

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-1

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2010 Survey Report

Gibbons Creek Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Gibbons Creek Reservoir were surveyed in 2010 using electrofishing and in 2011 using gill netting. Anglers were surveyed from March through May 2011 using 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:** 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- to 24-inch slot-length limit for largemouth bass. The slot limit on bass was amended to a 14- to 21-inch slot-length 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 under a 14- to 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 daily bag since 1988. Channel catfish and blue catfish were managed with a 9-inch minimum length limit and 25-fish daily bag until 1995 when the minimum-length limit was increased to 12 inches.
- **Fish community**
 - **Prey species:** The prey fish community at Gibbons Creek Reservoir consists primarily of threadfin shad, gizzard shad, and bluegill.
 - **Catfishes:** Substantial blue catfish and channel catfish populations are present in Gibbons Creek Reservoir. Blue catfish are dominant with an excellent size distribution.
 - **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 including the 16.12-pound reservoir record. Florida largemouth bass fingerlings are periodically stocked to enhance and maintain the trophy potential of the population.
 - **Crappie:** Both white crappie and black crappie are present and provide a significant fishery at Gibbons Creek Reservoir; however, crappie catches in standard samples are low.
- **Management strategies:** District staff will continue to monitor the largemouth bass population biennially with fall electrofishing. Largemouth bass genetics will be assessed and Florida largemouth bass fingerlings stocked when appropriate. District staff will monitor catfish and crappie populations by gill netting every four years. An access-point creel survey will be conducted in the spring of 2015. District staff will continue to work with TMPA personnel to assess exotic vegetation coverage and implement treatments as needed.

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INTRODUCTION

This document is a summary of fisheries data collected from Gibbons Creek Reservoir from June 2010 through May 2011. 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 2010-2011 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 2006) included:

1. Continue to monitor largemouth bass relative abundance annually by electrofishing. Request stocking of fingerling Florida largemouth bass at 100/acre in 2008 and 2009. Maintain existing harvest regulation.
Action: Electrofishing samples in 2008 and 2010 indicated a recovery of the largemouth bass population. Although the total fishing pressure decreased from 2007 to 2011, the percentage of anglers targeting largemouth bass increased sharply. Florida largemouth bass were stocked in 2008, 2010, and 2011.
2. Continue to monitor hydrilla and waterhyacinth annually. Assist the controlling authority as needed with treatments.
Action: Vegetation was surveyed annually. TPWD continues to support exotic species control efforts by TMPA.

Harvest regulation history: Since September 1, 2002, largemouth bass have been managed under a 14- to 24-inch slot-length limit, 5-fish daily bag with the harvest of one fish 24 inches or larger allowed per day per angler. This regulation was adopted to continue maximizing the trophy potential of the Gibbons Creek largemouth bass fishery while allowing some angler harvest. Prior to the current regulation, a catch-and-release-only regulation for largemouth bass was in place for ten years. 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 catfish, blue catfish, coppernose bluegill, redear sunfish, and Florida largemouth bass fingerlings. Kemp's bass were stocked in 1985. Florida bass were stocked in 2002, 2003, 2008, 2010, and 2011 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, along with a mixed native plant community, provided excellent fish habitat. By the late 1990s, vegetation coverage was greatly reduced. Mixed native plants as well as hydrilla have recovered in recent years. Waterhyacinth treatments have been conducted by TMPA whenever needed.

Water Transfer: Gibbons Creek Reservoir is owned and operated by TMPA as a cooling water reservoir for a coal fired power plant. Outflow is to Gibbons Creek, a tributary of the Navasota River in the Brazos River Watershed.

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METHODS

Fishes were collected by electrofishing (1 hour at 12, 5-min stations) and gill 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 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 2009). An access-point creel survey was conducted in the spring quarter of 2011 (March through May). Nine creel days (5 weekend days, 4 weekdays) were chosen randomly with each survey lasting 6.5 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 2009). Shoreline structural habitat, aquatic vegetation, and angler access were surveyed in the summer of 2010 according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], and condition indices [relative weights (W_i)] 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 SE was calculated for structural indices and IOV.

RESULTS AND DISCUSSION

Habitat: A physical habitat survey in 2010 revealed no substantial changes in shoreline structural habitat since 2002. The vegetation survey from 2010 indicated a marked increase in abundance of native plants. Native submersed plants were not observed in 2002 (Webb and Henson 2003), and occupied only 16.4 acres in 2006 (Webb and Henson 2007); however, in 2010, they occupied 203.7 acres with native emergent species covering an additional 198.2 acres (Table 4). Hydrilla also increased from 0.5 acres in 2006 to 79.3 acres in 2010; however, waterhyacinth decreased from 64.4 acres in 2006 to 13.7 acres in 2010.

Creel: Total angler effort decreased slightly from 2007 (22,697 hr) to 2011 (21,936 hr); however, the proportion of directed effort for largemouth bass increased from 18.4% to 29.1%. The proportion of directed effort decreased from 55.2% to 50.2% for catfishes and from 22.5% to 17.9% for crappies (Table 5). Even though total angler effort decreased, angler expenditures increased from \$86,429 in 2007 to \$97,491 in 2011 (Table 6).

Prey species: Threadfin shad relative abundance estimates decreased from 386.0/h in 2006 (Webb and Henson 2007) to 166.0/hr in 2010; however, as is frequently the case, there was a corresponding increase in gizzard shad relative abundance estimates from 78.0/hr in 2006 to 187/hr in 2010 (Appendix A). IOV for gizzard shad was 98 in 2010 (Figure 2), indicating almost all gizzard shad were available as prey for adult largemouth bass. Bluegill CPUE increased from 120.0/h in 2006 to 169.0/hr in 2010 (Figure 3) and may be related to the increase in submersed vegetation. The total CPUE of all prey fish species combined was 561.0/h in 2010 and included other species such as longear sunfish, redear sunfish (Figure 4), warmouth, bullhead minnow, and inland silverside (Appendix A).

Catfishes: Blue catfish remained the dominant catfish species in Gibbons Creek Reservoir. The gill net CPUE in 2011 (29.8/nn) was similar to 2007 (31.8/nn), with fish up to 30 inches in length present in the sample (Figure 5). An estimated 3,235 blue catfish (Table 7) were harvested by anglers during the spring creel period in 2011 (down from 7,443 in 2007) with only 3.7% of legal fish caught being released, indicating a highly harvest-oriented fishery. Fish up to 25 inches were observed during the creel survey (Figure 6)

Gill net CPUE of channel catfish increased from 8.6/nn in 2007 to 15.4/nn in 2011 (Figure 6). PSD-12 for channel catfish was 66 in 2011 indicating that the majority of stock size channel catfish are available for harvest. Angler harvest during the spring 2011 creel period was estimated at 7,865, with fish up to 22

inches in length observed in the creel (Figure 7).

