PERFORMANCE REPORT

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FEDERAL AID PROJECT F-30-R-34

STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2008 Survey Report

Meredith Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish Populations in Meredith Reservoir were surveyed in 2008 using electrofishing and trap nets and in 2009 using gill nets. Anglers were surveyed from April 2008 to September 2008 with a creel survey. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir Description:** Meredith Reservoir is an impoundment on the Canadian River 35 miles northeast of Amarillo, Texas. It was built in 1965 to provide municipal and industrial water. It experiences substantial water level fluctuations and covered approximately 4,200 acres during 2008-2009. Angler and boat access is adequate but only 1 boat ramp was usable in spring 2008 due to drought. There are two handicap accessible fishing piers. Habitat was primarily silt and rock, with some non-native macrophytes. There have been no significant man-made changes in habitat since 1998.

- **Management History:** Important sport fish include walleye, white bass, smallmouth bass, largemouth bass, white crappie, and catfish. Walleye are managed with a two under 16 inches regulation to improve angler catch rates and size of fish caught. Smallmouth bass were placed under a 12-15 inch slot limit in 1992 in an effort to increase the number of larger fish. Largemouth bass, crappie and catfish have been managed under statewide regulations.

- **Fish Community:**
  - **Prey species:** Gizzard shad continued to be present in the reservoir. Electrofishing catch rate for gizzard shad was good, with about 83% of gizzard shad available as prey to most sport fish. The electrofishing catch rate of bluegills was higher than last year, and there were some bluegills collected over 6-inches long.

  - **Catfishes:** The channel catfish population has remained stable with good angler catch rates. The flathead catfish population remains stable with a high percentage of the sampled population consisting of legal-size fish. No anglers were documented as targeting flathead catfish by rod and reel.

  - **Temperate basses:** White bass were present in the reservoir and were a popular sport fish. Condition of sampled fish was poor but they are reaching legal size by age 2.

  - **Black basses:** Smallmouth bass relative abundance has declined and is likely due to drought conditions. Size structure was poor. There was little directed angling pressure toward this species. The largemouth bass population declined in 2008. Directed angling pressure toward largemouth bass was low.

  - **Crappies:** Both white and black crappies are present in the reservoir, though white crappie are more abundant. Crappie were a popular sport species in the reservoir and directed angler effort has increased.

  - **Walleye:** The walleye population has remained relatively stable and was reproducing during record low water levels. Walleye are the most popular sport fish in the reservoir and some reached 16 inches by age 2.

- **Management Strategies:** Continue monitoring of smallmouth bass and walleye populations to determine impact of regulations during drought conditions. Conduct gill net, electrofishing, and creel surveys annually, and general monitoring with trap nets in 2010 and 2012. Conduct a habitat survey in 2009.

INTRODUCTION

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

Reservoir Description

Meredith Reservoir is a 16,505-acre impoundment constructed in 1965 on the Canadian River by the US Bureau of Reclamation. It is located in Hutchinson, Moore, and Potter Counties approximately 35 miles northeast of Amarillo and is operated and controlled by the Canadian River Municipal Water Authority. The land surrounding Meredith Reservoir is owned and operated by the US Department of the Interior, National Park Service as the Lake Meredith National Recreation Area and the Alibates Flint Quarries National Monument. Primary water uses included municipal water supply and recreation. Meredith Reservoir was mesotrophic with a mean TSI chl-*a* of 42.66 (Texas Commission on Environmental Quality 2008). Habitat at time of sampling consisted of silt, rocks, and non-native submerged vegetation. Water level has been declining since 2000 and set a new record low level of 45.25 feet (4,144 acres) in July 2008 (Figure 1). Boat access consisted of one open public boat ramp. Four ramps were closed due to low water levels. Other descriptive characteristics for Meredith Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Munger 2007) included:

1. Smallmouth bass slot length limit evaluation.
   Action: Extended drought conditions have impacted both angler access to the reservoir and quality habitat for smallmouth bass. Electrofishing catch rates have remained too low to complete the evaluation of the length limit. Sampling effort has continued.
2. Walleye length-limit evaluation.
   Action: Gill net sampling and creel surveys have continued for the study. Drought impacts on angler access and walleye reproduction have complicated data analysis.

Harvest regulation history: Sport fishes in Meredith Reservoir are currently managed with statewide regulations with the exception of smallmouth bass (Table 2). From 1988 to 1992, smallmouth bass were managed with a 14-inch minimum length limit. A 12- to 15-inch slot length limit was implemented in 1992 to improve the population size structure.

Stocking history: Meredith Reservoir has not been stocked since 2000 (largemouth bass and walleye). Largemouth bass have been stocked to supplement natural reproduction when the Young:Adult Ratio was <1 and water levels were sufficient to provide nursery habitat. Yellow perch were experimentally stocked six times between 1980 and 1995 to provide an alternate forage species for walleye and an additional sport fish for anglers. The complete stocking history is in Table 3.

Vegetation/habitat history: Meredith Reservoir supported a limited amount of aquatic vegetation (Munger 1999), primarily Eurasian watermilfoil and areas of cattail.

METHODS

Fishes were collected by electrofishing (1.5 hour at 18 5-min stations), gill netting (8 net nights at 8 stations), and trap netting (20 net nights at 20 stations). Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (n/h) of actual electrofishing and, for gill and trap nets, as the number of fish per net night (n/nn). Electrofishing survey sites were randomly selected. Trap net survey sites were biologist-selected. Gill net surveys were based on historical sampling sites. A roving creel survey was conducted on 6 weekend days and 7 week days in each quarter (April-June and July-September, 2008). 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 for creel statistics. Ages were determined using otoliths from 50 randomly selected white bass and the entire sample (99 in 2008 and 106 in 2009) of walleye. Source for water level data was the United States Geological Survey (USGS) website.

RESULTS AND DISCUSSION

Habitat: A habitat survey was last conducted in 1998 (Munger 1999). Littoral zone habitat consisted primarily of silt, rocks, submerged terrestrial vegetation, and non-native submerged vegetation (Eurasian watermilfoil).

Creel: Directed fishing effort by anglers was highest for walleye (35.0%), followed by anglers fishing for white crappie (23.2%), and 19.2% for anything (Table 4). Total fishing effort for all species at Meredith Reservoir was 22,264 h, which was less than half the effort seen each year from 2005 to 2007 (Table 5). Anglers spent an estimated $115,757 on direct expenditures in 2008 (Table 5).

Prey species: Electrofishing catch rates of bluegill and gizzard shad in 2008 were 51.3/h and 123.3/h, respectively. Index of vulnerability (IOV) for gizzard shad was good, indicating 83% of gizzard shad were available to existing predators; this was higher than IOV estimates for previous years (Figure 2). Total CPUE of gizzard shad was comparable to 2006 but four times the 2007 rate (Figure 2). Total CPUE of bluegill in 2008 was similar to 2006 but more than double the 2007 catch rate. Size structure continued to be dominated by small individuals (Figure 3).

Channel catfish: The gill net catch rate of channel catfish was 1.0/nn in 2009. The channel catfish population continued to have a stable population with low relative abundance (Figure 4). The percent of anglers seeking channel catfish increased from 5.5% in 2007 to 10.9% in 2008 (Table 4). Total estimated harvest in 2008 was 1,335 fish, and the angler catch rate was 0.36/h (Table 6). Percent of released legal channel catfish was variable and ranged from 0 to 27%. Observed harvest from April through September 2008 showed good angler compliance, and harvested fish ranged in length from 12 to 22 inches (Figure 5).

Flathead catfish: The gill net catch rate for flathead catfish in 2009 was 1.5/nn which was down from 2.3/nn in 2007 and 2.4/nn in 2008 (Figure 6). The flathead catfish population size structure is very good with over 90% of the population >18 inches (Figure 6). There was no documented rod and reel angler directed effort toward the species (Tables 4 and 7), and no fish were documented in the creel.

White bass: The gill net catch rate of white bass was 6.1/nn in 2009 (Figure 7). The catch rate was down slightly from 7.1/nn in 2007 and 8.3/nn in 2008. Catch rates indicated white bass were relatively abundant in the reservoir, but no fish less than 10 inches were collected in 2009, possibly indicating reduced reproduction (Figure 7). The percent of anglers seeking white bass was low at 1.2% which was the lowest since 2005 (Table 4). Directed fishing effort was only 260 hours in 2008 (Table 8). Total harvest for white bass was 1,717 fish in 2008. Anglers released 24% to 60% of legal-sized fish. Observed harvest in 2008 showed good angler compliance with harvested fish ranging in length from 10 to 14 inches (Figure 8). Growth of white bass is good as individual fish are reaching legal size by age 2, and fish continued to grow and survive to age 11 (Figure 9).

Smallmouth bass: The electrofishing catch rate of smallmouth bass was 10.7/h in 2008; lower than rates from 2006 and 2007 (Figure 10). Prior to the beginning of the drought in 2000, electrofishing catch rates were typically 40-70/h. Catch rates have decreased as water levels have declined. There was little directed effort toward smallmouth bass in 2008 with less than 1% of anglers seeking this species (Table 4). Angler harvest was only 34 fish in 2008 and only fish under the slot length limit were released (Table 9). Directed effort for smallmouth bass has typically been very low, and only one harvested smallmouth bass was observed during the 2008 creel period (Figure 11).

Largemouth bass: The electrofishing catch rate of largemouth bass was 9.3/h in 2008 and was less than half the catch rates from 2006 and 2007 (Figure 12). Body condition in 2008 was good (relative weight over 90) for all collected size classes of fish (Figure 12). Largemouth bass was not a highly sought species as only 2.5% of anglers sought this species (Table 4). Directed fishing effort for largemouth bass in 2008 (560 h) was the lowest seen since 2005 (Table 10). Total estimated harvest was only 41 fish. Percent of released legal largemouth bass varied from 20% to 43%. Only one fish was observed in the creel in 2008 (Figure 13).

White crappie: The trap net catch rate of white crappie was 6.5/nn in 2008 which was similar to the 2004 catch rate, but much higher than 2006 (Figure 14). Only a small percentage of the sampled population was legal size (10 inches) in 2008 as indicated by an RSD-P of 5. The relative weight of most collected fish was less than 90 (Figure 14). Twenty three percent of anglers sought white crappie (Table 4). Directed effort for white crappie increased from 2,431 hours in 2005 to 5,164 hours in 2008 (Table 11). Estimated total harvest declined from over 7,000 fish in 2006 to 1,727 fish in 2008 (Table 11). Size of harvested white crappie in 2008 was good and ranged from 10 to 16 inches in total length (Figure 15).

