PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-31

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2005 Survey Report

Bridgeport Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Bridgeport Reservoir were surveyed in 2005 using an electrofisher and trap nets and in 2006 using gill nets. Habitat was surveyed in 2005. A creel survey was conducted from June 2003 to May 2004. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Bridgeport Reservoir is an 11,954-acre impoundment located on the West Fork Trinity River approximately 8 miles west of Bridgeport. Water level has been below conservation elevation (836 feet-mean sea level) since June 2002. Bridgeport Reservoir has moderate, but increasing, productivity. Habitat features consisted mainly of rocky shoreline and submerged boulders. There was some standing timber and a small amount of hydrilla.

- **Management history:** Important sport fish included channel catfish, white bass, palmetto bass, smallmouth bass, spotted bass, largemouth bass, and white crappie. The management plan from the 2001 survey report included discontinuing stocking palmetto bass and monitoring the largemouth bass population annually. A creel survey in 2000 indicated low directed angler effort for palmetto bass. Directed angler effort for palmetto bass was second only to black basses in 2003 to 2004. Palmetto bass were stocked in 2002 at 5/acre, and resumed in 2005 at 6/acre. In 1992, a 14- to 18-inch slot length limit for largemouth bass was implemented and population structure improved. Smallmouth bass were stocked annually from 1982 through 1985. Florida largemouth bass were first stocked in 1982 and concluded in 1997. Threadfin shad were stocked in 1984 and 1985 and are still present.

- **Fish community**

  - **Prey species:** Threadfin shad continued to be present in the reservoir. Electrofishing catch of gizzard shad declined following palmetto bass stocking. Half the gizzard shad were available as prey to most sportfishes. Electrofishing catch of desirable prey-size bluegills was high.

  - **Catfishes:** Gill net catch of channel catfish was high with half the population being legal-size and in fair to excellent condition. Flathead catfish were present in the reservoir.

  - **Temperate basses:** Gill net catch of white bass was low, but most were legal-size. Gill net catch of palmetto bass was also low. However they were still the second most fished-for species in the reservoir in 2003-2004. No palmetto bass were collected from the 2005 stocking.

  - **Black basses:** Largemouth bass were the most abundant, followed by spotted bass and smallmouth bass. Size structure was adequate for largemouth and spotted bass. Largemouth bass had adequate growth rates and good condition, but Florida alleles were low. Most anglers were fishing for any of the black basses.

  - **White crappie:** Abundance and body condition of white crappie continued to be good.

- **Management strategies:** Stock palmetto bass at 5/acre in 2007 and 2009. Monitor gizzard shad population with electrofishing surveys in 2006 and 2008. Stock Florida largemouth bass at 10/acre in 2007 and 2008 to increase the percent Florida bass alleles in the largemouth bass population. Monitor hydrilla in 2007. Conduct general monitoring with electrofisher, trap nets, and gill nets in 2009-2010.

INTRODUCTION

This document is a summary of fisheries data collected from Bridgeport Reservoir in 2005-2006. This document also summarizes angler data from a creel survey conducted from June 2003 to May 2004. 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

Bridgeport Reservoir is an 11,954-acre impoundment constructed in 1932 on the West Fork Trinity River. It is located in Wise County approximately 8 miles west of Bridgeport and is operated and controlled by the Tarrant Regional Water District. Primary water uses included municipal and industrial water supply and recreation. Bridgeport Reservoir was mesotrophic with a mean TSI chl-*a* of 42.62 (Texas Commission on Environmental Quality 2002). Habitat at time of sampling consisted of rocks and boulders. There were small isolated patches of native submerged and emerged vegetation, and an isolated patch of hydrilla near the marina bay in Runaway Bay. Native aquatic plants present were pondweed and buttonbush. Hydrilla, a non-native, was first discovered in and around the marina bay December, 1994. It has not spread since its discovery. Water level has been low and unstable since April 2002 (Figure 1). At its lowest point, the reservoir was 14 feet below conservation elevation. Boat access consisted of three public boat ramps and several private boat ramps. Bank fishing access was restricted to the Wise County Park, the boat ramp site near the US Highway 380 Bridge, and the boat ramp site near the dam. Other descriptive characteristics for Bridgeport Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Hysmith and Moczygemba 2002) included:

1. Recommend discontinuing stocking palmetto bass.
   Action: After stocking 65,000 palmetto bass fingerlings in 2002, stocking was discontinued. Lots of complaints were received about this action. Most were from fishing guides who were displaced by the golden alga problem in Possum Kingdom Reservoir. After the completion of the creel survey in 2000, angling for palmetto bass began to increase and discontinuing stocking became a bigger issue. Another creel survey conducted in 2003-2004, indicated a big increase in angling pressure for palmetto bass and stocking was resumed in 2005 at 6/acre.
2. We considered changing the 14- to 18-inch slot length limit for largemouth bass because it appeared only marginally successful. There is also some angler confusion, since there are three species of black basses; largemouth, spotted, and smallmouth, in the reservoir with different harvest regulations. However, anglers liked the regulation and they harvested under-slot fish. We recommended keeping the current regulations.
   Action: Monitor the largemouth bass population with annual electrofishing procedures using RSD_{14-18} as a point of reference. RSD_{14-18} appeared to have reverted to pre-slot conditions in 2001 which supported dropping the slot.
3. Update the Bridgeport Reservoir web page as required.
   Action: Submitted updates as appropriate.

Harvest regulation history: Sportfishes in Bridgeport Reservoir are currently managed with statewide regulations with the exception of largemouth bass (Table 2). From 1986 to 1993, largemouth bass were managed with a 14-inch minimum length limit. A 14- to 18-inch slot length limit was implemented in 1993

to improve the population size structure. In September, 2000, the 12-inch minimum length limit for spotted bass was dropped to a no minimum length limit.

Stocking history: Bridgeport Reservoir was last stocked in 2005 (palmetto bass; 6/acre). Palmetto bass were first stocked in Bridgeport Reservoir in 1983 (11/acre) and from 1994 through 1999, they were stocked at an average annual rate of 13/acre. The last stocking prior to the moratorium was in 2002 at 5/acre. Adult threadfin shad were introduced in 1984 and 1985, walleye sporadically from 1974 to 1993, smallmouth bass in 1982 – 1985, and Florida largemouth bass during 5 years from 1982 - 1997; of these species, only walleye was not present in the reservoir. The complete stocking history is in Table 3.

Vegetation/habitat history: Bridgeport Reservoir supported limited aquatic vegetation (Table 4). The bulk of native submerged vegetation consisted of pondweed. Native emerged vegetation consisted mainly of buttonbush. Historically, submerged aquatic vegetation (southern naiad, muskgrass, and pondweed) was common, but never problematic (Hysmith and Moczygemba 1978). During a survey in 1977, 10 species of aquatic vegetation and marginal canopy consisting of black willow and cottonwood were documented (Hysmith and Moczygemba 1978). Historically, as well as currently, rocky shoreline provided the bulk of fishery habitat in Bridgeport Reservoir (Table 4, and Hysmith and Moczygemba 1978). Rocky shoreline habitat was augmented by boulders found at infrequent intervals around the reservoir.

Hydrilla, a non-native, was first documented in and around the marina bay in December 1994. It has not spread since its discovery.

METHODS

Fishes were collected by electrofishing (2 hours at 24 5-min stations), gill netting (15 net nights at 15 stations), and trap netting (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 caught per net night (fish/nn). Survey sites for electrofishing and gill netting were randomly selected, while trap netting sites were subjectively chosen by biologists for the best crappie habitat. All surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2004).

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. Ages for largemouth bass and white crappie were determined using Category 2 protocol according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2004). The manual specifies largemouth bass, but we adapted the protocol to include white crappie.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of gravel, rocks, and boulders (Table 4). As part of a study to identify reservoirs in the range of bald eagles, which may contain aquatic vegetation that provide habitat for a cyanobacteria that can infect bald eagles feeding on fishes in the vegetation, hydrilla was collected from the reservoir in September, 2005. Samples were sent to Susan Wilde, a research assistant professor of the Baruch Institute, University of South Carolina, for examination. Although there were numerous epiphytic algal species on the hydrilla, including cyanobacteria, the target species was not found.

Creel: Directed fishing effort by anglers was highest for black basses (28%), followed by anglers fishing for palmetto bass, and white crappie (Table 5). Total fishing effort for all species at Bridgeport Reservoir was 10.5 h/acre from June 2003 to May 2004, and anglers spent an estimated $635,467 on direct expenditures (Table 6).

Prey species: Electrofishing CPUE of gizzard shad and bluegill were 21.5/h and 227.5/h, respectively. The IOV for gizzard shad was fair, only 58 % of gizzard shad were available to existing predators. The IOV has remained around 58% since 1997, except for 78% in the 2001 survey (Figure 2). Prior to the resumption of palmetto bass stocking in 1994 (Table 3), the IOV for gizzard shad has been between 75 and 80 % (Figure 2). Threadfin shad established following their introduction in 1984 and 1985, and their CPUE has fluctuated over the years with 2005 CPUE being the highest since 1991 (Appendix E). While the CPUE of gizzard shad has declined over the years. Total CPUE of bluegill (227.5/h) in 2005 was a record for Bridgeport Reservoir (Appendix E) and size structure continued to be dominated by small individuals (Figure 3).

Channel catfish: The gill net CPUE of channel catfish was 3.3/nn in 2006, an increase from previous years (Figure 4). Relative weight ranged from 70 % to 110 %, increasing with size. This trend in relative weights did not change from previous years (Figure 4). Directed fishing effort, catch per hour, and total harvest for channel catfish showed a marginal fishery (Tables 5 and 7). Channel catfish was a harvest-oriented fishery as only 11 % of the legal-sized fish were released. Observed harvest from June 2003 to May 2004 showed good angler compliance, and harvested fish ranged in length from 12 to 20 inches (Figure 5).

Temperate basses: The gill net CPUE of white bass was 2.1/nn in 2006, a decline from previous years (Appendix E). Relative weight stayed between 70 % and 85 %, down from 90 % population-wide in 2002, but about the same as in 1997 (Figure 6). The highest relative weights among white bass in 2002 coincided with the end of a three-year moratorium on palmetto bass stocking. Perhaps we are seeing evidence of interspecies competition. Directed fishing effort, catch per hour, and total harvest for white bass showed a minimal white bass fishery (Tables 5 and 8). White bass angling was also harvest-oriented as only 27 % of the legal-sized fish were released. Observed harvest from June 2003 to May 2004 showed good angler compliance, and harvested fish ranged in length from 10 to 17 inches (Figure 7).

The gill net CPUE of palmetto bass was 0.9/nn in 2006, down from previous years, especially 1997 when the CPUE was 9.2/nn (Figure 8). Size structure was great in 1997, but not so good in 2002 – 2006. This comes as no surprise considering this is a put-grow-and-take fishery and no palmetto bass were stocked in 2000, 2001, 2003, and 2004. Directed angler effort for palmetto bass indicated a popular fishery (Table 5), however, angler catch and angler harvest showed only a fair fishery (Table 9). Palmetto bass angling was also harvest-oriented as only 19 % of the legal-sized fish were released. Observed harvest from June 2003 to May 2004 showed evidence of angler non-compliance, and harvested fish ranged in length from 17 to 27 inches (Figure 9).