Largemouth bass: Largemouth bass electrofishing catch rates increased from 42/hr in 2007 to 93/h in 2008 and 91/hr in 2010 (Figure 8). PSD-14 increased from 24 in 2007 to 36 in 2008 then declined to 21 in 2010. The length frequency from electrofishing indicates good reproduction and recruitment. Direct angling effort for largemouth bass increased from 4,166 h in 2007 to 6,380 h in 2011 (Table 9). The angling catch rate for largemouth bass in 2011 was 0.48/h, similar to the 2007 catch rate of 0.45/h.

White and black crappie: Trap net catches of both black and white crappie have been low since 2002 (Webb and Henson 2007). An attempt to collect crappie by gill netting in 2011 yielded no fish of either species. However, the results of the spring creel survey indicated 18% of anglers target crappie, fishing an estimated 3,934 h (Table 11). Anglers harvested an estimated 2,431 fish (all crappie combined), similar to a combined harvest of 2,602 in 2007 (Table 11).

Fisheries management plan for Gibbons Creek Reservoir, Texas

Prepared—July 2011

ISSUE 1: Largemouth bass provide an important fishery.

MANAGEMENT STRATEGIES

1. Continue to monitor largemouth bass relative abundance and population size structure biennially by electrofishing.
2. Sample largemouth bass genetics in fall 2012 to evaluate 2010 and 2011 largemouth bass stockings. Request stockings of fingerling Florida largemouth bass at 100/acre in 2014 and 2015 to continue supporting the trophy potential of Gibbons Creek Reservoir.
3. Continue to regulate the largemouth bass fishery with the 14- to 24-inch slot-length limit and a 5-fish daily bag limit with one fish > 24 inches allowed per angler per day

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

Exotic vegetation continues to be an issue at Gibbons Creek Reservoir. Hydrilla has begun to expand again, and while waterhyacinth abundance is currently under control, it can expand rapidly and will probably have to be treated again in the future.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir to help prevent the spread of exotic species to and from Gibbons Creek Reservoir.
2. Contact and educate local merchants about invasive species and provide them with posters, literature, etc. so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Continue to monitor hydrilla and waterhyacinth annually.
6. Assist the controlling authority as needed with treatments of waterhyacinth.
7. Deploy Portland Samplers in Gibbons Creek Reservoir to monitor possible infestations of zebra mussels.

SAMPLING SCHEDULE JUSTIFICATION:

District staff will conduct biennial electrofishing surveys for largemouth bass and forage species to monitor health of this important fishery (Table 12). District staff will monitor catfish populations every four years with gill netting. A spring creel survey will be conducted from March through May 2015 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. Access and structural habitat surveys will be conducted in summer 2014.

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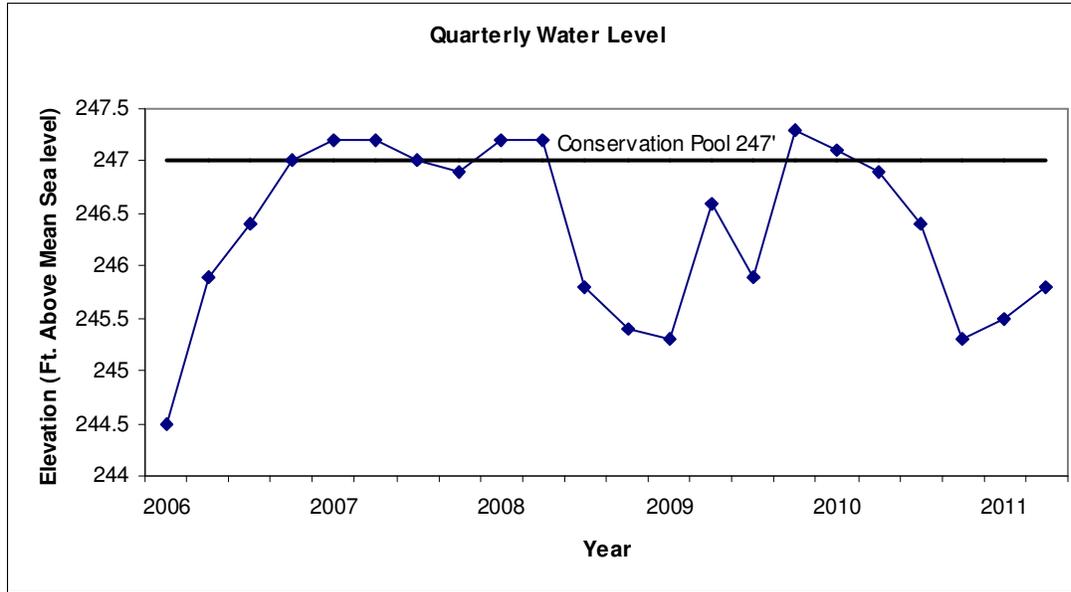


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Gibbons Creek Reservoir, Texas, 2006-2011.

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
	2008	138,625	
	2010	59,384	FGL
	2011	147,000	FGL
	Total	804,006	
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, 2010. 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			15.9	<0.1
Hydrilla			79.3	2.9
Waterhyacinth			13.7	<0.1
Native submersed			203.7	7.4
Native floating			<0.1	<0.1
Native emergent			198.2	6.9
Total			510.9	17.5

Table 5. Percent directed angler effort by species for Gibbons Creek Reservoir, Texas, March-May 2003, 2007, and 2011.

Species	Year		
	2003	2007	2011
Catfishes	28.4	55.2	50.2
Largemouth bass	51.8	18.4	29.1
Crappies	16.0	22.5	17.9
Anything	3.7	3.9	2.8

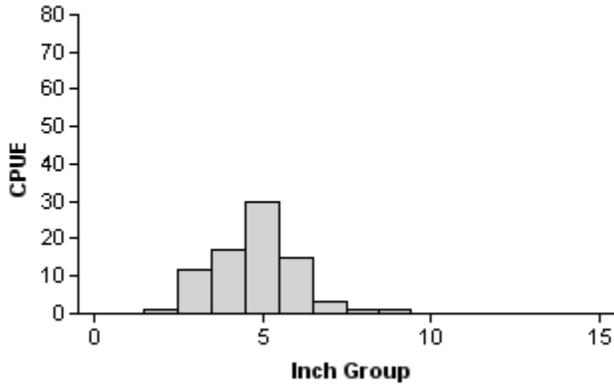
Table 6. Total fishing effort (h) for all species and total directed expenditures at Gibbons Creek Reservoir, Texas, March-May 2003, March-May 2007, and March-May 2011.

