PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

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FEDERAL AID PROJECT F-30-R-30

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

Hubbard City Lakes

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INTRODUCTION

This document is a summary of fisheries data collected from Hubbard City Lakes in 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 species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Fish Populations in Hubbard City Lakes were surveyed in summer 2007 using a boat electrofisher. This report summarizes the results of that survey and contains a management plan for the reservoir based on those findings.

Reservoir Description: Hubbard City Lakes is a series of five small impoundments, ranging from three to 18 acres, located just west of Hubbard, Hill County, Texas. The reservoirs were constructed in 1917, and are currently operated by the City of Hubbard for recreational use. Maximum water depths range from 5 to 6 meters, and the shoreline is mostly timbered combined with dense aquatic vegetation. Additional historical data are presented in Table 1.

Management history: Important sport fish include largemouth bass, catfish, and sunfishes. The management plan from the 1995 survey report included annual stockings of advanced fingerling channel catfish at 36 fish/acre, promoting Hubbard City Lakes's angling opportunities, and improving bank angler access (Sellers 1995).

Harvest regulation history: Sportfishes in Hubbard City Lakes are currently managed with statewide regulations, except there is no minimum length limit for channel and blue catfish, their daily bag limit is five in any combination, and fishing is by pole and line only (Table 2).

Stocking history: The complete stocking history of each impoundment can be found in Table 3.

METHODS

Fishes were collected by electrofishing at 10-min stations; the number of stations depended on the size of each impoundment (Lake 1 = 20 minutes, Lake 2 = 10 minutes, Lake 3 = 20 minutes, Lake 4 = 30 minutes, Lake 5 = 20 minutes). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing. Electrofishing sites were randomly selected and conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2002). Ages for largemouth bass were determined from otoliths and followed procedures for the category II age and growth sample.

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). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and SE was calculated for structural indices. Ages were determined using otoliths from 13 fish from 11.5 to 12.5 inches in total length.

RESULTS AND DISCUSSION

Habitat: Littoral zone habitat consisted primarily of dense overhanging trees, submerged timber, filamentous algae, and a variety of aquatic vegetation dominated by American lotus *Nelumbo lutea*, Coontail *Ceratophyllum demersum*, Water milfoil *Myriophyllum heterophyllum*, and Water willow *Justicia Americana*, Pondweed *Potamogeton spp.*, Stonewart *Chara spp.*, and Spike rush *Eleocharis spp.* . No habitat surveys have ever been conducted.

Prey species: The forage base is dominated by bluegill, redear, and warmouth in order of decreasing abundance. The average catch per unit of effort (CPUE) for bluegill, redear, and warmouth sunfishes was 75, 20, and 9 fish per hour respectively, all of which might be considered low. Prey numbers were adequate in Lakes 1, 2, and 3, but very low in Lakes 4 and 5. Sunfish rarely reach sizes greater than 5 inches in any of the lakes and thus contribute little to angling opportunities. Threadfin and gizzard shad have never been collected in Hubbard City Lakes.

Catfishes: Only two channel catfish were sampled with the boat electrofisher, and both of those were found in Lake 4. Two black bullheads were also collected in Lake 4.

Largemouth bass: Largemouth bass were moderately abundant (CPUE's ranging from 76 to 174 fish per hour) but recruitment is highly variable. Legal sized fish ranged from 14 to 20 inches, and were present in low numbers. Condition was low to fair with relative weights (Wr's) ranging from 70 to 100. Largemouth bass growth was evaluated by collecting bass from every lake between 11.5" and 12.5". Of those fish, seven were age-2, eleven were age-3, and 1 was age-4 (n = 19) which would be considered poor to average.

Fisheries management plan for Hubbard City Lakes, Texas

Prepared – July 2005.

ISSUE 1: Only two catfish were observed during electrofishing surveys, despite stocking advanced fingerlings every year for the past three years.

MANAGEMENT STRATEGY

1. Stock advanced channel catfish fingerlings every two years in Lakes 1 through 4. Because of access difficulties, discontinue stocking of Lake 5 with channel catfish.

ISSUE 2: Lake 2 was stocked with trout in July 2008 on a cost-share basis with the City of Hubbard. It has the best bank access of the 5 lakes and is conveniently located within sight of Highway 31.

