PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-32

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2006 Survey Report

Lake O' the Pines

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lake O' the Pines were surveyed in 2006 using electrofishing and trap nets and in 2007 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:** Lake O' the Pines is a 16,269-acre reservoir on Big Cypress Creek, which was constructed in 1956 by the U. S. Army Corps of Engineers (USACE) for flood control, municipal and industrial water supply, and public recreation. Habitat features consisted of inundated timber, brush, creek channels, and riprap. Aquatic plants were sparse in the lower end of the reservoir. Hydrilla was dominant in the upper end. Low water levels due to drought conditions existed until January 2007.

- **Management history:** Important sport fish include largemouth bass, channel catfish, white bass, sunfish, and crappie. Palmetto bass stocking was discontinued due to low angler utilization. All fish species are currently managed under statewide harvest regulations.

- **Fish community**
  - **Prey species:** Threadfin shad continued to be present in the reservoir. Electrofishing catch of gizzard shad has increased since previous surveys and 68% of fish collected during 2006 electrofishing were small enough to be available as prey to most sport fish. Bluegill catch was similar to previous surveys, and many of these fish were available as prey to most sport fish. Redbreast sunfish and redear sunfish serve as an additional prey source for predators and also grow to sizes desirable to anglers.

  - **Catfishes:** The channel catfish population had many fish above legal size and provided good angling opportunities. Gill net catch rates of channel catfish in 2007 were similar to previous surveys. Flathead catfish were also present in the reservoir. No blue catfish have been collected in gill net surveys since 1996.

  - **Temperate basses:** Gill net catch rates of white bass in 2007 were lower than 2003 but similar to 2001. No palmetto bass were collected during the 2007 survey. Because the last palmetto bass stocking occurred in 2000, it is likely that few fish remain in the reservoir. Yellow bass were also present.

  - **Black basses:** Largemouth bass electrofishing catch rates were similar to previous surveys. Growth rates were high. The average age of a 14-inch fish was 1.9 years. Largemouth bass as long as 21 inches were collected and body condition was good. Spotted bass abundance was lower in 2006 than previous years, but provides additional angling opportunities.

  - **Crappie:** Both black and white crappie were collected during fall 2006 trap net surveys. Abundance in 2006 was similar to the 2002 survey.

- **Management strategies:** Conduct general monitoring with trap nets, electrofishing, and aquatic vegetation surveys in 2010 and gill netting in 2011. Conduct angler creel survey from June 2010 to May 2011 to assess angler effort and harvest. Provide technical guidance to the controlling authority if the need arises to actively manage the hydrilla infestation.

INTRODUCTION

This document is a summary of fisheries data collected from Lake O' the Pines in 2006-2007. 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 fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2006-2007 data for comparison.

Reservoir Description

Lake O' the Pines is located in Marion, Morris, Upshur, and Camp Counties on Big Cypress Creek. It was constructed in 1956 by the U. S. Army Corps of Engineers (USACE) for flood control, municipal and industrial water supply, and public recreation. Shoreline length is 144 miles with a shoreline development ratio of 7.5. Annual water level fluctuation is 2-3 feet (Figure 1). Structural habitat is comprised of inundated timber, brush, and creek channels (Ryan and Brice 2003). Aquatic macrophyte densities have been historically low in the lower end of the reservoir. However, the upper end of the reservoir contained flooded timber and the majority of the aquatic vegetation, including hydrilla. Bank fishing and boating access was available at numerous USACE parks and private marinas. Other descriptive characteristics for Lake O' the Pines are in Table 1.

Management History

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

1. Monitor hydrilla and meet with controlling authority to develop management strategy if coverage becomes problematic.
   Action: The controlling authority has been kept abreast of hydrilla coverage. Fishing access has not been compromised and no treatment strategies have been pursued by the controlling authority.
2. Monitor genetic composition of the largemouth bass population and stock Florida largemouth bass if electrophoresis results indicate <20% Florida largemouth bass alleles.
   Action: Florida largemouth bass alleles have remained above 20%. No supplemental stocking has been required.
3. Keep anglers and other public aware of harvest regulations, fishing methods, and other fisheries-related topics.
   Action: District staff provided information to Fishing Hot Spots to assist with their development of a new map for Lake O' the Pines that will be beneficial to anglers.
4. Angler creel surveys indicated low utilization of the palmetto bass fishery.
   Action: Palmetto bass stocking was discontinued. The special 10-inch minimum length limit, daily aggregate bag limit of 25 fish of which only 5 may be 18 inches or greater for white bass and palmetto bass was reverted to statewide harvest restrictions for these two species.
5. Many angler access facilities did not meet ADA standards.
   Action: ADA access is unknown at this time.

Harvest regulation history: Sport fishes in Lake O' the Pines are currently managed with statewide regulations (Table 2). A special regulation for white bass and palmetto bass (10-inch minimum length limit, daily aggregate bag limit of 25 fish of which only 5 may be 18 inches or greater) was removed after palmetto bass stocking was discontinued. Largemouth bass have been managed with a 14-inch minimum length and 5-fish daily bag since 1986. Other black bass were included under this regulation in 1988. The minimum length limit on spotted bass was removed in 2000, but the daily bag for black bass in any

combination remains at 5 fish/day. The 12-inch minimum length limit and 25 fish daily bag for channel catfish and blue catfish (in any combination) has been in effect since 1994. The minimum length limit for flathead catfish was reduced from 24 inches to 18 inches in 1994. There is a 5-fish daily bag on flathead catfish. In 1991, a special winter season regulation for crappie was implemented, which states that for black and white crappie caught from 1 December through the last day of February, there is no minimum length limit, the daily bag is 25 fish in any combination, and all crappie caught must be retained.

Stocking history: Channel catfish were stocked in the late 1960s and 1970 and established a self-sustaining population. Blue catfish were stocked in 1971 and 1994 but a self-sustaining population was not established. Florida largemouth bass were last stocked in 2000. Population genetics are monitored to ensure sufficient Florida largemouth bass alleles are present to meet fisheries management objectives. Palmetto bass were stocked from 1977 to 2000 to create and sustain the fishery. The stocking was discontinued due to low angler utilization. The complete stocking history is in Table 3.

Vegetation/habitat history: Hydrilla coverage was greater than 3,000 acres in 1999 and declined to 700 acres in 2002. American lotus, Illinois pondweed, buttonbush, and chara have occurred at measurable levels during past surveys.

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). An aquatic vegetation survey was conducted in September 2006. 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 (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 SE was calculated for structural indices and IOV. Average age-at-length was determined using otoliths for largemouth bass from 13 fish (12.9-14.9 inches). Source for water level data was the United States Army Corps of Engineers website.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of hydrilla and American lotus (Figure 2, Table 4). Because the reservoir was 4.5 feet low at the time of the vegetation survey, many areas along the shoreline that may have had emergent vegetation were out of the water. Hydrilla covered an estimated 3,000 acres in the upper end of the reservoir (Figure 2). However, much of this area was dry land or inaccessible by boat at the time of the survey but had contained hydrilla in the past. Because hydrilla tubers likely remain in these areas, new growth should occur now that the water level has returned to conservation pool elevation. Hydrilla flies were released in 2006 as a potential biological control for hydrilla.

Prey species: Electrofishing catch rates of bluegill and gizzard shad were 288/h and 321/h, respectively. Index of vulnerability (IOV) for gizzard shad was good, indicating that 68% of gizzard shad were available to predators; this was similar to IOV estimates in 2002, and higher than 1999 (Figure 3). Total CPUE of gizzard shad has shown an increasing trend since 1999 (Figure 3). Total CPUE of bluegill has been stable since 1999. The size structure of bluegill continued to be dominated by small individuals (Figure 5). In addition to their function as a prey fish, redbreast sunfish, bluegill, and redear sunfish were present at

larger sizes and available to anglers (Figures 4-6).

Catfish: The gill net catch rate of channel catfish was 18.4/nn in 2007, which was higher than catch rates in 2003 and 2001. This population continued to have high relative abundance of larger fish beneficial to anglers (Figure 7). Historically, growth of channel catfish has been fast with fish reaching legal size in 2 or 3 growing seasons (Ryan and Brice 2003). Body condition was excellent with mean Wr for most inch groups >100 (Figure 7). Flathead catfish were also collected during the 2007 gill net survey (Figure 8) and provide an additional angling opportunity.

