

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-34

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2008 Survey Report

New Ballinger Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in New Ballinger Reservoir were surveyed in 2008 using electrofishing and trap nets, and in 2009 using gill nets. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** New Ballinger Reservoir is a 591-acre impoundment located on Valley Creek in the Colorado River basin in Runnels County, Texas. It was constructed in 1984 for municipal water supply and recreation. The reservoir water level dropped dramatically from 1997 to 2004, and the boat ramp was closed to the public for several of those years. The reservoir returned to conservation pool elevation by March 2005. Boat and shoreline access are good, and habitat is predominantly flooded saltcedar. Watershed land use is primarily ranching.
- **Management History:** Important sport fish included largemouth bass, white crappie, white bass, channel catfish and blue catfish. Following its construction in 1984, the reservoir was initially stocked with threadfin shad, coppernose bluegill, redbreast sunfish, blue catfish, channel catfish, palmetto bass, smallmouth bass, Florida largemouth bass and walleye. A severe drop in water level from 1997 to 2004 left the reservoir nearly dry. In 2005 the reservoir reached conservation level and was subsequently stocked with adult gizzard shad, bluegill, largemouth bass, white crappie, and fingerling channel catfish, Florida largemouth bass and walleye to re-build the fishery. Sport fish harvest has been managed according to statewide regulations.
- **Fish Community**
 - **Prey species:** Electrofishing catch rate of gizzard shad and index of vulnerability were good and higher than that recorded in the two previous surveys. A large proportion (82%) of these fish was available as prey to most sport fish. Electrofishing catch rate of bluegill was high, and size structure was good; fish up to seven inches in length were collected. Threadfin shad were present, but in low abundance.
 - **Catfishes:** No blue catfish were collected in gill nets in 2009. The catch rate of blue catfish has been in steady decline since 2005. Channel catfish catch rate was low, as was the case in 2007 and 2005, although some larger fish (up to 29 inches in length) were collected in 2009. Flathead catfish were present in low numbers.
 - **White bass:** White bass catch rate remained relatively low, however nearly all the fish collected were of harvestable size. Fish up to 16 inches in length were recorded.
 - **Largemouth bass:** Abundance and size structure improved since the last two surveys, highlighting the recovery of this population from the low water conditions of 1997 to 2004. The largest fish collected was 19 inches in length.
 - **Crappie:** Overall catch rate was lower than in previous years and the abundance of harvestable size fish (≥ 10 inches in length) has remained relatively low.
 - **Walleye:** No walleye were collected by gill nets in 2009. In fact, none have been collected in the three previous surveys.
- **Management Strategies:** Based on current data, New Ballinger Reservoir should continue to be managed with existing regulations. The reservoir should be monitored to evaluate the recovering fish populations. A mandatory standard survey is scheduled in 2012-2013 with trap nets, gill nets, and electrofishing gear to assess important fish populations. Additional sampling is scheduled for 2010-2011 with electrofishing gear and gill nets to monitor the recovery of fish populations.

INTRODUCTION

This document is a summary of fisheries data collected from New Ballinger Reservoir in 2008-2009. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. Although information on other species of fish was collected, this report deals primarily with major sport fish and important prey species. Historical data are presented with the 2008-2009 data for comparison.

Reservoir Description

New Ballinger Reservoir is a 591-acre impoundment located on Valley Creek in the Colorado River basin approximately 5 miles west of Ballinger in Runnels County, Texas. It was constructed in 1984 for municipal water supply and recreation on the Colorado River. The reservoir's water level dropped dramatically during the period from 1997-2004, and the boat ramp was closed to the public for several of those years. Intense rains in 2004 caused the springs in Valley Creek watershed to begin flowing again returning the reservoir to conservation pool elevation by March 2005 (Figure 1). Boat and shoreline access are good, and the habitat is predominantly flooded saltcedar. Watershed land use is primarily ranching. Other descriptive characteristics for New Ballinger Reservoir are shown in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Scott and Van Zee 2005) included:

1. Continue to rebuild the fishery by stocking channel catfish at 50/acre in addition to the adult gizzard shad, largemouth bass, and white crappie, and fingerling Florida largemouth bass and walleye already stocked in spring 2005.
Action: 30,766 channel catfish were stocked in 2005.
2. Conduct additional trap net sampling in fall 2006 and gill net sampling in spring 2007 to monitor the recovery of catfish, crappie, and walleye populations after restocking.
Action: Additional trap netting was carried out in fall 2005. Other district priorities prevented further trap netting in 2006. Gill netting was conducted in spring 2007 to monitor the catfish and walleye populations.
3. Conduct a new habitat survey on the reservoir in late summer or early fall of the next report year, 2008.
Action: A habitat survey was conducted in September 2008.

Harvest regulation history: Sport fish in New Ballinger Reservoir are currently managed with statewide regulations (Table 2).

Stocking history: In the summer of 2004 the reservoir was nearly dry, but by 2005 water level had reached conservation pool. As a consequence, adult gizzard shad, largemouth bass, white crappie, and fingerling largemouth bass, channel catfish and walleye were stocked in 2005 to rebuild the populations.

