

PERFORMANCE REPORT

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STATEWIDE FRESHWATER FISHERIES MONITORING AND MANAGEMENT PROGRAM

2007 Survey Report

Brandy Branch Reservoir

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SURVEY AND MANAGEMENT SUMMARY

Fish populations in Brandy Branch Reservoir were surveyed in 2007 using electrofishing and in 2008 using gill netting. Anglers were surveyed from December 2007 to February 2008 with an access creel survey. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Brandy Branch Reservoir is a 1,257-acre impoundment of Brandy Branch Creek in the Sabine River Basin in Harrison County. Structural habitat is mainly inundated timber. Native submersed aquatic vegetation and hydrilla each account for approximately 18% of the reservoir's surface area. Eurasian water milfoil was recently discovered and giant salvinia was introduced from a boat trailer.
- **Management history:** Largemouth bass are the primary sport fish in this reservoir. All sport fish have historically been managed with statewide harvest regulations. The largemouth bass population is comprised entirely of Florida largemouth bass.
- **Fish community:**
 - **Prey species:** Threadfin shad and gizzard shad were collected during the 2007 fall electrofishing survey, but their abundance was low. Bluegill were the most abundant prey species collected during the 2007 survey.
 - **Catfishes:** Only three large channel catfish were collected during 2008 gill netting. Previous efforts to establish a reproducing channel catfish population have not been successful.
 - **Largemouth bass:** The largemouth bass population was good with high relative abundance, good size structure, and adequate recruitment. Relative weights were good for all inch groups indicating adequate prey availability. Largemouth bass had adequate growth rates, reaching legal-size in three growing seasons. All anglers interviewed during a winter 2007/2008 creel survey were targeting largemouth bass.
 - **Crappie:** Trap netting was not conducted during this survey period, but crappie abundance has historically been very low.
- **Management strategies:** Conduct electrofishing surveys every other year beginning in 2009, and general monitoring with gill nets in 2012. Invasive vegetation surveys will be conducted annually beginning in 2008. Technical guidance will be given to controlling authority regarding vegetation management. All sport fish will continue to be managed under statewide harvest regulations.

INTRODUCTION

This document is a summary of fisheries data collected from Brandy Branch Reservoir in 2007 to 2008. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2007 and 2008 data for comparison.

Reservoir Description

Brandy Branch Reservoir is a 1,257-acre impoundment constructed in 1983 on Brandy Branch Creek in the Sabine River Basin. It is located in Harrison County near the City of Hallsville. The controlling authority is American Electric Power Company. Primary water uses are power plant cooling and public recreation. It has a watershed of approximately 4.1 square miles, a shoreline length of 17 miles, and a shoreline development index of 4.1. Annual water level fluctuation is 2 to 3 feet (Figure 1). Supplemental water is pumped in from Big Cypress River by the controlling authority to maintain sufficient water level for power plant cooling. Structural habitat consists of inundated timber, overhanging brush, Christmas tree reefs, and creek channels (Ryan and Brice 2004). Native submersed aquatic vegetation and hydrilla each account for approximately 18% of the reservoir's surface area. Eurasian water milfoil was discovered in the reservoir and giant salvinia was recently introduced from a boat trailer. Boat access consisted of one public boat ramp. Bank fishing access was limited. Other descriptive characteristics for Brandy Branch Reservoir are in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Ryan and Brice 2004) included:

1. Meet with AEP personnel in 2004 to develop advanced-size channel catfish stocking program.
Action: Advanced-size (9-inch) fish were stocked in 2004, but no stocking has been conducted since due to limited availability and no private partnerships.
2. Encourage the controlling authority to make improvements to the boat ramp, access road, and parking lot.
Action: Improvements were made and a light was installed in the boat ramp parking lot to enhance security.
3. Provide information to inform anglers of fishing opportunities.
Action: News releases were issued to inform anglers of artificial fish attractor locations within the reservoir.

Harvest regulation history: Sport fishes in Brandy Branch Reservoir are currently managed with statewide regulations (Table 2).

Stocking history: Brandy Branch Reservoir was initially stocked with Florida largemouth bass, coppernose bluegill, redear sunfish, and green sunfish in 1983. The complete stocking history is presented in Table 3.

Vegetation/habitat history: Hydrilla has been the most dominant submersed vegetation species in this reservoir over the last 10 years. Coverage has been as high as 40% of the reservoir's surface in the 1990s (Ryan and Brice 2000, Ryan and Brice 1997). Native species coverage has been low to moderate, but submersed native vegetation has increased in recent years.

METHODS

Fishes were collected by electrofishing (1.0 hour at 12, 5-minute stations) and gill netting (5 net nights at 5 stations). Trap netting was not conducted. An access-point angler creel survey was conducted from December 2007 to February 2008. The creel survey consisted of 4 randomly-selected weekdays and 5 randomly-selected weekend days. Each day was partitioned into two 5-hour survey periods, which were randomly selected for each survey day. An aquatic vegetation survey was conducted in August 2007. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill nets, as the number of fish caught per net night (fish/nn). All survey sites were randomly selected and electrofishing, gill netting, vegetation, and creel 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 and SE was calculated for structural indices and IOV. Ages were determined using otoliths from 33 randomly-selected largemouth bass (range 8 to 19 inches). Largemouth bass population genetics were assessed with micro-satellite DNA analysis in 2007 and 2005 and with electrophoresis in 2003 from a minimum sample of 30 young-of-the-year fish. Source for water level data was American Electric Power Company.