Temperate bass: The gill net catch rate of white bass in 2007 (2.3/nn) was lower than 2003 (7.3/nn) but similar to 2001 (2.1/nn). Recruitment was poor in 2007 and was likely related to low flow conditions in 2005 and 2006, but body condition was good with mean Wr for all inch groups >90 (Figure 9). No palmetto bass were collected in 2007. The last palmetto bass stocking occurred in 2000 and few fish from that stocking remain in the reservoir.

Black bass: The electrofishing catch rate of largemouth bass (Figure 11) was 173.5/h in 2006, which was higher than 2002 (135.0/h), but lower than 1999 (214.4/h). PSD was 33 in 2006, which was consistent with previous years but below the target range of 40-70 for a balanced population. However, RSD-P was 12 in 2006, which was similar to previous years and within the target range (10-40) for a balanced population. Recruitment has been stable in recent surveys. Growth of largemouth bass in Lake O' the Pines was excellent. Average age at 14 inches (12.9-14.9 inches) was 1.9 years (N = 13; range = 1-3 years). Body condition in 2005 was good (Wr above 90) for most size classes of fish (Figure 11). Florida largemouth bass influence has increased since 1999. The level of Florida largemouth bass alleles was 28% in 2006, which meets the objectives for largemouth bass management in the reservoir (Table 5). The relative abundance of spotted bass was lower in 2006 (20.5/h) compared to previous surveys (Figure 10). This species provides an additional opportunity for anglers.

Crappie: Trap net catch rates of white crappie (Figure 12) were similar in 2006 (0.6/nn) compared to 2002 (0.8/nn) and 1999 (0.5/nn). Black crappie catch rates (Figure 13) were higher in 2006 (0.8/nn) than in 2002 (0.4/nn), but lower than 1999 (3.0/nn). Body condition was good for both species with mean Wr values above 100 for all white crappie inch groups and near or above 100 for black crappie inch groups.

Fisheries management plan for Lake O' the Pines, Texas

Prepared – July 2007

ISSUE 1: Hydrilla coverage has increased since 2002 from 700 acres to 3,000 acres in the upper end of the reservoir. While hydrilla currently provides the majority of vegetated habitat for largemouth bass and sunfish species, it may cause access problems for anglers.

MANAGEMENT STRATEGY

1. Monitor hydrilla abundance at boat ramps and along boat roads in the upper end of the reservoir with periodic inspections.
2. Provide information regarding hydrilla abundance and technical guidance to controlling authority to facilitate hydrilla management strategies if angler/boater access is compromised.
3. Continue to release hydrilla flies in infested areas when available from the Lewisville Aquatic Ecosystem Research Facility.

ISSUE 2: Florida largemouth bass (FLMB) influence (percent FLMB alleles) has increased to >20% in Lake O' the Pines following supplemental stocking in 1998 and 2000. This level meets the management objectives for the reservoir. However, continued monitoring of population genetics is necessary to ensure management objectives continue to be met.

MANAGEMENT STRATEGIES

1. Conduct electrofishing survey in fall 2010 to assess Florida largemouth bass influence. If Florida largemouth bass alleles are <20%, request supplemental stocking for 2011 and 2012 at a rate of 25 fingerlings/acre.
2. Conduct standard electrofishing survey during fall 2010 to monitor the largemouth bass and prey species populations.

ISSUE 3: Anglers and stakeholders need to be informed about fisheries management activities, fishing opportunities, and other issues on Lake O' the Pines.

MANAGEMENT STRATEGIES

1. Continue to provide news releases to the print and broadcast media.
2. Continue to provide fisheries presentations to public regarding issues/angling opportunities at Lake O' the Pines.

ISSUE 4: Lake O' the Pines contains several good quality fisheries; however, a full-year angler creel survey has never been conducted to assess angling effort, catch, and harvest.

MANAGEMENT STRATEGIES

1. Conduct a roving angler creel survey June 2010-May2011.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes an angler creel survey from June 2010 through May 2011, largemouth bass genetic analyses in 2010, vegetation/habitat survey in 2010, and required monitoring surveys with electrofishing, trap netting, and gill netting in 2010/2011 (Table 6). Hydrilla coverage will be monitored in order to identify problems associated with angler access.

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DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

Ryan, M. J., and M. W. Brice. 2003. Statewide freshwater fisheries monitoring and management program survey report for Lake O' the Pines, 2002. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

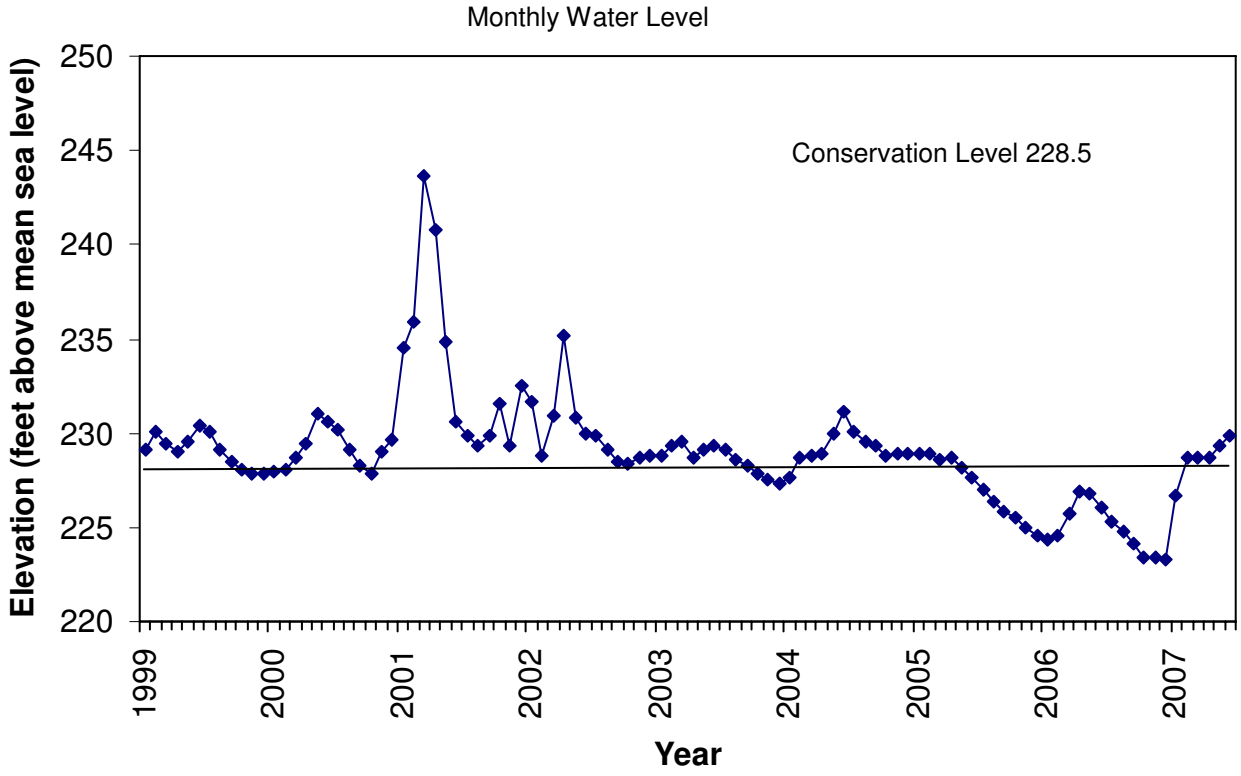


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lake O' the Pines, Texas. The horizontal line denotes conservation pool elevation.

Table 1. Characteristics of Lake O' the Pines, Texas.

Characteristic	Description
Year constructed	1956
Controlling authority	U. S. Army Corps of Engineers
Counties	Marion, Morris, Upshur, and Camp
Reservoir type	Mainstream
Shoreline development index (SDI)	7.5
Conductivity	178 umhos/cm

Table 2. Harvest regulations for Lake O' the Pines, 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
Bass, palmetto	5	18 - No Limit
Bass: largemouth	5[a]	14 – No Limit
Bass: spotted	5[a]	No Limit - No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10[b] - No Limit

[a] Daily bag for largemouth bass and spotted bass = 5 in any combination.
[b] For black and white crappie caught from 1 December through the last day of February, there is no minimum length limit, daily bag = 25 in any combination, and all crappie caught must be retained.