Threadfin shad, coppernose bluegill, redbreast sunfish, Palmetto bass, smallmouth bass, Florida largemouth bass and walleye were stocked in 1985. Blue catfish were first stocked in 1984 and channel catfish in 1986. The complete stocking history is shown in Table 3.

Vegetation/habitat history: New Ballinger Reservoir has no significant vegetation/habitat management history.

METHODS

Fish were collected by electrofishing (1.0 hour at 12, 5-min stations), gill netting (five net-nights at five stations), and trap netting (five net-nights at five stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2005).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD), Relative Stock Density (RSD)], and condition indices [relative weight (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error (RSE = $100 \times \text{SE of the estimate/estimate}$) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. A littoral habitat and vegetation survey was conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2008) in 2008. Source for water level data was the Ballinger water treatment plant.

RESULTS AND DISCUSSION

Habitat: In 2008, littoral zone habitat consisted primarily of natural shoreline (63%) and rocky shoreline (32%) and has remained relatively unchanged since 1998 (Jons and Dumont 1999). Vegetative cover was dominated by flooded terrestrial vegetation (primarily saltcedar) which occupied 23% of the reservoir surface area. Native submersed vegetation (3% of surface area) consisted of marine naiad, sago pondweed, and Illinois pondweed, and the native emergent vegetation (3% of surface area) was cattail (Table 4).

Prey species: In 2008, electrofishing CPUE of gizzard shad and bluegill were 245/h and 356/h, respectively. The IOV for gizzard shad was good, indicating that 81% of gizzard shad were available as prey; this was much higher than IOV estimates in previous years (Figure 2). Total CPUE of gizzard shad was considerably higher in 2008 (245.0/h) than in 2006 (76.6/h) and 2005 (127/h). Total CPUE of bluegill in 2008 (356.0/h) was much higher than in 2006 (96.9/h), but similar to that recorded in 2005 (318.0/h). Size structure had improved compared to previous surveys (Figure 3). The catch rate for threadfin shad was 54/h.

Blue and channel catfish: No blue catfish were collected by gill nets in 2009. Blue catfish abundance has been in decline since 2005. Survey results from 2005, 2006, and 2007 had corresponding CPUE of 2.8/nn, 0.6/nn and 0.2/nn (Figure 4). Channel catfish catch rate in 2009 was low (0.6/nn) and similar to values recorded in 2007 (1.4/nn) and 2005 (0.2/nn). Channel catfish up to 29 inches in length were collected (Figure 5).

White bass: The gill net CPUE of white bass was relatively low (2.8/nn) in 2009. It had declined somewhat from that recorded in 2007 (4.8/nn). The majority of fish were of harvestable size with relative weight >90 for all size classes (Figure 6).

Largemouth bass: The electrofishing catch rate for largemouth bass was 153/h in 2008, an improvement on the results of the last survey in 2006 (18.5/h). Size structure had also improved with good numbers of juvenile fish and an increase in the percentage of harvestable fish. The largest bass collected was 19 inches in length. Mean relative weight varied between 86 and 101 (Figure 7).

White crappie: The trap net catch rate of white crappie (16.4/nn) was lower compared to surveys in 2005 (25.6/nn) and 1998 (22.0/nn). The catch rate of harvestable fish (2.4/nn) was relatively low. Relative weight was greater than 90 for all size classes (Figure 8).

Walleye: No walleye were collected by gill nets during surveys in 2009, 2007, 2006, and 2005 even though a total of 16,602 walleye were stocked during the period 2005 to 2007.

Fisheries management plan for New Ballinger Reservoir, Texas

Prepared – July 2009.

ISSUE 1: New Ballinger Reservoir was nearly dry in summer 2004, but water level returned to conservation pool by 2005 and the reservoir was stocked with adult and fingerling size fish to rebuild the fish populations. The 2008/2009 survey results indicate that a recovery is taking place for most species of fish, however no walleye have been collected in gill net surveys conducted in 2009, 2007, 2006 and 2005.

MANAGEMENT STRATEGY

1. Discontinue stocking of walleye.
2. Assess other populations to document positive effects of water level increase, especially on bass.

ISSUE 2: The gill net catch rate of channel catfish and blue catfish has been low since 2005. Gill netting surveys may not be adequately describing the catfish populations.

MANAGEMENT STRATEGY

1. Sample the catfish population with hoop nets in 2010 and 2012.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes additional electrofishing and hoop netting in 2010, and gill netting 2011. Mandatory monitoring is scheduled in 2012/2013 (Table 5). An additional electrofishing survey in 2010 is necessary to monitor the recovery of the largemouth bass population. Additional hoop net survey in 2010 and 2012 are necessary to further evaluate the catfish population. Gill net surveys are necessary every two years to monitor abundance of white bass and catfish. Trap netting for white crappie at four-year intervals is adequate for monitoring the population.