RESULTS AND DISCUSSION

Habitat: Structural habitat consisted primarily of dead timber (Ryan and Brice 2000). During the 2007 survey, approximately 18% (230 acres) of the lake surface area was comprised of native submersed vegetation and 18% (221 acres) was hydrilla (Table 4). Only 15 acres of native emergent vegetation was present. During subsequent surveys on the reservoir, a trace amount of Eurasian water milfoil was detected. Also, giant salvinia was introduced by a boater in February 2008. Christmas tree fish attractor reefs have been constructed in the reservoir to help concentrate fish and increase angling success. There are currently seven attractors located in the reservoir (Appendix C).

Creel: One hundred percent of directed fishing effort by anglers was for largemouth bass during the 3-month winter creel survey period (Table 5). Total fishing effort at Brandy Branch Reservoir was 16,589 h from December 2007 through February 2008, and anglers spent an estimated \$159,770 in direct expenditures (Table 6).

Prey species: Gizzard shad, threadfin shad, and several sunfish species were present indicating good forage fish diversity. Electrofishing catch rate of gizzard shad in 2007 (3.0/h) was much lower than 2003 (33.0/h) and 2005 (9.0/h) (Figure 2). However, the electrofishing catch rate of bluegill was higher in 2007 (1,154.0/h) compared to 2003 (540.0/h) and 2005 (164.0/h), which indicated that adequate prey fish were available to predators (Figure 3). Redear sunfish also provide additional prey (Table 4).

Channel catfish: Attempts have been made in previous years to establish a reproducing channel catfish population in this reservoir through the stocking of advanced size fingerlings. These attempts have not been successful. Only three channel catfish (range 23 to 27 inches) were collected during 2008 gill netting.

Largemouth bass: The electrofishing catch rate of largemouth bass in 2007 was 62.0/h, which was less than 2005 (96.0/h) but similar to 2003 (55.0/h). Population size structure has been consistent over the last two surveys with a desirable proportion of the population in larger size groups. Genetic analysis of age-0 fish indicated that the population remained 100% Florida largemouth bass (Table 8). Growth of

largemouth bass was good. Average length at age-2 was 14.3 inches (Figure 6). No fish were sampled older than age 4. Condition of largemouth bass was good with mean W_r for most inch groups >90.

Anglers targeting largemouth bass fished 13.2 hours/acre during the winter 2007/2008 creel survey, and harvested an estimated 1.52 fish/acre (Table 7). Harvest of largemouth bass ranged from 14 to 24 inches (Figure 7), however many of these harvested fish were subsequently released following tournament weigh-in. Anglers released 71% of the legal-size black bass that they caught (Table 7).

Crappie: Trap netting was not conducted during this survey period. However, crappie abundance has historically been extremely low in this reservoir.

Fisheries management plan for Brandy Branch Reservoir, Texas

Prepared – July 2008

ISSUE 1: Hydrilla was first documented in this reservoir in 1990, but has not caused access problems. The controlling authority occasionally reports issues with keeping intake screens clean of hydrilla fragments. Eurasian water milfoil was not detected during the standard vegetation survey, but was seen during a subsequent trip to the reservoir. Giant salvinia was introduced during February 2008 by a boater. Giant salvinia has the potential to have negative impacts on boater access, fishing, fish populations, and power plant operations.

MANAGEMENT STRATEGY

1. Provide technical guidance to American Electric Power Company regarding invasive aquatic plant management.
2. Conduct annual surveys to monitor trends and estimate coverage of invasive aquatic plants.

ISSUE 2: American Electric Power, City of Longview, and Texas Parks and Wildlife have partnered in the past to place Christmas trees in the reservoir as fish attractors (Appendix C). These projects have been popular and well-received by the angling public. However, during a winter 2007/2008 angler survey, only 17% of anglers were aware of the presence of the fish attractors.

MANAGEMENT STRATEGY

1. Continue to participate in fish attractor placement projects.
2. Work with controlling authority to develop a brochure for Brandy Branch Reservoir that details angling opportunities, threats from invasive aquatic vegetation, and locations of fish attractors.
3. Recommend that information sign be constructed at the public boat ramp to allow posting of fish attractor location map, fish harvest regulations, and other pertinent information related to the reservoir.

ISSUE 3: Anglers and stakeholders need to be informed about fisheries management activities, fishing opportunities, and other issues at Brandy Branch Reservoir.

MANAGEMENT STRATEGIES

1. Continue to provide news releases to the print and broadcast media.
2. Continue to provide fisheries presentations to public regarding issues/opportunities at Brandy Branch Reservoir.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes annual invasive aquatic vegetation surveys, a supplemental electrofishing survey in 2009, and required electrofishing and gill netting surveys in 2011 and 2012, respectively (Table 11). Annual invasive vegetation surveys are necessary to monitor plant coverage and expansion and to provide management suggestions to the controlling authority. Supplemental electrofishing in 2009 will be conducted to monitor the largemouth bass and prey fish populations.