Walleye: The gill net catch rate of walleye was 13.3/nn in 2009 and had improved from 8.5/nn in 2007 (Figure 16). The RSD-16 was good at 49. Mean relative weight was under 90 for most size classes in 2009 and was similar to values observed in 2007 and 2008 (Figure 16). Electrofishing surveys indicated continued reproduction (Figure 17) even though most known spawning structure is now out of the water due to drought. Thirty five percent of anglers sought walleye (Table 4). Directed effort for walleye declined from 12,025 h in 2007 to 7,783 h in 2008 (Table12). Angler catch rate declined to 0.16/h in 2008 (Table 12). No legal fish were documented as being released in 2008. Length of harvested fish was evenly spread across the 13-18 inch size classes (Figure 18). Some walleye reached 16 inches in total length by age 2, and most were 16 inches by age 4 (Figure 19).

Fisheries management plan for Meredith Reservoir, Texas

Prepared – July 2009.

ISSUE 1: A 12 to 15-inch slot length limit was enacted for smallmouth bass at Meredith Reservoir in 1992. Assessment of the slot length limit has shown that anglers accept the regulation and that fish under the slot length limit had been harvested. Population structure indices and condition indices have remained essentially unchanged. An extended drought has complicated analysis and reduced electrofishing catch rates and angler use of the resource.

MANAGEMENT STRATEGY

1. Continue monitoring the smallmouth bass population through standard sampling.

ISSUE 2: The harvest regulation for walleye was changed on September 1, 1999 to no minimum length limit and a 5 fish bag with no more than 2 fish under 16 inches. This change was enacted to alleviate predatory pressure on gizzard shad without losing the positive impacts gained from the 16-inch minimum length limit. Harvest of fish <16 inches was approximately 52% of the total harvest in 2008, but the total harvest was estimated at only 1,240 fish (Table 12). This level of harvest is unlikely to have any impact on the population of fish <16 inches. Extended drought conditions may be impacting walleye reproduction and growth which could mask the impact of the regulation.

MANAGEMENT STRATEGIES

1. Continue monitoring the walleye population through fall electrofishing and standard spring gill netting.
2. Monitor angler harvest of walleye through creel surveys.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes trap net sampling in 2010 and 2012. Electrofishing, gill netting, and creel surveys are conducted every year. Sampling with all gears is conducted in 2010/2011 and 2012/2013 (Table 13). Gill net surveys are required to monitor the walleye population and experimental length limit. Electrofishing is required to monitor the smallmouth bass slot length limit.

LITERATURE CITED

Anderson, R. O., and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-482 in B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

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

Munger, C. 1999. Statewide freshwater fisheries monitoring and management program survey report for: Meredith Reservoir, 1998. Texas Parks and Wildlife Department, Federal Aid In Sport Fish Restoration, Grant F-30-R, Performance Report, Austin.

Munger, C. 2007. Statewide freshwater fisheries monitoring and management program survey report for: Meredith Reservoir, 2006. Texas Parks and Wildlife Department, Federal Aid In Sport Fish Restoration, Grant F-30-R, Performance Report, Austin.

Texas Commission on Environmental Quality (TCEQ). 2008. Trophic Classification of Texas Reservoirs, 2008 Water Quality Inventory and 303(d) List. 15 pp.

Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Meredith Reservoir, Texas. Conservation pool is 2941 ft MSL.

Table 1. Characteristics of Meredith Reservoir, Texas.

Characteristic	Description
Year constructed	1965
Controlling authority	Canadian River Municipal Water Authority
Counties	Hutchinson, Moore, Potter
Reservoir type	Mainstream
Shoreline Development Index (SDI)	5.05
Conductivity	2,909 µmhos/cm

Table 2. Harvest regulations for Meredith Reservoir.

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, smallmouth	5	12 – 15 Slot Limit
Bass: largemouth	5	14 – No Limit
Crappie: white and black crappie, their hybrids and subspecies	25 (in any combination)	10 – No Limit
Walleye	5	No more than 2 under 16

Table 3. Stocking history of Meredith Reservoir, Texas. Size Categories are: FRY =<1 inch, FGL = 1-3 inches, and ADL = adults.

Year	Number	Size
	Rainbow trout	
1973	50,000	ADL
	Brown trout	
1973	30,000	ADL
	Blue catfish	
1965	2,500	FGL
1966	9,000	FGL
1971	12,000	FGL
1972	30,000	FGL
1988	160,500	FRY
Total	214,000	
	Channel catfish	
1965	421,500	FGL
1966	360,000	FGL
1970	9,680	FGL
1971	12,000	FGL
1973	107,690	FGL
Total	910,870	
	Flathead catfish	
1966	15,000	FGL
1966	18	ADL
	White bass	
1965	15	ADL
	Smallmouth bass	
1974	11,100	FGL
1975	28,000	FGL
1976	66,000	FGL
1977	322,700	FGL
Total	427,800	
	Largemouth bass	
1965	480,000	FGL
1966	432,000	FGL
1973	61,000	FGL
1973	27,000	ADL
1983	553	ADL
1994	286,400	FGL
1995	586,663	FGL
1997	177,000	FGL
2000	20,370	FGL
Total	2,070,986	

Year	Number	Size
	Florida largemouth bass	
1986	631	ADL
1990	401,749	FGL
1993	100,000	FGL
Total	502,380	
	F1 Florida X northern largemouth bass hybrids	
2001	32,000	FGL
	Kemp's largemouth bass	
1988	412,727	FGL
1990	189	ADL
Total	412,916	
	Mixed largemouth bass	
1989	197	ADL
1990	40	ADL
Total	237	
	Crappie	
1994	308	ADL
	White crappie	
1965	125,000	FRY
1965	258	ADL
1966	50,000	FGL
Total	175,258	
	Black crappie	
1966	150,000	FGL
	Yellow perch	
1980	2,500	ADL
1981	2,500	ADL
1983	2,212	ADL
1984	400	ADL
1992	165,116	FGL
1995	30,381	FGL
Total	203,109	
	Walleye	
1965	500,000	FRY
1966	2,000,000	FRY
1969	750,000	FRY
1998	5,096,000	FRY
2000	290,196	FGL
Total	8,636,196	

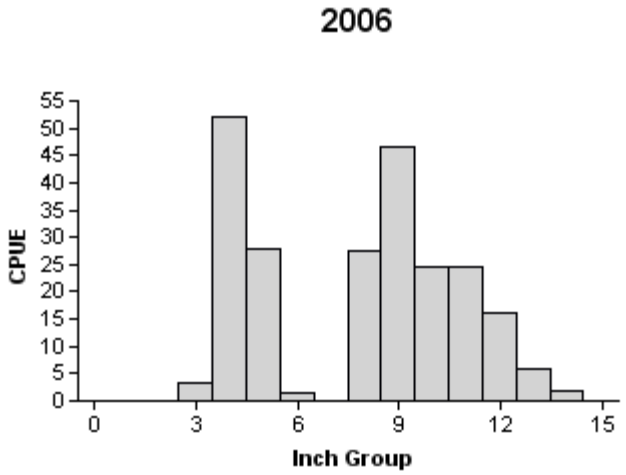
Table 4. Percent of anglers seeking each species as determined by angler surveys on Meredith Reservoir, Texas, April through September, 2005 – 2008.

Species	Year			
	2005	2006	2007	2008
Common carp			0.2	
Channel catfish	2.8	9.9	5.5	10.9
White bass	7.2	2.5	5.3	1.2
Bluegill		1.0	0.7	
Smallmouth bass	0.3			0.7
Largemouth bass	2.4	5.7	1.9	2.5
White crappie	6.6	5.4	8.9	23.2
Walleye	34.6	26.4	26.0	35.0
Anything	39.8	40.9	40.2	19.2
Black bass	5.3	1.8	6.2	3.4
Catfishes	0.9	6.3	5.1	3.9

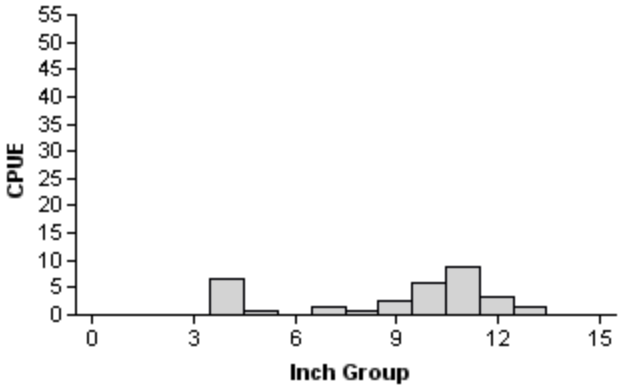
Table 5. Total fishing effort (h) for all species and total directed expenditures in US dollars at Meredith Reservoir, Texas, April through September, 2005-2008. RSE is in parentheses.

Creel Statistic	Year			
	2005	2006	2007	2008
Total fishing effort	36,931.9 (18)	43,665.8 (14)	46,303.8 (16)	22,264.1 (17)
Total directed expenditures ($)	141,350 (36)	152,099 (44)	199,446 (82)	115,757 (43)

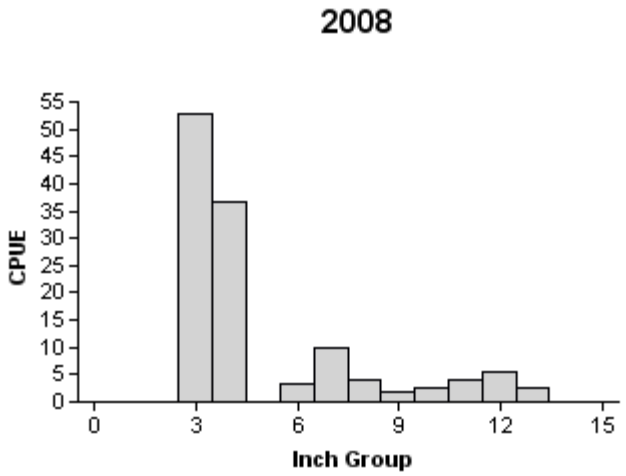
Gizzard Shad



Effort = 1.5
Total CPUE = 232.0 (22; 348)
Stock CPUE = 147.3 (22; 221)
PSD = 33 (8)
IOV = 36 (9)



Effort = 1.5
Total CPUE = 31.3 (21; 47)
Stock CPUE = 24.0 (22; 36)
PSD = 56 (11)
IOV = 28 (9)



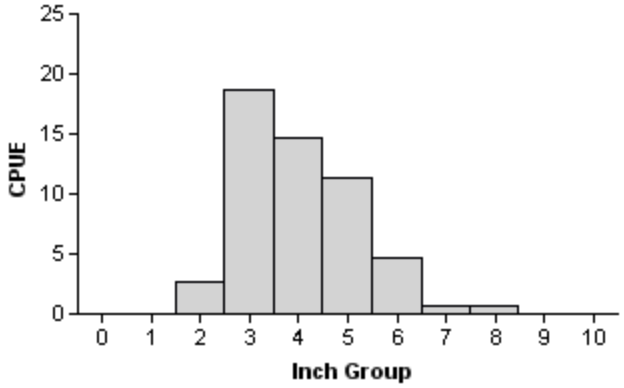
Effort = 1.5
Total CPUE = 123.3 (52; 185)
Stock CPUE = 30.7 (36; 46)
PSD = 39 (12)
IOV = 83 (7)

Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Meredith Reservoir, Texas, 2006, 2007, and 2008. RSE is used for CPUE values and SE is used for RSD/PSD values.

