PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-30-R-29

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2004 Survey Report

Averhoff Reservoir

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EXECUTIVE SUMMARY

Averhoff Reservoir was surveyed from June 2004 to May 2005 using electrofishing, trap nets, gill nets, 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**: Averhoff Reservoir (174 acres) is a riverine reservoir located on the Nueces River, near Crystal City, TX, in Zavala County. It was constructed by the Zavala-Dimmit Water Improvement District Number 1 in 1948 to provide water for agricultural, recreational, and flood control purposes. Water level records are currently not recorded. Access was fair with only one public ramp and there were no handicap specific facilities. The primary shoreline habitat feature was overhanging brush. Aquatic vegetation occupied about 4 acres of the reservoir with Illinois pondweed, Egyptian paspalidium, and stargrass being the predominant species.

- **Prey Species**: Electrofishing catch rate of gizzard shad ranged from 30.0-50.0/h in 2004, 2000, and 1998. Gizzard shad Index of vulnerability (IOV) was 24, indicating a low availability of gizzard shad as forage for predators. Threadfin shad were not collected in 2004 and 2000 and only one threadfin shad was collected in 1998. Electrofishing catch rate of bluegill was similar in 2004, 2000, and 1998, ranging from 100.0-122.0/h. Bluegill Proportional Stock Density (PSD) was low (5-16) in 2004, 2000, and 1998 indicating a high proportion of the population was of suitable size to be prey for predators. Electrofishing catch rate of all other sunfishes combined was 110.0fish/h. Sunfish are the dominant forage in this reservoir.

- **Catfishes:** Gill net catch rate of channel catfish was 3.6/NN, similar to the 2002 catch rate of 3.2/NN, but lower than the 2001 catch rate of 6.0/NN. Relative weights (Wr) were above 80 for all fish in all three sample years. PSD was high in 2005, 2002, and 2001 (ranging from 72-95) indicating the majority of the population is larger sized fish. Two flathead catfish were collected (one 24-inch and one 25-inch, total length). No blue catfish were collected in 2005.

- **Largemouth bass:** Electrofishing catch rate of largemouth bass in 2004 (50.0/h) was similar to the catch rate of 46.0/h in 2000 and higher than the catch rate of 27.0/h in 1998. Largemouth bass PSD ranged from 22 in 2004 to 28 in 1998. Largemouth bass average Wr ranged from 80 to 103. Electrophoretic analysis of age-0 and age-1 fish collected in 2004 indicated a 52.6% frequency of Florida largemouth bass alleles with 6.9% of the sample having the Florida largemouth bass genotype.

- **White crappie:** Trap net catch rate of white crappie was low in 2004 (1.6/NN) and similar to in 1998 (0.4/NN) and 2000 (1.4/NN).

- **Management Strategies:** Based on survey results all species should continue to be managed under current harvest regulations. Monitor fish populations with standard sampling conducted every fourth year. Stock threadfin shad. Prepare a press release detailing availability of water body fish records to be set in the reservoir.

INTRODUCTION

This document is a summary of fisheries data collected from Averhoff Reservoir 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 is presented with the 2004-2005 data for comparison.

STATUS OF MANAGEMENT ACTIONS PREVIOUSLY LISTED (Driscoll 2001)

1. Low water level due to drought conditions has reduced suitable spawning and recruitment habitat for many species found in the reservoir. Proposed action was to continue monitoring efforts.

   Action: Monitoring efforts were completed.

Current fish harvest regulations for Averhoff Reservoir, Texas, 2004-2005.