Creel Statistic	Year		
	2003	2007	2011
Total fishing effort (h)	24,210	22,697	21,936
Total directed expenditures	\$51,897	\$86,429	\$97,491

Gizzard shad

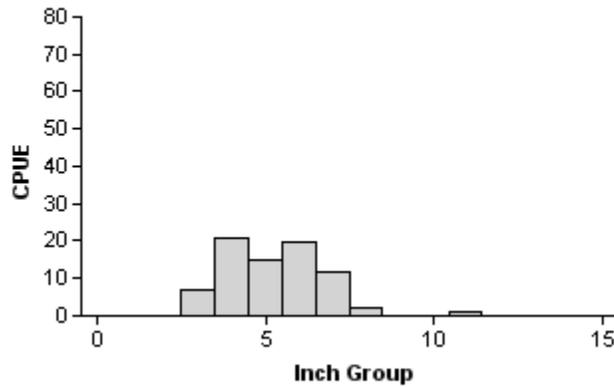
1999

Effort = 1.0
 Total CPUE = 80.0 (26; 80)
 IOV = 98 (1.9)



2006

Effort = 1.0
 Total CPUE = 78.0 (26; 78)
 IOV = 96 (2.2)



2010

Effort = 1.0
 Total CPUE = 187.0 (31; 187)
 IOV = 98 (1.1)

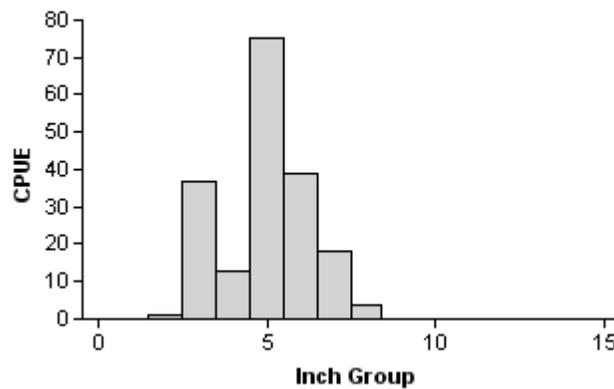
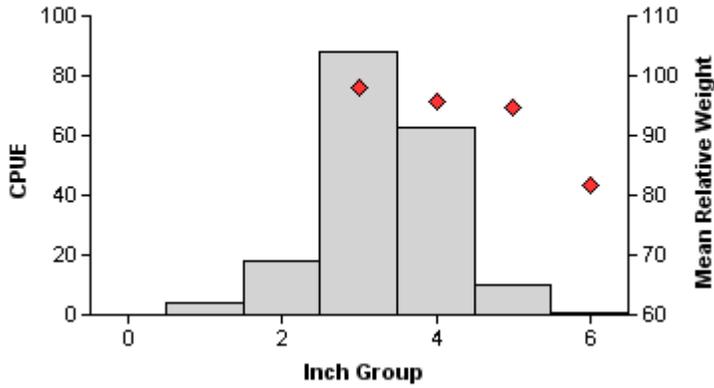


Figure 2. Number of gizzard shad caught per hour (CPUE, bars) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Gibbons Creek Reservoir, Texas, 1999, 2006, and 2010.

Bluegill

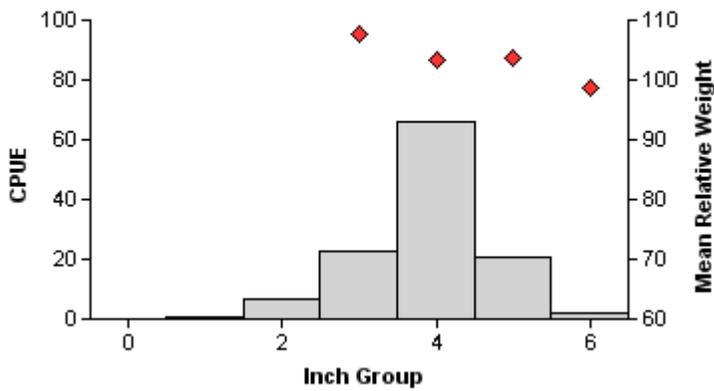
1999

Effort = 1.0
Total CPUE = 184.0 (23; 184)



2006

Effort = 1.0
Total CPUE = 120.0 (29; 120)



2010

Effort = 1.0
Total CPUE = 169.0 (42; 169)

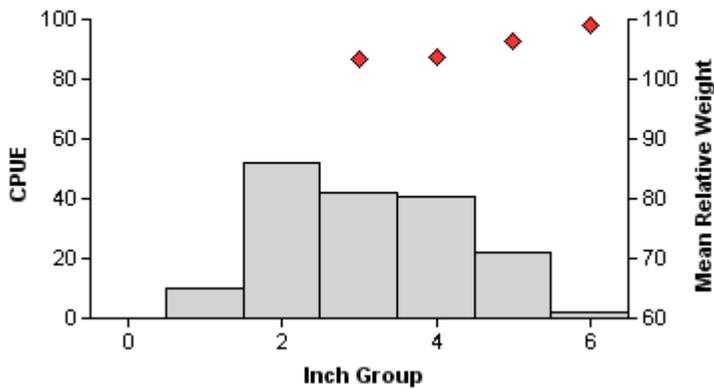
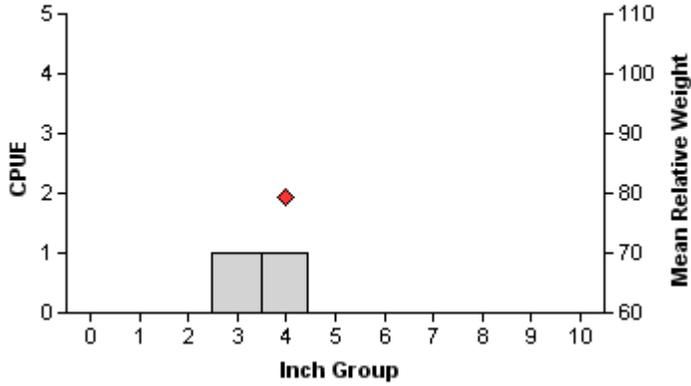


Figure 3. Number of bluegill caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, Gibbons Creek Reservoir, Texas 1999, 2006, and 2010.