LITERATURE CITED

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

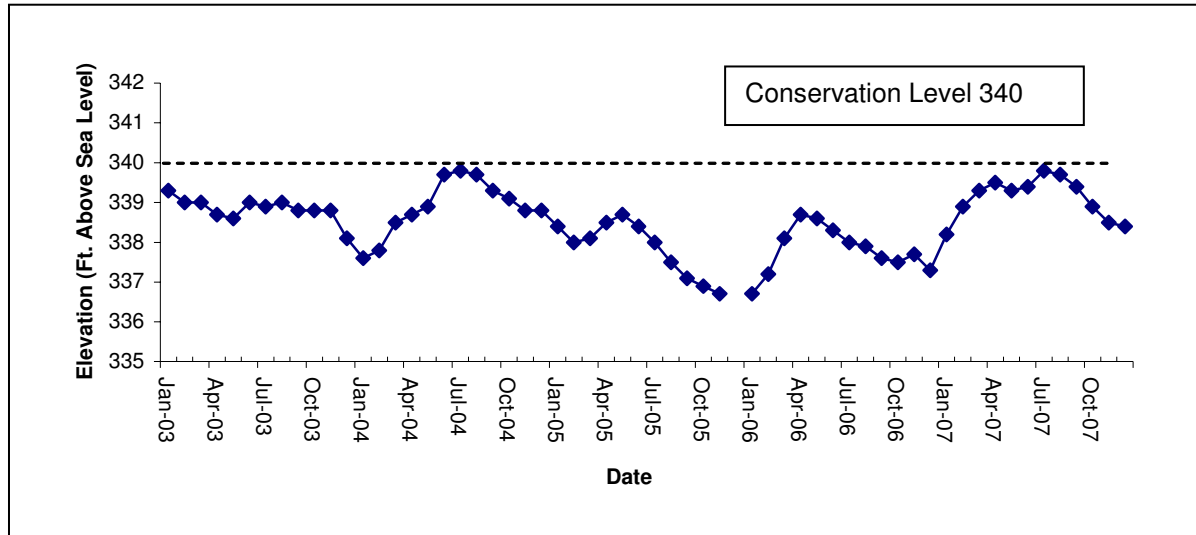


Figure 1. Monthly lake water elevations in feet above mean sea level (MSL) recorded for Brandy Branch Reservoir, Texas. Horizontal line denotes conservation pool level (340 msl).

Table 1. Characteristics of Brandy Branch Reservoir, Texas.

Characteristic	Description
Year constructed	1983
Controlling authority	American Electric Power Company (AEP)
County	Harrison
Reservoir type	Tributary/Cooling
Shoreline development index (SDI)	4.1
Conductivity	200 umhos/cm

Table 2. Harvest regulations for Brandy Branch Reservoir, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish, channel	25	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass, largemouth	5	14 – No Limit
Crappie, white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

Table 3. Stocking history of Brandy Branch Reservoir, Texas. Size categories are: FRY=<1 inch, FGL = 1-3 inches, AFGL = advanced fingerlings, ADL = adult, and UNK = unknown.

Species	Year	Number	Size
Gizzard shad	1991	1,260	UNK
	1992	1,000	UNK
	Total	2,260	
Threadfin shad	1986	1,500	AFGL
	1991	1,490	ADL
	1992	1,000	ADL
	Total	3,990	
Channel catfish	1983	81,831	AFGL
	1984	60,252	FGL
	1986	51,573	AFGL
	1986	10,435	FGL
	2004	10,624	AFGL
	2004	64,412	FGL
	Total	279,127	
Flathead catfish	1983	16	UNK
	Total	16	
Green sunfish	1983	67,200	UNK
	Total	67,200	
Bluegill	1993	416,780	FGL
	1993	9,984	FRY
	Total	426,764	
Coppernose bluegill	1983	123,000	UNK
	1985	88,014	FRY
	Total	211,014	
Redear sunfish	1983	129,450	UNK
	Total	129,450	
White crappie	1986	170	ADL
	1987	15,072	FRY
	Total	15,242	
Black crappie	1990	78,648	UNK
	Total	78,648	
Florida largemouth bass	1983	120,952	FRY
	1984	242,000	FGL
	Total	362,952	

Table 4. Survey of aquatic vegetation, Brandy Branch Reservoir, Texas, 2007. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found.

Habitat type	Acres	Percent of reservoir surface area
Native submerged vegetation	230	18.3
Native emergent vegetation	15	1.2
Hydrilla	221	17.5
Eurasian water milfoil	^a	Trace
Giant salvinia	^a	Trace

^a Not found during standard vegetation survey, but introduced or detected during other surveys.

Table 5. Percent directed angler effort by species for Brandy Branch Reservoir, Texas, December 2007 – February 2008.

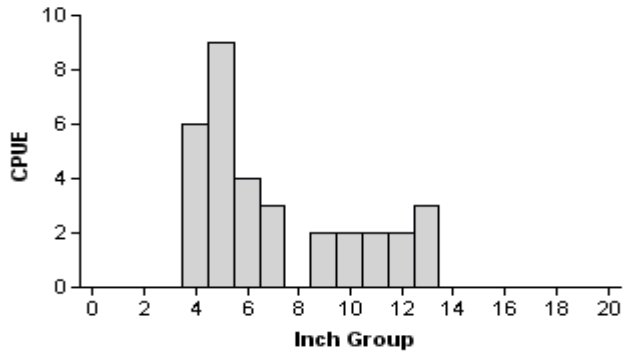
Species	Year
	December 2007 – February 2008
Largemouth bass	100

Table 6. Total fishing effort (h) for all species and total directed expenditures at Brandy Branch Reservoir, Texas, December 2007 – February 2008.

Creel Statistic	Year
	December 2007 – February 2008
Total fishing effort	16,589
Total directed expenditures	\$159,770

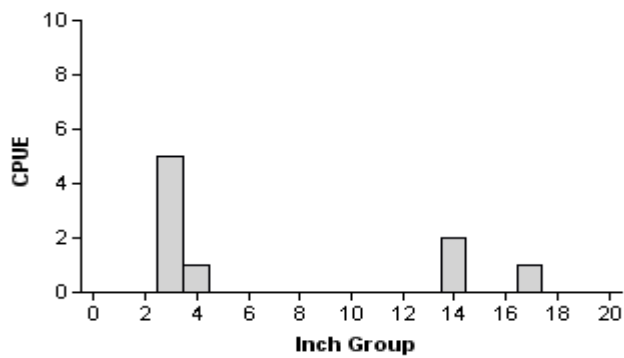
Gizzard Shad

2003



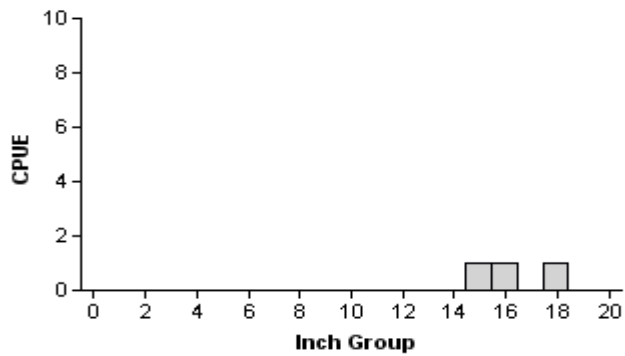
Effort = 1.0
Total CPUE = 33.0 (50; 33)
IOV = 66.67 (8.1)

