PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-30

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2004 Survey Report

Lake Somerville

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July 31, 2005

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EXECUTIVE SUMMARY

Lake Somerville was surveyed during the period June 2004 to May 2005 using electrofishing, trap netting, gill netting, a littoral zone habitat survey, an aquatic vegetation survey, and an angler access and facilities survey. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Lake Somerville is an 11,460-acre flood control reservoir constructed by the U.S. Army Corps of Engineers on Yegua Creek in Burleson and Washington Counties, Texas. Principle tributaries are Middle Yegua, West Yegua, and Nails Creeks. Lake Somerville has a drainage area of approximately 1,006 square miles, a shoreline length of 104 miles, and a shoreline development ratio of 5.7. The reservoir has a mean depth of 11 feet and a maximum depth of 38 feet. Average rainfall in the watershed is 39 inches per year. The reservoir lies within the Post Oak Savannah Land Resource Area with soils consisting of Falba-Burlewash, Kaufman-Gowen, and Tabor-Axtell associations. Land uses around the reservoir are primarily agricultural and recreational.

- **Prey species:** In past years, threadfin shad were the predominant prey species in Lake Somerville. In 2004, the electrofishing catch rate for threadfin shad was down to 174.0 fish/hour, the lowest since 1994. The electrofishing catch rate of gizzard shad was 304.0 fish/hour. Most individuals in the sample are less than 8 inches and available as prey. Bluegill and longear sunfish make up the bulk of sunfish prey with catch rates in 2004 of 313.5 fish/hour and 134.0 fish/hour, respectively. Other prey species include bullhead minnow, inland silverside, blacktail shiner, green sunfish, warmouth, and redear sunfish.

- **Catfishes:** Gill net catch rates of blue catfish have increased since 1994. The catch rate in 2005 was 2.7 fish/net night; an increase from 0.6 in 2001 and 1.7 in 2004. Length frequency data indicates a recruiting population with high growth potential. One individual in the 2005 sample was 42 inches. The sample PSD was 53.

  Lake Somerville supports a substantial population of channel catfish. The gill net catch rate in 2005 was 11.1 fish/net night, down from 2001 (20.3 fish/net night) but still higher than 9.9 fish/net night captured in 1997. Fish in inch groups from 7 through 22 inches were captured, suggesting adequate recruitment. The PSD was 20 and the RSD-12 was 96, indicating that the population contains good numbers of quality-sized fish.

  Creel results from 2001-2002 indicate low directed effort for catfishes (0.7 angler hours/acre), yet angler catch rates are very high at 3.3 fish/angler-hour.

- **White bass and palmetto bass**: Gill net CPUE of white bass was much lower in 2005 (5.8 fish/net night) than in 2004 (17.7 fish/net night). Proportional Stock Density was 100 in both years, and RSD-P was 97 in 2005 and 67 in 2004. Gill net CPUE of palmetto bass

was 2.5 fish/net night in 2005 and was similar to that of 2004 (2.3 fish/net night). However, the relative abundance of legal-length fish was much lower in 2005 than it was in 2004 or 2003. The RSD-18 was 3 in 2005; a decrease from 65 in 2004 and 48 in 2003. This is probably the result of missing year classes in 2001 and 2003.

The creel survey in 2001-2002 indicates a popular fishery for temperate basses. Directed effort by anglers seeking palmetto bass was 0.3 hours/acre and 1.4 hours/acre for anglers seeking white bass. The angler catch rate of white bass was the highest for all species at 6.7 fish/angler-hour. Anglers seeking that species harvested an estimated 19,195 white bass. This estimate is presumed to be low being based solely on anglers targeting white bass in the creel survey. It does not account for anglers targeting temperate basses as a species group. Over 7,000 additional hours were reported for anglers seeking temperate basses.

- **Black basses:** The electrofishing CPUE of largemouth bass increased greatly since 2000 from 7.0 fish/hour to 76.5 fish/hour. The low catch in 2000 was probably due to low water conditions. The 2004 catch rate is the highest since 1992. The sample was distributed across sizes from 3 to 21 inches TL. The PSD was 47 and RSD-P was 23. Electrophoretic analysis of 50 age-0 largemouth bass resulted in a Florida largemouth bass allele frequency of 58.0% with 20% pure Florida largemouth bass genotypes. The results of the 2001-2002 creel survey indicate that the largemouth bass fishery is very popular with anglers. Directed angling effort for largemouth bass was 2.1 hours/acre and an estimated total of 24,982 bass were caught by anglers seeking that species.

- **Crappie:** The trap net CPUE for white crappie was high in 1997 (9.5 fish/net night) and even higher in 2001 (17.7 fish/net night), the highest we have ever recorded. However, by the fall of 2004, the catch decreased to 1.6 fish/net night. Though relative abundance was low, the catch was well distributed across lengths from 4 to 12 inches with PSD=96 and RSD-10=57. The low CPUE is evidence of a decline in relative abundance possibly due to a succession of poor recruitment years beginning in 2000 when water levels were low during spring and summer. Also, the creel survey from 2001-2002 revealed that crappie were the most targeted species at Lake Somerville resulting in an estimated total harvest of 14,900 crappie that year alone. The total angler catch of crappie in 2001-2002 was estimated to be 55,000. Only one black crappie was caught in the fall 2004 trap netting survey; a decrease from 35 in 2000. Again, poor recruitment classes from 2000 and subsequent years is probably the reason for the decline in relative abundance of black crappie. The growth rate of crappie is high in Lake Somerville. White crappie reach legal size (10 inches) by age 1 and black crappie by age 2.

- **Management Strategies:** TPWD will continue to monitor the temperate bass populations annually with gill nets. The centrarchid and ictalurid fisheries will be monitored again in 2008-2009.

The creel results from 2001-2002 indicate that the crappie fishery is heavily exploited and numbers of crappie in our 2004 trap netting survey were much lower than they were in the 2000 survey. We will survey the crappie population again with trap nets in the fall of 2005.

The abundance of hydrilla has decreased in the past two years and is no longer a serious problem. TPWD will work with the U.S. Army Corps of Engineers to continue monitoring and, if necessary, control this species should it become a problem again. TPWD will also consider the feasibility of enhancing the diversity of the native plant community in the reservoir.

INTRODUCTION

This document is a summary of fisheries data collected from Lake Somerville in 2004-2005. 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. Management strategies are included to address existing problems or opportunities. Historical data are presented with the 2004-2005 data for comparison.

Fish harvest regulations at Lake Somerville in 2004-2005.

Species	Bag Limit	Minimum length (inches)
Bass, largemouth	5	14
Bass, palmetto	5	18
Bass, white	25	10
Catfish, flathead	5	18
Catfish, channel and blue	25 (in any combination)	12
Crappie, white and black	25 (in any combination)	10

METHODS

- Fishes were collected from randomly selected stations by electrofishing (2.0 hours at 24 5-minute stations), gill nets (15 net nights in winter and 15 net nights in spring), and trap nets (15 net nights). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour of actual electrofishing, and for gill and trap nets as the number of fish caught in one net set overnight. Largemouth bass electrophoresis samples were collected according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual, revised 2004).

- Sampling statistics (CPUE for various length categories), structural indices [Proportional Stock Density (PSD) and Relative Stock Density (RSD)], and Relative Weight (Wr) indices were calculated for target fishes according to Anderson and Neumann (1996).

- Littoral zone/physical habitat and angler access surveys were conducted in accordance with Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual, revised 2004).

- A roving creel survey (36 days; 9 each quarter) was conducted from June 2001 through May 2002 to assess angling pressure, catch rates, and harvest rates according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual, revised 2004).

- Historical data is presented with the 2004-2005 data for comparison.

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.

TPWD, Inland Fisheries Division. 2004. Texas Inland Fishery Assessment Procedures. Unpublished manual, Austin, Texas.

Physical and historical data for Lake Somerville, Texas, 2004-2005.

Inland Fisheries water body code:	0680
IF District:	3E - Bryan
Controlling authority:	U.S.A.C.O.E.
Area:	11,460 acres
Counties:	Washington (location of dam), Lee, and Burleson
Latitude:	30° 50'
Longitude:	96° 20'
Nearest major metropolitan area and distance:	Bryan/College Station MSA - 25 miles
Reservoir description:	Tributary
River system:	Brazos
Shoreline length:	104 miles
Mean depth (ft):	11.0
Maximum depth (ft):	38.0
Shoreline development ratio:	5.2
Watershed (mi^2):	1,006
Secchi disc range (ft):	1-2
Conductivity (umhos/cm):	290-330
Constructed:	1967
Access:	
Boat:	Good
Bank:	Good
ADA access:	Fair

Survey History of Lake Somerville, Texas, 1974-2005.

