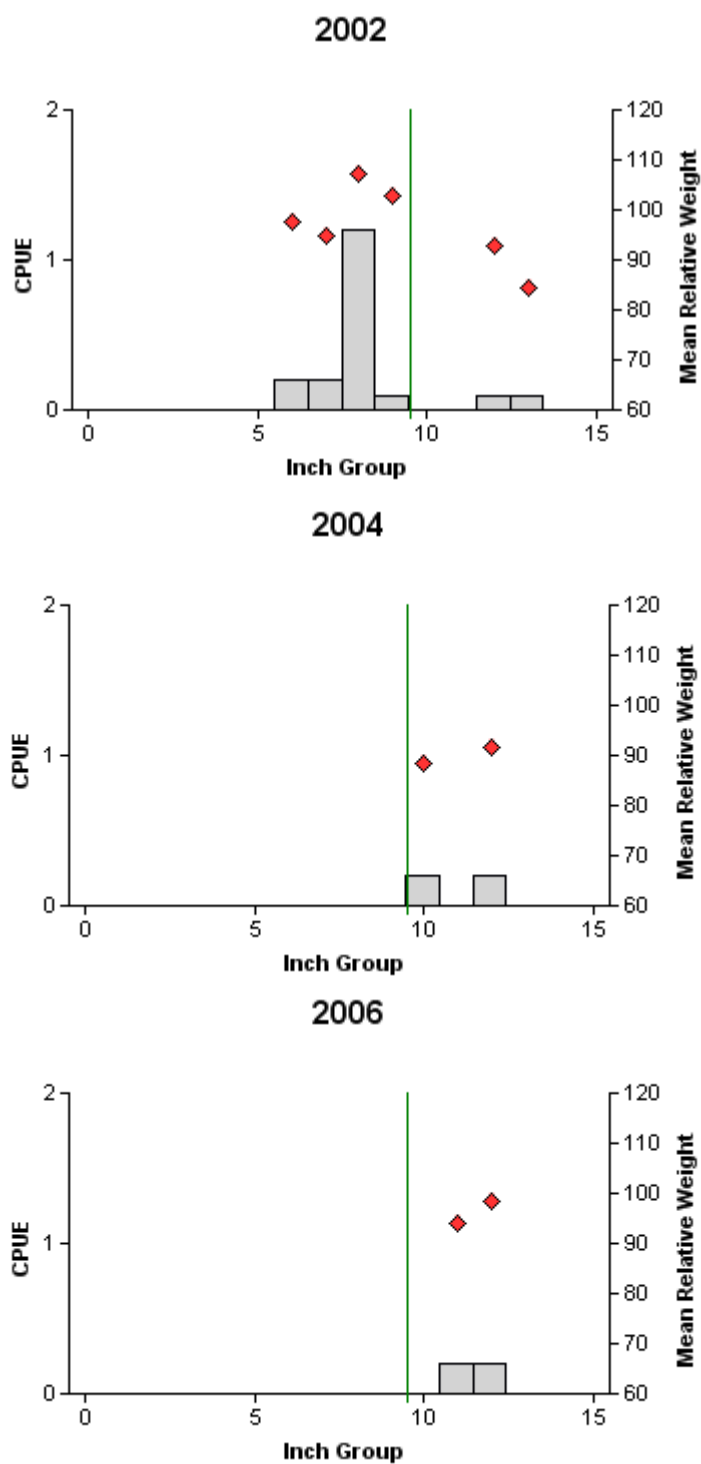


Figure 10. Length frequency of harvested white crappie observed during creel surveys at Gibbons Creek Reservoir, Texas, March through May 2007. N is the number of harvested white crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Black Crappie



Effort = 10.0
 Total CPUE = 1.9 (45; 19)
 PSD = 79 (8)
 RSD-10 = 11 (9.6)

Effort = 5.0
 Total CPUE = 0.4 (61; 2)
 PSD = 100 (0.0)
 RSD-10 = 100 (0)

Effort = 5.0
 Total CPUE = 0.4 (61; 2)
 PSD = 100 (0)
 RSD-10 = 100 (0)

Figure 11. Number of black crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Gibbons Creek Reservoir, Texas, 2002, 2004, and 2006. Vertical lines represents minimum length limit.