Species	Bag Limit	Minimum Length (Inches)
Largemouth bass	5	14
Palmetto bass	5	18
White bass	25	10
Blue and channel catfish	25 (in any combination)	12
Flathead catfish	5	18
Black and white crappie	25 (in any combination)	10

METHODS

- Fishes were collected by electrofishing (1.0 hour total at 12, 5-minute stations) and by trap netting (1 net-night each at 5 stations) in fall 2004, 2000, and 1998. Fishes were collected by gill netting in spring 2005, 2002, and 2001. Gill net sampling effort was 1 net-night each at 5 stations in 2005 and 2001, and 1 net-night each at 18 stations in 2002. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour of actual electrofishing (#/h), and for gill netting and trap netting as the number of fish caught in one net set overnight (#/NN). Sample station selection method for all gear types was random.

- Sampling statistics (CPUE for various length categories) and proportional stock density (PSD), relative stock density (RSD), and relative weight (Wr) were calculated for target fishes according to Anderson and Neumann (1996). The gizzard shad Index of Vulnerability (IOV) was calculated according to DiCenzo et al. 1996.

- Largemouth bass electrophoresis samples were collected according to Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2004).

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

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. Stimpert. 1996. Relationship between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.

Driscoll, J.A. 2001. Statewide freshwater fisheries monitoring and management program survey report for Averhoff Reservoir, 2001. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

Physical and historical data for Averhoff Reservoir, Texas, 2004-2005.

Inland Fisheries water body code	0035
IF District	1D
Surface area	174 acres
Conservation pool elevation	595 feet above mean sea level
Shoreline length	32 miles
Controlling authority	Zavala-Dimmit Water Improvement District No. 1
Water uses	Irrigation and recreation
Counties	Zavala
Latitude	28.778870
Longitude	-99.828148
Nearest major metropolitan area and distance	Laredo – 100 miles San Antonio – 100 miles
Reservoir description	Main stream
River system	Nueces
Mean depth	24 feet
Maximum depth	28 feet
Shoreline development ratio	2.685
Watershed area	unknown
Secchi disc range	2-4 feet
Conductivity	530 umhos/cm
Constructed	1948
Boat access	fair–1 public ramp
Bank access	Poor and at boat ramp only
Handicap access	Inadequate-none

Results of habitat survey conducted at Averhoff Reservoir, Texas, in May, 2005. Linear shoreline distance (miles) was estimated for each habitat type and divided by total shoreline distance (32 miles) to obtain percent of shoreline occupied by habitat type. Habitat types may overlap so their sum does not equal total shoreline distance. Lake elevation was at conservation pool elevation at time of survey.