Redear sunfish

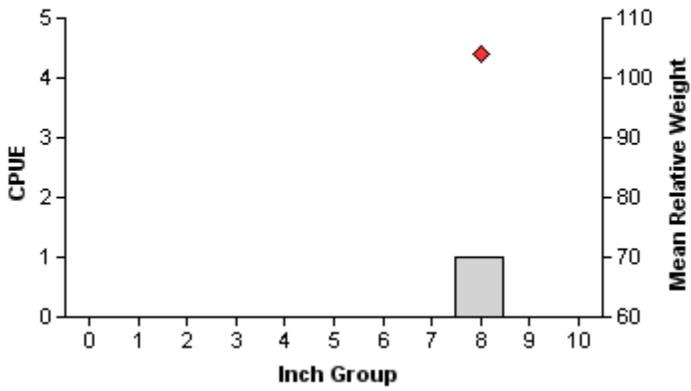
1999

Effort = 1.0
Total CPUE = 2.0 (67; 2)



2006

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



2010

Effort = 1.0
Total CPUE = 8.0 (59; 8)

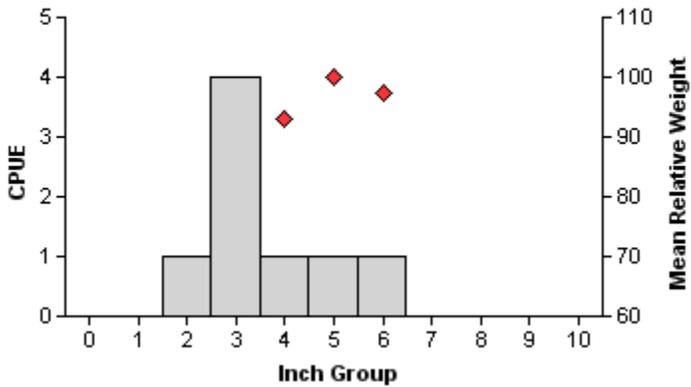


Figure 4. Number of redear sunfish caught per hour (CPUE, bars), mean Relative Weight (diamonds), and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, Gibbons Creek Reservoir, Texas, 1999, 2006, and 2010.

Blue catfish

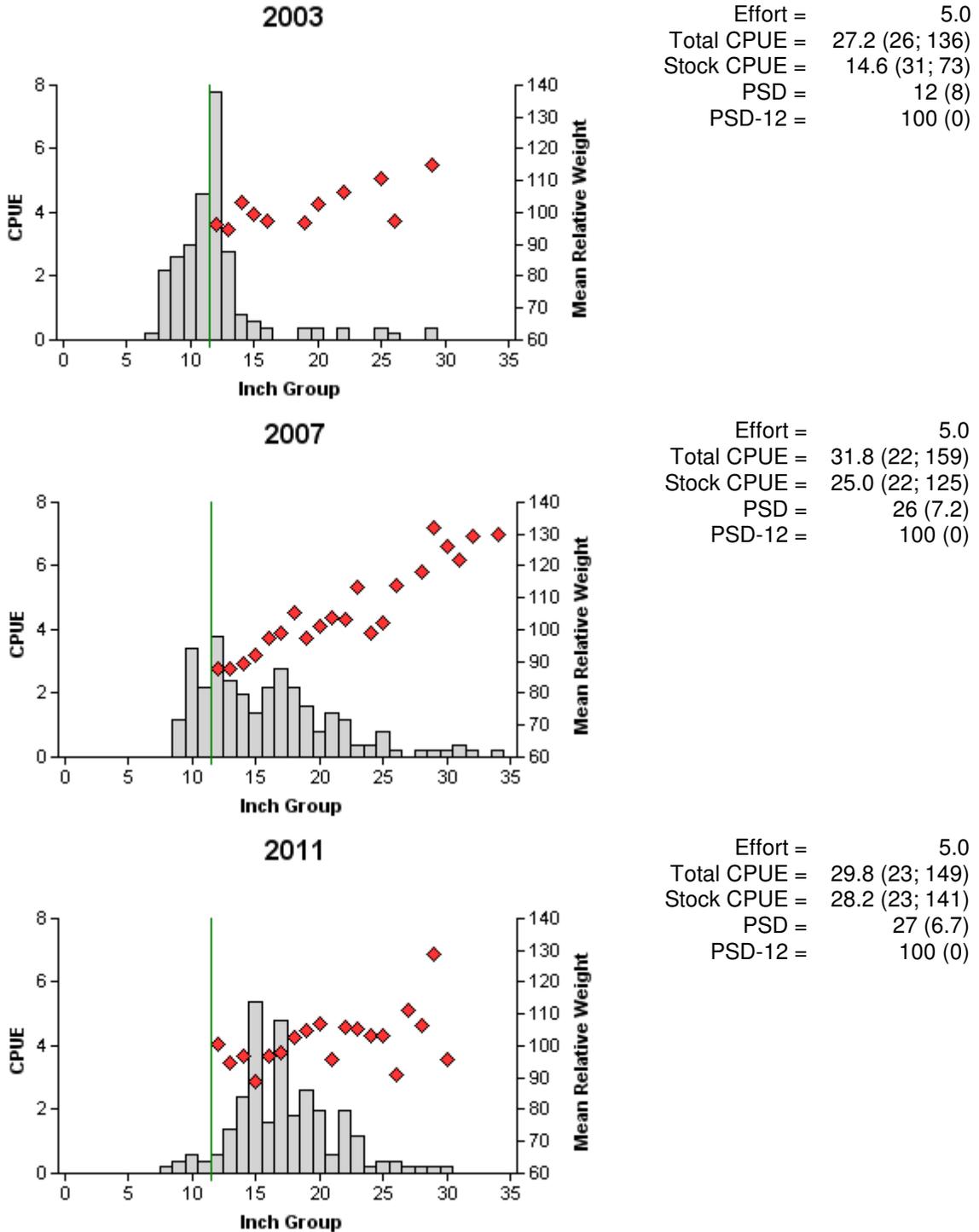


Figure 5. Number of blue catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Gibbons Creek Reservoir, Texas, 2003, 2007, and 2011. Vertical lines indicate minimum length limit.