Black basses: The electrofishing total CPUE of smallmouth bass was 1.0/h in 2005, and with the exception of 2002, unchanged since 2001 (Figure 10). Historically, electrofishing has not produced high catch rates of smallmouth bass (Appendix E) with the exception of 1998 and 1999 when CPUE was 6.5/h and 6.0/h, respectively. Anecdotal information from anglers provided a much brighter picture of the smallmouth bass fishery in Bridgeport Reservoir which began with the stocking of 104 adults in 1982. Smallmouth bass were not caught or harvested during the creel survey June 2003 to May 2004.

The electrofishing total CPUE of spotted bass was 37.5/h in 2005, down from 2003, but similar to 2001 and 2002 (Figure 11). Size structure showed evidence of recruitment to 12 inches in 2005 and 15 inches in 2003. Relative weights were consistent around 90 % since 2001 (Figure 11).

The electrofishing CPUE of stock-size largemouth bass in Bridgeport Reservoir was 37.5/h in 2005 an increase from 2002 and 2003, but a decrease since 2001 (Figure 13). Historically, since 1991 total CPUE averaged 78.5/hr (range 40.5/h to 119.5/h; Appendix E). Relative weights among largemouth bass seem unaffected by fluctuations in gizzard shad abundance. Size structure was good and consistently showed fish within the slot (Figure 13), but, as is typical for Bridgeport Reservoir, few fish above the slot were collected. On average, growth of largemouth bass in this reservoir approached 14 inches (13.21 – 13.92 inches) in 2 to 3 years (N = 12; range = 2 – 3 years). Florida largemouth bass were last stocked in 1997, but introgression of their genetic material persisted for years thereafter (Table 11). Only in 2005 did Florida alleles begin to decline.

Directed angler effort (28.2 %) was highest for black basses suggesting a popular fishery (Table 5). Black bass (spotted and largemouth) angling was non-harvest oriented; over 75 % of the legal-size catch was released (Tables 10 and 12). Observed harvest of spotted bass from June 2003 to May 2004 showed a range from 7 to 15 inches (Figure 12). There was also some harvest of largemouth bass, ranging from 8 to 13 inches and 18 to 21 inches, however, there was evidence of some non-compliance (Figure 14).

White crappie: The trap net CPUE of white crappie was 11.3/nn in 2005 (Figure 15), lower than in 2001 (13.6/nn) and similar to 1997 (10.2/nn). Size structure was adequate as shown by high PSD's, especially in 2001 when most of the population was quality-size and above. Average relative weight was 90 or better for all size classes since 1997 (Figure 15). Growth of white crappie in Bridgeport Reservoir was good. Average age at 10 inches (9.60 – 10.64 inches) was 1.5 years (N = 16; range = 1 – 2). Directed angler effort for white crappie (15.8 %) was third highest among all fish (Table 5). Size of harvested fish in 2003 and 2004 was excellent and ranged from 10 to 15 inches (Figure 16). White crappie angling was harvest oriented considering the high number taken home and only 5 % of the legal-size fish caught were released (Table 13).

Fisheries management plan for Bridgeport Reservoir, Texas

Prepared – July 2006.

ISSUE 1: Palmetto bass have been a part of the fishery at Bridgeport Reservoir since 1983; however, stocking was curtailed following 1999. Palmetto bass were thereafter stocked only in 2002 and 2005. As a result, gill net CPUE has declined to a record low. Since there was directed angling effort and a vocal constituency supporting continued stocking, we should attempt to identify a stocking density that will provide angling opportunities and protect the integrity of the gizzard and threadfin shad populations.

MANAGEMENT STRATEGIES

1. Cautiously continue stocking palmetto bass at 5/acre in 2007 and 2009.
2. Monitor palmetto bass population with a gill netting survey in 2008.

ISSUE 2: Gizzard shad abundance appears to decline following the stocking of palmetto bass and this appears to be an ongoing trend. The threadfin shad population fluctuates from survey to survey.

MANAGEMENT STRATEGY

1. Monitor gizzard and threadfin shad populations with an electrofishing survey in 2006 and 2008.

ISSUE 3: Florida bass alleles have decreased below 20% in Bridgeport Reservoir since 1995. Florida largemouth bass were last stocked in 1997.

MANAGEMENT STRATEGY

1. Stock Florida largemouth bass fingerlings at 10/acre in 2007 and 2008.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule (Table 14) includes an electrofishing survey to monitor affects of stocking palmetto bass on the gizzard shad population and a gill netting survey to monitor the palmetto bass population. General monitoring surveys in 2009 – 2010 require electrofishing, trap netting, and gill netting.

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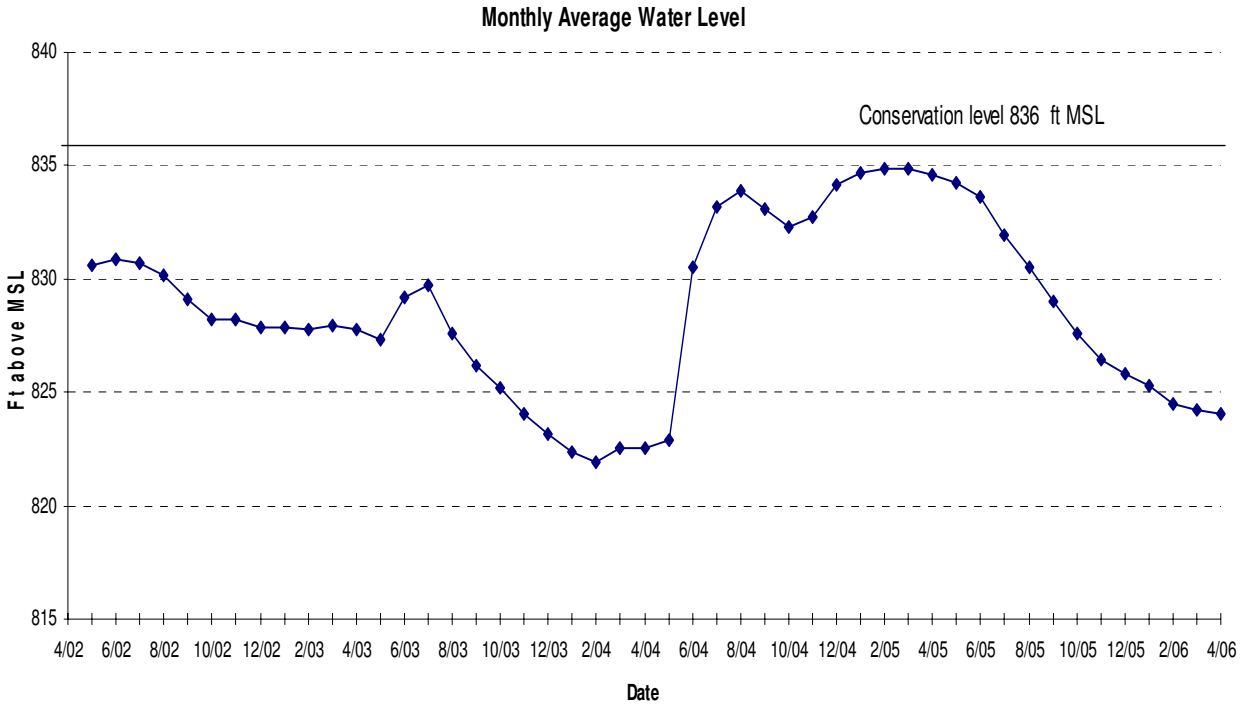


Figure 1. Monthly average water level elevations in feet above mean sea level (msl) recorded for Bridgeport Reservoir, Texas, May 2002-April 2006.

Table 1. Characteristics of Bridgeport Reservoir, Texas.

Characteristic	Description
Year constructed	1932
Controlling authority	Tarrant Regional Water District
Counties	Wise and Jack
Reservoir type	Mainstream
Shoreline development index	10.60
Conductivity	361 umhos/cm

Table 2. Harvest regulations for Bridgeport Reservoir.

Species	Bag Limit	Length Limit (inches)
Catfish, channel	25	12 minimum
Catfish, flathead	5	18 minimum
Bass, white	25	10 minimum
Bass, palmetto	5	18 minimum
Bass, smallmouth	5 (in any combination)	14 minimum
Bass, spotted		No Limit
Bass, largemouth		14 – 18 slot
Crappie: white and black crappie, their hybrids and subspecies	25	10 minimum
Walleye	5	No Limit – only two fish less than 16 inches may be retained each day

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

Species	Year		Number	Size
Threadfin shad	1984		4,500	ADL
	1985		4,300	ADL
		Total	8,800	
Channel catfish	1972		52,000	ADL
		Total	52,000	
Palmetto bass	1983		130,144	FGL
	1994		195,693	FGL
	1995		339,300	FGL
	1996		100,700	FGL
	1997		112,206	FGL
	1998		132,599	FGL
	1999		65,004	FGL
	2002		65,005	FGL
	2005		71,788	FGL
		Total	1,212,439	
Smallmouth bass	1982		104	ADL
	1983		130,034	FGL
	1984		50,826	FGL
	1985		33,172	FGL
		Total	214,136	
Largemouth bass	1970		250,000	FGL
		Total	250,000	
Florida largemouth bass	1982		1,439	FGL
	1985		10,700	FGL
	1988		10,000	FGL
	1990		326,430	FGL
	1997		125,264	FGL
		Total	473,833	
Mixed largemouth bass	1988		12,750	FGL
		Total	12,750	
Walleye	1974		204,000	FGL
	1975		247,000	FGL
	1984		4,692,000	FRY
	1992		7,834,586	FRY
		Total	12,977,586	
Coppernose bluegill	1983		130,000	FGL
		Total	130,000	

Table 4. Survey of littoral zone and physical habitat types, Bridgeport Reservoir, Texas, 2005. 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 Distance		Surface Area	
Shoreline habitat type	Miles	Percent of total	Acres	Percent of reservoir surface area
Riprap	0.3	< 1.0		
Rocky shore	120.8	71.1		
Boulder	5.8	3.4		
Indescript	25.5	15.0		
Rock bluff	2.0	1.2		
Cut bank	0.3	< 1.0		
Dead timber	2.0	1.2		
Flooded dead terrestrial	0.2	< 1.0		
Boat docks	6.8	4.0		
Native submerged vegetation	3.0	1.8	290.0	2.4
Native emerged vegetation	1.8	1.0	7.0	< 1.0
Hydrilla	1.5	< 1.0	7.0	< 1.0

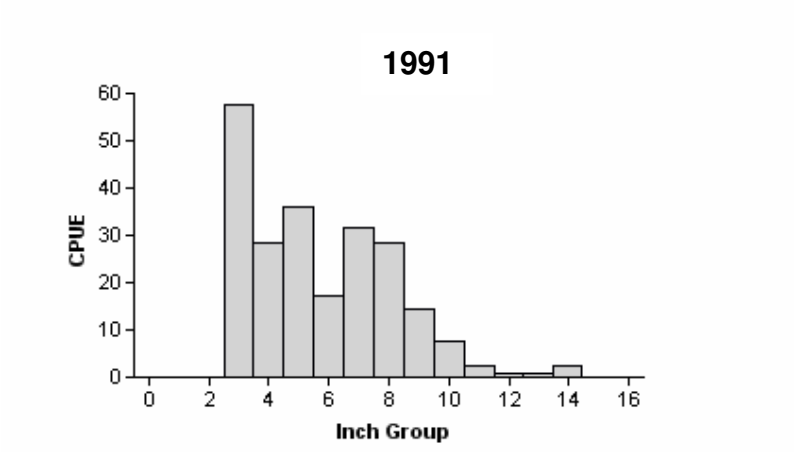
Table 5. Percent directed angler effort by species for Bridgeport Reservoir, Texas, June 2003 – May 2004.