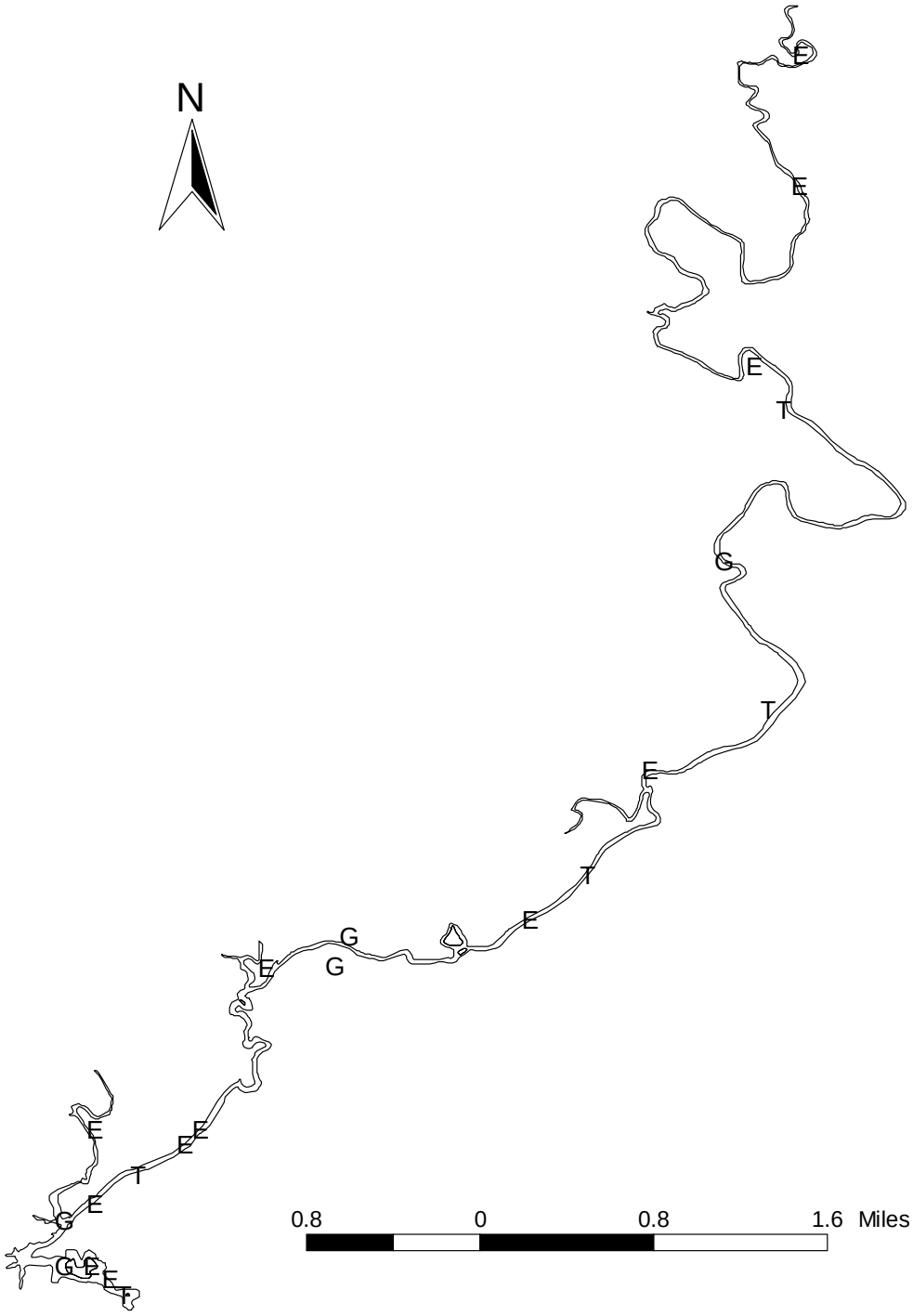
Habitat type	Shoreline distance	Percent
Overhanging brush	32.0	100.0
Native emergent	0.6	1.9
Native submerged	0.5	1.6

Results of a vegetation survey conducted at Averhoff Reservoir, Texas, in May, 2005. Surface area coverage (acres) was estimated for each vegetation type and divided by total reservoir area (174 acres) to obtain percent of reservoir area occupied by species.

Vegetation type	Surface area	Percent
Illinois pondweed	1.58	0.91
Egyptian paspalidium	0.93	0.53
Stargrass	0.76	0.44
Water willow	0.47	0.27
Southern naiad	0.11	0.06
Coontail	0.01	0.01
Chara spp.	<0.01	<0.01

Stocking history for Averhoff Reservoir (174 acres), Texas. Size of all stocked fish was fingerling (FGL).

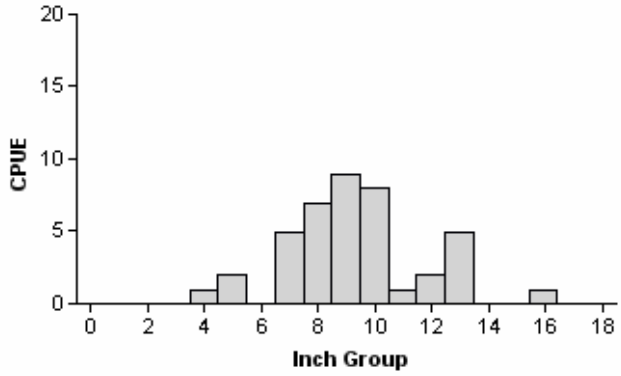
Species	Year	Number	Size
Palmetto bass	1979	3,550	FGL
	1981	1,300	FGL
	1983	1,620	FGL
	Species total	6,470	
Florida largemouth bass	1994	31,917	FGL
	1995	31,969	FGL
	1996	32,568	FGL
	Species total	96,454	



Location of Averhoff Reservoir, Texas, 2004-2005 electrofishing (E), gill netting (G), and trap netting (T) locations.