Bluegill

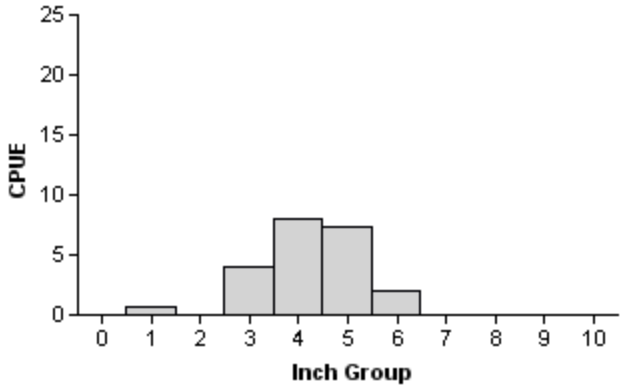
2006

Effort = 1.5
Total CPUE = 53.3 (19; 80)
Stock CPUE = 50.7 (19; 76)
PSD = 12 (5)



2007

Effort = 1.5
Total CPUE = 22.0 (23; 33)
Stock CPUE = 21.3 (23; 32)
PSD = 9 (5)



2008

Effort = 1.5
Total CPUE = 51.3 (29; 77)
Stock CPUE = 50.7 (30; 76)
PSD = 8 (2)

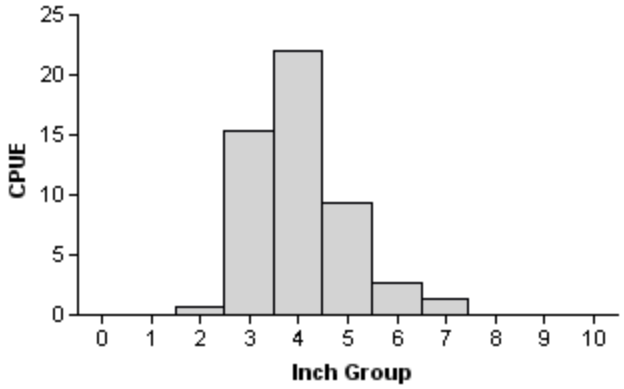


Figure 3. Number of bluegill caught per hour (CPUE) and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Meredith Reservoir, Texas, 2006, 2007, and 2008. RSE is used for CPUE values and SE is used for RSD/PSD values.

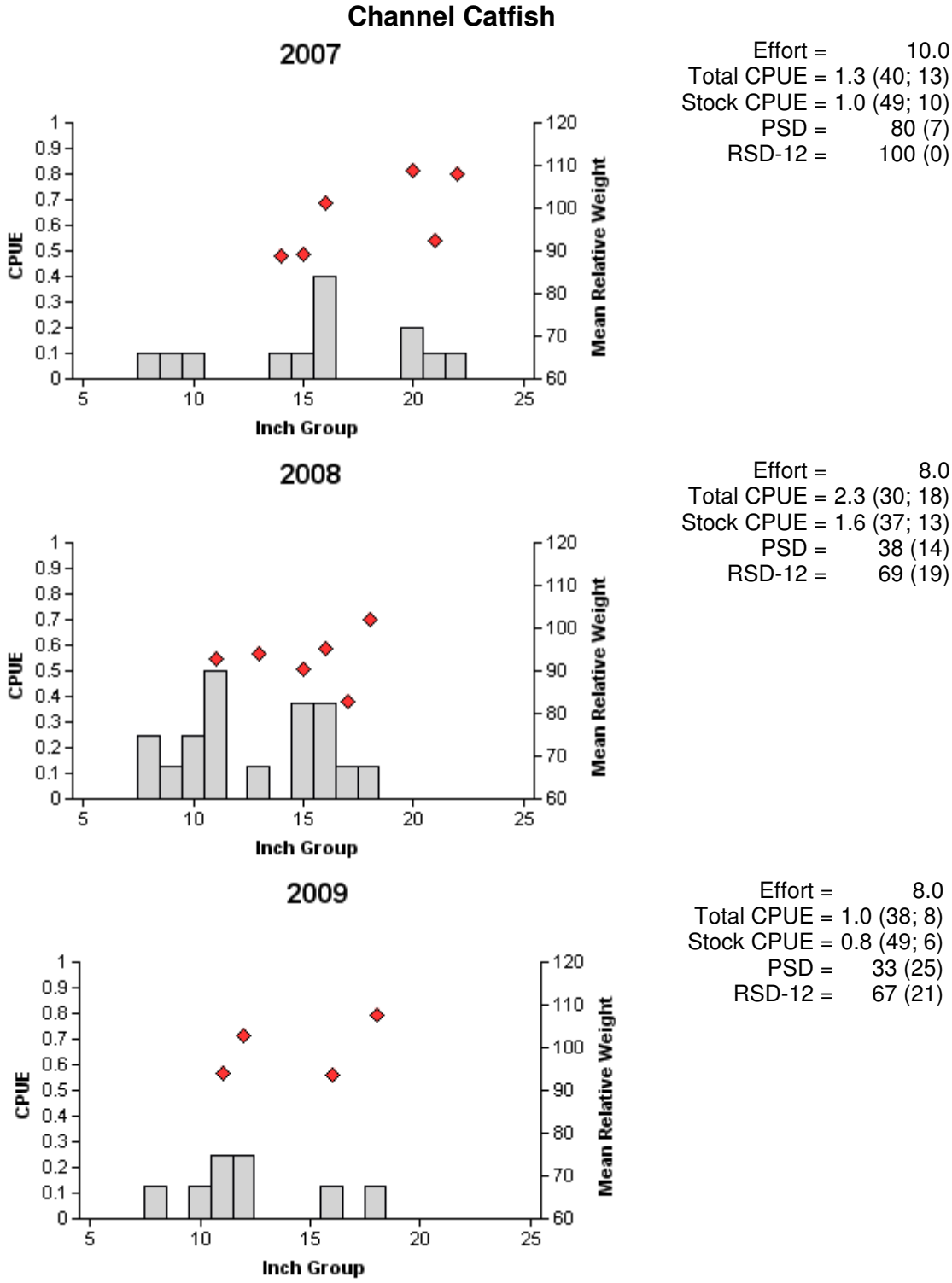


Figure 4. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Meredith Reservoir, Texas, 2007, 2008, and 2009. RSE is used for CPUE values and SE is used for RSD/PSD values.

Channel Catfish

Table 6. Creel survey statistics for channel catfish at Meredith Reservoir from April through September for 2005 to 2008, where total catch per hour is for anglers targeting channel catfish and total harvest is the estimated number of channel catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses. Meredith Reservoir was 7,047 surface acres in 2005, 6,164 acres in 2006, 5,650 acres in 2007 and 4,144 acres in 2008.

	Year			
Creel Survey Statistic	2005	2006	2007	2008
Directed effort (h)	1,049.26 (50)	4,342.73 (25)	2,558.03 (36)	2,437.29 (41)
Directed effort/acre	0.15 (50)	0.70 (25)	0.45 (36)	0.59 (41)
Total catch per hour	0.20 (74)	0.74 (102)	0.32 (61)	0.36 (35)
Total harvest	60 (541)	2,434 (11)	898 (75)	1,335 (48)
Harvest/acre	<0.01 (541)	0.39 (11)	0.16 (75)	0.32 (48)
Percent legal released	9	10	27	0

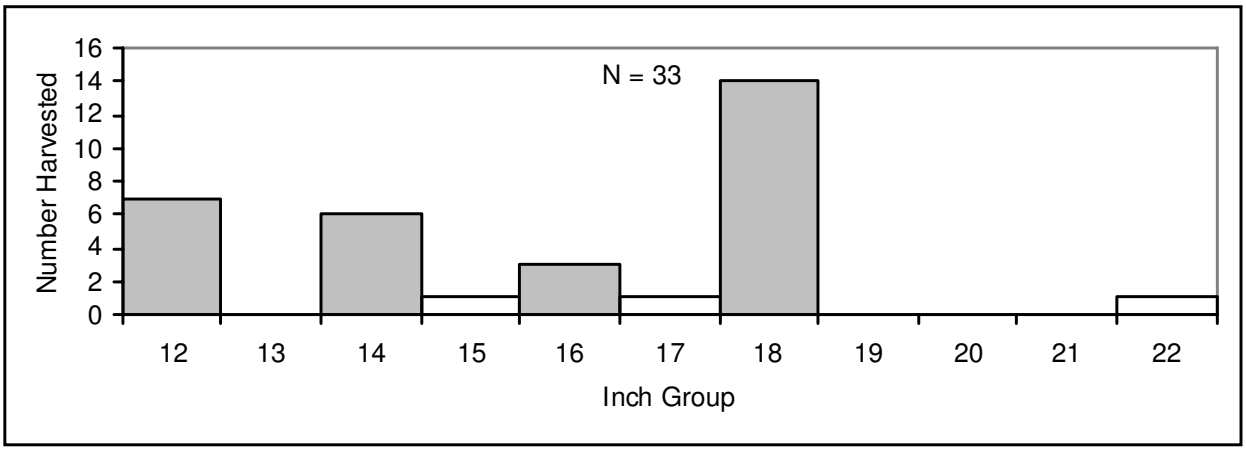


Figure 5. Length frequency of harvested channel catfish observed during creel surveys at Meredith Reservoir, Texas, April through September 2008, all anglers combined. N is the number of harvested channel catfish observed during creel surveys.