MANAGEMENT STRATEGIES

1. Continue trout stockings in Lake 2 as long as the City of Hubbard continues to cost share in the project.
2. Urge the City to improve bank access to Lake 2.
3. Contact City officials to discuss potential for contributing local money with TPWD grant money or KAST restitution money for improvements to the lakes.

ISSUE 3: Lake 1 has a gravel ramp, but access is via a dirt road that is not accessible during wet weather. The lake is very attractive, and easily accessible from Highway 31.

MANAGEMENT STRATEGY

1. Work with the City to see if the dirt road could be graveled and a small parking area constructed.

ISSUE 4: Because the lakes are fairly remote, anglers may also be unaware of the regulations regarding community fishing lakes.

MANAGEMENT STRATEGY

2. Work with the City to place and maintain regulation signs.

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.

Sellers, K. K.. 1995. Statewide freshwater fisheries monitoring and management program survey report for Hubbard City Lakes, 1996. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Table 1. Characteristics of Hubbard City Lakes, Texas.

Characteristic	Description
Year Constructed	1898 through 1925
Controlling authority	City of Temple
Counties	Hill
Reservoir type	Off-stream
Conductivity	120 to 253 umhos/cm

Table 2. Harvest regulations for Hubbard City Lakes.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish: channel and blue catfish, their hybrids and subspecies[a]	5 (in any combination)	No Limit
Catfish, Flathead	5	18 - No Limit
Bass: largemouth	5 (in any combination)	14 – No limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

[a] Fishing is by pole and line only.

Table 3a. Stocking history of Hubbard City, 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	1991	640	AFGL	5.9
	1992	492	AFGL	7.1
	2005	803	AFGL	10.2
	2006	825	AFGL	9.6
	2007	803	AFGL	9.5
	Total	3,563		
Coppernose bluegill	1983	7,300	UNK	UNK
	Total	7,300		
Florida Largemouth bass	1994	145	ADL	13.6
	1995	200	ADL	9.1
	1996	450	AFGL	7.3
	Total	795		
Largemouth bass	1996	157	ADL	8.4
	1998	166	ADL	9.9
	Total	323		

Table 3b. Stocking history of Hubbard City #2, 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	1991	208	AFGL	5.9
	1992	244	AFGL	7.1
	2005	552	AFGL	10.2
	2006	568	AFGL	9.6
	2007	552	AFGL	9.5
	Total	2,124		
Florida Largemouth bass	1994	60	ADL	12.6
	Total	60		
Largemouth bass	1995	100	ADL	8.0
	1996	60	ADL	8.4
	1998	34	ADL	9.9
	Total	194		
Rainbow trout	2007	551	AFGL	8.7
	Total	551		

Table 3c. Stocking history of Hubbard City #3, 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	1991	608	AFGL	5.9
	1992	492	AFGL	7.1
	2005	828	AFGL	10.2
	2006	836	AFGL	9.6
	2007	828	AFGL	9.5
	Total	3,592		
Florida Largemouth bass	1994	357	ADL	9.4
	1996	200	AFGL	7.3
	Total	557		
Largemouth bass	1995	220	ADL	8.0

Species	Year	Number	Life Stage	Mean TL (in)
	1996	140	ADL	8.4
	Total	360		

Table 3d. Stocking history of Hubbard City #4, 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.

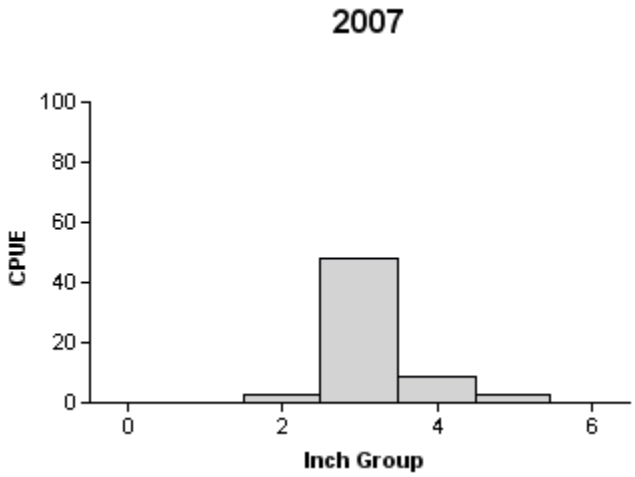
Species	Year	Number	Life Stage	Mean TL (in)
Channel catfish	1991	1,488	AFGL	5.9
	1992	900	AFGL	7.1
	2005	936	AFGL	10.2
	2006	954	AFGL	9.6
	2007	941	AFGL	9.1
	Total	5,219		
Florida Largemouth bass	1996	600	AFGL	7.3
	Total	600		
Largemouth bass	1996	270	ADL	8.4
	1998	135	ADL	9.9
	Total	405		

