PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-35

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2009 Survey Report

Bridgeport Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Bridgeport Reservoir were surveyed in 2009 using an electrofisher and trap nets and in 2010 using gill nets. Habitat was surveyed in 2009. 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) 42 of the past 48 months or since May 2006, therefore, at or above conservation elevation for only 6 months. 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 fisheries management plan prepared in 2006 included resuming stocking palmetto bass at 5/acre in 2007 and 2009. Monitoring the population with gill nets in 2008. Since gizzard shad appeared directly impacted by palmetto bass stocking, both gizzard and threadfin shad populations were to be monitored by electrofishing in 2006 and 2008. Florida largemouth bass (FLMB) alleles were below 20% indicating a need to restock. FLMB fingerlings were stocked last stocked in 2007 and 2008. In 1993, a 14- to 18-inch slot length limit for largemouth bass was implemented. Smallmouth bass were stocked annually from 1982 through 1985. Since then, the population has been maintained by natural reproduction. 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 has begun to rebound following a decline thought related to palmetto bass stocking. Half the gizzard shad were available as prey to most sportfishes. Electrofishing catch of desirable prey-size bluegills was high.
  - **Catfishes:** No gill net sampling due to reservoir closing because of high water. Gill get catch was high for channel catfish in 2008, but sample sites were subjectively selected. A make-up random site sampling will be conducted in 2011.
  - **Temperate basses:** No gill net sampling was cancelled due to reservoir closing because of high water. Gill net catch was high for white bass and palmetto bass, but sample sites were subjectively selected. A gill netting survey will be conducted in 2011.
  - **Black basses:** Largemouth bass were the most abundant, followed by spotted bass and smallmouth bass. Abundance and size structure of smallmouth bass continues to increase and improve. Abundance of spotted bass has significantly increased while largemouth bass abundance remains below previous numbers. All black basses demonstrated adequate growth rates and good condition.
    White crappie: Abundance of white crappie was low, but condition continued to be good.

- **Management strategies:** Conduct standard gill netting in 2011. Continue stocking palmetto bass at 5/acre in 2011 and 2013. Monitor the population during the standard gill net survey in 2011 and 2014. Monitor gizzard and threadfin shad populations during the standard electrofishing survey in 2013. Monitor smallmouth bass in the early spring of 2011 when water temperature is around 60° F. Inform the Tarrant County Regional Water District about new exotic species threats to Texas waters, and work with them authorities to display appropriate signage, educate constituents, and understand appropriate enforcement actions.

INTRODUCTION

This document is a summary of fisheries data collected from Bridgeport Reservoir in 2009-2010. 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 2009-2010 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 (Texas Commission on Environmental Quality 2007). Habitat at time of sampling consisted of rocks and boulders. There were small isolated patches of native submerged and emergent 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 marina bay in December, 1994, and has spread very little. Water level has been low and unstable for most of the time since May 2006 (Figure 1). At its lowest point, the reservoir was approximately 18 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 2006) included:

1. Recommended cautious resumption of palmetto bass stocking at 5/accre in 2007 and 2009.
   Action: Stocked palmetto bass at 5/acre in 2007 and 2009. The palmetto bass population was assessed with gill nets survey in 2008.
2. Recommended monitoring gizzard shad population in conjunction with the resumption of palmetto bass stocking.
   Action: Monitored gizzard and threadfin shad populations with an electrofishing survey in 2006 and 2008.
3. Recommended stocking Florida largemouth bass fingerlings at 10/acre in 2007 and 2008.
   Action: Stocked Florida largemouth bass fingerlings at 10/acre in 2007 and 2008.

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 2007 and 2009 (palmetto bass; 5/acre). The complete stocking history is in Table 3.

Vegetation/habitat history: Bridgeport Reservoir supported very limited aquatic vegetation (Table 4). Prevalent habitat consisted of rocky shoreline and standing timber and stumps. Rocky shoreline habitat was augmented by boulders found at infrequent intervals around the reservoir. Almost 99% of this reservoir is pelagic habitat. Hydrilla, an invasive species, was first documented in and around the marina bay in December 1994. It has not spread since its discovery.

Water Transfer: Bridgeport Reservoir is primarily used for municipal and industrial water supply and recreation. There are currently 11 permitted diversions from the reservoir: 5 municipal (City of Decatur, City of Bridgeport, City of Runaway Bay, Walnut Creek SUD, and West Wise SUD), 3 industrial (Hanson, Martin Marietta, and TXI), one golf course (Runaway Bay Golf Course), and 2 power companies (Brazos Power and Wise County Power). Other than downstream releases to Eagle Mountain Reservoir, no water is transferred to another public water reservoir basin.

METHODS

Fishes were collected by electrofishing (2 hours at 24 5-min 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 trap netting were randomly selected. All surveys were conducted 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_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and for creel statistics and SE was calculated for structural indices and IOV. Ages for largemouth bass and white crappie were determined using Category 1 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). In 2009 yellow floating heart was discovered in the reservoir at the confluence of Big Creek.

Prey species: Electrofishing CPUE of gizzard shad and bluegill were 39.5/h and 118.5/h, respectively. The IOV for gizzard shad was fair, with only 54 % vulnerable to predation. The IOV for gizzard shad has maintained an annual average of 53 % since 2003 (Figure 2). Well within the acceptable range (26 % to 70 %) reported by DiCenzo el al. (1996). DiCenzo et al. (1996) concluded the variance in IOV values among reservoirs was related to the trophic index of the water body. Threadfin shad established following their introduction in 1984 and 1985, and their CPUE has fluctuated over the years with the 2009 CPUE (456.0/h) being the highest on record (Appendix E). Although the electrofishing CPUE for bluegill was only about one-half of the CPUE in 2005 (Figure 3), it was the second highest CPUE of record (Appendix E). Based on size, most of the bluegill were vulnerable to predation.

Channel catfish: High water closure of the reservoir by controlling authority precluded gill net sampling. Supplemental gill net sampling will be conducted in the spring of 2011.

Temperate basses: High water closure of the reservoir by controlling authority precluded gill net sampling. Gill net sampling will be conducted in the spring of 2011. In accordance with a Fisheries

Management Plan (Hysmith and Moczygemba 2006), a supplemental gill net survey was conducted in the spring of 2008 using a subjective sampling design. The CPUE of white bass was 15.3/nn which was second only to 15.5/nn collected in 1991 (Figure 4 and Appendix E). Relative weight was fair, but consistent with previous catches (Hysmith and Moczygemba 2006). The gill net CPUE of palmetto bass was 19.6/nn (Figure 5), historically, the highest gill net CPUE on record (Appendix E). Relative weight of palmetto bass was fair and consistent with previous catches (Hysmith and Moczygemba 2006).

Black basses: The electrofishing total CPUE of smallmouth bass was 4.0/h and has steadily increased since 2005 (Figure 6). 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. Spring electrofishing when water temperature is around 60º F has been suggested to be more effective in collecting smallmouth bass.

The electrofishing total CPUE of spotted bass was 46.0/h, the highest CPUE since 2005 (Figure 7). Recruitment of substock spotted bass was consistent with past surveys. Relative weights remain consistent around 90 % (Figure 7).

The electrofishing total CPUE of largemouth bass was 47.0/h (Figure 8), which was down from the historical average total CPUE of 73.12/h (Appendix E). Recruitment of sub-stock fish was good and growth was excellent (Prentice 1987), nearly 14 inches in 2 years (N= 6; 13.22 inches). Relative weights were fair to low. A 14 to 18-inch slot length limit was implemented for largemouth bass in 1993. Over the past 17 years of the slot's existence, the population has shown marginal improvement, but improved it has. While $PSD_{>18}$ has remained fairly constant since implementation of the slot, PSD_{14-18} has shown a slight increase (Figure 9 and Table 5). However the linear regression for PSD_{14-18} ($r^2 = 0.1837$) was not significant at the $P=\leq 0.05$ level (Snedecor and Cochran 1967). As with smallmouth bass, anecdotal information from anglers indicate they are catching more and bigger largemouth bass than before the slot. Positive impact of the slot length limit is predicated on anglers harvesting fish below the slot and a 12-month roving creel survey conducted in 2003-2004 showed most of the harvest occurred in largemouth bass ≤ 13 inches (Hysmith and Moczygemba 2006).

White crappie: The trap net CPUE of white crappie was 4.6/nn (Figure 10), well below 6 survey average (9.5/nn) over the previous 18-year period (Appendix E). Relative weights increased upwards of 100 % (Figure 9). Growth, however, was slow according to Prentice, 1987 (average of 9.69 inches in 2 years; N= 12; range 9 – 10.7 inches). Size structure was not as good as previous years (Figure 10).

Fisheries management plan for Bridgeport Reservoir, Texas

Prepared – July 2010.

ISSUE 1: High water conditions precluded gill netting in 2010; hence, pelagic fishes are not represented in this report.