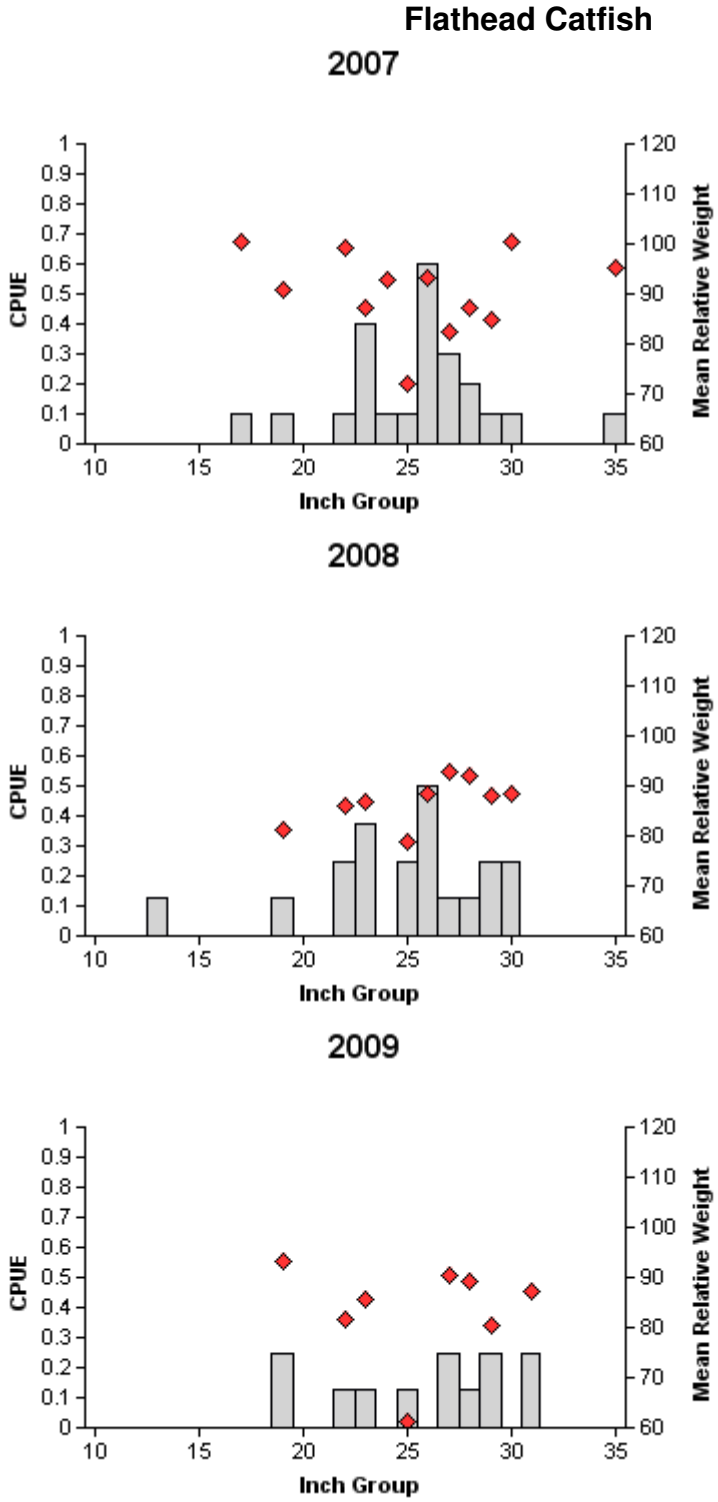


Figure 6. Number of flathead catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Meredith Reservoir, Texas, 2007, 2008, and 2009. RSE is used for CPUE values and SE is used for RSD/PSD values.

Flathead Catfish

Table 7. Creel survey statistics for flathead catfish at Meredith Reservoir from April through September for 2005 to 2008, where total catch per hour is for anglers targeting flathead catfish and total harvest is the estimated number of flathead catfish harvested by all anglers. Relative standard errors (RSE) are in parentheses. Meredith Reservoir was 7,047 surface acres in 2005, 6,164 acres in 2006, 5,650 acres in 2007 and 4,144 acres in 2008.

	Year			
Creel Survey Statistic	2005	2006	2007	2008
Directed effort (h)	0.0 (.)	0.0 (.)	0.0 (.)	0.0 (.)
Directed effort/acre	0.0 (.)	0.0 (.)	0.0 (.)	0.0 (.)
Total catch per hour	0.0 (.)	0.0 (.)	0.0 (.)	0.0 (.)
Total harvest	0 (.)	82 (557)	43 (636)	0 (.)
Harvest/acre	0.00 (.)	0.01 (557)	<0.01 (636)	0.00 (.)
Percent legal released	0	0	0	0

White Bass

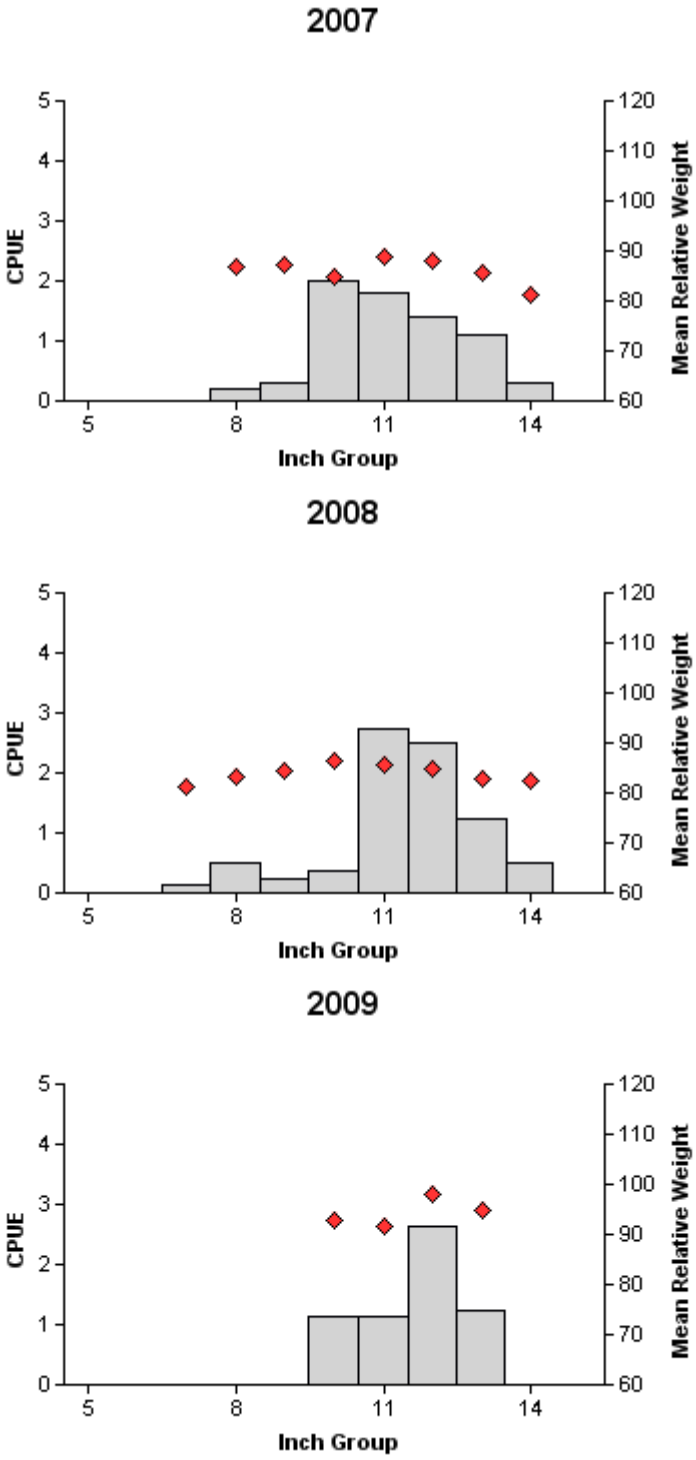


Figure 7. Number of white bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Meredith Reservoir, Texas, 2007, 2008, and 2009. RSE is used for CPUE values and SE is used for RSD/PSD values.

White Bass

Table 8. Creel survey statistics for white bass at Meredith Reservoir from April through September for 2005 to 2008, where total catch per hour is for anglers targeting white bass and total harvest is the estimated number of white bass harvested by all anglers. Relative standard errors (RSE) are in parentheses. Meredith Reservoir was 7,047 surface acres in 2005, 6,164 acres in 2006, 5,650 acres in 2007 and 4,144 acres in 2008.

	Year			
Creel Survey Statistic	2005	2006	2007	2008
Directed effort (h)	2,666.20 (38)	1,093.41 (52)	2,465.02 (35)	259.91 (95)
Directed effort/acre	0.38 (38)	0.18 (52)	0.44 (35)	0.06 (95)
Total catch per hour	0.54 (84)	0.68 (141)	0.78 (86)	0.00 (.)
Total harvest	1,830 (63)	5,605 (44)	3,516 (36)	1,717 (42)
Harvest/acre	0.26 (63)	0.91 (44)	0.62 (36)	0.41 (42)
Percent legal released	60	26	43	24

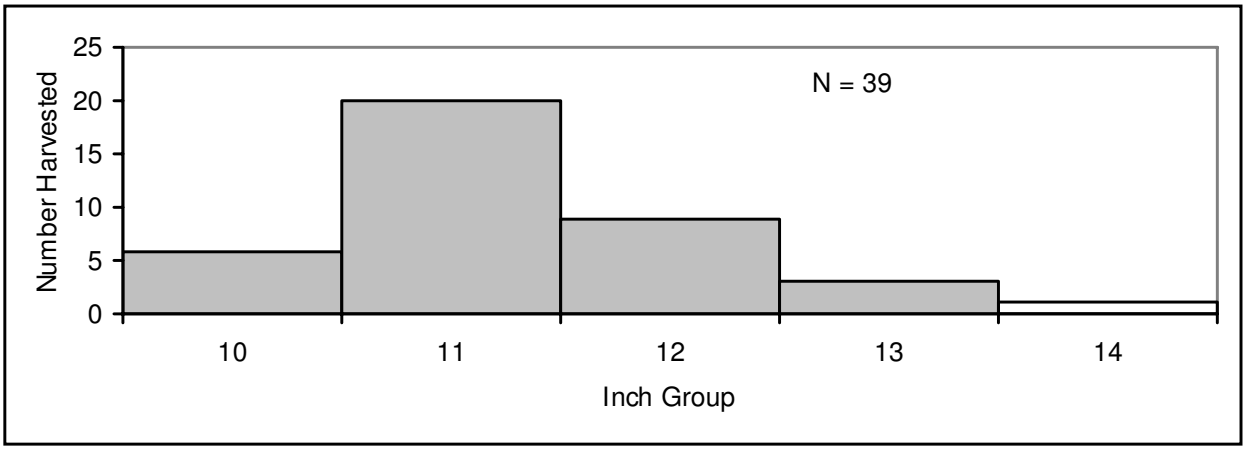


Figure 8. Length frequency of harvested white bass observed during creel surveys at Meredith Reservoir, Texas, April through September 2008, all anglers combined. N is the number of harvested white bass observed during creel surveys.