Method	Year
Gill netting	1976, 1983, 1987, 1989, 1991, 1993, 1994, 1997, 2001, 2002, 2003, 2004, 2005
Electrofishing	1979, 1987, 1991, 1992, 1994, 1997, 2000, 2004
Trap netting	1976, 1987, 1988, 1989, 1990, 1991, 1992, 1994, 1997, 2000, 2004
Cove rotenone	1974, 1976, 1983
Creel survey	2001, 2002
Habitat survey	1994, 1997, 2000, 2004

Summary of aquatic vegetation survey, Lake Somerville, Texas, September 2004.

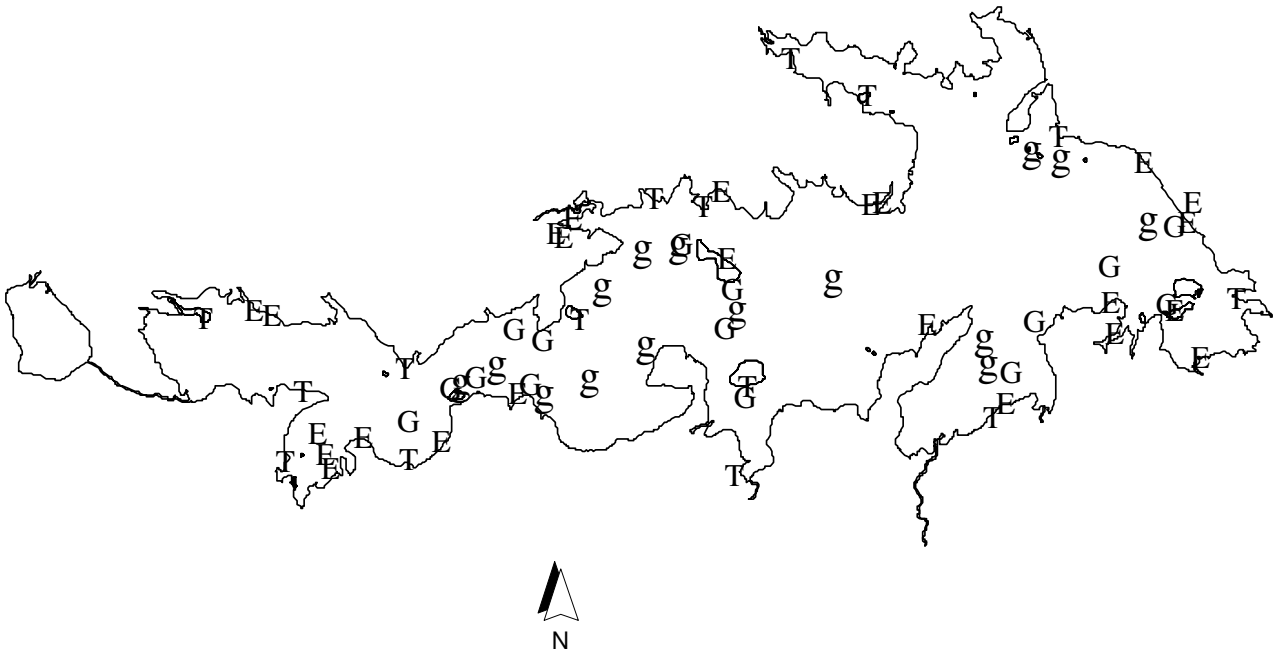
Vegetation type	Acreage	Percent of total
Native		
Native Emergent	666.3	5.8
Native Submergent	7.3	<0.1
Native Mixed (emergent/submergent)	238.8	2.1
Non-native		
Hydrilla	307	2.7
Alligator weed	Trace	

Stocking history of Lake Somerville, Texas.

Species	Year		Number
Blue catfish	1967		23,000
		Total	23,000
Channel catfish	1967		73,850
	1968		302,000
	1973		29,500
		Total	405,350
Palmetto bass	1975		50,000
	1977		72,649
	1979		128,500
	1981		67,416
	1983		76,912
	1984		250,576
	1985		144,271
	1986		170,600
	1987		184,600
	1988		232,347
	1989		232,497
	1991		116,651
	1992		178,626
	1993		92,723
	1994		170,800
	1995		324,800
	1996		173,638
	1997		50,215
	1998		177,621
	1999		85,436
	2000		29,800
	2002		22,020
	2004		115,312
		Total	3,148,010
Largemouth bass	1967		100,000
		Total	100,000
Florida largemouth bass	1990		287,680
	2000		287,642
	2001		259,707
		Total	835,029

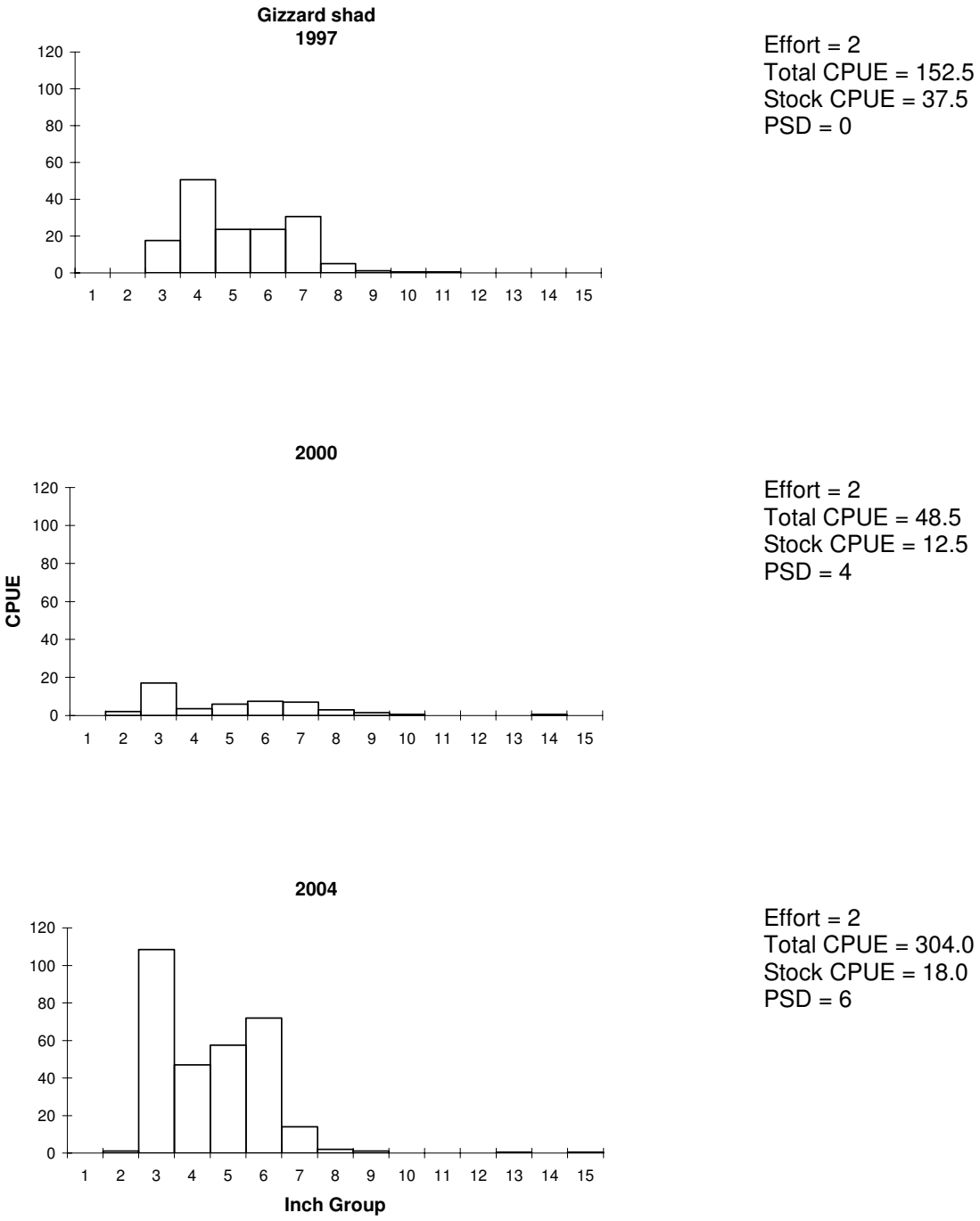
Stocking history of Lake Somerville, Texas, continued.