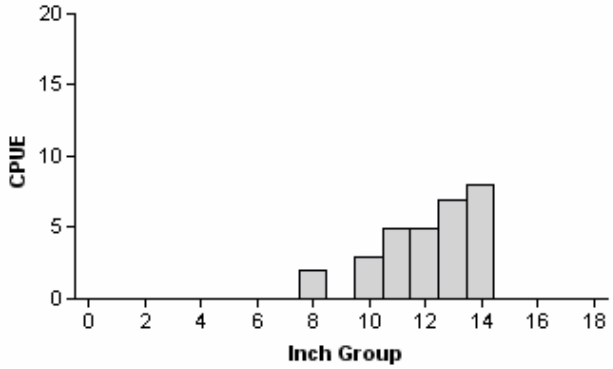
Gizzard Shad

1998



Effort = 1.0
Total CPUE = 41.0
Stock CPUE = 38.0
PSD = 24
IOV = 20

2000



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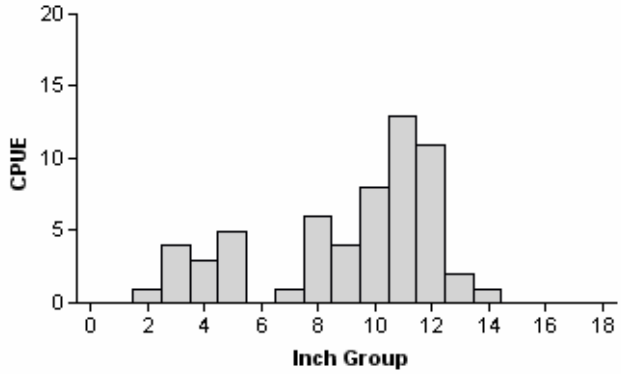
Total CPUE = 30.0
Stock CPUE = 30.0
PSD = 83
IOV = 0

2004

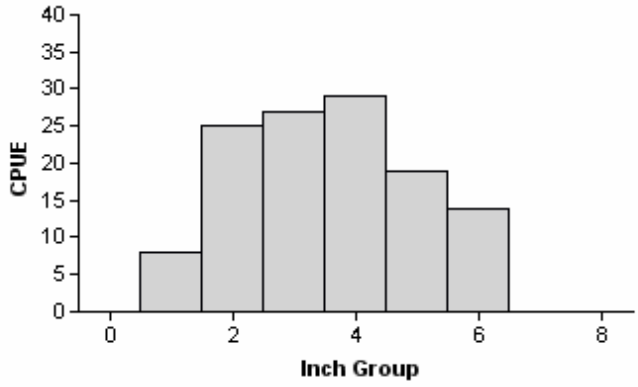


Effort = 1.0
Total CPUE = 59.0
Stock CPUE = 46.0
PSD = 59
IOV = 24

Comparison of the number of gizzard shad caught per hour (CPUE) and population indices from fall electrofishing surveys, Averhoff Reservoir, Texas.