	Year
Species	2003/2004
Channel catfish	8.2
White bass	2.9
Palmetto bass	18.9
Sunfishes	1.4
Black basses	28.2
White crappie	15.8
Anything	22.5

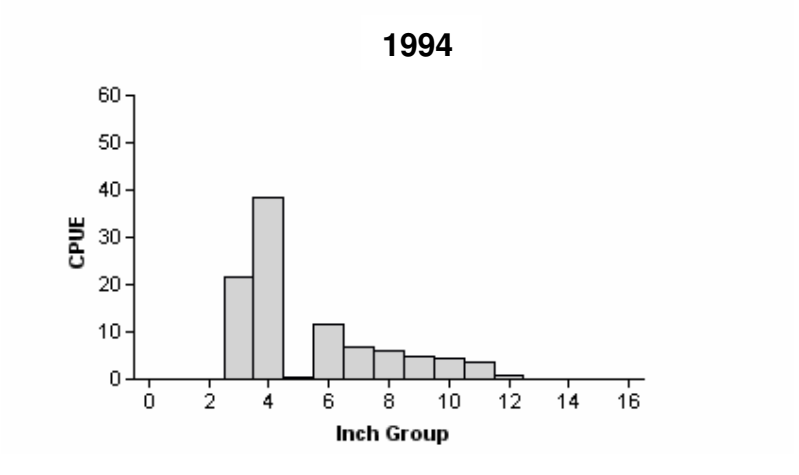
Table 6. Total fishing effort (h) for all species and total directed expenditures at Bridgeport Reservoir, Texas, June 2003 – May 2004.

	Year
Creel Statistic	2003/2004
Total fishing effort	125,233
Total directed expenditures	$635,467

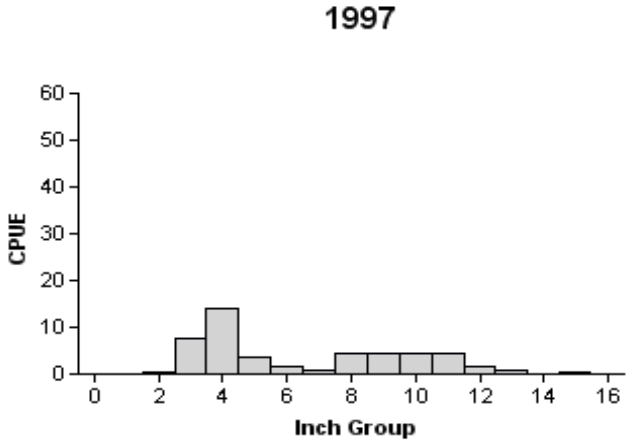
Gizzard Shad



Effort = 1.3
Total CPUE = 227.2 (47; 303)
IOV = 74.59 (0.47)



Effort = 2.0
Total CPUE = 99.0 (59; 198)
IOV = 79.80 (0.61)

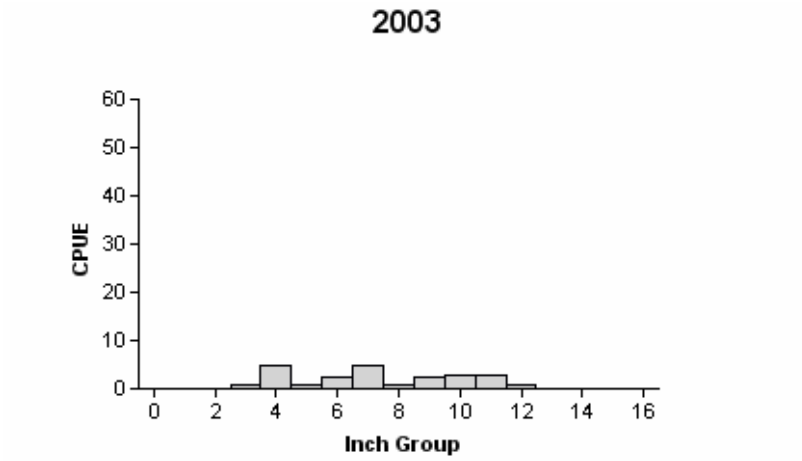


Effort = 2.0
Total CPUE = 49.0 (32; 98)
IOV = 57.14 (0.1)

Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Bridgeport Reservoir, Texas 1991, 1994, and 1997.

Gizzard Shad

Effort = 2.0
Total CPUE = 69.0 (42; 138)
IOV = 78.26 (0.11)

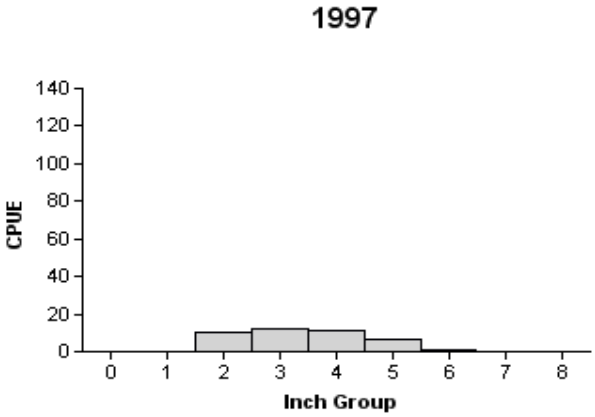


Effort = 2.0
Total CPUE = 25.0 (33; 50)
IOV = 58.0 (0.12)

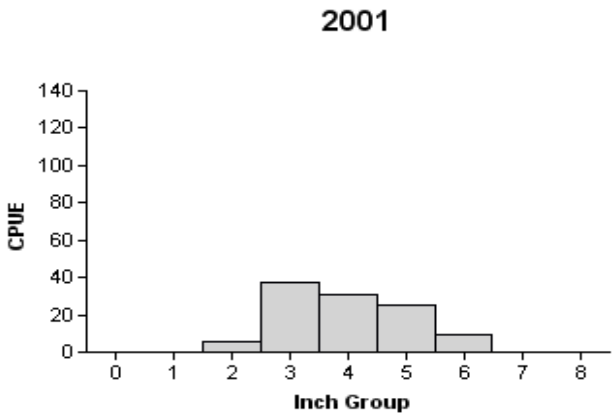
Effort = 2.0
Total CPUE = 21.5 (24; 43)
IOV = 58.14 (0.11)

Figure 2 continued. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Bridgeport Reservoir, Texas 2001, 2003, and 2005.

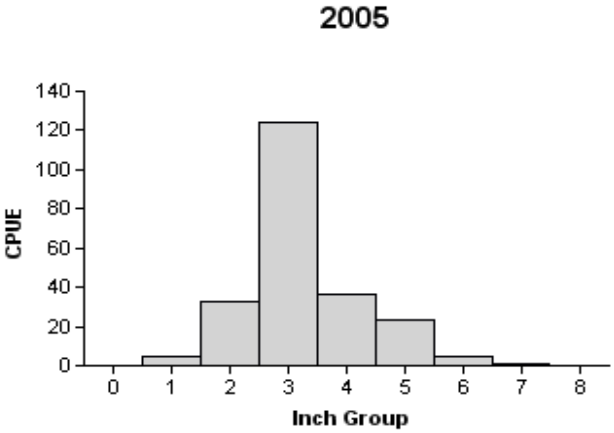
Bluegill



Effort = 2.0
Total CPUE = 42.0 (22; 84)
PSD = 3.0 (0.02)



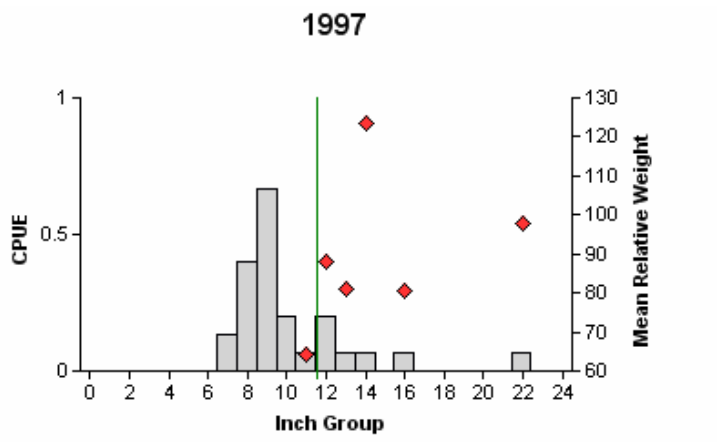
Effort = 2.0
Total CPUE = 109.0 (15; 218)
PSD = 9.0 (0.02)



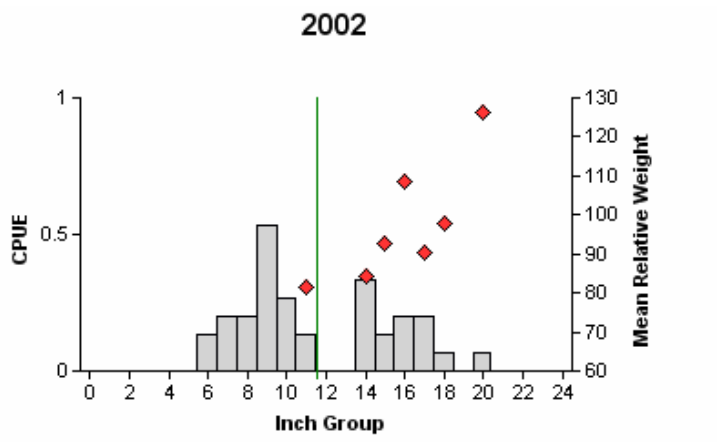
Effort = 2.0
Total CPUE = 227.5 (10; 455)
PSD = 3.0 (0.01)

Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Bridgeport Reservoir, Texas, 1997, 2001, and 2005.

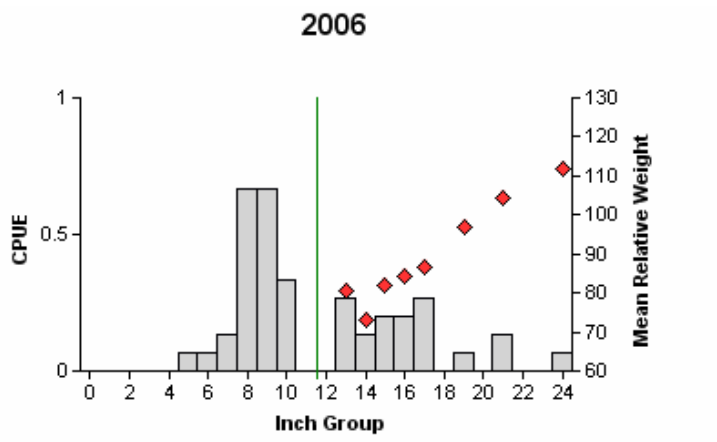
Channel Catfish



Effort = 15.0
Total CPUE = 1.9 (26; 29)
PSD = 25.0 (0.15)



Effort = 15.0
Total CPUE = 2.5 (33; 37)
PSD = 47.0 (0.11)



Effort = 15.0
Total CPUE = 3.3 (25; 49)
PSD = 55.0 (0.14)

Figure 4. 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, Bridgeport Reservoir, Texas, 1997, 2002, and 2006. Vertical lines represent length limit at time of collection.

Table 7. Creel survey statistics for channel catfish at Bridgeport Reservoir from June 2003 through May 2004, where total catch per hour is for anglers targeting channel catfish and total harvest is the estimated number of channel catfish harvested by all anglers. Relative standard errors are in parentheses.