2005



Effort = 1.0
Total CPUE = 9.0 (72; 9)
IOV = 66.67 (32.7)

2007



Effort = 1.0
Total CPUE = 3.0 (100; 3)
IOV = 0.0 (0)

Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Brandy Branch Reservoir, Texas, 2003, 2005, and 2007.

Bluegill

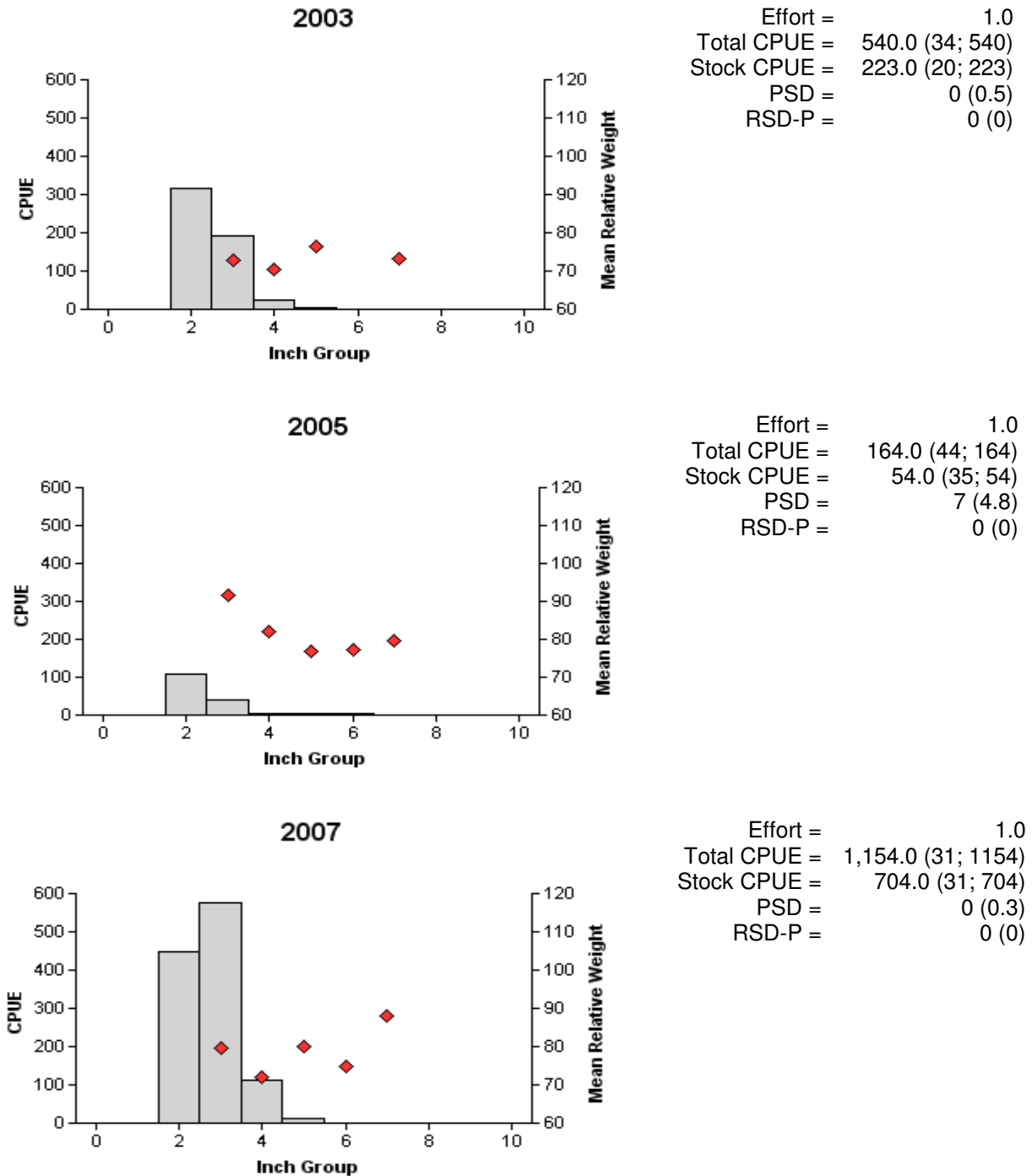


Figure 3. Number of bluegill caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Brandy Branch Reservoir, Texas, 2003, 2005, and 2007.