Table 3. Stocking history of Lake O' the Pines, Texas. Size categories are FRY =<1 inch, FGL = 1-3 inches, AFGL = 8 inches, and UNK = unknown.

Species	Year	Number	Size
Blue catfish	1971	19,654	UNK
	1994	307,248	FGL
	Total	326,902	
Channel catfish	1968	206,000	AFGL
	1969	27,000	AFGL
	1970	317,763	AFGL
	Total	550,763	
Florida largemouth bass	1982	500	AFGL
	1982	59,838	FGL
	1983	306,332	FGL
	1992	468,146	FGL
	1993	458,002	FGL
	1998	467,500	FGL
	2000	447,154	FGL
	Total	2,207,472	
Paddlefish	1992	15,401	UNK
	1998	9,646	UNK
	Total	25,047	
Palmetto bass	1977	157,505	UNK
	1979	180,000	UNK
	1981	177,815	UNK
	1994	191,338	FGL
	1995	280,754	FGL
	1996	140,612	FRY
	1997	50,658	FGL
	1998	191,837	FGL
	1999	62,182	FGL
	2000	44,931	FGL
	Total	1,477,632	
Smallmouth bass	1980	285,000	UNK
	1982	30,000	UNK
	Total	315,000	

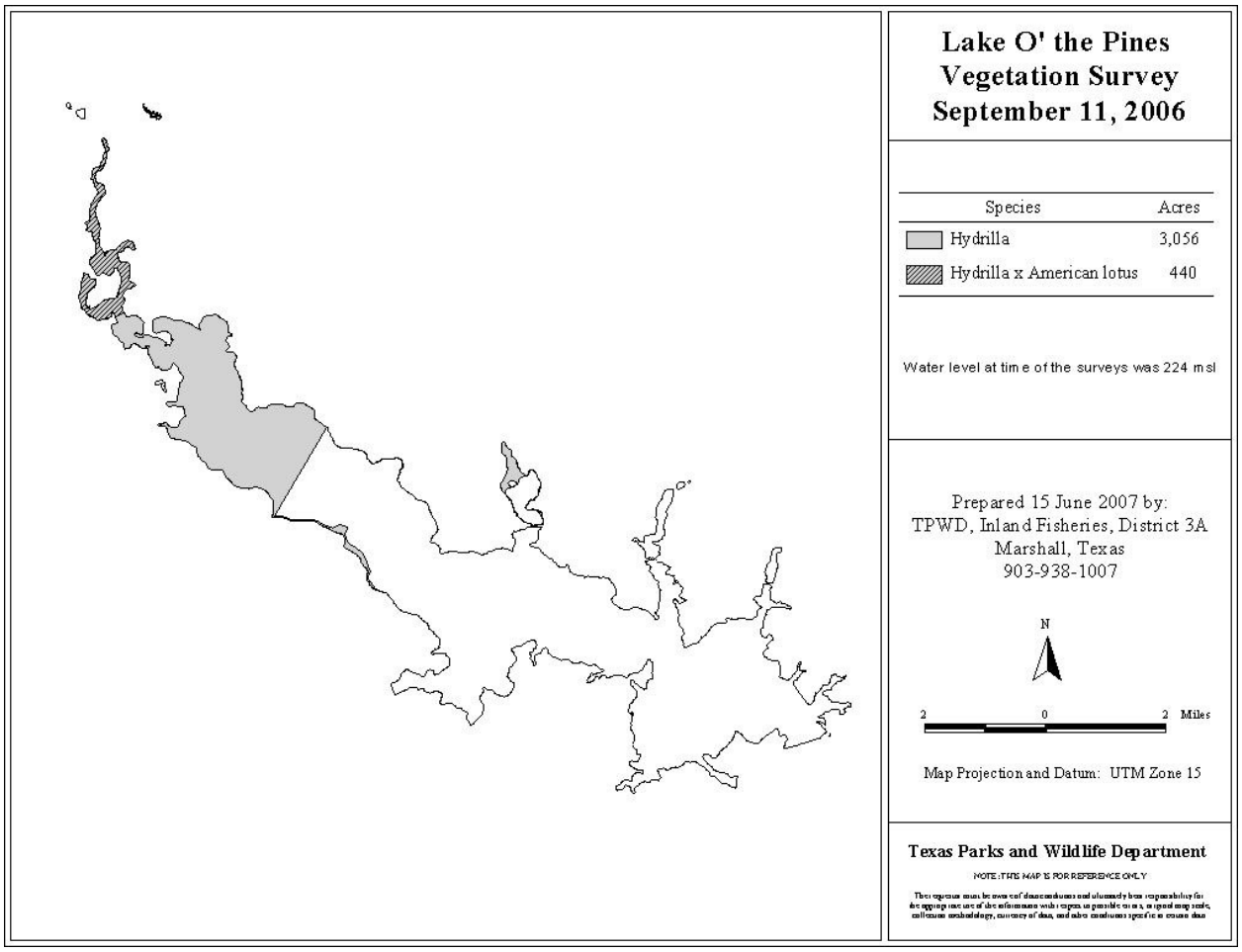
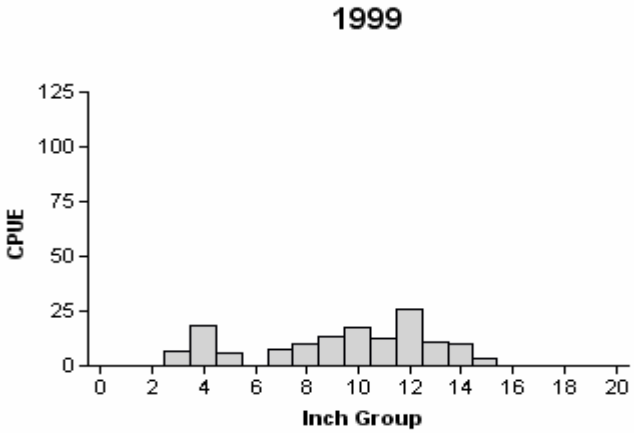


Figure 2. Results of 2006 summer survey of aquatic vegetation in Lake O' the Pines, Texas. Water level was 4.5 feet low at time of survey.

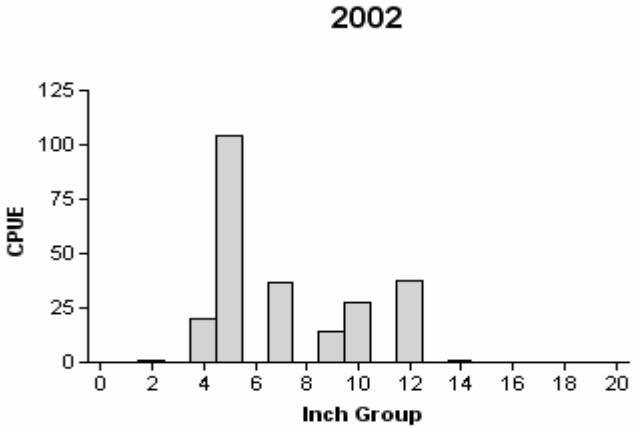
Table 4. Survey of aquatic vegetation, Lake O' the Pines, Texas, 2006. Surface area (acres) and percent of reservoir surface area was determined for dominant aquatic vegetation species. Water level was 4.5 feet low at time of survey.