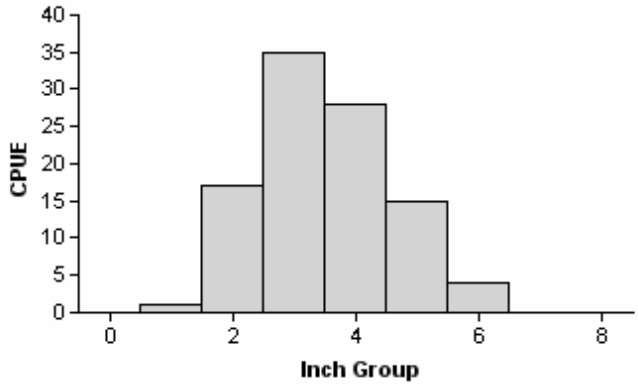
Bluegill

1998



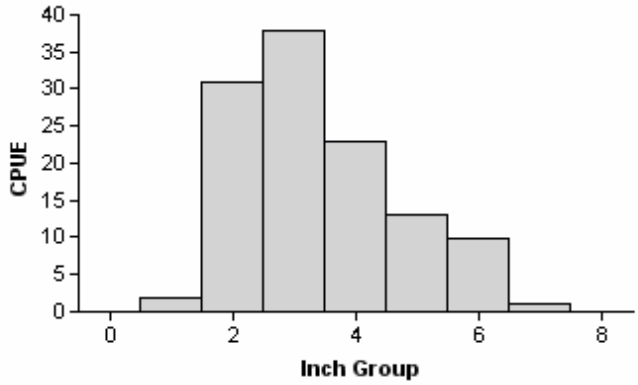
Effort = 1.0
Total CPUE = 122.0
Stock CPUE = 89.0
PSD = 16

2000



Effort = 1.0
Total CPUE = 100.0
Stock CPUE = 82.0
PSD = 5

2004

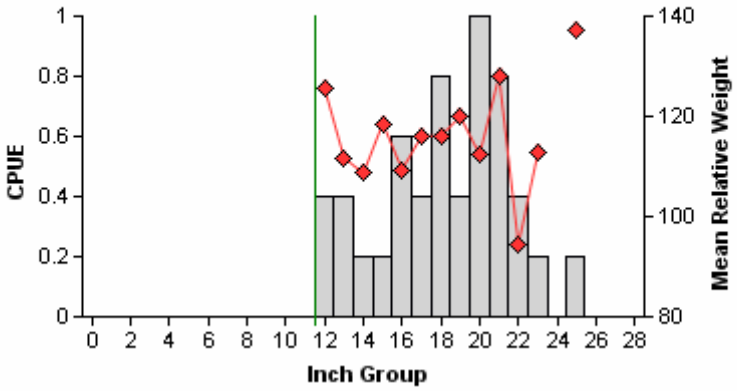


Effort = 1.0
Total CPUE = 118.0
Stock CPUE = 85.0
PSD = 13

Comparison of the number of bluegill caught per hour (CPUE) and population indices from fall electrofishing surveys, Averhoff Reservoir, Texas.