	Year
Creel Survey Statistic	2003/2004
Directed effort (h)	9,409.00 (19)
Directed effort/acre	0.79 (19)
Total catch per hour	0.60 (58)
Total harvest	3,478.00 (50)
Harvest/acre	0.29 (50)
Percent legal released	11.00

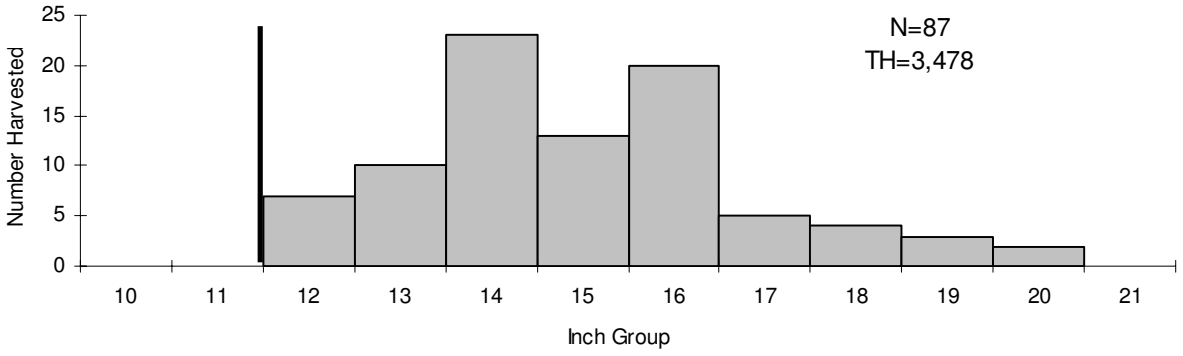
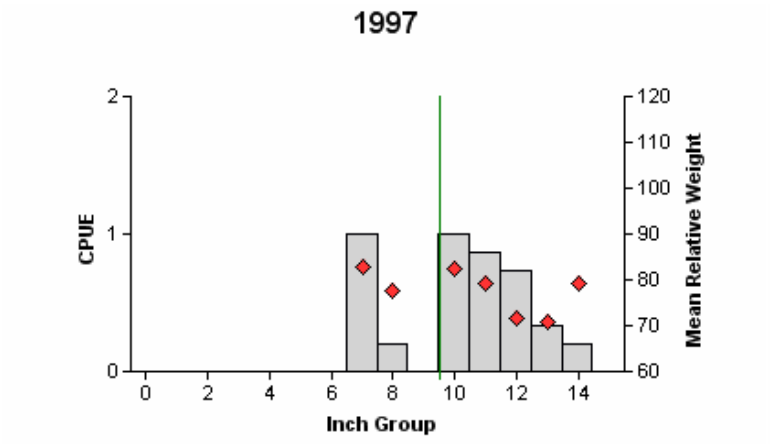
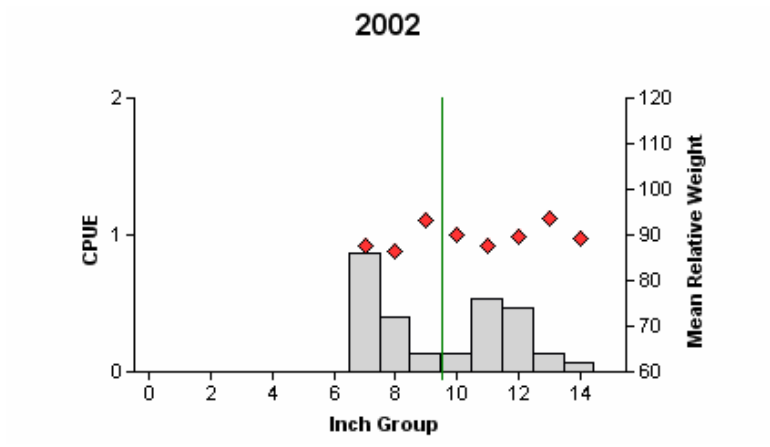


Figure 5. Length frequency of harvested channel catfish observed during creel surveys at Bridgeport Reservoir, Texas, June 2003 through May 2004, all anglers combined. N is the number of harvested channel catfish observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents length limit at time of creel survey.

White Bass



Effort = 15.0
Total CPUE = 4.3 (31; 65)
PSD = 72.0 (0.07)



Effort = 15.0
Total CPUE = 2.7 (44; 41)
PSD = 54.0 (0.04)

Effort = 15.0
Total CPUE = 2.1 (42; 32)
PSD = 97.0 (0.02)

Figure 6. Number of white bass 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, Bridgeport Reservoir, Texas, 1997, 2002, and 2006. Vertical lines represent length limit at time of collection.

Table 8. Creel survey statistics for white bass at Bridgeport Reservoir from June 2003 through May 2004, where total catch per hour is for anglers targeting white bass and total harvest is the estimated number of white bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

	Year
Creel Survey Statistic	2003/2004
Directed effort (h)	3,667.00 (31)
Directed effort/acre	0.31 (31)
Total catch per hour	2.86 (56)
Total harvest	17,590.00 (30)
Harvest/acre	1.47 (30)
Percent legal released	27.00

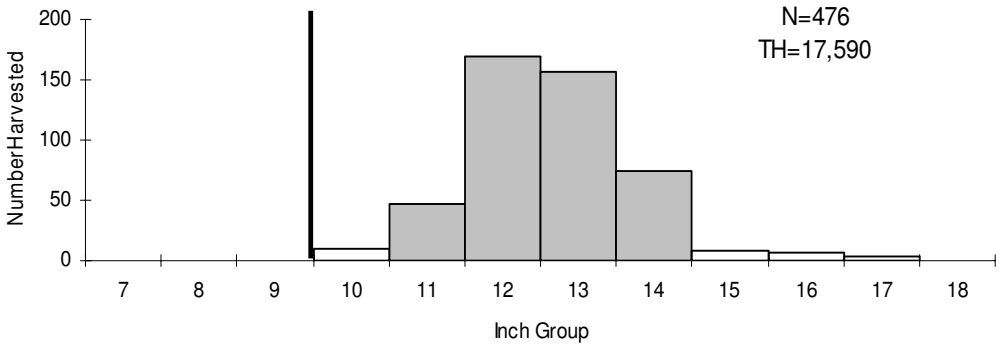
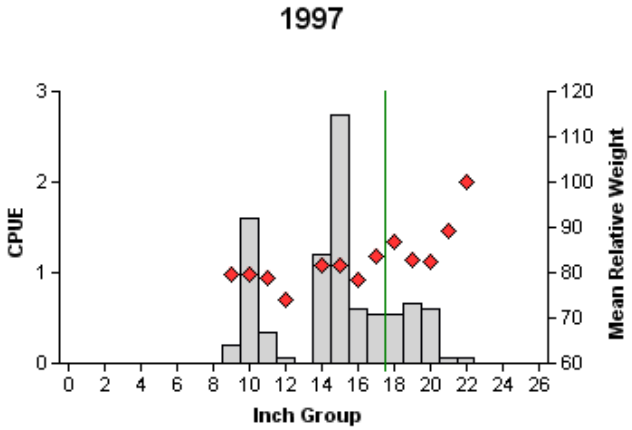
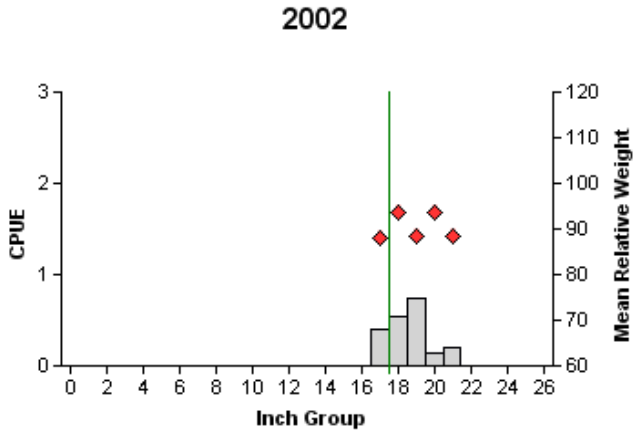


Figure 7. Length frequency of harvested white bass observed during creel surveys at Bridgeport Reservoir, Texas, June 2003 through May 2004, all anglers combined. N is the number of harvested white bass observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents length limit at time of creel survey.

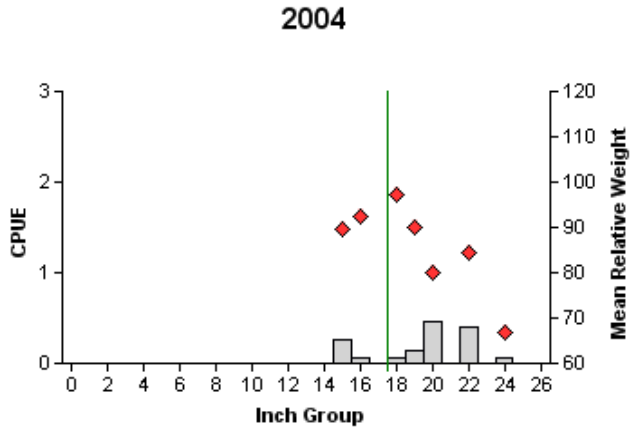
Palmetto Bass



Effort = 15.0
Total CPUE = 9.2 (38; 138)
PSD = 77.0 (0.06)



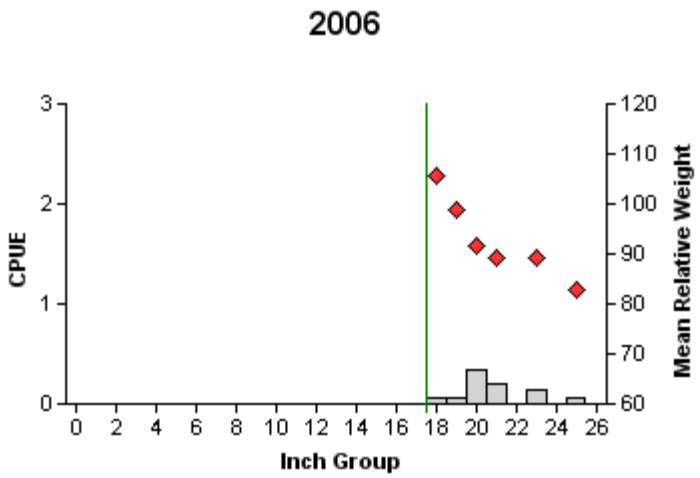
Effort = 15.0
Total CPUE = 2.0 (48; 30)
PSD = 100.0 (0.00)



Effort = 15.0
Total CPUE = 1.5 (40; 22)
PSD = 100.0 (0)

Figure 8. Number of palmetto bass 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, Bridgeport Reservoir, Texas, 1997, 2002, and 2004. Vertical lines represent length limit at time of collection.

Palmetto Bass



Effort = 15.0
Total CPUE = 0.9 (62; 13)
PSD = 100.0 (0)

Figure 8 continued. Number of palmetto bass 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, Bridgeport Reservoir, Texas, 2006. Vertical line represents length limit at time of collection.