LITERATURE CITED

- Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.
- Jons, G. D., and S. Dumont. 1999. Statewide freshwater fisheries monitoring and management program survey report for New Ballinger Reservoir, 1998. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- Scott, M., and B. Van Zee. 2005. Statewide freshwater fisheries monitoring and management program survey report for New Ballinger Reservoir, 2004. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

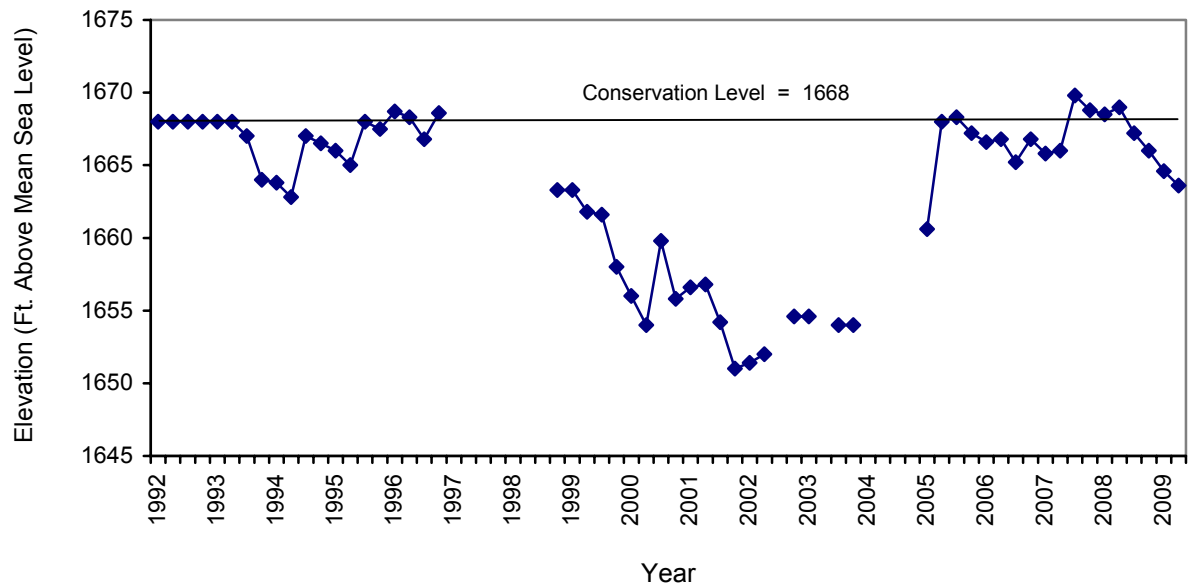


Figure 1. Quarterly water level elevations in feet above mean sea level recorded for New Ballinger Reservoir, Texas.

Table 1. Characteristics of New Ballinger Reservoir, Texas.

Characteristic	Description
Year constructed	1984
Controlling authority	City of Ballinger
County	Runnels
Reservoir type	Tributary
Shoreline Development Index	3.01
Conductivity	770 μ mhos/cm

Table 2. Harvest regulations for New Ballinger Reservoir, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Catfish, Flathead	5	18 - No Limit
Bass, White	25	10 - No Limit
Walleye	5	2 under 16 - No Limit
Bass: largemouth	5	14 - No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 3. Stocking history of New Ballinger Reservoir, Texas. Size categories are: FRY = ≤ 1 inch; FGL = 1-3 inches; ADL = adults, and UNK = unknown.

Species	Year	Number	Size
Threadfin shad	1985	1,200	UNK
Gizzard shad	2005	196	ADL
Coppernose bluegill	1985	60,000	UNK
Bluegill	2005	386	ADL
Redbreast sunfish	1985	8,262	FGL
Blue catfish	1984	1,000	FGL
	1985	12,022	FGL
	1986	12,005	FGL
	1995	57,500	FGL
Total		82,527	
Channel catfish	1986	30,012	FGL
	1987	31,030	FGL
	1995	58,894	FGL
	2005	30,766	FGL
Total		150,702	
Palmetto bass	1985	57,389	FRY
Smallmouth bass	1985	13,000	FGL
	1986	12,800	FGL
	1987	12,225	FGL
Total		38,025	
Largemouth bass	2005	68	ADL
Florida largemouth bass	1985	12,000	FGL
	1986	13,605	FGL
	1997	57,507	FGL
	2005	31,161	FGL
Total		114,273	
White crappie	2005	327	ADL
Walleye	1985	1,550,000	FRY
	1993	1,300,000	FRY
	1995	1,000,000	FRY
	1996	138,486	FGL
	2005	15,745	FGL
	2006	15,206	FGL
	2007	705	FGL
Total		4,020,142	

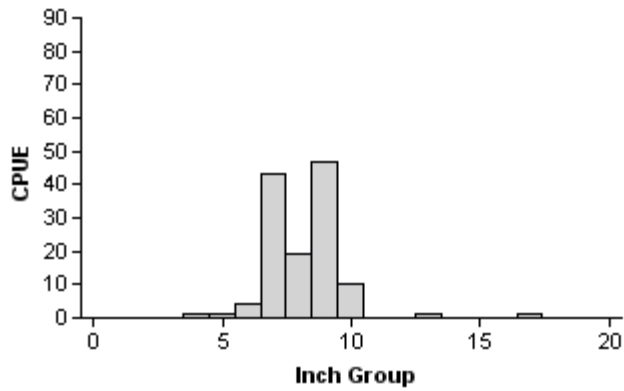
Table 4. Survey of littoral zone and physical habitat types, New Ballinger Reservoir, Texas, 2008. A linear shoreline distance (miles) was recorded for each shoreline habitat type found. Surface area (acres) and percent of reservoir surface area were determined for each type of offshore habitat, including aquatic vegetation. Native submersed vegetation consisted of marine naiad, sago pondweed, and Illinois pondweed, and the native emergent vegetation was cattail. Flooded terrestrial vegetation consisted primarily of saltcedar.

Habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of total
Rocky shoreline	2.3	32		
Natural shoreline	4.6	63		
Gravel shoreline	0.3	4		
Rock bluff	0.1	1		
Standing timber			18	3
Native emergent vegetation			17	3
Native submersed vegetation			15	3
Flooded terrestrial vegetation			132	23

Gizzard Shad

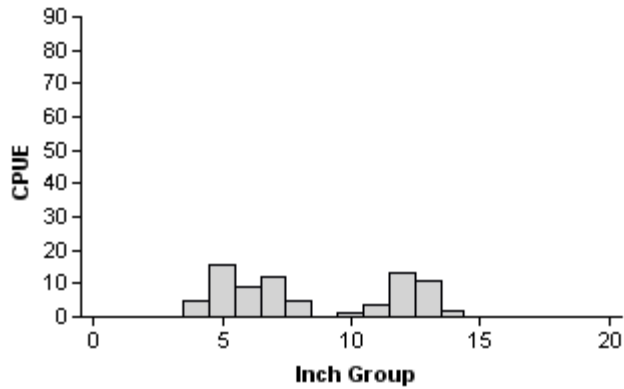
2005

Effort = 1.0
Total CPUE = 127.0 (31; 127)
IOV = 38 (4.9)



2006

Effort = 1.1
Total CPUE = 76.6 (35; 83)
IOV = 54 (10.6)



2008

Effort = 1.0
Total CPUE = 245.0 (26; 245)
IOV = 81 (4.7)

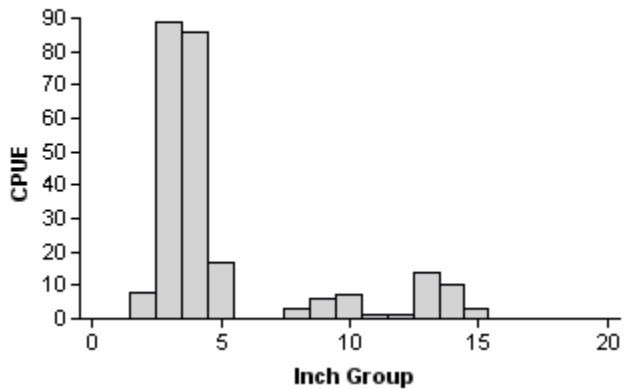
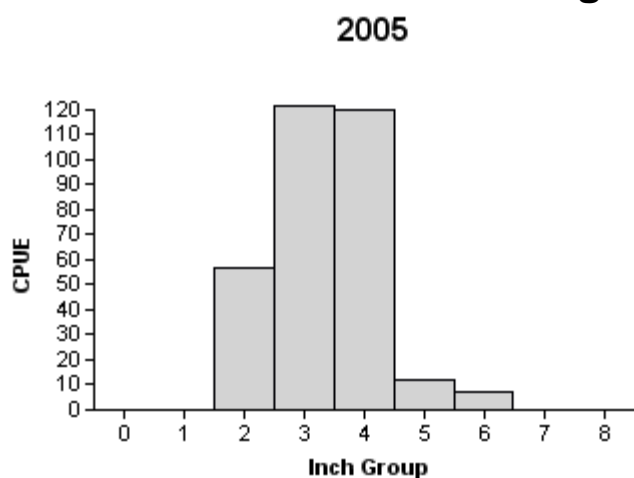
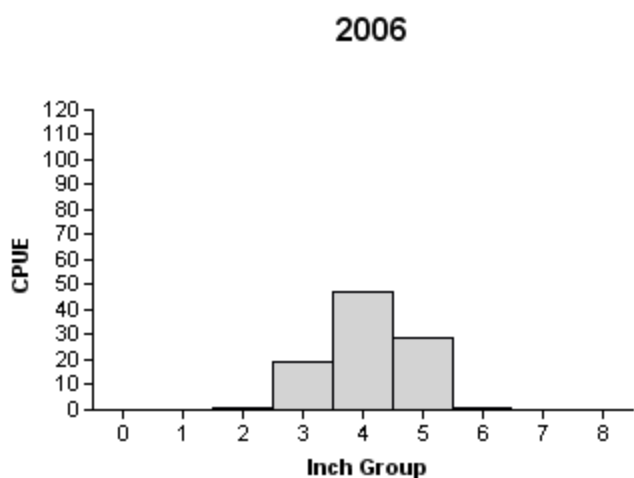


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, New Ballinger Reservoir, Texas, 2005, 2006, and 2008.