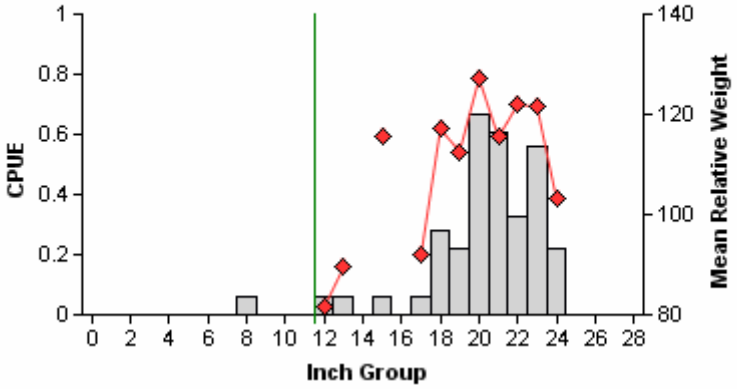
Channel Catfish

2001



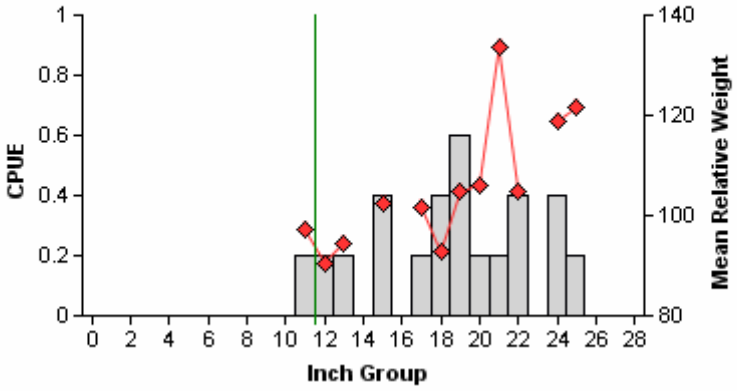
Effort = 5.0
Total CPUE = 6.0
Stock CPUE = 6.0
PSD = 80
RSD-P = 3

2002



Effort = 18.0
Total CPUE = 3.2
Stock CPUE = 3.1
PSD = 95
RSD-P = 7

2005

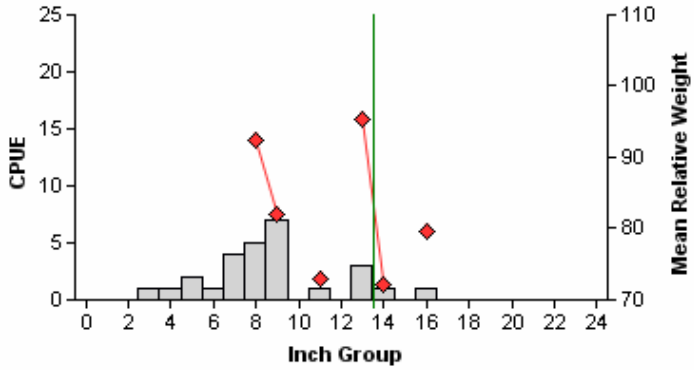


Effort = 5.0
Total CPUE = 3.6
Stock CPUE = 3.6
PSD = 72
RSD-P = 17

Comparison of the number of channel catfish caught per net night (CPUE), mean relative weight (diamonds), and population indices from spring gill net sampling in Averhoff Reservoir, Texas. Vertical line indicates minimum length limit at time of survey.

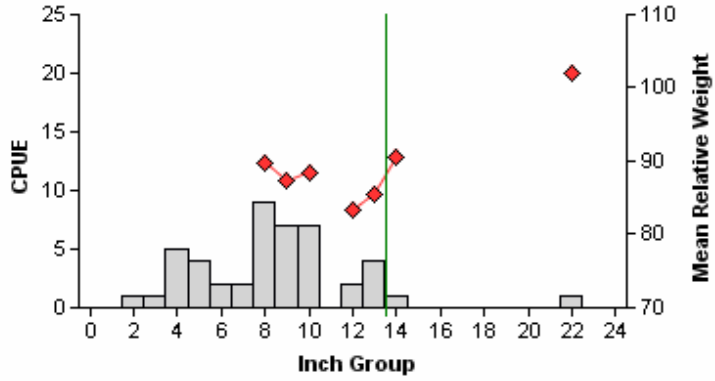
Largemouth Bass

1998



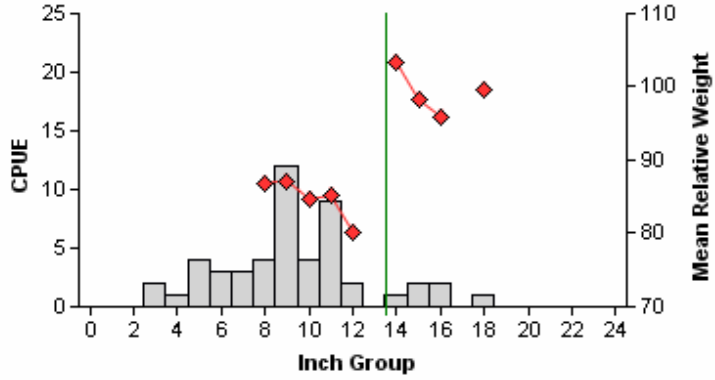
Effort = 1.0
Total CPUE = 27.0
Stock CPUE = 18.0
PSD = 28
RSD-P = 6
% FLMB Alleles: 34.7
%FLMB Genotype: 33.3