MANAGEMENT STRATEGY

1. Conduct gill netting in 2011.

ISSUE 2: Palmetto bass population is responding well to the stocking strategy of 5/acre every other year.

MANAGEMENT STRATEGIES

1. Continue stocking palmetto bass at 5/acre in 2011 and 2013.

2. Monitor the population during the standard random gill net survey in 2011 and 2014.

ISSUE 3: Gizzard and threadfin shad populations are responding with some increased CPUE in gizzard shad and a high increase in threadfin shad in conjunction with the new palmetto bass stocking strategy

MANAGEMENT STRATEGY

1. Monitor the shad populations during the standard electrofishing survey in 2013.

ISSUE 4: The smallmouth bass population is self-sustaining and may be improving, but historically, electrofishing has not produced high catch rates. Spring electrofishing, when water temperature is around 60º F, has been suggested to be more effective in collecting smallmouth bass.

MANAGEMENT STRATEGY

2. Monitor smallmouth bass by electrofishing in early spring 2011 when water temperature is around 60º F.

ISSUE 5: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) 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 (*Salvinia molesta*) 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.

MANAGEMENT STRATEGIES

1. Cooperate with the Tarrant Regional Water District to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc… so 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. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule (Table 6) involves gill netting and electrofishing in 2011 and general monitoring surveys in 2013 – 2014 which requires electrofishing, trap netting, and gill netting.

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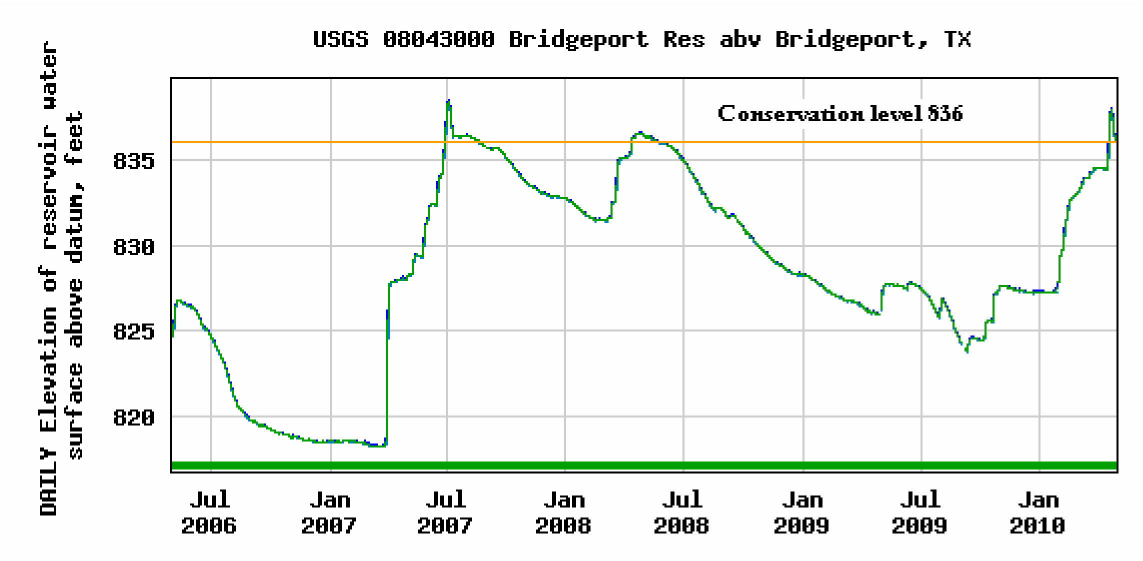


Figure 1. Monthly average water level elevations in feet above mean sea level (msl) recorded for Bridgeport Reservoir, Texas, May 2006-April 2010.

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 (in any combination)	10 minimum

Table 3. Stocking history of Bridgeport, Texas. Life stages are fry (FRY), fingerlings (FGL), advanced fingerlings (AFGL), adults (ADL) and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Channel catfish	1972	52,000	AFGL	7.9
	Total	52,000		
Coppernose bluegill	1983	130,000	UNK	UNK
	Total	130,000		
Florida Largemouth bass	1982	1,439	FGL	3.0
	1985	10,700	FRY	1.0
	1988	10,000	FGL	1.5
	1990	326,430	FRY	0.7
	1997	125,264	FGL	1.1
	2007	299,781	FGL	1.8
	2008	300,049	FGL	1.6
	Total	1,073,663		
Largemouth bass	1970	250,000	UNK	UNK
	Total	250,000		
Mixed largemouth bass	1988	12,750		1.5
	Total	12,750		
Palmetto Bass (striped X white bass hybrid)	1983	130,144	UNK	UNK
	1994	195,693	FGL	1.5
	1995	339,300	FGL	1.3
	1996	100,700	FGL	1.4
	1997	112,206	FGL	1.5
	1998	70,767	FGL	1.3
	1998	61,832	FRY	0.9
	1999	65,004	FGL	1.5
	2002	65,005	FGL	1.5
	2005	71,788	FGL	1.5
	2007	63,879	FGL	1.5
	2009	60,820	FGL	1.4
	Total	1,337,138		
Smallmouth bass	1982	104	UNK	UNK
	1983	130,034	UNK	UNK
	1984	50,826	FGL	2.0
	1985	33,172	FGL	2.0
	Total	214,136		

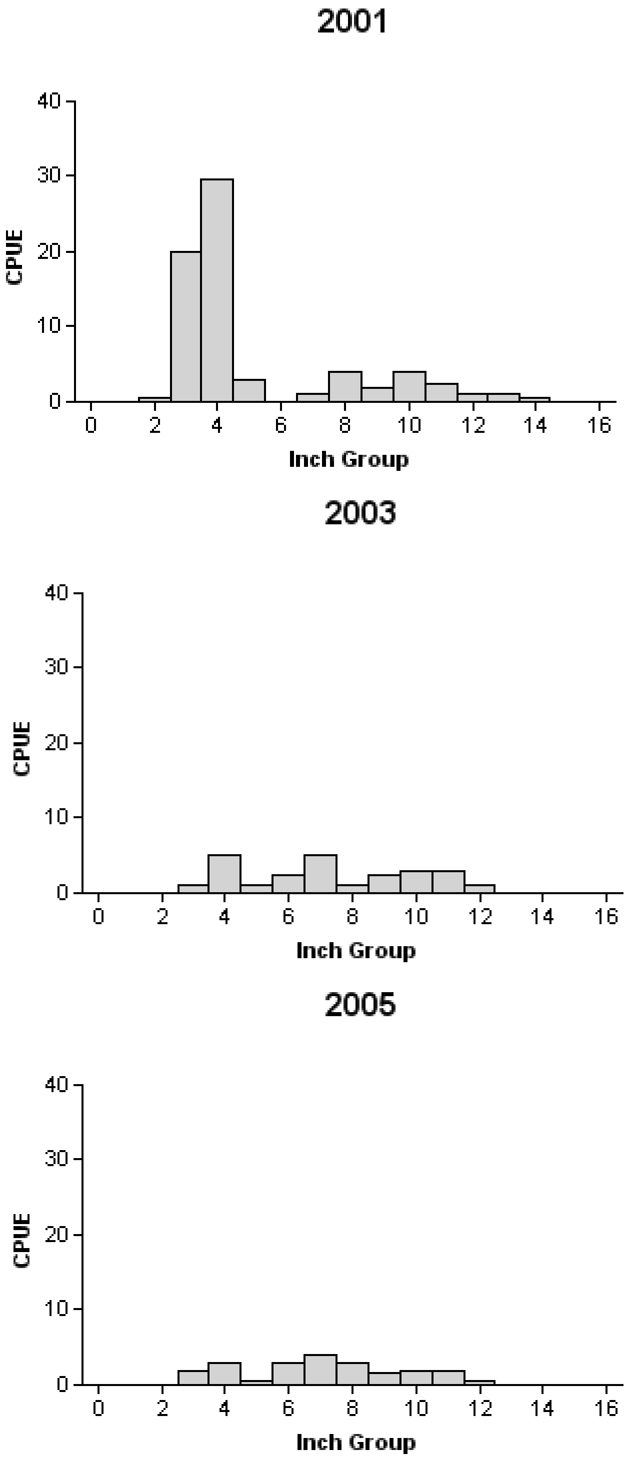
Table 3 continued.

Species	Year	Number	Life Stage	Mean TL (in)
Threadfin shad	1984	4,500	AFGL	2.0
	1985	4,300	ADL	4.0
	Total	8,800		
Walleye	1974	204,000	FGL	1.2
	1975	247,000	FGL	1.2
	1984	4,692,000	FRY	0.2
	1992	7,834,586	FRY	0.2
	Total	12,977,586		

Table 4. Survey of shoreline habitat and littoral and pelagic habitat types, Bridgeport Reservoir, Texas, 2009. A linear shoreline distance (miles) and percent of total was recorded for each shoreline habitat type found. Surface area (acres) and percent of total was determined for each type of littoral and pelagic habitat type found.