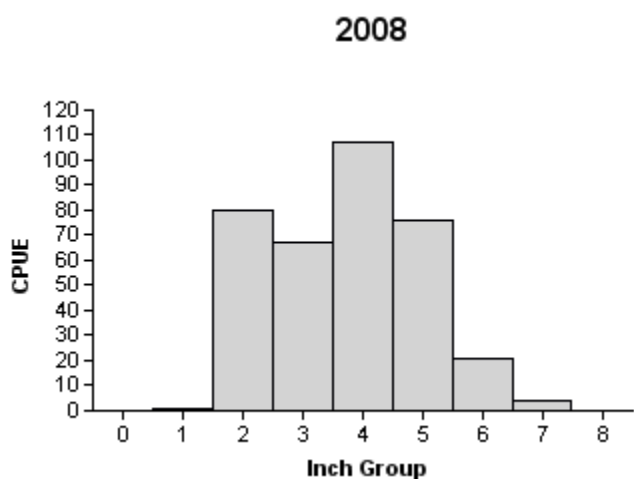
Bluegill



Effort = 1.0
 Total CPUE = 318.0 (25; 318)
 Stock CPUE = 261.0 (27; 261)
 PSD = 3 (1.3)



Effort = 1.1
 Total CPUE = 96.9 (39; 105)
 Stock CPUE = 96.0 (38; 104)
 PSD = 1 (0.6)

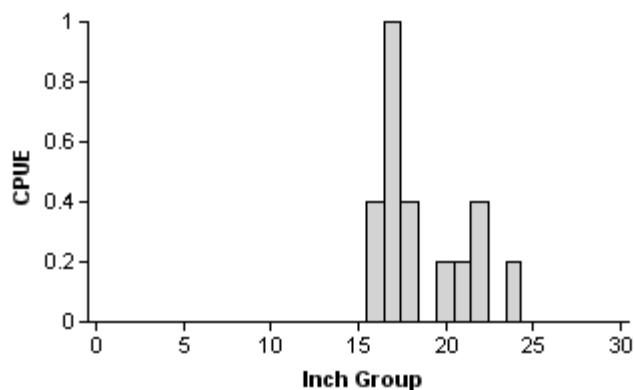


Effort = 1.0
 Total CPUE = 356.0 (16; 356)
 Stock CPUE = 275.0 (19; 275)
 PSD = 9 (1.8)

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, New Ballinger Reservoir, Texas, 2005, 2006, and 2008.

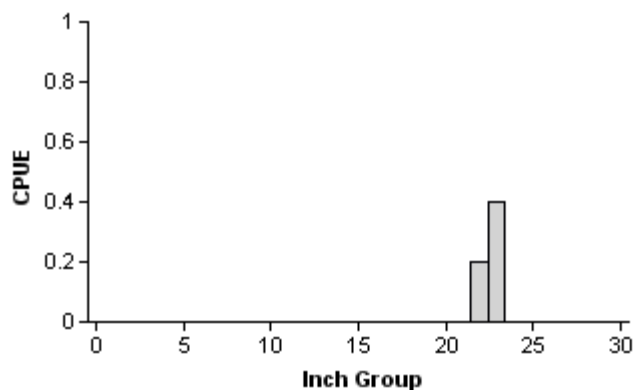
Blue Catfish

2005



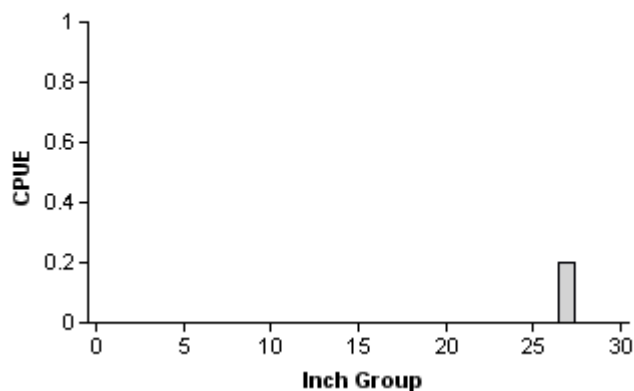
Effort = 5.0
Total CPUE = 2.8 (38; 14)
Stock CPUE = 2.8 (38; 14)
PSD = 36 (6.4)

2006



Effort = 5.0
Total CPUE = 0.6 (100; 3)
Stock CPUE = 0.6 (100; 3)
PSD = 100 (0.0)

2007



Effort = 5.0
Total CPUE = 0.2 (100; 1)
Stock CPUE = 0.2 (100; 1)
PSD = 100 (0.0)

Figure 4. Number of blue catfish caught per net night (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, New Ballinger Reservoir, Texas, 2005, 2006, and 2007. No blue catfish were collected in 2009.