Species	Year		Number
White crappie	1967		4,000
		Total	4,000
Black crappie	1967		4,000
		Total	4,000
Walleye	1973		655,000
	1974		171,600
	1975		253,200
		Total	1,079,800

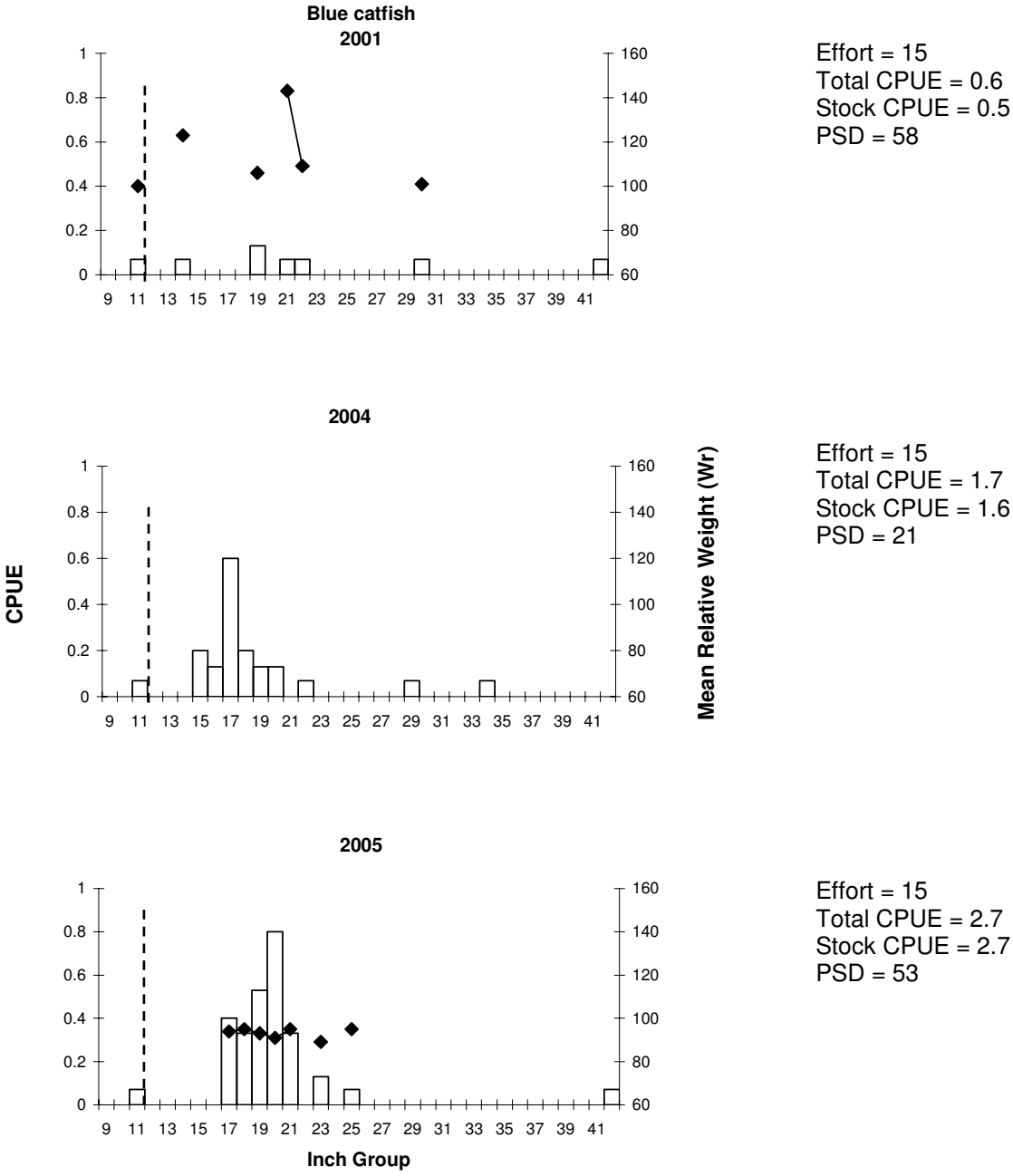


E: Electrofishing
T: Trap netting
G: Winter gill netting
g: Spring gill netting

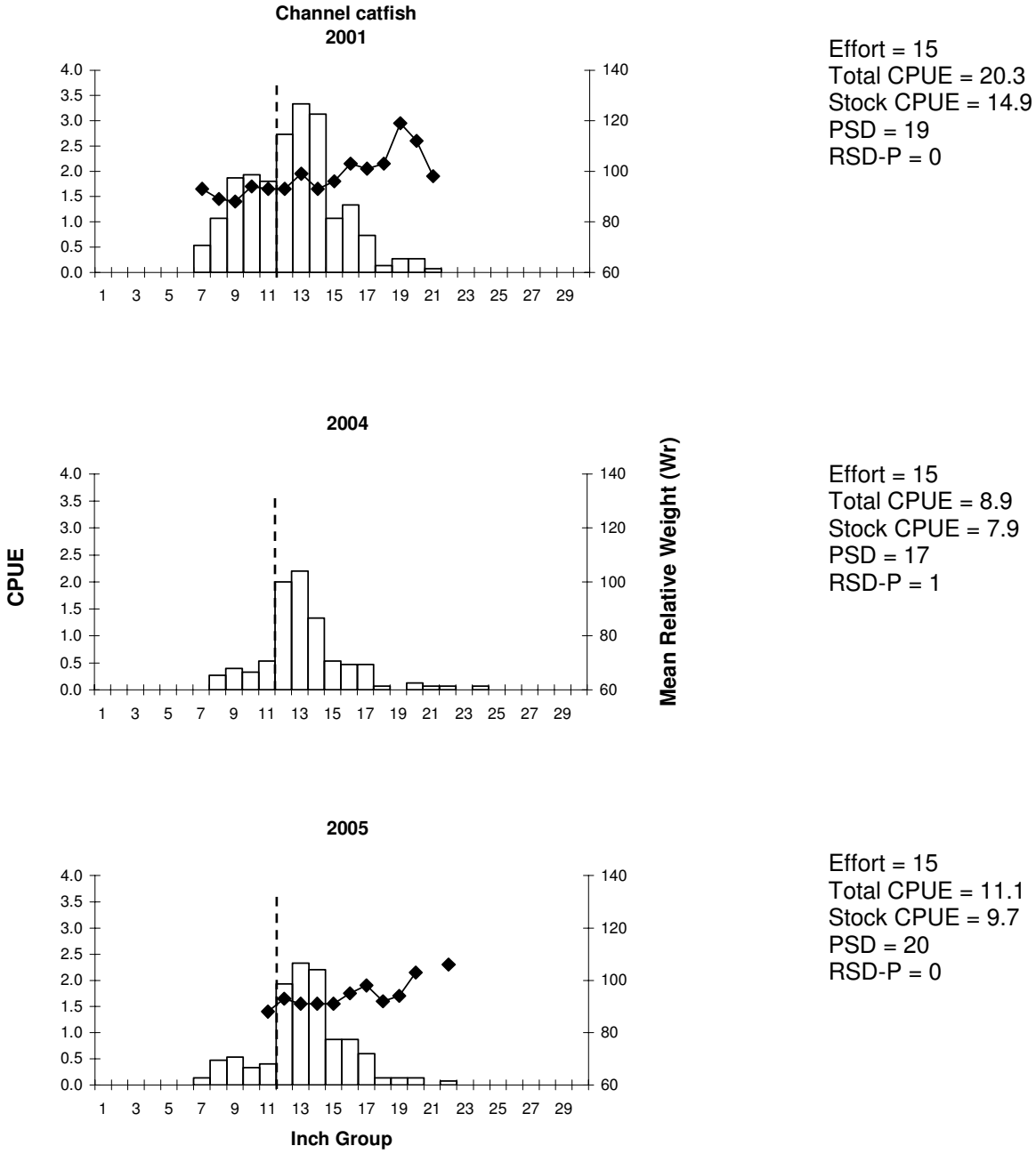
Location of fish community sampling stations, Lake Somerville, Texas, 2004-2005.