	Shoreline distance		Surface area	
	Miles	% of total	Coverage (acres)	% of total
Shoreline habitat type				
Natural shoreline	25.0	15.0		
Rocky shoreline	145.2	85.0		
Littoral and pelagic habitat type				
Standing timber, stumps			115.0	1.0
Native submersed			0.6	<0.1
Open water			11,826.0	98.9
Piers, boat docks, marinas			8.4	<0.1
Hydrilla			2.0	<0.1
Yellow floating heart			2.0	<0.1

Gizzard Shad



2001: Effort = 2.0
Total CPUE = 69.0 (42; 138)
IOV = 78.26 (10.7)

2003: Effort = 2.0
Total CPUE = 25.0 (33; 50)
IOV = 58.0 (11.5)

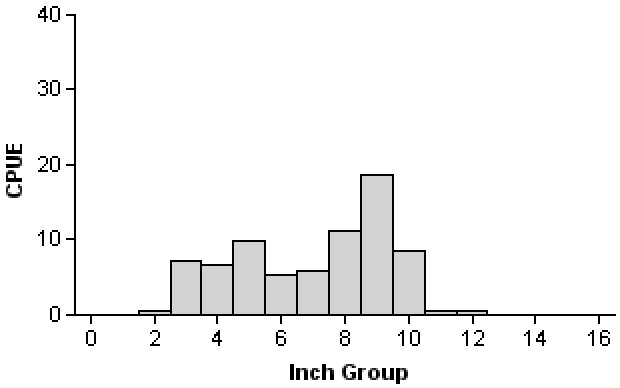
2005: Effort = 2.0
Total CPUE = 21.5 (24; 43)
IOV = 58.14 (11)

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 2001, 2003, and 2005.

Gizzard Shad

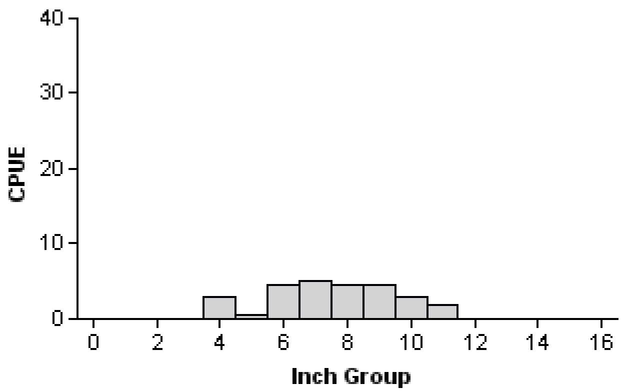
2006

Effort = 1.5
Total CPUE = 76.0 (19; 114)
IOV = 47.37 (9.5)



2008

Effort = 2.0
Total CPUE = 27.0 (21; 54)
IOV = 48.15 (10.8)



2009

Effort = 2.0
Total CPUE = 39.5 (29; 79)
IOV = 54.43 (8.6)

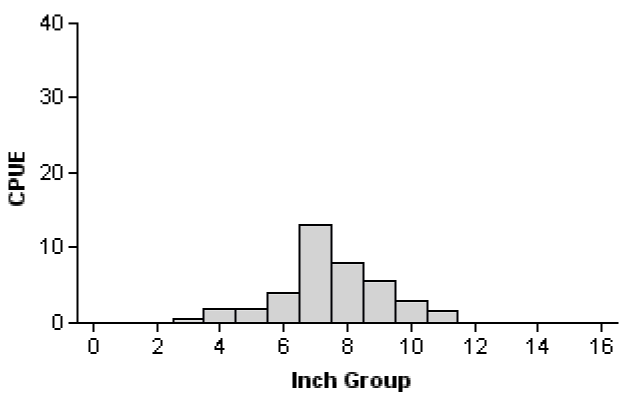
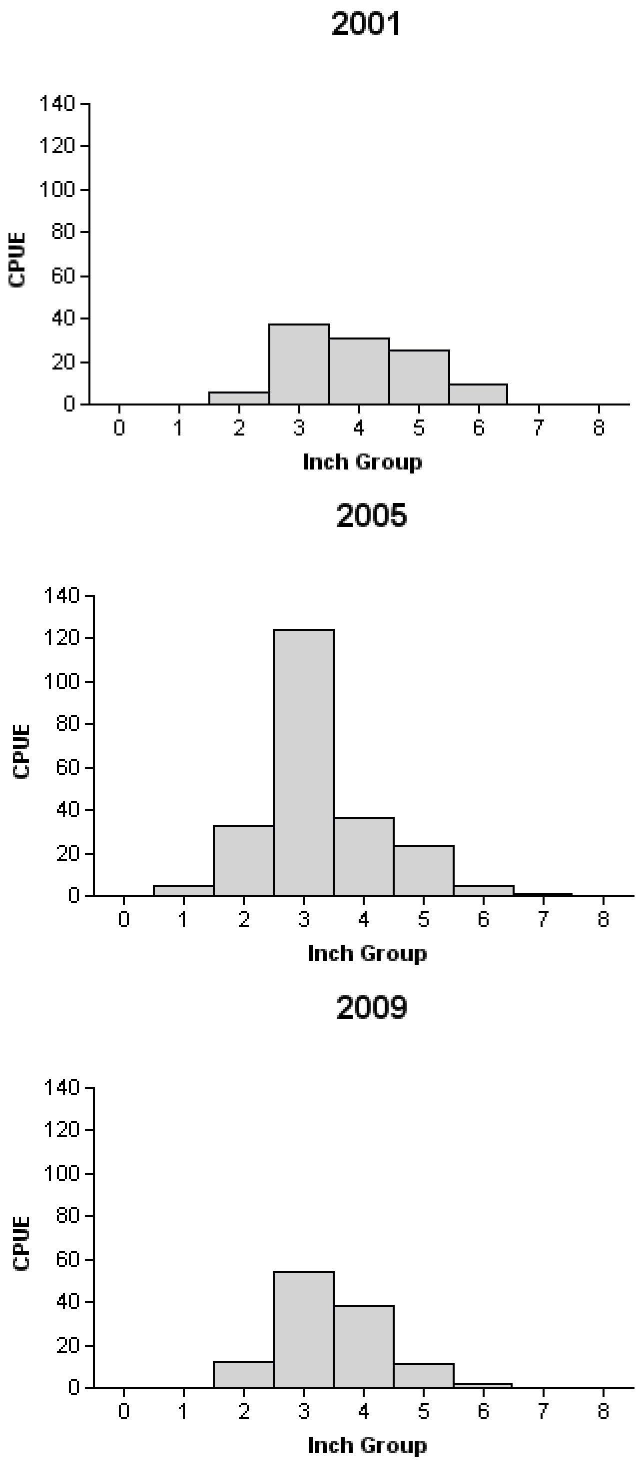


Figure 2 continued. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Bridgeport Reservoir, Texas 2006, 2008, and 2009.

Bluegill



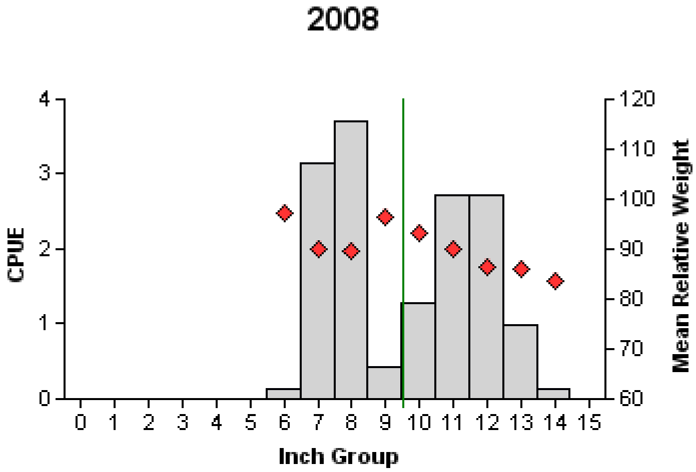
2001: Effort = 2.0; Total CPUE = 109.0 (15; 218)); PSD = 9 (2)

2005: Effort = 2.0; Total CPUE = 227.5 (10; 455); PSD = 3 (1.0)

2009: Effort = 2.0; Total CPUE = 118.5 (17; 237); PSD = 2 (0.9)

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, 2001, 2005, and 2009.