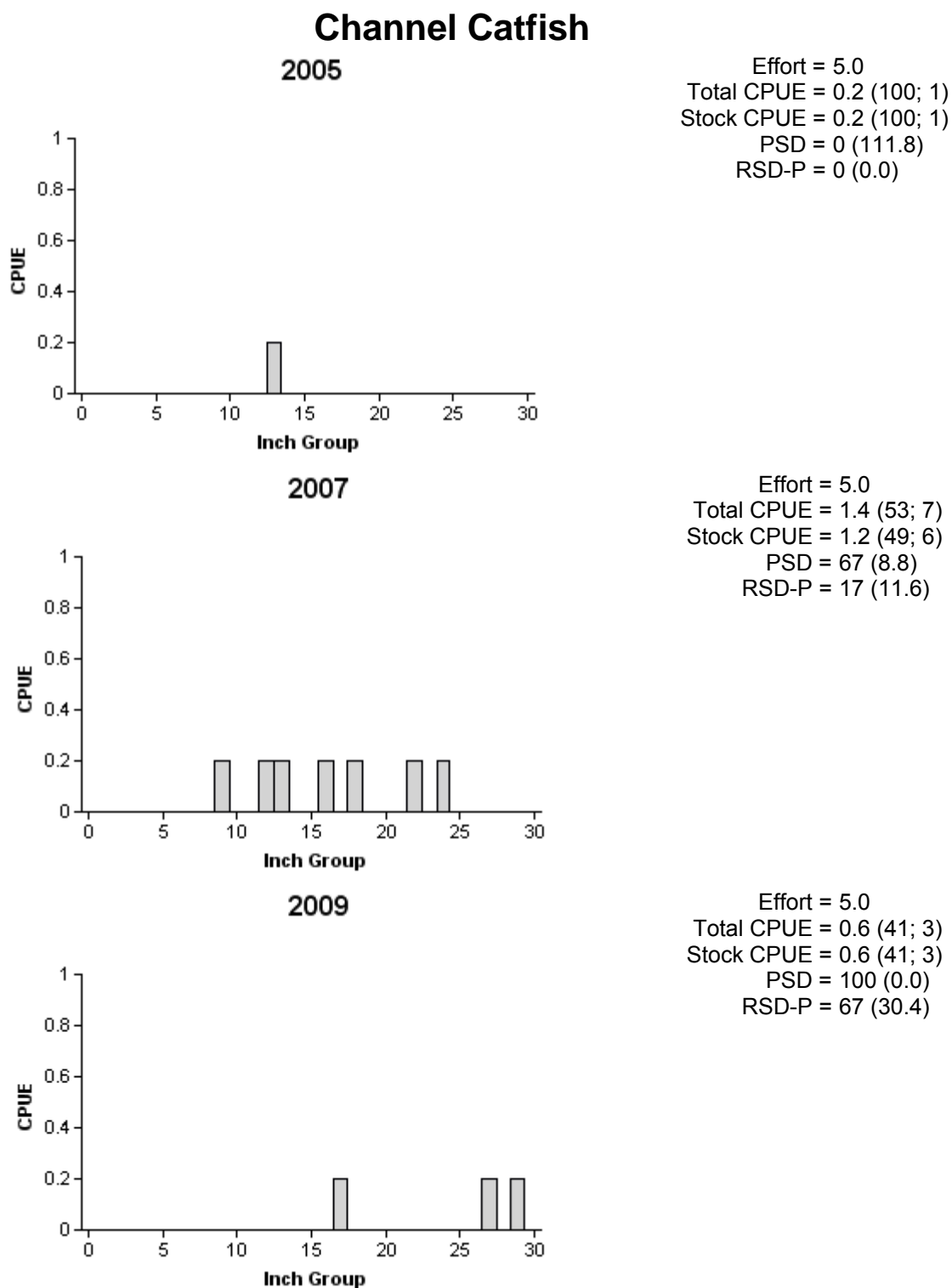


Figure 5. Number of channel catfish caught per net night (CPUE), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, New Ballinger Reservoir, Texas, 2005, 2007, and 2009.