Black Crappie

Table 12. Creel survey statistics for crappie (species combined) at Gibbons Creek Reservoir, Texas, from March through May 2001, where total catch per hour is for anglers targeting crappie (species combined) and total harvest is the estimated number of black crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

| Creel Survey Statistic | Year 2003 | Year 2007 |
|------------------------|--------------|--------------|
| Directed effort (h) | 3,111.7 (36) | 5121.6 (50) |
| Directed effort/acre | 1.12 (36) | 1.85 (50) |
| Total catch per hour | 0.44 (61) | 0.22 (65) |
| Harvest/acre | | 0.57 (114) |
| Total harvest | | 1575.1 (114) |
| Percent legal released | | 2.7 |

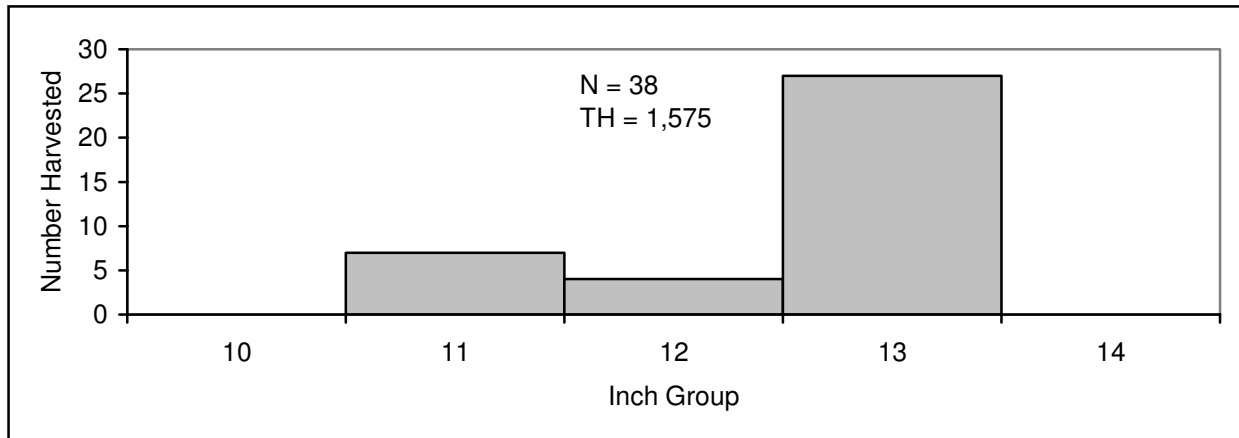


Figure 12. Length frequency of harvested black crappie observed during creel surveys at Gibbons Creek Reservoir, Texas, March through May 2007. N is the number of harvested black crappie observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 13. Proposed sampling schedule for Gibbons Creek Reservoir, Texas. Gill netting surveys are conducted in the spring while electrofishing and trap net surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