Channel catfish

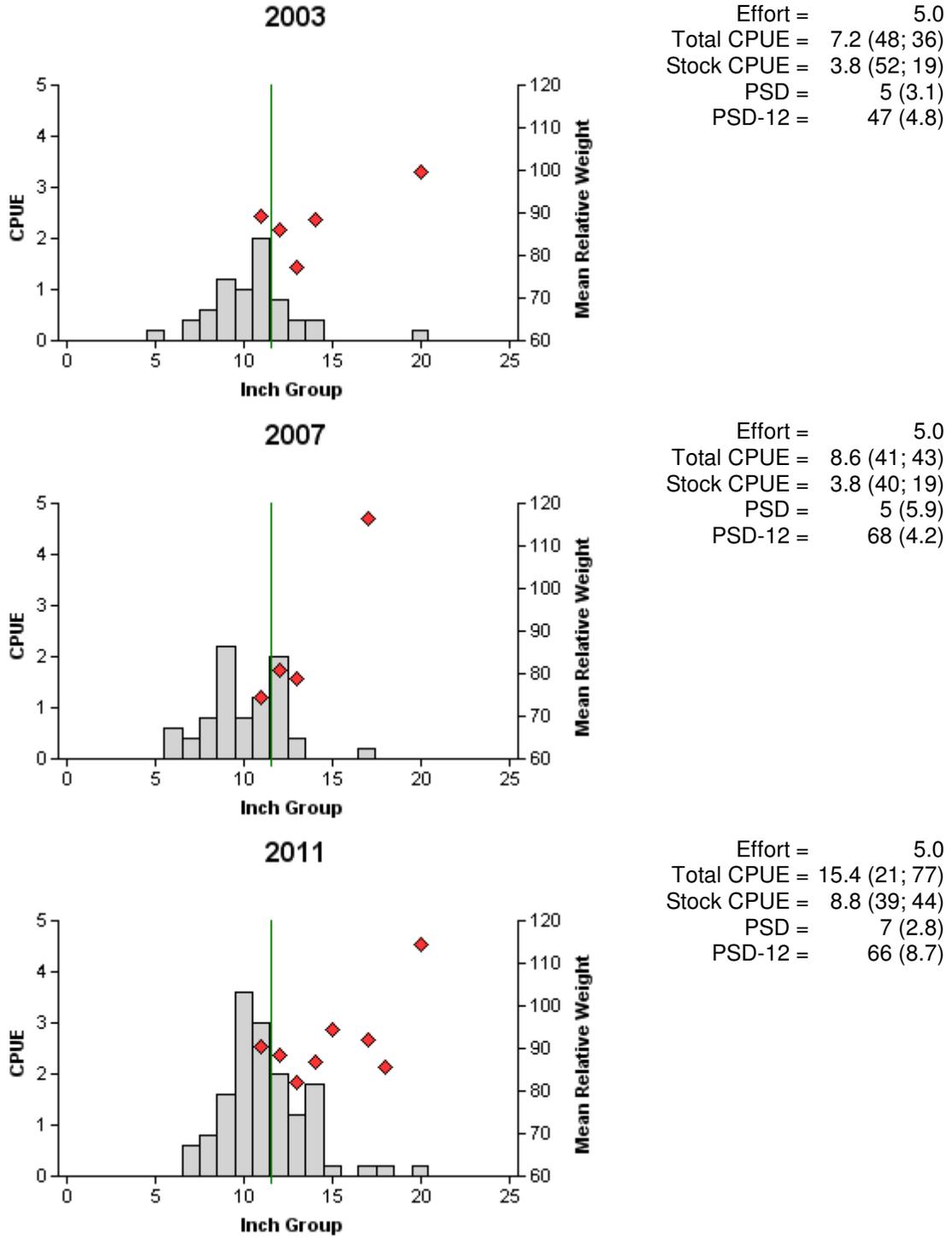


Figure 6. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Gibbons Creek Reservoir, Texas, 2003, 2007, and 2011. Vertical lines indicate minimum length limit.

Table 7. Creel survey statistics for catfishes at Gibbons Creek Reservoir from March through May 2003, 2007, and 2011 where total catch per hour is for anglers targeting catfishes (species combined) and total harvest is the estimated number of blue catfish or channel catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2003	2007	2011
Directed effort (h)	4,524 (27)	12,518 (43)	11,009(24)
Directed effort/acre	1.63 (27)	4.52 (43)	3.97 (24)
Total catch per hour	0.56 (30)	1.39 (26)	0.92 (21)
Blue catfish harvest/acre	0.0	2.69 (42)	1.17 (55)
Total blue catfish harvest	0.0	7,443 (42)	3,235 (55)
Percent legal blue catfish released	0.0	1.7	3.7
Channel catfish harvest/acre	0.14 (12)	2.54 (40)	2.84 (52)
Total channel catfish harvest	410.8 (12)	7,037 (40)	7,865 (52)
Percent legal channel catfish released	31.3	12.1	13.5

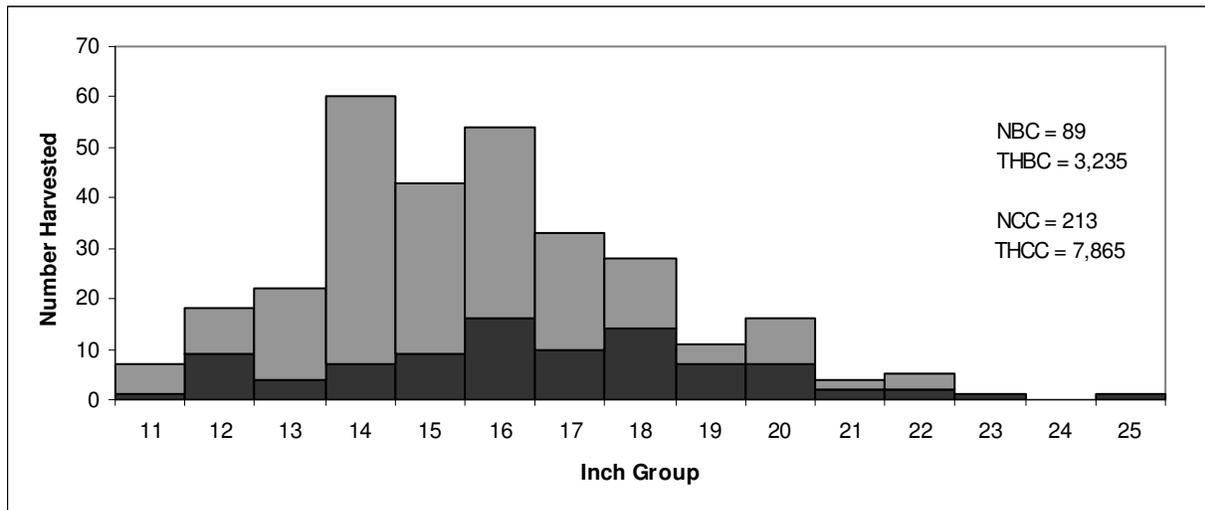
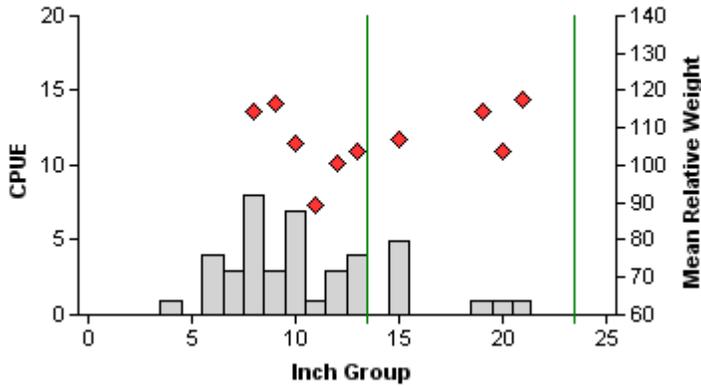


Figure 7. Length frequency of harvested blue catfish (black area) and channel catfish (grey area) observed during creel surveys at Gibbons Creek Reservoir, Texas, March through May 2011. NBC and NCC are the numbers of harvested blue catfish and channel catfish, respectively, observed during creel surveys. THBC and THCC are the total estimated blue catfish and channel catfish, respectively, harvested for the creel period.