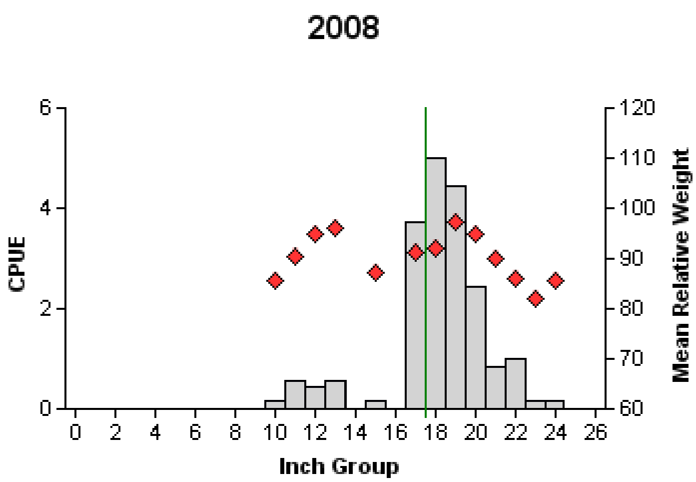
White Bass



Effort = 7.0
Total CPUE = 15.3 (18; 107)
Stock CPUE = 15.3 (18; 107)
PSD = 54 (11.6)

Figure 4. 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 survey, Bridgeport Reservoir, Texas, 2008. Sampling sites were subjectively selected. Vertical line represents length limit at time of collection.

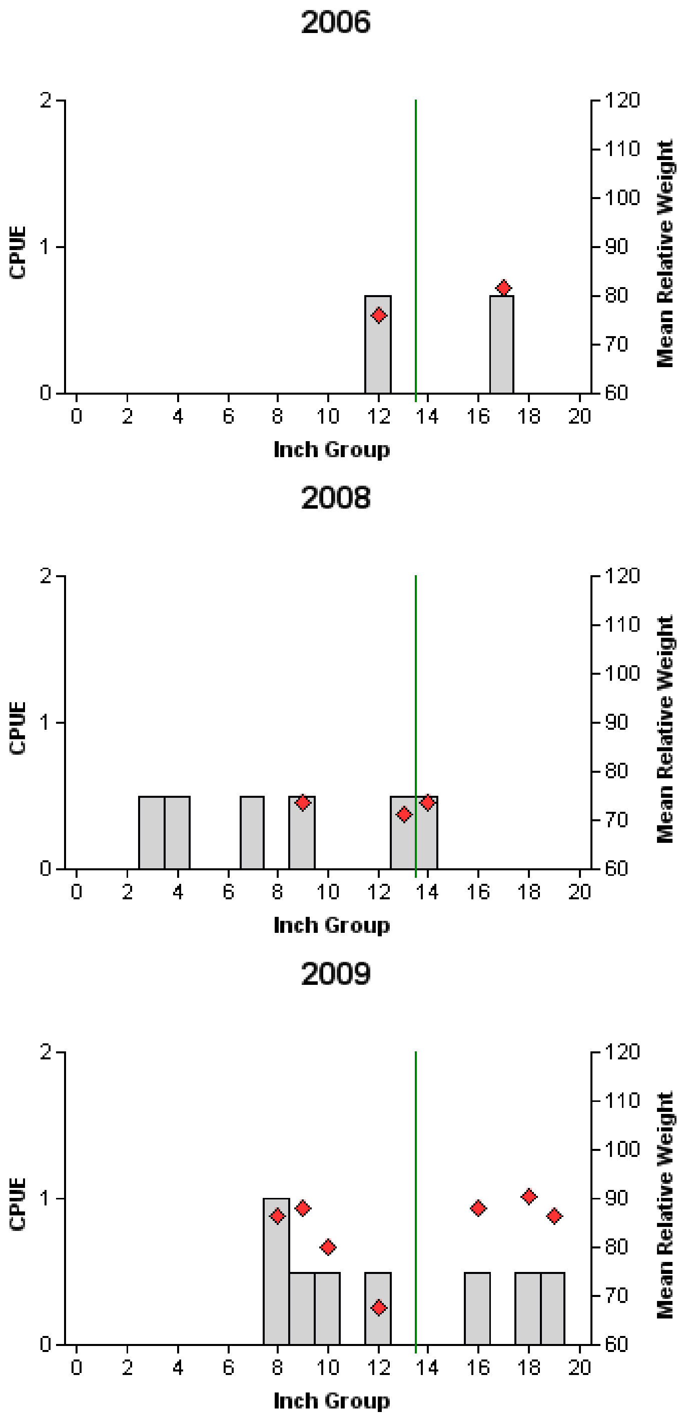
Palmetto Bass



Effort = 7.0
Total CPUE = 19.6 (37; 137)
Stock CPUE = 19.6 (37; 137)
PSD = 96 (1.5)

Figure 5. 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 survey, Bridgeport Reservoir, Texas, 2008. Sampling sites were subjectively selected. Vertical line represents length limit at time of collection.

Smallmouth Bass



2006

Effort = 1.5
Total CPUE = 1.3 (100; 2)
Stock CPUE = 1.3 (100; 2)
PSD = 100 (0)

2008

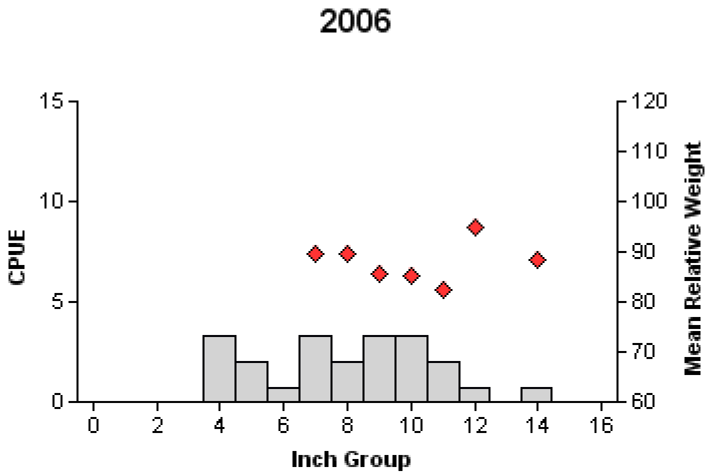
Effort = 2.0
Total CPUE = 3.0 (50; 6)
Stock CPUE = 2.0 (59; 4)
PSD = 50 (31.3)

2009

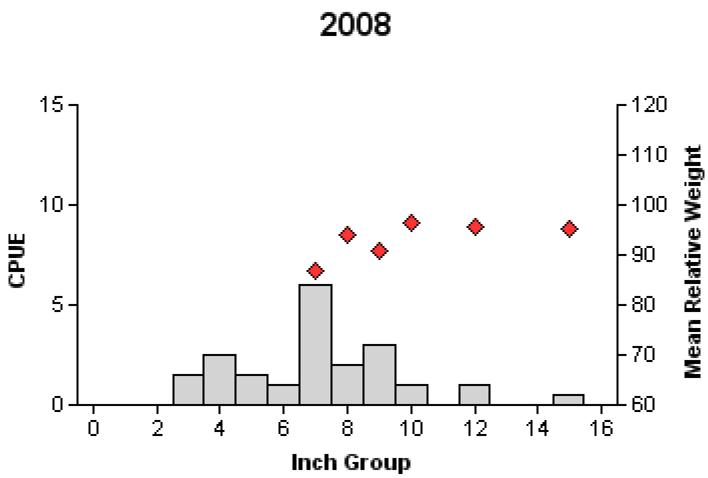
Effort = 2.0
Total CPUE = 4.0 (39; 8)
Stock CPUE = 4.0 (39; 8)
PSD = 50 (22.1)

Figure 6. 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,2006, 2008, and 2009. Vertical line represents length limit at time of collection.

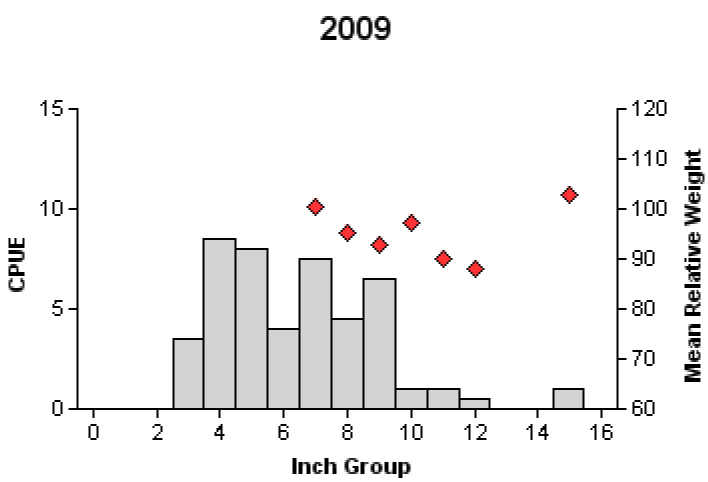
Spotted Bass



Effort = 1.5
Total CPUE = 21.3 (22; 32)
Stock CPUE = 15.3 (27; 23)
PSD = 22 (7)