Redear Sunfish

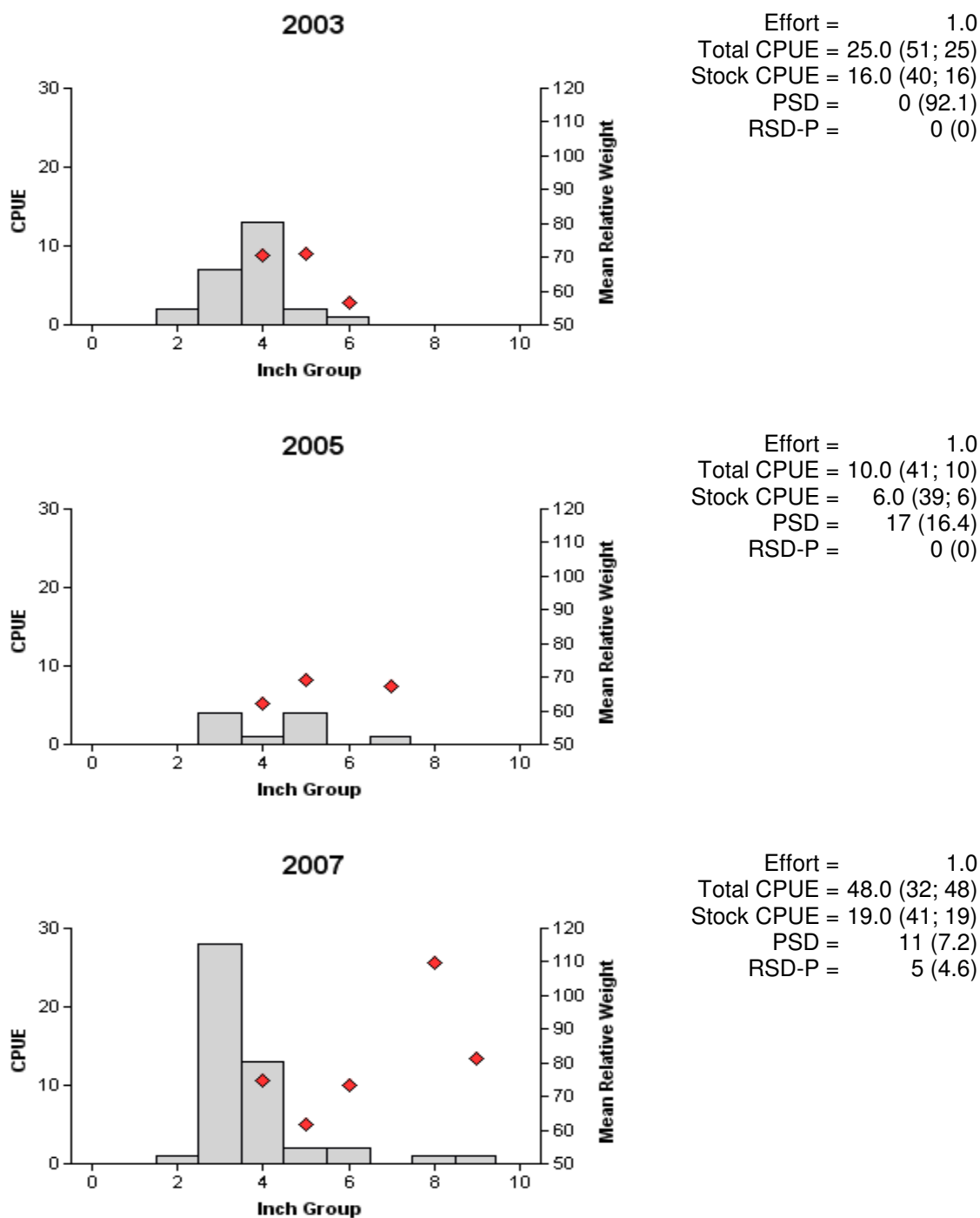
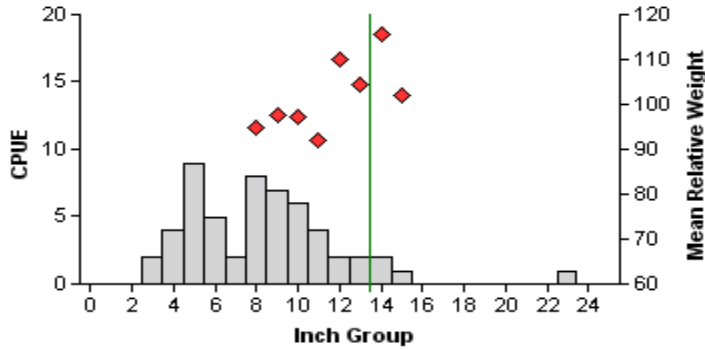


Figure 4. Number of redear sunfish caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Brandy Branch Reservoir, Texas, 2003, 2005, and 2007.

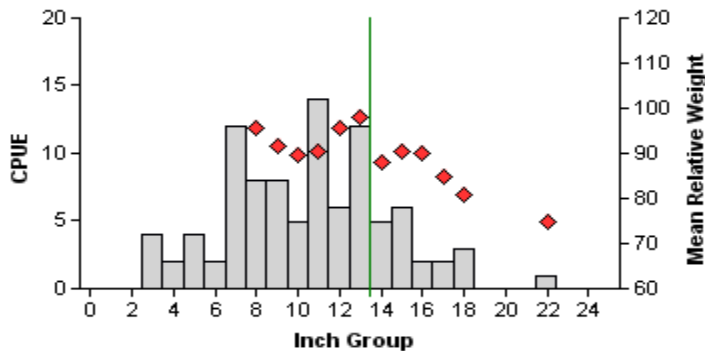
Largemouth Bass

2003



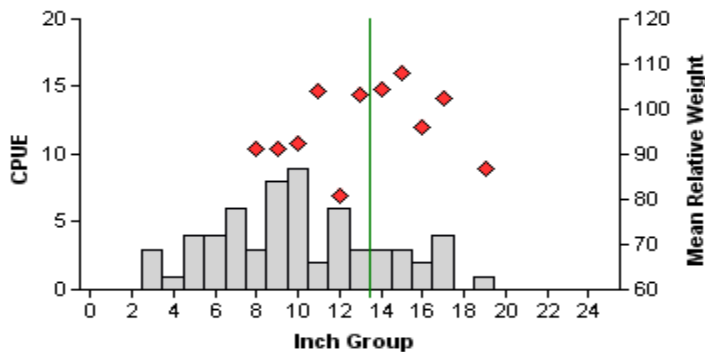
Effort = 1.0
 Total CPUE = 55.0 (16; 55)
 Stock CPUE = 33.0 (17; 33)
 CPUE-14 = 4.0 (56; 4)
 PSD = 24 (10.5)
 RSD-P = 6 (3.8)
 RSD-14 = 12 (6.6)