Table 3e. Stocking history of Hubbard City #5, 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	1991	384	AFGL	5.9
	1992	318	AFGL	7.1
	2005	674	AFGL	10.2
	2006	640	AFGL	9.7
	2007	640	AFGL	9.1
	Total	2,656		
Florida Largemouth bass	1996	200	AFGL	7.3
	Total	200		
Largemouth bass	1996	102	ADL	8.4
	Total	102		

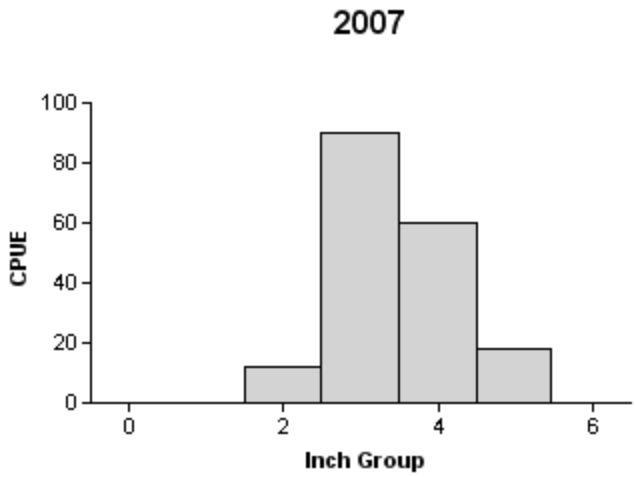
Bluegill

Hubbard City Lake 1



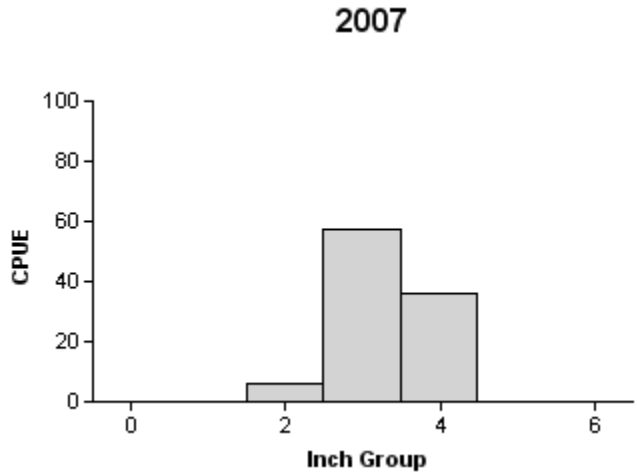
Effort =	0.3
Total CPUE =	63.0 (100; 21)
Stock CPUE =	60.0 (100; 20)
PSD =	0 (148.5)

Hubbard City Lake 2



Effort =	0.2
Total CPUE =	180.0 (100; 30)
Stock CPUE =	168.0 (100; 28)
PSD =	0 (106.6)

Hubbard City Lake 3

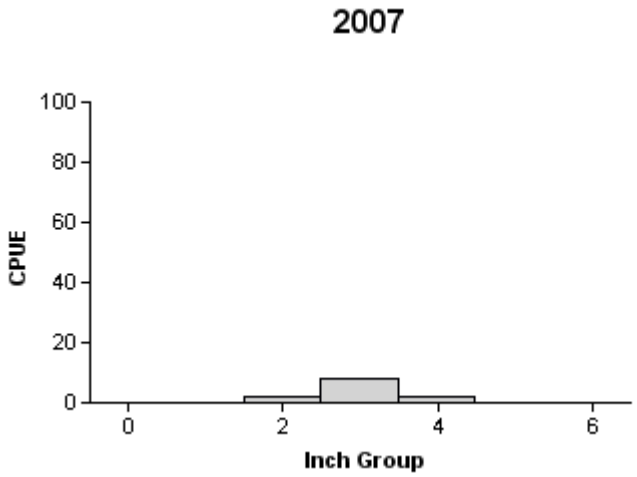


Effort =	0.3
Total CPUE =	99.0 (3; 33)
Stock CPUE =	93.0 (3; 31)
PSD =	0 (106.5)