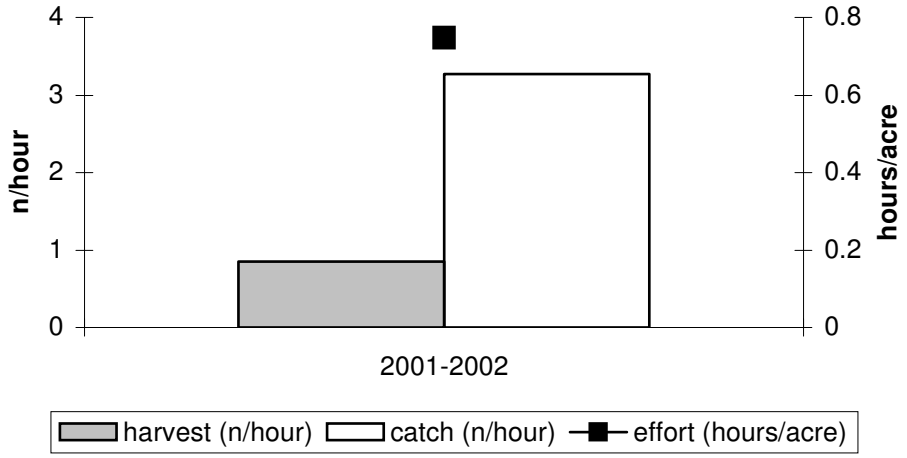
Number of gizzard shad caught per hour (CPUE, bars) and population indices for fall electrofishing surveys, Lake Somerville, Texas.



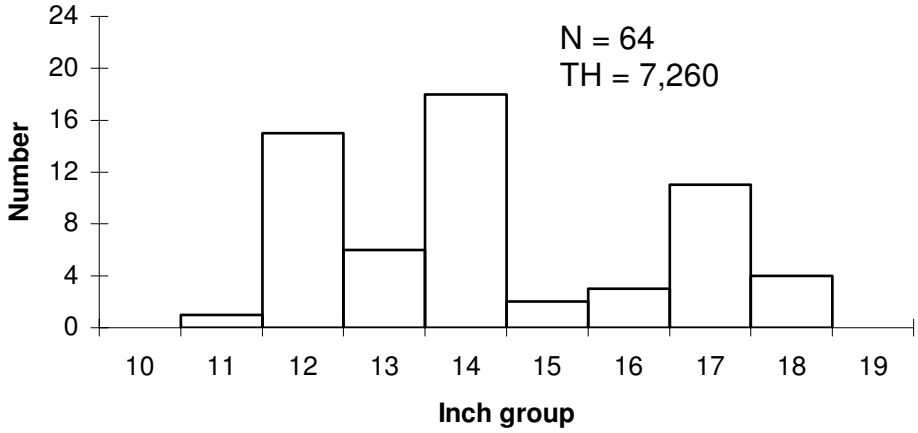
Number of blue catfish caught per net night (CPUE, bars), mean Relative Weight, (Wr, diamonds), and population indices for spring gill netting surveys, Lake Somerville, Texas. Relative Weight was not evaluated in 2004. Vertical dashed lines denote minimum legal length.



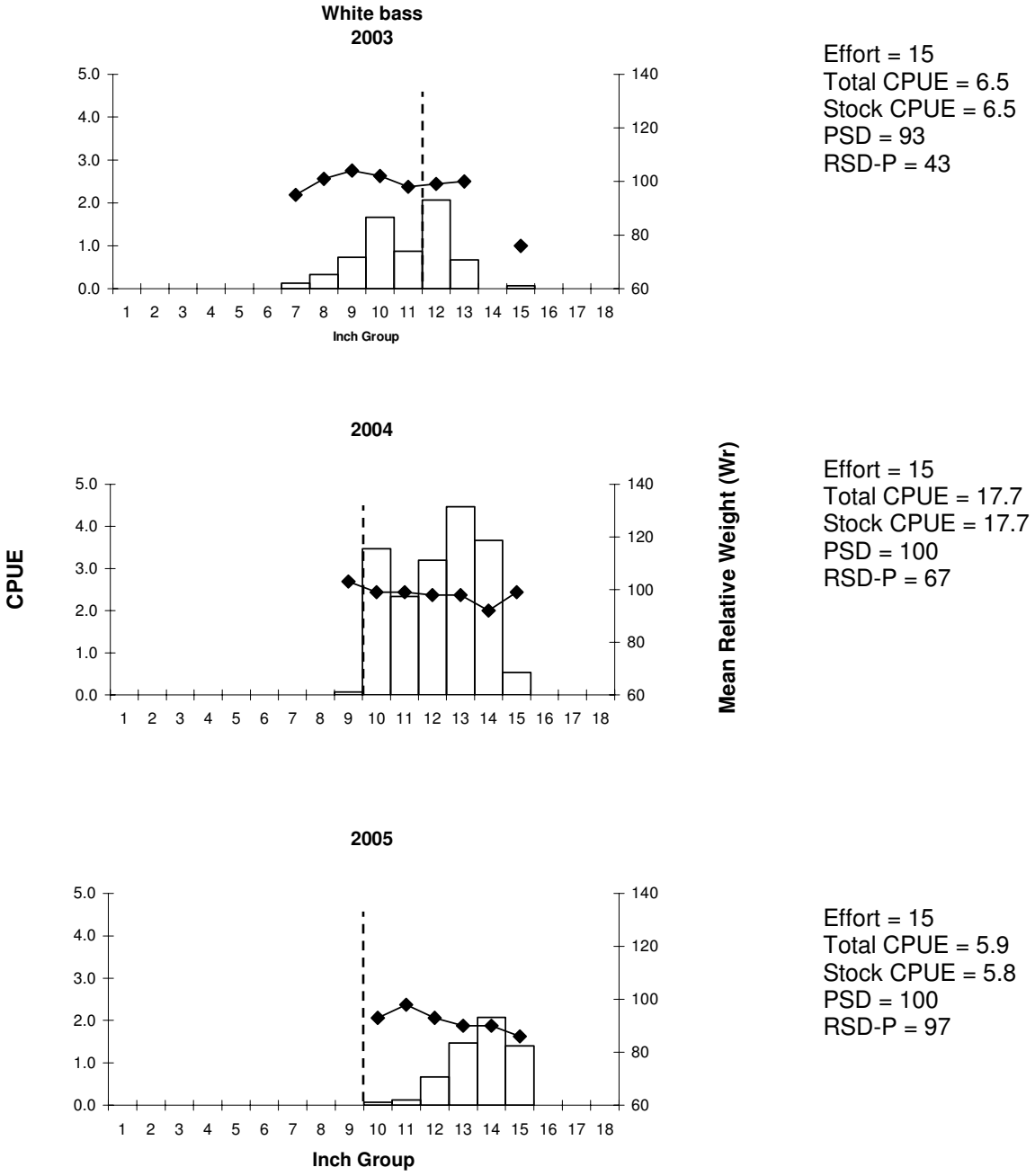
Number of channel catfish caught per net night (CPUE, bars), mean Relative Weight, (Wr, diamonds), and population indices for spring gill netting surveys, Lake Somerville, Texas. Relative Weight was not evaluated in 2004. Vertical dashed lines denote minimum legal length.



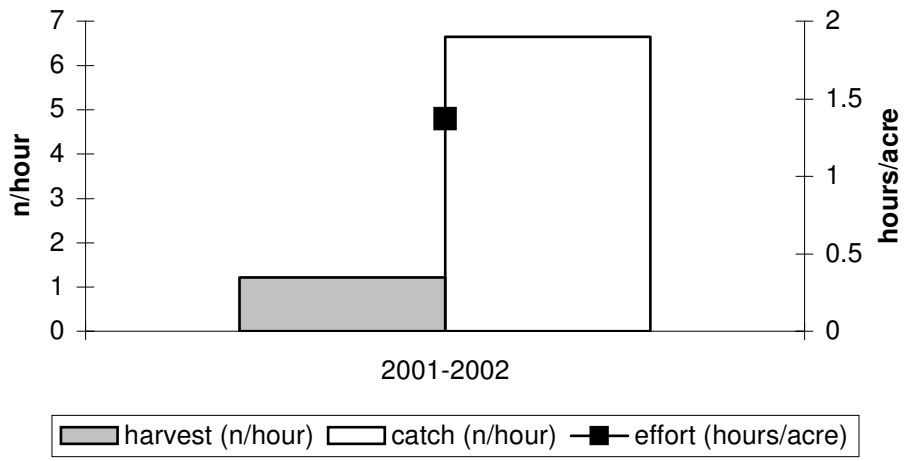
Annual creel statistics for rod and reel anglers seeking any catfish species on Lake Somerville, Texas, June 2001 through May 2002.