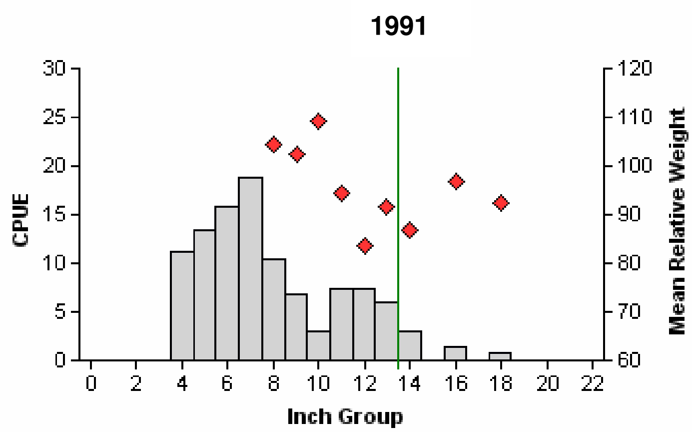
Effort = 2.0
Total CPUE = 20.0 (22; 40)
Stock CPUE = 13.5 (24; 27)
PSD = 11 (5.5)



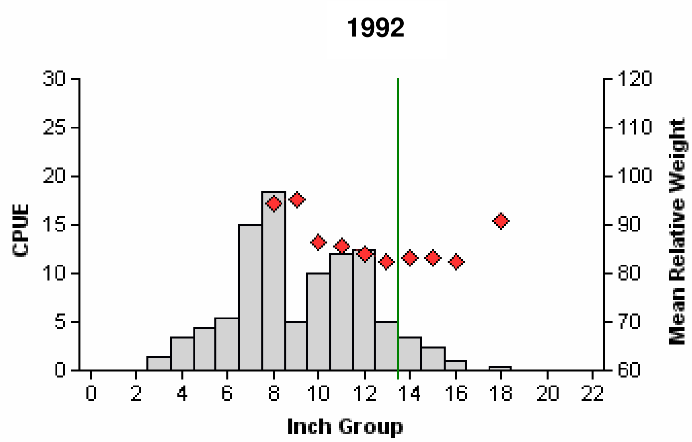
Effort = 2.0
Total CPUE = 46.0 (13; 92)
Stock CPUE = 22.0 (13; 44)
PSD = 11 (4.9)

Figure 7. 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, 2006, 2008, and 2009.

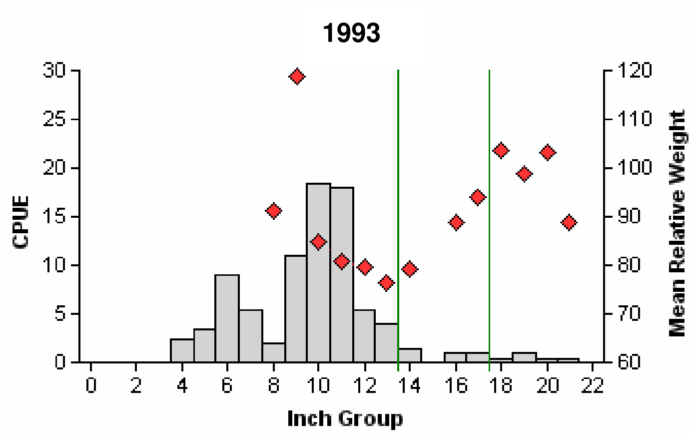
Largemouth Bass



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)



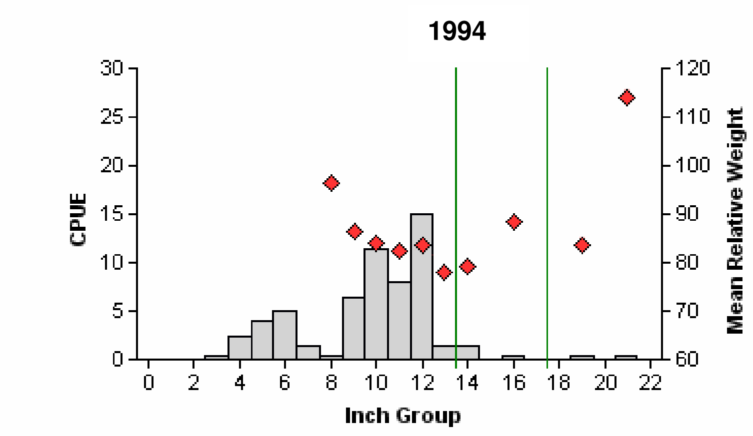
Effort =	2.0
Total CPUE =	102.0 (20;204)
Stock CPUE =	70.5 (21; 141)
PSD =	35.0 (0.12)
RSD_{14-18}=	9.8 (0.02)



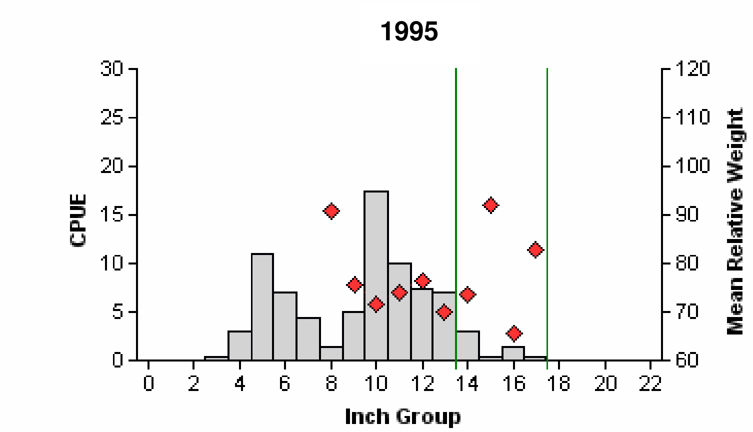
Effort =	2.0
Total CPUE =	85.5 (11;171)
Stock CPUE =	65.0 (15; 130)
PSD =	23.8 (0.08)
RSD_{14-18}=	5.4 (0.02)

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

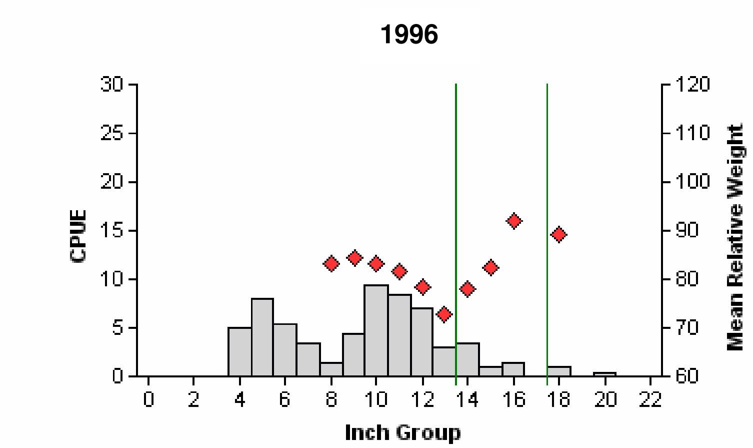
Largemouth Bass



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



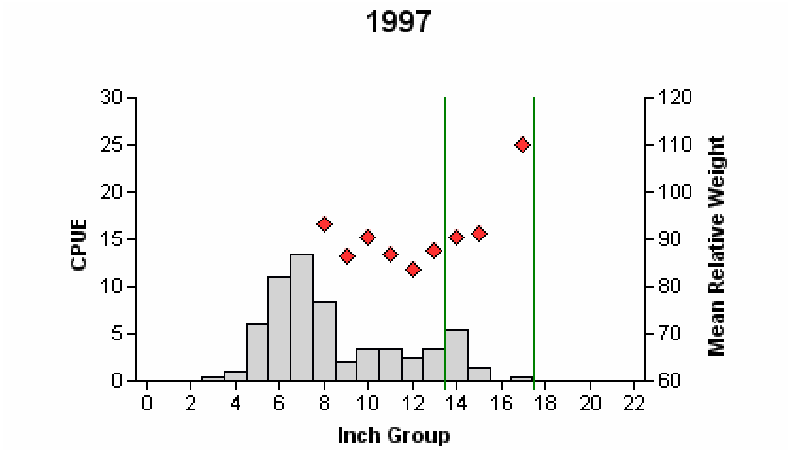
Effort = 2.0
Total CPUE = 72.0 (18; 144)
Stock CPUE = 46.5 (21; 93)
PSD = 39.1 (0.13)
$RSD_{14\text{-}18}$= 10.9 (0.02)



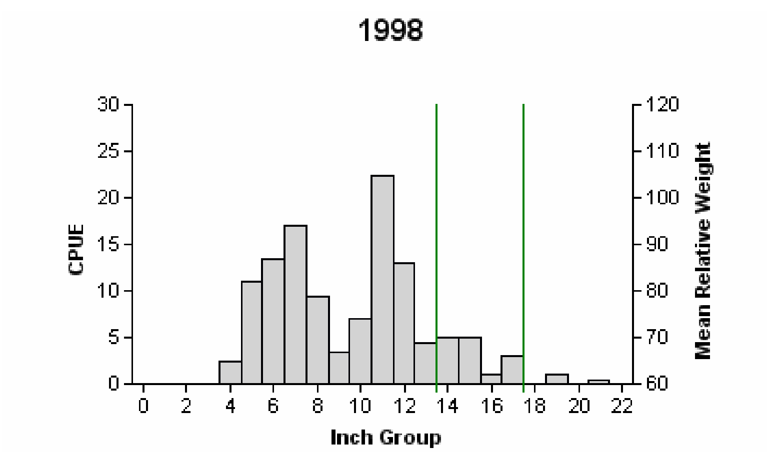
Effort = 2.0
Total CPUE = 63.5 (12; 127)
Stock CPUE = 41.5 (17; 83)
PSD = 42.2 (0.12)
$RSD_{14\text{-}18}$= 14.6 (0.05)

Figure 8 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.