Figure 1. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for summer electrofishing surveys, Hubbard City Lakes 1, 2 and 3, Texas 2007.

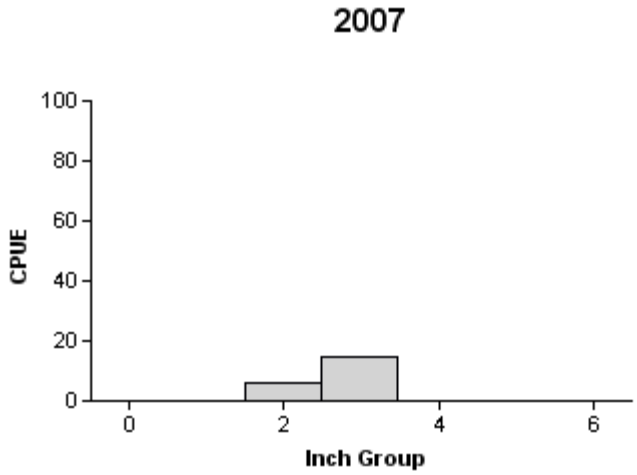
Bluegill Continued

Hubbard City Lake 4



Effort =	0.5
Total CPUE =	12.0 (100; 6)
Stock CPUE =	10.0 (100; 5)
PSD =	0 (147)

Hubbard City Lake 5

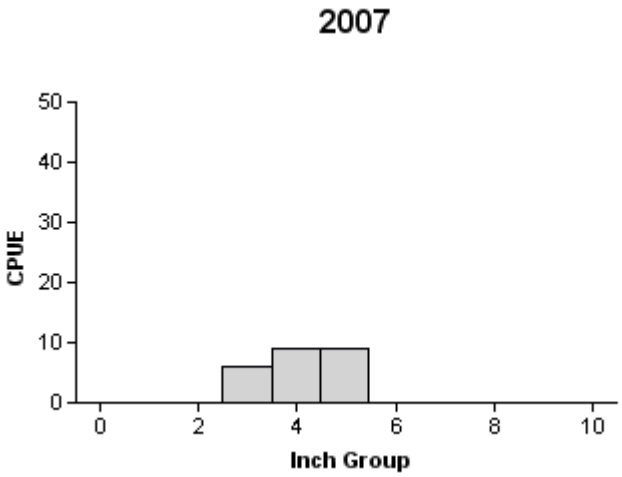


Effort =	0.3
Total CPUE =	21.0 (14; 7)
Stock CPUE =	15.0 (20; 5)
PSD =	0 (141.4)

Figure 1. Number of bluegill caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for summer electrofishing surveys, Hubbard City Lakes 4 and 5, Texas 2007.