Species	Acres	Percent of reservoir surface area
Hydrilla	3,056	19
Hydrilla and American lotus	440	3

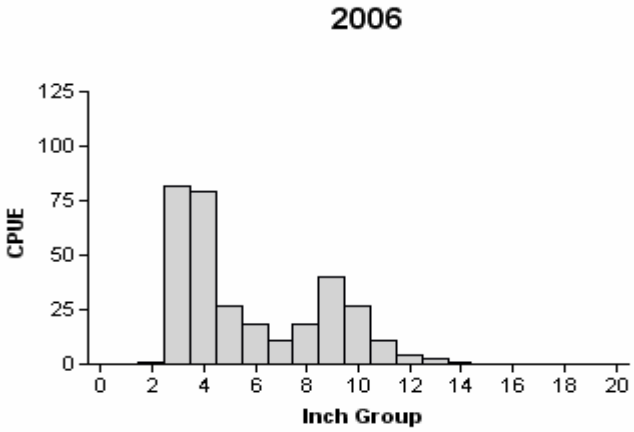
Gizzard Shad



Effort = 1.9
Total CPUE = 141.4 (17; 271)
Stock CPUE = 110.6 (16; 212)
PSD = 56 (5.7)
IOV = 27.21 (6.6)



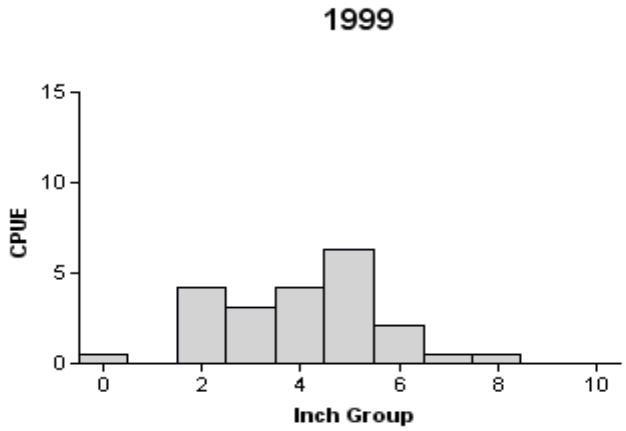
Effort = 2.0
Total CPUE = 242.0 (13; 484)
Stock CPUE = 117.0 (9; 234)
PSD = 33 (3.2)
IOV = 64.93 (4.3)



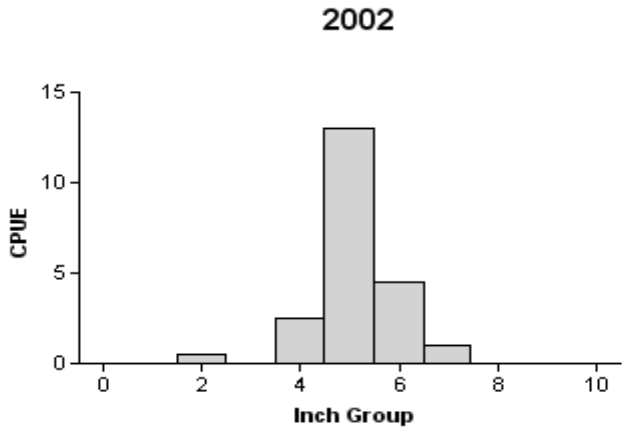
Effort = 2.0
Total CPUE = 321.0 (15; 642)
Stock CPUE = 114.5 (16; 229)
PSD = 16 (3.1)
IOV = 67.76 (4.9)

Figure 3. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for PSD and IOV are in parentheses) for fall electrofishing surveys, Lake O' the Pines, Texas, 1999, 2002, and 2006.

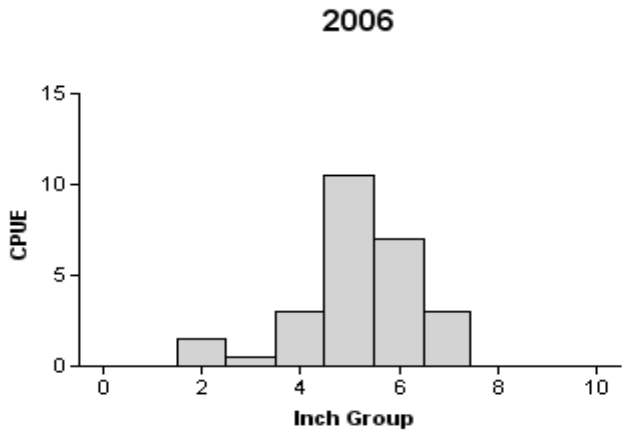
Redbreast Sunfish



Effort = 1.9
Total CPUE = 21.4 (39; 41)
Stock CPUE = 16.7 (40; 32)
PSD = 19 (3)
RSD-P = 3 (3.2)



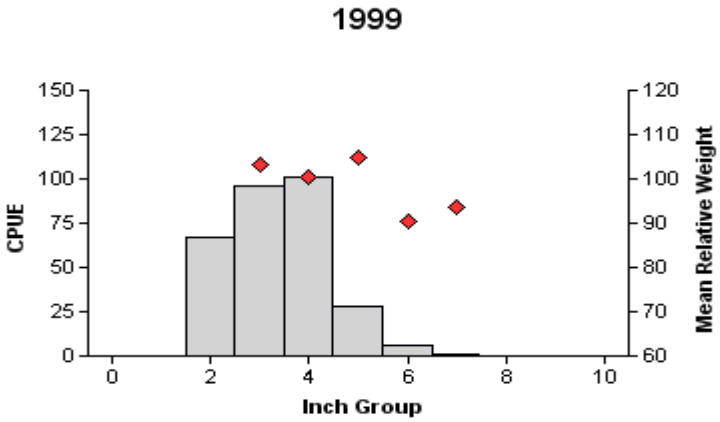
Effort = 2.0
Total CPUE = 21.5 (57; 43)
Stock CPUE = 21.0 (58; 42)
PSD = 26 (8.7)
RSD-P = 0 (0)



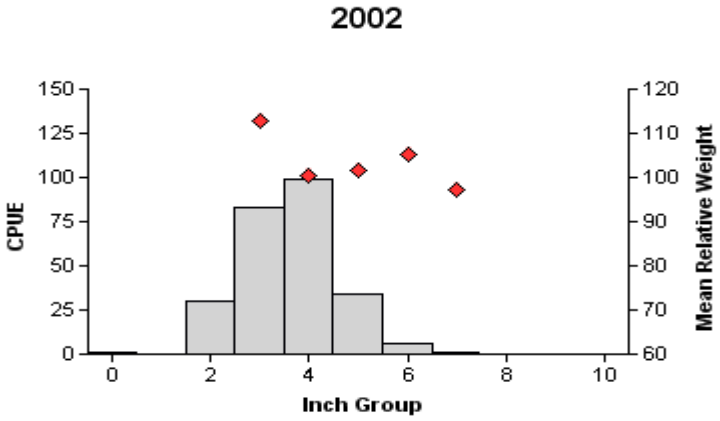
Effort = 2.0
Total CPUE = 25.5 (39; 51)
Stock CPUE = 24.0 (38; 48)
PSD = 42 (7.5)
RSD-P = 0 (0)

Figure 4. Number of redbreast sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake O' the Pines, Texas, 1999, 2002, and 2006.

Bluegill



Effort = 1.9
Total CPUE = 297.9 (16; 571)
Stock CPUE = 231.1 (14; 443)
PSD = 3 (0.8)
RSD-P = 0 (0)

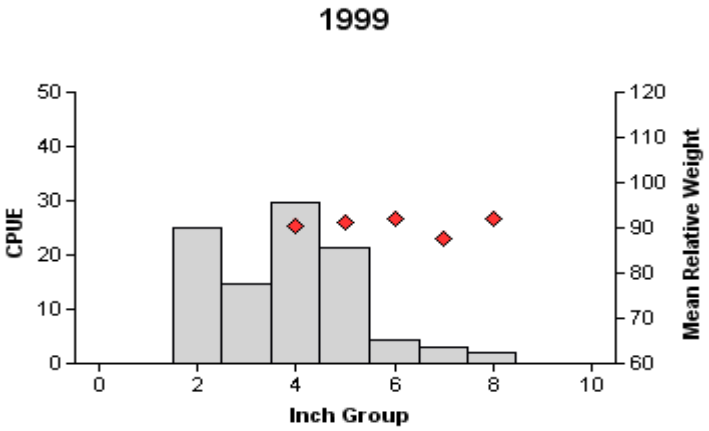


Effort = 2.0
Total CPUE = 255.5 (16; 511)
Stock CPUE = 224.0 (16; 448)
PSD = 3 (0.8)
RSD-P = 0 (0)

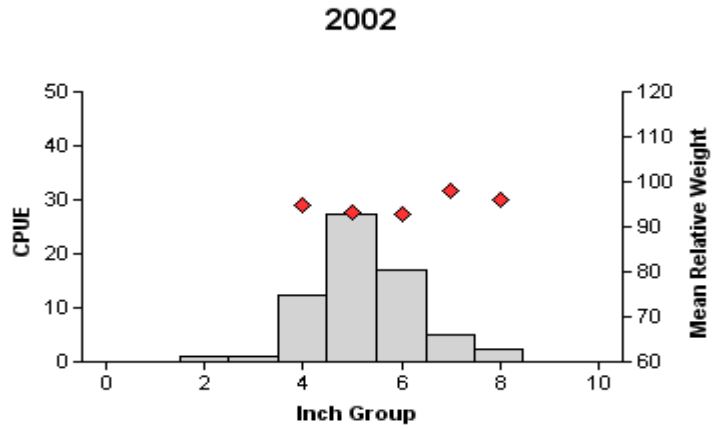
Effort = 2.0
Total CPUE = 288.5 (23; 577)
Stock CPUE = 260.5 (24; 521)
PSD = 4 (1.1)
RSD-P = 0 (0)

Figure 5. Number of bluegill caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake O' the Pines, Texas, 1999, 2002, and 2006.