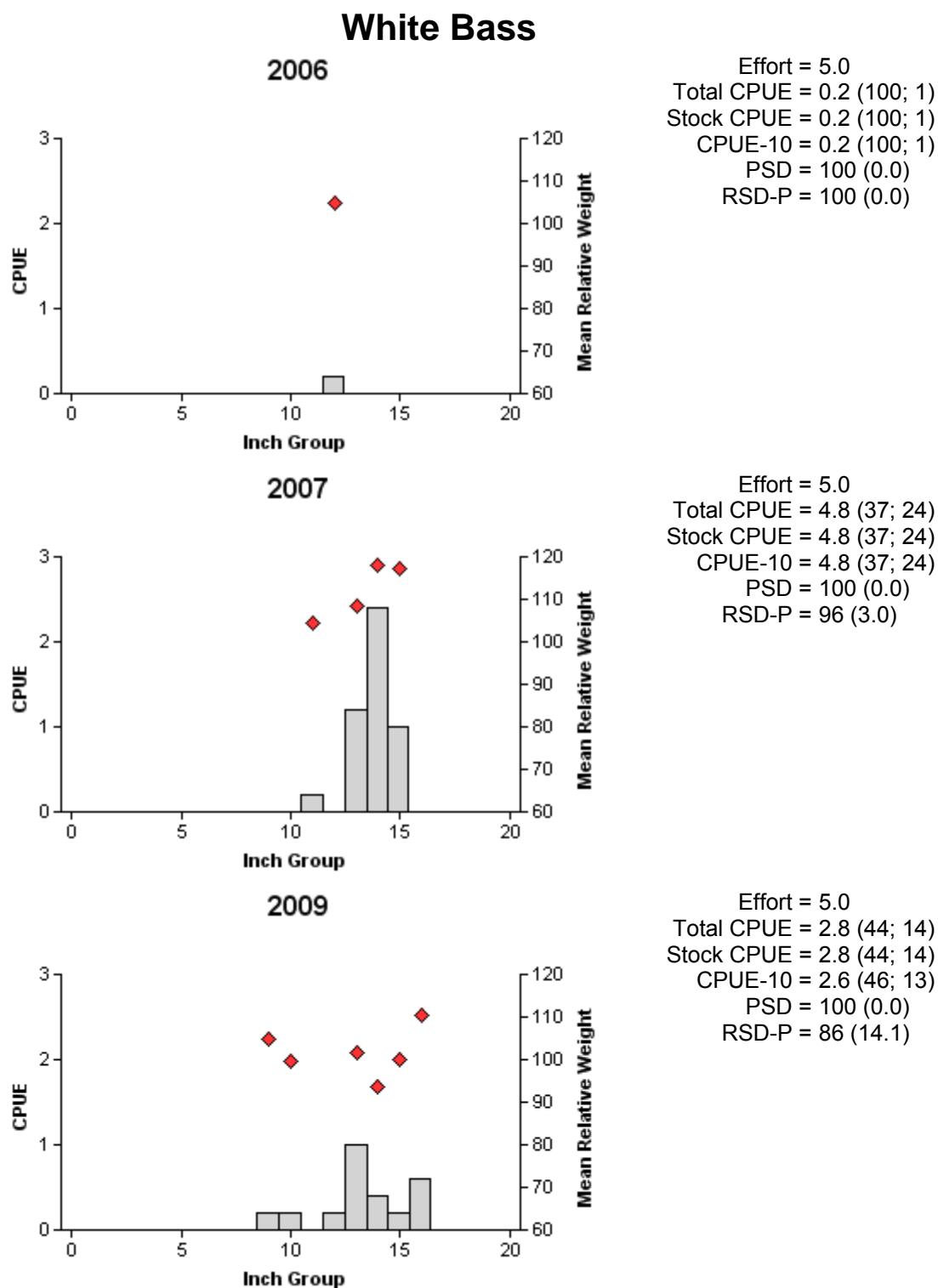
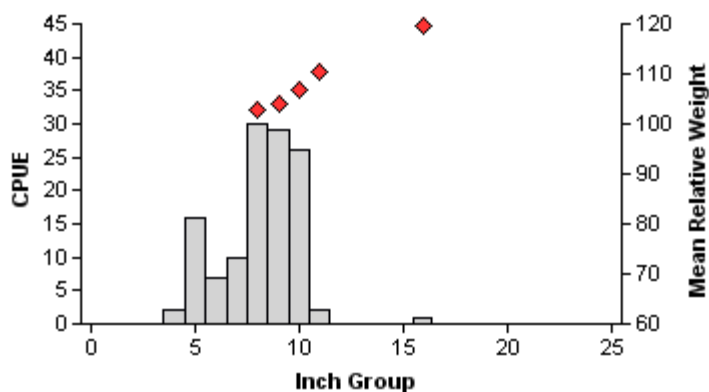


Figure 6. Number of white bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, New Ballinger Reservoir, Texas, 2006, 2007, and 2009.

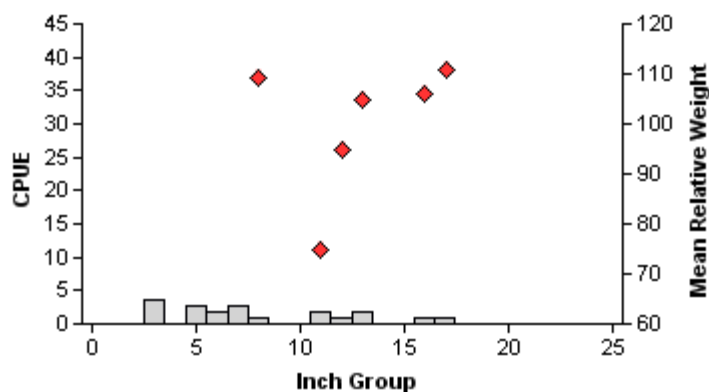
Largemouth Bass

2005



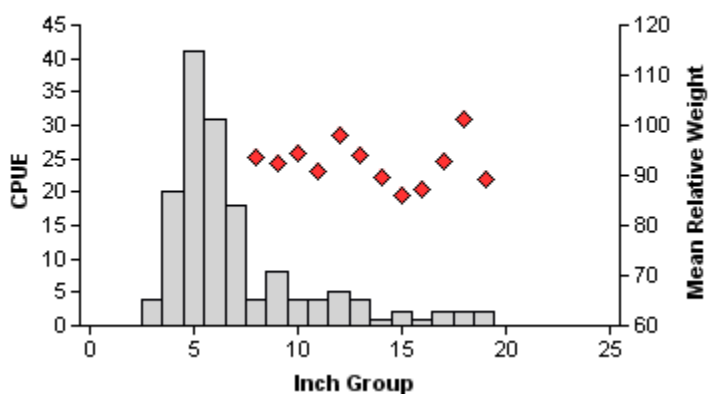
Effort = 1.0
 Total CPUE = 123.0 (29; 123)
 Stock CPUE = 88.0 (27; 88)
 CPUE-14 = 1.0 (100; 1)
 PSD = 1 (1.2)
 RSD-P = 1 (1.2)

2006



Effort = 1.1
 Total CPUE = 18.5 (23; 20)
 Stock CPUE = 7.4 (35; 8)
 CPUE-14 = 1.8 (68; 2)
 PSD = 62 (16.9)
 RSD-P = 25 (14.6)