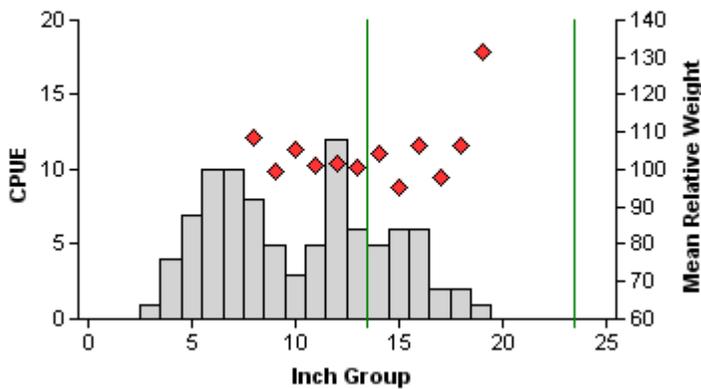
Largemouth Bass

2007



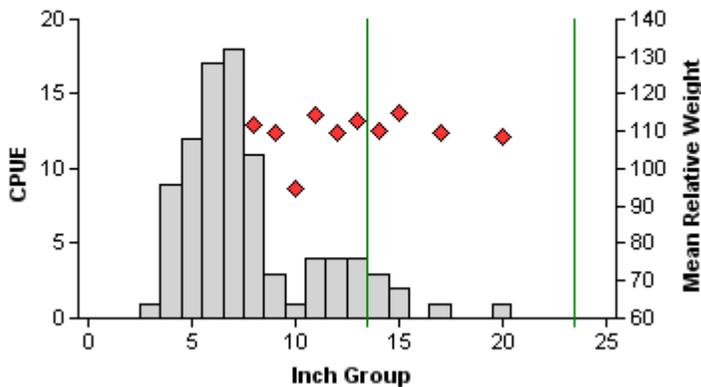
Effort = 1.0
 Total CPUE = 42.0 (43; 42)
 Stock CPUE = 34.0 (40; 34)
 PSD = 44 (11.9)
 PSD-14 = 24 (6.2)

2008



Effort = 1.0
 Total CPUE = 93.0 (36; 93)
 Stock CPUE = 61.0 (31; 61)
 PSD = 66 (4.9)
 PSD-14 = 36 (5.7)

2010



Effort = 1.0
 Total CPUE = 91.0 (31; 91)
 Stock CPUE = 34.0 (24; 34)
 PSD = 44 (9.7)
 PSD-14 = 21 (5.9)

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, 2007, 2008, and 2010. 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, 2007, and 2011 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	2007	2011
Directed effort (h)	10,081 (25)	4,166 (54)	6,380 (27)
Directed effort/acre	3.64 (25)	1.50 (54)	2.30 (27)
Total catch per hour	0.78 (45)	0.45 (31)	0.48 (16)
Harvest/acre	0	0	0.29 (191)
Total harvest	0	0	81 (191)
Percent legal release	100	100	61.6

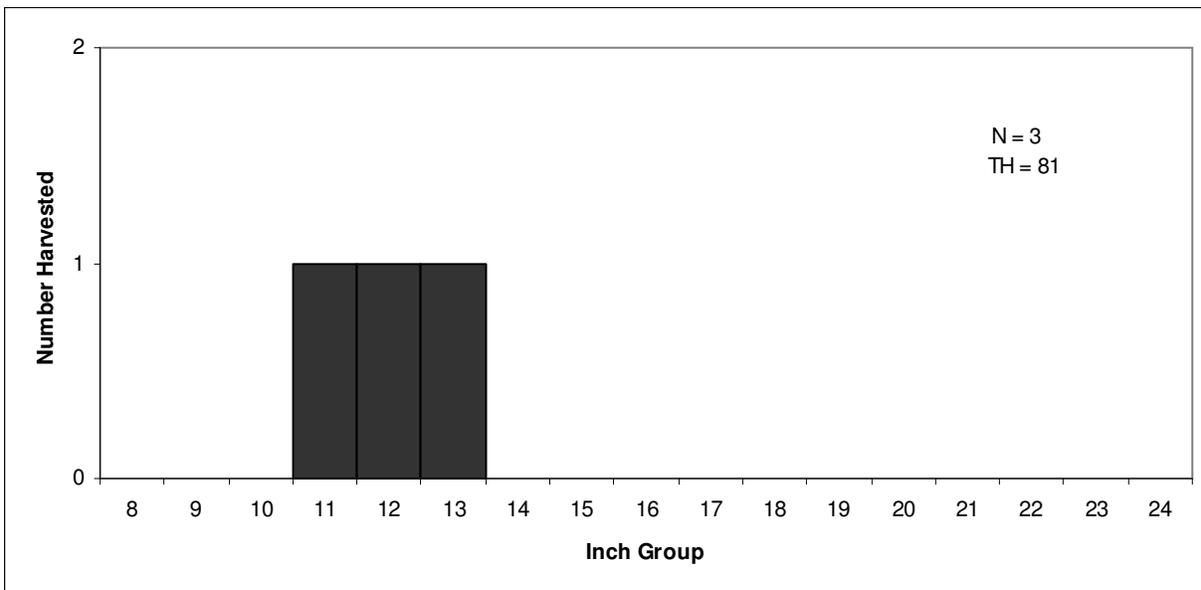


Figure 9. Length frequency of harvested largemouth bass observed during creel surveys at Gibbons Creek Reservoir, Texas, March through May 2011. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Largemouth Bass

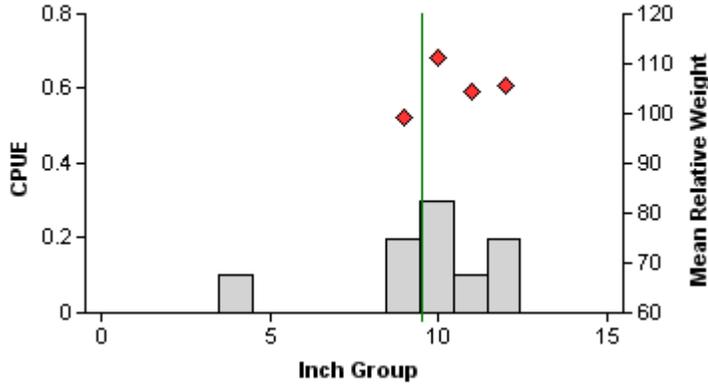
Table 10. Results of genetic analysis of largemouth bass collected by fall electrofishing at Gibbons Creek Reservoir, Texas, 1993-1995, 1998, 2002, 2004, and 2007. The 2007 data are age-0 largemouth bass collected in a spring sample. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB. Allozyme analysis was used prior to 2005. Beginning in 2005, Microsatellite DNA analysis was used.