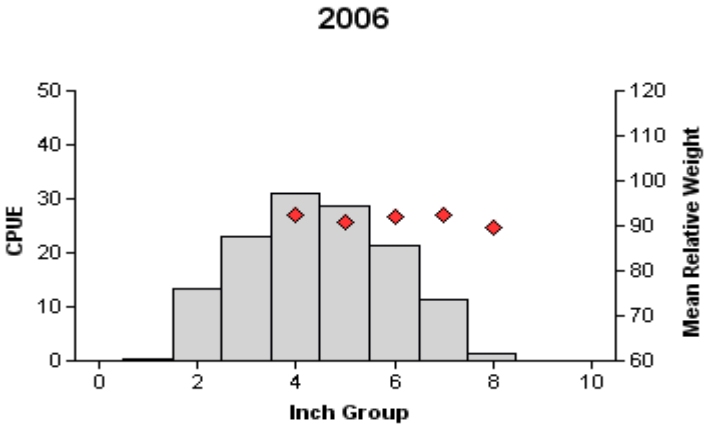
Redear Sunfish



Effort = 1.9
Total CPUE = 100.2 (24; 192)
Stock CPUE = 60.5 (25; 116)
PSD = 9 (3.4)
RSD-P = 0 (0)



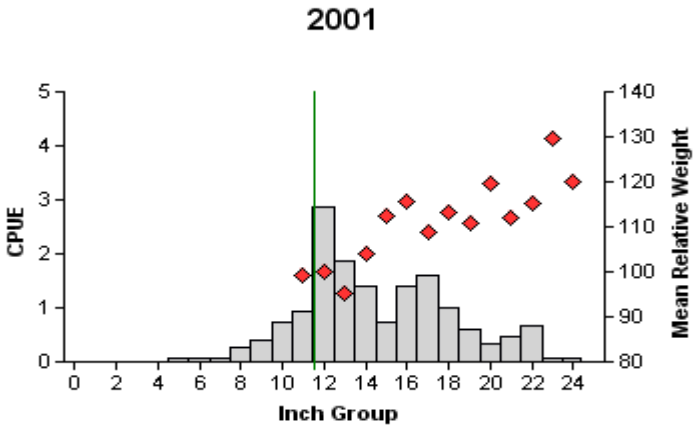
Effort = 2.0
Total CPUE = 66.5 (21; 133)
Stock CPUE = 64.5 (21; 129)
PSD = 12 (3.5)
RSD-P = 0 (0)



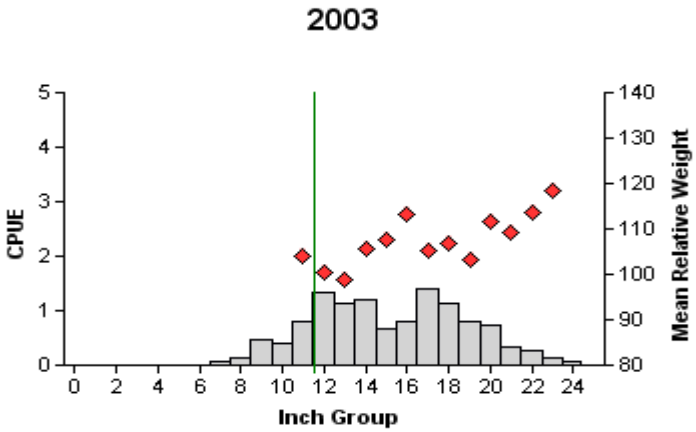
Effort = 2.0
Total CPUE = 131.0 (14; 262)
Stock CPUE = 94.0 (18; 188)
PSD = 14 (4.2)
RSD-P = 0 (0)

Figure 6. Number of redear sunfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lake O' the Pines, Texas, 1999, 2002, and 2006.

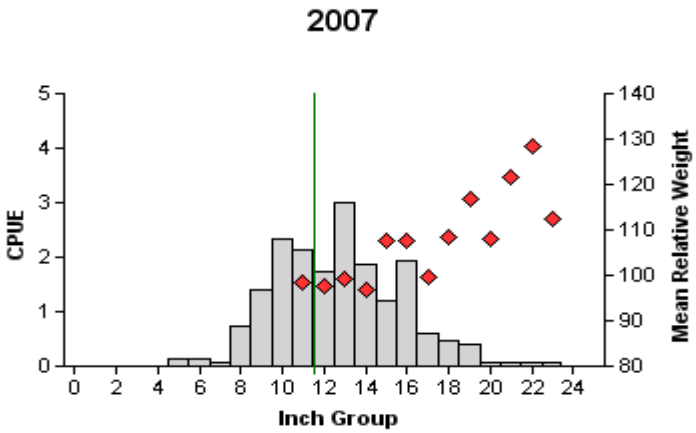
Channel Catfish



Effort = 15.0
Total CPUE = 15.6 (15; 234)
Stock CPUE = 14.0 (15; 210)
PSD = 44 (5.5)
RSD-P = 0 (0.5)



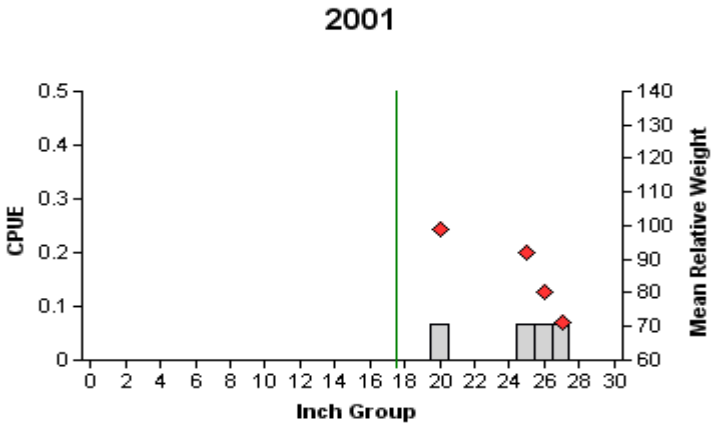
Effort = 15.0
Total CPUE = 11.9 (21; 178)
Stock CPUE = 10.8 (22; 162)
PSD = 52 (6.1)
RSD-P = 1 (0.7)



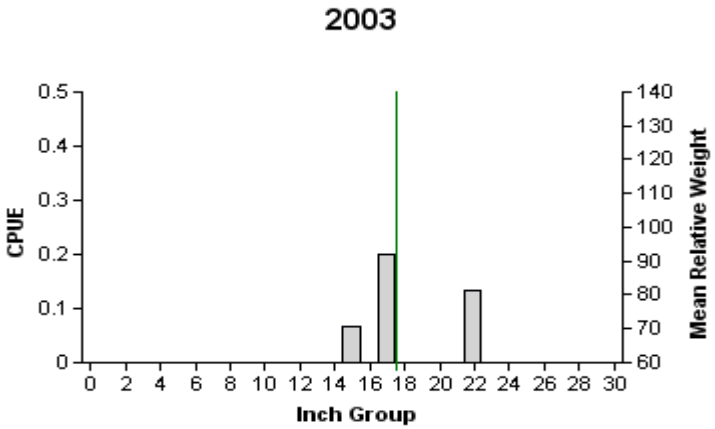
Effort = 15.0
Total CPUE = 18.4 (13; 276)
Stock CPUE = 13.6 (17; 204)
PSD = 27 (5.4)
RSD-P = 0 (0)

Figure 7. 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, Lake O' the Pines, Texas, 2001, 2003, and 2007. Vertical line indicates minimum length limit.