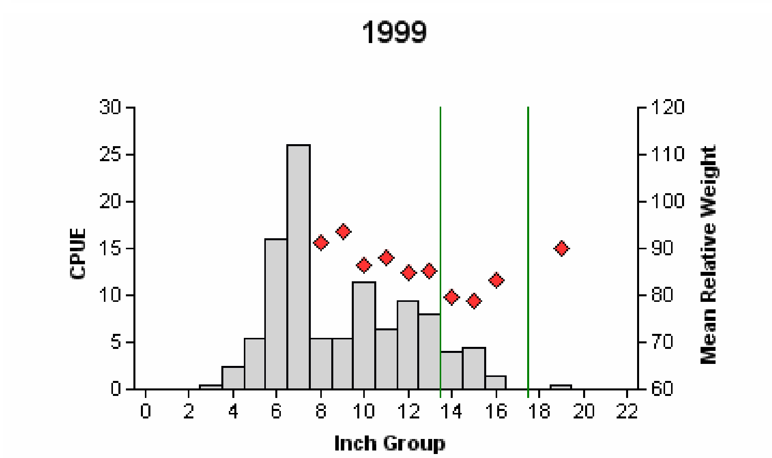
Largemouth Bass



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)



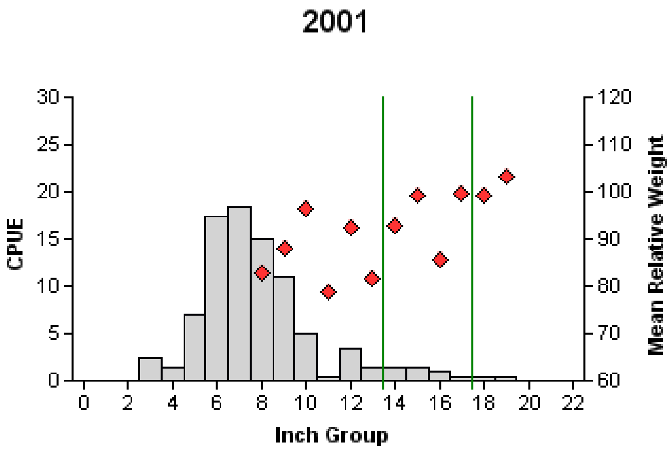
Effort = 2.0
Total CPUE = 119.5 (18; 239)
Stock CPUE = 75.5 (17; 151)
PSD = 44.0 (0.04)
$RSD_{14\text{-}18}$= 17.0 (0.04)



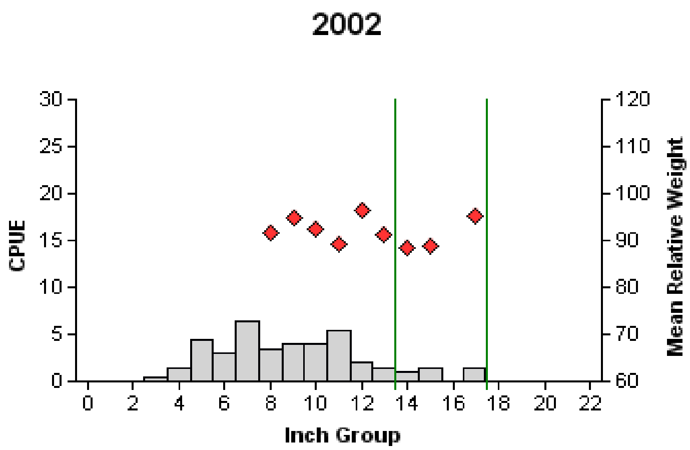
Effort = 2.0
Total CPUE = 107.5 (18; 215)
Stock CPUE = 57.0 (14; 114)
PSD = 49.0 (0.08)
$RSD_{14\text{-}18}$= 17.5 (0.03)

Figure 8 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.

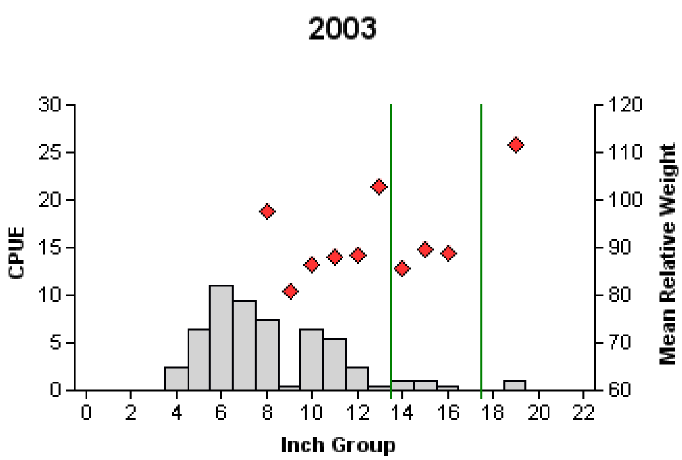
Largemouth Bass



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



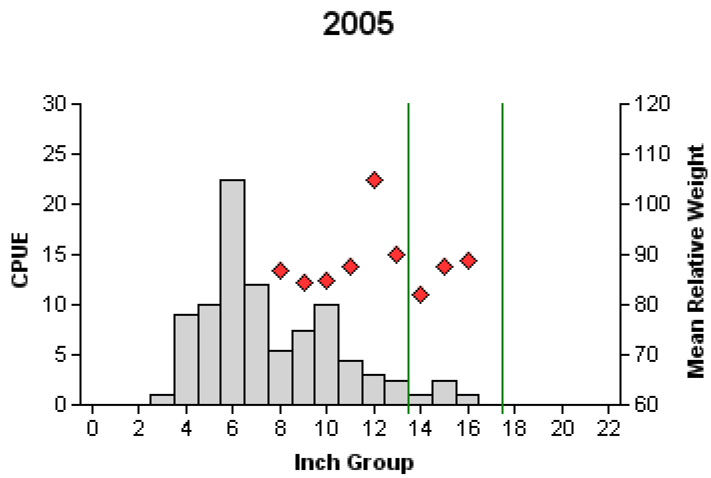
Effort = 2.0
Total CPUE = 40.5 (20; 81)
Stock CPUE = 24.5 (23; 49)
PSD = 31.0 (0.07)
$RSD_{14\text{-}18}$= 16.3 (0.05)



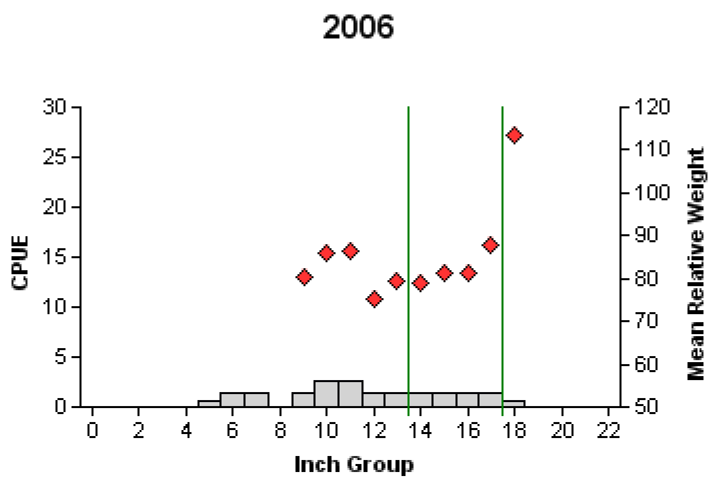
Effort = 2.0
Total CPUE = 56.0 (23; 112)
Stock CPUE = 26.5 (38; 53)
PSD = 25.0 (0.06)
$RSD_{14\text{-}18}$= 9.4 (0.04)

Figure 8 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.