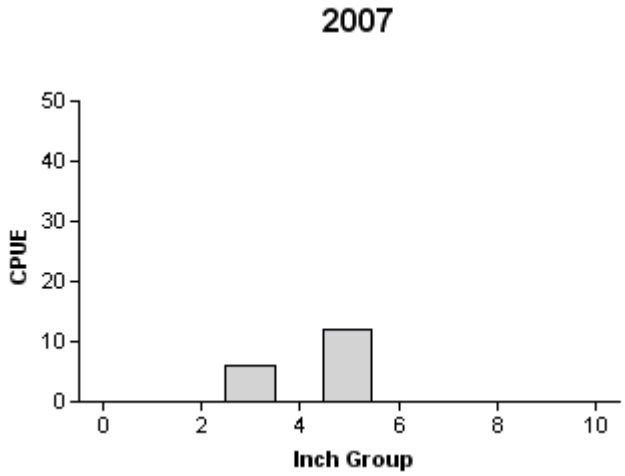
Redear sunfish

Hubbard City Lake 1



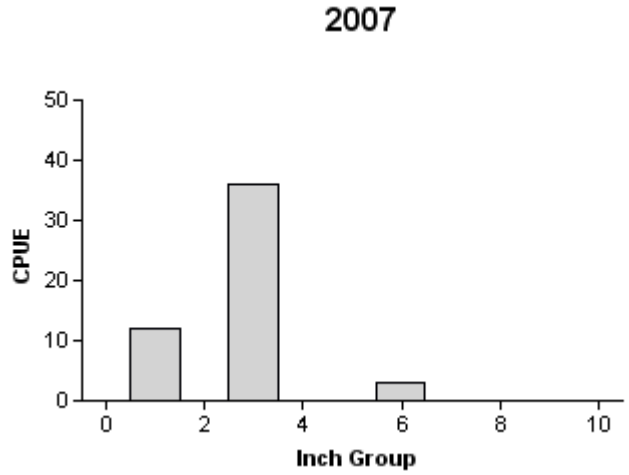
Effort =	0.3
Total CPUE =	24.0 (100; 8)
Stock CPUE =	18.0 (100; 6)
PSD =	0 (188.6)

Hubbard City Lake 2



Effort =	0.2
Total CPUE =	18.0 (100; 3)
Stock CPUE =	12.0 (100; 2)
PSD =	0 (149.3)

Hubbard City Lake 3

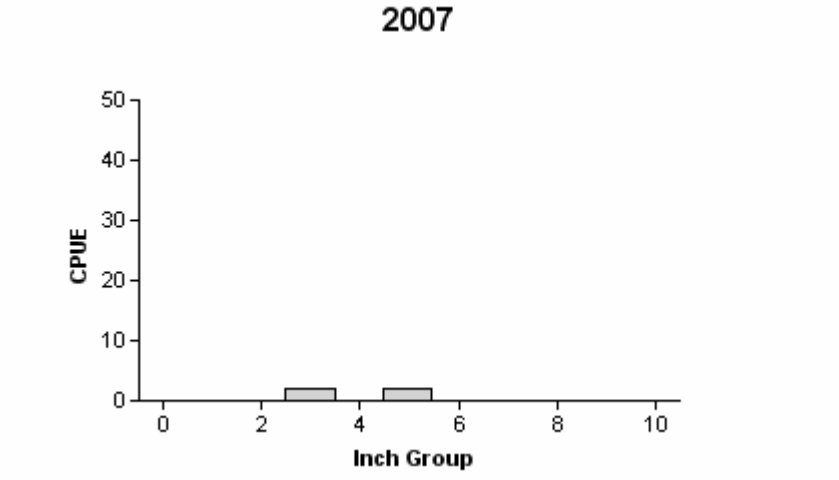


Effort =	0.3
Total CPUE =	51.0 (41; 17)
Stock CPUE =	3.0 (100; 1)
PSD =	0 (1838.5)

Figure 2. Number of redear sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for summer electrofishing surveys, Hubbard City Lakes 1, 2 and 3, Texas 2007.

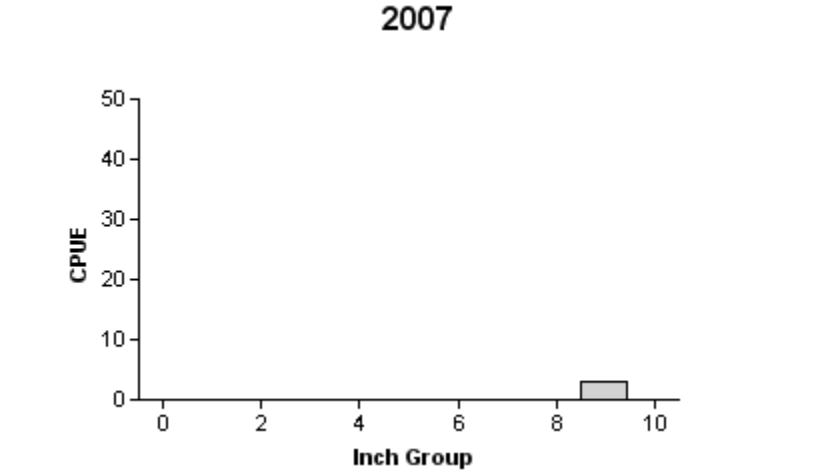
Redear sunfish Continued

Hubbard City Lake 4



Effort =	0.5
Total CPUE =	4.0 (100; 2)
Stock CPUE =	2.0 (100; 1)
PSD =	0 (245)