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.

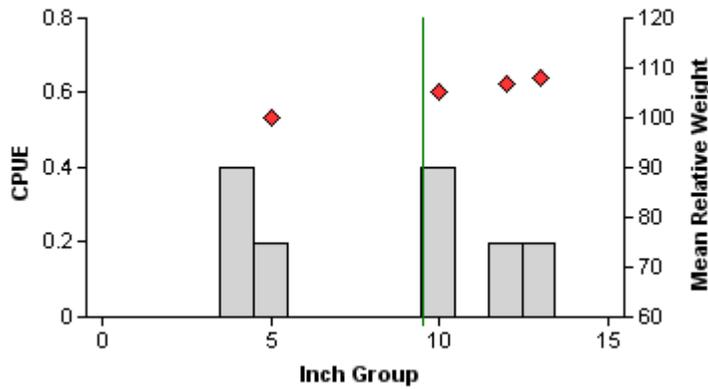
White Crappie

2002



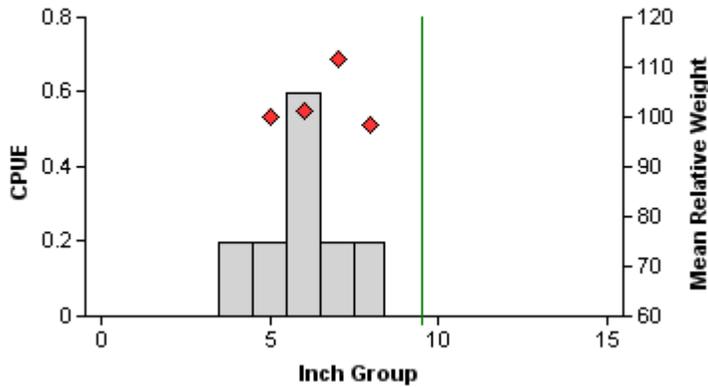
Effort = 10.0
 Total CPUE = 0.9 (67; 9)
 Stock CPUE = 0.8 (67; 8)
 PSD = 100 (0)
 PSD-10 = 75 (0)

2004



Effort = 5.0
 Total CPUE = 1.4 (83; 7)
 Stock CPUE = 1.0 (77; 5)
 PSD = 80 (6.3)
 PSD-10 = 80 (6.3)

2006

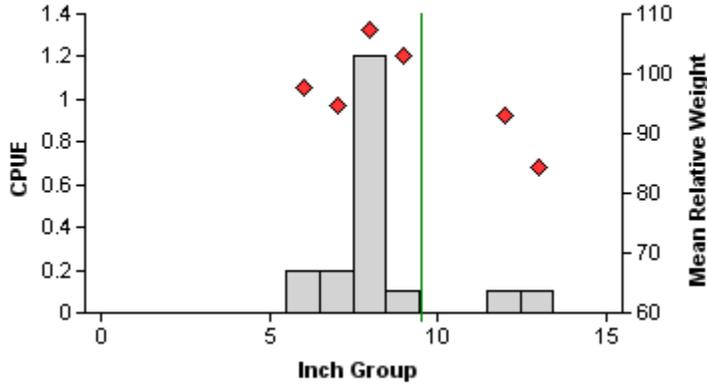


Effort = 5.0
 Total CPUE = 1.4 (66; 7)
 Stock CPUE = 1.2 (61; 6)
 PSD = 17 (20.2)
 PSD-10 = 0 (0)

Figure 10. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Gibbons Creek Reservoir, Texas, 2002, 2004, and 2006. Vertical lines represent minimum length limit.

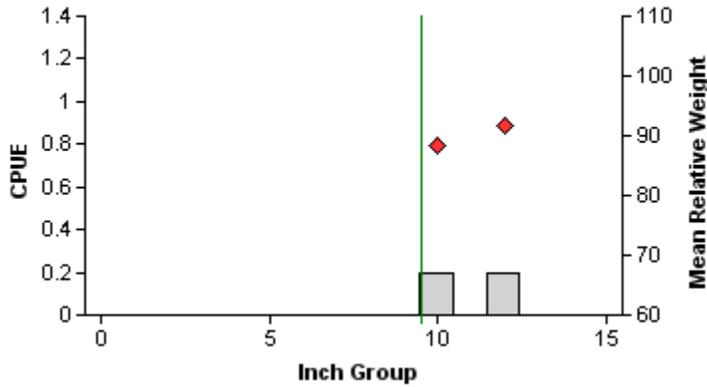
Black Crappie

2002



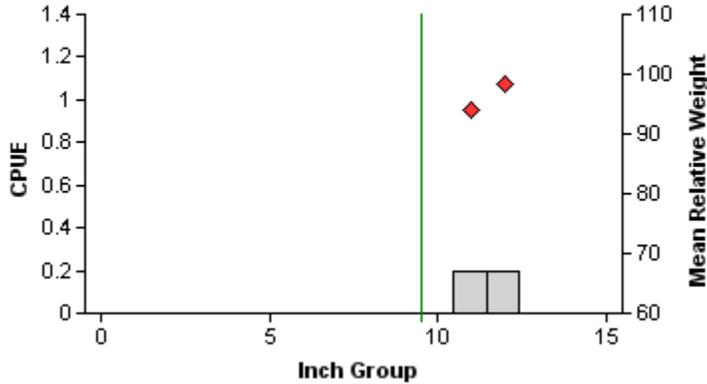
Effort = 10.0
 Total CPUE = 1.9 (45; 19)
 Stock CPUE = 1.9 (45; 19)
 PSD = 79 (8)
 PSD-10 = 11 (9.6)

2004



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

2006



Effort = 5.0
 Total CPUE = 0.4 (61; 2)
 Stock CPUE = 0.4 (61; 2)
 PSD = 100 (0)
 PSD-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 fall trap net surveys, Gibbons Creek Reservoir, Texas, 2002, 2004, and 2006. Vertical lines represent minimum length limit.