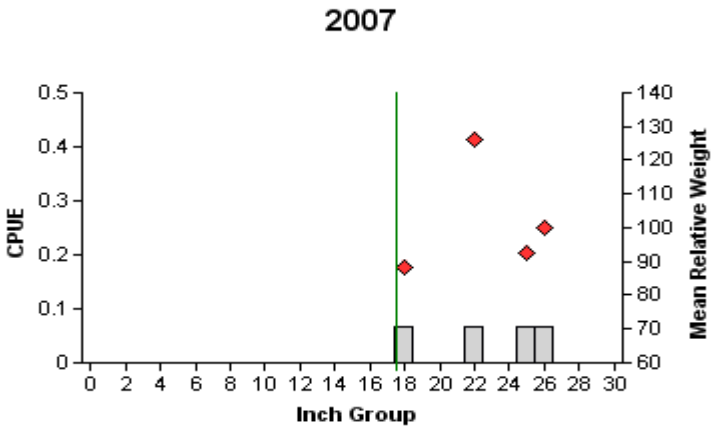
Flathead Catfish



Effort = 15.0
Total CPUE = 0.3 (57; 4)
Stock CPUE = 0.3 (57; 4)
PSD = 100 (0)
RSD-P = 0 (0)



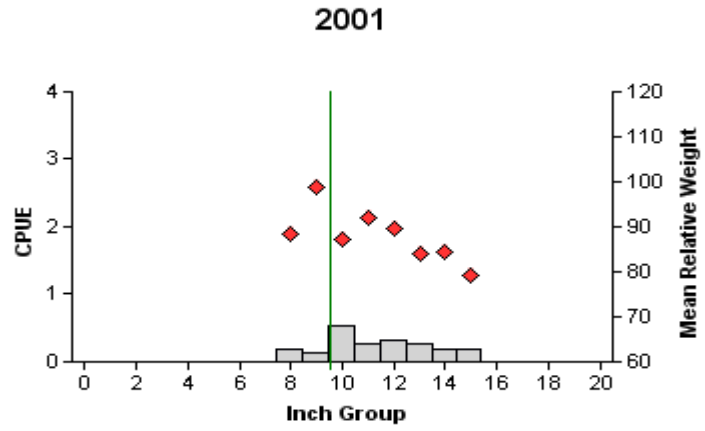
Effort = 15.0
Total CPUE = 0.4 (68; 6)
Stock CPUE = 0.4 (68; 6)
PSD = 33 (14.2)
RSD-P = 0 (0)



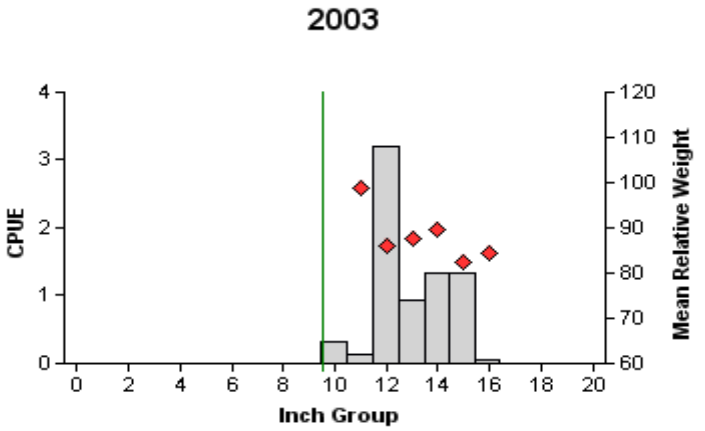
Effort = 15.0
Total CPUE = 0.3 (56; 5)
Stock CPUE = 0.3 (56; 5)
PSD = 80 (15.5)
RSD-P = 20 (15.5)

Figure 8. Number of flathead 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, Lake O' the Pines, Texas, 2001, 2003, and 2007. Vertical line indicates minimum length limit.

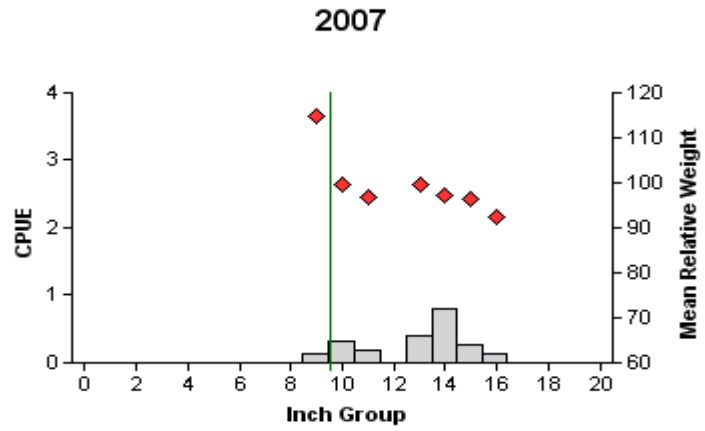
White Bass



Effort = 15.0
Total CPUE = 2.1 (34; 32)
Stock CPUE = 2.1 (34; 32)
PSD = 91 (6.1)
RSD-P = 47 (6.5)



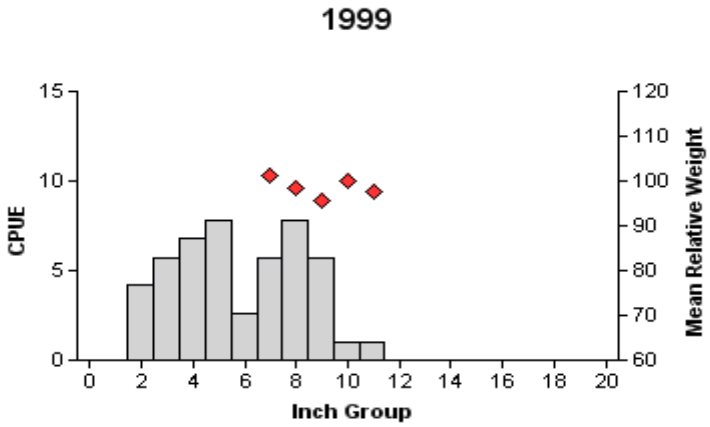
Effort = 15.0
Total CPUE = 7.3 (27; 110)
Stock CPUE = 7.3 (27; 110)
PSD = 100 (0.0)
RSD-P = 94 (2.4)



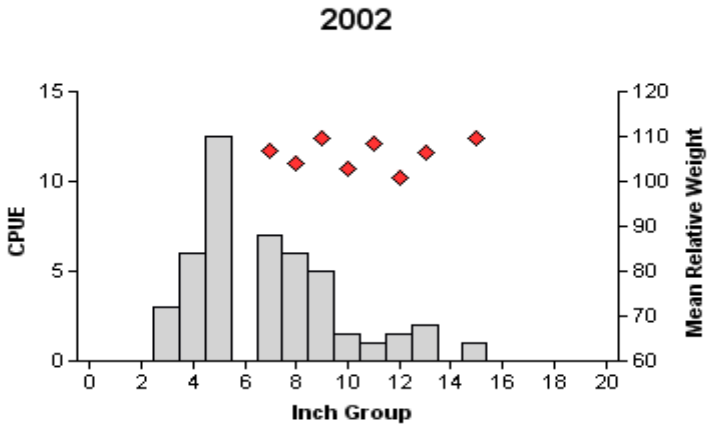
Effort = 15.0
Total CPUE = 2.3 (33; 34)
Stock CPUE = 2.3 (33; 34)
PSD = 100 (0)
RSD-P = 71 (10)

Figure 9. 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, Lake O' the Pines, Texas, 2001, 2003, and 2007. Vertical line indicates minimum length limit.