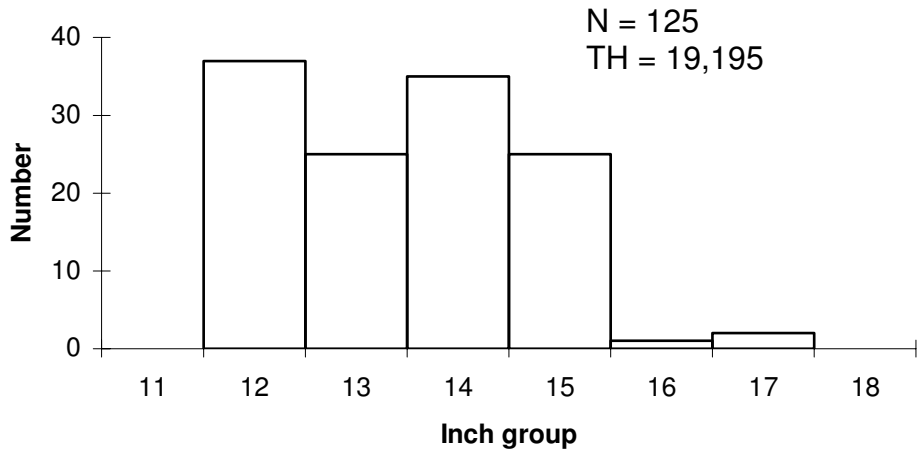
Length frequency of harvested channel and blue catfishes (species combined) observed during creel surveys at Lake Somerville, Texas, June 2001 through May 2002. The minimum length limit is12 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.



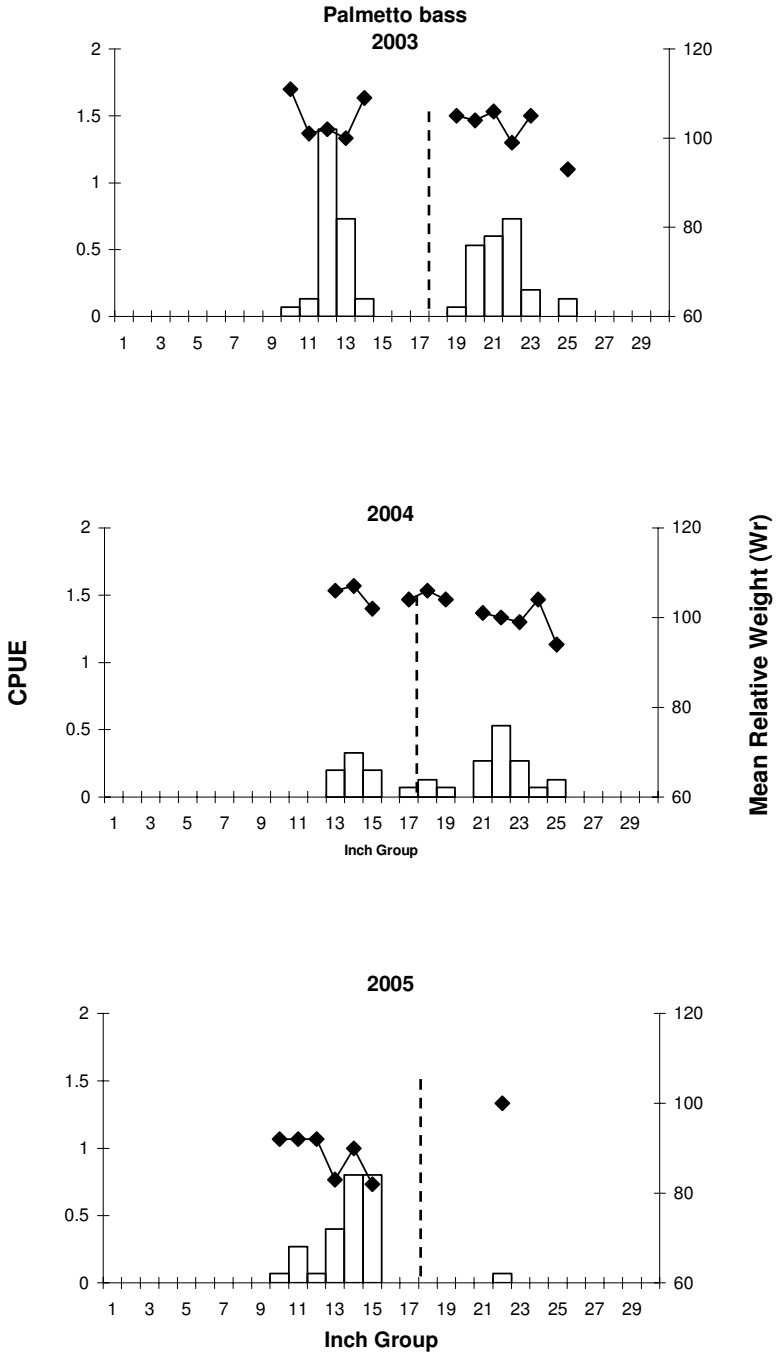
Number of white bass caught per net night (CPUE, bars), mean Relative Weight, (Wr, diamonds), and population indices for spring gill netting surveys, Lake Somerville, Texas. Vertical dashed lines denote minimum legal length.



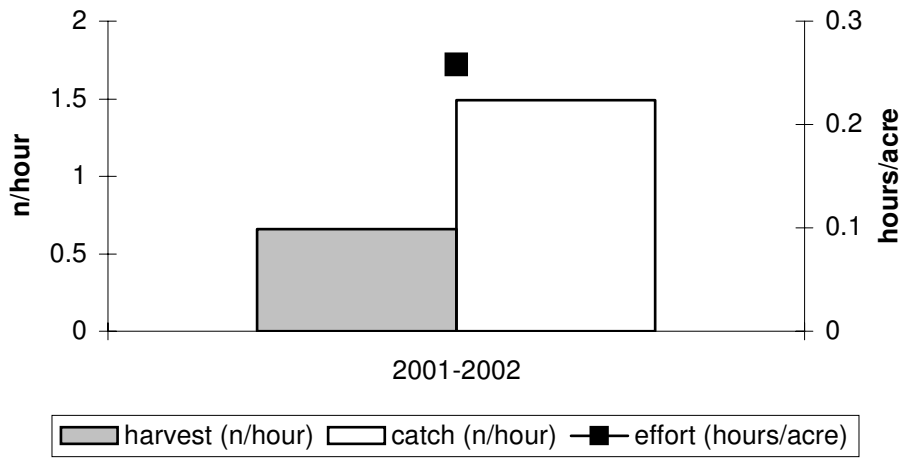
Annual creel statistics for rod and reel anglers seeking white bass at Lake Somerville, Texas, June 2001 through May 2002.



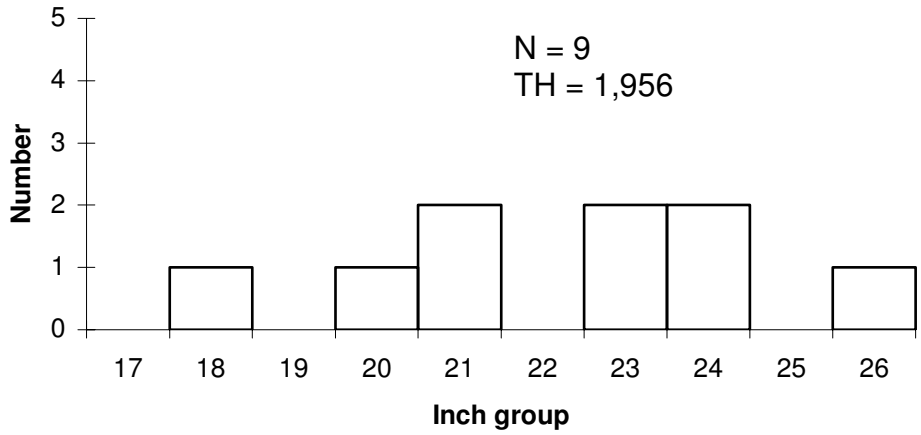
Length frequency of harvested white bass observed during creel surveys at Lake Somerville, Texas, June 2001 through May 2002. The minimum length limit is10 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.