White Bass

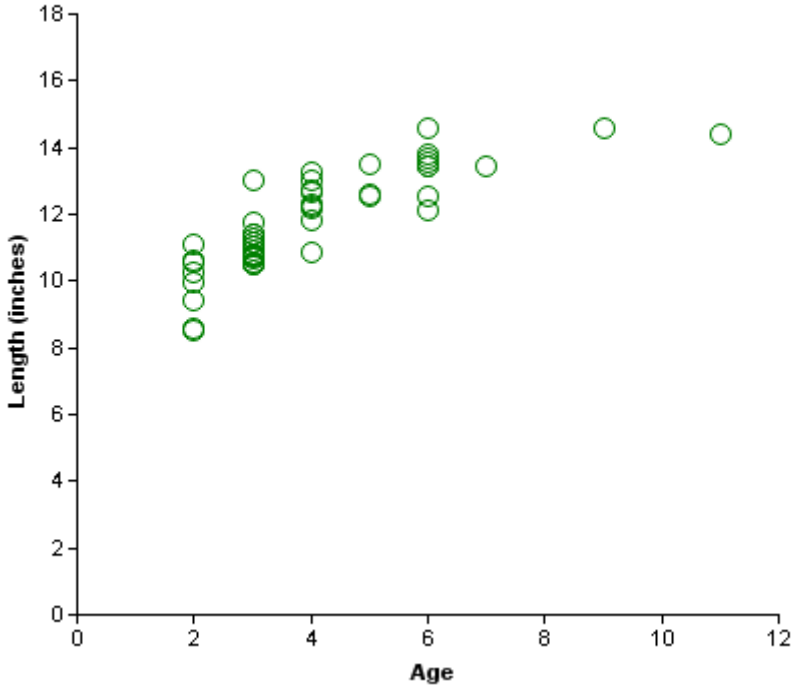


Figure 9. Length at age for 50 white bass collected from gill nets at Meredith Reservoir, Texas, April 2007.

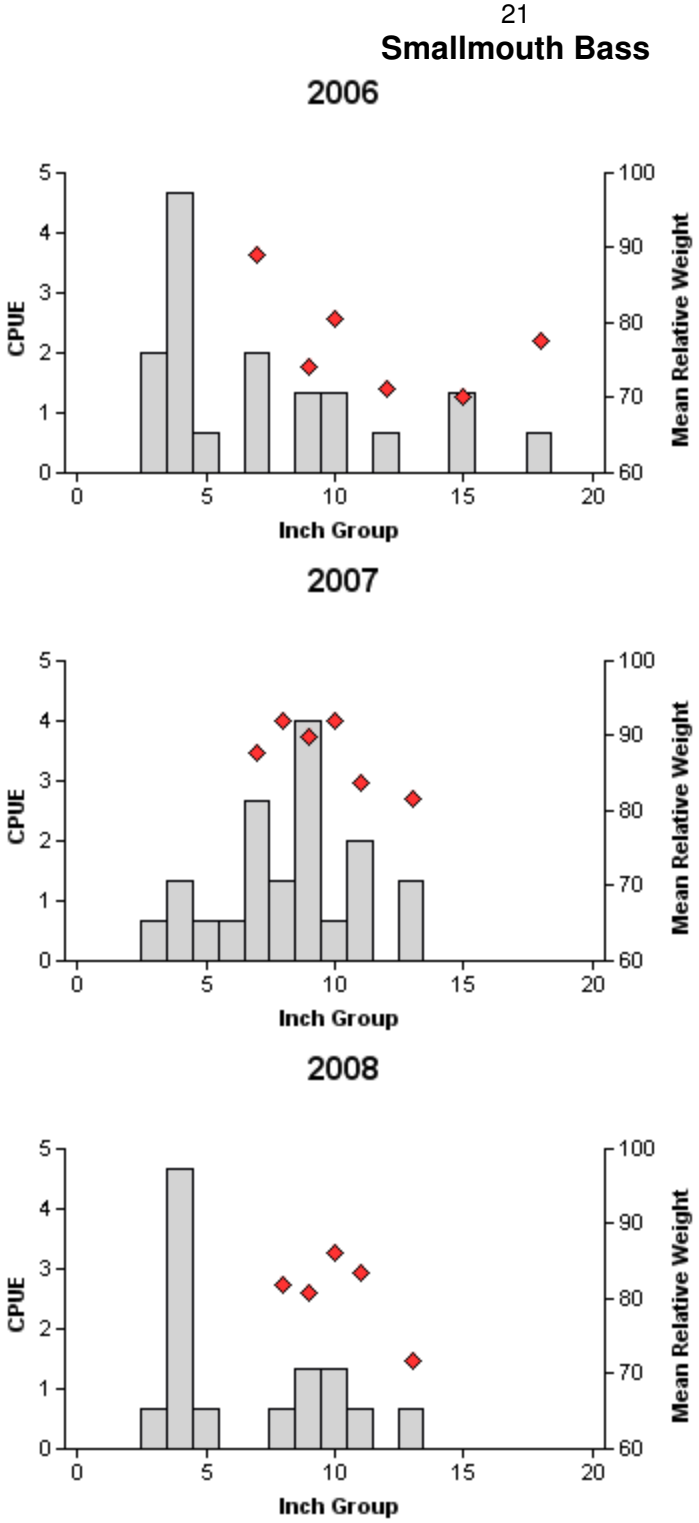


Figure 10. Number of smallmouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Meredith Reservoir, Texas, 2006, 2007, and 2008. RSE is used for CPUE values and SE is used for RSD/PSD values.

Smallmouth Bass

Table 9. Creel survey statistics for smallmouth bass at Meredith Reservoir from April through September for 2005 to 2008, where total catch per hour is for anglers targeting smallmouth bass and total harvest is the estimated number of smallmouth bass harvested by all anglers. Relative standard errors (RSE) are in parentheses. Meredith Reservoir was 7,047 surface acres in 2005, 6,164 acres in 2006, 5,650 acres in 2007 and 4,144 acres in 2008.

	Year			
Creel Survey Statistic	2005	2006	2007	2008
Directed effort (h)	119.52 (135)	0.0 (.)	0.0 (.)	146.93 (145)
Directed effort/acre	0.02 (135)	0.00 (.)	0.00 (.)	0.04 (145)
Total catch per hour	0.50 (.)	0.0 (.)	0.0 (.)	0.0 (.)
Total harvest	225 (140)	148 (228)	43 (333)	34 (400)
Harvest/acre	0.03 (140)	0.02 (228)	<0.01 (333)	<0.01 (400)
Percent legal released	17	8*	12	27*

*All fish released were below the slot length limit.

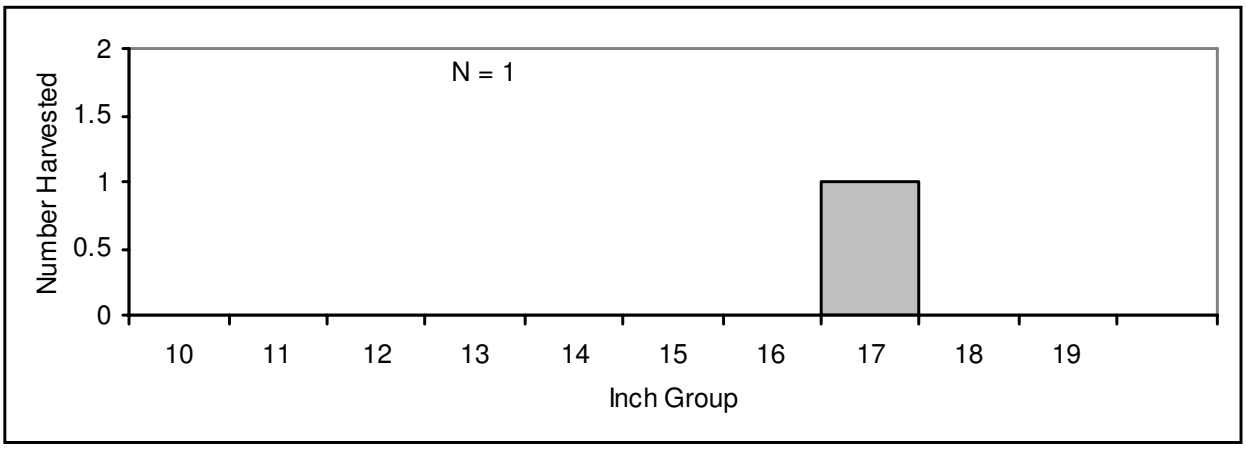


Figure 11. Length frequency of harvested smallmouth bass observed during creel surveys at Meredith Reservoir, Texas, April through September 2008, all anglers combined. N is the number of harvested smallmouth bass observed during creel surveys.