Table 9. Creel survey statistics for palmetto bass at Bridgeport Reservoir from June 2003 through May 2004, where total catch per hour is for anglers targeting palmetto bass and total harvest is the estimated number of palmetto bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

	Year
Creel Survey Statistic	2003/2004
Directed effort (h)	23,620.00 (16)
Directed effort/acre	1.98 (16)
Total catch per hour	0.27 (45)
Total harvest	4,312.00 (32)
Harvest/acre	0.36 (32)
Percent legal released	19.00

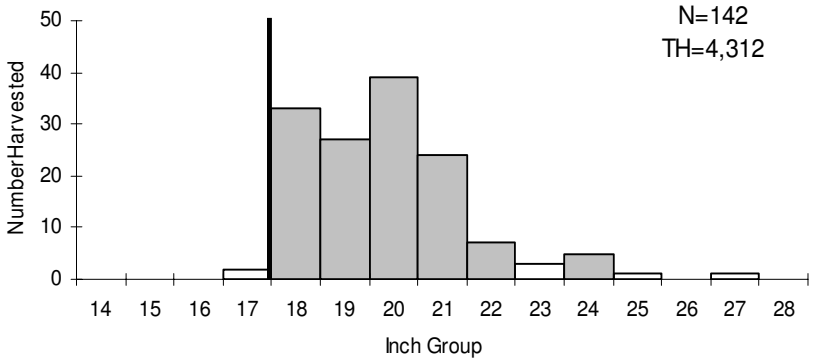
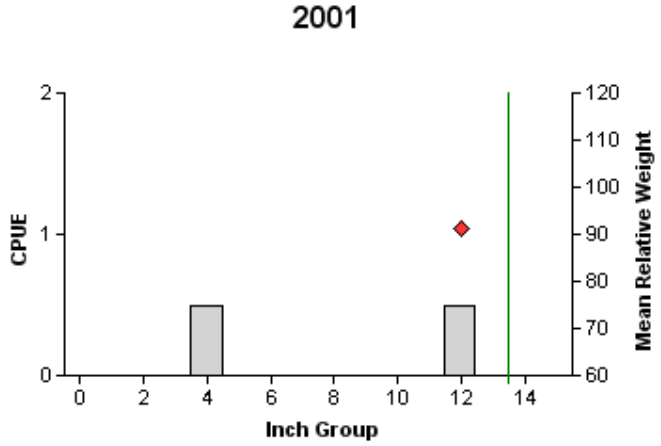
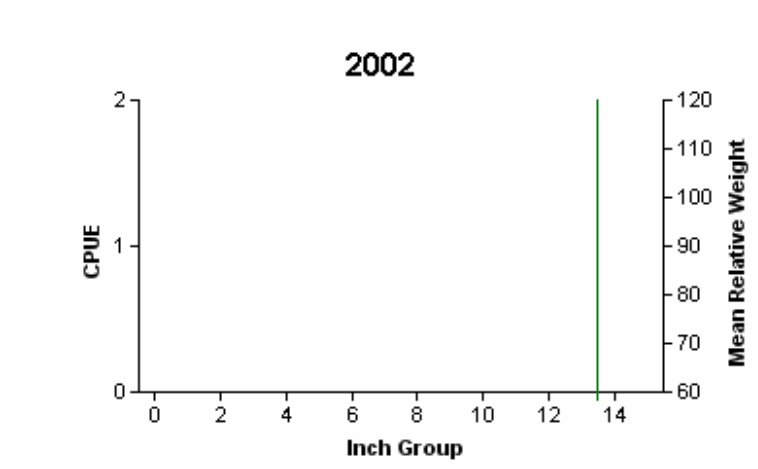


Figure 9. Length frequency of harvested palmetto bass observed during creel surveys at Bridgeport Reservoir, Texas, June 2003 through May 2004, all anglers combined. N is the number of harvested palmetto bass observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents length limit at time of creel survey.

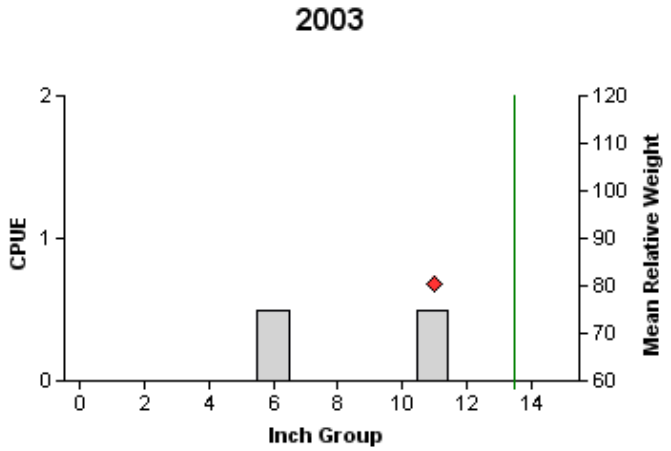
Smallmouth Bass



Effort = 2.0
Total CPUE = 1.0 (69; 2)
Stock CPUE = 0.5 (100; 1)
PSD = 100.0 (0)



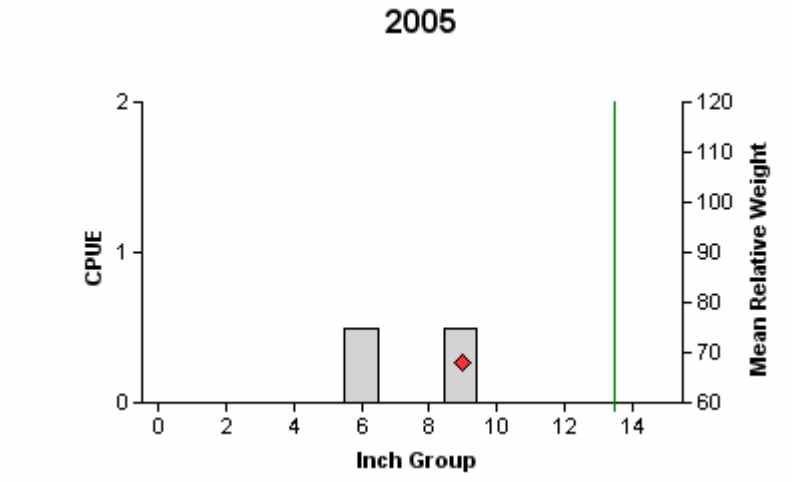
Effort = 2.0
Total CPUE = 0
Stock CPUE = 0
PSD = 0



Effort = 2.0
Total CPUE = 1.0 (69; 2)
Stock CPUE = 0.5 (100; 1)
PSD = 100.0 (0.00)

Figure 10. Number of smallmouth 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, Bridgeport Reservoir, Texas, 2001, 2002, and 2003. Vertical lines represent length limit at time of collection.

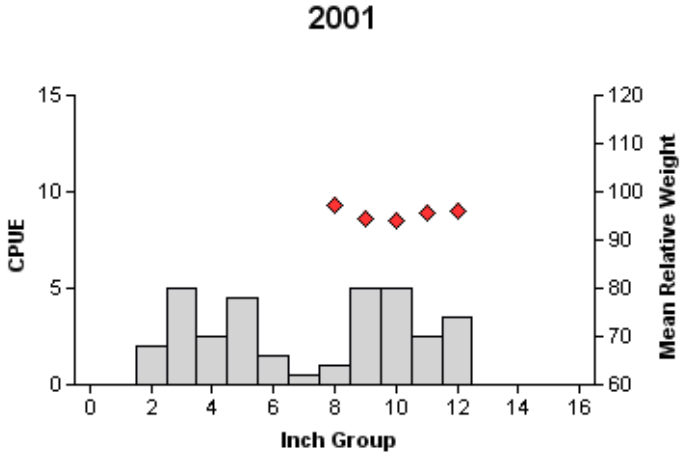
Smallmouth Bass



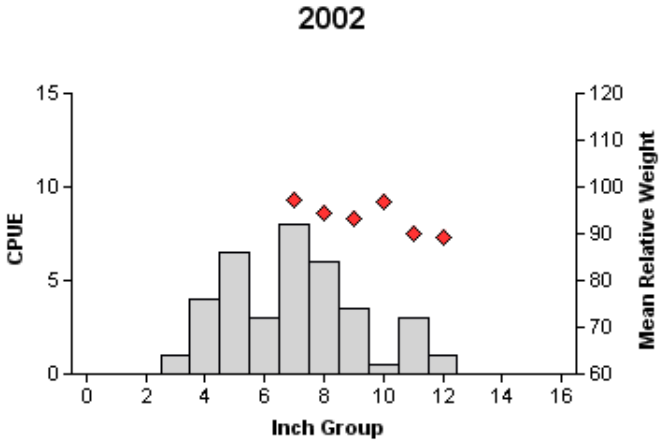
Effort =	2.0
Total CPUE =	1.0 (100; 2)
Stock CPUE =	0.5 (100; 1)
PSD =	0.0 (2.04)

Figure 10 continued. Number of smallmouth 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, Bridgeport Reservoir, Texas, 2005. Vertical line represents length limit at time of collection.

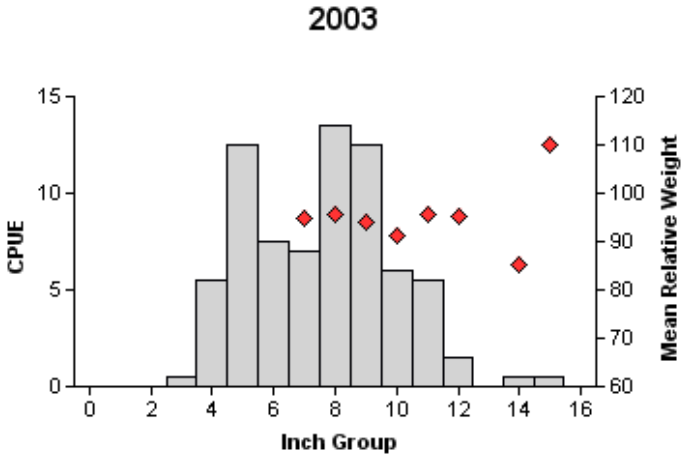
Spotted Bass



Effort = 2.0
Total CPUE = 33.0 (13; 66)
Stock CPUE = 17.5 (16; 35)
PSD = 34.0 (0.07)



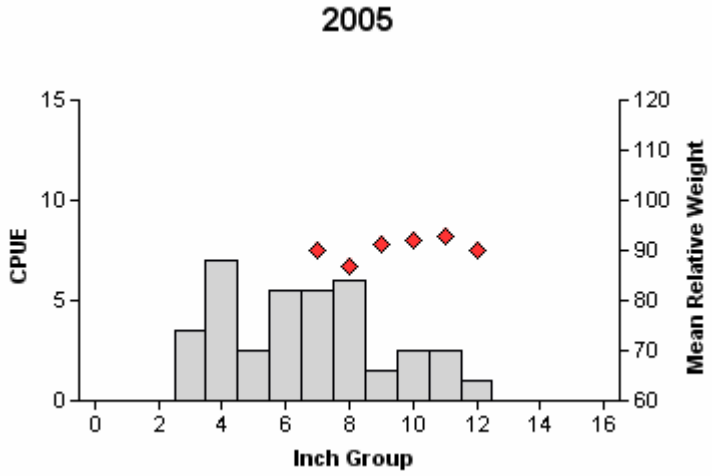
Effort = 2.0
Total CPUE = 36.5 (15; 73)
Stock CPUE = 22.0 (22; 44)
PSD = 18.0 (0.05)



Effort = 2.0
Total CPUE = 73.0 (17; 146)
Stock CPUE = 47.0 (17; 94)
PSD = 17.0 (0.06)

Figure 11. Number of spotted 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, Bridgeport Reservoir, Texas, 2001, 2002, and 2003.