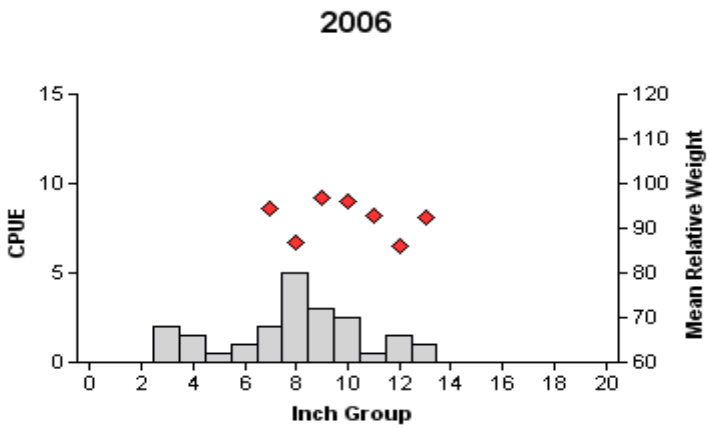
Spotted Bass



Effort = 1.9
Total CPUE = 48.5 (30; 93)
Stock CPUE = 21.4 (36; 41)
PSD = 5 (3.1)
RSD-P = 0 (0)



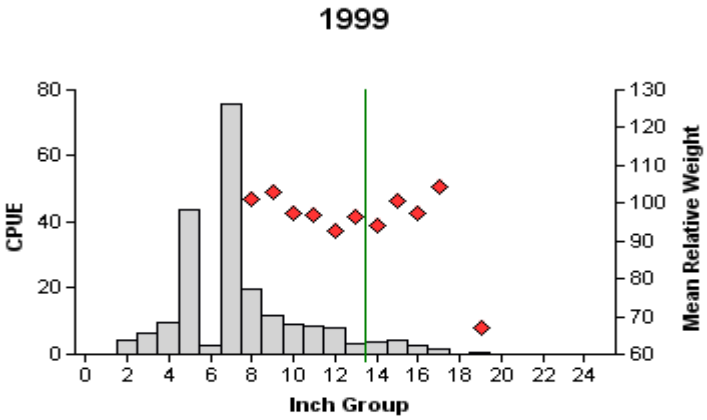
Effort = 2.0
Total CPUE = 46.5 (29; 93)
Stock CPUE = 25.0 (28; 50)
PSD = 22 (6.1)
RSD-P = 4 (2.7)



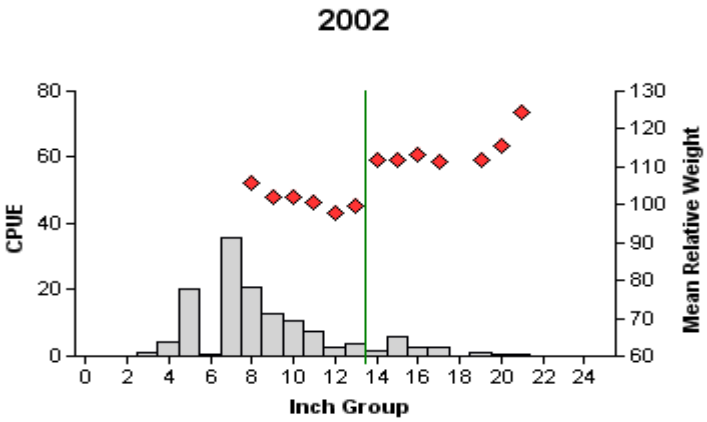
Effort = 2.0
Total CPUE = 20.5 (23; 41)
Stock CPUE = 15.5 (22; 31)
PSD = 19 (5.3)
RSD-P = 0 (0)

Figure 10. 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, Lake O' the Pines, Texas, 1999, 2002, and 2006.

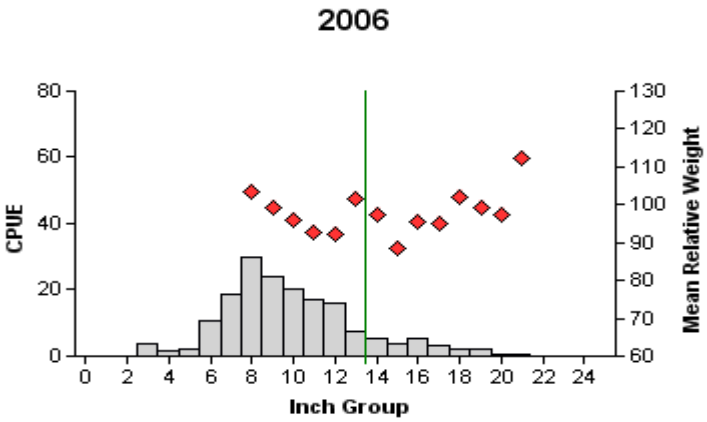
Largemouth Bass



Effort = 1.9
Total CPUE = 214.4 (14; 411)
Stock CPUE = 72.5 (13; 139)
PSD = 32 (4.8)
RSD-P = 12 (3.5)



Effort = 2.0
Total CPUE = 135.0 (12; 270)
Stock CPUE = 73.0 (14; 146)
PSD = 29 (4.3)
RSD-P = 18 (3.6)



Effort = 2.0
Total CPUE = 173.5 (16; 347)
Stock CPUE = 137.5 (18; 275)
PSD = 33 (3.3)
RSD-P = 12 (2.7)

Figure 11. 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, Lake O' the Pines, Texas, 1999, 2002, and 2006. Vertical line indicates minimum length limit.

Table 5. Results of genetic analysis of age-0 largemouth bass collected by fall electrofishing, Lake O' the Pines, Texas, 1999, 2002, and 2006. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB.

Year	Sample size	Genotype				% FLMB alleles	% pure FLMB
		FLMB	F1	Fx	NLMB		
1999	30	0	3	10	17	15.0	0
2002	48	0	4	10	21	20.6	0
2006	38	0	NA	34[a]	4	27.9	0

[a] Determination of hybrid status not conducted.

White Crappie

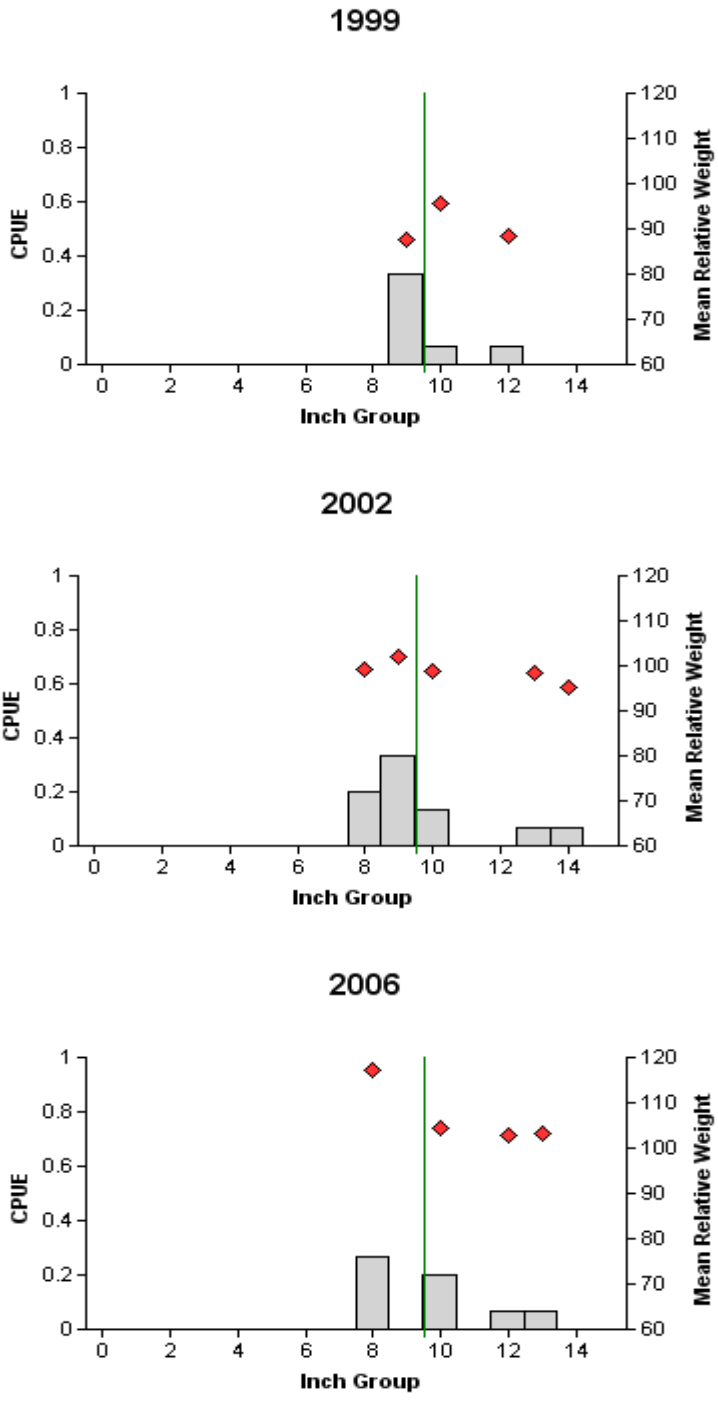
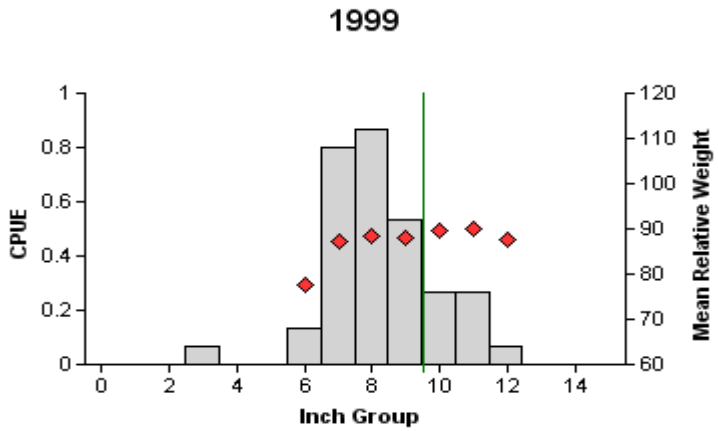
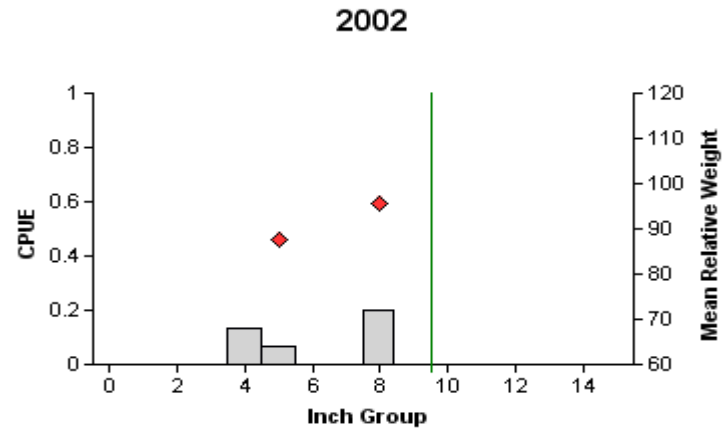