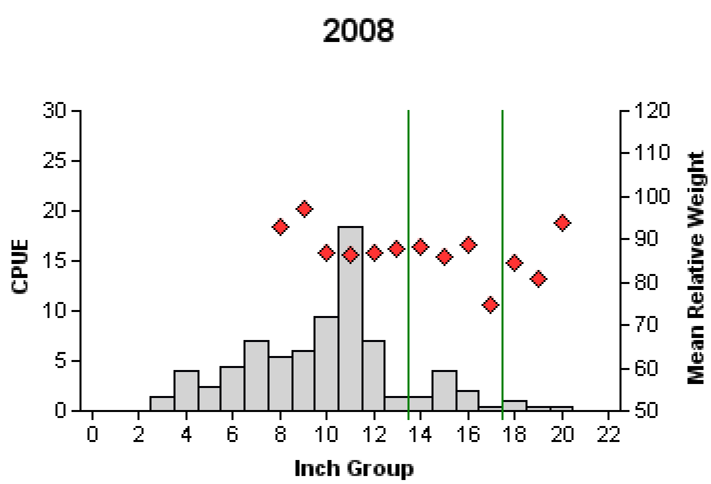
Largemouth Bass



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



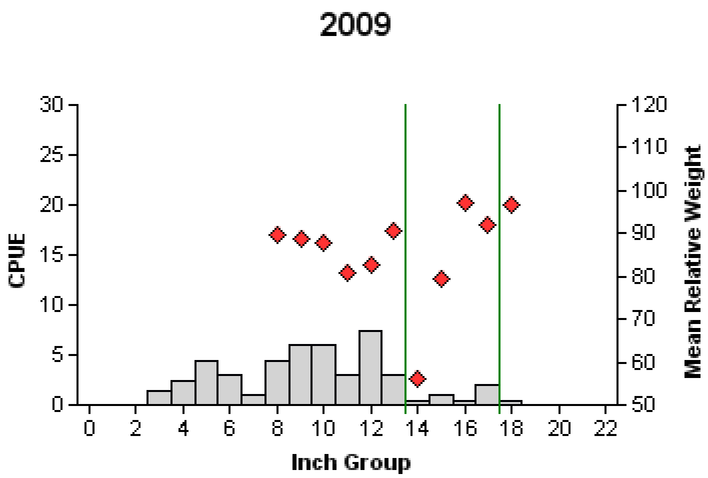
Effort = 1.5
Total CPUE = 18.7 (23; 28)
Stock CPUE = 15.3 (24; 23)
PSD = 57 (10.9)
PSD14-18= 33(0.1)



Effort = 2.0
Total CPUE = 77.5 (11; 155)
Stock CPUE = 58.0 (11; 116)
PSD = 32 (4.7)
PSD14-18= 14 (0.3)

Figure 8 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, 2006, and 2008. Vertical lines represent slot length limit at time of collection.

Largemouth Bass



Effort = 2.0
Total CPUE = 47.0 (17; 94)
Stock CPUE = 34.5 (19; 69)
PSD = 43 (6.3)
PSD_{14-18}= 13 (0.4)

Figure 8 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, 2009. Vertical lines represent slot length limit at time of collection.

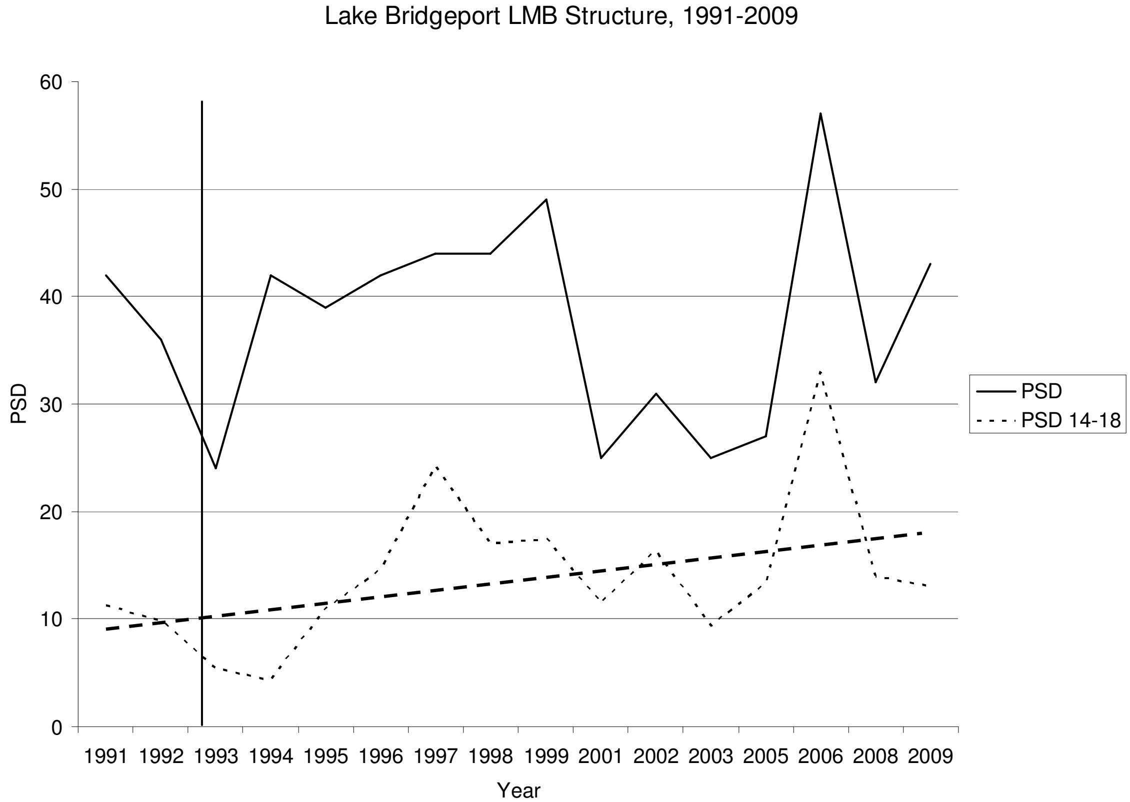
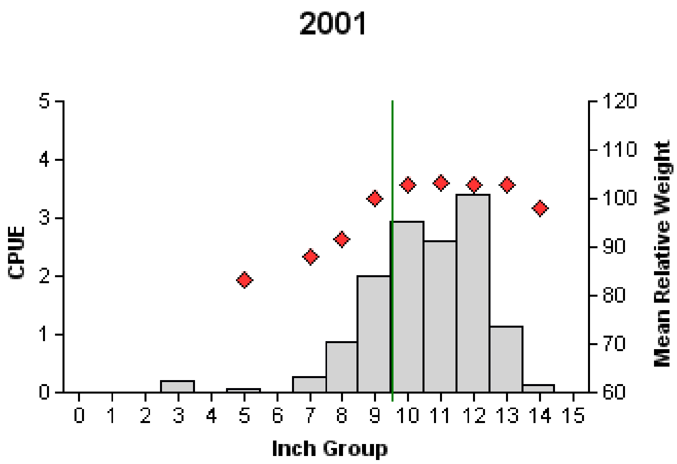


Figure 9. Population indices of largemouth bass for fall electrofishing surveys, Bridgeport Reservoir, Texas, 1991-1999, 2001-2003, 2005, 2006, 2008, & 2009. Vertical line represents implementation of 14-18 inch slot limit. Dashed line (– – – –) illustrates the linear regression of PSD 14-18 ($r^2 = 0.1837$; non-significant $P \leq 0.05$).

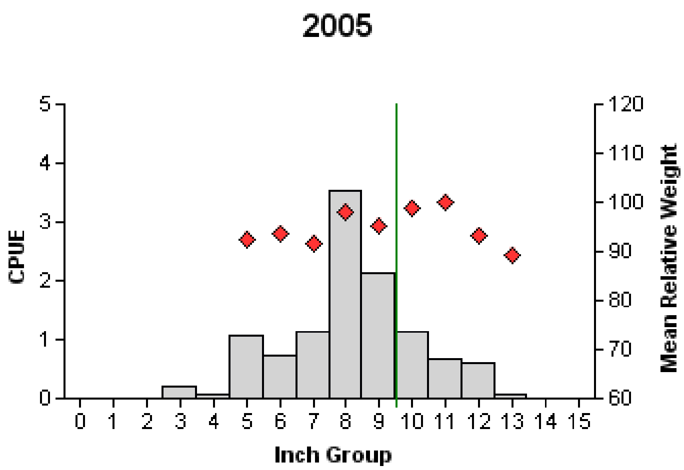
Table 5. Number of largemouth bass caught per hour (CPUE) for selected size groups and selected population indices for fall electrofishing surveys, Bridgeport Reservoir, Texas 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2001, 2002, 2003, 2005, 2006, 2008, and 2009.