Spotted Bass



Effort = 2.0
Total CPUE = 37.5 (19; 75)
Stock CPUE = 19.0 (20; 38)
PSD = 18.0 (0.06)

Figure 11 continued. Number of spotted 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, Bridgeport Reservoir, Texas, 2005.

Table 10. Creel survey statistics for black basses and spotted bass at Bridgeport Reservoir from June 2003 to May 2004, where total catch per hour is for anglers targeting black bass and total harvest is the estimated number of spotted bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

	Year
Creel Survey Statistic	2003/2004
Directed effort (h) for black bass	3,3814.00 (14)
Directed effort/acre for black bass	2.83 (14)
Total catch per hour for black bass	0.76 (20)
Total harvest of spotted bass	2,094.00 (48)
Harvest/acre of spotted bass	0.18 (48)
% legal released for spotted bass	75.00

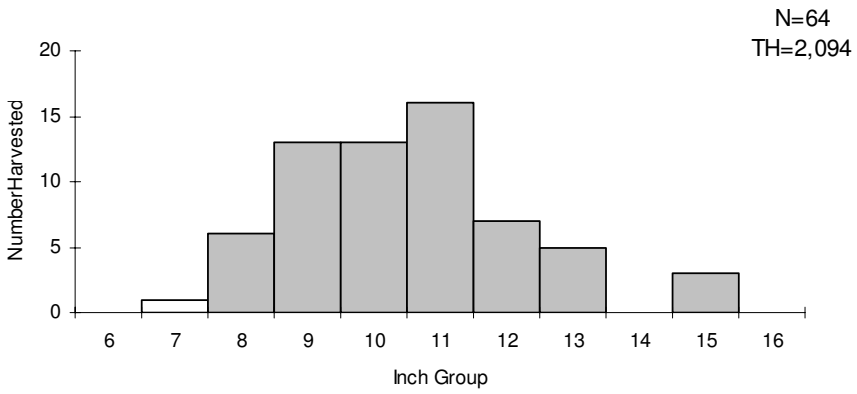
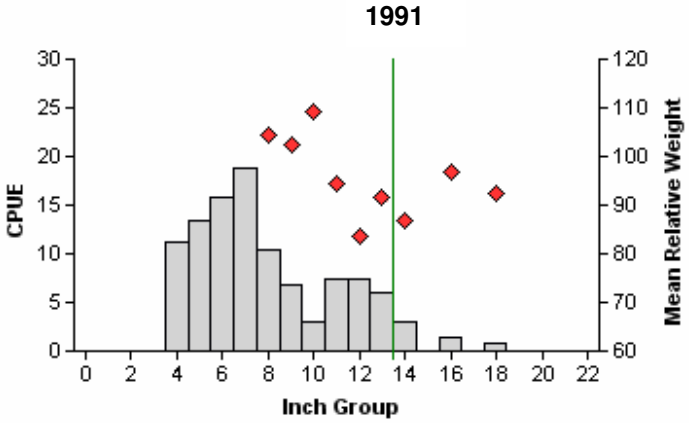
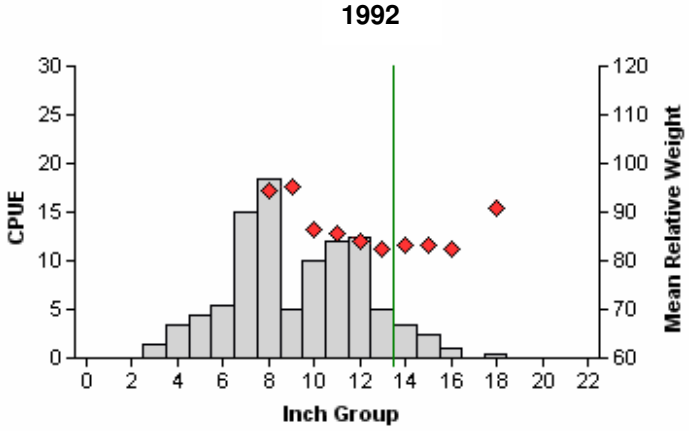


Figure 12. Length frequency of harvested spotted bass observed during creel surveys at Bridgeport Reservoir, Texas, June 2003 through May 2004, all anglers combined. N is the number of harvested spotted bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

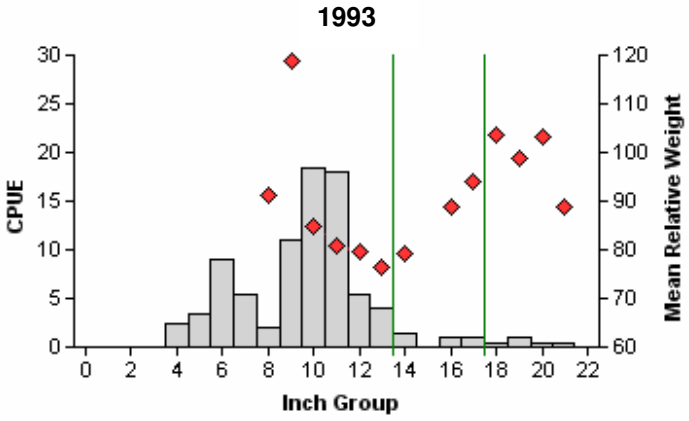
Largemouth Bass



Effort =	1.3
Total CPUE =	105.8 (13;141)
Stock CPUE =	46.5 (12;62)
PSD =	40.3 (0.14)
RSD_{14-18}=	11.3 (0.03)



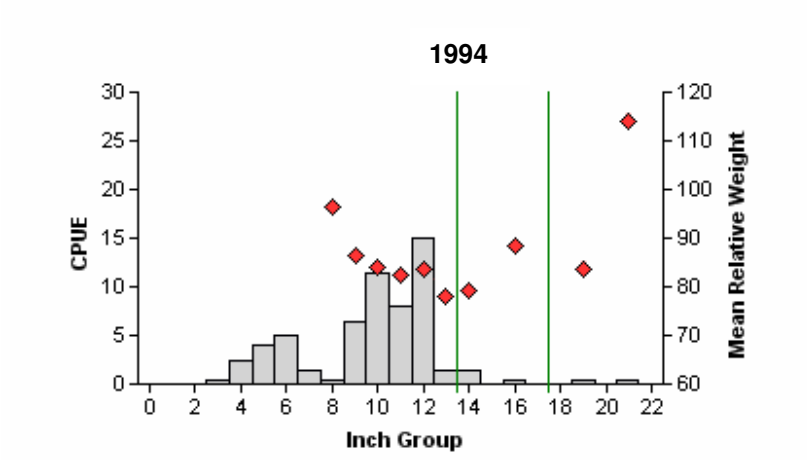
Effort =	2.0
Total CPUE =	102.0 (20;204)
Stock CPUE =	70.5 (21; 141)
PSD =	35.0 (0.12)
RSD_{14-18}=	9.8 (0.02)



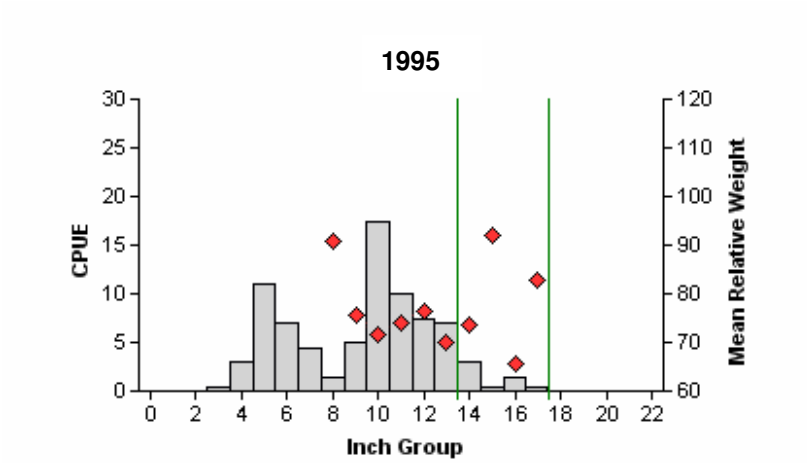
Effort =	2.0
Total CPUE =	85.5 (11;171)
Stock CPUE =	65.0 (15; 130)
PSD =	23.8 (0.08)
RSD_{14-18}=	5.4 (0.02)

Figure 13. 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, Bridgeport Reservoir, Texas, 1991, 1992, and 1993. Vertical lines represent length limit at time of collection

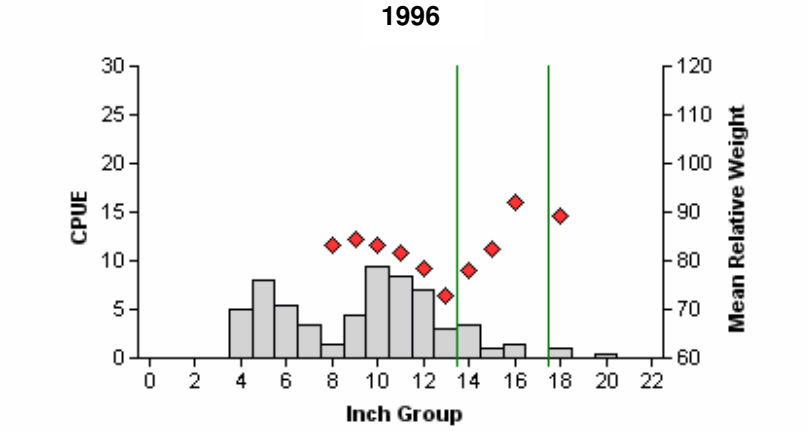
Largemouth Bass



Effort =	2.0
Total CPUE =	59.5 (15; 119)
Stock CPUE =	46.0 (14; 23)
PSD =	42.4 (0.16)
RSD_{14-18}=	4.3 (0.02)



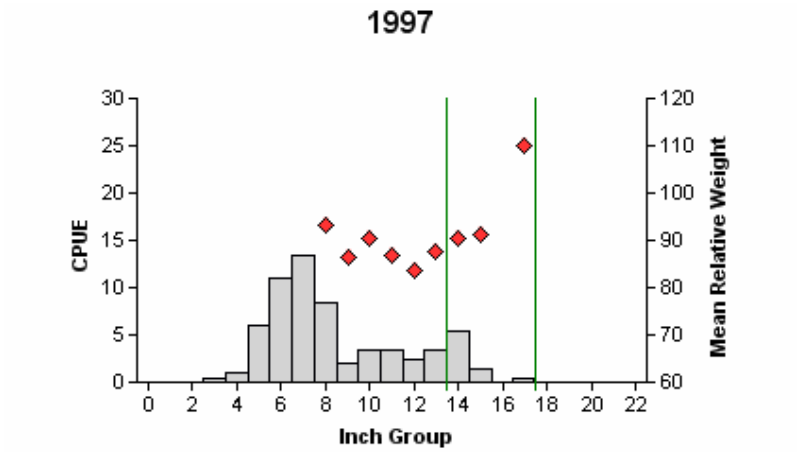
Effort =	2.0
Total CPUE =	72.0 (18; 144)
Stock CPUE =	46.5 (21; 93)
PSD =	39.1 (0.13)
RSD_{14-18}=	10.9 (0.02)



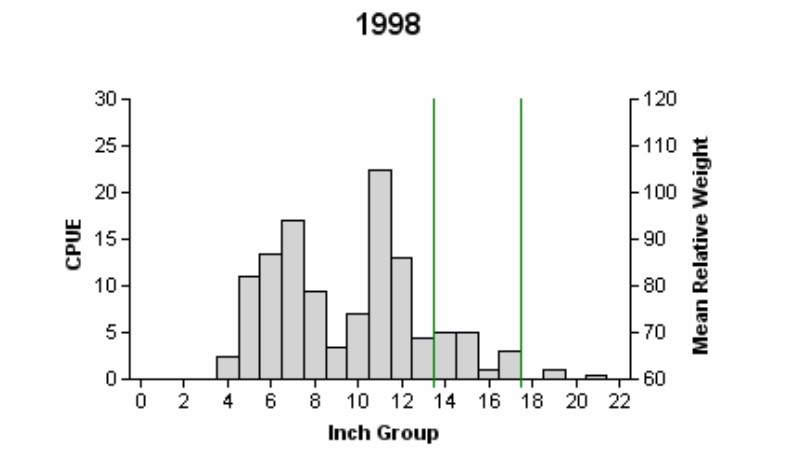
Effort =	2.0
Total CPUE =	63.5 (12; 127)
Stock CPUE =	41.5 (17; 83)
PSD =	42.2 (0.12)
RSD_{14-18}=	14.6 (0.05)

Figure 13 continued. 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, Bridgeport Reservoir, Texas, 1994, 1995, and 1996. Vertical lines represent slot length limit at time of collection.