2000



Effort = 1.0
Total CPUE = 46.0
Stock CPUE = 31.0
PSD = 26
RSD-P = 3
% FLMB Alleles: 53.1
%FLMB Genotype: 17.6

2004

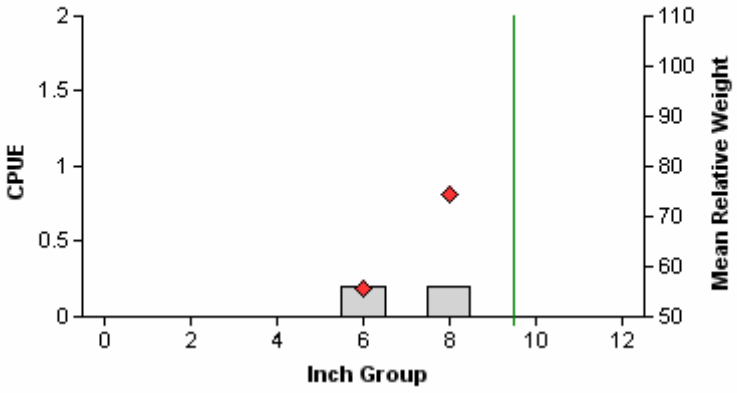


Effort = 1.0
Total CPUE = 50.0
Stock CPUE = 37.0
PSD = 22
RSD-P = 14
% FLMB Alleles: 52.6
%FLMB Genotype: 6.9

Comparison of the number of largemouth bass caught per hour (CPUE), mean relative weight (diamonds), and population indices from fall electrofishing sampling in Averhoff Reservoir, Texas. Vertical line indicates minimum length limit at time of survey.

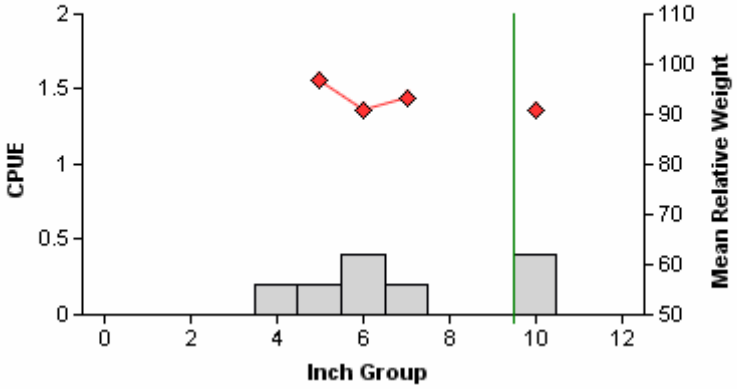
White Crappie

1998



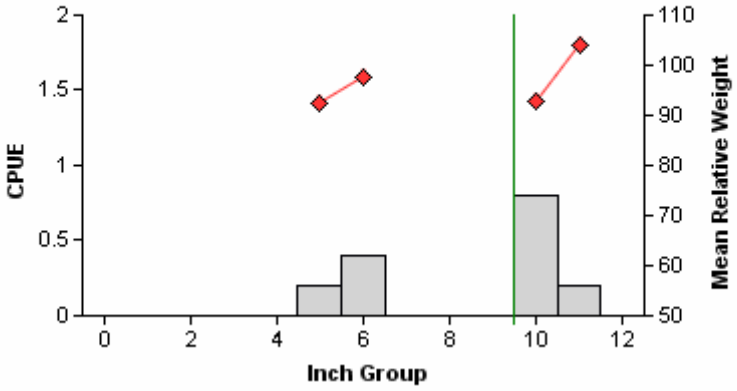
Effort = 5.0
Total CPUE = 0.4
Stock CPUE = 0.4
PSD = 50
RSD-P = 0