2005



Effort = 1.0
 Total CPUE = 96.0 (18; 96)
 Stock CPUE = 72.0 (20; 72)
 CPUE-14 = 19.0 (31; 19)
 PSD = 51 (7.5)
 RSD-P = 19 (3.9)
 RSD-14 = 26 (5.4)

2007



Effort = 1.0
 Total CPUE = 62.0 (22; 62)
 Stock CPUE = 44.0 (23; 44)
 CPUE-14 = 13.0 (31; 13)
 PSD = 50 (9.4)
 RSD-P = 23 (6.4)
 RSD-14 = 30 (6.9)

Figure 5. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Brandy Branch Reservoir, Texas, 2003, 2005, and 2007. Vertical lines indicate minimum length limit.

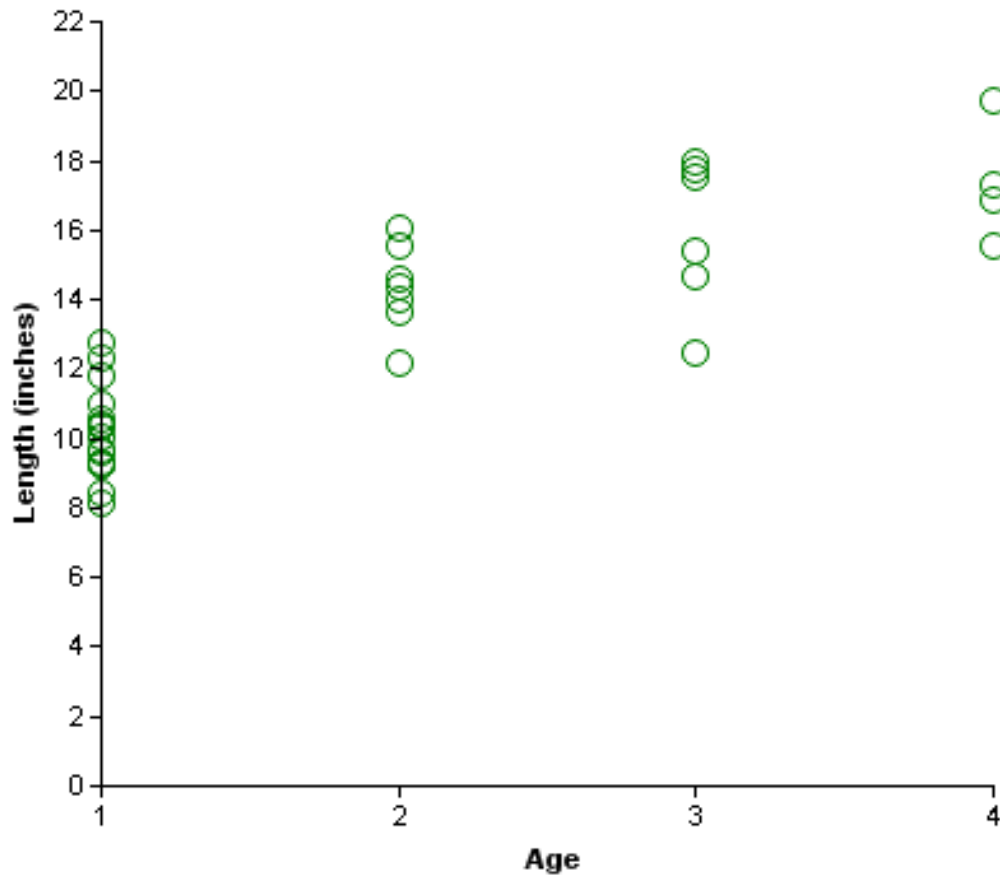


Figure 6. Length at age for largemouth bass collected by electrofishing at Brandy Branch Reservoir, Texas, November 2007.

Largemouth Bass

Table 7. Creel survey statistics for black bass at Brandy Branch Reservoir, Texas from December 2007 – February 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. Harvest estimates include fish held for tournament weigh-in and live release.

Creel Survey Statistic	Year
	Winter 2007/2008
Directed effort (h)	16,589 (36)
Directed effort/acre	13.2 (36)
Total catch per hour	0.40 (12)
Total harvest	1,912 (87)
Harvest/acre	1.52 (87)
Percent legal released	70.9