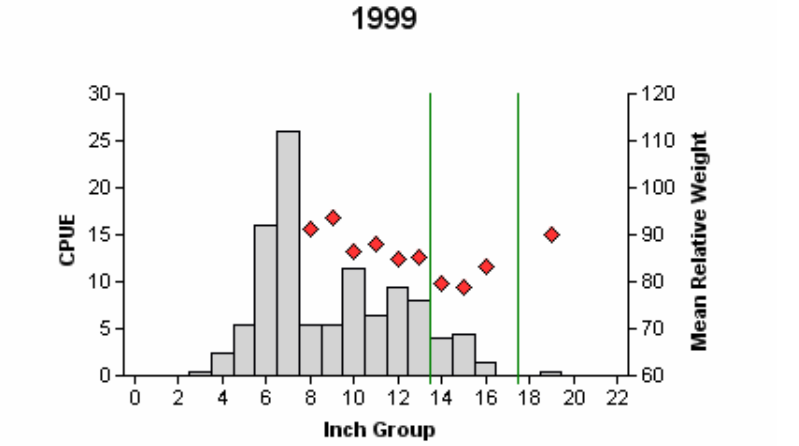
Largemouth Bass



Effort =	2.0
Total CPUE =	63.0 (15; 126)
Stock CPUE =	31.0 (19; 62)
PSD =	44.0 (0.05)
$RSD_{14\text{-}18}$=	24.2 (0.05)



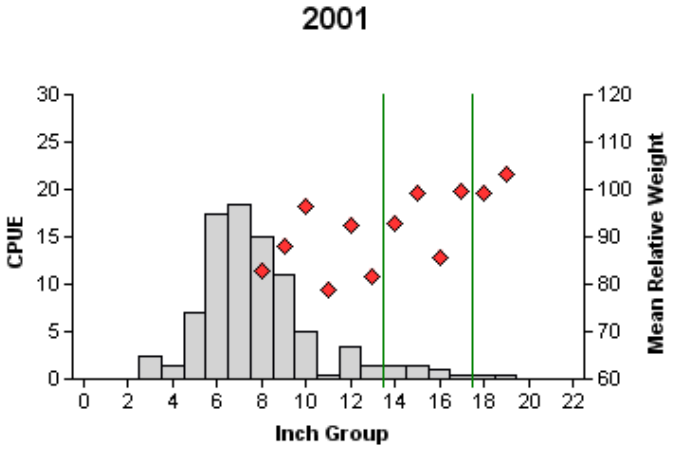
Effort =	2.0
Total CPUE =	119.5 (18; 239)
Stock CPUE =	75.5 (17; 151)
PSD =	44.0 (0.04)
$RSD_{14\text{-}18}$=	17.0 (0.04)



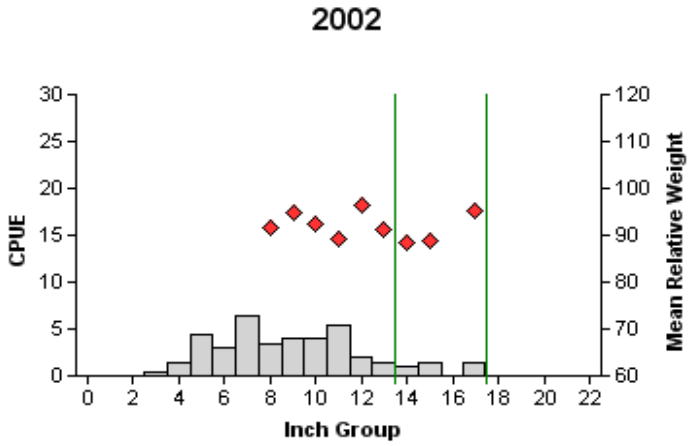
Effort =	2.0
Total CPUE =	107.5 (18; 215)
Stock CPUE =	57.0 (14; 114)
PSD =	49.0 (0.08)
$RSD_{14\text{-}18}$=	17.5 (0.03)

Figure 13 continued. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), except for 1998, and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Bridgeport Reservoir, Texas, 1997, 1998, and 1999. Vertical lines represent slot length limit at time of collection.

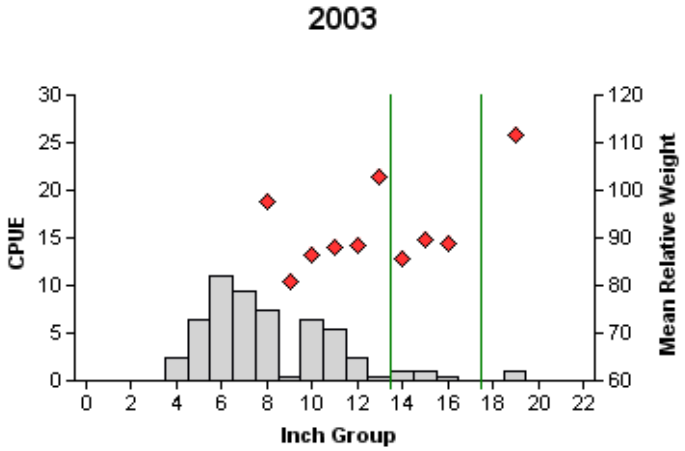
Largemouth Bass



Effort =	2.0
Total CPUE =	89.0 (18; 178)
Stock CPUE =	42.0 (23; 84)
PSD =	25.0 (0.04)
RSD_{14-18}=	11.5 (0.03)



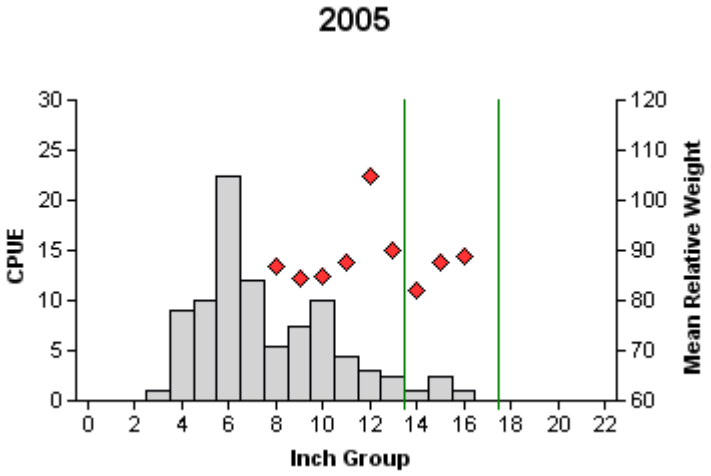
Effort =	2.0
Total CPUE =	40.5 (20; 81)
Stock CPUE =	24.5 (23; 49)
PSD =	31.0 (0.07)
RSD_{14-18}=	16.3 (0.05)



Effort =	2.0
Total CPUE =	56.0 (23; 112)
Stock CPUE =	26.5 (38; 53)
PSD =	25.0 (0.06)
RSD_{14-18}=	9.4 (0.04)

Figure 13 continued. 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, Bridgeport Reservoir, Texas, 2001, 2002, and 2003. Vertical lines represent slot length limit at time of collection.

Largemouth Bass



Effort =	2.0
Total CPUE =	92.0 (13; 184)
Stock CPUE =	37.5 (18; 75)
PSD =	27.0 (0.06)
RSD_{14-18}=	13.3 (0.04)

Figure 13 continued. 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, Bridgeport Reservoir, Texas, 2005. Vertical lines represent slot length limit at time of collection.

Table 11. Results of genetic analysis of largemouth bass collected by fall electrofishing, Bridgeport Reservoir, Texas, 1995, 1998, 1999, 2001, 2003, and 2005. 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.

		Genotype					
Year	Sample size	FLMB	F1	Fx	NLMB	% FLMB alleles	% pure FLMB
1995	35	1	8	5	21	19.3	2.9
1998	40	0	14	13	13	30.0	0.0
1999	40	3	3	22	12	38.8	7.5
2001	30	0	7	11	12	22.5	0.0
2003	30	1	6	15	8	35.0	3.3
2005	30	0	1	19	10	15.5	0.0

Table 12. Creel survey statistics for black basses and largemouth bass at Bridgeport Reservoir from June 2003 to May 2004, where total catch per hour is for anglers targeting black bass and total harvest is the estimated number of largemouth bass harvested by all anglers. Relative standard errors (RSE) are in parentheses.

	Year
Creel Survey Statistic	2003/2004
Directed effort (h) for black bass	3,3814.00 (14)
Directed effort/acre for black bass	2.83 (14)
Total catch per hour for black bass	0.76 (20)
Total harvest of largemouth bass	4,547.00 (30)
Harvest/acre of largemouth bass	0.18 (48)
% legal released for largemouth bass	77.00

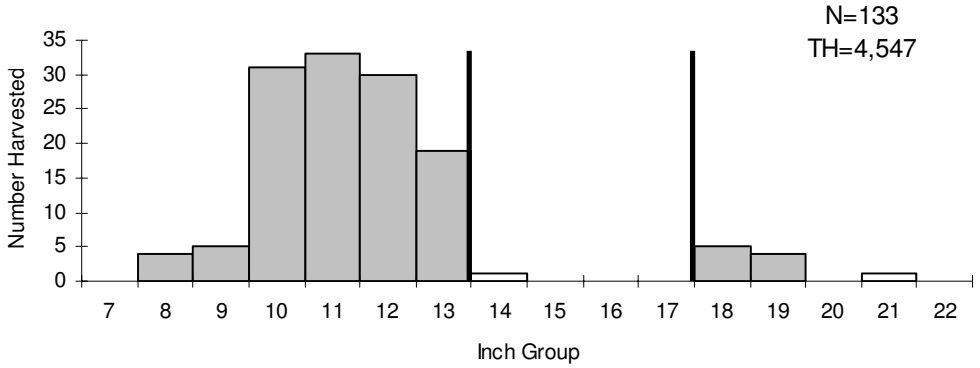


Figure 14. Length frequency of harvested largemouth bass observed during creel surveys at Bridgeport Reservoir, Texas, June 2003 through May 2004, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical lines represent slot length limit at time of creel survey.