Hubbard City Lake 5

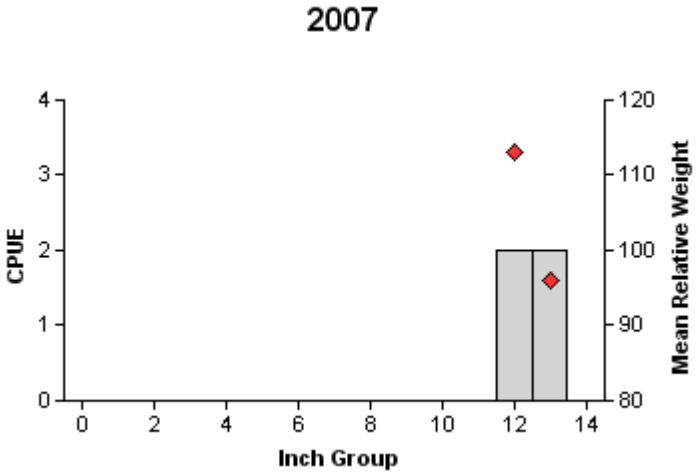


Effort =	0.3
Total CPUE =	3.0 (100; 1)
Stock CPUE =	3.0 (100; 1)
PSD =	100 (0)

Figure 2. Number of redear sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for summer electrofishing surveys, Hubbard City Lakes 4 and 5, Texas 2007. Note extended x-axis on Hubbard City Lake 5.

Channel catfish

Hubbard City Lake 4

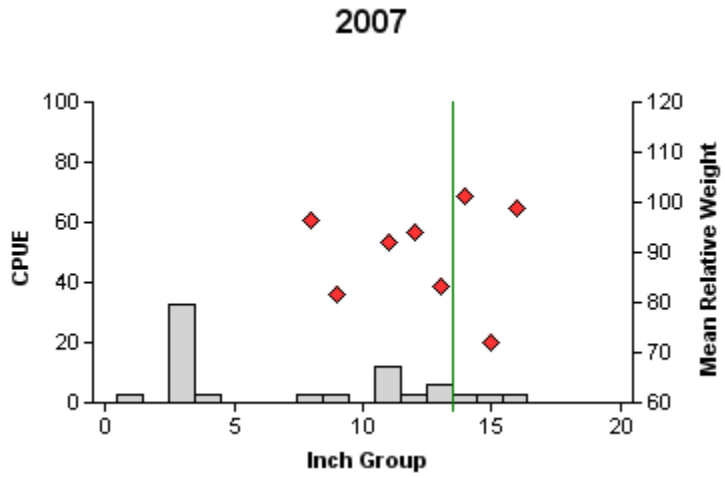


Effort =	0.5
Total CPUE =	4.0 (50; 2)
Stock CPUE =	4.0 (50; 2)
PSD =	0 (86.6)

Figure 3. Number of channel catfish caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for summer electrofishing surveys, Hubbard City Lake 4, Texas 2007.

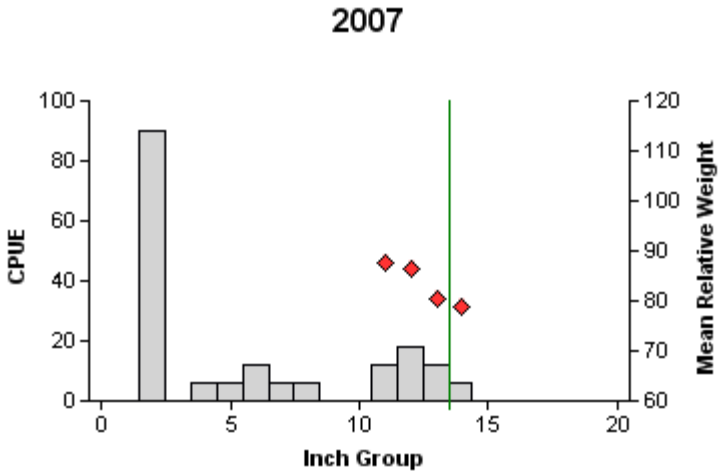
Largemouth bass

Hubbard City Lake 1



Effort =	0.3
Total CPUE =	75.0 (44; 25)
Stock CPUE =	36.0 (17; 12)
PSD =	50 (8.3)