Figure 12. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake O' the Pines, Texas, 1999, 2002, and 2006. Vertical line indicates minimum length limit.

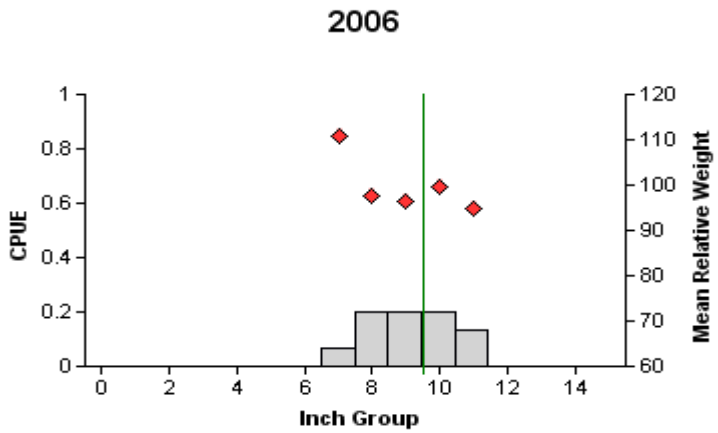
Black Crappie



Effort = 15.0
Total CPUE = 3.0 (63; 45)
Stock CPUE = 2.9 (64; 44)
PSD = 68 (1.5)
RSD-P = 20 (3.9)



Effort = 15.0
Total CPUE = 0.4 (68; 6)
Stock CPUE = 0.3 (77; 4)
PSD = 75 (9.2)
RSD-P = 0 (0)



Effort = 15.0
Total CPUE = 0.8 (48; 12)
Stock CPUE = 0.8 (48; 12)
PSD = 92 (8.4)
RSD-P = 42 (8.4)

Figure 13. Number of black crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Lake O' the Pines, Texas, 1999, 2002, and 2006. Vertical line indicates minimum length limit.

Table 6. Proposed sampling schedule for Lake O' the Pines, Texas. Gill netting surveys are conducted in the spring, electrofishing and trap netting surveys are conducted in the fall, and vegetation/habitat surveys are conducted in the summer. Standard survey denoted by S and additional survey denoted by A.

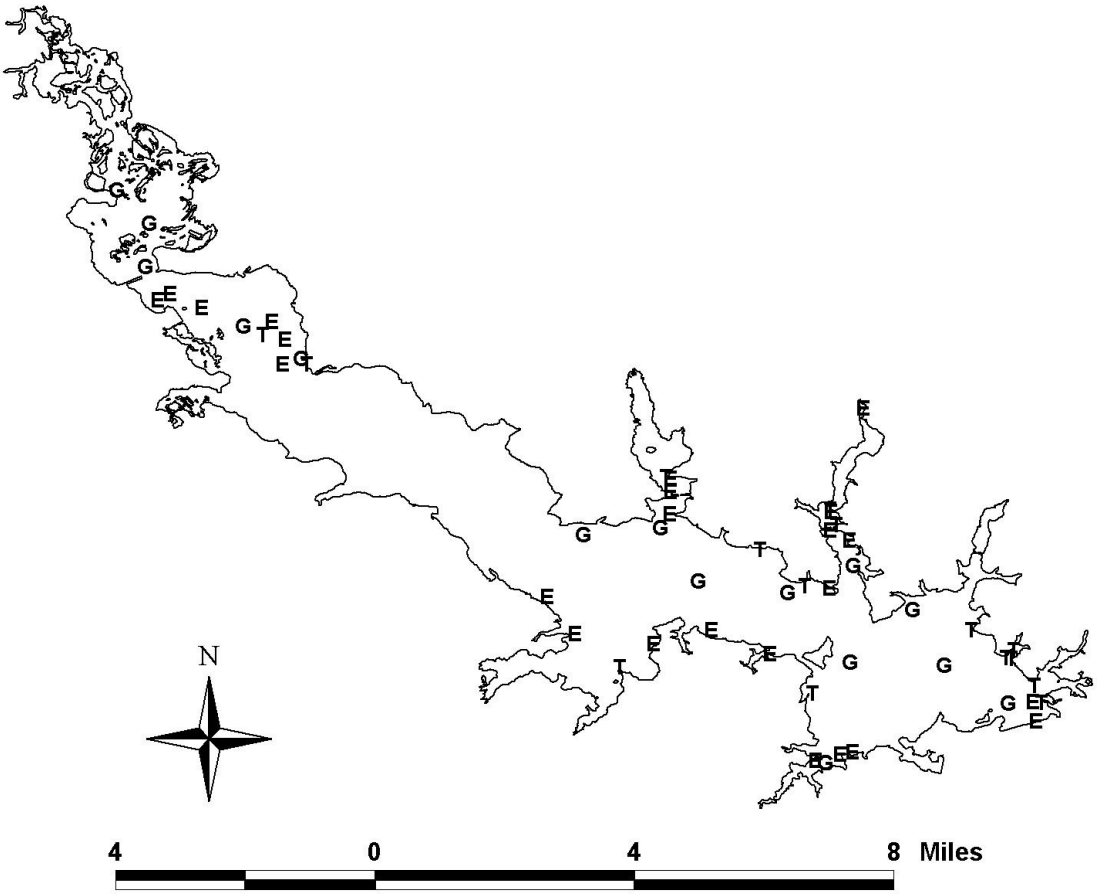
Survey Year	Vegetation	Electrofisher	Trap Net	Gill Net	Creel	Report
June 2010- May 2011	S	S	S	S	A	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lake O' the Pines, Texas, 2006-2007.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					642	321.0
Threadfin shad					205	102.5
Channel catfish	276	18.4				
Flathead catfish	5	0.33				
Redbreast sunfish					51	25.5
Warmouth					7	3.5
Orange spotted sunfish					2	1.0
Bluegill					577	288.5
Longear sunfish					74	37.0
Redear sunfish					262	131.0
Spotted sunfish					11	5.5
Bantam sunfish					3	1.5
Spotted bass					41	20.5
Largemouth bass					347	173.5
White crappie			9	0.6		
Black crappie			12	0.8		

APPENDIX B



Location of sampling sites, Lake O' the Pines, Texas, 2006-2007. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. Water level approximately 5 feet below full pool at time of electrofishing and trap netting, but close to full pool at time of gill netting.