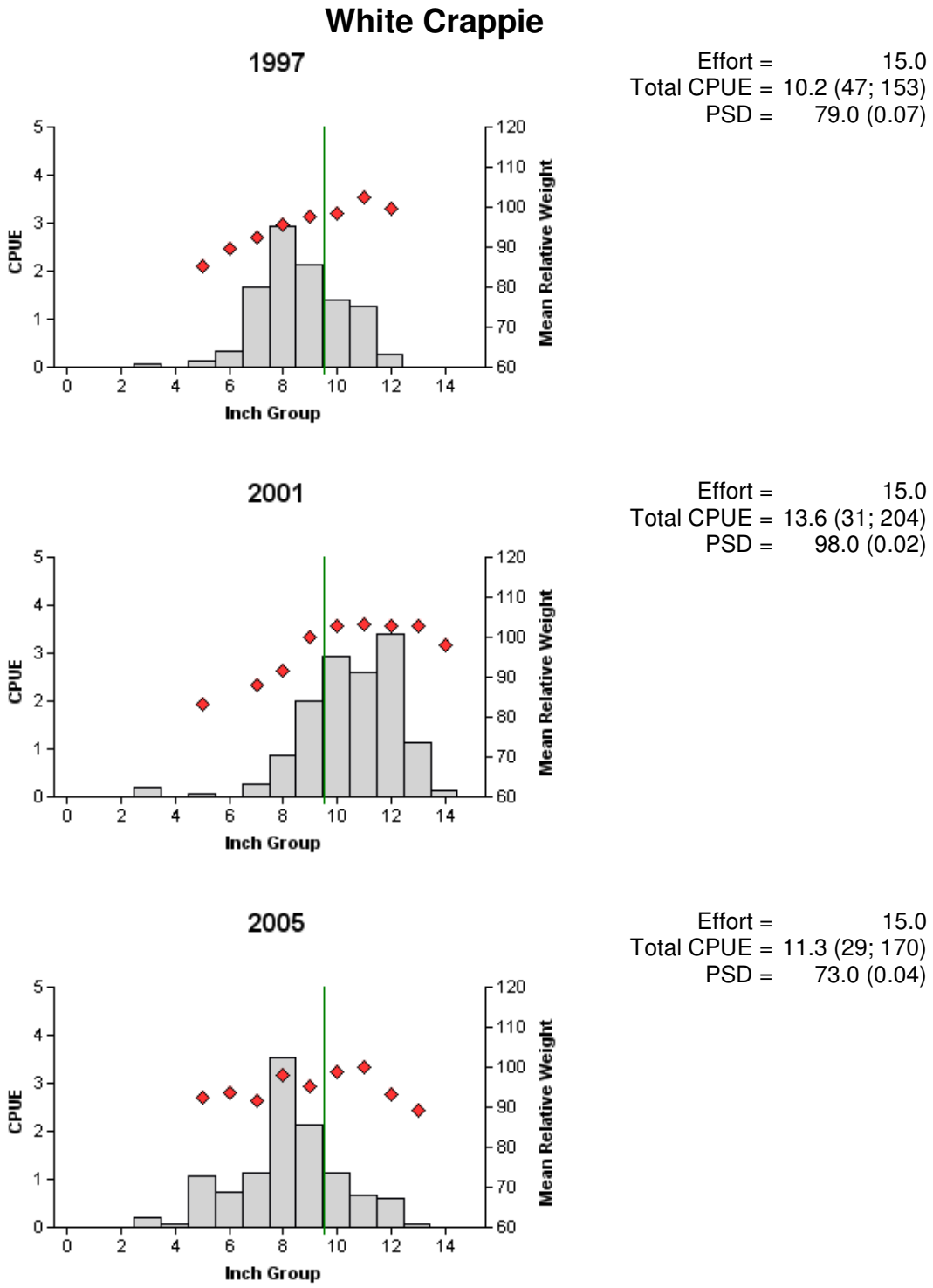


Figure 15. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap netting surveys, Bridgeport Reservoir, Texas, 1997, 2001, and 2005. Vertical lines represent length limit at time of collection.

Table 13. Creel survey statistics for white crappie at Bridgeport Reservoir from June 2003 to May 2004, where total catch per hour is for anglers targeting crappie and total harvest is the estimated number of white crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses.

	Year
Creel Survey Statistic	2003/2004
Directed effort (h)	16,878.00 (21)
Directed effort/acre	1.41 (21)
Total catch per hour	3.72 (46)
Total harvest	25,057.00 (38)
Harvest/acre	2.10 (38)
Percent legal released	5.00

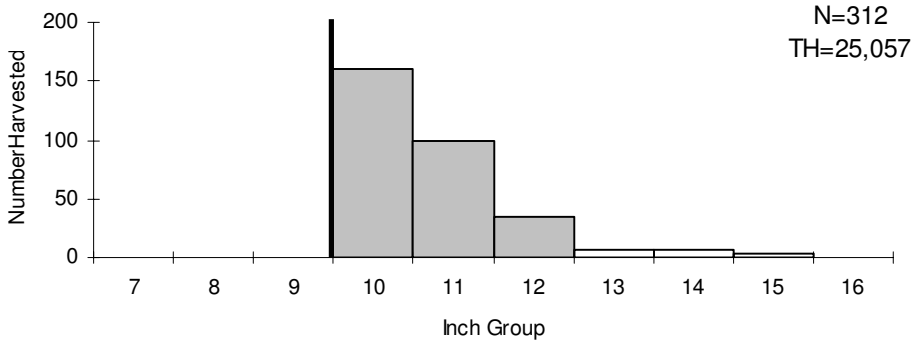


Figure 16. Length frequency of harvested white crappie observed during creel surveys at Bridgeport Reservoir, Texas, June 2003 through May 2004, all anglers combined. N is the number of harvested white crappie observed during creel surveys, and TH is the total estimated harvest for the creel period. Vertical line represents length limit at time of creel survey.

Table 14. Proposed sampling schedule for Bridgeport 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	Electrofisher	Trap Net	Gill Net	Creel Survey	Report
Fall 2006-Spring 2007	A				
Fall 2007-Spring 2008			A		
Fall 2008-Spring 2009	A				
Fall 2009-Spring 2010	S	S	S		S

APPENDIX A

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

	Gill Netting		Trap Netting		Electrofishing	
Species	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					43	21.5
Threadfin shad					177	88.5
Channel catfish	49	3.3				
Flathead catfish	5	0.3				
White bass	32	2.1				
Palmetto bass	13	0.9				
Green sunfish					122	61.0
Warmouth					18	9.0
Bluegill					455	227.5
Longear sunfish					520	260.0
Redear sunfish					66	33.0
Smallmouth bass					2	1.0
Spotted bass					75	37.5
Largemouth bass					184	92.0
White crappie	6	0.4	170	11.3		
Black crappie			1	0.1		

APPENDIX B

Location of sampling sites, Bridgeport Reservoir, Texas, 2005-2006. Trap netting, gill netting, electrofishing, and water sampling stations are indicated by T, G, E, and W, respectively. Water level was 10 feet below conservation for trap netting and electrofishing and 11 feet below during gill netting.

APPENDIX C

Water sample parameters for Lake Bridgeport, Texas, July 14, 2005. Sample station located at dam site.

Depth (m)	Temp (C°)	D.O. (ppm)	Chlorides (ppm)	Conductivity (mhos/cm)	Alkalinity (ppm)	Total dissolved solids (ppm)	pH
Surface	30.7	7.8	19	308	88	200	8.2
1.0	30.0	7.9					
2.0	29.2	8.3					
3.0	29.0	8.3					
4.0	28.8	8.1					
5.0	28.7	8.1					
6.0	28.5	7.8	18	305	93	198	8.3
7.0	27.3	6.2					
8.0	26.9	4.9					
9.0	25.1	0.2	18	320	97	208	7.6
10.0	24.2	0.0					
11.0	23.1	0.0					
12.0	21.8	0.0					
13.0	21.5	0.0					
14.0	21.1	0.0					
15.0	20.7	0.0					
16.0	20.5	0.0					
17.0	20.5	0.0					
18.0	20.8	0.0	18	326	108	212	7.7

APPENDIX D

Water sample parameters for Bridgeport Reservoir, Texas, July 14, 2005. Sample station located at Captain Kidd point.

Depth (m)	Temp (C°)	D.O. (ppm)	Chlorides (ppm)	Conductivity (mhos/cm)	Alkalinity (ppm)	Total dissolved solids (ppm)	pH
Surface	30.3	7.8	19	298	87	194	8.4
1.0	30.1	8.0					
2.0	29.9	7.9					
3.0	29.7	7.6					
4.0	29.5	7.6	18	301	85	196	8.3
5.0	28.7	3.3					
6.0	27.9	2.6	20	308	93	200	8.2
7.0	27.5	4.3					
8.0	27.3	3.0					
9.0	27.0	2.5					
10.0	25.9	0.0					
11.0	23.8	0.0	20	336	102	218	7.5

APPENDIX E

Historical catch rates of targeted species by gear type for Bridgeport Reservoir, Texas, 1991-1998.

		Year							
Gear		1991[a]	1992[a, b]	1993[a, b]	1994[a]	1995[a, b]	1996[a, b]	1997[c]	1998[b, c]
Gill Netting	Channel catfish	3.7			5.3			1.9	
	Flathead catfish				0.1				
	White bass	15.5			9.5			4.3	
	Palmetto bass				0.1			9.2	
Electrofishing	Gizzard shad	227.1			99.0			49.0	
	Threadfin shad	94.7			7.5			4.5	
	Green sunfish	13.5			97.0			37.0	
	Warmouth	15.8			4.5			5.5	
	Orangespotted sunfish	3.8							
	Bluegill	116.5			77.0			42.0	
	Longear sunfish	164.7			63.5			44.0	
	Redear sunfish	5.3			12.0			10.5	
	Smallmouth bass	0.8			1.0		1.0	2.0	6.5
	Spotted bass	63.9	50.0	52.5	66.0	61.5	93.0	55.5	76.0
	Largemouth bass	106.0	102.0	85.5	59.5	72.0	63.5	63.0	119.5
Trap Netting	White crappie	12.6			4.7			10.2	

[a] All sampling stations for all gear were subjectively selected.
[b] Black bass sampled only.
[c] All sampling stations for all gear were randomly selected.

Appendix E, continued. Historical catch rates of targeted species by gear type for Bridgeport Reservoir, Texas, 1999 and 2001 - 2006.

		Year						
Gear		1999[b, c]	2001[c]	2002[c]	2003[c, d, e]	2004[c]	2005[f]	2006[c]
Gill Netting	Channel catfish			2.5		1.8		3.3
	Flathead catfish			0.2		0.1		0.3
	White bass			2.7		4.3		2.1
	Palmetto bass			2.0		1.5		0.9
Electrofishing	Gizzard shad		69.0		25.0		21.5	
	Threadfin shad		43.5		22.0		88.5	
	Green sunfish		23.0				61.0	
	Warmouth		2.0				9.0	
	Orangespotted sunfish							
	Bluegill		109.0				227.5	
	Longear sunfish		138.5				260.0	
	Redear sunfish		10.5				33.0	
	Smallmouth bass	6.0	1.0		1.1/1.0		1.0	
	Spotted bass	79.0	33.0	36.5	27.4/73.0		37.5	
	Largemouth bass	107.5	89.0	40.5	44.0/56.0		92.0	
Trap Netting	White crappie		13.6				11.3	

[a] All sampling stations for all gear were subjectively selected.
[b] Black bass sampled only.
[c] All sampling stations for all gear were randomly selected.
[d] Bass only electrofishing survey in the spring of 2003.
[e] Bass and shad only electrofishing survey in the fall of 2003.
[f] Electrofishing and gill netting stations were randomly selected, while trap netting stations were subjectively selected.