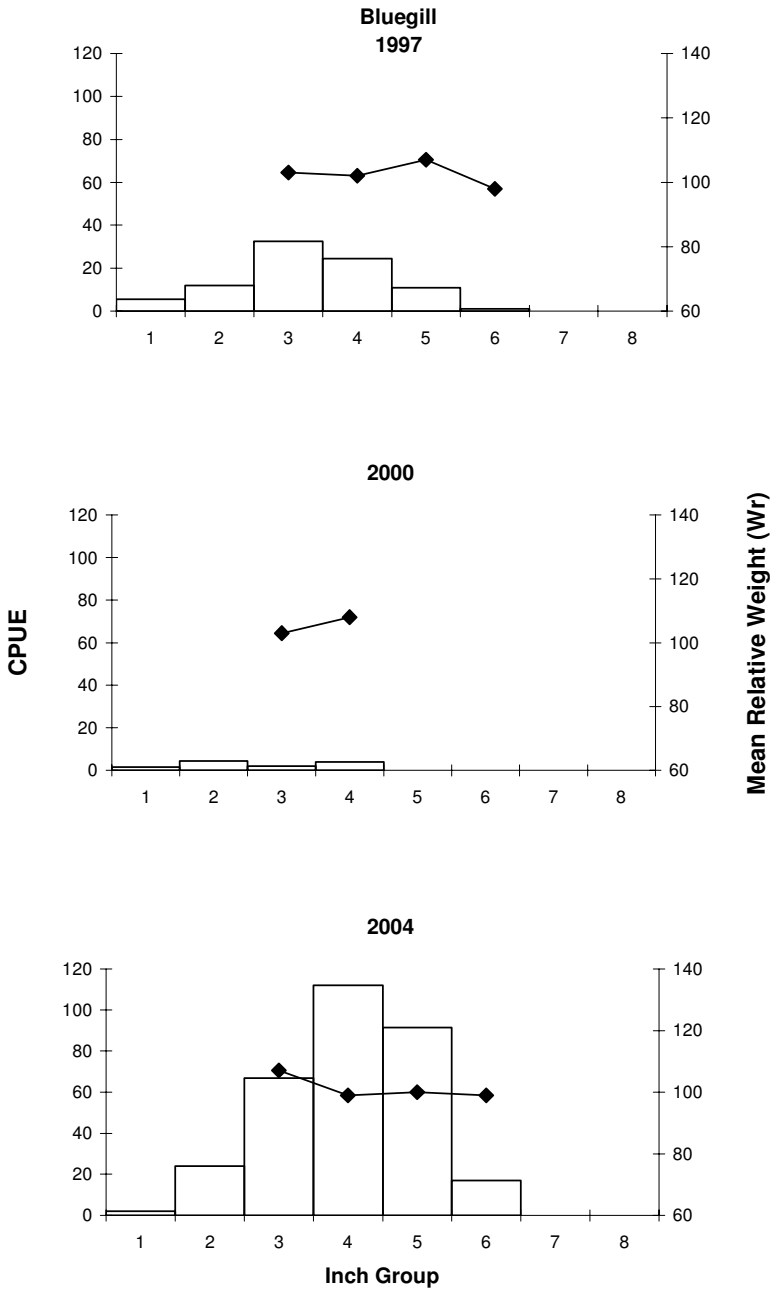
Number of palmetto bass caught per net night (CPUE, bars), mean Relative Weight, (Wr, diamonds), and population indices for gill netting surveys, Lake Somerville, Texas. Vertical dashed lines denote minimum legal length.



Annual creel statistics for rod and reel anglers seeking palmetto bass at Lake Somerville, Texas, June 2001 through May 2002.



Length frequency of harvested palmetto bass observed during creel surveys at Lake Somerville, Texas, June 2001 through May 2002. The minimum length limit is18 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

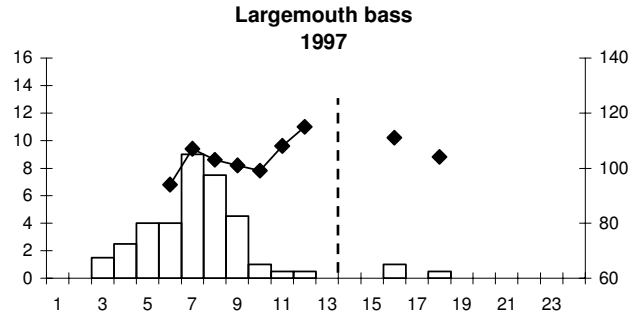


Effort = 2
Total CPUE = 86.5
Stock CPUE = 69.0
PSD = 1
RSD-P = 0

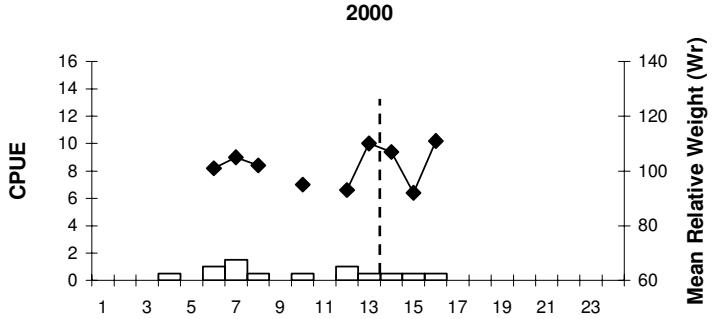
Effort = 2
Total CPUE = 12.0
Stock CPUE = 6.0
PSD = 0
RSD-P = 0

Effort = 2
Total CPUE = 313.5
Stock CPUE = 287.5
PSD = 6
RSD-P = 0

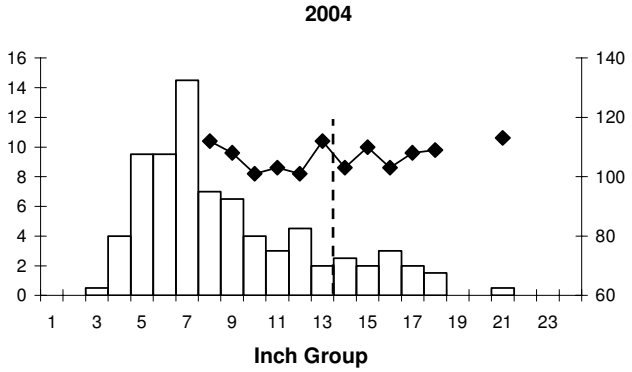
Number of bluegill caught per hour (CPUE, bars), mean Relative Weight (Wr, diamonds), and population indices for fall electrofishing surveys, Lake Somerville, Texas.



Effort = 2
Total CPUE = 36.5
Stock CPUE = 15.5
PSD = 13
RSD-P = 10
% FLMB alleles = 23.8

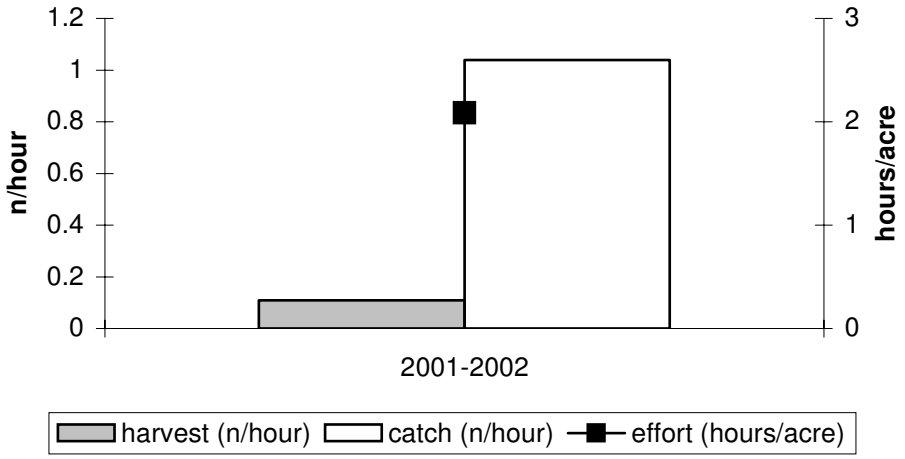


Effort = 2
Total CPUE = 7.0
Stock CPUE = 4.0
PSD = 75
RSD-P = 25
% FLMB alleles = 85.7