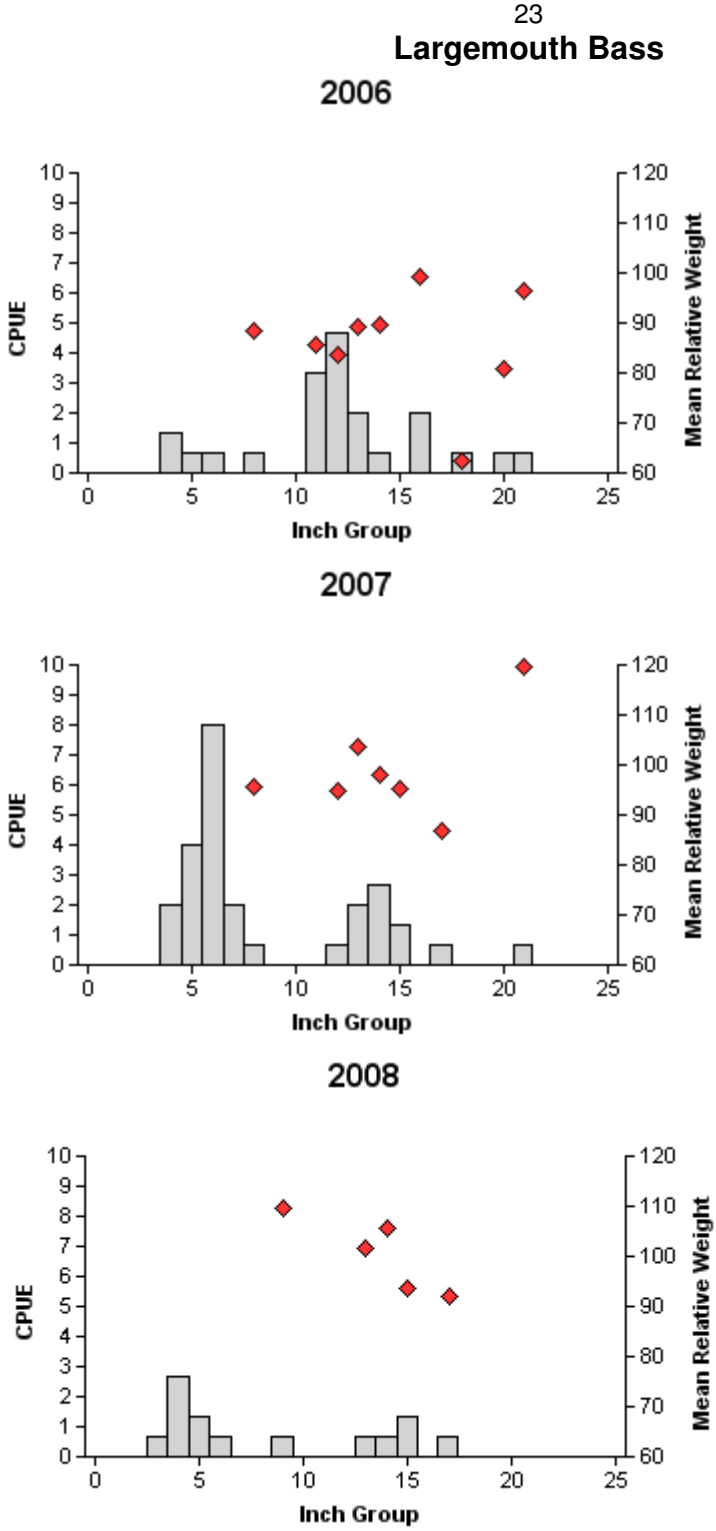


Figure 12. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Meredith Reservoir, Texas, 2006, 2007, and 2008. RSE is used for CPUE values and SE is used for RSD/PSD values.

Largemouth Bass

Table 10. Creel survey statistics for largemouth bass at Meredith Reservoir from April through September for 2005 to 2008, where total catch per hour is for anglers targeting largemouth bass and total harvest is the estimated number of largemouth bass harvested by all anglers. Relative standard errors (RSE) are in parentheses. Meredith Reservoir was 7,047 surface acres in 2005, 6,164 acres in 2006, 5,650 acres in 2007 and 4,144 acres in 2008.

	Year			
Creel Survey Statistic	2005	2006	2007	2008
Directed effort (h)	890.67 (53)	2,478.50 (35)	865.47 (58)	559.85 (63)
Directed effort/acre	0.13 (53)	0.40 (35)	0.15 (58)	0.14 (63)
Total catch per hour	0.00 (.)	0.39 (61)	0.03 (135)	0.29 (131)
Total harvest	41 (87)	179 (165)	0 (387)	41 (400)
Harvest/acre	<0.01 (87)	0.03 (165)	0.00 (387)	<0.01 (400)
Percent legal released	30	20	43	30

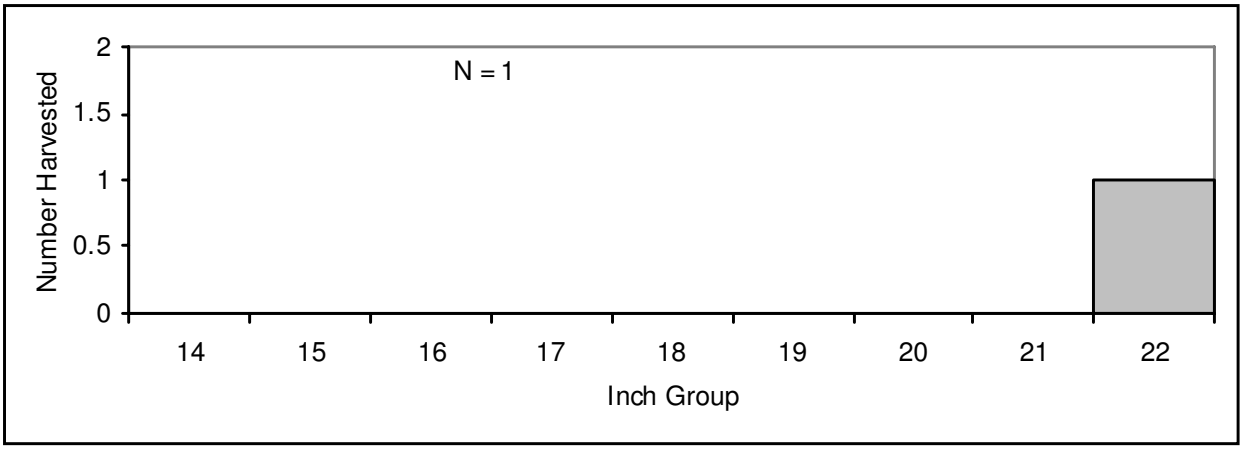
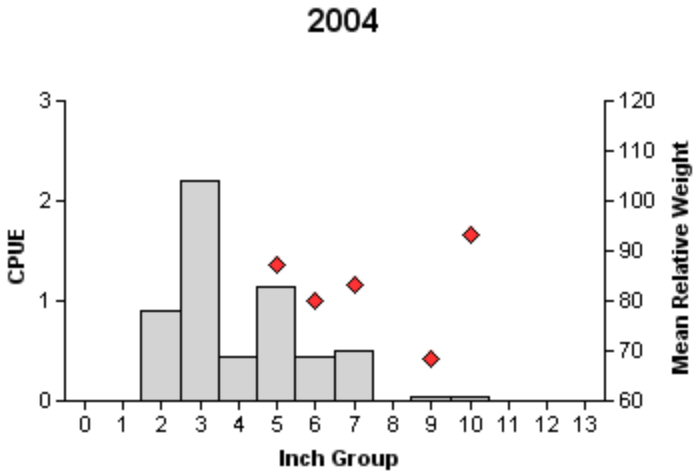
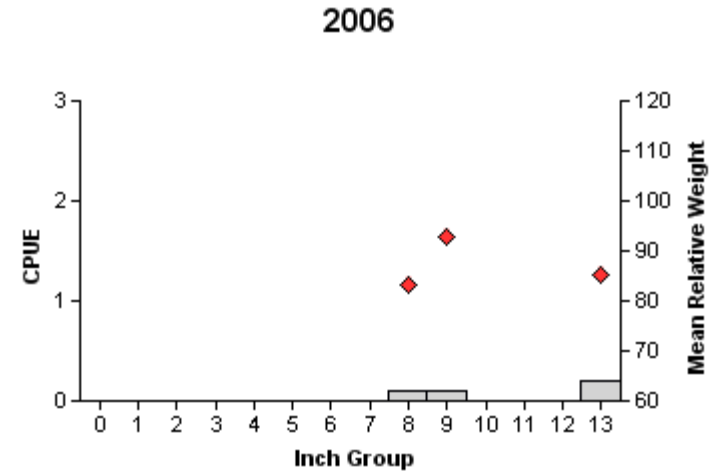


Figure 13. Length frequency of harvested largemouth bass observed during creel surveys at Meredith Reservoir, Texas, April through September 2008, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys.

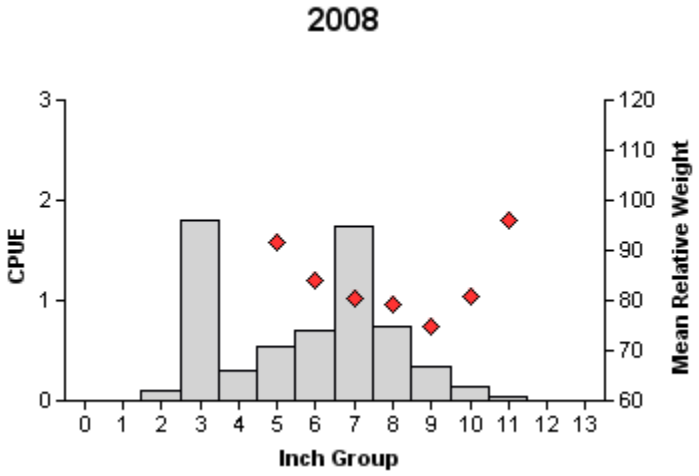
White Crappie



Effort = 20.0
Total CPUE = 5.8 (36; 115)
Stock CPUE = 2.2 (29; 44)
PSD = 5 (3)
RSD-P = 2 (2)



Effort = 10.0
Total CPUE = 0.4 (55; 4)
Stock CPUE = 0.4 (55; 4)
PSD = 100 (0)
RSD-P = 50 (32)



Effort = 20.0
Total CPUE = 6.5 (20; 130)
Stock CPUE = 4.3 (19; 86)
PSD = 30 (5)
RSD-P = 5 (2)

Figure 14. Number of white crappie caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for fall trap net surveys, Meredith Reservoir, Texas, 2004, 2006, and 2008. RSE is used for CPUE values and SE is used for RSD/PSD values.

White Crappie

Table 11. Creel survey statistics for white crappie at Meredith Reservoir from April through September for 2005 to 2008, where total catch per hour is for anglers targeting white crappie and total harvest is the estimated number of white crappie harvested by all anglers. Relative standard errors (RSE) are in parentheses. Meredith Reservoir was 7,047 surface acres in 2005, 6,164 acres in 2006, 5,650 acres in 2007 and 4,144 acres in 2008.