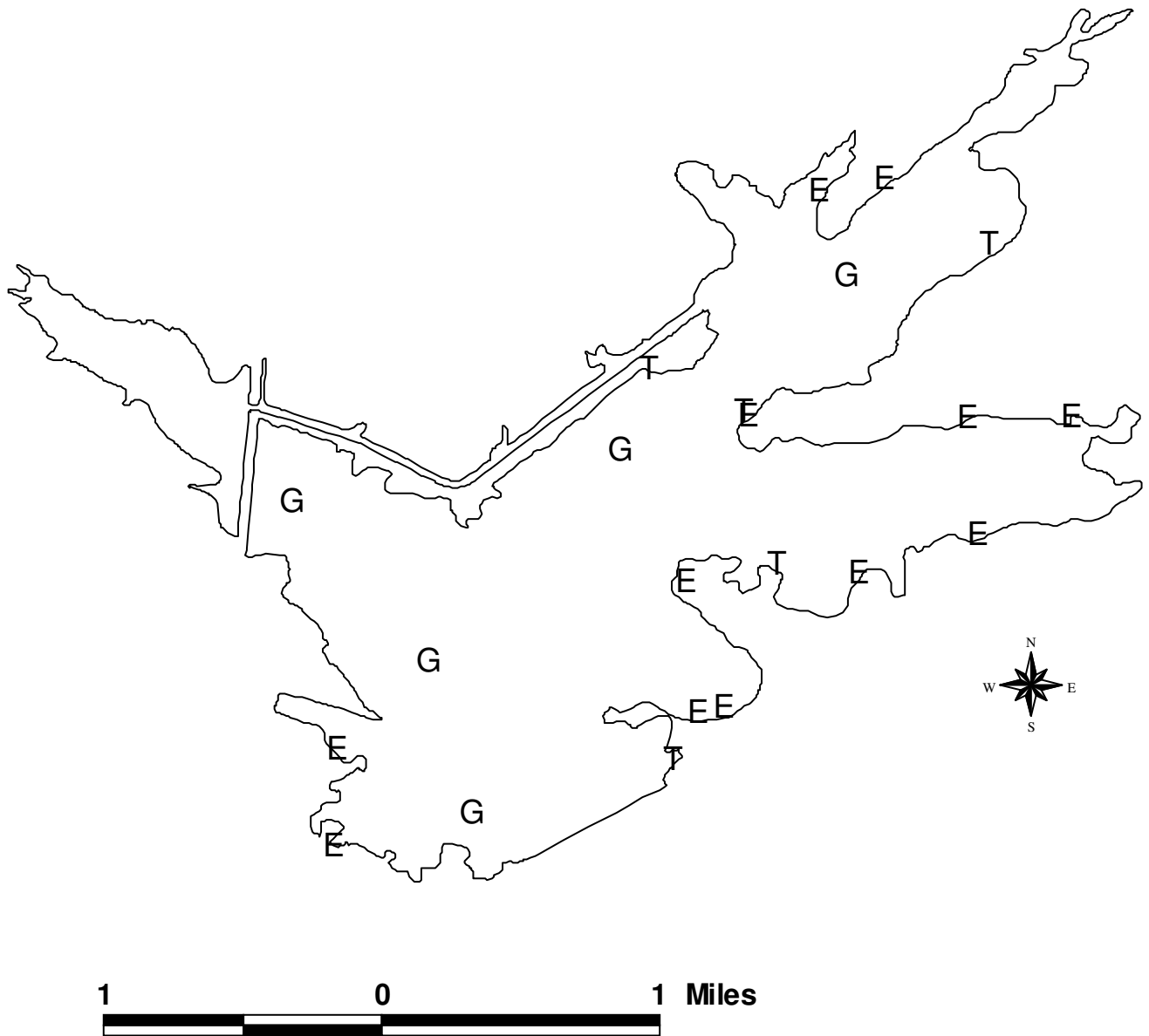
| Survey Year | Electrofishing | Trap Net | Gill Net | Creel Survey | Vegetation Survey | Habitat Survey | Access Survey | Report |
|--------------------|----------------|----------|----------|--------------|-------------------|----------------|---------------|--------|
| June 2007-May 2008 | A | | | | A | | | |
| June 2008-May 2009 | A | A | | | A | | | |
| June 2009-May 2010 | A | | | | A | | | |
| June 2010-May 2011 | S | A | S | A | S | S | S | S |

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Gibbons Creek Reservoir, Texas, 2006-2007.

| Species | Electrofishing | | Trap Netting | | Gill Netting | |
|-------------------|----------------|-------|--------------|------|--------------|------|
| | N | CPUE | N | CPUE | N | CPUE |
| Gizzard shad | 78 | 78.0 | | | | |
| Threadfin shad | 386 | 386.0 | | | | |
| Bullhead minnow | 1 | 1.0 | | | | |
| Inland silverside | 4 | 4.0 | | | | |
| Blue catfish | | | | | 159 | 31.8 |
| Channel catfish | | | | | 43 | 8.6 |
| Warmouth | 2 | 2.0 | | | | |
| Bluegill | 120 | 120.0 | | | | |
| Longear sunfish | 23 | 23.0 | | | | |
| Redear sunfish | 1 | 1.0 | | | | |
| Largemouth bass | 33 | 33.0 | | | | |
| White crappie | 8 | 8.0 | 7 | 1.4 | | |
| Black crappie | 3 | 3.0 | 2 | 0.4 | | |

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APPENDIX B



Location of sampling sites, Gibbons Creek Reservoir, Texas, 2006-2007. Electrofishing, trap netting, and gill netting are represented by E, T, and G, respectively.