2008

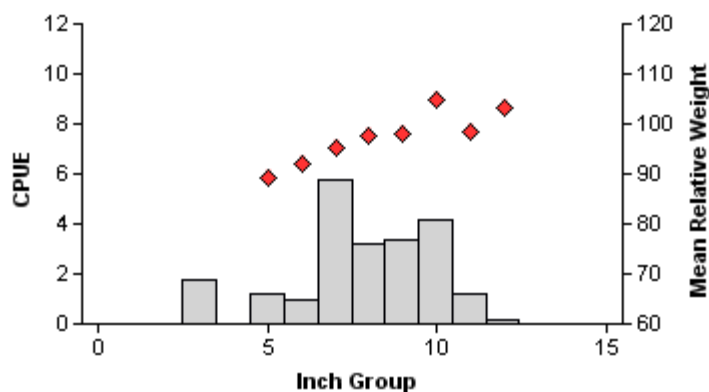


Effort = 1.0
 Total CPUE = 153.0 (21; 153)
 Stock CPUE = 39.0 (26; 39)
 CPUE-14 = 10.0 (25; 10)
 PSD = 49 (7.7)
 RSD-P = 23 (7.1)

Figure 7. 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, New Ballinger Reservoir, Texas, 2005, 2006, and 2008.

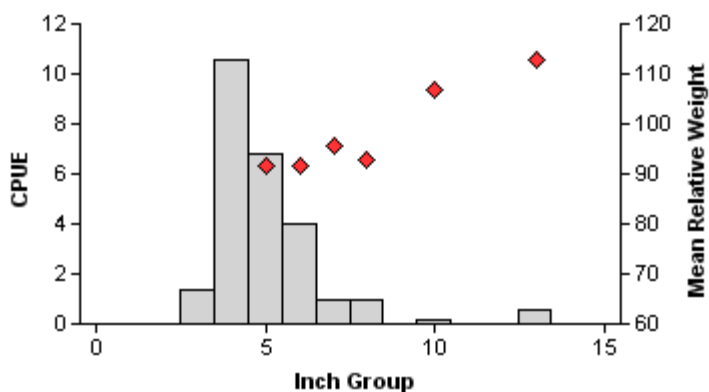
White Crappie

1998



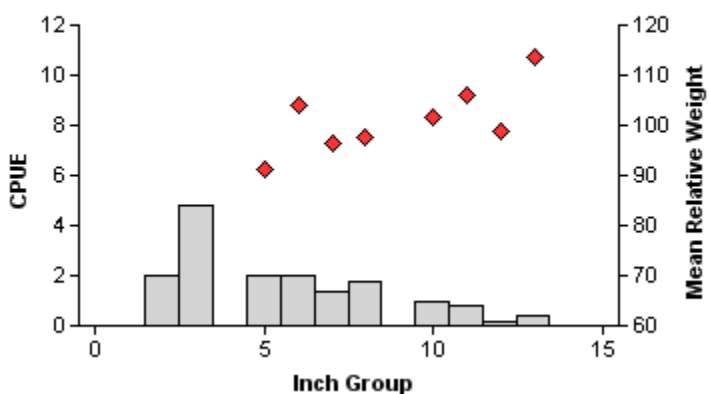
Effort = 5.0
 Total CPUE = 22.0 (47; 110)
 Stock CPUE = 20.2 (51; 101)
 CPUE-10 = 5.6 (69; 28)
 PSD = 60 (8.9)
 RSD-P = 28 (8.6)

2005



Effort = 5.0
 Total CPUE = 25.6 (27; 128)
 Stock CPUE = 13.6 (36; 68)
 CPUE-10 = 0.8 (73; 4)
 PSD = 13 (3.3)
 RSD-P = 6 (3.0)

2008



Effort = 5.0
 Total CPUE = 16.4 (40; 82)
 Stock CPUE = 9.6 (36; 48)
 CPUE-10 = 2.4 (57; 12)
 PSD = 44 (8.2)
 RSD-P = 25 (6.8)

Figure 8. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, New Ballinger Reservoir, Texas, 1998, 2005, and 2008.

Table 5. Proposed sampling schedule for New Ballinger, Texas. Gill netting surveys are conducted in the spring, hoop netting in the summer, and 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	Hoop Net	Report
Summer 2009-Spring 2010					
Summer 2010-Spring 2011	A		A	A	
Summer 2011-Spring 2012					
Summer 2012-Spring 2013	S	S	S	A	S

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected by all gear types from New Ballinger Reservoir, Texas, 2008-2009.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Longnose gar	33	6.6				
Gizzard shad	100	20.0			245	245.0
Threadfin shad					54	54.0
Common carp	35	7.0				
River carpsucker	37	7.4				
Smallmouth buffalo	38	7.6				
Channel catfish	3	0.6				
Flathead catfish	1	0.2			1	1.0
White bass	14	2.8			5	5.0
Green sunfish					2	2.0
Warmouth					17	17.0
Bluegill			77	15.4	356	356.0
Longear sunfish			3	0.6	77	77.0
Smallmouth bass	1	0.2				
Largemouth bass	1	0.2			153	153.0
White crappie	7	1.4	82	16.4	1	1.0
Logperch					1	1.0

APPENDIX B