	Year			
Creel Survey Statistic	2005	2006	2007	2008
Directed effort (h)	2,431.42 (39)	2,366.47 (34)	4,123.76 (31)	5,164.29 (28)
Directed effort/acre	0.34 (39)	0.38 (34)	0.73 (31)	1.25 (28)
Total catch per hour	0.25 (117)	0.99 (32)	1.28 (69)	0.60 (74)
Total harvest	482 (77)	7,034 (41)	3,731 (32)	1,727 (47)
Harvest/acre	0.07 (77)	1.14 (41)	0.66 (32)	0.42 (47)
Percent legal released	7	3	<1	0

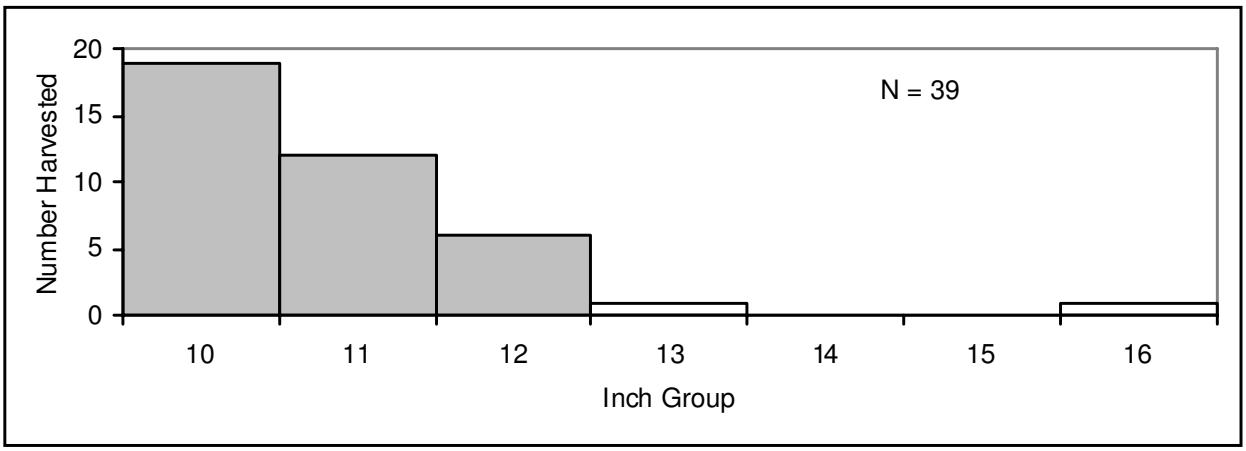


Figure 15. Length frequency of harvested white crappie observed during creel surveys at Meredith Reservoir, Texas, April through September 2008, all anglers combined. N is the number of harvested white crappie observed during creel surveys.

Walleye

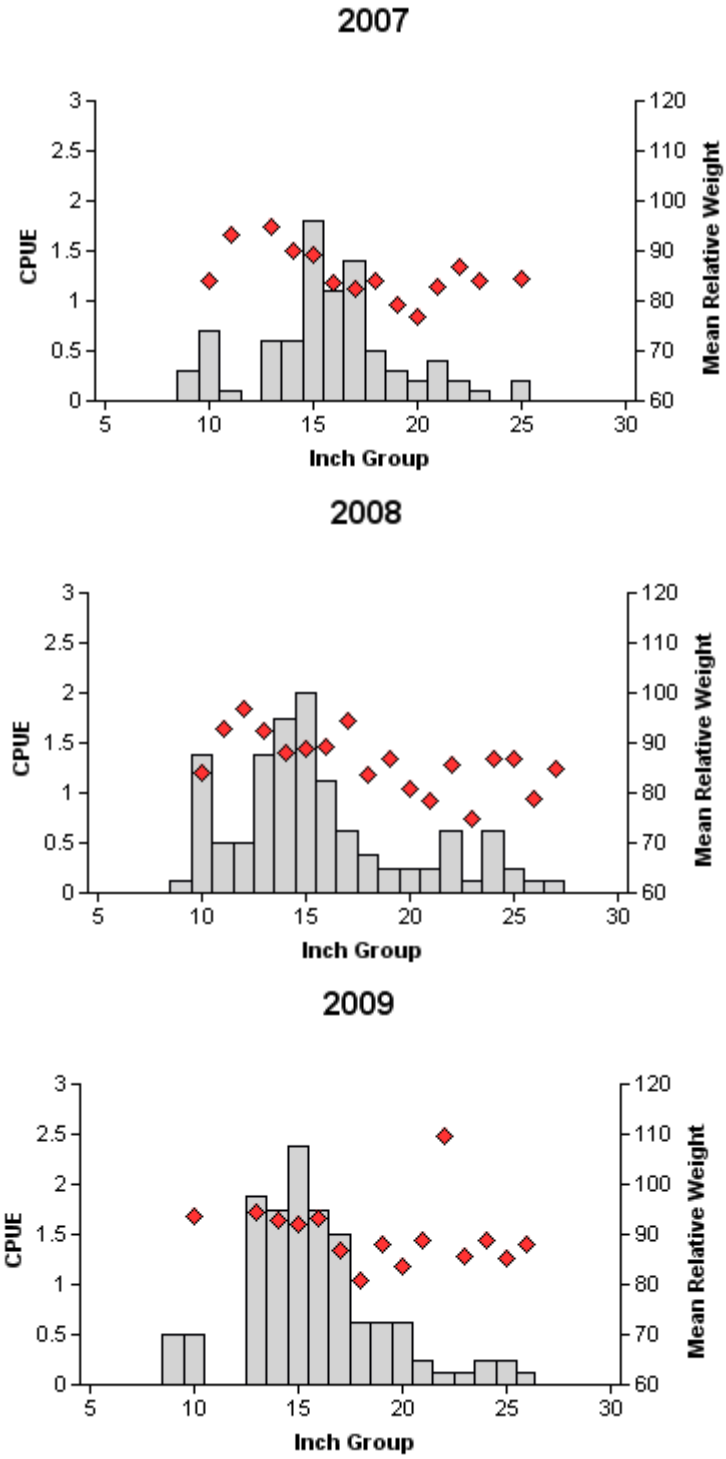


Figure 16. Number of walleye caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Meredith Reservoir, Texas, 2007, 2008, and 2009. RSE is used for CPUE values and SE is used for RSD/PSD values.

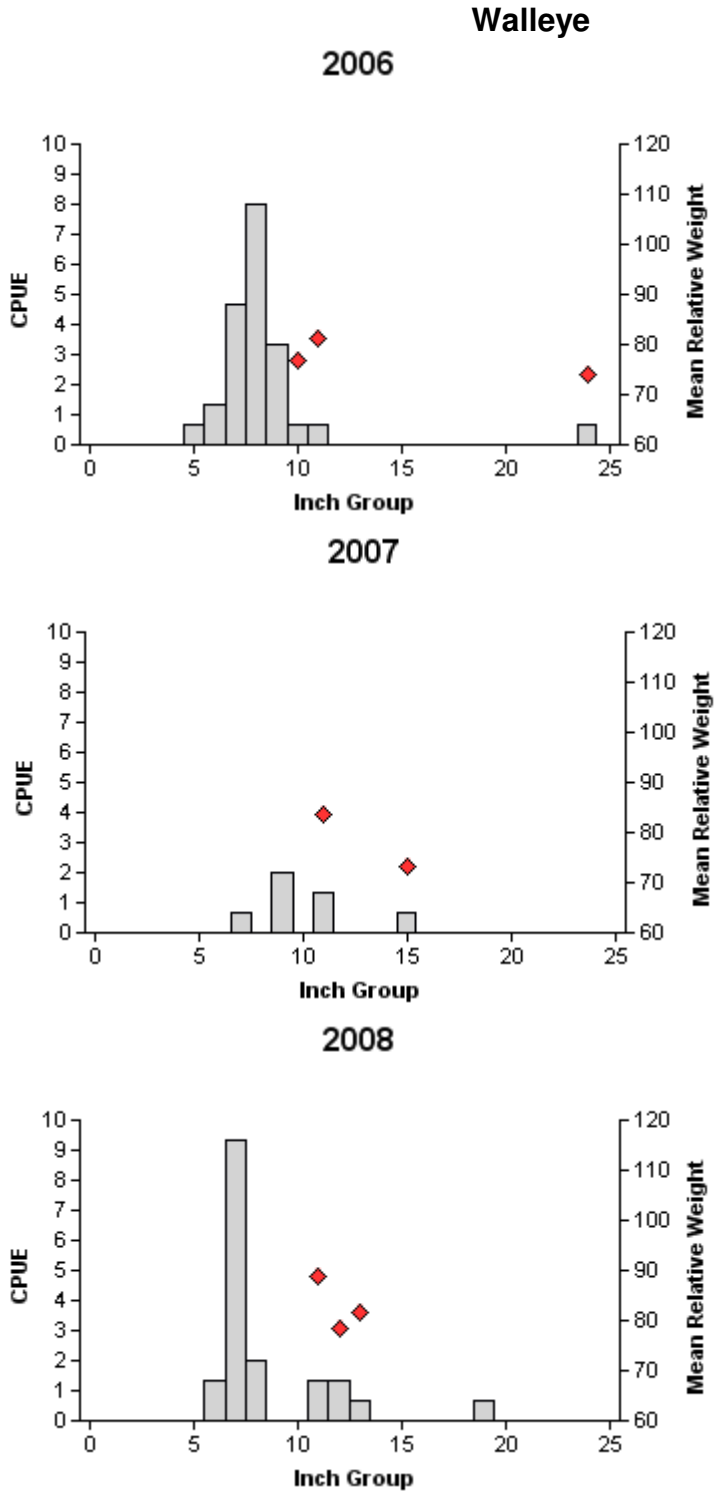


Figure 17. Number of walleye caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for fall electrofishing surveys, Meredith Reservoir, Texas, 2006, 2007, and 2008. RSE is used for CPUE values and SE is used for RSD/PSD values.

Walleye

Table 12. Creel survey statistics for walleye at Meredith Reservoir from April through September for 2005 to 2008, where total catch per hour is for anglers targeting walleye and total harvest is the estimated number of walleye harvested by all anglers. Relative standard errors (RSE) are in parentheses. Meredith Reservoir was 7,047 surface acres in 2005, 6,164 acres in 2006, 5,650 acres in 2007 and 4,144 acres in 2008.

	Year			
Creel Survey Statistic	2005	2006	2007	2008
Directed effort (h)	12,794.36 (20)	11,527.79 (28)	12,025.19 (23)	7,783.55 (24)
Directed effort/acre	1.82 (20)	1.87 (28)	2.13 (23)	1.88 (24)
Total catch per hour	0.22 (43)	0.63 (23)	0.37 (41)	0.16 (59)
Total harvest	3,231 (45)	4,636 (41)	2,409 (42)	1,240 (47)
Harvest/acre	0.46 (45)	0.75 (41)	0.43 (42)	0.30 (47)
Percent legal released*	0	12	4	0

*Only includes fish over 16 inches.