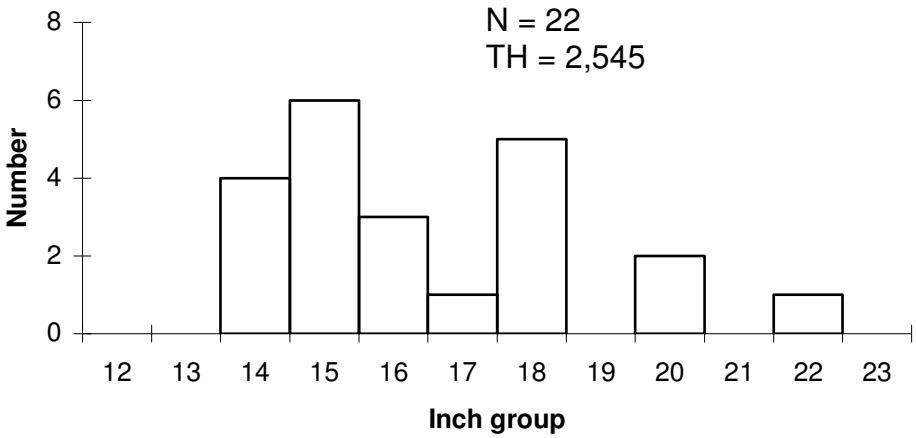


Effort = 2
Total CPUE = 76.5
Stock CPUE = 38.5
PSD = 47
RSD-P = 23
% FLMB alleles = 58.0

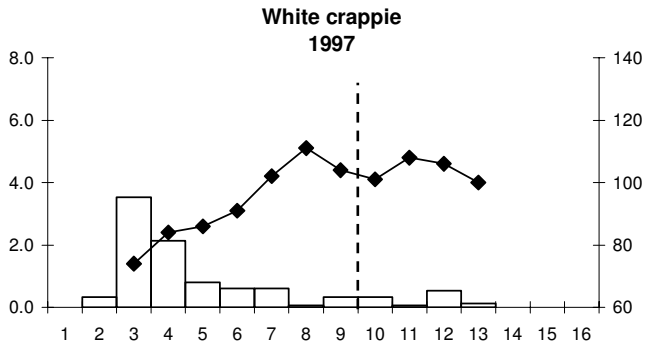
Number of largemouth bass caught per hour (CPUE, bars), mean Relative Weight (Wr, diamonds), and population indices for fall electrofishing surveys, Lake Somerville, Texas. % FLMB alleles = percent of Florida largemouth bass alleles present in a sub-sample of age-0 fish. Vertical dashed lines denote minimum legal length.



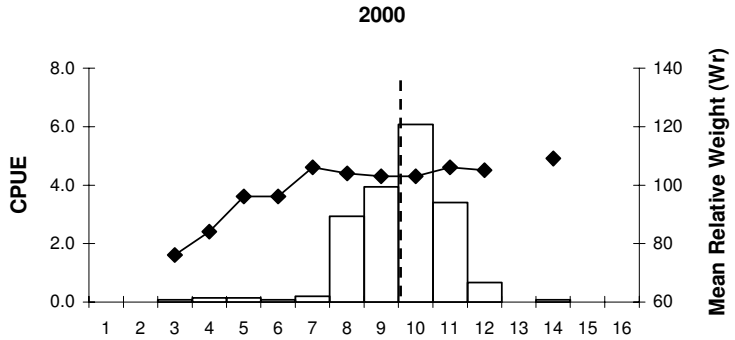
Annual creel statistics for rod and reel anglers seeking largemouth bass on Lake Somerville, Texas, June 2001 through May 2002.



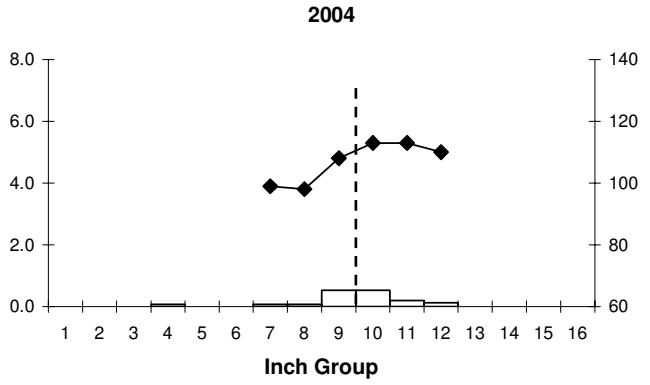
Length frequency of harvested largemouth bass observed during creel surveys at Lake Somerville, Texas, June 2001 through May 2002. The minimum length limit is14 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.