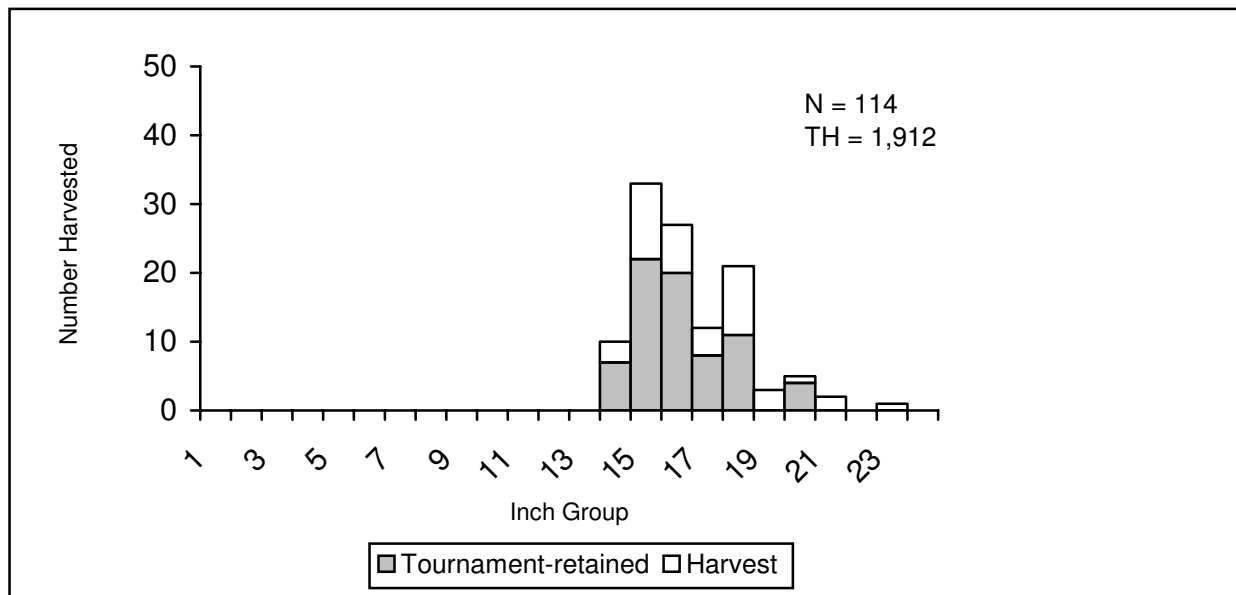


Figure 7. Length frequency of harvested largemouth bass (gray = tournament-retained, white = harvest) observed during creel surveys at Brandy Branch Reservoir, Texas, December 2007 – February 2008, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 8. Results of genetic analysis of largemouth bass collected by fall electrofishing, Brandy Branch Reservoir, Texas, 2003, 2005, and 2007. FLMB = Florida largemouth bass, NLMB = Northern largemouth bass, F1 = first generation hybrid between a FLMB and a NLMB, Fx = second or higher generation hybrid between a FLMB and a NLMB.

Year	Sample size	Genotype				% FLMB alleles	% pure FLMB
		FLMB	F1	Fx	NLMB		
2003	33	33	0	0	0	100.0	100.0
2005	30	30	^a	^a	0	99.5	100.0
2007	30	30	^a	^a	0	99.6	100.0

^a Determination of hybrid status not conducted.

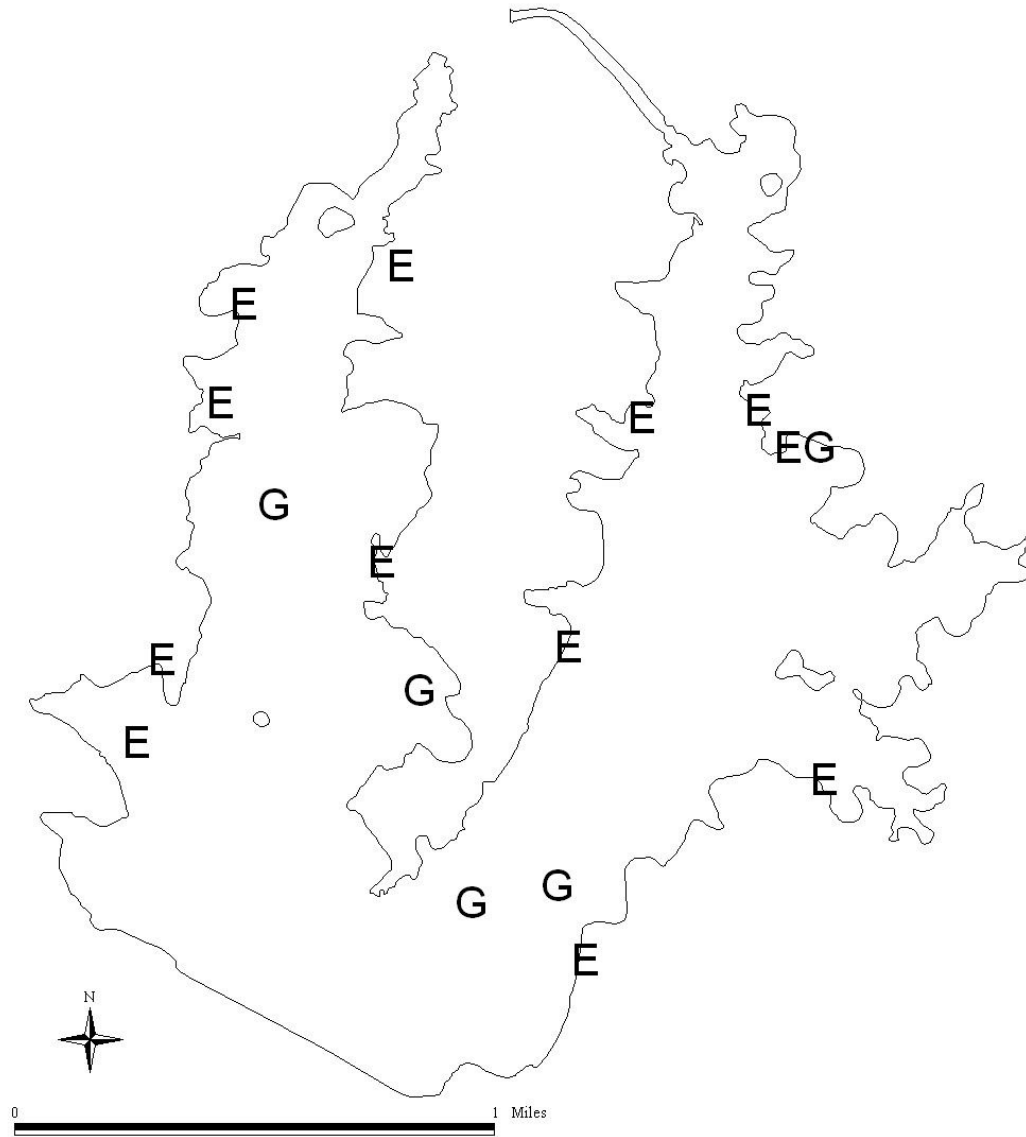
Table 9. Proposed sampling schedule for Brandy Branch Reservoir, Texas. Gill netting surveys are conducted in the spring, vegetation surveys are conducted in the summer, and electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey Year	Vegetation	Electrofisher	Gill Net	Report
Summer 2008 - Spring 2009	A			
Summer 2009 - Spring 2010	A	A		
Summer 2010 - Spring 2011	A			
Summer 2011 - Spring 2012	S	S	S	S