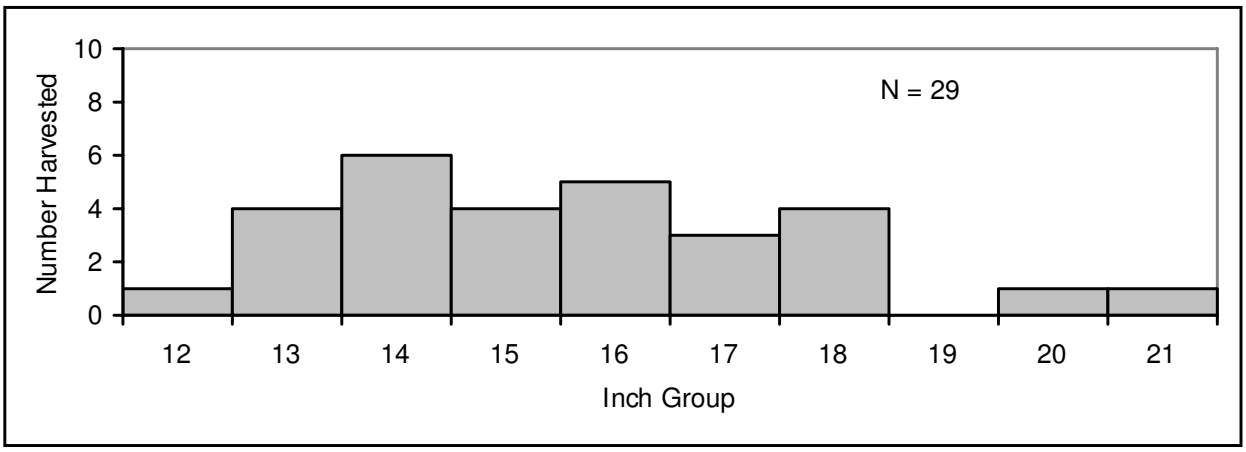


Figure 18. Length frequency of harvested walleye observed during creel surveys at Meredith Reservoir, Texas, April through September 2008, all anglers combined. N is the number of harvested walleye observed during creel surveys.

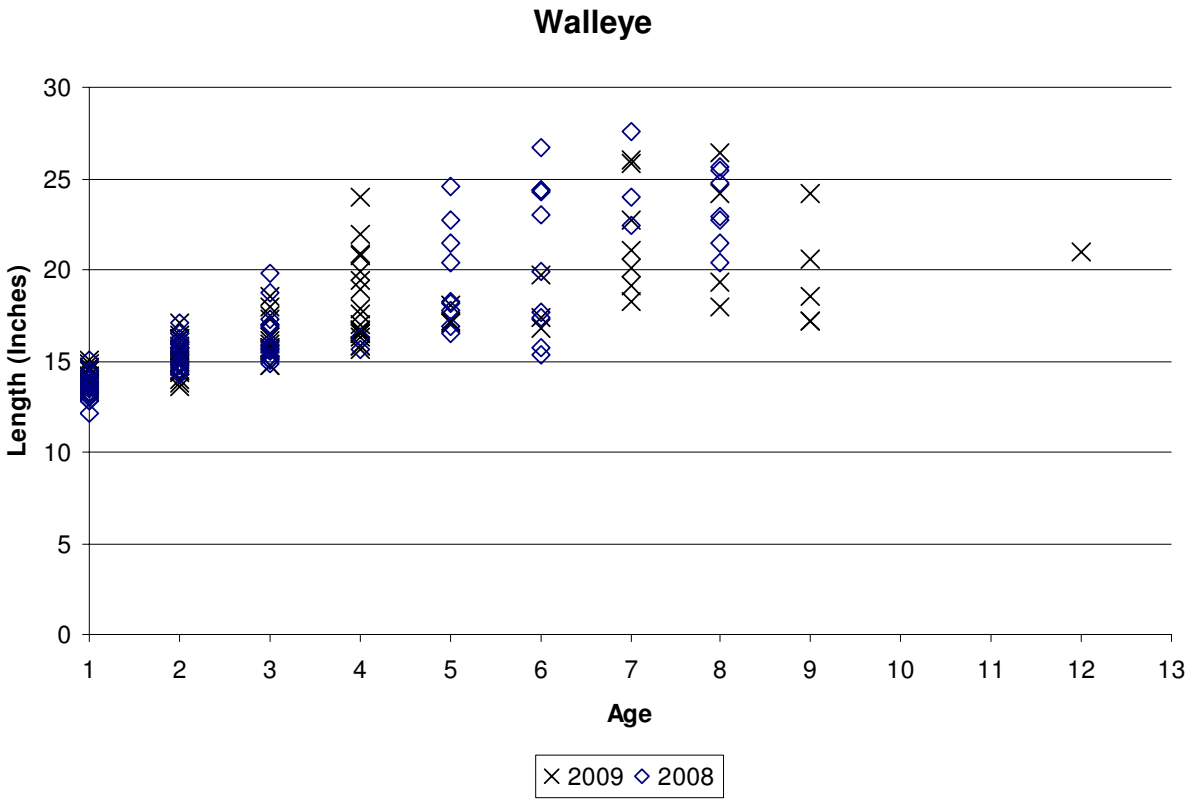


Figure 19. Length at age for walleye collected from gill nets at Meredith Reservoir, Texas, April 2008 and 2009. Ninety nine walleye were aged in 2008 and 106 were aged in 2009.

Table 13. Proposed sampling schedule for Meredith Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. S denotes standard survey and A denotes additional survey. The creel survey will be 6 months from April through September.

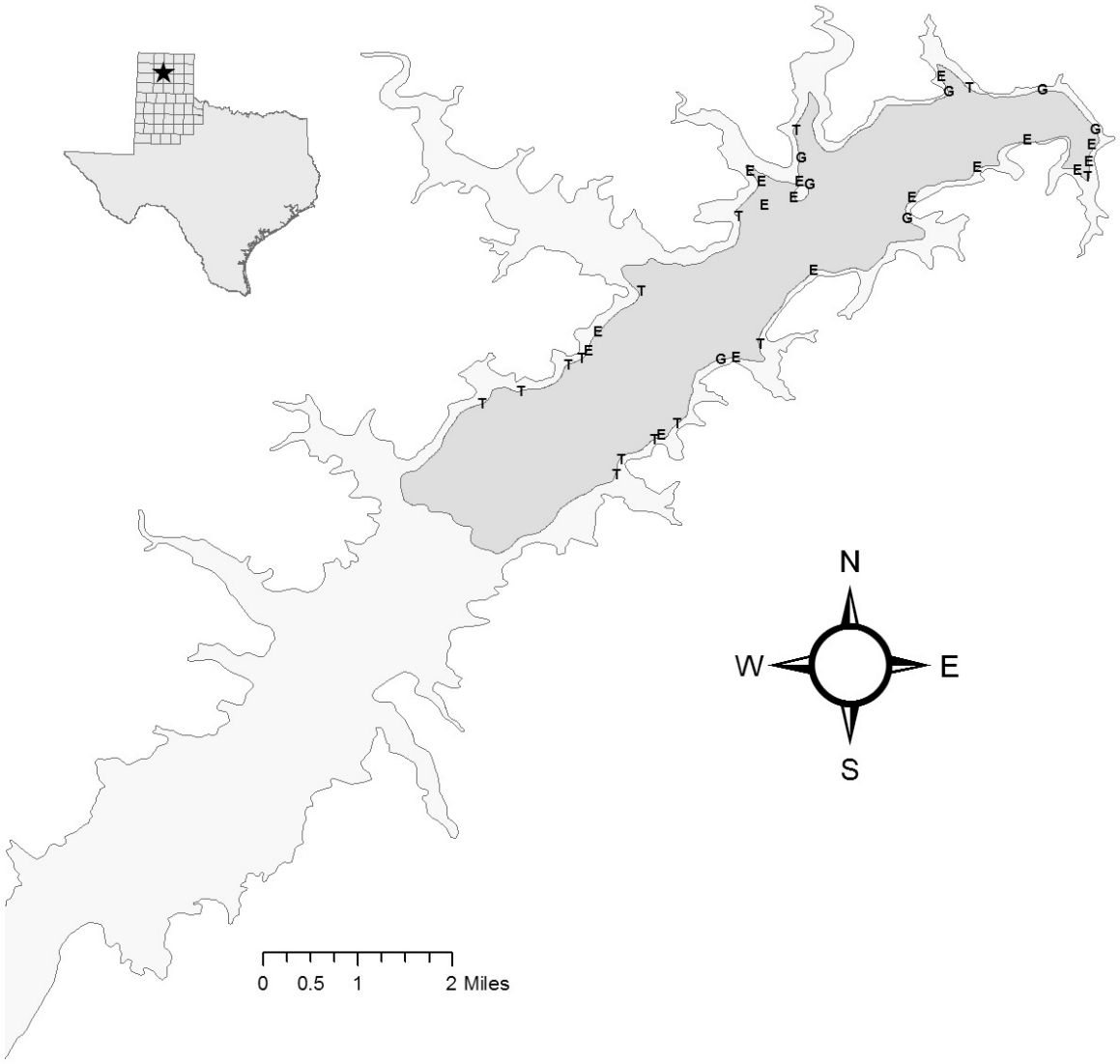
Survey Year	Electrofishing	Trap Net	Gill Net	Creel Survey	Report
Fall 2009-Spring 2010	A		A	A	
Fall 2010-Spring 2011	A	A	A	A	A
Fall 2011-Spring 2012	A		A	A	
Fall 2012-Spring 2013	S	S	S	S	S

APPENDIX A

Catch rate of all species collected from all gear types from Meredith Reservoir, Texas, 2008-2009. Effort was 1.5 h for electrofishing, 8 net nights for gill nets, and 20 net nights for trap nets.

Species	Electrofishing	Gill Netting	Trap Netting
Gizzard shad	123.33	14.13	0.15
Common carp	48.00	3.00	
River carpsucker	3.33	2.25	0.35
Channel catfish	7.33	1.00	
Flathead catfish	0.67	1.50	
White bass	28.00	6.13	1.10
Green sunfish	4.00		
Warmouth	0.67		
Bluegill	51.33	0.38	2.05
Longear sunfish	31.33		0.35
Smallmouth bass	10.67	0.25	
Largemouth bass	9.33	0.13	0.05
White crappie	22.00	0.38	6.50
Black crappie	0.67	0.25	0.10
Walleye	16.67	13.25	0.05
Freshwater drum		0.13	

APPENDIX B



Location of sampling sites, Meredith Reservoir, Texas, 2008-2009. Trap net, gill net, and electrofishing stations are indicated by T, G, and E, respectively. The dark grey color indicates approximate elevation at time of sampling.