Effort = 15
Total CPUE = 9.5
Stock CPUE = 3.5
PSD = 42
RSD-P = 31

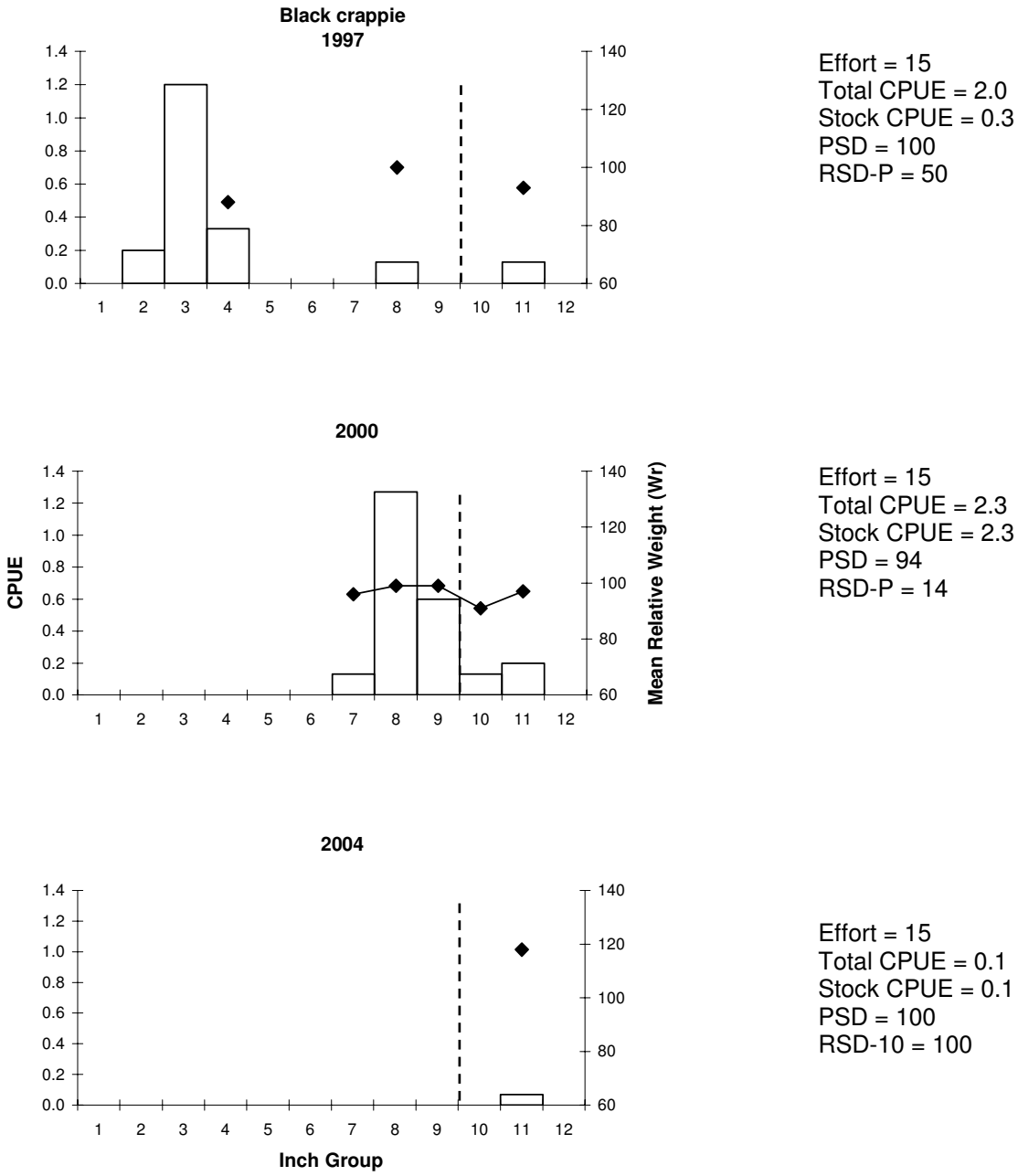


Effort = 15
Total CPUE = 17.7
Stock CPUE = 17.5
PSD = 98
RSD-P = 58

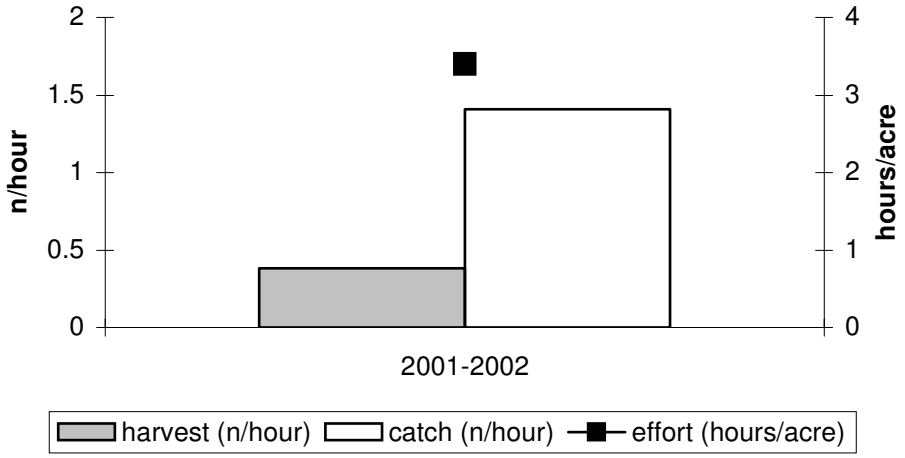


Effort = 15
Total CPUE = 1.6
Stock CPUE = 1.5
PSD = 96
RSD-P = 56

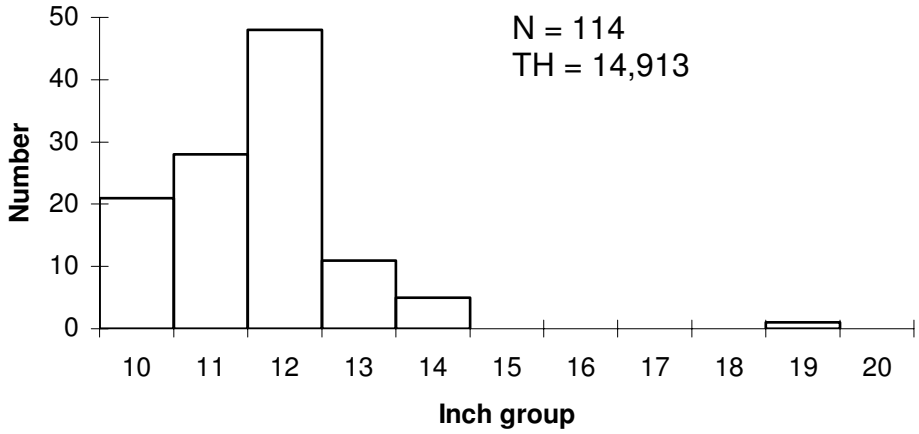
Number of white crappie caught per net night (CPUE, bars), mean Relative Weight, (Wr, diamonds), and population indices for fall trap netting surveys, Lake Somerville, Texas. Vertical dashed lines denote minimum legal length.



Number of black crappie caught per net night (CPUE, bars), mean Relative Weight (Wr, diamonds), and population indices for fall trap netting surveys, Lake Somerville, Texas. Vertical dashed lines denote minimum legal length.



Annual creel statistics for rod and reel anglers seeking any crappie species on Lake Somerville, Texas, June 2001 through May 2002.



Length frequency of harvested black and white crappie (species combined) observed during creel surveys at Lake Somerville, Texas, June 2001 through May 2002. The minimum length limit is10 inches. N = number of fish observed during creel surveys. TH = total annual estimated harvest.

Fisheries Management Plan
Lake Somerville, Texas

Prepared – August 1, 2004.

ISSUE 1 White bass and palmetto bass are popular sport fish on Lake Somerville. Maintaining quality fishing for these two species is important.

MANAGEMENT STRATEGIES

1. Monitor the morone population annually using gill nets.

2. Beginning in June 2006, conduct an angler creel survey for one year to estimate angler catch and harvest.

3. Continue stocking palmetto bass fingerlings annually at Lake Somerville at a rate of 5 per acre while monitoring forage fish populations.

ISSUE 2 Largemouth bass are also an important sport fish on Lake Somerville.

MANAGEMENT STRATEGIES

1. In June 2006, begin an angler creel survey for one year to estimate angler catch and harvest rates.

2. Conduct electrofishing surveys to monitor the largemouth bass population every 2 years.

3. Monitor population for Florida bass genetics every 2 years.

ISSUE 3 Crappie are popular with anglers as a harvestable resource. The 2001-2002 creel survey indicates heavy directed pressure when crappie are abundant.

MANAGEMENT STRATEGIES

1. Starting June 2006, conduct an angler creel survey for one year to estimate directed pressure, angler catch, and harvest.

2. Conduct trap netting surveys every 4 years to monitor the crappie population relative abundance.

ISSUE 4 Hydrilla is no longer present in amounts that are considered problematic; however, any resurgence of the plant should be carefully observed. Lake Somerville would benefit from efforts to establish native aquatic vegetation.

MANAGEMENT STRATEGIES

1. Cooperate with U.S. Army Corps of Engineers to monitor and, if necessary, control hydrilla.

2. Consider a cooperative project with the U. S. Army Corps of Engineers to establish native aquatic plants.

ISSUE 5 Keeping the public informed of angling opportunities and fisheries management activities is vital to our role as a resource management agency.

MANAGEMENT STRATEGIES

1. Cooperate with State Park and Corps of Engineers offices to increase public awareness concerning angling opportunities at Lake Somerville.

2. Write news releases for distribution to local outlets.

3. Produce a Lake Somerville fishing brochure.

4. Conduct fisheries management demonstrations for park visitors at Lake Somerville State Park.

ISSUE 6 Several access areas need repairs and improvements to ensure excellent access is maintained for reservoir users.

MANAGEMENT STRATEGIES

1. Cooperate with the Lake Somerville office of the Army Corps of Engineers to address needed access improvements at Rocky Creek Park, Overlook Park, and Welch Park.

2. Cooperate with Big Creek Marina to address needed improvements around boat dock.

Appendix 1

Number (N) and catch per unit effort (CPUE) of species collected from fall electrofishing (November 2004) and trap netting (December 2004) and gill netting (January and June 2005) from Lake Somerville, Texas. Electrofishing CPUE is the number of fish per hour, while trap netting and gill netting CPUE are the number of fish per net night.

	Gill netting (15 net nights)		Trap netting (15 net nights)		Electrofishing (2 hours)	
Species	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					608	304.0
Threadfin shad					348	174.0
Golden shiner					1	0.5
Bullhead minnow					12	6.0
Pugnose minnow					4	2.0
Inland silverside					61	30.5
Blue catfish	41	2.7				
Channel catfish	167	11.1				
Flathead catfish	1	0.1				
White bass	88	5.9				
Palmetto bass	38	2.5				
Green sunfish					3	1.5
Warmouth					12	6.0
Bluegill					627	313.5
Longear sunfish					268	134.0
Redear sunfish					16	8.0
Largemouth bass					153	76.5
White crappie			24	1.6		
Black crappie			1	0.1		

Appendix 2

Results of electrophoretic analysis of largemouth bass collected by electrofishing from Lake Somerville, Texas, 1994, 1997, 2000, and 2004.

Year	Sample size	Genotype				% Florida largemouth bass alleles	% pure Florida largemouth bass
		Florida	F1	Fx	Northern		
1994	43	3	9	14	17	27.5	7.0
1997	40	2	3	16	19	23.8	5.0
2000	7	5	2	0	0	85.7	71.4
2004	50	10	9	30	1	58.0	20.0

Appendix 3

Angler access facilities, Lake Somerville, Texas 2005.

Name	GPS coordinates	Fee charged	Number of lanes	Parking capacity	Accommodations for challenged	Bank fishing
Nails Creek State Park	30º 17’ 40” 96º 39’ 50”	Y	3	75	N	Y
Birch Creek State Park	30º 18’ 44” 96º 37’ 15”	Y	4	40	N	Y
Big Creek	30º 19’ 22” 96º 34’ 16”	N	4	40	N	Y
Rocky Creek Park A	30º 18’ 16” 96º 33’ 51”	Y	2	30	N	Y
Rocky Creek Park B	30º 17’ 57” 96º 34’ 13”	Y	2	25	N	Y
Welch Park	30º 20’ 12” 96º 33’ 07”	Y	2	30	Y	Y
Yegua Creek Park A	30º 18’ 21” 96º 32’ 09”	Y	3	15	N	Y
Yegua Creek Park B	30º 18’ 24” 96º 32’ 42”	Y	3	15	N	Y
Overlook Park	30º 18’ 27” 96º 30’ 58”	Y	2	97	Y	Y