Table 11. Creel survey statistics for crappie (species combined) at Gibbons Creek Reservoir, Texas, from March through May 2003, 2007, and 2011 where total catch per hour is for anglers targeting crappie (species combined) and total harvest is the estimated number of white and black crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2003	2007	2011
Directed effort (h)	3,111.7 (36)	5,121.6 (50)	3,934(32)
Directed effort/acre	1.12 (36)	1.85 (50)	1.42 (32)
Total catch per hour	0.44 (61)	0.22 (65)	0.41 (81)
White crappie harvest/acre	0.25 (130)	0.38 (104)	0.10 (171)
Total white crappie harvest	684.6 (130)	1,027 (104)	265 (171)
Percent legal white crappie released	0	4.1	7.4
Black crappie harvest/acre	0	0.57 (114)	0.10 (181)
Total black crappie harvest	0	1,575 (114)	274 (181)
Percent legal black crappie released	0	2.7	1.2
Total combined harvest	0	0	1,892 (101)

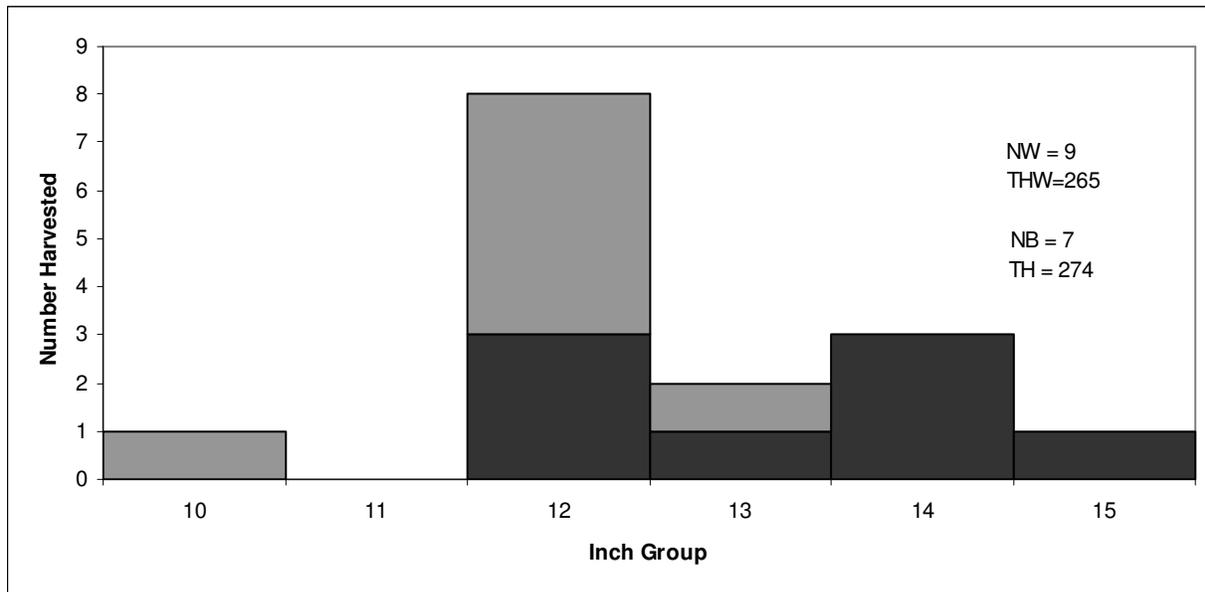


Figure 12. Length frequency of harvested black crappie (grey) and white crappie (black) observed during creel surveys at Gibbons Creek Reservoir, Texas, March through May 2011. NW and NB are the numbers of harvested white crappie and black crappie, respectively, observed during creel surveys. THW and THB are the total estimated numbers, respectively, of white crappie and black crappie harvested during the creel period.

Table 12. 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.

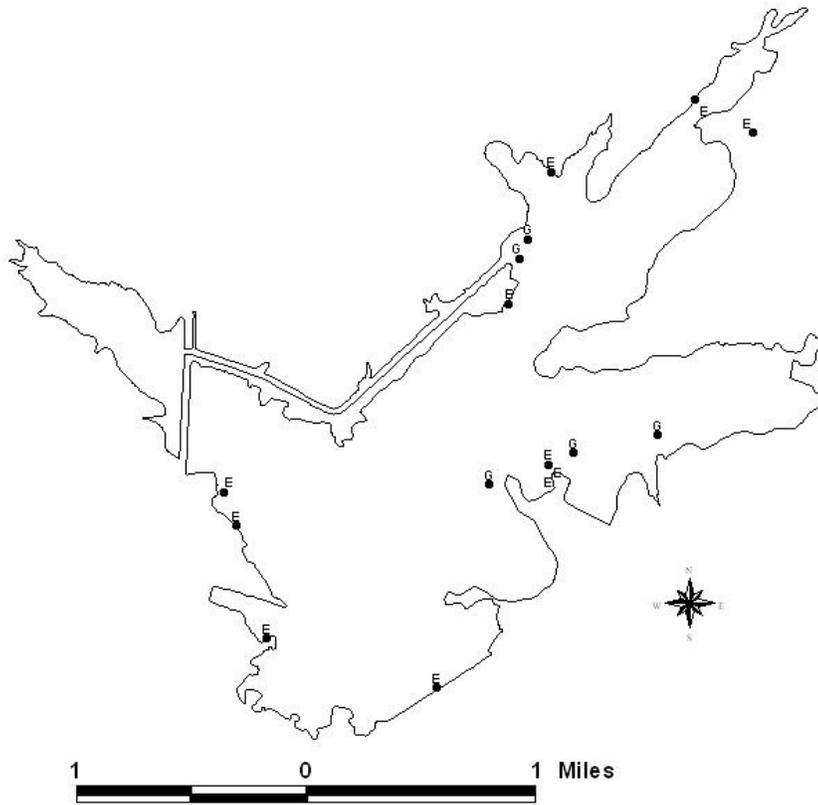
Survey Year	Electrofishing	Gill Net	Spring Creel Survey	Vegetation Survey	Habitat Survey	Access Survey	Report
June 2011-May 2012				A			
June 2012-May 2013	A			A			
June 2013-May 2014				A			
June 2014-May 2015	S	S	A	S	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Gibbons Creek Reservoir, Texas, 2010-2011.

Species	Electrofishing		Gill Netting	
	N	CPUE	N	CPUE
Gizzard shad	187	187.0		
Threadfin shad	166	166.0		
Bullhead minnow	4	4.0		
Inland silverside	7	7.0		
Blue catfish			149	29.8
Channel catfish			77	15.4
Warmouth	2	2.0		
Bluegill	169	169.0		
Longear sunfish	15	15.0		
Redear sunfish	8	8.0		
Largemouth bass	91	91.0		

Appendix B



Location of sampling sites, Gibbons Creek Reservoir, Texas, 2010-2011. Electrofishing and gill netting are represented by E and G, respectively.