Year	$CPUE_{stock}$	PSD_{14-18}	$CPUE_{14-18}$	$CPUE_{>18}$
1991	46.5	11.3	4.5	0.8
1992	70.5	9.8	7.0	0.5
1993	65.0	5.4	3.5	2.5
1994	46.0	4.3	2.0	1.0
1995	46.5	10.9	4.5	0.0
1996	41.5	14.6	6.0	1.5
1997	31.0	24.2	7.5	0.0
1998	75.5	17.0	14.0	1.5
1999	57.0	17.5	10.0	0.5
2001	42.0	11.5	4.5	1.0
2002	24.5	16.3	4.0	0.0
2003	26.5	9.4	2.5	1
2005	37.5	13.3	4.5	0.0
2006	15.3	33.0	5.3	0.7
2008	58.0	14.0	8.0	2.0
2009	34.5	13.0	4.0	0.5

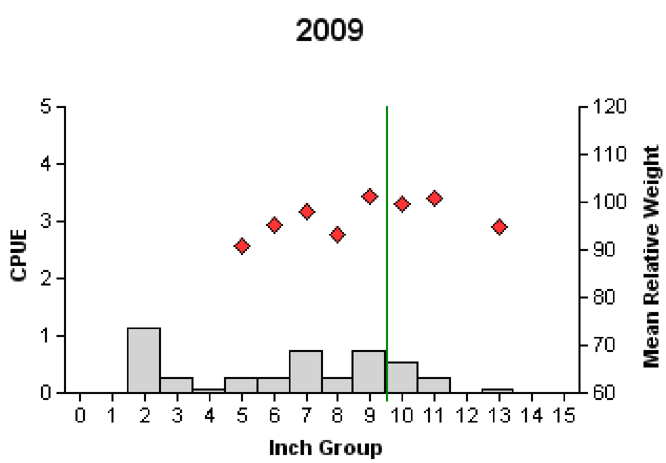
White Crappie



Effort = 15.0
Total CPUE = 13.6 (31; 204)
Stock CPUE = 13.4 (32; 201)
PSD = 98 (1.7)



Effort = 15.0
Total CPUE = 11.3 (29; 170)
Stock CPUE = 11.1 (29; 166)
PSD = 73 (4.0)



Effort = 15.0
Total CPUE = 4.6 (33; 69)
Stock CPUE = 3.1 (38; 47)
PSD = 60 (12.4)

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 netting surveys, Bridgeport Reservoir, Texas, 2001, 2005, and 2009. Vertical lines represent length limit at time of collection.

Table 6. 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.

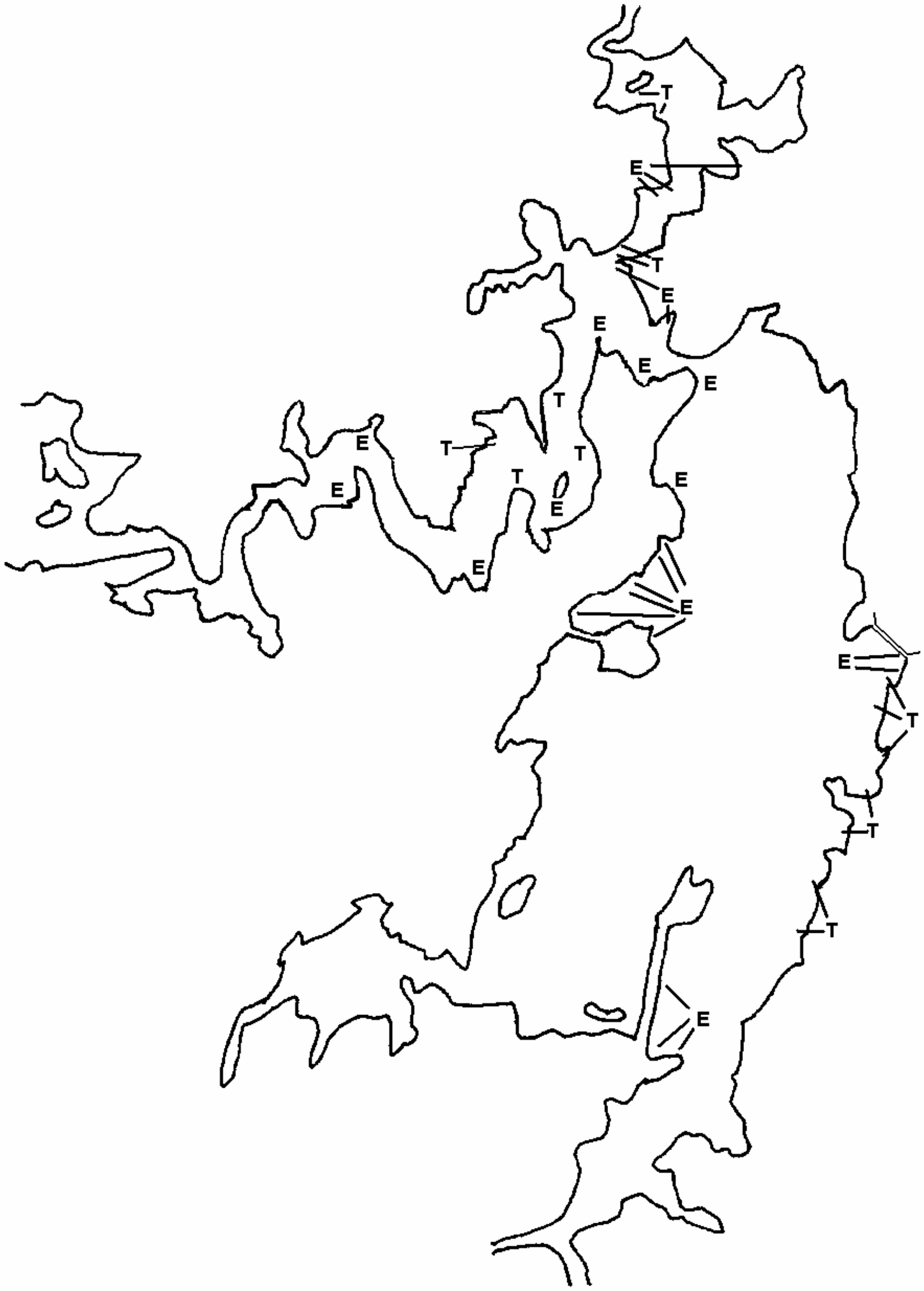
Survey Year	Electrofisher	Trap Net	Gill Net	Creel Survey	Report
Fall 2010-Spring 2011	A		A		
Fall 2011-Spring 2012					
Fall 2012-Spring 2013					
Fall 2013-Spring 2014	S	S	S		S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Bridgeport Reservoir, Texas, 2009.

	Trap Netting		Electrofishing	
Species	N	CPUE	N	CPUE
Gizzard shad			79	39.5
Threadfin shad			912	456.0
Green sunfish			107	53.5
Warmouth			3	1.5
Bluegill			237	118.5
Longear sunfish			186	93.0
Redear sunfish			24	12.0
Smallmouth bass			8	4.0
Spotted bass			92	46.0
Largemouth bass			94	47.0
White crappie	69	4.6		
Black crappie	1	0.1		

APPENDIX B



Location of sampling sites, Bridgeport Reservoir, Texas, 2009. Trap netting and electrofishing sampling stations are indicated by T and E, respectively. Water level was 8.75 feet below conservation for trap netting and 8.5 feet below conservation for electrofishing.

APPENDIX C

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

		Year							
Gear	Species	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	
(fish/net night)	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	
(fish/hour)	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	
(fish/net night)	Black crappie								

APPENDIX C (continued)

Historical catch rates of targeted species by gear type for Bridgeport Reservoir, Texas, 1999, 2001 – 2006, and 2008 – 2009.

		Year								
Gear	Species	2001[c]	2002[c]	2003[c, d, e]	2004[c]	2005[c, f]	2006[c, g]	2008[g, h]	2009[c]	**Avg.**
Gill Netting	Channel catfish		2.5		1.8		3.3	4.0		**3.2**
(fish/net night)	Flathead catfish		0.2		0.1		0.3			**0.2**
	White bass		2.7		4.3		2.1	15.3		**7.7**
	Palmetto bass		2.0		1.5		0.9	19.6		**5.6**
Electrofishing	Gizzard shad	69.0		25.0		21.5	76.0	27.0	39.5	**70.3**
(fish/hour)	Threadfin shad	43.5		22.0		88.5	12.7	37.0	456.0	**85.2**
	Green sunfish	23.0				61.0			53.5	**47.5**
	Warmouth	2.0				9.0			1.5	**6.4**
	Orangespotted sunfish								2.0	**2.9**
	Bluegill	109.0				227.5			118.5	**115.1**
	Longear sunfish	138.5				260.0			93.0	**127.3**
	Redear sunfish	10.5				33.0			12.0	**13.9**
	Smallmouth bass	1.0		1.1/1.0		1.0	1.3	3.0	4.0	**2.3**
	Spotted bass	33.0	36.5	27.4/73.0		37.5	21.3	20.0	46.0	**48.4**
	Largemouth bass	89.0	40.5	44.0/56.0		92.0	18.7	77.5	47.0	**73.1**
Trap Netting	White crappie	13.6				11.3			4.6	**9.5**
(fish/net night)	Black crappie								0.1	**0.1**

[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.
[g] Black bass and shad sampled only during electrofishing.
[h] Gill net survey sampling stations were subjectively selected and effort was 7 net nights.