Hubbard City Lake 2



Effort =	0.2
Total CPUE =	174.0 (100; 29)
Stock CPUE =	54.0 (100; 9)
PSD =	67 (0.3)

Hubbard City Lake 3

Effort =	0.3
Total CPUE =	144.0 (13; 48)
Stock CPUE =	30.0 (40; 10)
PSD =	80 (8)

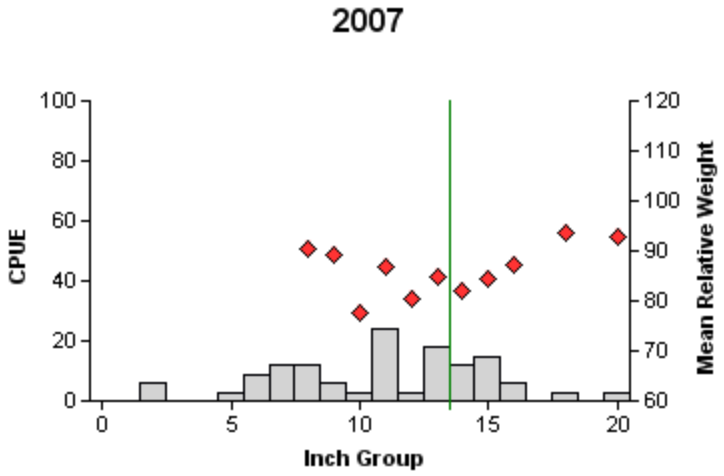
Figure 4. Number of largemouth bass caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for summer electrofishing surveys, Hubbard City Lakes 1, 2 and 3, Texas 2007.

Largemouth bass Continued

Hubbard City Lake 4

Effort =	0.5
Total CPUE =	76.0 (30; 38)
Stock CPUE =	50.0 (28; 25)
PSD =	88 (14)

Hubbard City Lake 5



Effort =	0.3
Total CPUE =	135.0 (20; 45)
Stock CPUE =	105.0 (26; 35)
PSD =	57 (8.9)

Figure 4. Number of largemouth bass caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for size structure are in parenthesis) for summer electrofishing surveys, Hubbard City Lakes 4 and 5, Texas 2007.

APPENDIX A

Number (N) and catch rate (CPUE) of all species collected from the summer electrofishing surveys of Hubbard City Lakes, Texas, 2007.

Hubbard City Lake 1

	Electrofishing	
Species	N	CPUE
Blackstripe topminnow	2	6.0
Bluegill	21	63.0
Redear sunfish	8	24.0
Largemouth bass	25	75.0

Hubbard City Lake 2

	Electrofishing	
Species	N	CPUE
Bluegill	31	180.0
Redear sunfish	3	18.0
Largemouth bass	29	75.0

Hubbard City Lake 3

	Electrofishing	
Species	N	CPUE
Warmouth	3	9.0
Bluegill	33	99.0
Redear sunfish	17	51.0
Largemouth bass	47	144.0

Hubbard City Lake 4

	Electrofishing	
Species	N	CPUE
Black bullhead	2	4.0
Channel catfish	2	4.0
Bluegill	6	12.0
Redear sunfish	2	4.0
Largemouth bass	38	76.0
White crappie	1	2.0

Hubbard City Lake 5

	Electrofishing	
Species	N	CPUE
Bluegill	7	21.0
Redear sunfish	1	3.0
Largemouth bass	44	135.0
Black crappie	2	6.0

APPENDIX B

Length at age for Largemouth bass collected from the summer electrofishing surveys of Hubbard City Lakes, Texas, 2007. Age data were pooled across all five lakes; sample sizes are in parenthesis.

	Length(inches) at age		
Year	2	3	4
2007	11.63 (7)	11.71 (11)	11.54 (1)