2000



Effort = 5.0
Total CPUE = 1.4
Stock CPUE = 1.2
PSD = 33
RSD-P = 33

2004



Effort = 5.0
Total CPUE = 1.6
Stock CPUE = 1.6
PSD = 62
RSD-P = 62

Comparison of the number of white crappie caught per net night (CPUE), mean relative weight (diamonds), and population indices from fall trap net sampling in Averhoff Reservoir, Texas. Vertical line indicates minimum length limit at time of survey.

Fisheries Management Plan
Averhoff Reservoir

Prepared June 2005

ISSUE 1 No threadfin shad, a potentially important prey species, have been collected in routine fish community sampling since 1998.

MANAGEMENT STRATEGIES

1. Stock threadfin shad.

ISSUE 2 No Texas Parks and Wildlife Department water body fish records exist for any species or gear for this reservoir.

MANAGEMENT STRATEGIES

1. Write press release about the Texas Parks and Wildlife Department's Water Body Record Program and the availability of records to set at this reservoir and distribute to local print media.

APPENDIX A

Catch rates, by gear type, of all species collected from Averhoff Reservoir, 2004-2005. Sampling effort totals were 1.0 hour of electrofishing, 5 net-nights of trap-netting in fall 2004, and 5 net-nights of gill-netting in spring 2005.

Species	Electrofishing (number/hour)	Trap net (number/net-night)	Gill net (number/net-night)
Spotted gar			1.2
Longnose gar			2.0
Gizzard shad	59.0		5.2
Smallmouth buffalo			1.4
Channel catfish			3.6
Flathead catfish			0.4
Mexican tetra	2.0		
Redbreast sunfish	19.0		
Warmouth	9.0	0.2	
Bluegill	118.0	0.4	0.2
Longear sunfish	37.0		
Redear sunfish	45.0	3.4	1.0
Largemouth bass	50.0		1.2
White crappie		1.6	2.4
Rio grande cichlid	2.0		

APPENDIX B

Proposed survey schedule for Averhoff Reservoir, Texas, from 2005 to 2009. Regularly scheduled surveys are denoted by S. No additional sampling is scheduled.

Survey year	Electrofishing	Trap netting	Gill netting	Report
2005-2006				
2006-2007				
2007-2008				
2008-2009	S	S	S	S

APPENDIX C

Results of electrophoretic analysis of age-0 largemouth bass collected by electrofishing during fall from Averhoff Reservoir, Texas, in selected years from 1998 to 2004. Fish resulting from a cross between pure Florida largemouth bass (FLMB) and pure northern largemouth bass (NLMB) are F1 and those resulting from all other crosses are FX.

		Number of fish by genotype					
Year	Sample size	FLMB	F1	FX	NLMB	% FLMB alleles	% FLMB genotype
1998	18	6	1	11	0	34.7	33.3
2000	17	3	2	10	2	53.1	17.6
2004	29*	2	4	21	2	52.6	6.9

* Age-0 and age-1 fish in the sample.

APPENDIX D

Water body records, all tackle category, for Averhoff Reservoir as of May 20, 2005.

Species	Weight (lbs)	Length (inches)	Date certified	Gear
*				

* No Texas Parks and Wildlife Department water body records exist for this reservoir.

APPENDIX E

Angler access facilities, Averhoff Reservoir, May 2005.

Facility type	Location name	Latitude Longitude	Fee charged	No. of lanes	Challenged access	Bank fishing	Comments
Boat ramp	County boat ramp	28.8058 -99.7964	N	1	N	Y	Limited parking