APPENDIX A

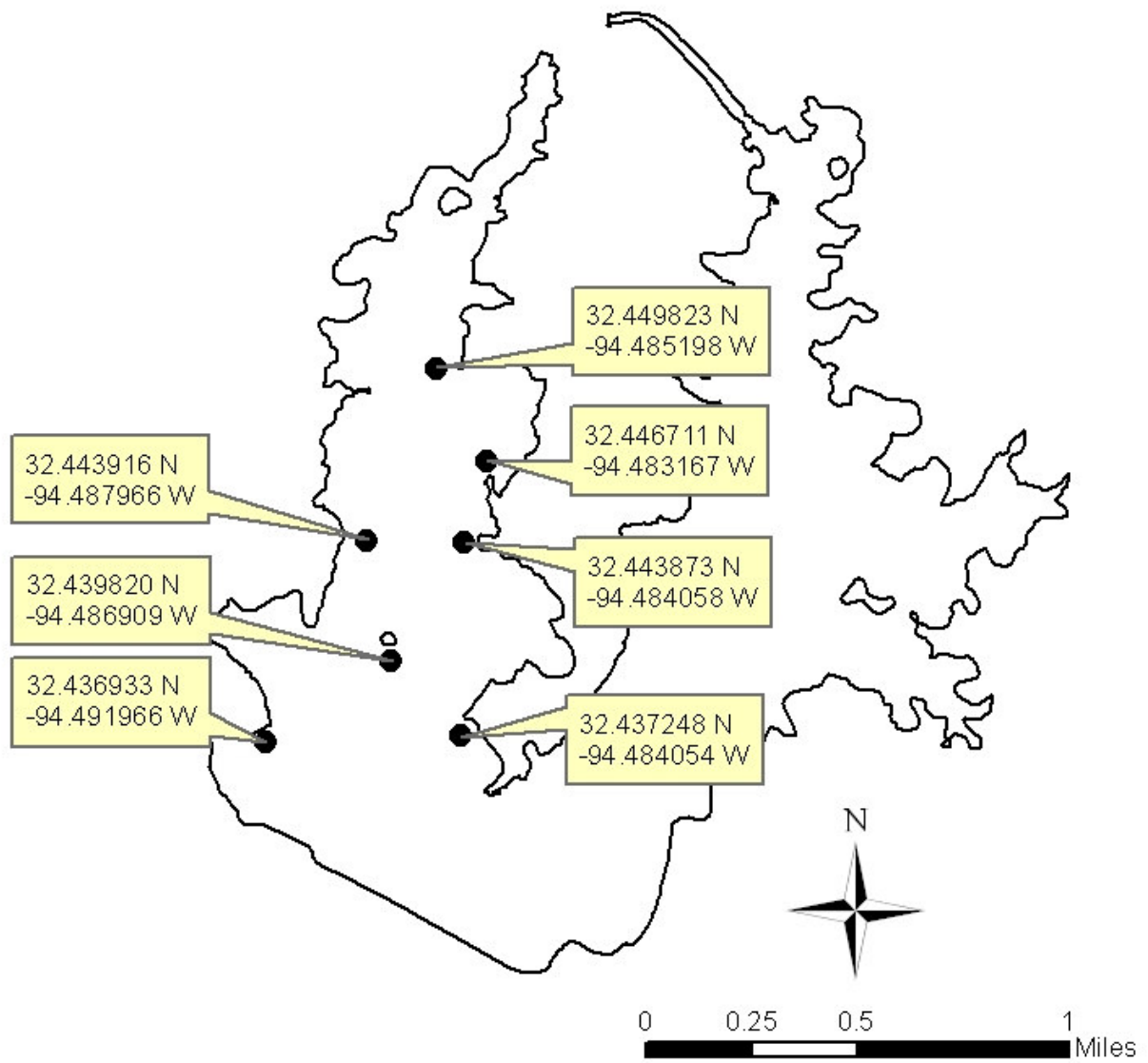
Number (N) and catch rate (CPUE) of all target species collected from all gear types from Brandy Branch Reservoir, Texas, 2007-2008. Trap netting was not conducted during this survey period.

Species	Gill Netting		Electrofishing	
	N	CPUE	N	CPUE
Gizzard shad			3	3.0
Threadfin shad			16	16.0
Warmouth			6	6.0
Bluegill			1,154	1,154.0
Longear sunfish			3	3.0
Redear sunfish			48	48.0
Spotted sunfish			3	3.0
Yellow bullhead	1	0.2		
Channel catfish	3	0.6		
Largemouth bass			62	62.0

APPENDIX B

Location of sampling sites, Brandy Branch Reservoir, Texas, 2007-2008. Gill net and electrofishing stations are indicated by G and E, respectively.

APPENDIX C



Locations of fish attractors, Brandy Branch Reservoir, Texas.